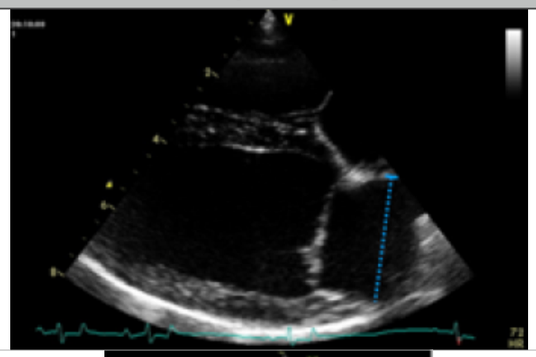
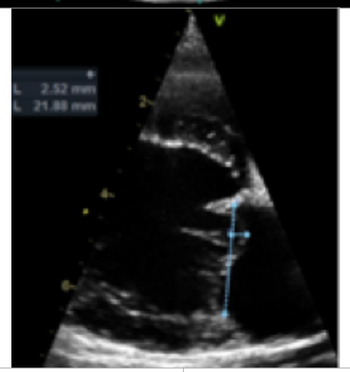
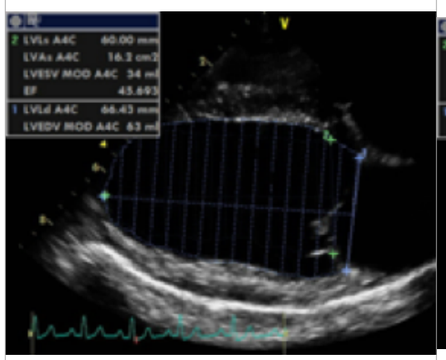
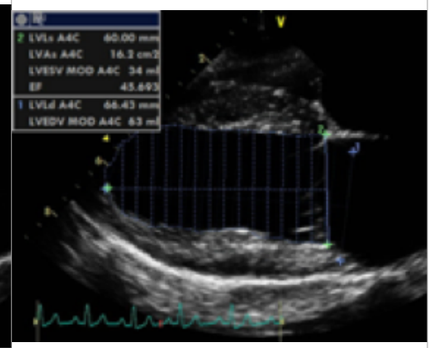
Requirements for echocardiographic measurements

View		Description		Example images		Assessment points
Right parasternal long axis 4 chamber view	**Left atrium**	**LAD**	Measurement of maximal left atrial size			• Measurement taken when left atrial chamber is largest (before mitral valve opening) • Measure from tissue blood interface of the interatrial septum to tissue blood interface of the lateral atrial wall • Approximately midway between the annulus and the roof of the LA • Measurement line should be parallel to mitral valve annulus
	Mitral valve prolapse (small breed only)	**MVP**	Measure maximal mitral valve prolapse			• Carefully evaluate hinge points of mitral valve • Base line from hinge point to hinge point • Operator selected optimal frame and point of maximum excursion • Measurement perpendicular from baseline to leading edge (atrial side) of maximal prolapse
	LV volume	**LVEDV LVESV EF%**	Measurement of LV end-diastolic volume and end-systolic volume and ejection fraction			• Simpson's Method of Discs • Select appropriate image to include clear view of the LV apex • Trace LV volume from septal mitral valve annulus hinge point, following the endocardial border to the lateral mitral valve annulus hinge point • Diastolic frame is at the peak of the QRS • Systolic frame is where the LV chamber is smallest, before opening of the mitral valve • End diastolic volume and end systolic volume are measured from the same cardiac cycle • Measure at least 3 cardiac cycles

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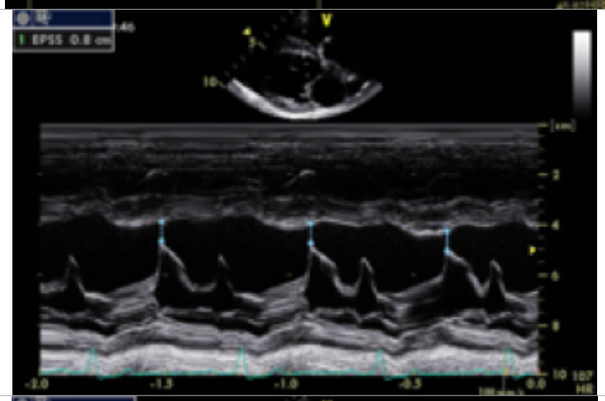
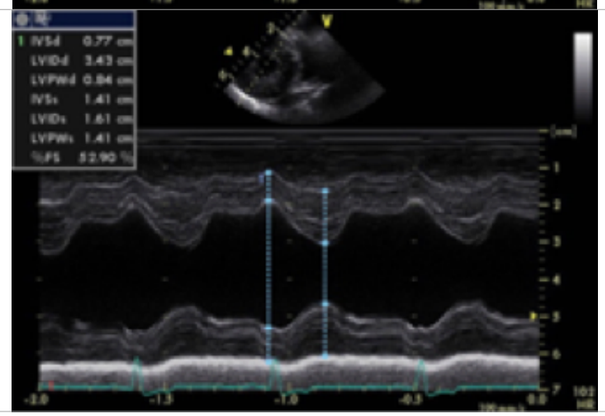
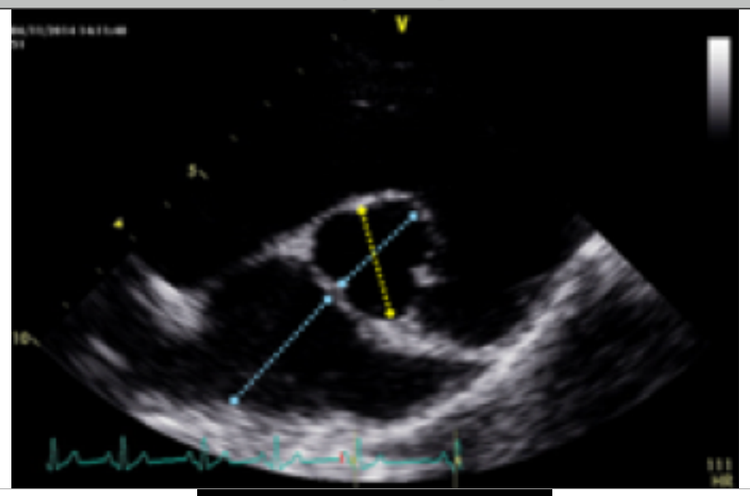
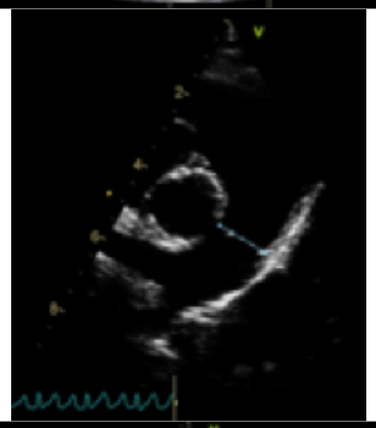
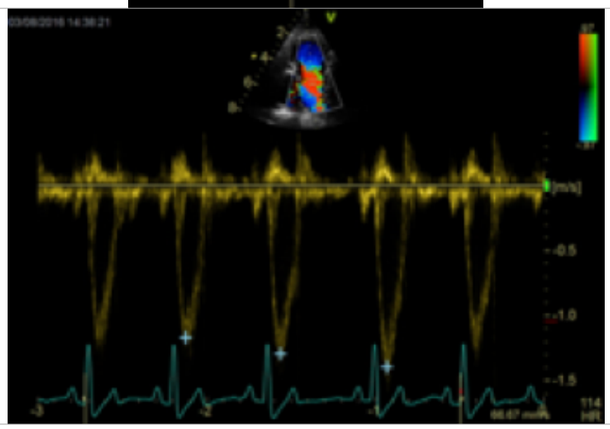
Right parasternal long axis 5 chamber view	**LV outflow tract**	**Ao-Lax**	Measurement of aortic annulus diameter		• Measure the internal aortic dimension at valve hinge-point level • Inner-edge to inner-edge technique
	M mode mitral valve	**EPSS**	Measurement of EPSS		• Shortest distance from the E-point of the mitral valve • Measurement from within the tip of the valve leaflet to the tissue-blood interface of the inter ventricular septum • Take at least 3 measurements
Right parasternal short axis view	**M mode chamber**	**LVIDD LVIDS FS% IVSD LVFWD**	M mode assessment of chamber size and fractional shortening		• Measurements of wall thickness should include both endocardial borders • Measurement of chamber size is at the tissue-blood interface • Diastolic measurement at peak of QRS • Systolic measurement at peak excursion of the interventricular septum • Measure at least 3 cardiac cycles

View		Description		Example images	Assessment points
Right parasternal short axis view	**Heart base - LA:Ao**	**LA:Ao**	Measurement of LA:Ao		• Measure first clear frame after aortic valve closure (Ao-max) using tissue-blood interface <u>Aorta</u> • Measure right coronary ostium to commissure of left- and non-coronary cusps (blue) *Or* • Measure commissure of right- and non-coronary cusps to left coronary ostium (yellow) <u>Left atrium</u> • Measure from atrial side of commissure of left- and non-coronary cusps to left atrial free wall, approximately parallel to aortic commissure, avoiding pulmonary veins.
	Heart base - pulmonary artery	**PV**	Measurement of pulmonic annulus dimension		• Measure the internal pulmonary artery dimension at the hinge points of the valve • Use the first diastolic frame of visible hinge points • Use inner-edge to inner-edge technique (tissue-blood interface).
	Heart base - pulmonary artery	**PA Vmax**	Measure pulsed wave Doppler trace of pulmonic outflow		• Measure peak velocity of flow • Measure at the tip of the spectral trace within the dense Doppler signal (not at the tip of the faint edge of the signal nor within the dense signal itself) • Measure at least 3 cardiac cycles

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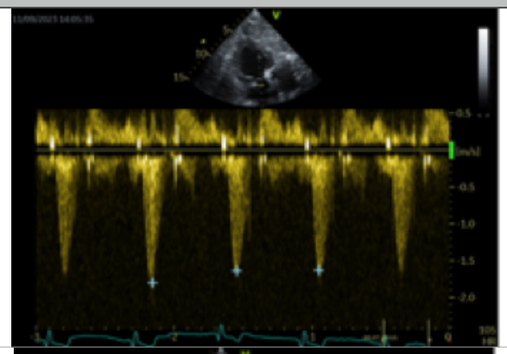
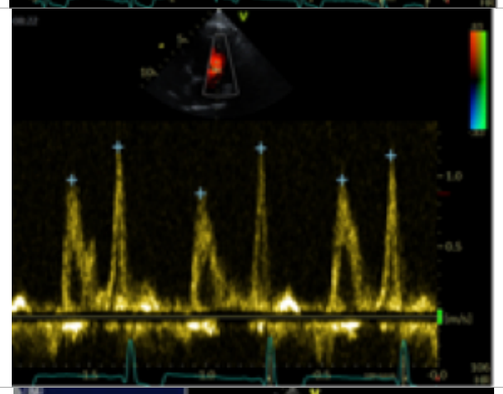
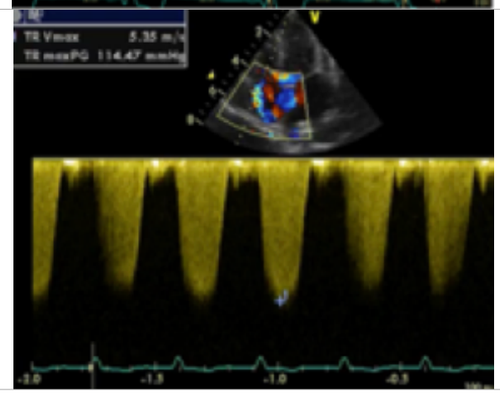
Subcostal view	**LVOT**	**Ao Vmax**	Measure continuous wave Doppler trace of aortic outflow		• Measure peak velocity of flow • Measure at the tip of the spectral trace within the dense Doppler signal (not at the tip of the faint edge of the signal nor within the dense signal itself) • Measure at least 3 cardiac cycles
Left parasternal 4 chamber view	**Mitral inflow**	**MV:E MV:A**	Measure pulsed wave Doppler trace of mitral inflow: E and A velocity		• Measurement of peak velocity of early diastolic filling (E) and peak velocity of atrial filling (A) • Measure at the tip of the spectral trace within the dense Doppler signal (not at the tip of the faint edge of the signal nor within the dense signal itself) • Measure at least 3 cardiac cycles
Left parasternal 5 chamber view	**Right atrium**	**TR Vmax**	Measure continuous wave Doppler of tricuspid regurgitation		• Measure peak velocity of flow • Measure at the tip of the spectral trace within the dense Doppler signal (not at the tip of the faint edge of the signal nor within the dense signal itself) • Measure at least 3 cardiac cycles