

Evaluation of point-of-care ultrasound performed by non-cardiologists for subjective assessment of cardiac chambers size in dogs presented to the cardiology service

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Introduction

- Cardiac point-of-care ultrasound (POCUS) is a rapid and non-invasive method to screen for gross cardiac pathology.
- In humans cardiac POCUS is used to assess cardiac chambers size and volume status^{1,2}.
- POCUS left atrial (LA) enlargement assessment helps in detection of leftsided congestive heart failure in companion animals^{3,4}.
- POCUS combined with physical examination improves the detection of feline occult heart disease⁵.
- This study evaluated the agreement between POCUS performed by trained clinicians and echocardiography by a board-certified cardiologist to assess cardiac chamber size changes in dogs presented to the cardiology service

Methods

- Descriptive study – March 2019 to January 2020.
- Two clinicians received a 2-hour theoretical and 6-hour practical course in cardiac POCUS.
- Clinicians were informed about the dogs' presenting clinical signs but blinded to the underlying structural heart disease and current medical treatment.
- Cardiac POCUS and physical examination were performed on each dog. LA, left ventricular (LV), and right heart (RH) size were scored subjectively to be small, normal or enlarged.
- Subjective assessments were compared to echocardiographic results, performed by the cardiologist.

Results

- 51 dogs were included: 5 with physiological murmurs and without structural heart disease, 46 with heart disease.

	LA		LV		RH	
	Cardiologist	Clinician	Cardiologist	Clinician	Cardiologist	Clinician
Small chamber's size	1/51	Small 100% Normal 0% Increased 0%	1/51	Small 0% Normal 100% Increased 0%	0/51	NA NA NA
Normal chamber's size	21/51	Small 0% Normal 100% Increased 0%	23/51	Small 0% Normal 87% Increased 13%	42/51	Small 0% Normal 97.6% Increased 2.4%
Increased chamber's size	29/51	Small 0% Normal 3.5% Increased 96.5%	27/51	Small 0% Normal 14.8% Increased 85.2%	9/51	Small 0% Normal 55.6% Increased 44.4%
Overall agreement POCUS/Echocardiography	50/51 (98%)		43/51 (84.3%)		45/51 (88.2%)	
Comments	There was an excellent agreement between echocardiographic measurement and subjective eyeball assesement of LA.		LV size was overestimated in 3/23 dogs who had no evidence of LV enlargement on echocardiography. LV enlargement was correctly identified with POCUS in 23/27 dogs.		Only 9 dogs displayed RH enlargement, which was correctly identified on POCUS in only 5/9 dogs.	

Cardiac POCUS for subjective assessment of LA and LV size by clinicians having received an 8-hour training has good agreement with echocardiography results performed by a cardiologist.

Caution seems warranted for the assessment of RH size, due to the proportionally high failure to detect RH enlargement. However, our population's low incidence of right heart disease prevents drawing strong conclusions.

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