



**PATIENT**

Zora Wright

**SPECIES**

Canine

**BREED**

Boxer

**SEX**

Female Spayed

**AGE**

9 years

**WEIGHT**

67lbs

**INTERPRETED BY**

Maggie Machen  
Lamy, DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

Kim Liedberg

**HOSPITAL NAME**

SVS Imaging

**REFERRING VET**

Dr. Courter

**INVOICE**

20845

**DATE**

9/1/21

**PRESENTING CLINICAL SIGNS**

History: Noted gallop rhythm on exam, no murmur present. Recent history of fatigue on walks.

-ECG (Idexx): Normal sinus rhythm with intermittent, single ventricular premature beats. One ventricular couplet identified.

-Radiographs: Revealed an overall mildly enlarged heart with evidence of left atrial enlargement.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Mild left ventricular dilation with decreased systolic function. Decreased LV wall thickness with increased sphericity. Moderate left atrial enlargement. The mitral valve appears thickened, with no obvious prolapse into the left atrial lumen. Moderate central mitral regurgitation. Mild tricuspid regurgitation. Mild right atrial and ventricular dilation. TR velocity consistent with mild pulmonary hypertension. The aortic valve is normal in morphology and mobility. No subvalvular ridge present; normal LVOT velocity. No aortic insufficiency. Normal pulmonic valve with no pulmonic insufficiency seen. Normal PA outflow velocities. No pericardial or pleural effusion noted. No obvious cardiac tumors.

**CARDIAC CHART**

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	4.7	3.3	1.7	1.78	16	32	1.20
CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA 2D short axis Base view (cm)	LVIDd Avg; 2D and m-mode short axis (cm)	LVIDs Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
PATIENT	166	1.0	0.74	30.4	4.2	6.0	5.1y
*Normal chamber parameters expressed as a mean value (SD)				3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
<b>BODY WEIGHT DEPENDENT PARAMETERS</b>				5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
*Note: All measurements based upon multi-modal images and methods. An average value is reported.				10	1.50 (3.8)	3.27 (3.5)	2.06 (3.1)
				15	1.83 (2.0)	3.71 (2.4)	2.43 (2.1)
				20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
				25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
				30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
				35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
				40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
				50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

Adapted from June Boon, Veterinary Echocardiography, 1998  
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435  
Hansson et al, Vet Rad and Ultrasound 2002  
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

Unfortunately, this patient has changes most consistent with occult Dilated Cardiomyopathy (DCM). There is a decline in systolic function, accompanied by mild LV dilation and increased sphericity. The right heart is also affected with RA and RV enlargement. Finally, the LA is moderately dilated, indicating relatively low risk for imminent complication; however, risk for



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progression to clinical signs is elevated in the future. Going forward there will be risk for development of right or left sided congestive heart failure, malignant arrhythmias (AF, VT), collapse and/or sudden death.

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Systolic failure can be primary in nature (DCM/ARVC) or secondary to taurine deficiency, certain drugs such as Doxorubicin, myocarditis, hypothyroidism, tachycardia-induced cardiomyopathy, or infiltrative disease such as lymphoma. In a Boxer, primary disease is certainly possible. That being said, consider testing for primary causes that may be treatable such as a full thyroid panel. A cTnI level can be submitted to further investigate possible infiltrative/inflammatory damage (myocarditis; not suspected). Finally, a taurine level may be helpful (to screen for concurrent malabsorption issue). Regardless of result, I would institute a taurine supplement to cover all bases. A thorough diet history is recommended, assessing for grain free, boutique brands and/or exotic ingredient options with a diet change if indicated. Regardless of cause, prognosis is guarded long term with risk for complications going forward.

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Based upon these findings, recommend Pimobendan as below. Additionally, a baseline BP is recommended with institution of an ACEI if >150mmHg. Monitor for development of a cough, labored breathing, exercise intolerance or collapse episodes in the future. Monitoring of sleeping breathing rates at home is recommended to screen for progression in the future. Mild activity restriction is advised. Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

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Treatment and follow up for the VPCs should be dictated by the ECG report. A holter may be indicated.

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Once on the medication for 3-5 days, anesthetic risk is considered moderate if needed. Ideally further evaluation of a possible arrhythmia is recommended prior to proceeding. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol or alfaxalone induction, isoflurane gas) are recommended. Pre-oxygenate for 5-10 minutes prior to induction. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Mild IV fluid restriction is recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

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**PLAN**

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Institute Pimobendan 0.25-0.3mg/kg PO q12h. Baseline BP recommended. If >150mmHg, institute ACEI 0.5mg/kg PO q12h. Institute taurine supplement 1000mg PO q12h. Consider thyroid panel, cTnI, taurine level as discussed. A thorough diet history with avoidance of BEG options is recommended. Highly recommend extended tracing ECG and/or holter monitor in this case.

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Consider a holter, etc as dictated by the ECG report.

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A recheck echocardiogram is recommended in 4-6 months to assess for progression, sooner if clinical signs arise.



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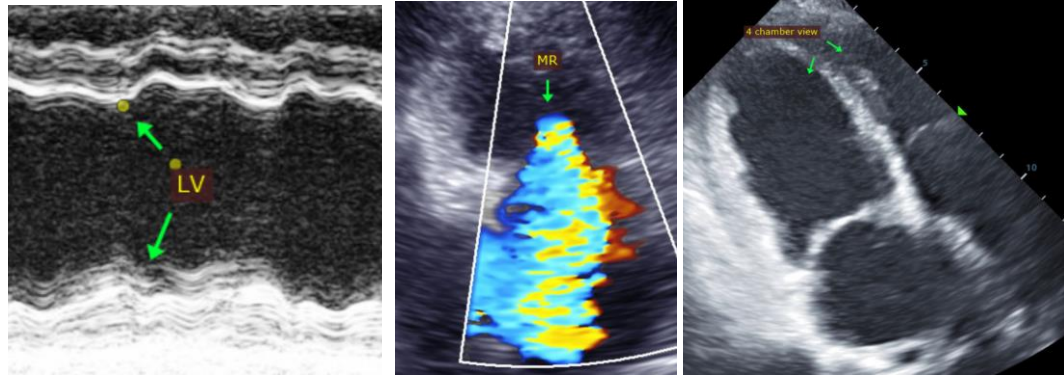
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**IMAGES**



The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

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