



## PATIENT

Ginger Rinkin

## SPECIES

Canine

## BREED

Chihuahua Mix

## SEX

Female Spayed

## AGE

12.1 years

## WEIGHT

11.4lbs

## INTERPRETED BY

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

## IMAGING PERFORMED BY

Amanda Lacey-Crook, SDEP

## HOSPITAL NAME

Rivers Edge Pet Medical Center

## REFERRING VET

Dr. Gray

## INVOICE

25391

## DATE

7/18/22

## PRESENTING CLINICAL SIGNS

History: History of heart murmur - seen 5/21/22: grade 3/6, today presents for worsening/uncontrolled cough, grade 4-5/6 and constipation owing to hydrocodone therapy.  
-Current medications: Pimobendan 2.5mg 1/2-tab BID and hydrocodone syrup 0.5mg TID.  
-Blood pressure: 154, 152, 154mmHg.

**RADIOGRAPHIC FINDINGS** \*NOTE: Images submitted for supplemental cardiac information only.  
Mild cardiomegaly. No obvious evidence of CHF.

## ELECTROCARDIOGRAPHIC FINDINGS

A six lead ECG is available at 25mm/s; 10mm/mV. The average heart rate is 188bpm (range 166-214bpm). The rhythm is sinus in origin, with a p for every QRS complex and vice versa. The P wave morphology is positive with a normal dimension. Normal PR. The QRS morphology is positive with normal dimension. MEA is normal. No ectopic beats, pauses or dysrhythmias observed.

ECG diagnosis: Normal sinus rhythm with respiratory variation.

## ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets (anterior>>posterior) with mild prolapse into the left atrial lumen. Moderate anterior-directed mitral regurgitation with moderate left atrial dilation. Normal MR velocity. Mildly increased LV with hyperdynamic myocardial function. The tricuspid valve appears mildly thickened with mild to moderate tricuspid regurgitation. Velocity consistent with moderate pulmonary hypertension (PG 50mmHg). Mild right atrial and ventricular prominence. The pulmonic and aortic valves are normal in morphology and mobility. Normal pulmonic outflow velocities. Normal aortic outflow velocities. No pulmonic or aortic insufficiency. No pericardial or pleural effusion noted. No cardiac tumors observed.

## 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	5.9	3.4	NM	1.7	45	79	NM
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	NM	0.95	1.0	5.2	2.3	3.0	1.5
*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)
<i>*Note: All measurements based upon multi-modal images and methods. An average value is reported.</i>				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)

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



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Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995	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)

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## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Chronic degenerative valve disease causing moderate mitral and tricuspid regurgitation. Moderate left atrial enlargement indicates the risk for imminent complication is low; however, there is risk for progression to spontaneous congestive heart failure in the future. TR and moderate PAH are also identified, likely due to respiratory disease in this signalment. Given the combination of MV disease and moderate pulmonary arterial hypertension I would continue Pimobendan at this time in this patient as below. Sildenafil is not warranted in the absence of exertional dyspnea or syncope; however, if either should develop this should also be utilized. Prognosis is guarded at this stage (B2). The ECG is unremarkable with a normal sinus tachycardia.

Given these findings, the cough is likely multi-factorial in origin. The left atrial enlargement may partially be causing mainstem bronchi compression, however this breed is highly predisposed to both upper and lower airway disease as well and primary respiratory causes for coughing (tracheal collapse seen on films, respiratory infection, etc.) should also be considered. Pulmonary antibiotics, hydrocodone, etc. may be useful for acute onset of a primary airway cough.

Anesthetic risk is considered reasonable. Cardiac protective drug choices (opioid/benzodiazepine premedication, propofol induction, etc.) are recommended. Monitor for arrhythmias, hypotension, and hypoxia both intra and post-operatively and intervene as necessary. Judicious IV fluid rates are recommended to avoid fluid overload. Avoid heart rate stimulating drugs such as atropine unless clinically indicated.

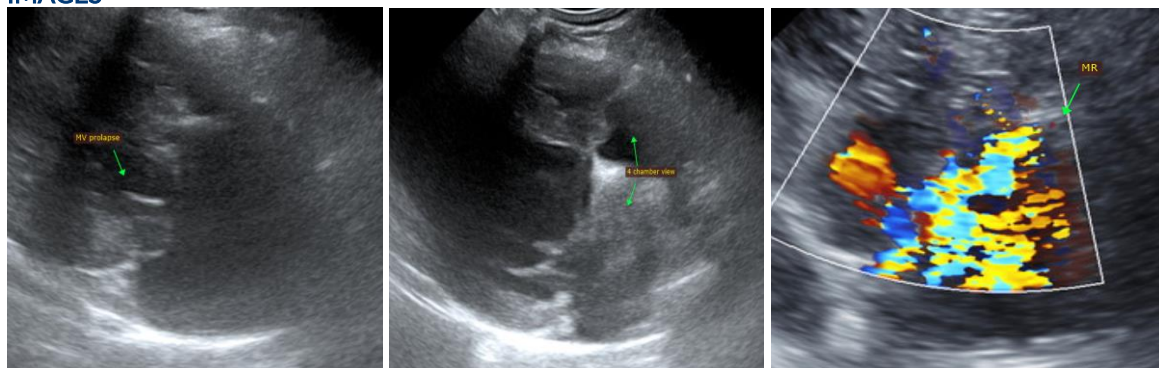
Omega fatty acid supplementation and mild salt restriction may also be of some long-term benefit. Monitor for development of a progressive cough, labored breathing, exercise intolerance or collapse episodes.

## PLAN

Administer Pimobendan, 0.25-0.3mg/kg PO BID. Continue Hydrocodone. Consider further respiratory treatment/work up as discussed. If syncope develops, institute Sildenafil 1-2mg/kg PO q12h.

Recommend monitor for progression with a recheck echocardiogram in 6 months, sooner if any development of clinical signs.

## IMAGES





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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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