



**PATIENT**

Clyde Urfirer

**PRESENTING CLINICAL SIGNS**

History: Clyde presented to the hospital for a check up and dental consultation. As per owner, previous vet diagnosed some cardiac disease and mentioned that he is not a candidate for anesthesia, however, no records were available at the time. Patient has been taking Vetmedin. A heart murmur grade 2/6 was detected.

**SPECIES**

Canine

**ULTRASONOGRAPHIC EXAMINATION OF THE HEART**

**BREED**

Mixed

**SEX**

Neutered male

**AGE**

13 years

**WEIGHT**

11.5 lbs

**INTERPRETED BY**

Lisa Carioto, DVM,  
DVSc, Diplomate  
ACVIM

**IMAGING PERFORMED BY**

Dr. Kim

**HOSPITAL NAME**

Ridgefield Park AH

**REFERRING VET**

Dr. Kim

**INVOICE**

31781

**DATE**

7/18/22

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swedish)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	5.78	NM	NM	1.8	46	NM	NM
CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA (2D long axis Base view)	LVIDd (Avg; 2D and m-mode short axis)	LVIDs (Avg; 2D and m-mode short axis)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6				
PATIENT	80-120	1.65	1.19	5.23	2.36	2.96	Long axis

Adapted from June Boon, Veterinary Echocardiography, 1998  
Sisson D et al. JVIM 1991; 5: 232, and Jacobs et al. Am J Vet Res 1985; 46:1705

**Electrocardiogram** (lead II) performed during echocardiogram

Sinus arrhythmia

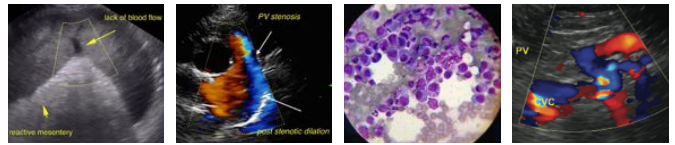
**Echocardiographic findings**

*Mitral valve*

- Mild (posterior) and severe (septal) thickening and irregularity; consistent with myxomatous degeneration
- Moderate prolapse of the septal leaflet
- Severe mitral regurgitation.
- Mild to moderate left auricular enlargement.
- LA: Ao ratio – mild increase
- LA normalized for BW (LAN = 1.3), moderate enlargement
- LVIDd normalized for BW (LVIDND = 1.8), mild enlargement
- LVIDs normalized for BW (LVIDNs = 0.96); within normal limits (WNL)



<b>PATIENT</b>	<i>Aortic valve</i>
Clyde Urfirer	<ul style="list-style-type: none"> <li>No abnormalities</li> <li>No aortic insufficiency</li> </ul>
<b>SPECIES</b>	<i>Tricuspid valve</i>
Canine	<ul style="list-style-type: none"> <li>Very mild (posterior) to mild (septal) thickening and irregularity; consistent with myxomatous degeneration</li> </ul>
<b>BREED</b>	<ul style="list-style-type: none"> <li>Very mild prolapse of the septal leaflet.</li> </ul>
Mixed	<ul style="list-style-type: none"> <li>No right ventricular or atrial enlargement.</li> </ul>
<b>SEX</b>	<i>Pulmonic valve</i>
Neutered male	<ul style="list-style-type: none"> <li>No abnormalities</li> <li>No pulmonary insufficiency.</li> </ul>
<b>AGE</b>	<ul style="list-style-type: none"> <li>Main pulmonary artery within normal limits.</li> </ul>
13 years	<ul style="list-style-type: none"> <li>Pulmonary artery - bifurcation, no abnormalities.</li> <li>Pulmonary artery: aortic ratio within normal limits.</li> </ul>
<b>WEIGHT</b>	<ul style="list-style-type: none"> <li>No signs of heart worm.</li> </ul>
11.5 lbs	<i>Other</i>
<b>INTERPRETED BY</b>	<ul style="list-style-type: none"> <li>No signs of pericardial or pleural effusion</li> <li>No evidence of pulmonary edema.</li> <li>No obvious signs of a mass.</li> <li></li> </ul>
Lisa Carioto, DVM, DVSc, Diplomate ACVIM	
<b>IMAGING PERFORMED BY</b>	<b>ULTRASONOGRAPHIC FINDINGS</b>
Dr. Kim	<ul style="list-style-type: none"> <li>Myxomatous degeneration of the mitral (moderate to severe) and tricuspid (mild) valves, ACVIM stage B2, with moderate left atrial enlargement and mild left ventricular enlargement.</li> </ul>
<b>HOSPITAL NAME</b>	<ul style="list-style-type: none"> <li>The results of the echocardiogram meet the criteria of the EPIC study, which demonstrated that the administration of pimobendan (Vetmedin) can help slow the progression of Clyde's heart disease.</li> </ul>
Ridgefield Park AH	<ul style="list-style-type: none"> <li>There are increased risks associated with general anesthesia, however, it is best to pursue general anesthesia while Clyde's heart disease is stable and prevent him from experiencing pain associated with periodontal disease. An anesthesia protocol will be suggested to minimize the risks.</li> <li></li> </ul>
<b>REFERRING VET</b>	
Dr. Kim	
<b>INVOICE</b>	
31781	<b><u>INTERPRETATION OF THE FINDINGS &amp; FURTHER RECOMMENDATIONS</u></b>
<b>DATE</b>	Suggestions/recommendations include:
7/18/22	<ul style="list-style-type: none"> <li>Evaluation of arterial blood pressure</li> </ul>



<b>PATIENT</b>	<ul style="list-style-type: none"> <li>pimobendan (Vetmedin) at a dose of 0.25-0.30 mg/kg PO every 12 hours. If he has a sensitive GI system, the dose should be started at 0.10 mg/kg PO every 12 hours for 3 days prior to increasing to the full dose. Administer with a small amount of food to decrease nausea.</li> </ul>
Clyde Urfirer	
<b>SPECIES</b>	<ul style="list-style-type: none"> <li>Monitoring of the resting (sleeping) respiratory rate (RRR) is highly recommended once a day. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, <u>or</u> if there is a gradual increase (over a day or two) toward 30 bpm, the patient should be evaluated immediately for congestive heart failure and the appropriate treatment initiated.</li> </ul>
Canine	
<b>BREED</b>	<ul style="list-style-type: none"> <li>Other clinical signs clients should monitor for include coughing (particularly at night), fatigue, lethargy, decreased exercise tolerance (i.e., not being able to walk for as long before becoming tired, or “running out of breath” while playing, or going up and down stairs, as well as syncope (collapsing or fainting spells). Restlessness, or agitation during the night, or being unable to find a comfortable position to sleep are also very common clinical signs.</li> </ul>
Mixed	
<b>SEX</b>	<ul style="list-style-type: none"> <li>Mild salt restriction is suggested (less than 0.9 grams/1000 kcal of food). Monitor salt content in treats.</li> </ul>
Neutered male	
<b>AGE</b>	<ul style="list-style-type: none"> <li>Omega-3 fatty acids may be helpful (EPA = 40 mg/kg/day and DHA = 25 mg/kg/day); gradual up-titration of the dose is suggested to decrease risk of gastrointestinal effects. However, <i>they should not be introduced at the same time as pimobendan.</i></li> </ul>
13 years	
<b>WEIGHT</b>	<ul style="list-style-type: none"> <li>Monitoring for progression of heart disease with a re-evaluation of an echocardiogram every 6 to 8 months, or sooner if clinical signs develop, is recommended.</li> <li>The dentistry should be postponed, if possible if Clyde is not painful, for approximately 2-4 weeks, while initiating therapy with pimobendan, as this will help stabilize his heart prior to the procedure. Analgesics and antibiotics may be considered during this time to improve his comfort.</li> </ul>
11.5 lbs	
<b>INTERPRETED BY</b>	<p><b>Example of general anesthesia protocol for a dentistry</b></p> <ul style="list-style-type: none"> <li>Premedication with an opioid, such as hydromorphone, butorphanol, or methadone, +/- low dose of midazolam. Avoid dexmedetomidine (label indications).</li> <li>Avoid acepromazine, atropine and glycopyrrolate. The latter two drugs should only be considered if a patient becomes bradycardic during the procedure.</li> <li>Preoxygenation for 10-15 minutes (minimum 5 minutes).</li> <li>Induction with alfaxalone, or propofol, if alfaxalone is not available. Avoid ketamine, if possible.</li> <li>Monitor arterial blood pressure during the procedure. The mean blood pressure should be between 90 - 100 mm Hg. If the patient’s blood pressure is decreased, dobutamine is suggested, i.e. fluid boluses should <i>not</i> be administered to avoid volume overload and congestive heart failure.</li> <li>The intravenous fluid rate should be approximately ¼ of the DAILY maintenance requirements, or 1.75-2 ml/kg/hour to avoid fluid overload.</li> <li><b>Dental blocks</b> are <i>strongly</i> recommended to decrease MAC and the amount of isoflurane necessary, as the latter tends to cause hypotension, particularly in cardiac patients.</li> </ul>
Lisa Carioto, DVM, DVSc, Diplomate ACVIM	
<b>IMAGING PERFORMED BY</b>	<ul style="list-style-type: none"> <li>Monitor arterial blood pressure during the procedure. The mean blood pressure should be between 90 - 100 mm Hg. If the patient’s blood pressure is decreased, dobutamine is suggested, i.e. fluid boluses should <i>not</i> be administered to avoid volume overload and congestive heart failure.</li> </ul>
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7/18/22	



## PATIENT

Clyde Urfirer

- *\*Two shorter procedures* are preferable to performing one long procedure, if the dentistry will take longer than originally expected.

## SPECIES

Canine

- The procedure should be performed as quickly as possible, i.e. extract loose teeth, perform radiographs and then remove dental calculus (unless the excessive calculus will affect interpretation of radiographs). Polishing of teeth is not a necessity and should be done based on stability of patient (arterial blood pressure, oxygenation, ECG, etc.).

## BREED

Mixed

- One could consider sending the patient home with *furosemide in case of an emergency* (1-2 mg/kg PO q12h).

## SEX

Neutered male

- Monitoring the patient's resting respiratory (breathing) rate *twice a day* for 4-6 weeks following general anesthesia is suggested to monitor for signs of decompensation of heart disease.

## AGE

13 years

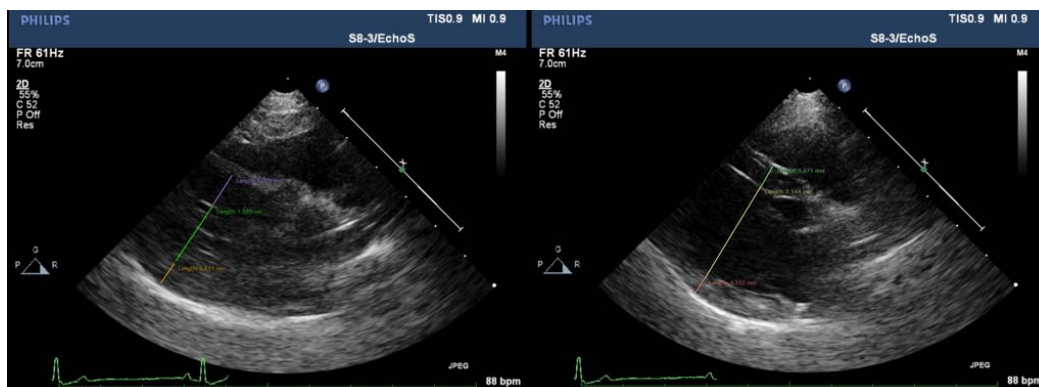
- Weigh and auscultate lungs prior to procedure, upon recovery and prior to discharge from hospital to ensure volume overload has not occurred.

## WEIGHT

11.5 lbs

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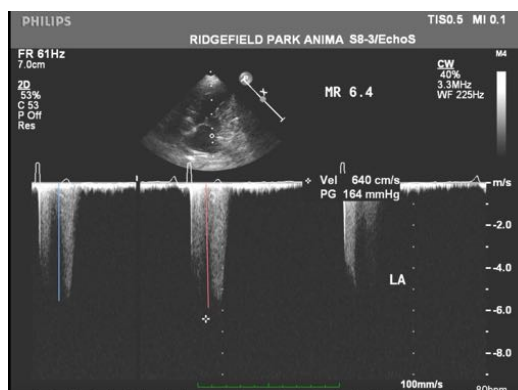


## IMAGING PERFORMED BY

Dr. Kim

## HOSPITAL NAME

Ridgefield Park AH



## REFERRING VET

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## INVOICE

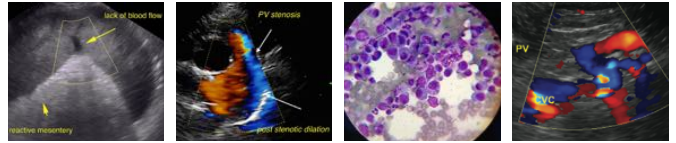
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

## DATE

7/18/22

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I



**PATIENT**

Clyde Urfirer

can be of any further assistance please contact me.

**Lisa Carioto, DVM, DVSc, Diplomate ACVIM**

[Lisa.Carioto@sonopath.com](mailto:Lisa.Carioto@sonopath.com)

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