



**PATIENT**

Alfred Wolff

**SPECIES**

Canine

**BREED**

German Shephard

**SEX**

Male

**AGE**

11 months

**WEIGHT**

67.8lbs

**INTERPRETED BY**

Maggie Machen Lamy,  
DVM, DACVIM  
(Cardiology)

**IMAGING PERFORMED BY**

K. Kicker, DVM

**HOSPITAL NAME**

Wauwatosa  
Veterinary Clinic

**REFERRING VET**

Dr. Kicker

**INVOICE**

28704

**DATE**

2/1/23

**PRESENTING CLINICAL SIGNS**

History: Was diagnosed with pneumonia on 1/13/23 and has recovered with treatment. Grade IV/VI murmur identified at puppy visit. Rechecking chest radiographs post antibiotics and echo to assess heart health and recommendations for anesthesia.

**ECHOCARDIOGRAM FINDINGS**

2D, m-mode, color flow and doppler imaging is available. Normal mitral valve with no obvious prolapse into the left atrial lumen. Mild central mitral regurgitation with no left atrial dilation. Normal LV with adequate myocardial function. Normal LV wall thickness. A small VSD is suspected on color flow imaging with turbulence seen within the apical RV. The shunt is suspect to left to right, although max velocity is not assessed. Color flow is inconclusive, making this a suspicion rather than a diagnosis. The tricuspid valve appears normal in form and function. Trace TR. Normal right atrial and ventricular diameter and morphology indicating no overt evidence of pulmonary arterial hypertension. The pulmonic valve is normal in morphology and mobility. Normal aortic outflow velocities. The aortic valve appears thickened in some views, although inconsistent. The aortic root appears dilated. Trace aortic and no pulmonic insufficiency. Normal pulmonic 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			1.0	1.2	36	65	0.30
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	95	1.9		30.8	2.8	4.2	2.7
*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)
				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**

Multiple small abnormalities are visualized. First, there is suspicion for a restrictive perimembranous ventricular septal defect (VSD). This is suspicious as color flow is inconclusive and the location atypical; however, color flow is suggestive. There is also an abnormal aortic valve; however, flow through the region appears normal. A small aortic leak is appreciated and lifelong blood pressure monitoring is advised. Finally, trace MR is noted, which appears



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hemodynamically insignificant at this time. No additional issues are identified; however, it is important to note that small defects are easily missed without advanced diagnostics such as a bubble study, angiography, etc.

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**Referral to a local Cardiologist is recommended for any patient with congenital disease, particularly with multiple defects.** The goal of this would be to confirm the diagnosis and ensure no additional defects are missed. Based upon what is seen here, prognosis is guarded long-term as many small VSD patients will live a normal life free of complications.

**BREED**

German Shephard

Treatment of an asymptomatic patient with a VSD is of no known benefit and assuming this is the diagnosis, prognosis is good.

**SEX**

Male

Mild lifelong activity restriction is advised.

**AGE**

11 months

Anesthetic risk is considered mild if needed. 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.

**WEIGHT**

67.8lbs

Monitor closely for any development of associated clinical signs, including changes in RR/RE, cough, syncope or significant exercise intolerance.

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(Cardiology)

**PLAN**

Consider referral as discussed.

Recommend conservative monitoring with a recheck echocardiogram in 6-12 months, sooner if any development of clinical signs.

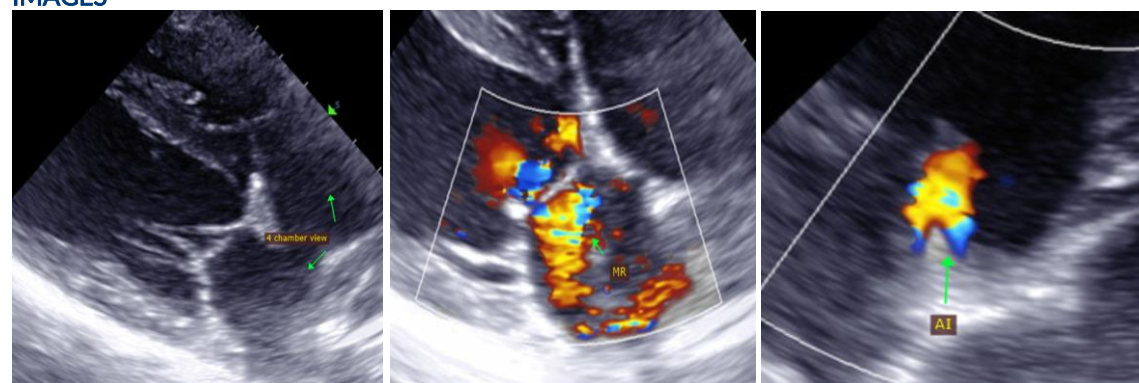
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**IMAGES**

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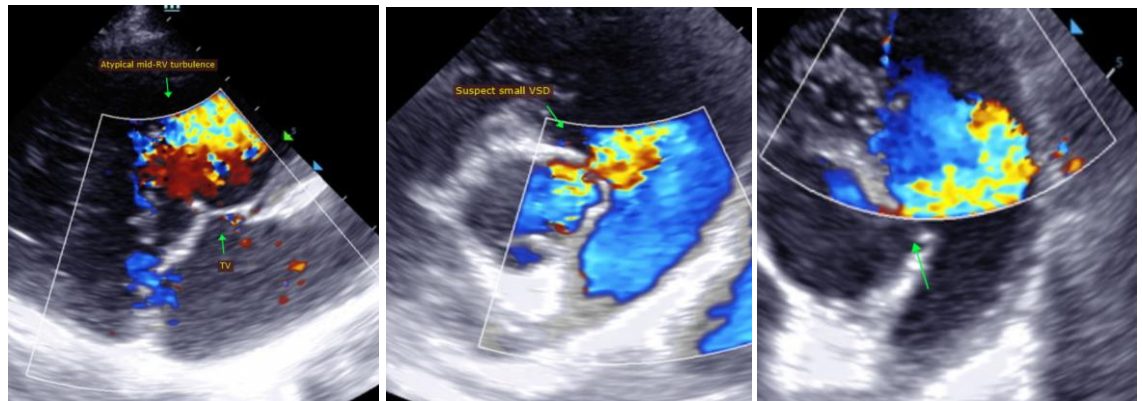
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The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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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