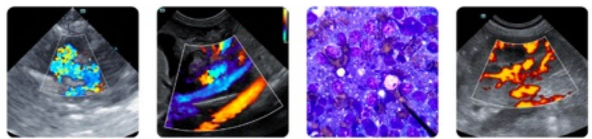




**PATIENT**
Belle Knight

**SPECIES**
Feline

**BREED**
Domestic Shorthair

**SEX**
Spayed female

**AGE**
14 ½ years

**WEIGHT**
14 lbs

**INTERPRETED BY**
Eric Lindquist, DMV
DABVP, Cert. IVUSS

**IMAGING PERFORMED BY**
Dr. Hollway

**HOSPITAL NAME**
Valley Green VH

**REFERRING VET**
Dr. Hollway

**INVOICE**
72201

**DATE**
3/4/26

## PRESENTING CLINICAL SIGNS

- Known uncontrolled hypertension despite Benazepril 5mg/mL - 1.5mL PO every 24 hours with worsening/significant proteinuria. NEW 3/6HM. IRIS STAGE 2 CKD (on K/D diet). NO c/s/v/d. E/D/U/D all WNL. Last meal and last dose of benazepril was 8pm 3/3/26 PM.
- PE = BAR. Euhydrated. ABD = SNP though difficult to palpate due to over conditioning. NEW Grade 3/6 HM -- loudest on the left; increased proBNP. Lungs auscultated clear bilaterally; trachea clear. Overweight. Small brown pigment change to the lateral ventral OS iris. Appears flat. Normal retropulsion OU. Grade 3-4 ddz
- BP = 205mmHg CBC: NSF CHEMISTRY: SDMA = 20 HIGH Creat = 1.9 --> IRIS STAGE 2 BUN = 38 Lytes: NSF T4 = 3.9 normal Feline Triple SNAP = (-)x3 proBNP = 351 HIGH cysto UA USG = 1.028 6pH 2+ protein occ hyaline casts Reflex UPC Ratio = 1.1 --> proteinuria PT/PTT shows appropriate clotting ability.

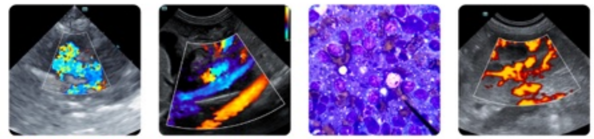
## ULTRASONOGRAPHIC EXAMINATION OF THE HEART

The echocardiogram in this patient demonstrated normal **left atrial** size based on 3 separate LA measurements. **Mitral** valve insufficiency was noted on spectral doppler and color flow assessment. The **left ventricle** presented a moderate amount of remodeling and areas of microinfarcts and retraction. The **myocardium** presented normal echogenicity without subjective evidence of significant fibrotic or ischemic disease. **Contractility** of the left ventricle was adequate. . The **left ventricular outflow** tract demonstrated normal laminar flow and subjective structural integrity. The **right atrium** and auricle revealed normal size, structure and content. No evidence of masses was noted or chamber overload. **Tricuspid** valvular assessment demonstrated adequate linear morphology and kinetics. The **right ventricle** was of normal size (1/3 diameter of LV), chordae structure, myocardial echogenicity and thickness. **Pulmonic** tract assessment revealed normal valve structure, laminar flow, and diameter (approx.1:1 pa/ao ratio). No visible **pericardial** or free pleura fluid was noted or extra cardiac pathology in the visible planes. The cranial **mediastinum and pericardial regions** were free of masses in the visible window. The hepatic veins were not dilated.

E wave 0.7

| FELINE CARDIAC PARAMETERS | BODY WEIGHT | HR (BPM) | IVSd (cm) | LVIDd (cm) | LVWd (cm) | FS (%) | EF (%) |
|---|---|---|---|---|---|---|---|
| NORMAL PARAMETER | ------ | 150-240 | 0.3-0.6 | 1.0-2.1 | 0.25-0.6 | 35-67 | 80-100 |
| PATIENT | 14 lbs | 180 | 0.67 | 1.2 | 0.65 | 50 | 80 |
| **FELINE CARDIAC PARAMETERS** | **LA/AO** (M-mode) | **LA/AO HEART BASE** (Sisson) | **LAD** LA MAX 4 Chamber | | **LVOT VEL.** (m/s) | **RVOT VEL.** (m/s) | **IVRT** (m/) |
| NORMAL PARAMETER | <1.5 | 1.6 | 0.7-1.7 | | <1.6 | <1.3 | 40-60 |
| PATIENT | 1.2 | 1.3 | 1.2 | | 1.0 | 0.6 | NM |

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





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## ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

### *Urinary System*

The **urinary bladder**, trigone, and pelvic urethra presented normal thicknesses and normal tone. The ureters were not visible which is normal. A small amount of sand was noted in the bladder/urolith measuring up to 0.2 cm. No evidence of inflammatory or neoplastic changes was noted. Ureteral papillae were normal.

The **kidneys** presented a relatively uniform cortical hyperechogenicity when compared to the renal medulla, spleen and liver. No overt masses were noted. Corticomedullary definition was nebulous and the ratio favored the cortex slightly. The ureters were not visible and assumed to be normal. These changes are most consistent with chronic interstitial nephritis yet infiltrative disease could not be entirely ruled out without biopsy though neoplasia is not suspected. Slight, non-obstructive pinpoint mineralization was noted. The left kidney measured 3.9 cm. The right kidney revealed cortical infarcts, capsular retraction and mineralization. The right kidney measured 2.82 cm.

### *Adrenal Glands*

Both **adrenal glands** were visualized and recognized as having normal shape, size, position and echogenicity for this breed. The phrenic vasculature, glandular echogenicity and detail were unremarkable. Capsule, cortex, and medullary definition were normal for this age patient. The left adrenal gland measured 0.3 cm.

### *Spleen*

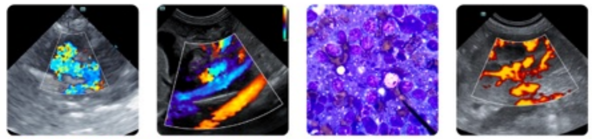
The **spleen** was at the upper limits of normal and measured 1.0 cm.

### *Liver*

The **liver** images from right and left intercostal as well as subcostal views revealed subjectively normal liver size, contour, and structure. Some age-related parenchymal remodeling was noted but likely not clinically significant at this time. Vascular and biliary tracts were of normal volume and no evidence of congestion was noted. The gallbladder presented some dependent debris with essentially normal contour. The cystic and common bile ducts were normal. No overt evidence of active inflammatory, infiltrative or regenerative pathology was noted but should be paired with current or past LE elevations regarding any clinical significance to this presentation. The hepatic lymph nodes were unremarkable.

### *Gastrointestinal*

Examination of the **gastrointestinal tract** revealed a stomach and intestine free of stasis, of normal wall thickness, acceptable curvilinear mural detail, and peristaltic activity. Small and large intestine demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.





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### *Pancreas*

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Pancreatic duct and capsular contour were acceptably normal and parenchyma respected normal curvilinear patterns. No overt evidence of active inflammatory or neoplastic disease was noted.

## ULTRASONOGRAPHIC FINDINGS

Left ventricular hypertrophy and mitral insufficiency. Consistent with hypertensive cardiomegaly.

Mitral insufficiency without volume overload.

Moderate degenerative right renal changes with non-obstructive nephrolithiasis.

Mild interstitial nephrosis left renal pattern.

Small bladder calculi, non-obstructive at the time of the sonogram.

Splenomegaly.

## INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

I cannot completely rule out a mild form of compensated hypertrophic cardiomyopathy phenotype. However, given the age of the patient I expect this to have been developed earlier. I believe the heart is more of an effector organ owing to systemic disease as opposed to a primary disease. I recommend controlling systolic blood pressure measurements to reach a systolic target of 150. No specific cardiac medications are recommended at this time. Recheck echocardiogram in 6 months.

If any weight loss is an issue then 25-gauge FNA of the spleen is warranted to assess for reactive state or possible low-grade splenitis.

Subjectively the kidneys do not appear end stage from a sonographic perspective. The patient may be undergoing periodic episodes of calculi passage and result in infarcts, yet no obstructive disease was noted at the time of the sonogram. There was no evidence of active inflammation from a sonographic perspective.

I recommend to continue to maintain renal support and controlling hypertension in this patient as a primary issue.

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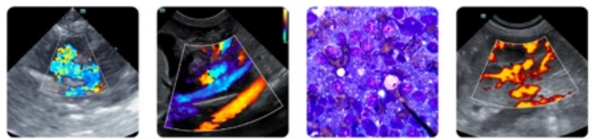

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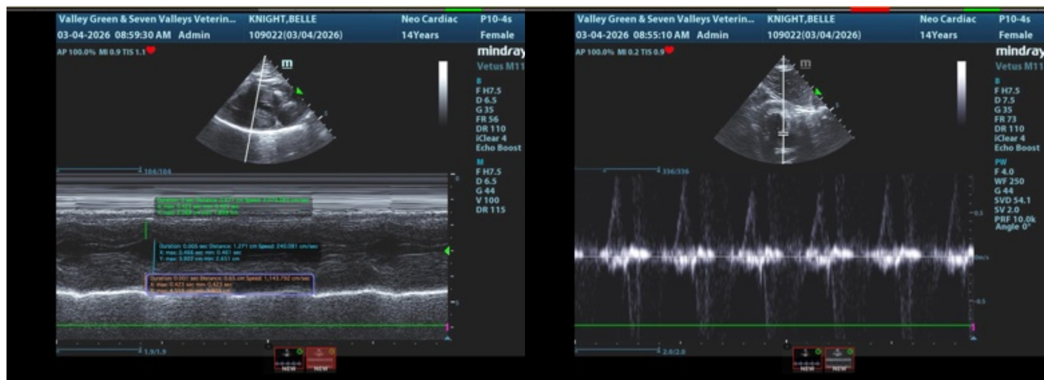


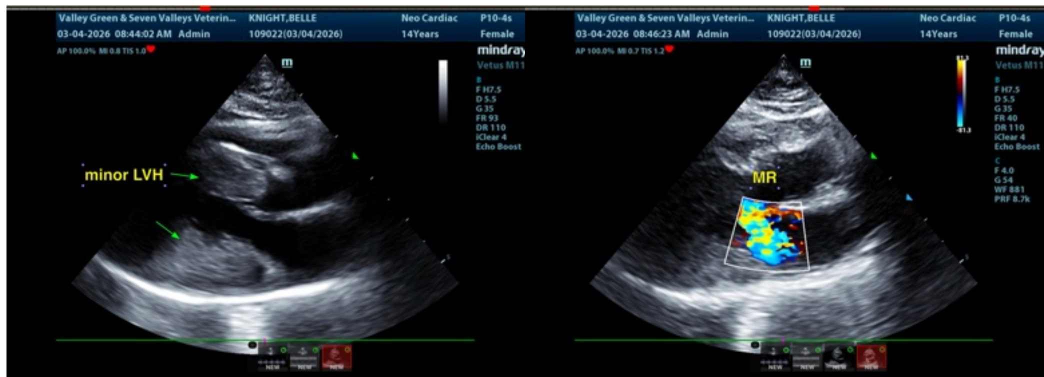


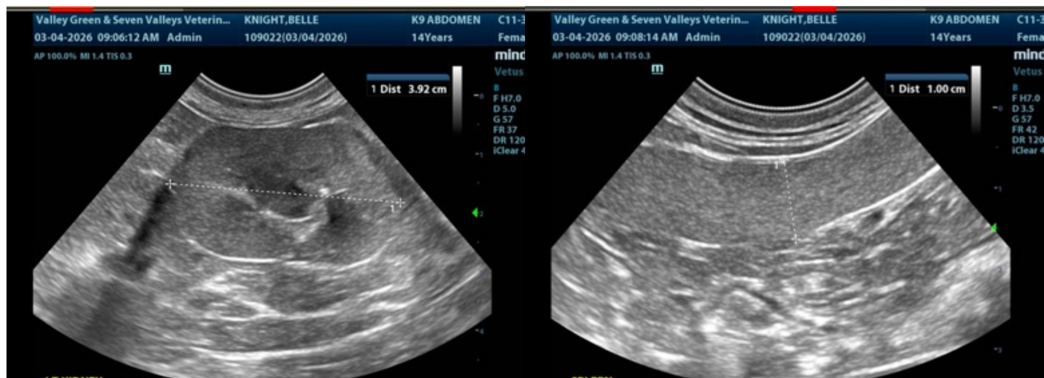

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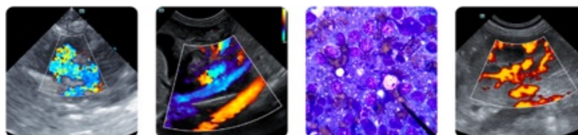



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**The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.**

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS, CEO of SonoPath.com

info@SonoPath.com