

**PATIENT**

Pippy Gillis

**SPECIES**

Feline

**BREED**

DSH

**SEX**

Neutered Male

**AGE**

11 Years

**WEIGHT**

13.8 Pounds

**INTERPRETED BY**Lisa Carioto, DVM,  
DVSc, Diplomate  
ACVIM**IMAGING PERFORMED BY**

Amy Mayhew, LVT

**HOSPITAL NAME**

SVS Imaging MI

**REFERRING VET**

Union Lake VH

**INVOICE**

39724

**DATE**

7/20/22

**PRESENTING CLINICAL SIGNS**

Vomiting, loose stool

Abnormal PE/Chem/CBC/UA Results: Increased liver values (ALT and ALP), improved- ALT was 380, now 318. ALP was 121, now 90. PLI WNL Radiographs of abdomen/thorax-cardiac silhouette mildly enlarged but no obvious mets seen, liver normal size, no masses in abdomen, several fecal balls in descending colon.

**ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN****Urinary System**

The **urinary bladder** is adequately distended. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A mild to moderate amount of free floating and aggregated sediment is present. There is no evidence of cystoliths, polyps or a mass.

**Kidneys**

The **left kidney** measures 4.58 cm (3.80-4.40 cm), mild renomegaly. The capsule is smooth. The cortex is moderately hyperechoic (i.e. it is hyperechoic to the spleen). Its overall architecture, including the definition of the cortico-medullary junction, is relatively well preserved for Pippy's age. There are no signs of nephroliths or pyelectasia. A very small subcapsular, anechoic cortical structure is noted at the anti-mesenteric border. It is consistent with a benign cyst. The surrounding mesentery is not hyperechoic.

The **right kidney** measures 4.80 cm (3.80-4.40 cm), mild renomegaly. The capsule is smooth. The cortex is moderately hyperechoic (i.e. it is hyperechoic to the liver, which is also hyperechoic). Its overall architecture, including the definition of the cortico-medullary junction, is relatively well preserved for Pippy's age. There are no signs of nephroliths or pyelectasia. Two very small subcapsular, anechoic cortical structures are noted at the anti-mesenteric border. They are consistent with benign cysts. The surrounding mesentery is not hyperechoic.

**Aortic bifurcation/trifurcation** No abnormalities observed.

**Adrenal Glands**

The **left adrenal gland** measures 0.43 cm. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

The **right adrenal gland** measures 0.43 cm. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

**Spleen**

The spleen is within normal limits in echotexture and echogenicity, and the capsule is smooth. Occasional pinpoint hyperechoic foci are visualized throughout the parenchyma. They are attributed to mineralizations, which are not considered clinically significant. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. Mild splenomegaly is present 11.1 mm (normal = 10 mm),

**Liver**

Although overt hepatomegaly is not present, the liver is subjectively "generous" with smooth, but mildly rounded borders. Its echotexture is homogeneous, but diffusely hyperechoic, i.e. it is isoechoic to the

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falciform fat. Focal lesions are not observed and no abnormalities are observed with the hepatic vessels.

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The **gallbladder** (GB) is mildly dilated (consistent with a fasted individual). The wall is within normal limits in thickness and echogenicity. A small amount of free floating and gravity-dependent echogenic material is present within the GB. The cystic and common bile ducts are not dilated or tortuous, i.e. there are no signs of an obstruction, however, the CBD is at the high end of the normal reference range (0.41 cm) and its walls are hyperechoic.

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**Gastrointestinal**

The gastric wall is within normal limits in thickness and the wall layers are well defined, however, subjectively, the mucosa is mildly prominent with signs of fogging and stippling of the muscularis. No obvious abnormalities are observed with the pyloric-duodenal junction. Peristalsis is within normal limits.

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**Duodenum:** The duodenum is thickened (0.33 cm). Gas and fluid are present. Mild fogging of the mucosa is present depending on the segment evaluated. Peristalsis is within normal limits.

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**Jejunum:** Multiple segments of jejunum are thickened (0.33 cm – 0.40 cm). Although the definition of the wall layers is preserved, moderate fogging of the mucosa is present and the submucosa is thickened. Certain segments also show a mildly to moderately prominent muscularis with stippling. Two loops of jejunum show possible very focal loss of definition of wall layering, however, artifact due to the angle of the probe cannot be ruled out. The surrounding mesentery is moderately to severely hyperechoic. Abnormally dilated loops of bowel are not observed. No major abnormalities are noted with the ICCJ.

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**Ileum:** All layers are prominent and fogging of the mucosa and muscularis are noted.

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**Transverse colon:** A large amount of gas and small amount of ingesta are noted.

The colonic wall is mildly thickened (0.26 cm), however, mural detail is considered normal. A large amount of gas is present within the colon. Semi-formed stools are noted within the descending colon.

**Pancreas****IMAGING PERFORMED BY**

Amy Mayhew, LVT

The **left limb** has a mildly coarse echotexture. It consists of hypoechoic nodules of variable size and pinpoint to punctate hyperechoic foci scattered throughout the parenchyma. These changes are suggestive of nodular hyperplasia and fibrosis, respectively. Fibrosis may be an age-related change, secondary to previous episodes of pancreatitis, mineralization and amyloid deposition. Signs of active pancreatitis or neoplasia are not appreciated.

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Similar findings are noted with the right limb.

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**Lymph nodes**

**Mesenteric root:** Moderate lymphadenomegaly of multiple lymph nodes, one of which measures 1.02 cm in diameter x 2.84 cm in length. The LN is hypoechoic and multilobulated. The mesentery surrounding the lymph node is severely hyperechoic. A few single lymph nodes in the same region are enlarged and hypoechoic.

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Lymph node adjacent to the *ICCJ* is mildly enlarged, plump and hypoechoic

**Abdominal effusion** is not visualized.

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**ULTRASONOGRAPHIC FINDINGS**

- **Gastrointestinal (GI) tract:** Diffuse inflammation of GI tract is noted. A chronic enteropathy due to a steroid responsive diarrhea (e.g. inflammatory bowel disease), food-responsive diarrhea or food intolerance, dysbiosis, etc. are possible differential diagnoses. Although the definition of the wall layers is preserved, neoplasia, such as lymphoma, or other round cell tumour, cannot be excluded without performing tissue biopsies, and in some cases, immunohistochemistry and PARR.
- **Liver:** Cholangitis/cholangiohepatitis and cholestasis are suspected. A secondary bacterial infection may also be present. Hepatic lipidosis may also be contributing to the hyperechogenicity.
- **Gallbladder:** Cholecystitis is suspected. Furthermore, a suppurative component, due to an ascending bacterial infection from the GI tract, is not uncommon.
- **Lymph nodes:** The size and shape of the lymph nodes increases the risk of neoplastic disease, however, reactive hyperplasia remains a valid differential diagnosis.
- **Spleen:** Splenomegaly with preservation of the normal architecture. Differential diagnoses include splenitis due to antigenic stimulation and secondary inflammation. Other differential diagnoses include extramedullary hematopoiesis, hypersplenism and reactive hyperplasia. Neoplasia, such as lymphoma or other round cell tumour, cannot be excluded. A fine needle aspirate is required to obtain a definitive diagnosis.
- **Pancreas:** Age-related changes are noted, as well as possible previous episodes of pancreatitis, fibrosis, ischemia, mineralization and amyloid deposition.
- **Kidneys:** The hyperechogenicity of both cortices cannot be ignored. Subclinical pyelonephritis cannot be ruled out, in addition to glomerulonephritis and interstitial nephritis.
- **Urinary bladder:** Although the free floating sediment is most likely clinically significant, it should not be disregarded due to the renal changes noted.

**INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS**

Fine needle aspirates of a few of the lymph nodes, and ideally, the spleen and liver (pending coagulation profiles).

Note, vitamin K (0.5 mg/kg SQ) is recommended even if the coagulation profile is within normal limits.

A single dose of vitamin K (0.5 mg/kg SQ) is suggested (cholestasis likely).

A urinalysis and urine culture and sensitivity to exclude pyelonephritis

Analgesia for visceral pain, such as buprenorphine (0.005-0.01 mg/kg sublingually every 8-12 hours) for a minimum of 7-10 days. Continue for 3-4 weeks if an improvement is noted; the dose and frequency may be weaned to the minimum effective dose during that time.

Supportive care (maropitant, mirtazapine, SQ fluids, etc.)

If signs of gastroesophageal reflux disease are present, 10-14 day trial with famotidine or omeprazole (0.7-1 mg/kg PO q12h)

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Cholangitis/cholangiohepatitis and cholecystitis cannot be excluded, including a secondary ascending bacterial infection. Although indiscriminate use of antibiotics is not normally recommended, one could start treatment with a broad-spectrum antibiotic.

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Supplement current diet with soluble fibre (psyllium).

+/- TLI, serum cobalamin, and folate, to assess for underlying maldigestion and malabsorption disease and dysbiosis

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If still no improvement, consider dietary trial (veterinary prescription brand hypoallergenic, i.e., hydrolyzed or novel protein); ensure appetizing to prevent hepatic lipidosis, sarcopenia and cachexia.

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Ultimately, gastrointestinal biopsies of the upper and lower GI tract are required to obtain a definitive diagnosis of inflammatory bowel disease vs. neoplasia. If little to no improvement is observed with the above treatment suggestions, and further diagnostic tests are not pursued, although not ideal, empirical treatment for severe inflammatory bowel disease or lymphoma may be considered.

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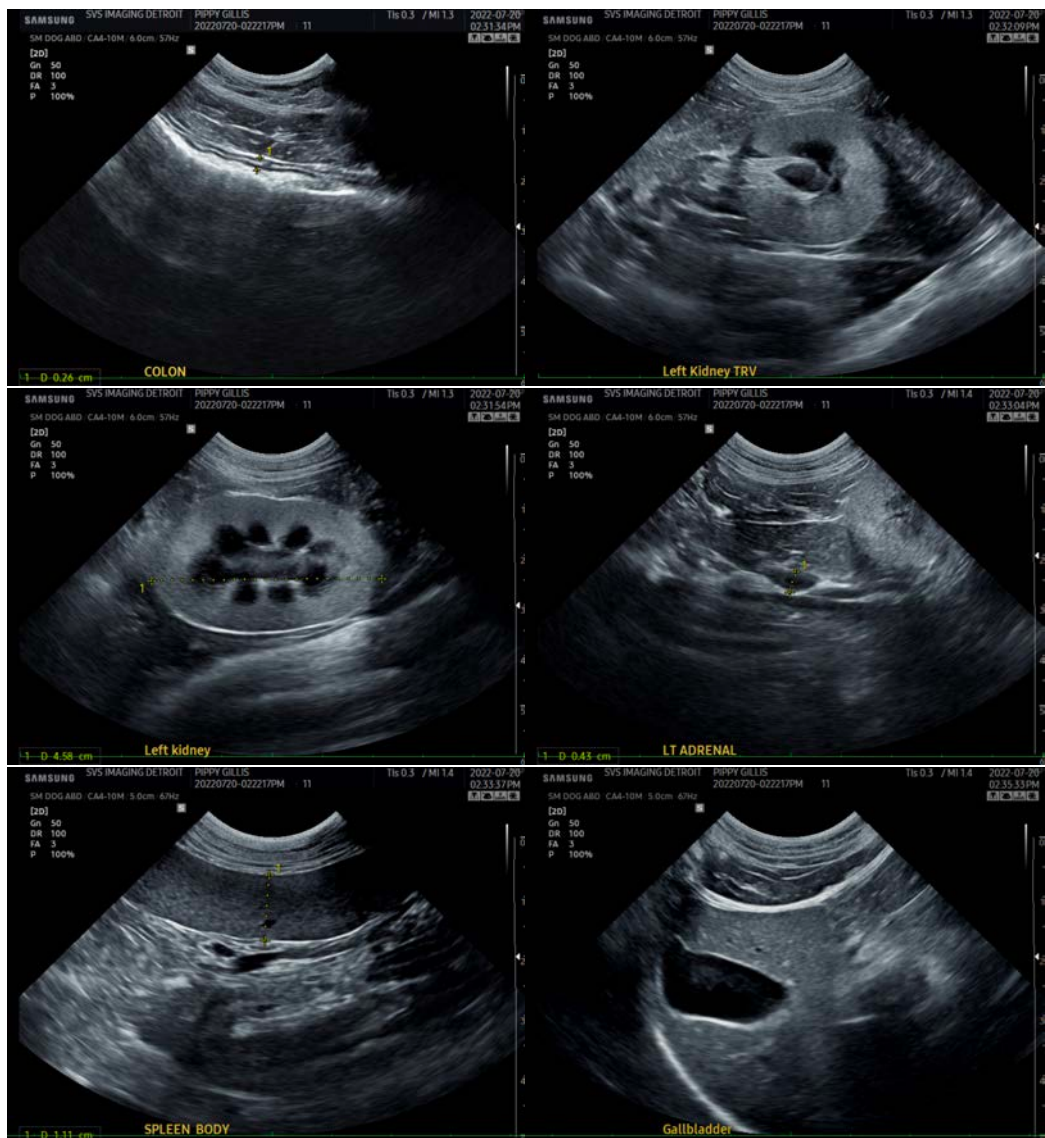
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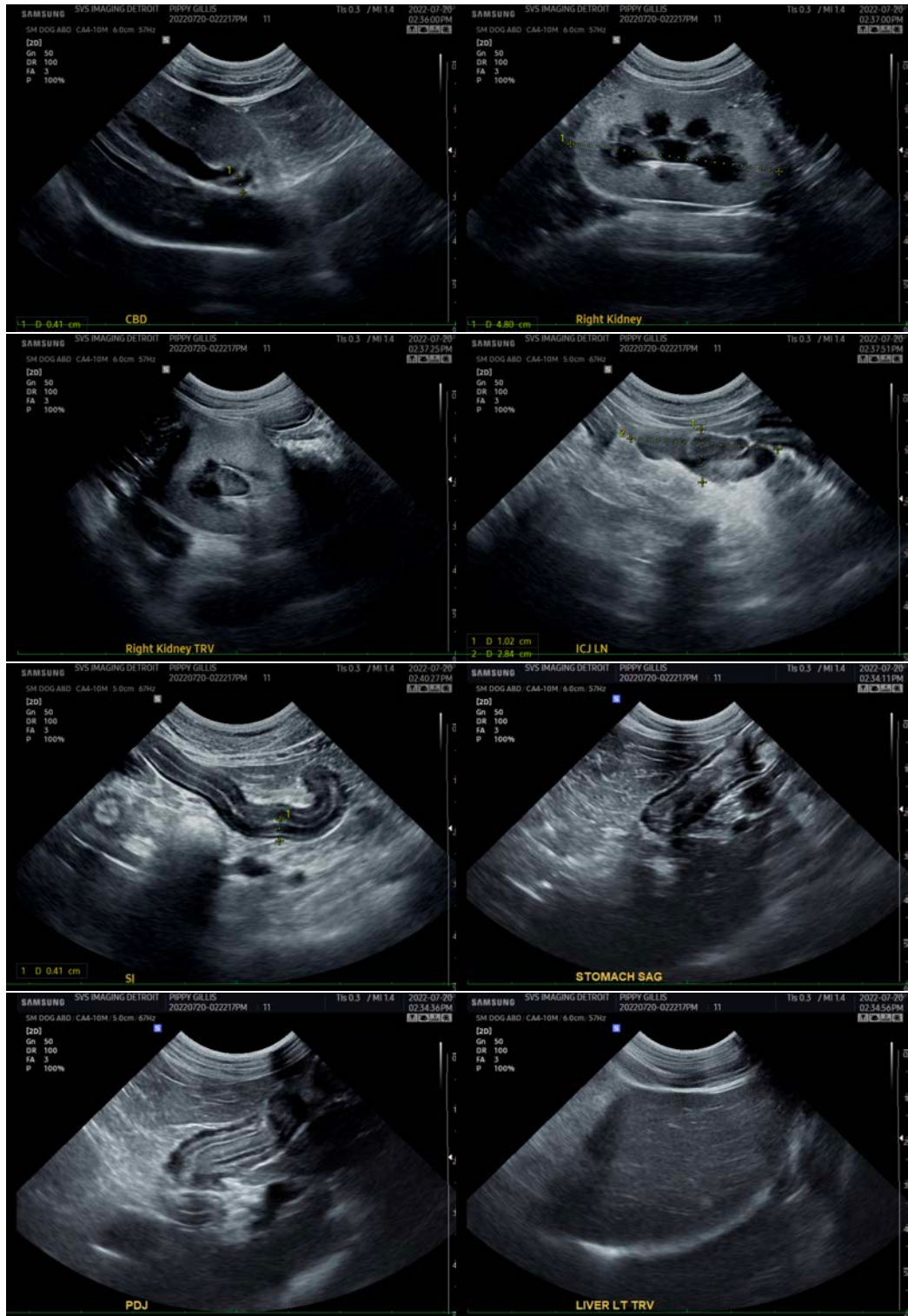
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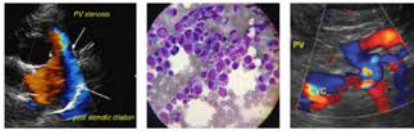
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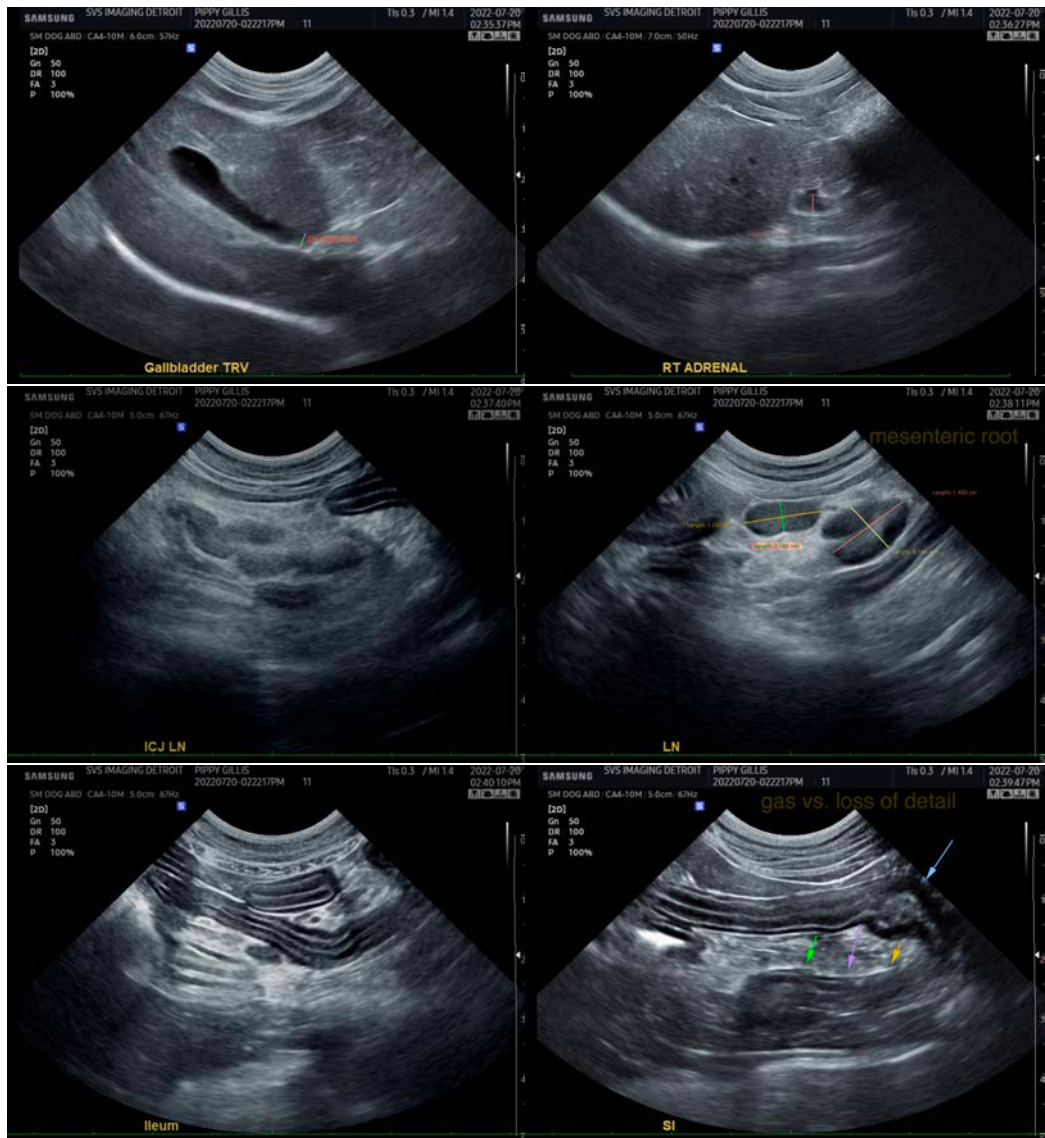
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

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