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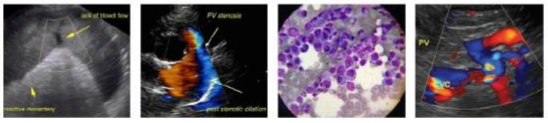

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pawsonography@gmail.com 530-786-8340

PATIENT

Valentino Van Epps

SPECIES

Canine

BREED

Australian Shepherd Mix

SEX

Neutered Male

AGE

12 Years 2 Months

WEIGHT

N/A

INTERPRETED BY

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

IMAGING PERFORMED BY

Loetitia Saint-Jacques, RVT

HOSPITAL NAME

Tahoe Integrative Care

REFERRING VET

Dr. Wendy Robinson

INVOICE

15198

DATE

5/13/22

PRESENTING CLINICAL SIGNS

History: Patient not sedated- 2 restrainers- panting and trying to get up constantly- uncooperative. Valentino Van Epps 12y2m, MN, Australian Shepard mix Bi-cavitary ultrasound; Echo and Abdo Previous ultrasounds with PAWS through Dr. Hartzell. Last one in August 2021; heart murmur noted with low progression of disease, and liver nodule noted. Historic 3/6 heart murmur. Historic GI sensitivities. PU/PD since December 2021 with normal bloodwork in January 2022. Last month the owner noted a coughing and gagging had started. Our goals for a bicavitary ultrasound include monitoring for the heart murmur and to R/O cardiogenic progression of the cough. And a survey of the abdomen to monitor the liver nodule and R/O cystitis vs early renal disease vs early endocrine disease for the PU/PD over the last 6 months, as well as, evaluation of the GI system due to acute on chronic GI upset with vomiting and diarrhea at time

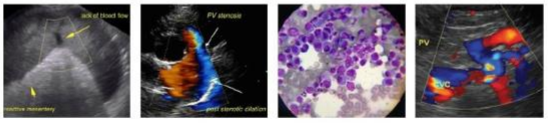
Abnormal PE/Chem/CBC/UA Results: 160 mmHg systolic (average of 3 readings) Left dorsal pedal, #4 cuff

ULTRASONOGRAPHIC EXAMINATION OF THE HEART & ABDOMEN

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	<1.3	28-40	40-100	<0.6
PATIENT	3.0-4.98	1.75-2.67	NM	1.26	30	NM	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				
PATIENT	NM	1.34	0.97	33kg	3.54	4.21	3.00

Cardiac Presentation

- Mildly thickened myxomatous degeneration of the mitral valve
- Minimal prolapse of the posterior leaflet
- Very mild mitral regurgitation.
- Mild left atrial enlargement; LA normalized for BW (LAN = 1.0).
- LA: Ao ratio (Rishniw method) = 1.39
- No left auricular enlargement.
- No left ventricular enlargement



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  - LVIDd normalized for BW (LVIDND = 1.5)
  - LVIDs normalized for BW (LVIDNS = 1.1)

- Scant aortic insufficiency
- Very mild myxomatous degeneration of the tricuspid valve
- Trivial prolapse of the septal leaflet
- Trace to mild tricuspid regurgitation.
- No evidence of pulmonary hypertension.
- Pulmonic valve, no abnormalities.
- Pulmonary veins, no abnormalities.
- Pulmonary artery - bifurcation, no abnormalities.
- Pulmonary artery: aortic ratio within normal limits.
- No evidence of pulmonary insufficiency.
- No evidence of right atrial enlargement.
- Right ventricle appears slightly “generous” in two views, but both are still images and are likely artifact.
- No signs of heart worm.
- No signs of pericardial or pleural effusion.
- No evidence of pulmonary edema.
- No obvious signs of a mass.
- Hepatic vessels – no sign of congestion.

Urinary System

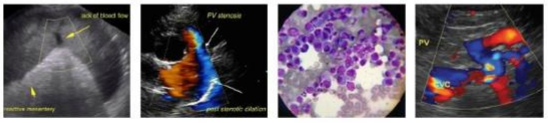
The urinary bladder is well distended. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A small to moderate amount of free-floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass.

Prostate

The prostate is homogenous and measures 1.03 cm, which is within normal limits for a neutered male.

Kidneys

The **left** kidney measures at least 7.20 cm. The capsule is smooth. A hyperechoic “band” and mineralization are observed along the medulla, traversing parallel to the corticomedullary junction, which accentuates the definition of the cortico-medullary junction. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. The surrounding mesentery is not hyperechoic.



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The **right** kidney measures 7.47 cm. Findings are similar to the left kidney.

Aortic Bifurcation/Trifurcation

No abnormalities observed.

Adrenal Glands

The **left** adrenal gland measures 0.56 cm at the cranial pole; 0.48 cm at the caudal pole. 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 is replaced by a mass. The mass measures 3.04 cm in diameter in one view and 4.25 cm in length in a different view. It is very mildly heterogeneous. An ill- defined hyperechoic area is noted at the periphery of the cranial pole. The latter measures 1.41 cm in depth x 1.01 cm in length. The caudal vena cava appears to be invaded in certain views.

Spleen

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. An ill-defined hypoechoic nodule is observed at the tail of the spleen. It measures 0.68 cm in diameter x 0.53 cm in length. It does not disrupt the integrity of the capsule. Perivascular cuffing consistent with myelolipomas is observed, which is not considered clinically significant. Multiple pinpoint mineralizations are also noted dispersed haphazardly throughout the parenchyma. The latter is likely an age-related change. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified.

Liver

There are no obvious signs of hepatomegaly and its borders are smooth, but mildly rounded. A diffuse, mildly coarse or granular echotexture is observed. The liver is within normal limits in echogenicity, i.e., it is hypoechoic to the spleen. No abnormalities are observed with the hepatic vessels visualized.

A very mildly hypoechoic nodule, i.e. it is almost isoechoic to the remainder of the hepatic parenchyma, is observed. It measures 1.47 cm in depth x 2.98 cm in length. A few other small, hypoechoic nodules are observed, see images below for measurements. A round, anechoic structure, measuring 1.05 cm in depth x 0.96 cm in length, is visualized within the right liver. It is most consistent with a benign cyst.

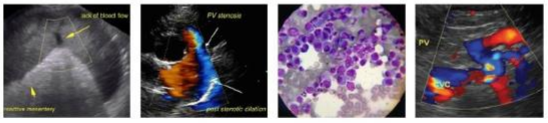
The gallbladder (GB) is moderately distended with a trivial amount of free floating echogenic material. The GB wall is within normal limits in thickness and echogenicity. The portions of the cystic and/or common bile ducts observed are not dilated or tortuous, i.e. there are no signs of an obstruction.

Gastrointestinal

The gastric wall is within normal limits in thickness and the wall layers are well defined. No obvious abnormalities are observed with its peristalsis.

The small intestinal wall thickness, including the duodenum, is within normal limits and the definition of the wall layers is preserved. No abnormalities are noted with the ileo-cecal-colic junction. Abnormally dilated loops of bowel are not observed.

Ingesta and gas are present within the descending colon.



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The colonic wall is very mildly thickened (0.21-0.22 cm), however, mural detail is considered normal.

Pancreas

The right limb has a coarse echotexture, consisting of punctate, hyperechoic foci, scattered throughout the parenchyma. The latter are suggestive of fibrosis, which may be due to age, previous episodes of pancreatitis, as well as amyloid deposition. Signs of active pancreatitis or neoplasia are not appreciated.

Similar changes are observed with the left limb.

Other

Lymph nodes

No abnormalities are observed

Abdominal effusion is not visualized.

Omentum

Certain regions of the mesentery are hyperechoic, despite the absence of gastrointestinal tract abnormalities. A hyperechoic mesentery is usually secondary to inflammation.

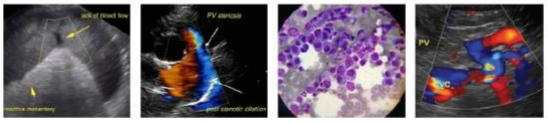
ULTRASONOGRAPHIC FINDINGS

Heart Findings

- Myxomatous degeneration of the mitral (mild) and tricuspid (very mild) valves, ACVIM stage B2, with mild left atrial enlargement.
- Results appear to be stable compared to Valentino's previous exam, which was performed April 19, 2021 (performed by PAWS Inc., and interpreted by Dr. Carley Saelinger, from Cardiac Vet, Inc.).
- There are no obvious signs of congestive heart failure based on the ultrasound findings. His left atrium is only mildly enlarged, and not likely to be causing compression of of the mainstem bronchus, however, radiographs are required to confirm or exclude this possibility. Another possible cause for Valentino's cough includes mild tracheal collapse, laryngeal paresis or pulmonary metastases (from the adrenal mass).

Abdomen Findings

- A mass affecting the **right adrenal gland** is present. The caudal vena cava appears invaded in certain views. An adenocarcinoma or carcinoma is the most likely diagnosis. A pheochromocytoma cannot be excluded despite Valentino's arterial pressure within the normal reference range.
- A reactive hepatopathy appears to be present based on the course, granular echotexture, in addition to a benign cyst in the right **liver**. Multiple hypoechoic nodules of variable size are also observed throughout the liver. These may be due to nodular hyperplasia or regeneration.



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Target lesions are not visualized; however, fine needle aspirates would be required to exclude neoplasia with certainty.

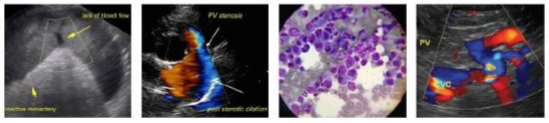
- An ill-defined hypoechoic nodule is observed at the tail of the **spleen**. The appearance of the nodule is suggestive of a benign process, such as nodular or lymphoid hyperplasia and extramedullary hematopoiesis. Neoplasia, such as a round cell tumour, is considered unlikely.
- Age-related changes are observed in both the **kidneys** and **pancreas**.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Cardiac medications are not necessary at this time.

Other suggestions/recommendations include the following:

- Evaluation of arterial blood pressure
- Monitoring of the resting (sleeping) respiratory rate (RRR) is suggested once or twice a month. The RRR should NOT EXCEED 30 breaths per minute (bpm). If the respiratory rate is greater than 30 bpm, *or* 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.
- 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.
- Mild salt restriction is suggested (less than 0.9 grams/1000 kcal of food)
- Omega-3 fatty acids may be helpful (EPA = 40 mg/kg/day and DHA = 25 mg/kg/day); gradual uptitration of the dose is suggested to decrease risk of gastrointestinal effects
- Monitoring for progression of heart disease with a re-evaluation of an echocardiogram every 8 - 12 months, or sooner if clinical signs develop, is recommended.
- If general anesthesia is required in the future, the following protocol may be considered.
    - Premedication with an opioid, such as hydromorphone, butorphanol, or methadone, +/- *low dose* of midazolam. Avoid dexmedetomidine (label indications).
    - Avoid acepromazine, atropine and glycopyrrolate. The latter two drugs should only be considered if a patient becomes bradycardic during the procedure.
    - Preoxygenation for 10-15 minutes (minimum 5 minutes).
    - Induction with alfaxalone, or propofol, if alfaxalone is not available. Avoid ketamine, if possible.
    - 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 *not* be administered to avoid volume overload and congestive heart failure.



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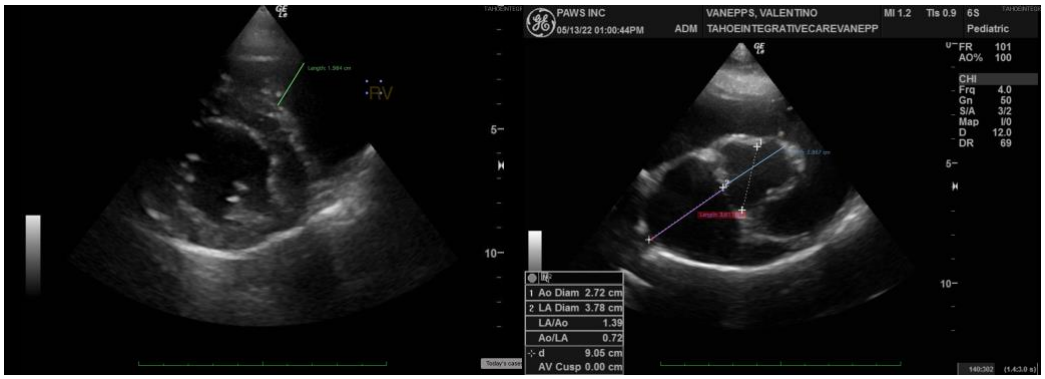
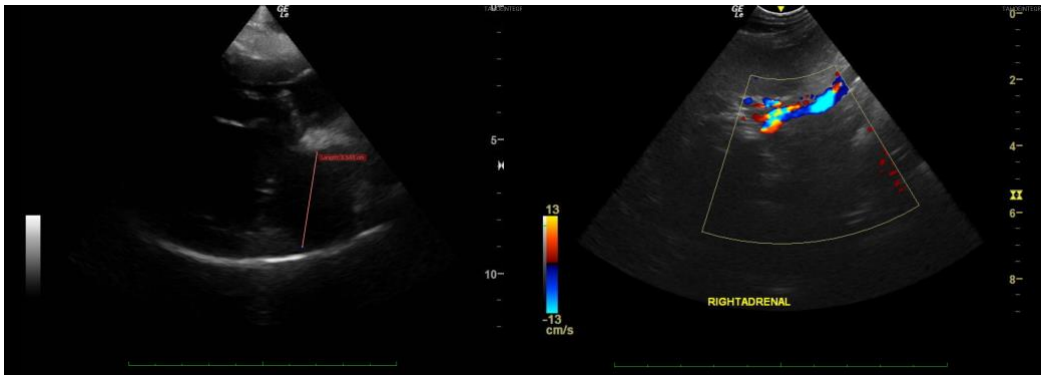
- The intravenous fluid rate should be approximately ¼ of the DAILY maintenance requirements, or 1.75-2 ml/kg/hour to avoid fluid overload.
- Local blocks are strongly recommended to decrease MAC and the amount of isofluorane necessary, as the latter tends to cause hypotension, particularly in cardiac patients.
- 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.

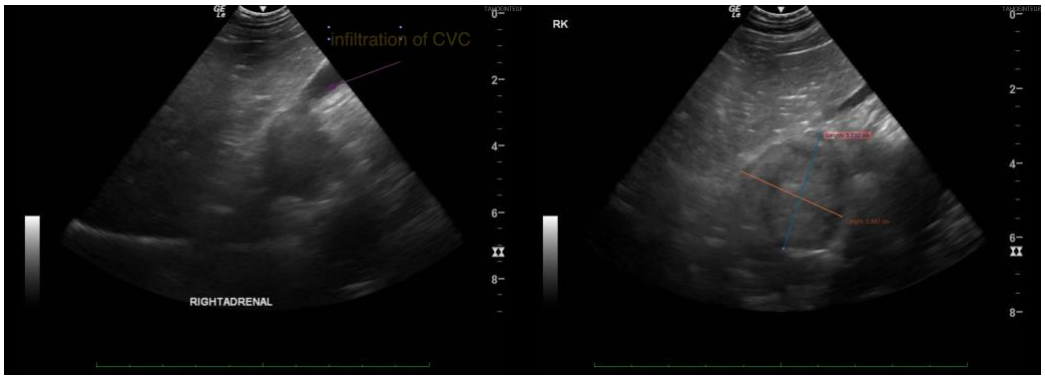
A urine culture and sensitivity is recommended. If negative, a protein: creatinine ratio is suggested.

Thoracic radiographs should be performed to exclude metastases to the lungs.

Medical management of adrenal tumors is possible with trilostane or mitotane (Lysodren).







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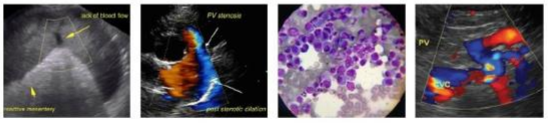

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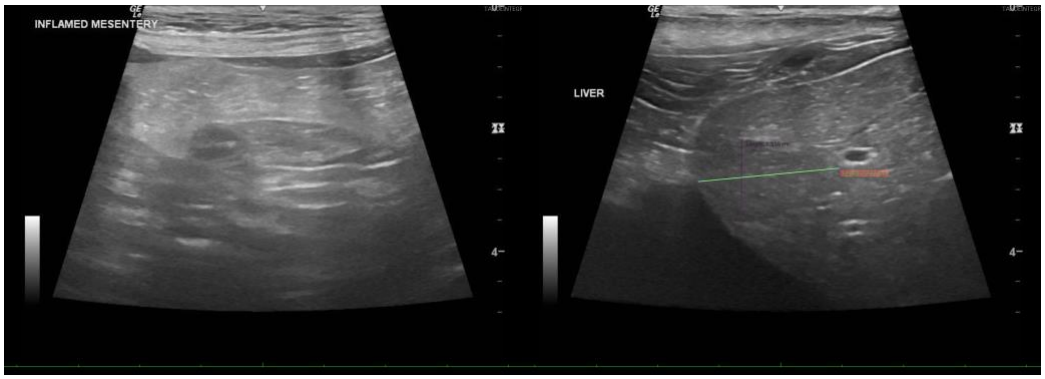

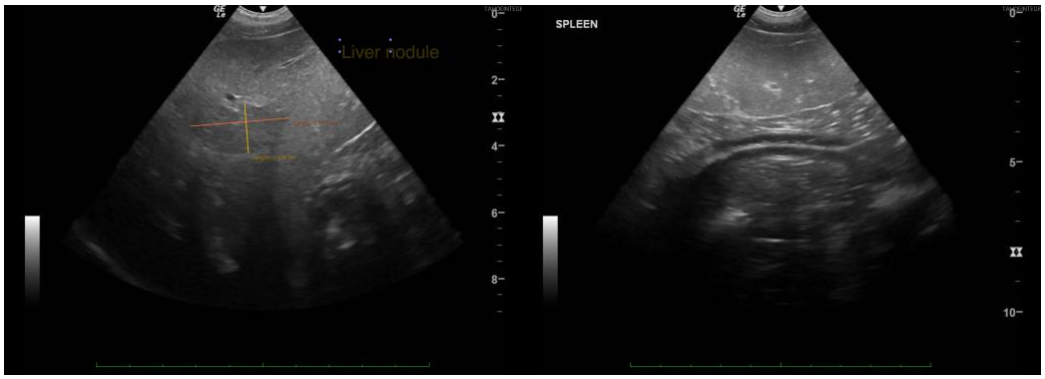

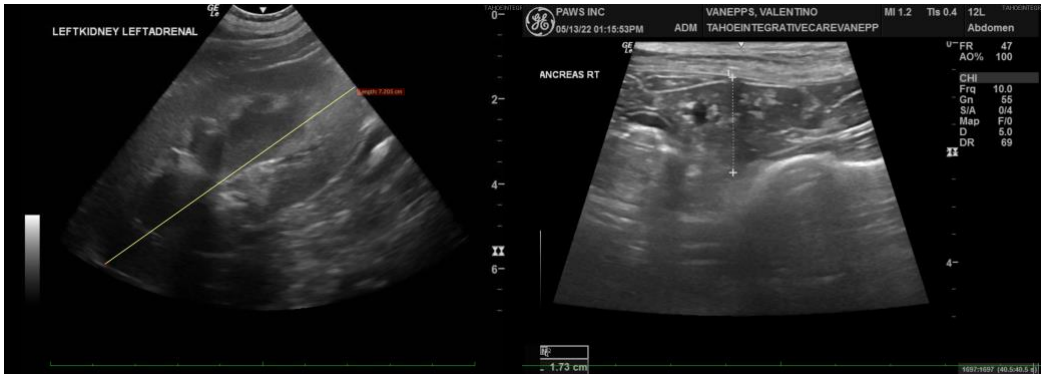

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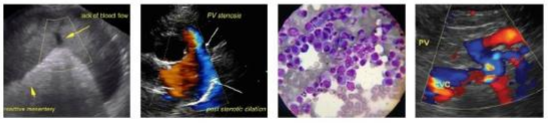

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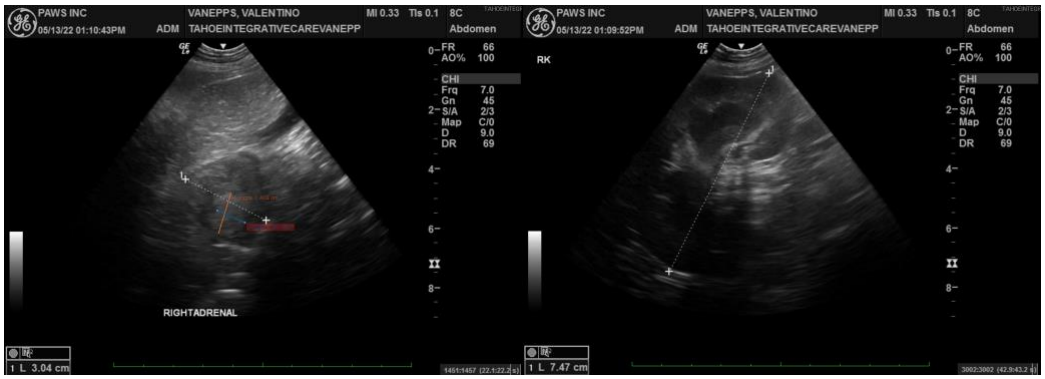

The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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