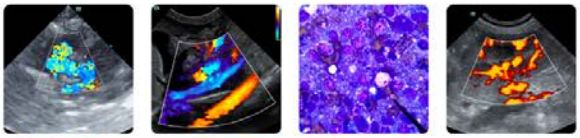


SonoPath www.carolinavetmobile.com info@carolinavetmobile.com 800.808.5948

PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

Dr. Sandra Welsh

INVOICE

72450

DATE

12/9/25

PRESENTING CLINICAL SIGNS

Seen by regular vet 2 weeks previously for lameness issues, unsure of exactly what meds were given. Presented to CityVet for a second opinion and she noted a 4 pound weight loss.

Abnormal PE/Chem/CBC/UA Results: PE: no pain on palpation of abdomen. No preputial discharge noted. CBC: normal CHEM: BUN 88, creat 2.3, alb 2.1, SDMA 24.9 UA: 1.020, +3 blood; cocci noted Lepto urine PCR neg Urine culture (free catch)- beta hemolytic strep >100,000 col- resistant to many antibiotics except Clavamox so will RX it today

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. No uroliths or sediment were visualized and anechoic urine was present. No evidence of inflammatory or neoplastic changes were noted. Ureteral papillae were normal.

The **kidneys** presented normal size and contour with minor non-specific corticomedullary remodeling and. Changes appeared to be minor. Left kidney measured 5.18 cm with slight pyelectasia noted at 0.31 cm. Right kidney measured 5.51 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. Right measured 2.17 cm x 0.57 cm at the caudal pole and 0.84 cm at the cranial pole. Left measured 0.64 cm at the cranial pole and 0.71 cm at the caudal pole.

Spleen

The **spleen** presented a smooth homogeneous parenchyma hyperechoic to liver and renal cortical parenchyma. The capsule was smooth without noticeable expansion or deviation from within the spleen or adjacent pathology. The splenic vasculature demonstrated normal volume without signs of congestion or thrombosis. No sonographic evidence of acute or chronic inflammatory, neoplastic, or infarctual changes were noted.

Liver

The **liver** images submitted revealed subjectively normal liver size, contour, and structure. Parenchymal echogenicity was naturally coarse and hypoechoic to the spleen. Vascular and biliary tracts were of normal volume with no evidence of congestion. The gallbladder presented acceptably thin walls with primarily anechoic content. The cystic and common bile ducts were normal. No pathological hepatic lymphadenopathy was evident. No overt structural evidence of inflammatory, infiltrative or regenerative pathology was evident.

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

PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

Dr. Sandra Welsh

INVOICE

72450

DATE

12/9/25

demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

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

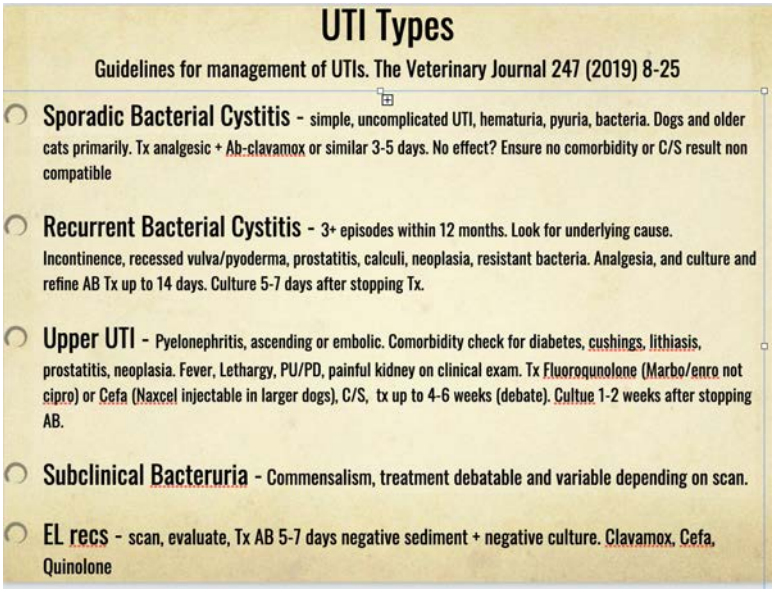
- Minor degenerative renal changes and left kidney pyelectasia. Acute insult suspected.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Management of the UTI, IV fluid support, assessment for concurrent complicating disease such as Leptospirosis and Addison's indicated, even though the adrenals appear structurally normal.

The following is to be utilized for UTI with chronic urinary tract changes found sonographically that may serve as nidus of infection and history of chronic or recurrent UTI is an issue.

I recommend Clavamox as a first level approach to chronic UTI at 12.5-25 mg/kg bid owing to optimal urinary concentrations. If bacterial resistance is an issue then **Enrofloxacin** (5-10 mg/kg SID PO) (In patients > 1 year of age) in late pm after urination to maximize urinary concentrations overnight. This assumes that culture supports this use. Repeat **culture** at 3-4 weeks and continue treatment at least 7-10 days post negative urinary sediment and negative culture. *Note: Negative culture does not necessarily mean lack of UTI.* Other favorite antibiotics for chronic UTI include third generation Cefa (Ceftiofur or similar s.i.d. injectable) or Clavamox. If suspicion of occult urinary incontinence is present, then **phenylpropanolamine (PPA)** (1-2 mg/kg BID) can be employed long term to enhance urethral tone.



PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

Dr. Sandra Welsh

INVOICE

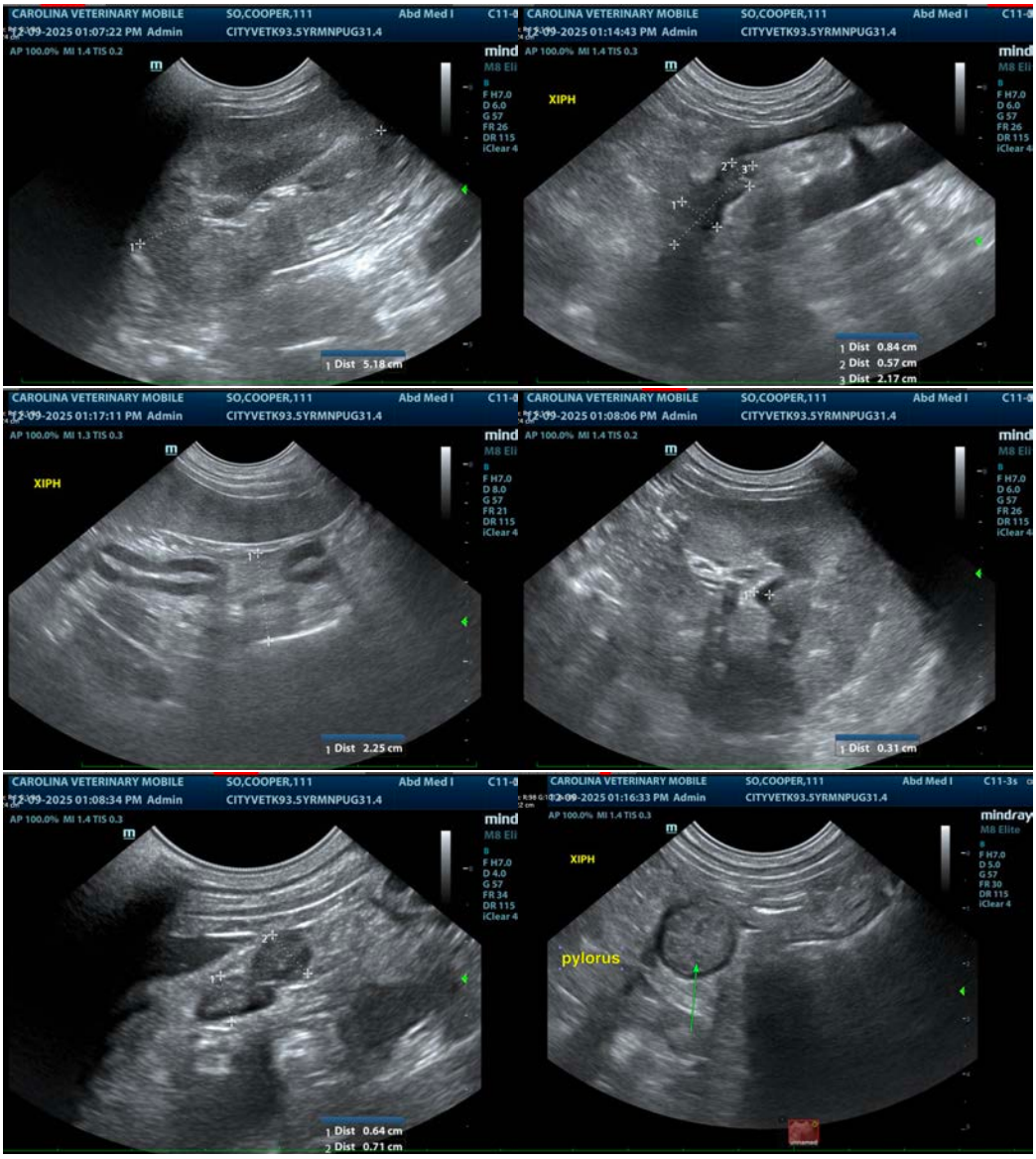
72450

DATE

12/9/25

For an additional charge an internal medicine consult can be utilized through Sonopath.com. You can select the internal medicine drop down at http://spa.sonopath.com/.

One of the world's top internists & SonoPath associate Dr. Remo Lobetti BVSc, MMedVet, PhD, DECVIM can evaluate your case through SonoPath. https://sonopath.com/resources/sonopath-services/internal-medicine-teleconsultation-services



PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

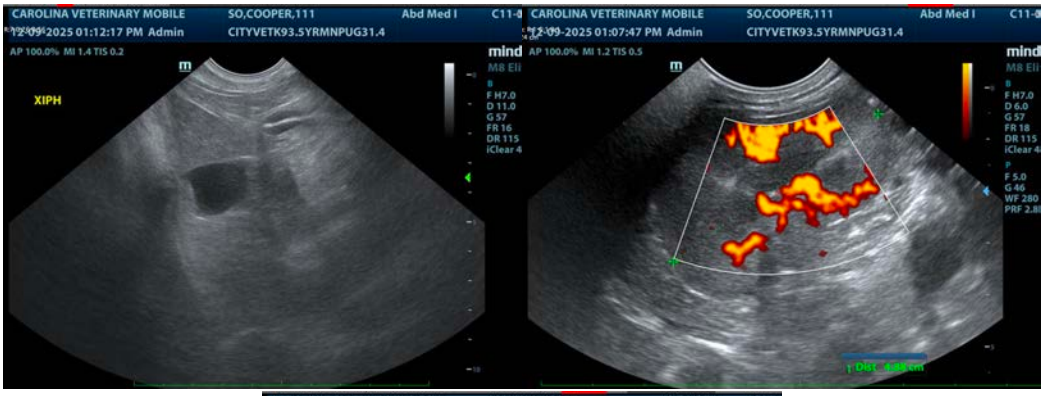
Dr. Sandra Welsh

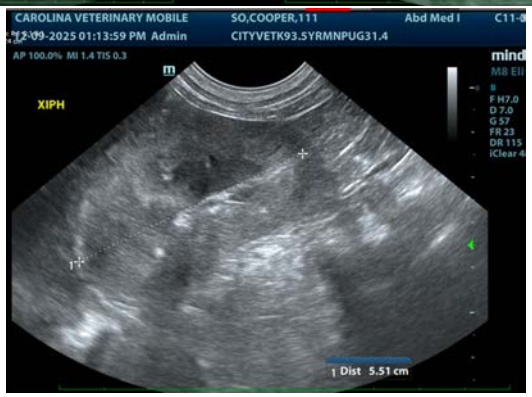
INVOICE

72450

DATE

12/9/25





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, Owner, Founder -- SonoPath.com
info@SonoPath.com

PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

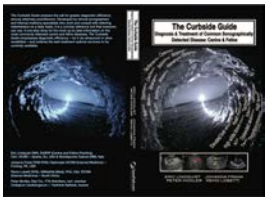
Dr. Sandra Welsh

INVOICE

72450

DATE

12/9/25



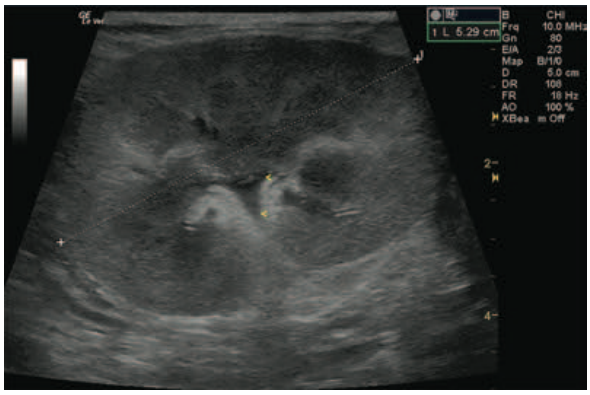
The following is an applicable excerpt from the *Curbside Guide to Diagnosis & Treatment of Sonographic Disease* offered by SonoPath.com Lindquist, Frank, Lobetti, and Modler.

An essential quick guide for every general practitioner and sonographer.

https://sonopath.com/products/curbside-guide-editing-due-release-12012015

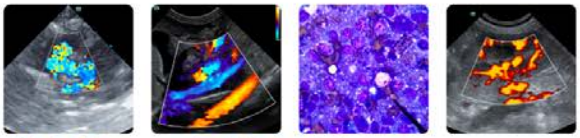
Acute Renal Failure

http://www.sonopath.com/ARF



Long axis of the kidney in a cat with a renal transplant and acute renal failure. Note the generalized swelling of the kidney with loss of corticomedullary definition. The renal pelvis shows mild dilation with anechoic content (arrow heads). The renal crest and sinus are hyperechoic.

Description: Acute renal failure (ARF)—also referred to as acute kidney injury—is defined as a rapid deterioration in renal function that results in the accumulation of metabolic waste in the body. It is characterized by an impaired regulation of water and solute balances, and may be due to prerenal, postrenal, and/or primary renal causes. Prerenal azotemia reflects a reduced glomerular filtration rate (GFR), which is a consequence of renal hypoperfusion; it is not the result of structural renal damage. Immediate restoration of renal blood flow will reverse the azotemia over a period of time; however, if the hypoperfusion is severe or prolonged, or if there is prior renal dysfunction, acute primary renal failure due to ischemic acute tubular necrosis will be induced. Postrenal azotemia occurs when urine flow is obstructed or the excretory pathway is ruptured and there is subsequent urine resorption. Persistent urinary obstruction may cause irreversible renal damage. Early detection of postrenal azotemia will result in complete restoration of renal function. Acute tubular necrosis accounts for the majority of acute primary renal failure cases and is characterized by an abrupt and sustained reduction in GFR due to an ischemic or toxic renal insult. The conditions that incite ischemia are the same as those for prerenal azotemia; however, the duration of the ischemia is important. Nephrotoxins are a frequent cause of tubular necrosis. The high rates of blood flow and metabolic activity in the kidneys as well as their excretory function predispose dogs and cats to the toxic effects of drugs as well as endogenous or exogenous toxins.



PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

Dr. Sandra Welsh

INVOICE

72450

DATE

12/9/25

Clinical Signs: The clinical course in acute tubular necrosis can be divided into three phases: an initiating phase, a maintenance phase, and a recovery phase. The initiating phase, which is marked by the onset of renal injury, is the period in which there is the greatest potential for preventing or reversing tubular damage and the progression to overt renal failure because it is during this period that renal cell damage develops. The challenge, however, is that the initiating phase may only become evident in retrospect as it generally lacks characteristic signs. The maintenance phase is characterized by the onset of oliguria (i.e., urine production is less than 1ml/kg/hour). The onset of this phase typically occurs during the first 24 hours, but may be delayed for up to 1 week. The duration of this phase is highly variable, but usually persists for up to 2 weeks. It is characterized by: fluid and electrolyte imbalances, including an alteration in hydration; hyponatremia; hyperkalemia; high anion gap metabolic acidosis; hypocalcemia; hyperphosphatemia; and azotemia. Clinical signs include gastrointestinal, hematological, and neurological manifestations of renal failure. The recovery phase commences when the GFR increases, which consequently slows down and reverses the azotemia. There is a progressive increase in urine volume, and although the tubular function begins to improve, it nevertheless remains impaired. Diuresis persists because of the diminished ability of the tubules to reabsorb sodium and respond to vasopressin. Clinical manifestations observed in the maintenance phase persist into the recovery phase. In some patients, infections and/or gastrointestinal bleeding may occur. Sites of infection include the respiratory tract, operative sites, and the urinary tract. Septicemia may also occur and is sometimes the result of intravenous and urinary indwelling catheters.

Diagnostics: Extraurinary disorders that produce prerenal azotemia are associated with concentrated, hypersthenuric urine, which contains a relatively low concentration of sodium and high concentration of creatinine. ARF is typically characterized by enlarged or swollen kidneys, elevated hematocrit, and azotemia. Urine is isosthenuric or minimally concentrated, and contains high concentrations of creatinine. Proteinuria or glycosuria may also accompany this condition. The sediment will show casts and RTE cells. Complete anuria is usually associated with postrenal azotemia. Features that are typical for acute tubular necrosis include: anuria in the absence of a urinary tract obstruction or rupture; severe proteinuria; significant hematuria with red cell casts; and prolonged oliguria. In these cases, a diagnostic renal biopsy is indicated.

Treatment: Most patients with ARF are volume depleted. Fluid therapy is indicated to correct dehydration, which will restore adequate renal perfusion and may prevent further renal damage. If the etiology was prerenal in origin, then urine volume will increase. In the maintenance phase, fluid therapy should be directed toward maintaining fluid balance and preventing both overhydration and dehydration. In cases of renal disease it is important that only maintenance needs and ongoing losses are attended to as overhydration can develop if there is reduced renal function. Insensible losses are calculated at 20 ml/kg/day. Aggressive fluid therapy during the recovery phase may perpetuate polyuria. As the urine volume stabilizes, the volume of fluid administered should be reduced correspondingly. Because dehydration may occur during this phase, one should monitor body weight and clinically assess the hydration status as fluid therapy is being reduced. Oliguric patients who are unresponsive to fluid volume replacement can be treated with mannitol, furosemide, and/or dopamine in an attempt to increase GFR and urine volume. Hyperkalemia is commonly associated with the maintenance phase of ARF. Concentrations greater than 6 mmol/l may require treatment with sodium bicarbonate, dextrose, insulin and/or calcium gluconate. Hemodialysis should be considered in patients with severe, persistent uremia, acidosis, or hyperkalemia. It may also be used to treat overhydration and hasten the elimination of nephrotoxins.

PATIENT

Cooper SO

SPECIES

Canine

BREED

Boston Terrier

SEX

Neutered Male

AGE

3 Years 9 Months

WEIGHT

31 lbs

INTERPRETED BY

Eric Lindquist, DMV, DABVP (CFM), Cert. IVUSS

IMAGING PERFORMED BY

Ginny Dodd, DVM, D, ABVP (CFP)

HOSPITAL NAME

CityVet Marvin

REFERRING VET

Dr. Sandra Welsh

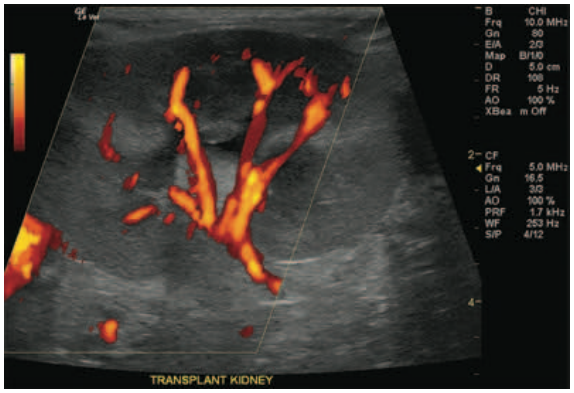
INVOICE

72450

DATE

12/9/25

Conclusion: Because ARF is frequently iatrogenic and associated with nephrotoxic drugs or inadequate fluid therapy, prevention is the best therapy.



Long axis of the kidney of the same cat as in the previous title image. Note the non-uniform power Doppler signal distribution with significant hypovascularity of the cranial pole compatible with regional infarction and transplant failure.

References:

Acierno MJ, Maeckelbergh V. Continuous renal replacement therapy. *Compend Contin Educ Vet* 2008;30:264-72.

Grauer GF. Early detection of renal damage and disease in dogs and cats. *Vet Clin North Am Small Anim Pract* 2005;35:581-96.

Labato MA. Strategies for management of acute renal failure. *Vet Clin North Am Small Anim Pract* 2001;31:1265-87.

Ross L. Acute kidney injury in dogs and cats. *Vet Clin North Am Small Anim Pract* 2011;41:1-14.