Animal Sounds
Mobile Veterinary Ultrasound

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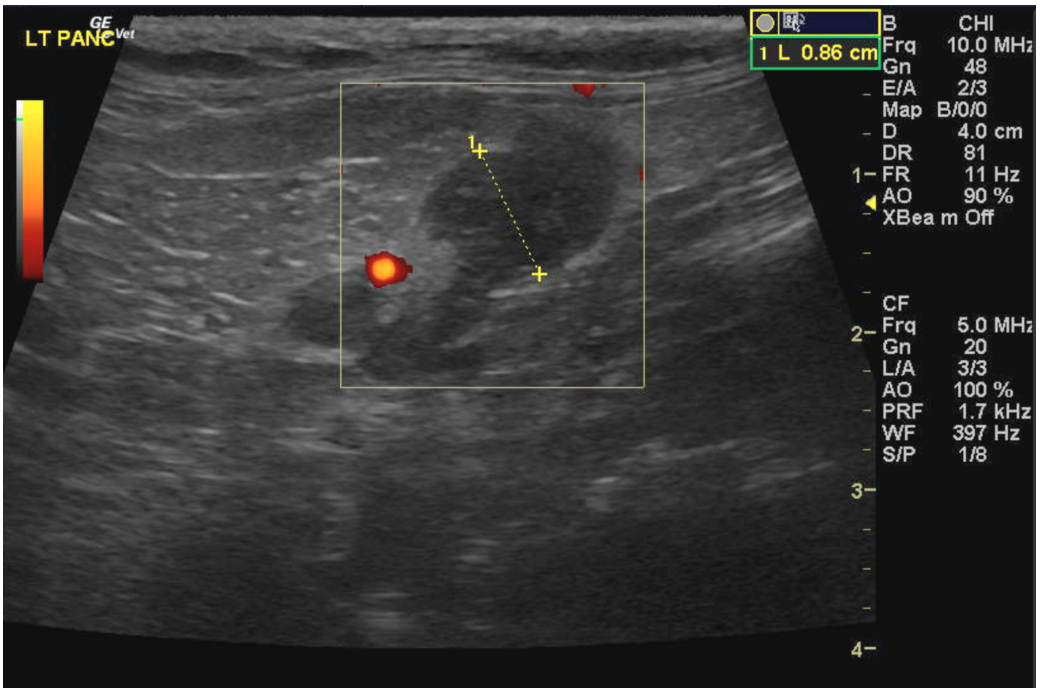
THE ENZYME CHASE

PART 2 OF 2: FROM CHOLESTEROL - NA/K RATIO



Cholesterol: Low density lipoproetin produced by the liver for cel membrane composition and is a precursor to steroid hormone formation. Normal values in Dogs (125-300 mg/dl), Cats (75-200 mg/dl).
Decreased: Hepatic disease, PLE, severe malnutrition, variable disease states
Increased: Diet, endocrinopathies, cholestasis, pancreatitis, hepatic insufficiency, breed predisposition- Miniature Schnauzer and Beagles (ettinger 288), glucocorticoid injection, idiopathic, post prandial sample.

Triglycerides: The major form of fat stored in the body.
Increased: same as cholesterol.

BUN (Blood Urea Nitrogen): BUN is a product of protein metabolism. Elevations are considered synonymous with ?azotemia.?
Decreased: Hepatic insufficiency, dietary protein deficit, polyuria, late term pregnancy
Note: Increased BUN is categorized as prerenal (USG > 1.030 in dogs; > 1.035 in cats), renal, and post renal. The BUN must be paired with urinalysis (Obtained prior to fluid therapy) results to help differentiate these categories (See Azotemia and PU/PD chapters)
Increased: Prerenal azotemia, , dehydration, shock, cardiac disease, diminished GFR, renal disease (compromizing > 65% of parenchymal capacity), obstructive urinary disease, urinary rupture, high protein diet, drug influence.

Creatinine: Chemical waste molecule deriving from muscle metabolism. This parameter is paired with BUN and urine specific gravity in the evaluation of azotemia.
Increased: Creatinine + Increased BUN: renal failure, E.coli infection, Addison?s disease, Hypercalcemia, Diabetes Mellitus and Insipidis with dehydration, Hepatic failure, Obstructive urinary disease.
Increased Creatinine + normal BUN: Hepatic failure, PU/PD, low protein diet, myositis/trauma, meat diet.

Amylase: This is a poorly specific and poorly sensitive screening enzyme marker for pancreatic disease and may be elevated in non pancreatic disease states. This enzyme is also found in other tissues such as intestine and liver. Normal values can occur in patients with pancreatitis (False negative).
Increased: Causes of poor GFR (i.e. any disease that causes dehydration/volume contraction), pancreatitis, drug therapy, intestinal disease*, hepatic disease*. (*suspected not proven wilalrd p 215)

Lipase: As with lipase this is a poorly specific and poorly sensitive screening enzyme marker for pancreatic disease. Elevations do not correlate with severity of pancreatic disease. Normal values can occur in patients with pancreatitis (False negative).
Increased: Causes of poor GFR, pancreatitis, duodenal foreign body, chronic gastritis, drug therapy.

Pancreatic Lipase Immunnoreactivity (PLI): Most sensitive and specific serum test for pancreatitis. Variably poor sensitivity in chronic and chronic active pancreatic disease which is the most frequent form of pancreatitis in dogs and cats. (Saunders and hess and pull form latest panc chapter). For more information see canine and feline pancreatitis chapters.
Decreased: Exocrine pancreatic insufficiency or isolated pancreatic lipase deficiency.
Increased: Pancreatitis, potentially other diseases.

Calcium: Total serum calcium concentration: Corrected calcium (mg/dl) = measured calcium (mg/dl) ? albumin (g/dl) + 3.5. Confirm abnormal values in serial samples.
Normal values: Total Calcium in adults 9-11.5 mg/dl, ionized calcium 1.12-1.42 mmol/L.
Decreased: Acute and chronic renal failure, puperal tetany, malasimilation syndrome, hypoalbuminemia (relative), hypoparathyroidsim post thyroidectomy.
Increased: Paraneoplastic syndrome (Lymphosarcoma; particularly cranial mediastinal and sternal lymphosarcoma, anal gland carcinoma, bone metastasis, other), idiopathic (cats levels < 13 mg/dl), primary hyperparathyroidism (parathyroid adenoma), renal failure, Addison?s disease, drug therapy (glucocorticoids, other), hypervitaminosis D lab error.
*Note: Serum ionized calcium, PTH, and PTH rp (paraneoplastic protein), together with calcium levele will help differentiate the cause of hypercaclemia but all levels must be evaluated form the same serum sample.

Glucose: Its important to separate serum immediately from red blood cells for accurate measurement as RBCs will consume the glucose. Normals: 70-110 mg/dl.
Decreased: Drug therapy (insulin, antihistamines, beta blockers, anabolic steroids, aspirin therapy, other), insulinoma, hepatic insufficiency, sepsis (adolescence), Addison?s, paraneoplastic syndrome, incomplete dietary intake, hypocortisolism. Insulin profile reciommended if persistent hypoglycemia is present in serial samples and other causes have been ruled out.
Increased: Drug therapy (glucocorticoids, iv dextrose infusion, other), Diabetes mellitus, stress (cats). Concurrent disease to rule out include pancreatitis, pancreatic neoplasia, Cushing?s disease, obesity, acromegaly (cats), hyperthyroidism, infection. PU/PD occurs after serum levels fof 180 mg/dl are

reached.

Potassium: Normal Values 3.5-5.5 mEqu/L (mmol/L). Hemolysis elevates potassium levels.
Decreased: Renal (Intersitial nephritis) or GI loss (Vomiting), drug therapy (Loop diuretics, laxatives, thiazides, other), decreased intake, cellular translocation (insulin therapy), post obstructive diuresis, hyperaldosteronism (adrenal adenoma/hyperplasia). Ventroflexion in cats is a common sign.
Increased: Renal failure (anuric/oliguric) owing to obstructive disease or rupture, Addison?s, cellular translocation (acidosis), Drug therapy (KCL suplementation, ACE-inhibitors, mannitol, NSAIDS, other), Increased intake (rare).

Sodium: Evaluated with respect to normal plasma osmolality. Minimal most common causes are mentioned here.
Decreased: Hyperlipidemia, hepatic failure with ascites, congestive heart failure, nephrotc syndrome, renal failure (oliguric/anuric), GI loss, third space loss (effusions), Addison?s, diuretics,psychogenic PU/PD, iatrogenic (inappropriate fluid therapy).
Increased: dehyrdation/volume contraction, diabetes insipidis, GI disease, third space f luid loss (effusions), renal failure, diuresis, hyperaldosteronism, dietary.

NA/K ratio: Normal > 25:1.
Decreased: Addison?s disease (< 25:1). 10% or more Addisonian dogs will be atypical and have normal Na/K ratios.

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