

Lab Hacks with Feline Patients

Presented BY: Dr Liz Ruelle, DVM DABVP (Feline)

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Interpreting feline laboratory results start before we draw that first sample. Having a complete physical examination is essential as we must always interpret lab results in context of how the patient is doing including hydration status, demeanour (i.e. how stressful was the blood collection), fasting status, and muscle mass. In addition to a good physical examination, an established healthy baseline for an individual cat will also provide immense value as it allows a practitioner to compare to that individual's normal as opposed to established reference ranges, which are designed to represent what is happening in 90% of cats.

Cat urine:

Fondly described as liquid gold, the diagnostic value of cat urine is incredible. Cat urine can quickly point us in a disease direction such as diabetes mellitus (based on the presence of glucosuria) or kidney insufficiency/CKD (based on a decrease in concentration or urine specific gravity). Even a quick urine chemistry stick and USG from a sample "donated" by a fearful cat during routine examination can affirm organ function in an otherwise limited physical examination situation.

Leukogram:

We turn to the leukogram to evaluate the inflammatory and infectious state of a patient. That said, the leukogram is often not very sensitive in detecting focal, mild, or chronic inflammation (which can be very frustrating when faced with a sick cat and an owner in search of answers). As fantastic as newer blood analyzers are at differentiating white cell types, they do not replace the microscopic examination of a stained blood smear when looking for morphological changes/shifts.

In cats, the leukogram is subject to stress change. Physiologic or acute stress occurs very quickly (within 30 minutes) and is due to the effects of epinephrine on the white cells. The classic "stress leukogram" by comparison is in response to cortisol release in the feline patient and is more often associated with illness. Iatrogenic glucocorticoids can mimic the effects of cortisol and thus affect the leukogram although these effects appear to be milder in cats. The inflammatory leukogram, by contrast, shows as being both highly variable and primarily neutrophil driven with white cell changes being triggered by the inflammatory nature of disease (including infection, immune-mediated diseases, neoplasia, tissue necrosis and foreign bodies). Stress patterns may or may not be seen in the inflammatory leukogram due to concurrent cortisol release. Although we tend to associate neutropenia with the inflammatory leukogram, by the vary nature of reference ranges, 5% of healthy cats will present as neutropenic. Further case work-up for any neutropenic cat, even if presenting as healthy, should be screening for retroviruses (FIV, FeLV).

Liver and pancreas:

Although we look at four liver enzymes in cats (ALP, ALT, AST, and GGT) as well as total bilirubin, changes in one enzyme/parameter in relation to the others can help narrow down the disease process (and how I am going to treat the cat). ALT and AST are found in hepatocytes and can go up in cases of hepatocellular damage. However, AST is found in muscle tissue so elevations of both enzymes would be more suggestive of liver cell damage as opposed to an increase in just AST. ALP

and GGT tend to be more closely associated with hepatic disease however GGT tends to be minimally increased in cases of hepatic lipidosis (compared to ALP). Bilirubin flows from the biliary tree into the gall bladder then through the pancreas (via the common bile duct) to the intestines. It is important to note that pancreatitis can cause sufficient compression of the common bile duct to cause mild increases in total bilirubin without altering liver enzymes. If pancreatitis is suspected, feline specific pancreatic-lipase immunoreactivity assays are commercially available.

What to do when labs do not make sense:

Although lab analyzers are a valuable part of practice, there are times when they yield results that simply do not make sense. When lab results do not fit with the patient, having a good quality control protocol in place will help troubleshoot these cases. Quality control protocols can include rerunning a test on a new blood sample and sending out samples to an external reference lab for confirmation of test results.

References/Resources:

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