

New Tests for Pancreatitis

Recent studies suggest that pancreatitis is far more common in dogs and cats than previously believed.

Some patients, especially dogs, have clinical signs, such as vomiting and abdominal pain, which are classically associated with acute pancreatitis. However, other patients have less pronounced clinical pictures or even subclinical disease. Diagnostic tests are crucial to determining the correct diagnosis.

Many tests have been evaluated for diagnosis of pancreatitis in small animal patients and are discussed in detail elsewhere.¹ This discussion will focus exclusively on Spec cPL, SNAP cPL, and Spec fPL (idexx.com); this set of diagnostic tests became available over the last 2 years. While these are the most sensitive and specific tests available for diagnosis of pancreatitis in dogs and cats, sound medical judgment and evaluation of all available data allow a practitioner to make an accurate diagnosis.

PANCREATIC LIPASE IMMUNOREACTIVITY

Assays for measuring pancreatic lipase immunoreactivity (PLI) determine the serum concentration of lipase that originates from acinar cells of the exocrine pancreas. When the pancreas is inflamed, acinar cells leak pancreatic



lipase into the vascular space and serum pancreatic lipase immunoreactivity increases. Serum lipase activity, which has traditionally been part of serum biochemical profiles, cannot differentiate between lipases of various cellular origins. In contrast, serum PLI concentration measures only lipase that originates from pancreatic acinar cells.

The half-life of PLI is estimated to be approximately 90 minutes in dogs. Therefore, if leakage of pancreatic lipase is stopped, serum pancreatic lipase immunoreactivity quickly returns to the reference range. Leakage must be ongoing in order to maintain an increased serum concentration of PLI.

Assays that measure PLI are species-specific. The Spec cPL assay (Figure 1) is for use in dogs and the Spec fPL assay for cats; both of these must be sent out to a laboratory. The SNAP cPL (Figures 2 and 3) is a patient-side test for use in dogs only.

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An ELISA plate of an Spec cPL assay that has been fully developed. In the top 2 rows the color intensity increases from left to right for the first 8 wells, representing the standard curve. Note the varying color intensity in the remaining rows showing samples from dogs with normal serum cPL concentrations and those with increased concentrations.

INDICATIONS

SNAP cPL

A SNAP cPL should be performed in any dog with acute signs of gastrointestinal disease and does not have an obvious diagnosis. If the SNAP cPL is negative, pancreatitis can essentially be ruled out.

If the SNAP cPL is positive, an abdominal ultrasound should be performed. In addition, serum for measurement of Spec cPL should be sent out to help confirm diagnosis of pancreatitis. This is important because the SNAP test provides only a negative or positive result, while the Spec cPL is a quantitative test with 3 diagnostic ranges—a reference range (< 200 mcg/L), questionable range (≥ 200 mcg/L, but < 400 mcg/L), and diagnostic cut-off for pancreatitis (≥ 400 mcg/L). If the SNAP cPL is positive, Spec cPL will fall in the questionable or diagnostic ranges. In addition, Spec cPL assays help monitor disease progression in patients with pancreatitis.

Spec cPL & fPL

Indications for the measurement of Spec cPL and Spec fPL depend on the goal of the clinician: In patients with classic clinical signs—acute onset of vomiting and abdominal discomfort—or those with less specific clinical signs that cannot be explained by another diagnosis, these tests can help confirm or exclude pancreatitis.

If the goal is to identify even subclinical pancreatitis, these tests should be added to any serum biochemical profile. At first thought this recommendation may seem extreme; however, few clinicians would argue against measuring serum creatinine concentrations as part of every serum biochemical profile to diagnose subclinical renal insufficiency. It would appear to be just as reasonable to routinely measure serum PLI concentrations to diagnose subclinical pancreatic inflammation.

CONTINUES



2 SNAP cPL, negative: The test spot is lighter in color than the control spot, which indicates a serum cPL concentration within the reference range and suggests that pancreatitis is highly unlikely.

3 SNAP cPL, positive: The test spot is darker in color than the control spot, suggesting that serum cPL is above the reference range and that further tests to confirm pancreatitis are indicated.

Figures 2 and 3. Reprinted from *Small Animal Gastroenterology*, Steiner JM (ed). Hannover: Schlütersche Verlagsgesellschaft, 2008, with permission.

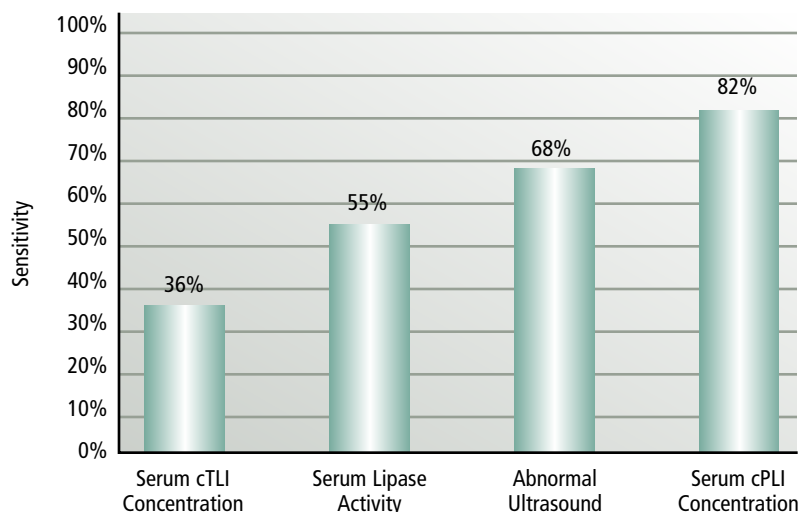
ADVANTAGES

The SNAP cPL allows clinicians to rule out pancreatitis in dogs with acute gastrointestinal signs and also to strengthen a suspicion of pancreatitis within minutes. Many dogs with acute gastritis, hypoadrenocorticism, renal failure, or other diseases may present with similar clinical signs. A negative SNAP cPL helps the clinician quickly shift the focus of the clinical investigation to other conditions. Measurement of Spec cPL or Spec fPL often allows diagnosis even in animals with mild or chronic disease (Figure 4).

DISADVANTAGES

While a positive SNAP cPL test helps strengthen a suspicion of pancreatitis, it does not definitively diagnose it. Other diagnostic tests, including abdominal ultrasound and measurement of Spec cPL, are necessary. In addition, no diagnostic test is 100% sensitive and specific.

**Comparison of Sensitivity
Diagnostic Modalities for Canine Pancreatitis**



4 Serum trypsin-like immunoreactivity (cTLI) concentration, abdominal ultrasound, and serum pancreatic lipase immunoreactivity (cPLI) concentration have high specificity for canine pancreatitis, whereas only approximately 50% of dogs with an increased serum lipase activity have pancreatitis.^{5,7}

Thus, it is crucial to integrate all clinical data available during the diagnostic process.

RELIABILITY OF RESULTS

SNAP cPL

As mentioned earlier, a negative SNAP cPL test can be used to rule out pancreatitis in patients with acute gastrointestinal signs. While no studies have determined the exact sensitivity of the SNAP cPL test, experience suggests that false-negative results are uncommon. A positive SNAP cPL result helps confirm a suspicion of pancreatitis, but further diagnostics are crucial to confirm the diagnosis because serum Spec cPL concentrations in the questionable range will produce a positive SNAP cPL test.

Spec cPL & fPL

Spec cPL and Spec fPL cannot differentiate between primary and secondary pancreatitis—some patients with an inflammatory disease process in another organ in the region may have secondary pancreatic inflammation.

The specificity for the Spec cPL and Spec fPL assays has been estimated at 96.8% and 100%, respectively.^{2,3} The sensitivity of Spec cPL has been estimated at 82% in 2 studies of dogs with more severe forms of pancreatitis and at 63.6% in those with mild pancreatitis.^{4,6} In an initial study involving a small number of cats, the Spec fPL was reported to have a sensitivity of 67% in all cats with pancreatitis and 100% in cats with moderate to severe pancreatitis.³

Several multicenter studies are underway to further assess the clinical utility of these tests in relatively large patient populations.

ECONOMIC IMPACT

All 3 tests discussed are economical, with prices ranging between \$10 to \$30, depending on whether tests are ordered as stand-alone tests or part of a panel.

See Aids & Resources, back page, for references and suggested reading.

Dr. Steiner discloses that he is a paid consultant for IDEXX Laboratories, Inc.