

IDEXX Reference Laboratories Introduces the Spec fPL Test™

Pancreatitis, an inflammatory condition of the exocrine pancreas, is a multifactorial disease in cats with a variable clinical course and outcome. Feline pancreatitis is more common than many practitioners realize and diagnosis of this elusive disease can be extremely challenging.

Recognizing these challenges, Dr. Jörg Steiner and Dr. David Williams developed and validated the feline pancreatic lipase immunoreactivity (fPLI) assay for the diagnosis of pancreatitis at the Gastrointestinal Laboratory at Texas A&M University. The fPLI test has been shown to be both sensitive for detecting significant pancreatitis and specific for helping to rule out pancreatitis.

Previously, IDEXX had collaborated with Drs. Steiner and Williams to develop the Spec cPL® or canine pancreas-specific lipase test to assist in the diagnosis of pancreatitis in dogs. The acceptance of this test has been overwhelmingly positive. The most frequent question asked of IDEXX has been “when is the cat test going to be available?” In response to these inquiries, IDEXX has continued to work with Drs. Steiner and Williams to develop the Spec fPL™ (feline pancreas-specific lipase) assay. The Spec fPL assay utilizes monoclonal antibody and recombinant antigen technology and is available through IDEXX Reference Laboratories.

Prevalence of Pancreatitis in Cats

A 2007 study published in *The Journal of Veterinary Pathology* found 67% of cats presented for necropsy, irrespective of the cause of death, had histologic evidence of pancreatitis, including 45% in apparently healthy cats. Chronic pancreatitis was more common than acute pancreatitis (60% versus 15.7%).¹

Although the prevalence of clinically significant pancreatitis is likely not this high, these findings suggest that pancreatic inflammation likely occurs with a wide variety of clinical conditions and potentially explains why mild pancreatic lesions are common even in clinically healthy animals.¹

Cats with other common ailments, including diabetes mellitus, inflammatory bowel disease, cholangiohepatitis and hepatic lipidosis, often have concurrent pancreatitis that is usually overlooked.²⁻⁵

Clinical Signs

Cats with pancreatitis typically present with nonspecific signs of illness including lethargy, decreased appetite, dehydration and weight loss.⁶ Vomiting and abdominal pain

are hallmarks of this disease in dogs, but in cats vomiting may be absent or intermittent and abdominal pain is rarely recognized. Diarrhea can be associated with pancreatitis or secondary to concurrent gastrointestinal disease. Icterus, fever and a palpable abdominal mass may be found on physical examination.

Laboratory Findings

Routine laboratory findings in cats with pancreatitis may be normal, nonspecific or attributed to concurrent conditions which are common in this species. CBC changes most commonly seen in cats with pancreatitis are nonregenerative anemia, leukocytosis and leukopenia.⁶ Increased liver enzymes, hyperbilirubinemia, hyperglycemia, azotemia, electrolyte imbalances and hypocalcemia can be seen on a complete biochemical profile.⁶ Serum activities of amylase and lipase are not helpful in diagnosing pancreatitis in cats.⁷

Serum trypsin-like immunoreactivity (TLI) concentration is specific for exocrine pancreatic function and is the test of choice for diagnosing exocrine pancreatic insufficiency in cats. However, in cats with clinical signs of pancreatitis, serum fTLI concentration has been shown to be poorly associated with histopathologic diagnosis and overall sensitivity of 28% and specificity of 75% for the diagnosis of pancreatitis.^{8,9}

Diagnostic Imaging

Radiographs are an important diagnostic tool when evaluating sick cats, especially if they present vomiting. In cats with pancreatitis, abdominal radiographs may show a loss of detail in the cranial abdomen, shifting of abdominal organs, and in some cases suggestion of a mass in the cranial abdomen. However, these findings are rather subjective and a conclusive diagnosis of pancreatitis is not possible by abdominal radiography alone.

Abdominal ultrasonography is also a valuable tool when evaluating sick cats for evidence of pancreatitis. In addition, ultrasound allows evaluation of other organs. This is important because it is common for cats with pancreatitis to have liver and/or intestinal disease concurrently. As technology has improved, it is no longer sufficient just to visualize the pancreas or an enlarged pancreas to diagnose pancreatitis on ultrasound. Changes in pancreatic parenchymal echogenicity, evidence of peripancreatic fat necrosis and fluid accumulation are supportive of pancreatitis. Recent studies have shown ultrasound to be 24% to 67% sensitive and 73% specific for the diagnosis of pancreatitis.^{5,8}

Pancreatitis In Dogs Versus Cats

	CANINE		FELINE	
Classic Signalment	Age: Middle-aged to older Sex: Male or Female Breeds predisposed: Schnauzers, Yorkshire terriers, poodles		Age: Middle-aged to older Sex: Male or female Breeds predisposed: Possibly Siamese	
Weight	Often obese		Often underweight or history of weight loss	
Prevalence	1.0% of 9,342 dogs on necropsy ¹⁰ >90% of cases undiagnosed (results on recent necropsy study) ¹¹		0.6% of 6,504 cats on necropsy ¹⁰ 67% of cats presented for necropsy (45% of healthy cats) ²	
Risk Factors	Drugs: Potassium bromide, azathioprine, furosemide, tetracycline, aspirin, sulfa drugs, L-Asparaginase, zinc toxicosis Diet: High-fat foods; dietary indiscretion	Hyperlipidemia (e.g., familial in miniature schnauzers) Hypercalcemia Hypothyroidism Hyperadrenocorticism Blunt trauma	Drugs: Organophosphates Infectious causes: <i>Toxoplasma gondii</i> , pancreatic fluke (<i>Eurytrema procyonis</i>), liver fluke (<i>Amphimerus pseudofelineus</i>); Viral – FIP, herpesvirus, VS-calicivirus	Diet: High-fat foods not implicated in cats Hypertriglyceridemia Hypercalcemia Blunt trauma
Common Concurrent Diseases	Familial hyperlipidemia in miniature schnauzers		Hepatic lipidosis Cholangiohepatitis	Inflammatory bowel disease Diabetes mellitus
Clinical Signs*	Anorexia Vomiting Weakness	Abdominal pain Dehydration Diarrhea	Lethargy Anorexia/decreased appetite Dehydration Weight loss Icterus	Vomiting Fever Abdominal pain Diarrhea Palpable abdominal mass
CBC*	Thrombocytopenia Neutrophilia with left shift Anemia		Nonregenerative anemia Leukocytosis Leukopenia	
Chemistry Profile*	Increased liver enzymes Azotemia Electrolyte imbalances Hyperbilirubinemia	Hypoalbuminemia Hypercholesterolemia Hypoglycemia Hyperglycemia	Increased liver enzymes Hyperbilirubinemia Hyperglycemia	Azotemia Electrolyte imbalances Hypocalcemia
Amylase and Lipase	55% sensitive ¹² Specific if 2–3 times above the upper limit of the reference interval Trending increases utility		Not shown to be useful ⁷	
Radiographs	Nonspecific Identify obstruction, radiodense foreign bodies, etc.		Nonspecific Identify obstruction, identify radiodense and suspect linear foreign bodies, etc.	
Abdominal Ultrasound	Up to 68% sensitive ¹³ High specificity with experienced ultrasonographer		24–67% sensitive ^{5,9} 73% specific ⁵	
TLI	33% sensitive ¹²	65% specific ¹²	28% sensitive ⁵	75% specific ⁵
Pancreas-Specific Lipases Spec cPL/SNAP cPL Spec fPL	82% sensitive ¹⁴ >95% specific ^{15,16}		67% overall sensitive ⁵ 54% in mild cases 100% in severe cases	91% overall specificity ⁵ 67% in symptomatic cats 100% in healthy cats
Treatment	Fluids & Electrolytes: Rehydration, pancreas perfusion, correct electrolyte and acid-base imbalances Analgesics: Routinely administer Antiemetics: Control vomiting to allow nutritional support Nutritional support: NPO no longer recommended; low-fat food per os or via feeding tube	Plasma: Provide clotting factors, antiproteases, α -macroglobulins Colloids: Improve oncotic pressure to enhance pancreatic perfusion Antacids: If evidence of gastrointestinal bleeding Antibiotics: Rarely indicated	Fluids & Electrolytes: Rehydration, pancreas perfusion, correct electrolyte and acid-base imbalances Analgesics: Routinely administer Antiemetics: Control vomiting to allow nutritional support Nutritional support: NPO not recommended; fat content not important; feeding tube usually required Plasma: Provide clotting factors, antiproteases, α -macroglobulins Colloids: Improve oncotic pressure to enhance pancreatic perfusion	Antacids: If evidence of gastrointestinal bleeding Antibiotics: Rarely indicated Cobalamin (vitamin B₁₂): Deficiency common with concurrent gastrointestinal disease Glucocorticoids: Believed to be beneficial especially in chronic disease; not contraindicated to treat concurrent disorders Appetite stimulants Treat concurrent diseases (e.g., insulin for diabetes)

*Listed in order from most to least frequent findings. For canine clinical signs, see reference 12. For feline clinical signs, see reference 6.

Clinical Utility of the Spec fPL Test

Diagnosis

In a recent study the fPLI assay was shown to be the most accurate test for diagnosing pancreatitis in cats. The sensitivity (ability to detect pancreatitis) of the fPLI test in cats with moderate to severe pancreatitis was 100%. In cats with mild pancreatitis the sensitivity did decrease to 54%, resulting in an overall sensitivity of 67%. The specificity (ability to rule out pancreatitis) of the fPLI test was 100% in healthy cats and 67% in symptomatic cats with histologically normal pancreata with an overall specificity of 91%.⁵

The Spec fPL assay correlates extremely well with the fPLI assay. Analysis of over 1,000 samples from Texas A&M showed a correlation of over 93% and a diagnostic agreement of 98% for characterizing a cat as having pancreatitis or not based upon the fPLI and Spec fPL results. Therefore, based on this previous study, cats with significant pancreatitis should have an elevated Spec fPL and healthy cats should have a normal Spec fPL. The preliminary results from a follow-up study evaluating the Spec fPL test in over 150 clinically characterized healthy and sick cats appear to support the diagnostic utility of this test. Data from this study will be available once the manuscript has been accepted for publication.

Concurrent conditions

As previously noted, it is very common for cats with pancreatitis to have other concurrent conditions.²⁻⁵ The term “triaditis” has been used to describe the complex of cholangiohepatitis, inflammatory bowel disease and pancreatitis. Hepatic lipidosis and pancreatitis commonly occur together. Chronic pancreatitis is identified at necropsy in approximately 50% of diabetic cats.² Therefore, it is recommended that a Spec fPL test be performed in cats with liver and/or intestinal disease and in newly diagnosed and hard to regulate diabetic cats.² Similarly, a serum cobalamin (vitamin B₁₂) concentration should be performed in cats with pancreatitis to look for evidence of intestinal disease.

Monitoring

Because of the sensitivity for pancreatic inflammation and the tight precision of the assay, Spec fPL concentrations may be helpful for monitoring cats with pancreatitis. In cats with acute pancreatitis, it may be useful to evaluate the Spec fPL concentration every few days during hospitalization and at recheck visits. In cats with chronic pancreatitis, monitoring the Spec fPL concentration to assess the response to treatment or management changes (e.g., introduction of corticosteroid therapy) may be valuable.

Prognosis

The prognosis for cats with pancreatitis is directly related to the severity of the disease. Patients with mild chronic pancreatitis may do well long-term, but may also develop intermittent episodes of severe disease. Patients with acute, severe disease, especially if systemic complications are present, have a poor prognosis. Pancreatitis may complicate management of concurrent diseases in cats such as diabetes mellitus. It also has been shown that cats

with concurrent acute pancreatitis and hepatic lipidosis have a poorer prognosis than cats with hepatic lipidosis alone.³ Therefore, diagnosis and management of the pancreatitis may be critical to the successful management of these other conditions.

Tests Available Now

Order a Spec fPL test as part of your initial blood work and get more information to better assess the health of the cat.

test code	test name, contents and specimen requirements
FPL	Spec fPL 1 mL serum
FPA	Add-on Spec fPL 1 mL serum
FPF	Follow-up Spec fPL 1 mL serum

* See the Directory of Tests and Services for specific turnaround times. Fasted sample preferred.

Learn More About Spec fPL Testing as a Diagnostic Tool for Your Practice

If you have any questions regarding Spec fPL or how to interpret test results, please call our Internal Medicine Consultant on 1300-443-399, or visit www.idexx.com.au.

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The information contained herein is intended to provide general guidance only. As with any diagnosis or treatment, you should use clinical discretion with each patient based on a complete evaluation of the patient, including history, physical presentation and complete laboratory data. With respect to any drug therapy or monitoring program, you should refer to product inserts for a complete description of dosages, indications, interactions and cautions.