

# DIAGNOSING & MANAGING FELINE PANCREATITIS

A roundtable discussion

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## Moderator

**Jane Robertson, DVM, DACVIM**  
IDEXX Reference Laboratories  
West Sacramento, Calif.

**Dr. Jane Robertson:** Let's begin our discussion with what sounds like a simple question. How does pancreatitis in cats differ from pancreatitis in dogs?



## Participants

**Marnin Forman, DVM, DACVIM**  
MedVet, Medical Center for Pets  
Worthington, Ohio

**Dr. Marnin Forman:** The clinical presentations differ between species. Many dogs develop acute, severe signs including vomiting, anorexia, fever, and marked abdominal pain. It is a more vague disease with cats presenting lethargic with a decreased appetite. Cat's physical exam findings often don't suggest pancreatitis. For example, detecting abdominal pain is uncommon, but this may be underestimated because it's difficult to assess in cats.



**Jörg Steiner, MED. VET., DR. MED. VET., PhD, DACVIM, DECVIM-CA**  
Texas A&M University  
College Station, Texas

**Dr. Jörg Steiner:** There may not be a big difference between the two. Acute pancreatitis has been studied more in dogs and chronic pancreatitis has been studied more in cats. If you look at the histopathology, there are two studies, one in dogs and one in cats.<sup>1,2</sup> The frequency of changes suggesting chronic inflammation is almost the same in dogs and cats, which is around 60%. Both species have acute and chronic disease—it's just that we focus on the acute disease in dogs. In cats, the focus has been on chronic disease, and acute cases have been less talked about.



**David Twedt, DVM, DACVIM**  
Colorado State University  
Fort Collins, Colo.

**Dr. David Williams:** I agree. There probably is more chronic disease in cats than in dogs, but both species can have acute and chronic disease. So when managing a patient, you have to keep an open mind. During the past five years, veterinarians have become more aware of chronic disease in both species.



**David Williams, VETMB, MA PhD, DACVIM, DECVIM-CA, MRCVS**  
University of Illinois  
Urbana, Ill.

## Prevalence

**Robertson:** What is the prevalence of pancreatitis? Because it can be difficult to differentiate between acute and chronic

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disease, do you think we are actually missing cases of pancreatitis?

**Forman:** One study showed that 67% of cats presented for necropsy irrespective of the cause of death had evidence of pancreatitis on biopsy.<sup>1</sup> I think that is too high. We need to agree about what pancreatitis is on a histopathologic level. If you agree with Dr. De Cock's assessment of pancreatitis, then the prevalence is extremely high in the population of cats that she evaluated at a tertiary hospital.<sup>1</sup> Earlier studies established the prevalence as 1.3%, but that is very likely too low.<sup>3</sup> It is probably much higher than initially thought.

**Robertson:** So we agree that the prevalence of pancreatitis in cats is unknown but between 1.3% and 60%. This is an extremely wide range, but it's probably much more common than previously believed.

## Clinical signs and risk factors

**Robertson:** What are the classic clinical signs in a cat presenting with pancreatitis?

**Forman:** The clinical signs are vague, but we usually see lethargy and inappetence. Cats often vomit, though it's not usually severe, and some are thin and have been ill. Nothing is specific to the pancreas.

**Robertson:** You are describing cats with the more typical clinical signs of chronic pancreatitis. Do cats with acute pancreatitis present differently than dogs?

**Forman:** One study showed cats with acute necrotizing pancreatitis could not be distinguished from chronic pancreatitis based on history, physical examination, results of clinicopathologic testing, abdominal radiographs or ultrasound.<sup>4</sup> Cats with chronic pancreatitis were significantly more likely to have higher serum alanine aminotransferase and alkaline phosphatase activities and concurrent diseases. However, in my experience, cats with acute necrotizing pancreatitis are frequently hypotensive, febrile, and, more commonly than dogs, develop cavitory effusions.

**Robertson:** Pain is harder to detect in cats. How frequent is vomiting, anorexia, and abdominal pain in cats with acute pancreatitis compared with dogs?

**Williams:** With regards to vomiting and abdominal pain, the literature would say less frequently in cats than in dogs, and I think that's true. However, anorexia is common in cats and may be a manifestation of abdominal pain.

**Dr. David Twedt:** More than 90% of the dogs that I treat have vomiting as part of their clinical

presentation. Cats with acute pancreatitis are dehydrated and may have metabolic changes. We should include pancreatitis as a differential diagnosis for sick cats regardless if vomiting is present or not.

**Steiner:** Maybe vomiting is more common than we think. When you carefully question the owner, you often find that the cat had a couple of vomiting episodes two or three weeks back and then seemed fine. Then when the cat is presented it is anorectic and lethargic. The owner doesn't come in because of the vomiting.

Another presentation that veterinarians should consider is a cat with diabetes mellitus. Our focus is on the diabetes when, in fact, the underlying cause of the diabetes may be pancreatitis. I think we miss a lot of those cases.

**Twedt:** That's a good point about diabetes. In an unpublished study reviewing 40 cases of pancreatitis in necropsied cats, I found about 35% were ketoacidotic diabetics. The pancreatitis probably significantly contributed to the reason those diabetic cats died.

**Robertson:** To summarize, cats with pancreatitis can present with lethargy, decreased appetite, weight loss, and vomiting and/or diarrhea. Abdominal pain is difficult to appreciate. They may present for other diseases like diabetes mellitus and pancreatitis is often overlooked.

Are there any known age, breed, or sex predispositions associated with pancreatitis in cats?

**Twedt:** I don't think any information exists on that, but I see more problems in older cats.

**Williams:** I'm agree that older cats get more pancreatic disease, just like older dogs and older people. However, there's a published case about chronic pancreatitis in a 9-month-old cat that led to pancreatic insufficiency. A whole spectrum exists.<sup>5</sup>

## Causes of pancreatitis

### Drugs

**Robertson:** In dogs, drugs such as potassium bromide and L-asparaginase have been implicated as a cause of pancreatitis. Are any drugs thought to cause pancreatitis in cats?

**Steiner:** The only class of drugs proven is organophosphates.<sup>6</sup> In people, virtually every drug is considered capable of causing pancreatitis as an idiosyncratic reaction. I think that is true in any species, just as you can have hepatic necrosis from almost any drug. It is not predictable. Potassium bromide in dogs shows no dose response,<sup>7</sup> which would suggest that it is an idiosyncratic reaction

## In cats, clinical signs of pancreatitis commonly include:

- lethargy
- inappetence
- weight loss
- anorexia
- mild or intermittent vomiting.

### Other signs may include:

- dehydration/hypotension
- fever
- cavitory effusions
- diarrhea
- abdominal pain.

Diagnosing pancreatitis can be difficult because these clinical signs are often associated with other diseases and pancreatitis can occur simultaneously with other diseases, such as diabetic ketoacidosis.

rather than a side effect of the drug. I think that's also true in cats, but hasn't been studied enough. When a cat has pancreatitis, I believe it's important to look at the medications the cat is receiving.

### Trauma

**Forman:** Do you believe that trauma causes pancreatitis in cats?

**Steiner:** This occurs most commonly in dogs and cats hit by a car. They develop pancreatitis a couple of days later. In children, trauma is one of the most frequent causes of acute pancreatitis. It's probably not that common in cats, but it happens.

**Williams:** Several case reports of cats falling from high-rise buildings show the development of pancreatitis. I think that is more likely related to pancreatic ischemia subsequent to shock because the blood gets diverted away from the gastrointestinal tract.

### Diet

**Robertson:** How about the role of diet? Dogs that eat a high-fat meal, get into the garbage, or are given leftovers are more apt to develop acute pancreatitis. Have there been similar associations in cats?

**Steiner:** I believe this does happen in cats. My colleagues and I at the Gastrointestinal Laboratory at Texas A&M University have recently studied the association of hypertriglyceridemia and pancreatitis in cats. We analyzed the data in four ways. One of the analyses was statistically significant, which suggests that there may be some relationship. I think that this relationship it is not as important as it is in dogs, but I think there is an association. Based on this, I think

that a cat with pancreatitis doesn't need to be on an ultra-low-fat diet like a dog, but it should not be fed a high-fat diet either.

**Williams:** There still remains the issue of whether or not any trend for an association of pancreatitis with mild hyperlipidemia is the cause or the effect of pancreatitis. Cats with pancreatitis and feeding tubes are often fed very high-fat content liquid diets and seem to tolerate them well. It is not standard practice to formulate lower fat content liquid diets. There are no published studies of this; only the observations of criticalists and nutritionists who do not seem to worry about dietary fat content in cats with pancreatitis.

**Twedt:** Dogs that develop acute pancreatitis after eating a high-fat meal are classically small breed and obese. In cats with pancreatitis, that is not the classic presentation.

**Robertson:** Does obesity predispose cats to developing pancreatitis?

**Steiner:** I don't think so.

**Forman:** We treat a fair population of cats that are overweight with hepatic lipidosis and pancreatitis.

**Williams:** Patients with pancreatitis are not all overweight—many are normal or even underweight. I don't believe that obesity is a basis for worrying more or less about pancreatitis in any species.

## Associated conditions

**Robertson:** What other diseases predispose cats to developing pancreatitis? Are there infectious causes of feline pancreatitis?

**Forman:** There is a paper in press on a pancreatic fluke that causes pancreatitis in cats.<sup>8</sup>

**Twedt:** Yes, there is a pancreatic fluke, *Eurytrema procyonis*. There is also a causal relationship with toxoplasmosis. Also, ascending bacteria into the pancreatic ducts from the gastrointestinal tract are another cause of pancreatitis.

**Robertson:** Do most cases of pancreatitis have a bacterial or infectious component?

**Steiner:** Based on cultures, the answer is no. Individual cats may have an infection, but most don't. However, the question is whether bacteria exist that we just can't find with traditional culture methods. The problem is that there are digestive enzymes in the pancreas, and they digest not only proteins but also RNA and DNA. All of the sensitive methods for detecting infectious agents that have been used in the liver, blood, and brain cannot easily be used in the pancreas.

**Twedt:** We've found bacteria in some cats with chronic

pancreatitis and ductular inflammation. We've identified enteric bacteria associated with the wall in and around the pancreatic ducts and fibrous tissue. With some chronic cases of pancreatitis there may be resident bacteria that persists and could be responsible for the chronic inflammatory changes. We've yet to determine the significance of the bacteria in these cases.

**Robertson:** Should virulent, systemic feline calicivirus be on the list of infectious causes of pancreatitis in cats?

**Forman:** A study about an outbreak in California showed histopathologic proof that it was.<sup>9</sup>

**Twedt:** Occasionally we will see cases of cats with toxoplasmosis or feline infectious peritonitis, especially the dry form, that involve the pancreas.

**Robertson:** The term triaditis is used to describe cats with pancreatitis, inflammatory bowel disease (IBD), and cholangitis. Do you agree that this condition exists, and do we know why these

**Steiner:** The only problem I have with triaditis is the term itself. In human medicine, triaditis means something completely different—inflammation of the portal triad in the liver. However, I certainly believe that a combination of inflammatory diseases of abdominal organs occurs in cats, but I don't think it's unique to cats. In people there is an association of IBD and pancreatitis. Many dogs have chronic IBD and chronic mild pancreatitis. We just ignore the chronic mild pancreatitis.

**Forman:** It's important to remember that disease may exist in other organs because if we focus on treatment for pancreatitis, we sometimes have therapeutic failure—we have to redirect treatment to the intestinal disease. It's good to keep in mind that you have to look at the pancreatitis and other disease processes at the same time.

**Twedt:** I agree. If an animal has cholangitis, it is prudent to evaluate that animal's pancreas as well. Pancreatitis may be a complicating factor in the overall course of the disease, and it would be good to know that as early as possible.

“Detecting abdominal pain is uncommon, but this may be underestimated because it's difficult to assess in cats.”

— Dr. Marnin Forman



diseases frequently occur in combination?

**Williams:** A 1972 study identifies an association between pancreatitis and inflammation in the biliary tree.<sup>10</sup> Subsequently, others identified similar types of pancreatic pathology along with inflammation of the intestine.<sup>11</sup> Clinically over the years, Dr. Steiner and I have seen very large numbers of abnormal serum cobalamin, folate, TLI, and pancreatic lipase immunoreactivity (PLI) test results, all in association in individual patients. A considerable body of evidence supports this association between pancreatitis, IBD, and cholangiohepatitis.

**Twedt:** Clinically, I see this association as well. The duct system in cats is different than in dogs. The common bile duct attaches to the pancreatic duct and a common channel enters the intestinal tract. It's not hard to see that if inflammatory changes are present around one duct system, then inflammatory changes can also exist around the second duct system.

**Forman:** In the study we did on PLI, we included biopsies of the intestinal tract and the liver in addition to the pancreas. Fifty percent of the cats had triaditis or inflammation at three different sites.<sup>12</sup>

**Williams:** We occasionally see dogs with obvious clinical signs of inflammatory disease of the biliary tract, and we tend not to look for concurrent pancreatitis or small intestinal disease. It could be there, but we don't look for it.

**Robertson:** So do you think veterinarians look for concurrent diseases in cats more than in dogs?

**Twedt:** Yes, I think so.

**Williams:** Clearly, more diffuse, multi-organ disease exists in cats than in dogs. For example, cobalamin deficiency reflecting malabsorption secondary to IBD, is far more commonly seen in association with pancreatitis in cats than it is seen in association with pancreatitis in dogs.

**Robertson:** So IBD, cholangiohepatitis, and pancreatic disease occur together commonly in cats. Do any other diseases occur with pancreatitis in cats?

**Forman:** Hepatic lipidosis.

**Twedt:** My philosophy is that sick anorexic cats mobilize fat to the liver and develop secondary

lipidosis. The question is whether it is idiopathic hepatic lipidosis or it is a sick cat that is mobilizing fat. Cats with evidence of lipid in their livers may have idiopathic disease but research has shown many have other conditions such as renal disease, IBD, or pancreatitis.<sup>13</sup> This is important to know when recommending therapy.

**Robertson:** One disease mentioned earlier that often develops secondary to chronic pancreatitis in cats is diabetes mellitus. It is important to recognize if diabetes is present or develops in these cats, so that it can be managed appropriately. This usually requires insulin therapy, at least in the short term. However, the diabetes in these cats may be transient and as the pancreatitis resolves, the diabetes may also resolve. Managing these cats can be challenging.

**Forman:** I agree. The pancreatitis is also a common contributing factor in insulin resistance in diabetic cats.

**Williams:** Even if the diabetes mellitus is not caused by the pancreatitis per se destroying islet cells, the presence of inflammation in the pancreas can make diabetic cats more difficult to regulate and stabilize. Also, in rare cases chronic pancreatitis can lead to concurrent exocrine pancreatic insufficiency and diabetes mellitus, so that treatment with pancreatic extract supplements as well as insulin is required.

**Steiner:** I think that it is pretty much agreed upon that pancreatitis and diabetes mellitus often occur together. Managing the pancreatitis may alleviate the need for insulin therapy. I think that is quite significant for the cat and the owner.

**Robertson:** In summary, the clinical signs of pancreatitis are vague and varied. It is not uncommon for cats with other diseases such as diabetes mellitus, IBD, hepatic lipidosis, or cholangitis to also have pancreatitis.

## Diagnostic testing

**Robertson:** What changes would veterinarians see on a minimum database, including a complete blood count (CBC), serum chemistry profile, and urinalysis, to make them suspect pancreatitis in a cat?

**Williams:** The results of those tests don't make me suspect pancreatitis. Rather, I look at the cat's clinical signs and presentation.

**Steiner:** What is useful in the serum chemistry profile for specifically diagnosing pancreatitis? Absolutely nothing. But is it still useful to run a serum chemistry profile and a CBC? Absolutely. We want to look for concurrent conditions that are either complicated by pancreatitis or may actually be the underlying cause of the pancreatitis, and we want to evaluate the patient as a whole. A serum chemistry profile can suggest other diseases occurring concurrently with pancreatitis, such as hepatic disease, intestinal disease,

hypoalbuminemia, or diabetes mellitus.

**Robertson:** So a cat with pancreatitis can have normal or nonspecific changes on its CBC, serum chemistry profile, and urinalysis results, or it can have evidence of concurrent disease. A retrospective study of cats with acute pancreatitis found that the most common abnormalities on the CBC were a nonregenerative anemia, leukocytosis or leukopenia, and the most common chemistry abnormalities were hypocalcemia, hypokalemia, azotemia, hyperglycemia, hypercholesterolemia, elevated liver enzymes, and hyperbilirubinemia.<sup>6</sup> However, no specific findings on a CBC or serum chemistry profile would make you say this cat has pancreatitis?

**Twedt:** That is correct, but certain changes are suggestive and require follow-up. In addition, if you have a diabetic patient, you should investigate its pancreas. If you have evidence of liver disease, investigate the pancreas. Unexplained inflammatory leukogram? Investigate the pancreas.

**Forman:** When the cats in the feline PLI study were broken into subgroups of cats that were sick without pancreatitis, with mild pancreatitis, or with severe pancreatitis, there was no difference between their liver enzyme activities, bilirubin levels, or calcium levels. We couldn't statistically pick out anything that was more likely to occur in cases of pancreatitis.<sup>12</sup> The feline pancreatic lipase immunoreactivity (PLI) test is a radioimmunoassay that detects a unique lipase that is only present in the feline pancreas. Feline PLI was shown to be elevated in cats with pancreatitis and within the normal range in cats without pancreatitis.

**Robertson:** Amylase and lipase activities have been used to help diagnose pancreatitis in dogs. Is there any clinical utility to amylase and lipase activities in cats for diagnosing pancreatitis?

**Williams:** No. Only one abstract is published on this topic.<sup>14</sup> Not a single cat with severe acute pancreatitis had serum amylase or lipase activities above those in the control group.

**Robertson:** Can the feline TLI test be used to diagnose pancreatitis in cats?

**Steiner:** The fTLI test should no longer be used for diagnosing feline pancreatitis. The fTLI is a fantastic diagnostic tool for diagnosing exocrine pancreatic insufficiency, but it has a poor sensitivity for diagnosing pancreatitis. The feline pancreatic lipase immunoreactivity (fPLI) test is more sensitive, and is at least as specific as the TLI test.

**Williams:** The fTLI test was the one that first alerted us to the fact that so many cases of feline pancreatitis existed. But the fPLI has replaced it for diagnosing feline pancreatitis because it is more sensitive.

**[IDEXX:  
Is that  
correct?]**

**Robertson:** We have mentioned that the fPLI is a more sensitive and specific diagnostic tool for pancreatitis in cats. What is its sensitivity and specificity for the diagnosis of pancreatitis?

**Forman:** This is one area where we have the data. We have numbers for the sensitivity and specificity. From our study, 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, resulting in an overall specificity of 92%.<sup>12</sup> Our clinical impressions correlate with these numbers.

**Steiner:** Despite Dr. Forman's study, I still do not believe we know the true sensitivity and specificity of the fPLI. The reason we don't know is because it depends on the severity of the disease. The more severe the disease, the higher the sensitivity, until the

**Steiner:** The equipment and training have dramatically improved during the past 20 years. We have better equipment now—and such a high level of suspicion for pancreatitis—that we have to be careful that we don't over interpret ultrasonographic findings. Many years ago it was believed that when you could find the pancreas, that meant that the cat has pancreatitis. But the equipment got better and expertise with abdominal ultrasound rose and we realized that wasn't the case any more. So what Dr. Forman said is important. You need expertise in this area; the ultrasonography needs to be done by either a trained radiologist or an internist who performs a lot of ultrasounds every day.

**Twedt:** Years ago, people didn't think cats had pancreatitis, so they did not try to look at the pancreas. Our level of suspicion has markedly increased since that time. The more you look, the more you can find.

**Forman:** But we need to consider all findings in these cases. For example, we would never perform abdominal ultrasonography, look at changes in the kidneys, and say this cat is in chronic kidney failure,

“...the fPLI is the most sensitive and most specific test available—no matter what group of patients you are looking at.”  
— Dr. Jörg Steiner



pancreas is so heavily autolyzed that there is nothing left to be leaking. So the answer really depends on the patient. The important point is that the fPLI is the most sensitive and most specific test available—no matter what group of patients you are looking at.

**Twedt:** I agree. There is a need for more studies. We need to classify these diseases differently.

**Robertson:** So what other diagnostic tests along with fPLI would you perform to enhance the sensitivity and specificity?

**Forman:** I'd recommend an ultrasound, done by a skilled ultrasonographer using good equipment. This approach also allows evaluation for concurrent disease. Intestinal thickening is an example.

**Robertson:** Two older retrospective studies showed that the sensitivity of ultrasound for pancreatitis was 24%<sup>15</sup> to 35%.<sup>16</sup> Dr. Forman's more recent prospective study showed a much higher sensitivity of 80% in cats with moderate to severe disease and 62% in cats with mild disease.<sup>12</sup> What do you think the difference is between these studies?

so let's start therapy. A correlation exists between changes we see in the kidneys on ultrasound and blood work changes. We use them together. We should probably go about evaluating the pancreas in the same way—if we see changes in the ultrasound, we should correlate that with the fPLI.

**Steiner:** Excellent point.

**Robertson:** Concurrent ultrasound is ideal. However, some practitioners may not have access to ultrasonography by an experienced radiologist, or the client may not have the financial means to pursue that option. In these cases, how would you interpret an elevated fPLI test in a cat?

**Steiner:** If a cat has an elevated serum fPLI concentration, you can assume pancreatitis exists. We don't know of anything, such as dehydration or other diseases, which falsely increases fPLI concentrations. An ultrasound just adds more information; it doesn't make the fPLI test invalid.

**Twedt:** You have to evaluate the other laboratory information and put everything together to make the diagnosis, such as the clinical signs, fPLI, and

other test results.

**Williams:** You have to ask yourself when you do an ultrasound what you're likely to find. What findings would change what we are going to do? If everything fits with pancreatitis and fPLI is elevated, ultrasonographic findings are not going to change your approach in most cases. If more severe pancreatitis exists, you can identify that with ultrasound, whereas you cannot establish severity from the degree of the fPLI elevation.

**Forman:** The ultrasound might give you some information about concurrent diseases, such as a possible intestinal foreign body or a concern for hepatic lipidosis.

**Robertson:** So when would you recommend a veterinarian run an fPLI test on a cat?

**Williams:** I would run it on any cat with unexplained lethargy, decreased appetite, vomiting, diarrhea, or weight loss. Even if you have another diagnosis, some cats could have concurrent pancreatitis. With the Spec fPL test now being widely available through IDEXX Laboratories, veterinarians have good reason to run this test in many cases.

**Steiner:** I think that 10 to 20 years from now, we won't be able to afford not to look at the pancreas. When I went to veterinary school 15 years ago, we had to justify why we wanted to run an ALT and ALP test. Today students want to run a full serum chemistry profile. I'm happy with that because I want to know what the liver and kidneys are doing. We almost automatically perform a full profile, including measurement of serum hepatic enzyme activities, to get a complete picture of the patient. I think that sometime in the future, we will perform pancreatic screening automatically.

**Twedt:** That's probably true. A good example of that is  $T_4$  measurement. It used to be that for every sick cat I would see I would do a routine minimum database. If that didn't give me a diagnosis, then I would do a  $T_4$ , which is often included as part of our feline minimum database.

**Robertson:** Dr. Steiner and Dr. Williams have worked closely with IDEXX Laboratories during the past few years to develop the feline pancreas specific lipase or Spec fPL test, which is a modification of the fPLI test. Dr. Steiner, do you think that now this test is more routinely available to practitioners, it will change the way we look at the pancreas?

**Steiner:** Absolutely. The pancreas is an organ that we need to evaluate in every patient on whom we perform routine blood work.

**Williams:** The fPLI, now the Spec fPL test, is an emerging gold standard for pancreatic inflammation. A corollary would be the TLI, which is effectively a gold standard for pancreatic mass. When it first came

out and we saw animals with slightly subnormal TLI, I thought that was a failing of the test. It was not as good as I had hoped it would be; however, time has shown that when patients have a subnormal TLI, they have reduced pancreatic mass even if it is subclinical. I think we are on that path with the Spec fPL test. It is going to become the gold standard. The histologic definition is limited and impractical because you can rarely do histopathologic examination of the whole pancreas. Ultrasonography cannot detect pancreatitis in the more mildly affected patients.

**Robertson:** So an elevated Spec fPL test in a cat with compatible clinical signs will help you diagnose pancreatitis. In an animal without compatible clinical signs, the test still tells us something is wrong with the pancreas.

**Williams:** Yes. An elevated Spec fPL indicates a pancreatic abnormality, most likely pancreatitis, even if the animal is asymptomatic.

**Steiner:** If a cat has a creatinine level of 3.5 mg/dl and is not dehydrated or obstructed, it doesn't matter whether it has any clinical signs. I have no doubt this cat has renal insufficiency. If you have a cat with an fPLI/Spec fPL that is above the cut-off value for pancreatitis, there is no question that the cat has pancreatic inflammation. However, I can't tell you whether that is the primary disease process in this cat—it may also have gastric or intestinal disease. Knowing that the cat has an elevated Spec fPL may change how I approach the case. For example, I normally would put a diabetic cat on a low-carbohydrate diet, which is also high in fat. But if the cat also has pancreatitis, I certainly wouldn't do that. If a cat just has IBD, I am likely to perform a dietary trial. But if the cat has IBD and pancreatitis, I'm more likely to prescribe steroids. In other words, I will treat a cat differently if I know complicating pancreatitis exists.

**Robertson:** Other than ultrasonography, do you use any other imaging in cats with pancreatitis?

**Steiner:** Radiography is important for ruling out other diseases, such as a foreign body, which would be more of a differential diagnosis in cats with acute clinical signs.

**Twedt:** You may see evidence of effusion or a pancreatic mass, but those aren't very common. But ruling out other diseases is important.

**Robertson:** What are the specific changes that you look for on ultrasound in a cat with pancreatitis?

**Forman:** No one abnormality on ultrasound has been identified that is pathognomonic for pancreatitis in the cat. A change in the size and echogenicity of the pancreas is a common finding. The pancreas will be larger than normal and hypoechoic with a hyperechoic surrounding mesentery. Other findings include a change in the echotexture or peripancreatic fluid. An irregular

pancreatic margin rather than a smooth one is also a consistent finding. Based on recent report that showed the pancreatic duct width was associated with age and not associated with pancreatitis, the duct width has been determined to be an inconsistent finding.<sup>17</sup>

**Robertson:** Do you ever collect a fine-needle aspirate of the pancreas in a cat?

**Twedt:** We do.

**Forman:** Radiologists in the past have been concerned about creating pancreatitis by doing that, but this has been shown not to be the case. I do it, and it is helpful for me to see if I find a lymphocytic or neutrophilic population. Sometimes it helps us diagnose cancer.

**Steiner:** Yes, even on ultrasound, it can be difficult to distinguish cancer from pancreatitis because inflammatory masses of the pancreas develop quite often. A fine-needle aspirate of a mass-like lesion can help determine if it is pancreatitis or cancer.

be intestinal disease causing malabsorption, and it must have been present for a significant period of time in order to deplete the body stores.

**Twedt:** All of us have probably seen cases in which we treat a patient for IBD or pancreatitis that does not respond. When we find out an animal is cobalamin-deficient, and with adequate supplementation, then there is clinical improvement.

**Robertson:** So if you have a cat with intestinal disease, you should test them for concurrent pancreatic disease.

**Williams:** Yes.

**Forman:** One of the advantages of testing for cobalamin and folate deficiencies is that we can treat them. It is a way that we can help these cats, even though we don't have a clear-cut treatment for pancreatitis.

**Robertson:** Do you think we should perform intestinal biopsies on cats diagnosed with pancreatitis?



**Williams:** Techniques such as contrast-enhanced ultrasound may help elucidate some of these differences in the future.

**Robertson:** Do you perform any other diagnostics on a cat in which you've diagnosed pancreatitis, based on its history, clinical signs, or fPLI elevations plus or minus compatible ultrasonographic changes?

**Williams:** I almost always perform serum cobalamin and folate measurements because of the frequency of concurrent intestinal disease. A low cobalamin or folate and high PLI would indicate concurrent intestinal and pancreatic pathology. If liver enzymes were increased too we would likely make a diagnosis of "triaditis."

**Robertson:** For clarification: how are cobalamin and folate helpful in diagnosing intestinal disease?

**Williams:** Cobalamin and folate are two water-soluble vitamins. In cats, cobalamin is absorbed in the distal small intestine, and folate is absorbed in the proximal small intestine. Given that all feline diets have sufficient amounts of cobalamin and folate if subnormal serum concentrations of cobalamin or folate exist, there must

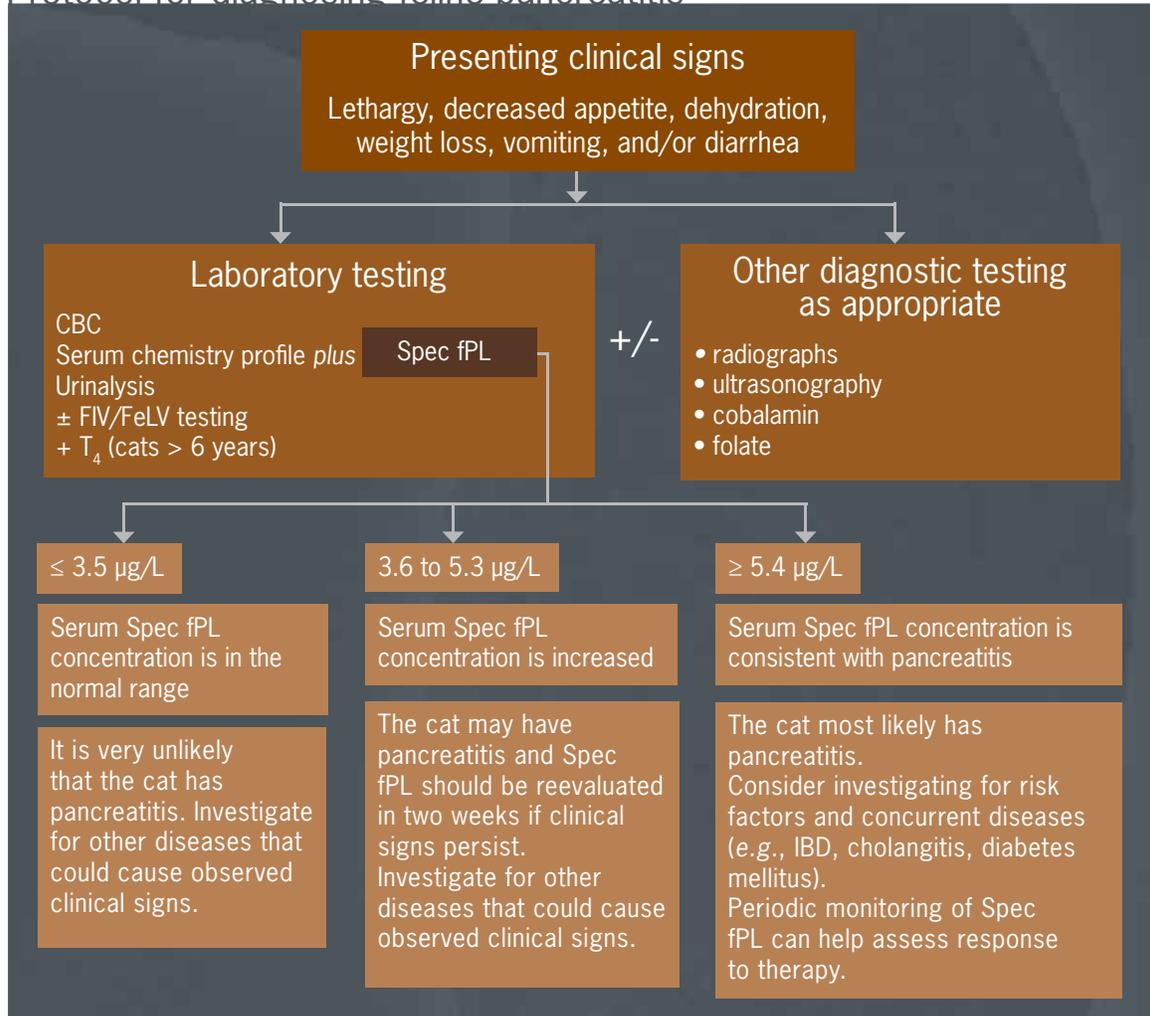
**Forman:** In cats that I am suspicious of pancreatitis and intestinal disease I always recommend intestinal biopsies. It permits specific therapy if lymphoma or rarely fungal disease is present or documentation of IBD. On some occasions I will delay anesthesia if the patient is unstable and wouldn't tolerate anesthesia.

**Williams:** I would take a slightly more conservative approach. It is not wrong to perform biopsies, but many clients can't afford it. Also, I would ask myself what I would be likely to find and how that would change my plan of action.

**Twedt:** My philosophy is that you do your diagnostic tests to rule out diseases. If you think it is pancreatic disease based on your diagnostics you would then treat that patient. If the animal fails to improve, then I would investigate further and possibly perform intestinal biopsies because the patient could have gastrointestinal lymphoma and pancreatitis or severe cholangitis and pancreatitis.

**Steiner:** The question is what the client's goal is. If the owner wants a definitive diagnosis, then I would recommend doing biopsies early in the disease process. On the other hand, I think it is fine to treat as

## Protocol for diagnosing feline pancreatitis



if it is IBD without taking intestinal biopsies if the client wishes to be less aggressive.

## Treatment

**Robertson:** What are your treatment recommendations for cats with acute pancreatitis?

**Steiner:** It's very important to recognize that no specific treatment exists for pancreatitis, except for the small subgroup of cats with autoimmune pancreatitis. Everything else is management of pancreatitis. The truth of the matter is that of the treatments we'll discuss, none are established for cats. We can only extrapolate from human studies and even those are often unclear.

**Twedt:** When you look at placebo-controlled studies in people, about the only treatment strategies proven effective for pancreatitis are fluid therapy, pain management, and nutritional therapy.

**Steiner:** I'm a minimalist, meaning I only do what I really think will make a difference. Everybody can agree on fluids, nutrition, pain medication, and antiemetics. Everything else becomes very muddy.

**Williams:** First we want to remove the cause of the pancreatitis if it is one of those rare cases in which you think you know what the cause is. I inquire about possible toxicity such as exposure to organophosphates, consider infectious causes such as FIP, toxoplasmosis, or the pancreatic fluke, and I evaluate current medications and consider concurrent illnesses.

**Steiner:** I routinely tell practitioners to measure calcium as part of their serum chemistry profile because hypercalcemia may be associated with pancreatitis. I routinely ask for the patient's drug history and any concurrent conditions. My main therapies are pain management and antiemetic therapy, even if the cat is not vomiting. In a significant number of these cases, the cat is anorectic, which may be due to nausea.

## Antiemetic therapy

**Robertson:** Do you recommend a specific antiemetic for pancreatitis?

**Steiner:** I use dolasetron (Anzemet—Avantis) the most in cats simply because I'm most familiar with it. A lot of practitioners now use maropitant citrate (Cerenia—Pfizer) but this drug is only labeled for use in dogs, not cats.

**Twedt:** Even though it is off-label, I often use maropitant in cats and have been very pleased with the results. Metoclopramide is a dopamine antagonist and inhibits vomiting by blocking the CNS dopamine receptors in the chemoreceptor trigger zone (CRTZ). It is probably not a very good antiemetic in cats because they are reported to have few CNS dopamine receptors in the CRTZ. Side effects can also occur at high doses as it causes CNS excitement from dopamine antagonism.

## Fluid, colloid, and plasma therapy

**Robertson:** Do you use fluid therapy in cases of acute pancreatitis?

**Williams:** Yes, fluid therapy is very important.

**Robertson:** Beyond crystalloid therapy for hydration and to restore electrolyte and acid-base balance, do you routinely use colloid therapy in these cats?

“I think fluid therapy with or without support of oncotic pressure is fundamental.”  
— Dr. David Williams

fentanyl levels for pain control in cats, the protocol that I have used is to administer another analgesic such as buprenorphine IV at the time the fentanyl patch is placed. I then monitor the cat to see if additional pain medication is required.

**Twedt:** That is also my protocol. If I diagnose an animal with acute pancreatitis, even if the patient does not show signs of pain, I begin pain management. I have been surprised by how many patients improve clinically with the only difference being pain management.

**Robertson:** Do we have any alternatives to opiates?

**Steiner:** No, not for serious pain. Nothing is as effective in my opinion.

**Twedt:** People with chronic pancreatitis usually have pancreas-associated pain. For cats that have vomiting flare-ups, rather than just putting them on antiemetics, maybe we should also provide more pain control because we know pain will trigger vomiting. For some of those patients that have flare-ups and



**Forman:** I don't routinely use it, but if the cat is extremely depressed and hypotensive, I'll use it for blood pressure support and to better perfuse the pancreas.

**Robertson:** What about plasma therapy?

**Forman:** It depends on the case. If a concurrent coagulopathy exists, I'll use plasma therapy.

**Twedt:** I don't have plasma readily available for cats as I do for dogs. I use colloids if I think I need to improve oncotic pressure. The most important thing is to ensure that there is adequate perfusion of the pancreas.

## Pain management

**Robertson:** What analgesics do you routinely use in cats for pain control?

**Forman:** I prefer buprenorphine.

**Robertson:** Fentanyl transdermal patches have become popular as an adjunctive therapy for pain relief because they provide a longer duration of analgesia. Since it takes at least six hours to achieve adequate

vomiting episodes associated with chronic pancreatitis, I prescribe buprenorphine for the owners to administer sublingually at home.

## Nutritional support

**Robertson:** Beyond fluid therapy, pain control, and antiemetic therapy, what are your recommendations for nutritional support for a cat with acute pancreatitis? The historical recommendation of nothing per os (NPO) for animals with pancreatitis is no longer accepted.

**Steiner:** If the gastrointestinal tract works, use it.

**Williams:** If they are vomiting, give an antiemetic so that they keep the food down.

**Twedt:** Sometimes they don't eat because of the nausea or pain. If you can control the pain and nausea, they might start to eat. Anorexic cats are prone to also develop hepatic lipidosis. If I have a cat that hasn't had adequate nutrition for three or more days, I often put in a nasogastric or some other feeding tube to begin nutritional support. We have been very happy with esophageal feeding tubes for enteric nutritional support, If we were ever to perform

surgical exploration on a patient, we always put in a jejunostomy feeding tube.

**Williams:** Does it make a lot of difference where you deliver the nutrition?

**Twedt:** No. But if a patient is vomiting, a jejunostomy tube allows the food to go farther down in the gastrointestinal tract and beyond where nutrients stimulate pancreatic secretion. The limitation of the tubes is that the nutrition must be a liquid diet.

**Forman:** I prefer to place gastrostomy tubes and feed right into the stomach in these cats.

**Steiner:** You can also provide nutrition to these cats parenterally. You can use partial parenteral nutrition (PPN) or total parenteral nutrition. PPN is more user-friendly, and I think it's adequate for a while.

**Robertson:** Parental nutrition supports the patient's caloric needs, but it doesn't nourish the enterocytes. Some internists and criticalists recommend providing microenteral nutrition by trickle feeding through a feeding tube to provide nourishment to the gastrointestinal tract. Do you do that?

**Forman:** Yes, even a small amount of enteral nutrition has been shown to prevent the complications of NPO.

**Robertson:** I put a jejunostomy tube in my cat when he developed pancreatitis and was anorectic, but this became a problem when it came home because you can't meal feed through a jejunostomy tube. Only small amounts of food are tolerated at one time. With a gastrostomy tube, you can still give food through the tube as a CRI while the cat is hospitalized, but then when the cat goes home, the owner can bolus or meal feed the cat if some nutritional support is still necessary. Nasogastric tubes are convenient especially for short-term nutritional support, either because you think the cat is getting better or it is too unstable to anesthetize for a more permanent tube. However, nasogastric tubes limit what you can feed because they require a very liquid diet. What do you recommend feeding the cats through tubes?

**Williams:** Low-fat diets can be formulated that are easily injected down feeding tubes, but I don't worry too much about fat content unless the cat has hyperlipidemia, which is rare. Anecdotally, veterinary nutritionists have told me they don't see any benefit from administration of special low-fat liquid diets.

**Twedt:** I use CliniCare Canine/Feline Liquid Diet (Abbott Animal Health) if I'm using a nasogastric or jejunostomy feeding tubes.

**Forman:** I avoid high fat levels and choose diets that are better balanced for the intestinal tract. A low-

residue diet is my first choice for feeding through a gastrostomy tube.

**Steiner:** I would use the diet with the lowest fat content that I can find.

**Twedt:** Practitioners must be careful about using human preparations because of the protein content being too low for cats because of their high protein requirements.

**Robertson:** We discussed diet for hospitalized patients. What about the feeding of cats with chronic pancreatitis? The challenge I've had with these cats is that they often have concurrent disease, such as IBD, and I wanted to put them on a low-fat, novel protein source diet but no such diet is commercially available. So I focused on the intestinal disease. What are your recommendations?

**Forman:** If I think that the cat only has pancreatitis, then I put it on a low-residue diet. If I think that the cat has pancreatitis and intestinal disease, I usually put it on a novel protein diet. The caveat for owners is that the cat must eat. So if their cat won't eat one of these special diets, they need to go back to whatever they were previously feeding.

**Steiner:** If the cat just has IBD, I would use a novel protein diet. No studies show whether a novel protein diet, a hydrolyzed protein diet, an easily digestible diet, or a low-carbohydrate diet works better than any of the others in patients with IBD. So I don't think it makes a difference. If the cat I am treating has IBD and pancreatitis, I use an easily digestible diet because it is lower in fat than the others. Also, if the cat has pancreatitis and diabetes, then I use a high-fiber diet. No diet is perfect for any one of these situations, so I choose the one that is best for the patient as a whole.

**Williams:** My dietary recommendations are driven by the clinical signs. If chronic diarrhea is the major clinical problem, no matter what the laboratory results are, I recommend a low-carbohydrate diet or highly digestible diet in the first instance. If the major problem is chronic vomiting, I try a novel antigen diet. If these choices do not work then try an alternative diet before abandoning the dietary management route.

**Twedt:** We have no studies to support these diet choices; all of these recommendations are opinions. It's trial and error to find a diet that works and that the cat will eat.

**Robertson:** This is another area where we may be able to use the Spec fPL test. We can start a diet and then retest. We can change the diet and look at the response. Maybe monitoring these cats with the Spec fPL will help us sort out these dietary recommendations.

## Antibiotics

**Robertson:** Do you recommend using antibiotics to treat a cat with pancreatitis, especially a cat with acute pancreatitis?

**Twedt:** We don't have any scientific evidence to show that bacteria are the cause in most cases. Some cats with acute suppurative cholangitis probably also have acute suppurative pancreatitis. I put those patients on antibiotics.

**Robertson:** So if a patient has a concurrent disease that warrants antibiotic therapy, you treat the concurrent disease.

**Twedt:** Yes, I do. I do not think we have enough data to say antibiotics are indicated in cats that have chronic lymphocytic plasmacytic changes in their pancreas.

**Williams:** They don't seem to die of septic complications. Scientifically, I don't think there is any reason to put them on antibiotics.

“It's trial and error to find a diet that works and that the cat will eat.”  
— Dr. David Twedt

## Glucocorticoids

**Robertson:** I would like to discuss the use of glucocorticoids in the treatment of feline pancreatitis. Is glucocorticoid therapy ever recommended for treating acute pancreatitis?

**Steiner:** No, I don't think so.

**Robertson:** As we have discussed, chronic pancreatitis is more common in cats than acute pancreatitis. These cats often usually do not require hospitalization or may be hospitalized during acute flare-ups of their pancreatitis, but their pancreatitis persists after returning home. How should cats with chronic pancreatitis be managed?

**Steiner:** The first thing I do is look for potential causes. I look for and treat concurrent disease. After that, I decide whether I want to use glucocorticoids. Many of us believe that glucocorticoids are effective in some cats with chronic pancreatitis, but so far we do not have any studies to support that.



**Forman:** Yes, but a lot of practitioners put pancreatitis patients on antibiotics. We know that antibiotics can cause side effects. We know they can cause vomiting, and the fluoroquinolones are associated with acute retinal blindness in cats. A rationale exists for not using them in these patients.

**Twedt:** Sepsis, bacterial peritonitis, and urinary tract infections are indications. But that's probably about it.

## H<sub>2</sub> blockers

**Forman:** I place most of my acute pancreatitis patients on H<sub>2</sub> blockers because I'm concerned about gastric ulceration. Do you do that?

**Twedt:** I usually don't unless I see evidence of gastric ulceration. No research shows that it prevents gastric ulcer development.

**Williams:** I suspect it is mostly a habit to prescribe H<sub>2</sub> blockers. We presume patients are better off not vomiting acid, but that may not be true. Personally I do not prescribe H<sub>2</sub> blockers for these patients unless an endoscopic examination has provided evidence that there is significant gastritis, and that is rarely the case.

**Robertson:** So what is the rationale for using glucocorticoids in cats with chronic pancreatitis?

**Twedt:** We use them to address chronic inflammation, just as with our IBD patients. The interesting thing is that when you rebiopsy the gastrointestinal tract of animals that are doing well clinically, many times no significant histologic abnormalities are present. Would we see similar significant histologic improvement in cats with chronic pancreatitis given corticosteroids? That would be a good study to perform.

**Steiner:** I have found that the fPLI decreases in many cats given steroids. Would it decrease anyway just because the disease is cyclic? It is hard to prove a cause and effect relationship, but the cats certainly feel better.

**Robertson:** For cats with chronic pancreatitis alone, we have a rationale for considering glucocorticoids. For cats with suspected IBD or intestinal disease, decreased serum cobalamin, and an elevated fPLI, we have reason to supplement with parenteral cobalamin and treat concurrently with glucocorticoids.

**Williams:** That's right.

**Twedt:** For cats with chronic cholangitis and pancreatitis, it is also reasonable to treat them with corticosteroids.

**Steiner:** It is important that practitioners don't just give corticosteroids as a knee-jerk reaction. I only give corticosteroids while monitoring Spec fPLI results. I want to have a Spec fPLI result before I start therapy 10 days later. If the cat is clinically improved and the Spec fPLI decreases, I'll certainly continue. If the cat is better but the Spec fPLI doesn't decrease, I reconsider. Similarly, if the Spec fPLI decreases but the cat doesn't feel better, I think twice about corticosteroid use. If the Spec fPLI increases and the cat doesn't feel better, I certainly stop corticosteroid use.

**Twedt:** What regimen do you use?

**Steiner:** I use anti-inflammatory doses of oral prednisolone twice a day for 10 days. Further therapy is dependent on clinical signs and the re-evaluation of the Spec fPLI.

**Williams:** When people started putting gastrostomy tubes in cats with pancreatitis and feeding them, a concern was that they would crash and burn, but they didn't. They did better. I think it's the same with corticosteroids. When we started giving them because we were certain they had IBD, we worried that the pancreatitis would flare up. It didn't. I don't hear about corticosteroid use causing patients to fall apart.

**Twedt:** Probably the biggest contraindication for corticosteroids would be concurrent diabetes in a cat.

**Steiner:** We've put a few diabetic cats with chronic pancreatitis on corticosteroids and were happy with the result. However, you do have to be extremely cautious.

**Robertson:** Dr. Richard Nelson at the UC-Davis School of Veterinary Medicine has put cats with pancreatitis and hard-to-regulate diabetes on a two-week tapering course of prednisone to get the pancreatic inflammation under control. During that time, you don't worry about the diabetes that much. Then after the two weeks when the cat has been tapered off of the prednisone, you manage the diabetes. If the pancreatitis improves with prednisone therapy, the diabetes itself becomes easier to regulate.

## Appetite stimulants

**Robertson:** Do you use any other therapies to manage cats with pancreatitis?

**Forman:** I use appetite stimulants. I've been using mirtazapine (Remeron®—Schering-Plough), although we have no studies to support this and it is off-label. One advantage is that you only need to medicate the cat every third day.

**Robertson:** Does mirtazapine have benefits over cyproheptadine? Is it just that the dosing schedule is easier, or is it also more effective?

**Forman:** It seems to work better and the cats only need to be pillled once every third day rather than twice daily.

**Twedt:** I think it's more effective, and it also has some antiemetic effects.

**Forman:** I start with mirtazapine, but if it doesn't work and the owner doesn't want to figure out why the cat is not eating, I switch to cyproheptadine or place a feeding tube.

## Monitoring

**Robertson:** For hospitalized cats with acute pancreatitis, how do you monitor these patients?

**Forman:** A lot of cats with acute pancreatitis need to be monitored closely, especially when we put them on crystalloids and colloids. I find that I monitor the body weight and respiratory rate closer to make sure that they are tolerating these fluids, and I stay alert for complications of pancreatitis, such as pleural effusion and dyspnea.

**Twedt:** Electrolyte and acid-base balance are also important to monitor in these cases.

**Forman:** I will also monitor blood pressure and urine output, especially if the cat is markedly depressed. I agree with Dr. Twedt, monitoring electrolytes once to twice a day and a PCV to screen for progressive anemia is important. Making sure the patient is not becoming hyperglycemic, especially if IV nutrition is being used, is also important. How I tailor my therapy to the individual patient is often dependent on these results.

**Robertson:** In dogs with acute pancreatitis, we monitor the Spec cPL™ during hospitalization. Would you similarly recommend monitoring the Spec fPL for a cat with acute pancreatitis?

**Steiner:** Yes. For acute pancreatitis cases, I would run the Spec fPL every two to three days or so.

**Robertson:** When you are managing cats with chronic pancreatitis, how do you monitor them? For example, we've discussed repeating a Spec fPL 10 to 14 days after initiation of glucocorticoids. What do you consider a significant decrease in Spec fPL?

**Steiner:** I look for big decreases. In my own cat the fPLI went from a measurement of above 300 to 32 µg/L in three days. That's a significant decrease. If the results are not much different, say it goes from 35 to 30 µg/L, then I would want to see at least three measurements to convince me that it's dropping.

**Robertson:** So you look for a significant difference and also the trend.

**Steiner:** Yes, and the clinical findings—how is the cat doing?

**Robertson:** With chronic disease, it would depend on the individual cat. If you're giving corticosteroids, such as prednisone, prednisolone or dexamethasone, the recommendation is to retest 10 to 14 days after initiating therapy. We've talked about supplementing cobalamin in cats with intestinal disease. When would you recheck cats with an elevated Spec fPL that you supplemented with cobalamin?

**Williams:** When giving cobalamin, we generally wait about a month to check that the cobalamin replacement is working. Unless something changes, it is reasonable to wait four weeks and recheck the Spec fPL at the same time. If you are not worried about cobalamin and just want to recheck this Spec fPL, then retesting

**Steiner:** It depends on the case. Some cats have mild elevations of Spec fPL and are clinically normal. If I have ruled out risk factors and concurrent conditions in those cats I will do a trial therapy with corticosteroids, but if there is no response then I really just monitor them. However, if the increase of Spec fPL is more severe or the cat has clinical signs I would be more aggressive in trying to treat the cat.

**Twedt:** Another good time to reevaluate a cat with chronic pancreatitis is when the patient has been progressing well and then it gets sick. Is it a flare-up of the pancreatitis or is something else occurring? The Spec fPL test might help direct us. If the cat is running consistent values, gets sick and Spec fPL has not changed I would look for something else causing the signs.

**Robertson:** Thank you for participating in today's roundtable discussion on feline pancreatitis. It was an informative discussion, but it is also quite clear that there is still a lot that is unknown about

"If the pancreatitis improves with prednisone therapy, the diabetes itself becomes easier to regulate."  
— **Dr. Jane Robertson**



every two to three weeks is fine. That is based on experimental studies done in Greece where researchers induced mild transient pancreatitis in cats, and as those cats recovered there was a steady decrease in fPLI toward normal after two weeks. Therefore, if the result is still elevated two or three weeks later, something more chronic is going on. You are not dealing with a mild episode of a transient disease.

**Steiner:** I also use two to three weeks as a recheck interval initially. If the Spec fPL is mildly elevated initially and two to three weeks later it is unchanged or only mildly decreased, I'm not going to keep rechecking it every two to three weeks. I'll do it every three months and then every six months. Of course the goal is for the patient to have a normal Spec fPL concentration, but many cats will not normalize completely. We believe many of them will have some residual inflammation.

**Forman:** If you recheck and the result is unchanged, you might decide to add a treatment or change your therapy. How do you use that number to determine this?

this disease in cats.

I would like to summarize what we have discussed today. Cats with pancreatitis are lethargic and present with nonspecific clinical signs. The prevalence of the disease is unknown but is more common than previously believed. There are no specific findings on routine laboratory work that confirm a diagnosis of pancreatitis. The Spec fPL test is the most sensitive and specific laboratory test available for diagnosing pancreatitis in cats. It is common for cats to have other concurrent illnesses including IBD, cholangitis, hepatic lipidosis, and diabetes mellitus. Treatment involves fluid therapy, pain control, antiemetic therapy, and nutritional support in acute cases. In cats with chronic pancreatitis, diet selection is often important, appetite stimulants, antiemetics, and pain control may be required, and glucocorticoid therapy is often effective. Management of concurrent diseases is critical, and serial Spec fPL measurements can be helpful in managing this disease. Now that the Spec fPL test is a widely available diagnostic and monitoring tool, hopefully we will continue to learn more about this elusive disease.



**IDEXX**  
LABORATORIES

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