

## Pancreatitis (Inflammation of the Pancreas)



### Basics

#### OVERVIEW

- Inflammation of the pancreas
- Sudden (acute) pancreatitis—inflammation of the pancreas that occurs abruptly, with little or no permanent damage to the pancreas
- Long-term (chronic) pancreatitis—continuing inflammation of the pancreas that is accompanied by irreversible damage to the pancreas
- “Edematous pancreatitis” is characterized by fluid build-up in the interstitium (small spaces between tissues or parts of the pancreas) and mild inflammation with neutrophils and lymphocytes (two types of white-blood cells); the animal generally recovers rapidly
- “Necrotizing pancreatitis” is inflammation of the pancreas characterized by bleeding (hemorrhage) and areas of death of tissues (known as “necrosis,” thus the name “necrotizing pancreatitis”); it usually is a severe and prolonged disease and many affected animals die

#### SIGNALMENT/DESCRIPTION OF ANIMAL

##### *Species*

Dogs and cats

##### *Breed Predilection*

- Miniature schnauzer
- Miniature poodle
- Cocker spaniel
- Siamese (cat)

##### *Mean Age and Range*

- Sudden (acute) pancreatitis is most common in middle-aged and old dogs (over 7 years of age); mean age at presentation is 6.5 years
- Mean age for sudden (acute) pancreatitis in cats is 7.3 years

##### *Predominant Sex*

Female—dogs

#### SIGNS/OBSERVED CHANGES IN THE ANIMAL

- Dogs—gastrointestinal tract signs (such as vomiting, diarrhea)
- Cats—vague, non-specific signs that generally do not localize problem to the pancreas
- Sluggishness (lethargy), depression, lack of appetite (anorexia)—common in dogs and cats
- Vomiting—common in dogs, less common in cats
- Diarrhea—more frequently seen in dogs than in cats
- Weight loss—common in cats
- Dogs may exhibit abdominal pain
- Yellowish discoloration to gums and moist tissues of the body (known as “jaundice” or “icterus”)—common in dogs and cats
- Dehydration—common; due to gastrointestinal losses of fluid
- Mass lesions may be felt during physical examination in both dogs and cats.
- Fever—common in dogs; both fever and low body temperature (known as “hypothermia”) reported in cats

- Less common systemic abnormalities include severe breathing difficulties (known as “respiratory distress”), bleeding disorders, and irregular heart beats (known as “cardiac arrhythmias”)

## CAUSES

- Usually unknown; possibilities include the following:
  - Nutritional factors (such as an increase in lipoprotein [complexes of lipid and protein] concentration in the blood [known as “hyperlipoproteinemia”])
  - Pancreatic trauma or lack of blood flow (known as “ischemia”) to the pancreas
  - Duodenal reflux (a condition in which contents in the upper small intestine [duodenum] move backward)
  - Drugs or toxins
  - Pancreatic duct blockage or obstruction
  - High levels of calcium in the blood (known as “hypercalcemia”)
  - Infectious diseases—toxoplasmosis, feline infectious peritonitis (FIP)
  - Extension of inflammation from the liver and bile duct system or intestines in the cat

## RISK FACTORS

- Breed—dog: miniature schnauzer, miniature poodle, cocker spaniel; cat: Siamese
- Obesity in dogs
- Another disease (such as sugar diabetes [diabetes mellitus]; increased levels of steroids produced by the adrenal glands [known as “hyperadrenocorticism” or “Cushing's disease”]; long-term [chronic] kidney failure, and cancer) in dogs
- Recent administration of certain drugs
- Liver (hepatic) or gastrointestinal tract inflammation in cats



## Treatment

### HEALTH CARE

- Inpatient medical management
- Aggressive intravenous (IV) fluid therapy
- Fluid therapy goals—correct low circulating blood volume (known as “hypovolemia”) and maintain pancreatic circulation
- A balanced electrolyte solution (such as lactated Ringer's solution [LRS]) is the first-choice for providing hydration
- May need colloids; colloids are fluids that contain larger molecules that stay within the circulating blood to help maintain circulating blood volume, examples are dextran and hetastarch
- Following replacement of fluid deficits, give additional fluids to match maintenance requirements and ongoing losses
- Potassium chloride (KCl) supplementation usually needed, because potassium is lost from the body in the vomit

### ACTIVITY

Restrict

### DIET

- Continue to feed by mouth, unless vomiting is difficult to control; feeding maintains the integrity of the intestinal lining and minimizes bacterial invasion from the intestines and into the body
- Animals with intermittent vomiting should be treated with drugs to control nausea and vomiting (known as “antiemetics”), such as metoclopramide or phenothiazines
- Tube feeding into the jejunum (the middle section of the small intestine) allows feeding into the intestines (known as “enteral feeding”), while allowing the pancreas to rest

- Withhold all food and water by mouth (known as “NPO”) in animals with persistent vomiting; when no vomiting has occurred for 24 to 48 hours, offer small volumes of water; if tolerated, begin small, frequent feedings of a carbohydrate (such as boiled rice); gradually introduce a protein source of high biologic value (such as cottage cheese or lean meat)
- Avoid high-protein and high-fat diets
- Patients needing extended time without food and water by mouth (NPO) may require tube feeding into the jejunum or intravenous feeding (known as “total parenteral nutrition”)

## **SURGERY**

- May need surgery to remove localized accumulations of fluid (known as “pseudocysts”), abscesses, or areas of dead (necrotic) tissue seen with necrotizing pancreatitis (inflammation of the pancreas characterized by bleeding and areas of death of tissues)
- May need surgical exploration of the abdomen and biopsy of the pancreas to confirm pancreatitis and/or to rule out other diseases not involving the pancreas
- Bile-duct blockage outside of the liver (known as “extrahepatic biliary obstruction”) from pancreatitis requires surgical correction



## **Medications**

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

- Steroids are indicated only for the treatment of shock
- Drugs that act on the vomiting center of the brain to control nausea and vomiting (known as “centrally acting antiemetics”) are indicated with vomiting that is difficult to control—metoclopramide, chlorpromazine, or prochlorperazine
- Antibiotics, if evidence of sepsis (presence of pus-forming bacteria and their poisons in the blood or tissues)—penicillin G, ampicillin, and enrofloxacin
- Pain relievers (analgesics) to relieve abdominal pain, such as buprenorphine



## **Follow-Up Care**

### **PATIENT MONITORING**

- Evaluate hydration status closely during first 24 hours of therapy; twice daily check physical examination; body weight; packed cell volume (“PCV,” a means of measuring the percentage volume of red-blood cells as compared to the fluid volume of blood) and total solids (a quick laboratory test that provides general information on the level of protein in the fluid portion of the blood); and blood urea nitrogen (BUN) and urine output to monitor the kidneys and hydration status
- Evaluate the effectiveness of fluid therapy after 24 hours, and adjust flow rates and fluid composition accordingly; repeat blood tests (serum biochemistries) to assess electrolyte/acid–base status
- Repeat plasma enzyme concentrations (pancreatic-lipase immunoreactivity [PLI] assay, a test that determines the levels of lipase, a pancreatic enzyme) after 7 days, to evaluate the status of the inflammation of the pancreas
- Watch closely for complications involving a variety of organ systems; perform appropriate diagnostic tests as needed
- Gradually taper fluids down to maintenance requirements, if possible
- Maintain feeding by mouth or into the jejunum (enteral nutrition)
- Reassess and correct on-going low serum cobalamin (Vitamin B12) concentrations

## **PREVENTIONS AND AVOIDANCE**

- Weight reduction, if obese
- Avoid high-fat diets
- Avoid drugs that may increase the risk of inflammation of the pancreas (pancreatitis)

## **POSSIBLE COMPLICATIONS**

- Failed response to supportive therapy
- Life-threatening associated conditions

## **EXPECTED COURSE AND PROGNOSIS**

- Good for most patients with edematous pancreatitis (inflammation of the pancreas characterized by fluid build-up in the interstitium and mild inflammation with neutrophils and lymphocytes [two types of white-blood cells]); these patients usually respond to appropriate symptomatic therapy
- More guarded to poor for patients with necrotizing pancreatitis (inflammation of the pancreas characterized by bleeding [hemorrhage] and areas of death of tissues [necrosis]) and systemic conditions



## **Key Points**

- Sudden (acute) pancreatitis—inflammation of the pancreas that occurs abruptly, with little or no permanent damage to the pancreas
- Long-term (chronic) pancreatitis—continuing inflammation of the pancreas that is accompanied by irreversible damage to the pancreas
- Need for extended hospitalization
- Diagnosis and treatment can be expensive
- Possible complications include lack of response to supportive therapy and life-threatening conditions