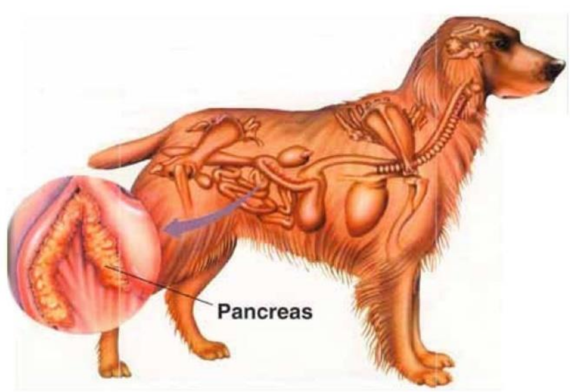
<table>
<tr>
<td>Pancreatic Cancer, Insulinoma</td>
<td>
Pancreatic cancer is an uncommon cancer that can occur in dogs and cats. The pancreas is a glandular organ that lies below the stomach and to the left of the duodenum (first portion of the small intestine). It has exocrine function for digestion and endocrine function to regulate blood glucose (blood sugar). The most common types of pancreatic cancer are pancreatic adenocarcinoma arising from exocrine cells of the pancreas or insulinoma arising from beta cells of the endocrine functioning part of the pancreas that secretes insulin. Breeds of dogs that are at increased risk for insulinomas include Boxers, Standard Poodles, German Shepherds, Golden Retrievers, and Irish Setters. Breeds of dogs that are predisposed to pancreatic adenocarcinoma are Boxers, Airedale Terriers, Cocker Spaniels, and Labrador Retrievers. Pancreatic adenocarcinomas derived from digestive enzyme secreting cells are typically more aggressive than insulinomas.



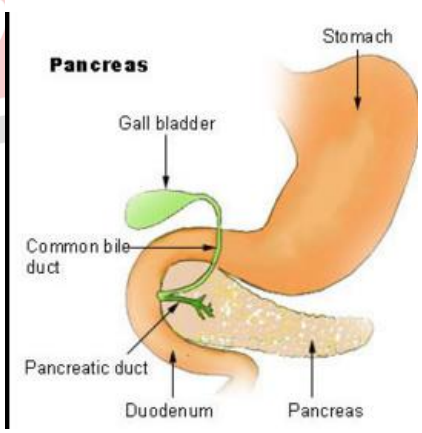


Image showing the location of the pancreas in a dog. Image showing the orientation of the pancreas with the stomach and duodenum.
</td>
</tr>
</table>

Veterinary Surgical Center of Long Island * 188 East Main Street * Huntington, NY 11743 * 631-517-1773 * Fax 631-517- 1753

Signs and Symptoms: Clinical signs of pancreatic adenocarcinoma include:

- Abdominal pain
- Vomiting
- Weight loss
- Anorexia
- Abdominal distension
- Hyperglycemia (increased blood glucose)
- Ascites (fluid in the abdominal cavity)
- Icterus (jaundice- yellow coloring of the skin, mucous membranes, and white of the eye)

Clinical signs of insulinoma are related to the excess production of insulin which leads to hypoglycemia (low blood glucose). Signs of insulinoma include:

- Generalized weakness
- Lethargy
- Confusion
- Unsteady gait
- Collapse
- Dull mentation
- Seizures

Diagnosis: Diagnostic testing will include routine bloodwork. Insulinoma may suspected based on clinical signs and low blood glucose on initial bloodwork. Insulinoma is strongly supported by paired bloodwork demonstrating low blood glucose and high blood insulin level. Additional diagnostic tests that may be recommended include:

- Abdominal ultrasound
- Thoracic radiographs for metastatic screening.
- CT scan abdomen and thorax for metastatic screening.
- Ultrasound guided fine needle aspirate cytology if a mass is detected.

Treatment: Treatment of pets with insulinoma involves a combination of both medical and surgical involvement.

Medical treatment of insulinoma is used to increase or stabilizing blood glucose. It involves the use of diet and medication that may include:

- Diet: Feeding small meals frequently composed of a higher fiber diet.
- Steroids: Glucocorticoid drugs which stimulate the liver to produce more sugar.

	• Diazoxide: This medication raises blood glucose by slowing the release of insulin from the pancreas. Surgical treatment of insulinoma and pancreatic adenocarcinoma is performed to definitively diagnose, stage, and attempt to remove the pancreatic mass. An abdominal exploratory surgery is performed to identify the mass or masses in the pancreas and evaluate other organs for metastatic masses (spread of the pancreatic mass). As much of the identified abnormal pancreas is removed with a partial pancreatectomy (removal of part of the pancreas). Some pancreatic adenocarcinomas are highly invasive into the surrounding tissues and may not be resectable. In cases of insulinoma, metastatic masses may be removed and biopsied depending on how many metastatic masses are present and the size and location of these masses. Postoperative care: A pet may be hospitalized for 1 to 3 days after surgery. During hospitalization, the pet will be given intravenous fluids, pain medication, and antibiotics. Additionally, blood glucose monitoring will be performed to assess for possible persistent hypoglycemia in pet's with advanced macro or microscopic metastatic disease or hyperglycemia. Hyperglycemia could occur as a result of down-regulated insulin production and may be transient (short-term) or uncommonly, the result of decreased pancreatic volume after partial pancreatectomy. Additionally, when the pancreas is manipulated, it can become inflamed, causing pancreatitis. Pancreatitis can occur postoperatively as the result of inflammation associated with surgery of the pancreas which can cause the pet to vomit, have inappetence, and have abdominal pain. Prognosis: Dogs with a solitary insulinoma mass that is surgically removed have a prognosis of surviving 1.5 to 2 years. Pets with metastatic disease have a prognosis for survival of approximately 7 to 9 months with a combination of surgery and medication. Pancreatic adenocarcinoma usually carries an unfavorable prognosis due to its invasiveness and high rate of metastasis.