

Tumors of the Pancreas

These notes are provided to help you understand the diagnosis or possible diagnosis of cancer in your pet. For general information on cancer in pets ask for our handout "What is Cancer". Your veterinarian may suggest certain tests to help confirm or eliminate diagnosis, and to help assess treatment options and likely outcomes. Because individual situations and responses vary, and because cancers often behave unpredictably, science can only give us a guide. However, information and understanding for tumors in animals is improving all the time.

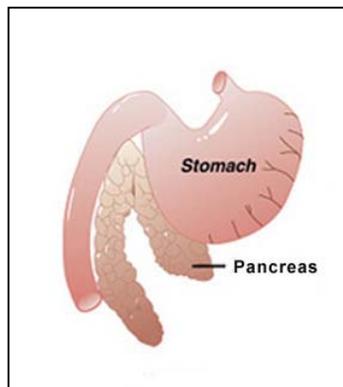
We understand that this can be a very worrying time. We apologize for the need to use some technical language. If you have any questions please do not hesitate to ask us.

What is the pancreas and what does it do?

The pancreas is a gland beside the intestines where they make their first bend, just below the stomach and liver. It has two main tasks.

Most of the gland produces substances called enzymes to help digestion (the exocrine function). The ducts of the gland take these enzymes into the intestine. The bile duct from the gall bladder of the liver is very close to this duct so diseases affecting one duct often affect the other.

Other cells in small groups ('islets') within the pancreas produce substances called hormones that have effects in other parts of the body. This is the endocrine function. The hormones include insulin, which is the main hormone regulating sugar levels in the blood. Loss of, or poor functioning, of this hormone causes diabetes mellitus.



What types of pancreatic tumor are there?

Tumors in the pancreas are not all cancerous. **Pancreatic nodular hyperplasia** with multiple nodules is a common finding in old dogs and cats, sometimes compensating for previous injury but usually without any known cause.

Cancers of the pancreas are of two main types, those arising from the part which produces enzymes to aid digestion (exocrine) and those arising from the groups of cells that produce hormones such as insulin (endocrine). Both groups of tumors may be benign (**pancreatic adenomas**) or malignant (**pancreatic carcinomas**).

Exocrine **pancreatic adenocarcinomas** are aggressive and invade the wall of the adjacent gut and rapidly spread (metastasize) around the inside lining of the abdomen (peritoneum) and to the liver and other organs.

Endocrine tumors often produce hormones with effects on other parts of the body. Benign tumors grow slowly and can be surgically removed but some malignant tumors rapidly metastasize to liver and lymph nodes. Rarely, as in any part of the body, there may be cancers of the fibrous connective tissue, nerves, blood vessels and lymphatics.

What do we know about the cause?

The reason why a particular pet may develop this, or any cancer, is not straightforward. Cancer is often seemingly the culmination of a series of circumstances that come together for the unfortunate individual.

Pancreatic nodular hyperplasia sometimes follows injury but is usually without any known cause. We do not know the specific causes of the cancers.

Why has my pet developed this cancer?

Some animals have a greater tendency (genetic susceptibility) to cancer. Some breeds have far more cancers than others, often of specific types. The more divisions a cell undergoes, the more probable is a mutation so cancer is more common in older animals.

Are these common tumors?

Pancreatic nodular hyperplasia is a common finding in old dogs and cats. Exocrine cancers are uncommon and benign tumors are rarer than their malignant counterparts. They are more common in dogs than cats. Older animals are more often affected but they can occur in animals as young as three years of age.

Endocrine cancers are also uncommon. The most common type is derived from the insulin secreting 'beta cells'.

How will these cancers affect my pet?

For exocrine lesions, there is a continuum and progression from hyperplasia to malignancy. Pancreatic nodular hyperplasia does not usually affect pets clinically but if there is scar tissue (fibrosis) and inflammation of the adjacent bile ducts of the liver, signs may include local pain and vomiting. Benign exocrine tumors are often small and incidental findings. Malignant exocrine tumors cause abdominal pain, vomiting and weight loss. An abdominal mass can usually be felt. Jaundice is often present due to obstruction of the bile duct and swelling of the abdomen with fluid (ascites) occurs as a result of compression of veins. Leakage of digestive enzymes makes surrounding tissue die. The course of malignant disease is rapid and these are painful cancers.

Endocrine cell tumors usually produce hormones with effects on other parts of the body. The most common type is derived from the cells that make insulin (**insulinomas**) so there are low blood sugar concentrations. This produces clinical signs including weakness, confusion, collapse and possibly convulsions and coma. A hormone called 'gastrin', which increases the acid in the stomach and intestine to cause ulcers, is produced by another type of tumor (**gastrinomas**). There is loss of appetite, vomiting with blood, intermittent diarrhea and progressive weight loss. **Glucagonomas** that produce glucagon, induce high blood glucose and damage to the liver. There is usually diabetes mellitus as well. These endocrine tumors can also produce abnormal hormones so there may be a 'paraneoplastic syndrome' of hair loss or a specific inflammatory and degenerative condition of the skin known as 'metabolic epidermal necrolysis' or 'hepatocutaneous syndrome'.

How are these cancers diagnosed?

Malignant cancers may be palpable through the abdominal wall. X-rays and ultrasonography can indicate changes in the pancreas and show lumps but the techniques are incapable of



X-ray &
Ultrasound
machines

distinguishing nodular hyperplasia and true cancers. Blood tests often suggest disease affecting the pancreas but no blood test is specific for exocrine cancers. Endocrine cancers induce such varied clinical signs that they can be challenging to diagnose. Blood tests can be a good indication of insulinoma but are not specific. The multiple ulcerations of the stomach and intestine induced by gastrinomas can sometimes be seen on X-rays and there is a special blood test for the hormone. Ultimately, diagnosis relies on opening the abdomen to see the tumors and taking tissue for microscopic examination of tissue by histopathology. This is done at a

specialized laboratory by a veterinary pathologist.

What types of treatment are available?

If there is inflammation of the pancreas or adjacent bile ducts of the liver, antibiotics or anti-inflammatory drugs may be helpful. Special diets and medication to replace digestive enzymes may also help.

There is no satisfactory treatment to treat cancer of the exocrine pancreas. Diagnosis is usually too late for successful surgery and chemotherapy is usually contra-indicated because the cancers are too painful.

Benign endocrine cancers can be removed surgically but multiple or malignant ones are not surgically treatable. Medical therapy to control blood sugar is indicated for insulinomas and protective therapy for the stomach and intestine for gastrinomas.

Can these cancers disappear without treatment?

It is not common, but the loss of blood supply to a cancer can make the cells die. Unfortunately, the disappearance of the cancer is rarely complete.

How can I nurse my pet?

After surgery, the operation site needs to be kept clean and your pet should not be allowed to interfere with it. Any loss of sutures or significant swelling or bleeding should be reported to your veterinarian. You may be asked to check that your pet can pass urine and feces or to give treatment to aid this. Your pet may require a special diet or medical supplements to aid digestion.



If you require additional advice on post-surgical care, please ask.

How will I know how the cancer will behave?

Histopathology will give your veterinarian the diagnosis that helps to indicate how it is likely to behave. The veterinary pathologist usually adds a prognosis that describes the probability of local recurrence or metastasis (distant spread).

When will I know if the cancer is permanently cured?

'Cured' has to be a guarded term in dealing with any cancer.

Pancreatic nodular hyperplasia does not usually affect pets clinically. If there is accompanying inflammation of the liver, there may be some ongoing clinical malaise.

Histopathology is not always able to distinguish between a benign and malignant tumor. In people, the continuum of benign to malignant pancreatic exocrine cancers is recognized by describing them as “transitional” or “of uncertain malignant potential”. Malignant tumors will invade the gut, spread on the inside lining of the abdomen (peritoneum) and metastasize to the liver and other organs. The combination of rapid local growth, early metastasis and side effects of enzyme release, makes these tumors aggressive and painful cancers. The course of disease is rapid and incurable.

Endocrine tumors are difficult to predict behaviorally on the basis of their histopathology. Benign tumors can be surgically removed but there are often small tumors in other parts of the pancreas. After removal of part of the pancreas, one study showed that the mean time to recurrence of clinical signs was 12 months (4-16). Mean survival was 15 months. Tumors growing more rapidly tended to have a worse prognosis but this was not statistically significant. Regrowth or spread of tumors to the lymph nodes (glands) and liver may be indicated by return of clinical signs associated with the tumors. Some are highly malignant.

Are there any risks to my family or other pets?

No, these are not infectious tumors and are not transmitted from pet to pet or from pets to people.