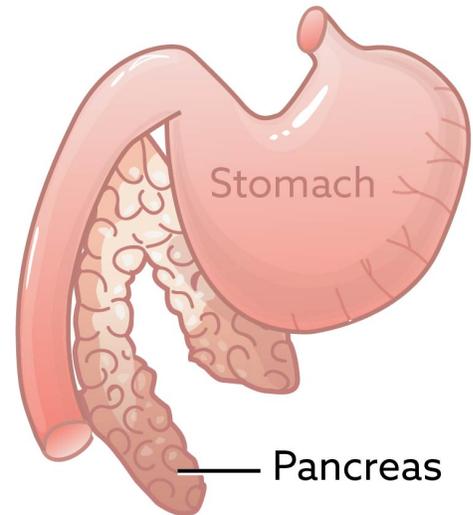


## Diabetes Mellitus in Cats – Overview

### What is diabetes mellitus?

**Diabetes mellitus** is a disease of the pancreas, a small organ located near the stomach. The pancreas has two different types of cells that have very different functions. One group of cells produces the enzymes necessary for proper digestion. The other group, called beta cells, produces the hormone **insulin**, which regulates the level of glucose (sugar) in the bloodstream and controls the delivery of glucose to the tissues of the body. In simple terms, diabetes mellitus is caused by the failure of the pancreas to regulate blood sugar.

The clinical signs of diabetes mellitus are related to elevated concentrations of blood glucose and the inability of the body to use glucose as an energy source.



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### What are the clinical signs of diabetes mellitus in cats?

The four main symptoms of diabetes mellitus are increased thirst, increased urination, weight loss, and increased appetite. Because of the nature of cats, these signs may go unnoticed, especially in the early stages of disease or if a cat spends a lot of time outdoors. Cats that are fed canned or semi-moist diets receive much of their water intake from their food, and increased water intake will be harder to recognize.

### Are there different types of diabetes mellitus in cats?

Diabetes mellitus is usually classified into three types of disease:

Type I diabetes mellitus results from total or near-complete destruction of the beta cells. This appears to be a rare type of diabetes in the cat.

Type II diabetes mellitus is different because some insulin-producing cells remain, but the amount of insulin produced is insufficient, there is a delayed response in secreting it, or the tissues of the cat's body are relatively insulin-resistant. Obesity is a predisposing factor in type II diabetes, which appears to be the most common type of diabetes in the cat.

Type III diabetes results from insulin resistance caused by other hormones and can be due to pregnancy or hormone-secreting tumors.

## How common is diabetes mellitus in the cat?

Diabetes mellitus is the second most common endocrine disease in cats. It is seen more frequently in middle-aged to senior cats and is more common in males than females. While the exact incidence is unknown, the number of diabetic cats is increasing at an alarming rate due to the tremendous increase in the number of overweight and obese cats. It is important to note that a cat three pounds over its ideal weight is considered obese, and that means the average domestic cat weighing 13 pounds or more is at high risk for developing type 2 diabetes mellitus.

## How is diabetes mellitus diagnosed?

Diabetes mellitus is diagnosed by the presence of the typical clinical signs (excess thirst, excess urination, excess appetite, and weight loss), a persistently high level of glucose in the blood, and the presence of glucose in the urine. Diabetes is the most common disease that will cause the blood glucose level to rise substantially.

To conserve glucose within the body, the kidneys do not filter glucose out of the blood stream into the urine until an excessive level is reached. This means that cats with normal blood glucose levels will not have glucose in the urine. Diabetic cats, however, have excessive amounts of glucose in the blood, so it spills into the urine. Once blood glucose reaches a certain level, the excess is removed by the kidneys and enters the urine. This is why cats and people with diabetes mellitus have sugar in their urine (glucosuria).

Definitive confirmation of feline diabetes mellitus may require a specialized test called a serum fructosamine test. This test tells us average blood glucose levels over the past 7 –14 days.

## How is diabetes mellitus treated in cats?

Diabetes mellitus is a treatable condition. Although long-term treatment requires commitment and dedication, it can be rewarding to manage this condition successfully in a beloved cat.

Initial steps in treating a diabetic cat include removing potential predisposing causes for the diabetes. For example, some medications such as corticosteroids predispose cats to develop diabetes, and withdrawal of these drugs may lead to resolution of the condition. Obesity is a risk factor for diabetes in cats, so weight normalization may actually lead to resolution of diabetes in some cats.



A urine dipstick tests the chemical properties of the urine.

**"All cats with diabetes mellitus benefit from being fed a well-balanced diet."**

All cats with diabetes mellitus benefit from being fed a well-balanced diet, and your veterinarian is the best source for guidance about which nutrient profile will best benefit your cat. Many cats with diabetes mellitus benefit from a diet that is high in protein and relatively low in carbohydrates because a relatively low carbohydrate diet decreases the amount of glucose absorbed from the intestinal tract and lowers the requirement for insulin. Unfortunately, while nutrition is a critical element of diabetes management success in cats, it is generally not as easy as making a simple nutritional choice.

Most cats require regular insulin injections to control the diabetes mellitus, at least initially. Your cat may require several hospital visits until an appropriate insulin dosage is determined. New technology has allowed the adoption of home glucose monitoring with the use of a simple device, such as an AlphaTrak® 2. Additional home monitoring can involve the evaluation of urine for the presence of glucose, although this is not a very sensitive way to monitor glucose levels and insulin changes should not be made based on urine glucose levels. Most cats will achieve initial stabilization within a few days to a few weeks, and will require once or twice daily injection of a small dose of insulin. Very small needles are available which cause no pain to the cat, and within a short time the procedure becomes routine. Insulin 'pens' are now available which make it even easier to give your pet an insulin injection. Your veterinarian will determine the appropriate administration frequency, dosages, and type of insulin that your cat requires.



## Do treated cats need to be monitored?

Yes, it is important to monitor treatment of diabetes mellitus to be sure the cat is doing well. Home monitoring of blood glucose is becoming more popular and more common, although part of treatment monitoring will involve periodic blood samples collected by your veterinarian.

To assist in the care of your cat, it is particularly valuable to keep accurate records of the following information:

### Daily record:

- time of insulin injection
- amount of insulin injected
- amount and time of food fed and eaten
- amount of water drunk

### Weekly record:

- weight of the cat

Although urine test strips cannot be used to guide insulin dose it may be valuable to monitor the quantity of glucose passed in the urine to identify need for further testing including full glucose curves or other laboratory tests.

To collect cat urine, it is usually easiest to replace the normal cat litter with specially designed urine collecting pellets or with clean and washed aquarium gravel overnight. These materials will not soak up any urine, which can then be collected into a clean container for testing. Your veterinarian may provide you with test strips to dip into the urine and measure the sugar level. If there is a marked change in the amount of glucose in the urine or in blood glucose levels, this may indicate the need to modify the insulin dose, but you should never change the dose of insulin without first discussing it with your veterinarian. Changes in insulin doses are usually based on trends in blood glucose levels, as there is normally some day-to-day variation.

## What happens if my cat receives too much insulin?

If a cat receives too much insulin, it is possible for the blood sugar level to drop dangerously low (hypoglycemia). For this reason, it is important to be very careful to ensure the cat receives the correct dose of insulin.

**"If a cat receives too much insulin, it is possible for the blood sugar level to drop dangerously low."**

Clinical signs displayed by a cat with a very low blood sugar level include weakness and lethargy, shaking, unsteadiness and even convulsions. If a diabetic cat shows any of these signs it is important to take a blood glucose reading if you have a home monitoring device, and seek immediate veterinary attention. In mild cases of hypoglycemia, you may observe wobbling or a 'drunken' walk, or the cat may seem sedated when you call or pet them. Low blood sugar is a medical emergency! Your veterinarian can advise you about specific emergency treatment of low blood sugar in your cat that you can deliver at home until the cat can be seen by a veterinarian.

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