

Diabetes in Dogs and Cats

Adapted from <http://www.mypet.com/pet-diabetes.aspx>

If your dog or cat has been diagnosed with diabetes mellitus, it's easy to feel alone—but you're not. It is estimated that 1 out of every 100 dogs that reaches 12 years of age will develop diabetes. In cats, it's estimated that between 1 in 50 and 1 in 500 will develop diabetes mellitus.

Diabetes mellitus occurs when your dog or cat has stopped producing insulin, has inadequate levels of insulin, or has an abnormal response to insulin.

In dogs, diabetes mellitus is common in middle-aged to older animals, especially in females, but it is also seen in young dogs of both sexes. When seen in younger animals, it can be a sign that your cat or dog is genetically predisposed to diabetes—this can mean that related animals may also be predisposed. Certain breeds of dogs also experience above-average rates of diabetes. These include: Toy Poodles, Terriers, Cocker Spaniels, Dachshunds, Doberman Pinschers, German Shepherds, Labrador Retrievers, and Golden Retrievers

In cats, diabetes mellitus is more common in middle- to older-aged animals as well, and also in cats that are overweight. Also, neutered males are at a greater risk than females. Certain breeds, such as Siamese cats, experience an above-average rate of diabetes.

Some drugs, when used long-term, may interfere with insulin and lead to diabetes mellitus in your pet. These include glucocorticoids (cortisone-type drugs) and hormones.

It is important to note the difference between diabetes mellitus and diabetes insipidus. Diabetes insipidus, also known as water diabetes, occurs when the kidneys are unable to regulate fluids in the body, and large amounts of dilute urine are produced. This condition is far less common than diabetes mellitus. Diabetes insipidus is caused by problems in part of the brain or in the kidneys, and there is no glucose (sugar) present in the urine of these animals. Diabetes insipidus is very rare in dogs and cats, and is only diagnosed after extensive testing of your pet's blood and urine. Some common signs of diabetes insipidus include excessive thirst and drinking of water, increased urination, and dilute urine.

Can your dog or cat be cured?

In general, diabetes cannot be cured. However, if you establish an appropriate lifestyle for your dog or cat, including good glycemic management with a diabetes product such as Vetsulin® (porcine insulin zinc suspension), your pet will likely be capable of leading a happy, healthy life.

Some cats have transient diabetes and can go into remission, but it is more likely that a cat will have diabetes for life.

Understanding insulin

During digestion, food is broken down into smaller components for use by the body. Carbohydrates are converted into various sugars, including glucose. Glucose is absorbed from the intestines into the blood and provides the body's cells with energy. However, glucose can only enter into most cells if the hormone known as insulin is present.

Insulin is normally produced by the beta cells of the pancreas and is required by the body to transport glucose (sugar) from the bloodstream into the cells of the body for energy.

In diabetic dogs and cats, these cells in the pancreas produce little or no insulin, or there is an abnormal response to the insulin that is produced. When this happens, glucose cannot enter into the body's cells and therefore begins to accumulate in the blood. In addition, the cells of the body are starved for energy. This combined effect is known as diabetes mellitus. Simply put, diabetes results from a shortage of insulin.

Signs of diabetes mellitus

If any of the following signs apply, you should bring your pet to your veterinarian for a checkup.

1. *Urinating frequently*
Your dog or cat wants to go outside often. Your dog may urinate in the house; your cat may urinate outside of the litter box.
2. *Drinks a lot of water*
You must fill the water bowl more often than before, or notice your cat or dog drinking from unusual places, such as the toilet bowl.
3. *Is always hungry*
Never seems to get enough; always begging for food.
4. *Has lost weight*
5. *Eyes appear cloudy*
This sign is only present in dogs.
6. *Coat has deteriorated*
Your cat has stopped grooming, and fur becomes dry and dull.
7. *Sleeps more or is less active*

Diagnosis

The above signs certainly suggest diabetes, but they are also seen in other diseases. The diagnosis only becomes definite when glucose is found both in the urine and at a high level in the blood. This is why your dog or cat needs to be examined thoroughly by a veterinarian.

To confirm the diagnosis, your veterinarian will take blood and urine samples from your pet and determine the glucose content or "sugar" in both. Your veterinarian will also check your pet's general health status (to rule out the presence of other diseases or infections). This is very important, as infections, some diseases, and other medications can make the management of diabetes more difficult.

Management

Because diabetes is caused by a lack or shortage of insulin, your dog or cat may need management with insulin. Diabetes can usually be controlled by simply learning to give your pet daily insulin injections to control blood glucose level. If your pet has other problems as well, your veterinarian will suggest the appropriate management.

Your veterinarian will help you find your dog's or cat's correct dose. This process may take a few weeks, but the end result is very manageable. Once you have the correct dose, it is extremely important that you administer your pet's therapy at approximately the same time every day.

Just like any routine, getting used to this will take a little time. Once you and your pet acclimate, however, you'll both find the process fairly simple, painless, and quick. Along with insulin therapy, your veterinarian will set up a management program that will include recommendations for feeding your dog or cat (type of food, quantity, and timing of meals). Diabetic pets also benefit from regular exercise—especially if they are overweight.

Possible complications of diabetes in dogs and cats

The long-term complications of diabetes mellitus are a result of prolonged high blood glucose (hyperglycemia). Obtaining optimal control of blood glucose helps to minimize these long-term complications.

IN DOGS, the most common diabetes-related complications include:

- Low blood sugar or hypoglycemia (that may be induced by incorrect insulin dosing)
- Ketoacidosis (ketones and high acidity in body fluids)
- Cataracts

IN CATS, the most common diabetes-related-complications include:

- Low blood sugar or hypoglycemia
- Chronic pancreatitis (inflammation of the pancreas)
- Poor grooming and dry, lusterless coat
- Recurrent infections
- Ketoacidosis (ketones and high acidity in body fluids)
- Peripheral Neuropathy (nerve dysfunction resulting in an abnormal stance)

Diabetic ketoacidosis in dogs & cats

What causes diabetic ketoacidosis (DKA)?

DKA is a condition that develops when cells do not get the amount of glucose they need to produce energy, and the body attempts to supplement the lack of glucose by breaking down muscle and fat for energy. When this happens, ketones and fatty acids enter the bloodstream, causing the chemical imbalance known as DKA.

DKA develops due to:

- Long-standing, undiagnosed diabetes mellitus.
- Insufficient insulin dose in treated diabetics.
- Reduced insulin action—caused by obesity, concurrent illness, or drugs.

Due to a lack of insulin, glucose cannot be used by the body cells as an energy source. Instead, fat is broken down to provide energy.

When fat is used as an energy source, acids known as ketones are produced. Ketones circulating in the blood cause signs of DKA—decreased appetite, vomiting, and lethargy.

Diagnosis

The diagnosis of DKA is based on detecting ketones in the urine along with signs of illness. Diabetic ketoacidosis is an emergency and can be life-threatening.

Management

Your veterinarian will administer intravenous fluids and short-acting insulin and correct any underlying disorders to stabilize your pet. Once your pet is stabilized, he or she will be started on long-term insulin therapy again.

Diabetic cataracts in dogs

This is one of the most common complications of diabetes in dogs. A cataract is when the lens of the eye becomes cloudy; blindness results in the affected eye or eyes.

What causes diabetic cataracts?

Excess glucose in the bloodstream causes changes in the lens of the eye. Water enters into the lens, causing swelling and changes in the lens structure. This results in the cloudiness that is seen.

Management

The lens of the eye can be removed surgically to restore vision. Control of high blood glucose levels may help delay the onset of diabetic cataracts, but they can occur even if your dog's diabetes is well-controlled.

Peripheral neuropathy in cats

Peripheral neuropathy, a disease or degeneration that affects the nerves, is one of the most common chronic complications of diabetes in cats. Often referred to as diabetic neuropathy, this disorder typically affects the hind legs, causing weakness, loss of coordination, inability to jump, and a distinct stance or posture in which the cat's rear legs touch the ground when it walks.

Management

Though there is no specific therapy for diabetic neuropathy in cats, intensive blood glucose control decreases the risk and improves clinical signs in humans. Aggressive adjustment of insulin therapy may improve nerve function and reverse hind leg weakness and abnormal stance in diabetic cats. However, a cat's response to this therapy varies and aggressive insulin management increases the risk of hypoglycemia.

Summary

Successfully managing your diabetic pet's health is possible with insulin therapy, the correct diet, and exercise. With the successful control of diabetes mellitus, you can expect your pet to live a happy and normal life.