



## Feline Diabetes

Diabetes Mellitus is a fairly common disease, usually seen in cats over 5 years of age. Simply stated, diabetes is a failure of the pancreas to regulate blood sugar. The pancreas is a small but vital organ that is located near the stomach. It has two significant populations of cells. One group produces enzymes necessary to properly digest food and the other group produces the hormone called insulin. Glucose is a vital substance that provides much of the energy needed for life, and it must work inside the cells. Without an adequate amount of insulin, glucose is unable to enter into the cells. It accumulates in the blood, setting in motion a series of events that can ultimately prove fatal.

When insulin is deficient, the cells become starved for a source of energy. In response to this, the body starts breaking down stores of fat and protein to use as alternative energy sources. As a consequence, the cat eats more. The body then tries to eliminate the excess glucose in the urine. Glucose, however, attracts water; thus urine glucose takes with it large quantities of the body's fluids, resulting in the production of a large amount of urine. To avoid dehydration, the cat drinks more and more water. Thus we have the four classical clinical signs of diabetes in cats: **weight loss, ravenous appetite, increased water consumption and increased urination.**

A diagnosis of diabetes is made based on three criteria: the four classical clinical signs, the presence of persistently high levels of glucose in the blood stream and the presence on glucose in the urine. The normal level of glucose in the blood is 80-120 mg/dl. It may rise to 250-300 mg/dl following a meal or when the cat is very excited. However, diabetes is the only common disease that will cause the glucose to rise to 400 mg/dl or higher. To keep the body from losing its needed glucose, the kidneys do not allow glucose to be filtered out of the blood until an excessive level is reached. This means that cats with a normal glucose level will not have glucose in the urine. Diabetic cats, however, have excessive amounts of glucose in the blood, so it will be present in the urine. The diagnosis of diabetes seems rather simple, and in most cases it is. However, some diabetic cats do not meet all the criteria. For these, another test is performed called a fructosamine. This test represents the average glucose level for the past few weeks. It minimizes the influence that stress and eating have on blood glucose levels and can be very helpful in understanding difficult cases.

For the diabetic cat, blood glucose concentrations can not be normalized without treatment. Although the cat can go a few days without treatment and not get into a crisis, treatment should be looked upon as a part of the cat's daily routine. Treating cats for diabetes is generally achieved in two ways, dietary modification and medications to lower glucose concentrations. Diets that are high in fiber are preferred because they are generally lower in sugar and slower to be digested. This means that the cat does not have to digest large amounts of sugar at one time. The cats feeding routine is also important. The average cat prefers to eat about 10-15 times per day, one mouthful at a time. Fortunately, this is the best way to feed a diabetic cat. It is also important to monitor the amount of food that is eaten during a day. If the cat is overweight, a reducing diet is fed until the proper weight is achieved, then the cat is switched to a high fiber maintenance food.

In addition to dietary modification, drug therapy is also initiated to regulate the blood sugar. The choices are to give insulin injections or to give an oral medication. Either is acceptable, and both have advantages and disadvantages. Insulin injections are usually the first choice because this approach is to replace the hormone that is missing or made in inadequate amounts. Insulin injections typically have to be given two times a day. Many people are initially fearful of giving their cat injections, however, in just a short period of time become very comfortable with it. Oral medication in cats can be used to lower the blood glucose concentration. This is normally reserved for cats with non-insulin dependant diabetes. With non-

insulin dependant (Type II), some of the insulin producing cells still remain. However, the amount produced is insufficient, there is a delayed response in the secretion, and the tissues of the cat's body are relatively resistant to the insulin. There is no reliable or practical test to determine if a cat is Type II diabetic. Cats that have been started on oral hypoglycemic medication may show an initial response. This response may, however, last from months to years depending upon the progression of the destruction on the cells of the pancreas. This means that a time will come when the tablets are no longer effective.

Treating a diabetic cat can be a challenge, however there are a few important points that one should remember. Consistency is the key. In order to do this, one must eliminate as many variables as possible. The goal is to give the same dose of insulin the same time each day, to feed the same food and the same quantities each day, to keep the activity level the same each day and to keep the cats stress level the same each day. The second point to remember is that tight control is not necessary. Human diabetic patients must maintain the blood glucose values very close to normal at all times. If they don't, many can develop severe complications such as loss of fingers, toes, feet, hands, kidney failure and cataracts. These complications do not develop in the cat, therefore it is better for the glucose to be too high than too low.

It is necessary that a diabetic cat be monitored on a regular basis. This is best achieved as a joint project in which owners and veterinarians must work together. Monitoring at home can be accomplished in a variety of ways. The first is to monitor the cat for signs of diabetes by paying special attention to appetite, water consumption, weight and urine output. The second method of home monitoring is to determine the presence of glucose in the urine. If the cat is properly regulated, there should be no glucose in the urine. The most accurate means of monitoring is for routine blood work to check the level of glucose. If a cat appears to be well regulated this should be performed approximately every 3-4 months. If however, the cat's clinical signs are still present, more frequent visits to your veterinarian may be needed.

As previously stated, feline diabetes is a fairly common disease affecting middle aged to older cats. Classical clinical signs include ravenous appetite, weight loss, increased water consumption and increased urination. Once a diagnosis is made, you, as the owner must commit both financially and personally to treat the cat. When a cat is well regulated, the maintenance costs are minimal. However, the financial commitment can be significant during the initial regulation process and if complications arise. The personal commitment of treating a diabetic cat is very important in maintaining regulation and preventing crises. Most cats require insulin two times daily, at about 12 hour intervals. They must be fed the same food on the same schedule every day. If one should go out of town, the cat must receive proper treatment while you are gone. These are just a few of the factors that should be carefully considered before deciding to treat a diabetic cat.