



DIABETES MELLITUS FACT SHEET

What is diabetes mellitus?

There are two forms of diabetes in dogs: diabetes insipidus (drinking diabetes) and diabetes mellitus (sugar diabetes). Diabetes insipidus is a very rare disorder that results in failure to regulate body water content. The more common type of diabetes is diabetes mellitus and is most often seen in dogs 5 years of age or older.

There is a congenital form that occurs in puppies, but this is not common. Diabetes mellitus is a disease of the pancreas. This is a small but vital organ that is located near the stomach. It has two significant populations of cells. One group of cells produces the enzymes necessary for proper digestion. The other group, called beta-cells, produces the hormone called insulin. Simply put, diabetes mellitus is a failure of the pancreas to regulate blood sugar.

In humans, two types of diabetes mellitus have been discovered. Both types are similar in that there is a failure to regulate blood sugar, but the basic mechanisms of disease differ somewhat between the two groups.

- Type I, or Insulin Dependent Diabetes Mellitus, results from total or near-complete destruction of the beta-cells of the pancreas. This is the only type of diabetes known in dogs. As the name implies, dogs with this type of diabetes require insulin injections to stabilise blood sugar.
- Type II, or Non-Insulin Dependent Diabetes Mellitus, is different because some insulin-producing cells remain. However, the amount produced is insufficient and there is a delayed response in secreting it. People with this form may be treated with an oral drug that stimulates the remaining functional cells to produce or release insulin in an adequate amount to normalise blood sugar. Because Type II diabetes is rare in dogs, generally oral medications are not appropriate for treating diabetic dogs.



Why is insulin so important?

The role of insulin is much like that of a gatekeeper: it stands at the surface of body cells and opens the door, allowing glucose to leave the blood stream and pass inside the cells. 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 get into the cells. It accumulates in the blood, setting in motion a series of events which 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 dog eats more; thus, we have weight loss in a dog with a ravenous appetite. The body tries to eliminate the excess glucose by excreting it in the urine. However, the excess blood sugar 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 dog drinks more and more water.



CLASSICAL SIGNS OF DIABETES MELLITUS

- Weight loss
- Ravenous appetite
- Increased water consumption
- Increased urination

How is diabetes mellitus diagnosed?

The diagnosis of diabetes mellitus is based on three criteria: the four classical clinical signs, the presence of a persistently high level of blood glucose and the presence of glucose in the urine.

The normal level of glucose in the blood is 4.4-6.6 mmol/l. It may rise to 10 mmol/l following a large meal. However, diabetes is the only common disease that will cause the blood glucose level to rise above 22 mmol/l. Some diabetic dogs will have a glucose level as high as 44 mmol/l, although most will be in the range of 22-33 mmol/l.

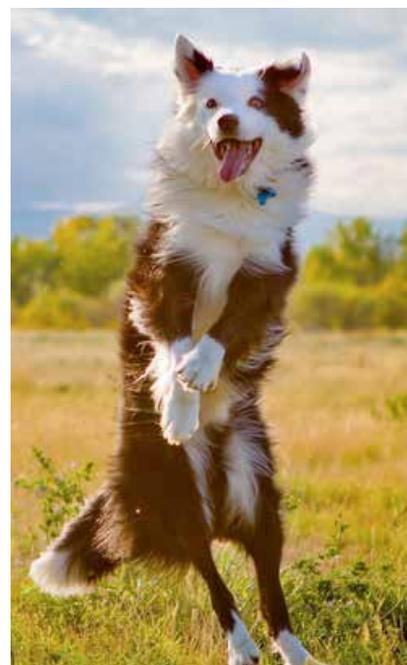
To prevent glucose loss from the body the kidneys only allow it to pass out in the urine when very high levels of glucose are circulating in the blood. This means that dogs with a normal blood glucose level will not have glucose in the urine. Diabetic dogs, however, have excessive amounts of glucose in the blood, so it will be present in the urine.

What are the implications for me and my dog?

For the diabetic dog, one reality exists: blood glucose cannot be normalised without treatment. Although the dog can go a day or so without treatment and not get into a crisis, treatment should be looked upon as part of the dog's daily routine. Treatment almost always requires administration of insulin and some modification of the diet.

For the owner, there are two implications: financial commitment and personal commitment. When your dog is well regulated, the maintenance costs are minimal. The special diet, insulin, and syringes are not very expensive.

However, the financial commitment is significant during the initial regulation process and if complications arise. Initially, your dog may be hospitalised for a few days to deal with the immediate crisis and to begin the regulation process. The "immediate crisis" is only great if the dog is so sick that it has stopped eating and drinking for several days. Dogs in this state, called ketoacidosis, may require a week or more of hospitalisation with a number of laboratory tests. Otherwise, the initial hospitalisation may be only for a day or two in order to start stabilisation. At that point, your dog goes home for you to administer medication. At first, return visits are required frequently to monitor progress. It may take a month or more to achieve good regulation.



For more information about diabetes in our pets feel free to contact one of the vets at HVC on (02) 60362374.