Diabetes in Dogs and Cats

Diabetes is a common condition in both dogs and cats. It tends to affect middle aged to older animals with a slightly increased incidence in female dogs and male cats. Being overweight can predispose your pet to getting this condition, so keeping your pet slim is one thing you can do to help prevent your animal developing this condition.

Diabetes is a medical condition involving a lack of insulin, which is the hormone required to control the body’s sugar levels. When animals eat food sugar gets absorbed through the gut and passes into the blood stream. The blood then acts as a transport system to deliver sugar to all the cells and tissues in the body that require it, where it is then used as an energy source.

For the sugar to move from the blood to the areas it is needed the hormone insulin is required. Therefore in diabetic patients there may be plenty of sugar in the blood but without insulin it can’t pass into the cells, and thus the body fails to function properly.

Symptoms

The classic clinical signs to look out for are excessive thirst/urination/appetite along with weight loss. If left diabetes can progress and become a life threatening condition which can eventually lead to a coma.

Diagnosis and Treatment

Diabetes is very simple to diagnose with urine and blood tests.

In general diabetes is managed by replacing the lack of insulin in the body by an injection. Generally insulin is required twice daily. This is a non-painful injection that most animals do not even notice as it is a very small dose given via a very small needle. The other long term management include a regular diet and exercise, weight management and neutering female dogs.

Diabetes in general is a lifelong condition that will need continuous treatment. Some cats can suffer from a form of diabetes that is transient and sometimes can be weaned off insulin, but this is not the case with dogs. Blood and urine tests are required periodically to monitor the stability of the disease during the entire lifetime of the animal.

Obesity is a known predisposing factor for Diabetes thus weight management is crucial in reducing the incidence of this disease.

Diabetes is a commonly and easily diagnosed condition in cats and dogs. Initial stabilisation of patients can take a little time and generally relies on twice daily insulin injections. Treatment is typically life-long with periodic monitoring, but is very successful in returning your pet to full health again.

Learning that your pet is diabetic can be a shock for most owners. Diabetics can be managed very effectively with a combination of diet and insulin therapy, however success depends very much on your commitment, attention to detail.
Management of a Diabetic pet

Diabetes mellitus cannot be cured. However successful stabilisation can be achieved with careful management for the majority of pets. Most diabetics require a combination of insulin therapy and dietary management. For success, it is vital that the insulin and dietary programs recommended are followed precisely.

Your veterinary surgeon may wish to admit your pet into the hospital for stabilisation. This allows them to accurately determine the amount of insulin required daily, under controlled conditions and a fixed diet. Once stabilised, the pet is discharged for insulin injections at home in conjunction with a fixed diet and daily routine.

Daily Routine

Insulin injections

As the body cannot produce sufficient insulin we need to administer insulin in the form of injections, given so that the insulin is working harder when the blood glucose level rises after eating. The amount of insulin required varies considerably between pets, so your veterinary surgeon will provide you with advice on how much insulin your pet requires, how to inject your pet, at what time the insulin should be given and the best feeding pattern for your pet depending on the type of insulin that you have been prescribed.

The timings involved are very important to prevent hyperglycaemia (too high a blood sugar level) and hypoglycaemia (too low a blood sugar level) which can lead to a coma.

Exercise

Controlled periods of exercise are recommended for most diabetic dogs. Over exertion should be avoided to prevent severe fluctuations in glucose demand. Consistency is really the name of the game in managing diabetics!

Diabetic cats, should be kept to a consistent daily routine and have limited periods of freedom away from home.

Diet

Dietary control is of critical importance to the diabetic pet. Consistency in diet content, quantity and meal times are crucial. Diabetic pets are unable to efficiently utilize the protein, fat and carbohydrate in their diet, and particular attention should be paid to these nutrients. Dietary therapy in diabetic pets aims to maintain a stable, ideal body weight, with a diet that is suitable for long term feeding. Dietary therapy also aims to reduce the severity of hyperglycemia and avoid complications sometimes associated with diabetes.

Diabetes Mellitus

Diabetes mellitus (sugar diabetes) is a relatively common disease in dogs, and occasionally seen in cats. It is usually seen in pets over 8 years of age, although ‘juvenile diabetes’ can occur. In the dog, bitches are three times more likely to suffer from diabetes, especially if they have not been neutered, whereas the condition most commonly effects entire male cats.

Diabetes results in serious problems with the metabolism of carbohydrate, fat and protein in the body leading the variety of clinical signs associated with the disease; increased thirst, increased volume and frequency of urination and ‘accidents’ in the night are commonly seen. Appetite is usually increased but this is usually accompanied by weight loss as the patient cannot obtain all the nutrients that it needs from its food. Diabetic animals may also show tiredness, poor coat condition, and in chronic cases bilateral cataracts (dogs) and enlargement of the liver. In the more advanced, and sometimes life threatening stages of the disease, animal show severe depression, vomiting, inappetance, more rapid breathing and the development of a sweet smell on their breath.

In order to understand the management of diabetes, it is important to consider the processes involved in the diabetic pet.
Glucose Metabolism

The pancreas is a V-shaped gland which lies in close proximity to the stomach. The majority of the organ is made up of cells which secrete enzymes needed for digestion and which pass through the pancreatic duct into the small intestine. The islets of Langerhans, responsible for the production of hormones, are small groups of specialised cells scattered throughout the pancreas; alpha cells produce insulin. In the normal pet, these two hormones work together to maintain blood sugar levels within a tight range.

Carbohydrates in the diet are broken down in the small intestine into simple sugars (eg glucose) and absorbed into the bloodstream. If the level of simple sugars in blood exceeds a certain amount (the renal threshold), these sugars are excreted by the kidneys in the urine (‘overflow’). Shortly after eating, the influx of sugar into the body will reach a maximum and blood sugar levels rise. The body produces insulin to help the transport of sugar into cells and keep blood sugar levels below the renal threshold and prevent passage of glucose into the urine.

Diabetes occurs when the beta cells are unable to produce insulin, or produce enough insulin to meet the body’s needs.

This can occur due to:

- Damage to the beta cells follow inflammation of the pancreas
- Disappearance of beta cells e.g. as part of the ageing process
- Failure of tissues to respond to insulin (insulin resistance)
- The presence of hormones which ‘antagonise’ or work in opposition to insulin eg male and female hormones. If your pet is un-neutered, your veterinary surgeon may recommend neutering to prevent these hormones from affecting treatment.
- Obesity leads to increased insulin production whilst the pet is increasing in weight. This may eventually lead to exhaustion of the beta cells and the development of diabetes. If your pet is overweight, your veterinary surgeon will recommend weight loss. It is not uncommon for the beta cells to start producing insulin again, with the result that insulin therapy can be reduced or even stopped altogether

Insulin reduces blood sugar levels by:

- Aiding uptake of glucose by the tissues
- Stimulating the conversion of glucose to glycogen for storage in the liver
- Inhibiting the body from producing glucose from the metabolism of fat and protein

Glucagon increases blood sugar levels by:

- Working in opposition to insulin