

Diabetes Mellitus



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Diabetes Mellitus

Diabetes mellitus is common, both in humans, and in dogs and cats. Diabetes mellitus is a condition caused by a lack of insulin or lack of response to insulin. It is characterised by increased hunger, thirst, urination and weight loss.

WHAT IS INSULIN, AND WHY IS IT IMPORTANT?

The food we eat is used for energy. Food must be broken down by the body to provide glucose (sugar) which is the fuel for cells. Glucose is needed by cells to perform their normal functions. Glucose normally circulates in the bloodstream ready to be taken up by cells as they need it. Insulin is a hormone made in the pancreas and is released when blood glucose rises after a meal. Insulin helps glucose move into cells. Without insulin, many cells of the body cannot use the glucose for energy even though the blood glucose levels may be high. The body then starts to breakdown fat and muscle to use as an alternate energy source resulting in weight loss.

WHY DOES A DEFICIENCY OF INSULIN OCCUR?

Insulin is normally produced by specialised cells of the **pancreas** and released as glucose rises after a meal. In certain situations, either the pancreas stops producing insulin (type 1 diabetes) or the cells of the body become somewhat resistant to its effects known as insulin resistance (type 2 diabetes). Dogs most commonly are type 1 diabetics and cats are most commonly type 2.

WHAT ARE THE SYMPTOMS OF DIABETES MELLITUS?

The classic symptoms of diabetes mellitus are increased hunger, thirst, urination and weight loss. Animals that develop ketoacidosis can be very unwell and usually have reduced appetite and vomiting.



WHAT TESTS ARE NEEDED?

Diabetes mellitus is diagnosed based on clinical symptoms, blood and urine tests demonstrating persistent high blood glucose and glucose being lost in the urine. Additional tests are required to determine if there are other complicating problems occurring. These may include further blood and urine tests, x-rays, and ultrasound. Other problems that are common in diabetic patients include urinary tract infections and pancreatitis.

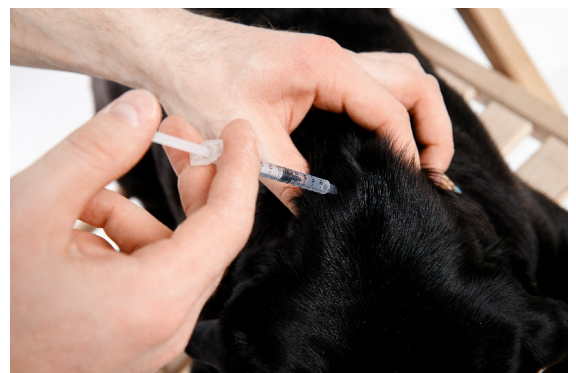
WHAT TREATMENT IS AVAILABLE?

The best treatment for diabetic dogs and cats is twice daily injections of insulin. Unfortunately, dogs and cats do not respond well to the tablets that some human diabetics use to control blood glucose, so insulin injections are necessary for diabetes treatment in dogs and cats.

If your pet has developed diabetic ketoacidosis (DKA) they usually require hospitalisation with intensive care as this is a life-threatening condition. To treat DKA your animal may need insulin intravenously, close monitoring of blood glucose and electrolytes and treatment of concurrent medical problems.

HOW DO I GIVE INSULIN?

Insulin is given as an injection under the skin. It can be a daunting prospect for some owners, but most people become quickly proficient and most animals tolerate the injections very well. The injection is usually given in the region of the back of the neck or shoulder area. Usually the patient is not aware they are receiving an injection, especially if they are distracted when it is given, for example when eating a meal. Some owners find it easier if to begin with if we clip a patch of hair, so they can see the needle going under the skin. Moving the injection site is recommended to decrease scar tissue forming under the skin over time. Insulin can be administered with a syringe or using an insulin pen. For pen details see separate information sheet.



WHEN DO I GIVE INSULIN?

Insulin should be given 12 hours apart (twice daily) with meals. Meal feeding is important in dogs. Cats may graze if they prefer rather than eating meals at specific times. Your animal should be eating before insulin is given. Administering insulin to an animal that won't eat might result in low blood glucose so if your animal is not eating check with your vet.

IMPORTANT NOTE ON INSULIN SYRINGES

We use both human and veterinary insulin to treat diabetes in dogs and cats. It is very important to know the difference as the syringes used to give the insulin are different and if mixed up they can cause a significant insulin overdose or under dose. This is because veterinary insulin is less concentrated than human's insulin. Caninsulin is a veterinary insulin and should only be used with veterinary insulin syringes, these have U40 written on the side of the syringes and are purchased at veterinary clinics. Human insulin (Lantas, Humalin, Levemir) are more concentrated and should only be used with human insulin syringes, these have U100 written on the side of the syringe. You should always know if you are using U40 or U100 syringes. If you are unsure talk to your veterinarian.

WHAT ELSE SHOULD I DO (EXERCISE AND DIET)?

A different diet may be suggested to help improve diabetic control. A low carbohydrate diet that is high in protein has been shown to help glucose control in cats. There are some prescription diets made especially for diabetic cats. There is less evidence for a special diet in diabetic dogs. Depending on other medical conditions a lower fat higher fibre diet may be recommended. It is important in dogs that the diet is consistent, such as the same type of food and volume is fed. Frequently changing the diet can make diabetic stabilisation very difficult. Food high in sugar should be avoided.

WHAT DOES HOME MONITORING INVOLVE?

Monitoring your pet at home is important for not only establishing the ideal treatment for them, but also ensuring that their treatment remains adequate. Monitoring your pet means keeping an eye on:

- Water intake (volume)
- Body weight
- Appetite
- Checking urine for ketones and glucose (you can purchase ketodiastix from human pharmacies).

NOTE: If your results show no glucose or positive ketones, please call your vet immediately.

Keeping a weekly diary of body weight appetite and water intake can be very useful to assess diabetic control and is relatively easy for most owners to do, this will help you catch a problem early and help us look at trends over time.

In some animals more, detailed monitoring at home may be needed. We may send your pet home with a freestyle libre sensor and scanner to check glucose levels or even request you take blood glucose samples (see separate handout on home glucose monitoring)



RECHECKS

Rechecks will be required regularly to ensure that your pet is continuing to receive appropriate therapy. They may be every few weeks after your pet is newly diagnosed to make sure we are getting the glucose levels under control. After adequate control is achieved (stable body weight, normal appetite and water intake) we may only need to see your pet periodically. Usually every 3 to 6 months.

Sometimes your pet may need an in-hospital glucose curve. Usually we get you to feed your pet and give insulin as normal at home. Then they come into the clinic and we take a small sample of blood every 2 hours over the day to assess the blood glucose levels. Stress affects this test so we usually cannot do any other procedures on this day and try and keep stress to a minimum. We may alter the insulin dose based on the results of this test and the information you give us on how your pet is doing at home.

WHAT ARE DIABETIC COMPLICATIONS?

Diabetes may predispose pets to some other complications. It is important to recognise abnormal behaviour in your pet and to monitor their thirst, urination, hunger and body weight.

Potential problems with diabetics include:

- Cataracts (dog) – progressive blindness – almost all dogs with diabetes will develop cataracts within months of becoming a diabetic. This usually slowly results in blindness. Cataracts can in most cases be removed but many diabetics cope well with blindness. Cats do not tend to develop cataracts.
- Persistent symptoms of diabetes (urinating and drinking more, increased hunger, weight loss)
- Ketoacidosis – lethargy, inappetence, vomiting. If your diabetic misses more than one meal or insulin dose you need to talk to your vet. They can be prone to developing ketoacidosis if they are not receiving insulin but if you give insulin to an animal that is not eating, they are prone to low blood glucose, so if in doubt check with your vet.

WHAT IS THE LIKELY OUTCOME?

Most pets with diabetes live full and happy lives. Management of diabetic animals requires a team approach. There is no doubt successful management of diabetes in dogs and cats requires a significant commitment from the pet owner and a good relationship with the treating veterinarian.

**If you have any questions, please feel free to contact of the Specialist Surgeons at
Veterinary Specialist Services.**



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