



## Feline Diabetes

Diabetes mellitus is characterised by uncontrolled high blood sugar levels due to insufficient insulin production by the pancreas. Insulin is necessary for the uptake and use of glucose (sugar) by cells in the body. It is also important for the appropriate processing of other nutrients such as fat and protein.

In overweight animals there is insulin resistance. This means that insulin is less effective, and more insulin is required to control blood sugar. Overworked insulin-producing cells become exhausted over time leading to a drop in insulin production. The resulting high blood sugar also has a toxic effect on the insulin-producing cells, further worsening the situation. Early diagnosis and management of diabetes is most effective as it helps break this cycle.

Insulin resistance also occurs with some diseases such as pancreatitis (inflammation of the pancreas), infections and with medications such as steroids. This is why these can trigger the onset of diabetes, or make it unstable in a previously well-managed patient.

### Signs of Diabetes

- Increased thirst and urination – this may lead to inappropriate urination in the house
- Increased appetite
- Weight loss – often despite an increased appetite
- Lethargy
- Vomiting – mainly occurs in the later stages of uncontrolled diabetes



### Complications of Diabetes

In the longer term, especially if untreated, diabetes can cause other problems:

- Infections, especially cystitis (bladder infection)
- Cataracts may develop leading to blindness
- Nerve problems can develop leading to weakness and the back legs may collapse
- Diabetic ketoacidosis is a life-threatening condition caused by abnormal metabolism secondary to insulin deficiency; it often starts with vomiting and lethargy and can rapidly progress to collapse and death.

### Diagnosis

Checking the glucose levels in the blood and urine is the first step in diagnosing diabetes. Normal glucose rules out diabetes, however cats can sometimes get high glucose when they are stressed or with certain types of sedation.

Additional testing can include repeating the urine test on a sample caught at home (where stress should be minimal), repeating blood testing on a different day and often requires sending blood to a laboratory to check fructosamine, a protein that indicates glucose levels over a few weeks.

We also often need to rule out other concurrent conditions such as kidney, liver and thyroid disease as these will affect long term treatment.

## Treatment & Management

Treatment of diabetes in cats always requires injections of insulin, usually twice daily. The insulin stimulates the proper use and storage of glucose preventing the secondary effects of hyperglycaemia (high blood sugar).

Insulin glargine (Lantus) is often used in cats due to the slow release formulation tending to give more stable control over time. This is usually given twice daily, but may be used once daily in some cats. Other insulins with shorter action are occasionally used e.g. Caninsulin. Different syringes are required for each insulin, it is important to get the correct syringes.

Insulin dosing must be optimised for the individual which means regular checks to ensure the dose is appropriate and the blood sugar is not going too high or too low.

### Insulin storage and administration

Insulin is a fragile protein-compound and can be easily damaged so appropriate storage and handling is essential:



- Insulin should be stored in the fridge to maintain it at a constant temperature
- The bottle should be stored upright and gently turned to mix prior to use but NOT shaken
- Insulin should be discarded 28 days after opening as it will deteriorate after this time
- Dose should be carefully drawn up as shown and checked prior to administration
- Injections should be 12 hours apart where possible (please discuss with your vet where this needs to be varied)
- Injections are given into the loose skin on the scruff of the neck as demonstrated
- It is best to vary the exact place you inject to avoid fibrous scarring in the long term which can affect insulin absorption

### Feeding

Diet has a proven impact on improving management of diabetes in cats. The correct diet can reduce insulin requirements, improve quality of life and even lead to remission in some individuals.



Diabetic prescription diets have high protein, low carbohydrate and appropriate fibre which helps normalise metabolism and reduce glucose fluctuations.

Cats which are used to 'grazing' during the day may continue to do this but the total amount of food given each day should be kept constant. If cats are fed twice daily this should be at the time of insulin injections.

If your cat has concurrent disease e.g. kidney disease, we will discuss which diets will be most appropriate

## Monitoring

It is VERY important that your cat is monitored closely when starting insulin treatment. Insulin is started at a low dose and increased gradually (rarely more than once weekly) to ensure we do not cause hypoglycaemia (low blood sugar – see below).

A blood glucose curve will usually be performed, where we hospitalise your cat and take regular samples throughout the day. This enables us to document the extent and duration of effect and the time of peak insulin action in each individual patient (the lowest the blood sugar gets).

These can be performed at home in some instances with a purchased glucometer, this is great for cats that are very anxious at the vets. There is also a continuous glucose monitor which can be temporarily implanted in the skin – this can be very helpful where monitoring is difficult or the diabetes is difficult to stabilise.

We may perform a fructosamine blood test which gives us an idea of recent glucose control. We also check urine samples for glucose levels and for signs of secondary infection.

It is also important to monitor water intake, appetite, demeanour and urination at home. Body weight will also be carefully monitored. Keeping a 'diabetic diary' can be very useful.

Other illnesses, such as infections, will often lead to insulin resistance so any issue should be treated promptly.

## Long term

Most cats will continue to need insulin injections long term, however many remain stable on a consistent dose for some years. Frequency of check-ups will vary up to a maximum of every 6 months in a very stable patient.

Some cats on effective insulin treatment and correct diet will enter diabetic remission and no longer require insulin. If checks suggest this has happened we withdraw insulin and monitor closely. They will need to remain on a diabetic diet and be monitored closely as they may develop full diabetes again in the future.

## Complications – Urgent

- Hypoglycaemia – if your cat's blood sugar drops too low you may start to see signs of weakness and confusion, your cat may appear blind or disorientated, this may progress to collapse, coma and even seizures.

If you suspect this is happening you must contact us immediately and feed the cat or rub honey or sugar onto the gums if they will not eat.

- Hyperglycaemia – very high blood sugar can occasionally cause similar signs of confusion. However this is much less common so if in doubt give food or sugar and contact your vet.

- Diabetic ketoacidosis – this usually starts with vomiting and lethargy and can be life-threatening. It is very important to get any illness seen to immediately in a diabetic patient as it may be serious.

Many cats with diabetes can live a long and normal life on treatment but will need careful monitoring throughout their life. If you have questions about any aspects of treatment, including the impact of the condition on both you and your pet then please talk to your vet or nurse.

Website for more information:

<https://icatcare.org/advice/cat-health/diabetes-mellitus>

<http://www.cat-dog-diabetes.com/>