

Diabetes Mellitus (DM)

What is DM?

Many pets (and people) are diagnosed with diabetes every day, it can be successfully controlled with daily injections of insulin and a consistent routine of diet and exercise management. With such therapy, your pet can lead a happy, healthy and active life. DM is a condition in which there is a **deficiency of the hormone INSULIN, or insensitivity to it.**

Carbohydrates from your pet's food are broken down and converted into various sugars – glucose being the most important one. Glucose is the essential fuel of the body's cells. At the same time as digestion is taking place, insulin is being produced and released by the pancreas. In normal animals, insulin allows the glucose to be absorbed after a meal and enter cells where it can be used for energy or stored for later use (e.g. liver, kidney, brain, muscle cells). Insulin is the hormone that signals the cells to take up the glucose.

Without adequate amounts of insulin, glucose is unable to get into the cells and blood glucose concentrations rise to abnormally high levels. Eventually, blood glucose levels become so high that glucose leaks out into the urine (often causing the urine to be concentrated and strong smelling – the smell is exacerbated by the very common urinary infections diabetics suffer).

Clinical Signs of DM

The loss of glucose in urine takes water with it and causes larger volumes of urine to be produced than normal. This excessive loss of water in urine is compensated for by thirstiness and increased drinking. The primary clinical signs of an animal with DM are therefore **excessive urination and drinking.**

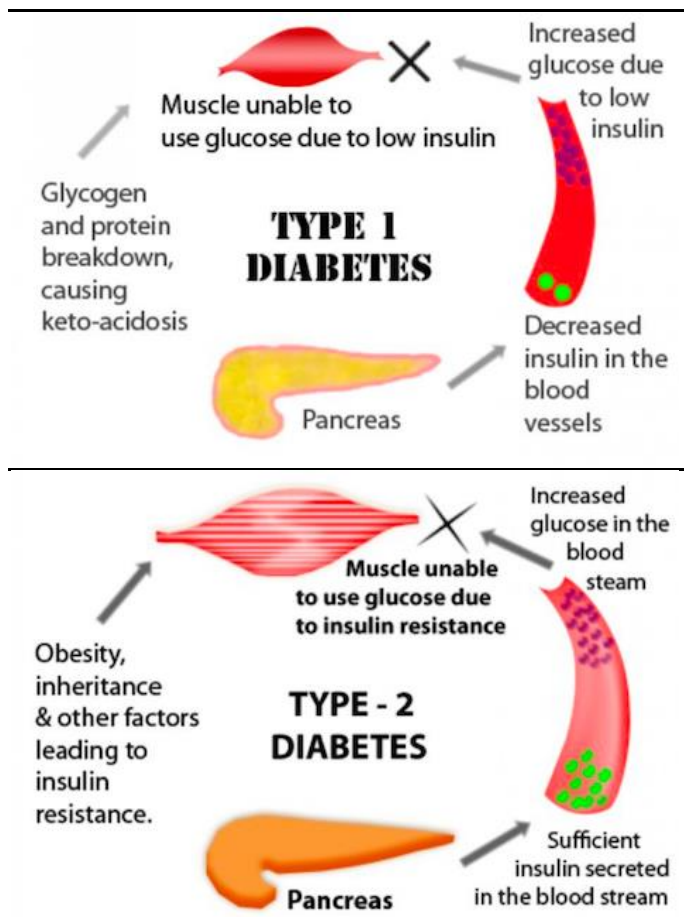
Because they can no longer efficiently utilise glucose as an energy source, diabetic animals tend to **lose weight** as they break down stores of fat and muscle to use as alternative energy sources. Unfortunately, if left to continue, these processes eventually create toxic by-products that can make your pet very unwell e.g. **vomiting, dehydration, not eating, dullness, and depression.**

Other clinical signs of DM include; **increased appetite, frequent infections** (especially skin or urinary infections), and **cataracts** (sudden or progressive blindness).

Therefore, with DM treatment and control you should notice; improvement in demeanour, reduced water intake, less urine output, less frequency of urination and continence throughout the night.

Types of DM

- **TYPE 1:** This type of diabetes is insulin dependent and is most commonly seen in DOG.
- **TYPE 2:** This type of diabetes is considered non-insulin dependent and is most commonly seen in CATS. Occasionally weight-management and dietary control can cause remission in these cases.



DM Treatment

Aims of treatment

- Lower the blood glucose and maintain it within a relatively normal, stable range.
- Avoid large fluctuations in daily blood glucose by establishing a simple routine (see 'Daily Home Routine' below).
- Treat any concurrent problems e.g. urinary infections.
- If female animal and not sterilised, she should be spayed as soon as stable enough to undergo an anaesthetic. This is due to DM being virtually impossible to stabilise when competing with the effects of oestrogen on insulin/glucose metabolism.
- Gradually stop steroid medications due to their interaction with insulin, causing large blood glucose fluctuations.

Insulin is the treatment of choice for DM in animals. Daily insulin injections will replace the insulin that your pet can no longer produce.

Insulin containing products regularly used in the Veterinary industry are; **Caninsulin**, and **Lantus** (insulin glargine). Your pet has to have an insulin dose tailored to its individual needs. The process of determining this amount is known as '**stabilisation**'. After such a period, maintenance insulin doses should remain relatively constant.

During the initial **stabilisation** period, we will ask you to monitor the effects of this dose on your pet's symptoms. Several return visits may be required for us to monitor progress. From time to time you will also be required to leave your pet in hospital for the day so that repeated blood glucose measurements can be taken. Using these results, if necessary, the dose will be adjusted gradually until the correct dose is established. It may take several weeks before the correct dose for your pet is determined.

Once stable, we usually do long-term check-ups of anything from 3-6 months to assess progress and we will periodically adjust insulin dosages if necessary.

Administering Insulin at Home

Drawing up the correct dose

1. Remove the insulin bottle from the refrigerator and gently but thoroughly mix the contents by inverting or rolling the bottle several times. **Do not shake the bottle as this will damage the insulin.**
2. Use a new syringe for each injection. Not all syringes used to inject insulin are alike. Always use the syringes supplied by us.

3. Hold the bottle upside down, remove the needle cap on the syringe and insert the needle into the centre of the rubber bung.
4. Fill the syringe with the correct dose and remove any air bubbles by tapping the syringe with your finger and gently pressing the plunger.

Injecting your pet

1. 'Tent' the skin at the area you are planning to inject. Do this by grasping the skin gently and pull upwards to form a fold. NOTE: It is recommended to vary the site of injection each time.
2. Place the needle at the bottom of the skin fold and gently but firmly push the needle through the skin of the fold, ensuring that the needle has gone under the skin.
3. Push the plunger in to inject the whole amount of insulin.
4. Withdraw the needle and release your hold on the skin.
5. Gently rub or massage the injection site to help disperse the insulin.
6. Replace the cap on the needle and dispose of the used syringe as instructed by us.

NOTE: If you are unsure if the insulin was administered correctly; do not give another injection as two injections could be harmful. Record what occurred and give the next injection at the usual time.

Daily Home Routine

In order to achieve good control of your pet's DM, all factors which affect blood glucose concentration must be kept constant from day to day. These factors include the timing and amount of medication; the composition, volume and timing of meals; and the amount of exercise your pet gets.

MEDICATION:

It is important to inject your pet with the prescribed dose of insulin at the same time(s) each day. Do not change the dose unless instructed to do so by us. **If you forget to give a dose at the appropriate time, contact us for advice. If this occurs outside of clinic hours, it is usually safer to skip the dose altogether and resume as normal at the next appointed time.**

MEALS:

Please feed only the amount and type of food we have recommend (usually one that is low in fat, high in protein, and high in fibre). Feed the same amount at the same time each day. Do not give any treats or titbits between mealtimes. Make sure an ample supply of fresh clean water is always available.

EXERCISE:

The amount of exercise your pet takes each day should remain as constant as possible. Try to exercise your pet at the same time every day. Avoid any sudden increase in exercise as this can result in unduly low blood glucose levels.

Home Monitoring

Daily monitoring: **Appetite** (not eating or unusually hungry); **General Behaviour** (if unwell in any way, please consult us as soon as possible).

Weekly monitoring: **Drinking** (keep a record of the amount of water your pet drinks over a 24-hour period. Consult us if the amount suddenly increases). **Urine** (we may provide you with urine glucose test strips. If so, please collect fresh urine samples at a random time throughout the day once a week and record this result).

Monthly monitoring: **Bodyweight** (if your pet is overweight/underweight at the time of diagnosis, we will adjust your pet's feeding to try and restore normal weight. Once normal, weigh your pet once a month (same scales). Weight loss, particularly, may be a reason for concern).

Problems to watch for; lethargy, shaking / shivering, unwillingness to eat for more than 24 hours, vomiting, excessive thirst + urination, continued weight-loss, significant weight-gain, progression of blindness / cataracts.

Low Blood Glucose Levels (Hypoglycaemia)

Although a rare complication, this is an important condition which occurs if your pet's blood glucose level drops too low. If mild, this results in little more than discomfort and hunger. If more severe the usual signs in a dog with a low blood glucose level are; trembling, agitation and muscle incoordination. Ultimately a seizure may occur. In cats, salivation, muscle tremors and weakness may be seen. Your animal should be closely monitored for hypoglycaemia, especially if they vomit or skip a meal but the insulin has been administered.

Causes of hypoglycaemia

1. Your pet has not eaten its normal quantity of food.

2. Abnormally increased activity (more glucose used).
3. Too much insulin was administered.
4. In cats, if they regain their natural insulin production.

Hypoglycaemia management

- If mild signs: Offer food.
- If more severe signs or your pet refuses to eat: Administer a sugar solution / honey ASAP. Recovery is usually rapid, once recovery is seen, give food. Closely observe your pet in case signs return. If your pet's condition worsens (muscle twitching, seizures, unconsciousness), call us or an afterhours clinic immediately. Please contact us as soon as possible if your pet has a hypoglycaemic episode – changes may be required in your pet's regime.

If you have any concerns at any time, please call us on (08) 9384 2644.

