Treating Diabetes in Cats and Dogs

Brockville
Animal Hospital

Treating Diabetes in Cats and Dogs

The cells of the body require glucose (sugar) to fuel their functions. Glucose comes from the diets our pets eat in the form of carbohydrates. That is why diet is so important when managing diabetes. The cells in their tissue cannot absorb or take in the glucose without a hormone known as insulin to "unlock the door into the cell". Once the glucose is in the cell it can be used for fuel. That is why insulin injections are needed to manage diabetes.

Cats or dogs that don't make enough insulin to get the glucose into the cells, have all this "un-usable" glucose in the blood stream. The glucose is excreted in high amounts in the urine pulling extra water with it. This translates into our diabetic pet urinating excessively.

(large clumps of urine in the litter or urinating on the floor) and thus being extra thirsty from all the water they are losing. They lose weight because they cannot use their food for fuel and they are usually extremely hungry. Other signs from all this glucose in the blood stream include the development of cataracts (especially in dogs) and neuropathies where a cat may walk down on its hocks "like a bunny".

The goal of our treatment is to lower the blood glucose by providing insulin so the cells can once again feed themselves and thus alleviate the clinical signs. Dogs will need lifelong treatment with insulin but some cats may go into remission and have the pancreas start producing insulin again. Both dogs and cats need insulin initially.

Videos on how to give insulin injections

CAT

https://www.youtube.com/watch?v=c8rIOozAJ7o

DOG

https://www.youtube.com/watch?v=M_OStT3ERX8

Administration

Store the insulin in the fridge. The dose can be drawn up in the syringe and allowed to warm up to room temperature before injecting if the pet finds this most comfortable. If the whole bottle is accidently left out for 24 hours it should be fine- any longer it should be discarded. Do not shake the bottle because this makes it frothy and not mixed uniformly.

Before drawing up a dose, gently rock the bottle back and forth between hands.

When drawing up an insulin dose, hold the bottle vertically upside down. Insert the needle into the grey central stopper of the bottle and draw up more insulin than you need. With the needle still stuck in the bottle, gently flick the syringe with your finger so any air bubbles will flow to the top of the syringe.

Then depress plunger so the air bubbles go into the bottle along with any extra insulin so the volume is the correct dose in the syringe.

Feed your pet when you are giving the insulin injections. For cats, feeding canned food at this time is a good way to ensure they are eating. This way they are distracted and are less likely to feel the tiny needle and you also know that they are going to eat before they get their insulin injection.

Using your non-dominant hand, gently draw the scruff skin up to make a tent of skin. Insert the needle into the tent of skin and then depress the plunger. Withdraw the needle. Feel the skin after to see if it is wet. If it is dry, you have successfully given the insulin injection.

Troubleshooting

Do NOT give insulin if your pet is not eating or ill.

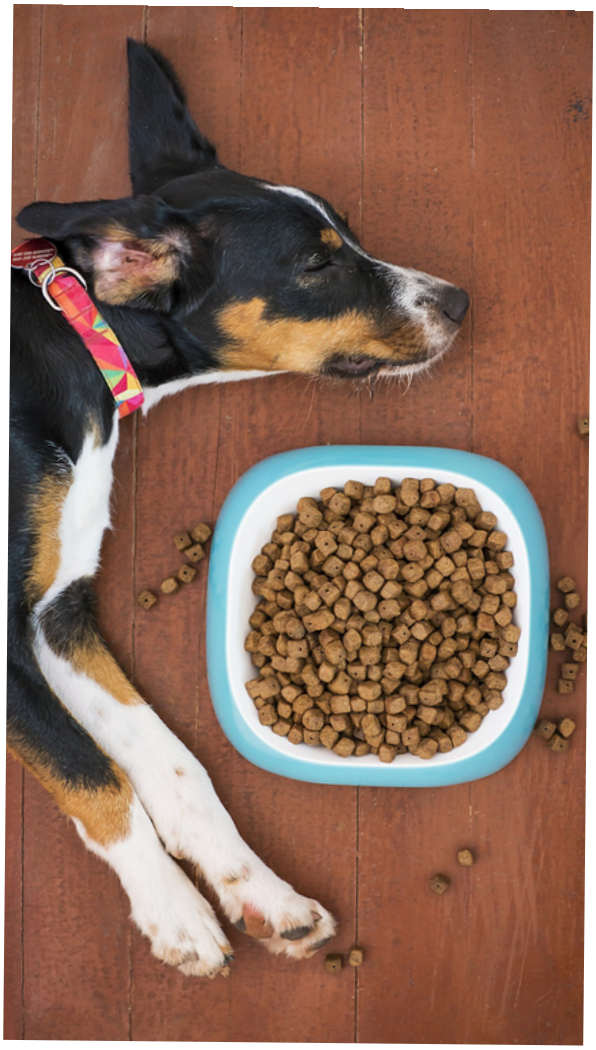
If your pet was vomiting the previous day, please wait 1 hour after feeding before giving insulin to ensure that food will not be vomited.

A short period of fasting without insulin therapy (up to 2 days) is permissible as long as a pet is drinking AND urinating adequately. If a pet has prolonged fasting, we need to examine your pet.

Signs of low blood glucose include weakness, twitching, pacing, acting blind, or even collapse and seizures. If you are suspicious of this problem rub corn syrup, maple syrup, or nutrical gel on their gums and call the hospital for more instructions. If the signs are more subtle simply feed them an irresistible meal such as canned food and do not give insulin.

Diet

If your pet is currently on a specific diet for another medical reason, we may need to adjust the type of food and the timing of the meals and treats. The amount of food needs to be consistent for us to regulate your pet on its insulin dose.



Controlling the total amount of carbohydrates and how long it takes to digest and absorb their food is one of the best ways to help us control diabetes. In some cases, we will recommend a diet change. For cats we use a high protein, low carbohydrate diet. For dogs we use a high fibre diet to slow absorption of food.

Ultimately, we will want to get any overweight pets back to a normal weight. We will adjust the calories for weight loss AFTER we have the pet regulated on its insulin. We want to control the diabetes first.

Monitoring

In general, our goal of treatment is to have the signs of diabetes controlled with normal drinking, normal urination and maintaining weight. These signs seem to resolve fairly soon after starting insulin. The dropped hocks neuropathies in cats can take months to resolve. Unfortunately, almost all dogs will develop cataracts despite controlled signs.

The initial starting dose of insulin is unlikely to be the perfect dose. It is the individual pet's response to the insulin in their unique environment that determines the dose. To determine if our dose of insulin is correct for your pet, we need to do glucose curves and we need to monitor clinical signs.

This involves:

1) Keeping a diabetic diary.

Recording the frequency and volume of urination in cats is helpful. Even if you have multiple cats in the house, we can still determine the total size and number of urine clumps in the litter box for all the cats in the house as a whole. As your diabetic cat responds to treatment the total number of clumps in the litter box will decrease. When your pet visits the hospital, we will weigh them but you can also do this at home.

Keeping track of water consumption in dogs is also a way to monitor. Sometimes we will also check for glucose in the dog's urine with a uristrip to help assess how the diabetes is being controlled.

2) Blood glucose curves.

The day we start insulin on your pet, we may want to have them come in the morning AFTER eating their breakfast. We will have them stay with us for the day. We will give them their calculated first insulin dose and then take a few glucose readings that day to make sure that they are not overly sensitive to the insulin. We will then make an appointment later that day to show you how to give insulin injections at home. We will then have you continue with injections for a week.

After the first week we will have your pet back for us to apply a flash glucose monitoring system developed for humans called a Freestyle libre glucose monitoring system. A flash monitoring system allows us to monitor your pet's glucose levels at home without pricking foot pads or ears to collect blood. We can get more frequent readings without additional stress for your pet.

Home Care Diary

Home monitoring is an essential part of caring for a diabetic pet. This diary can help you effectively manage your pet's diabetes between veterinary visits and provide your veterinarian with valuable data. Simply enter your pet's information each day and bring the completed form to your veterinarian at your pet's next appointment.

Date	Time of feeding	Amount Eaten	Insulin dose	Time of insulin dose	Water intake	Urine output	Notes/observations
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	
	______ ☐ a.m. ______ ☐ p.m.		______ units ______ units	______ ☐ a.m. ______ ☐ p.m.	☐ Increasing ☐ Decreasing ☐ No change	☐ Increasing ☐ Decreasing ☐ No change	

How It Works

A sensor with a tiny, flexible sampling catheter (tube) is painlessly implanted in your pet's skin. The sampling catheter is linked to a glucose analyzer that has a wireless link to a reader similar to a grocery store bar code reader. The reader can sense the glucose level when it is within a few feet of the sensor, but active readings (passing the reader over the sensor) should be taken at intervals recommended by your veterinarian.

The sensor should be actively scanned at least every 8 hours to maximize the data capture within that 24-hour period. Instead of the Reader, a smartphone app can be used as the reader if the pet owner has an iPhone 7 or newer or Android 5.0 or newer. Only one smartphone should be used as the Reader, as there will be big gaps in the data if two phones in the house are used.

The sensor is about the size of a quarter and about as thick as two stacked quarters.

How The Sensor Is Implanted

Implanting the sensor should be done by your veterinarian. Implanting the sensor takes only seconds and is less painful than a vaccination. Most pets don't even notice when the sensor is implanted.

A small area on your pet's back is shaved, the area is cleaned, and the sensor, which comes with its own implantation device, is pressed into the skin. Sometimes adhesive is used to make sure that it sticks to the skin.

Ready for implant

Sensor applied

Where Do I Get One?

FreeStyle Libre sensors and readers can be purchased over the counter at the drugstore. The Brockville Animal Hospital can supply a sensor, but readers are the responsibility of the owner.

A reader can last for 3 years if you take care of it. A charging cord is supplied in the reader kit that you purchase from the drug store. The other option is to download the free Libre Reader app to your smartphone.

There is a fee for the veterinarian to implant the sensor and for interpretation of results. This includes an interpretation at 5 days and again at 10 days, as well as the removal of the sensor.

Each sensor is only used once and can generate 2-10 days of continuous glucose data. You will need to purchase a new sensor any time your veterinarian recommends repeating the glucose monitoring.

Since animals have their own ideas, many pets manage to dislodge the sensor before the 14-day expiration. Don't despair, on average your veterinarian can get 2-10, or more days of data which can still provide accurate information to manage your dog or cat's blood glucose concentrations appropriately. Cats and some dogs may need to wear a "onesie" pajama to protect the sensor from being removed pre-maturely. Even wearing the sensor for 24 hours can provide a wealth of information.

How do I Interpret the Information?

The most economical way to obtain the information from the libre sensor is by downloading the libre app to your smartphone. The other method is to purchase a libre reader from the drugstore that you can attach to your computer with a cord. You will need to determine which method you prefer BEFORE the glucose sensor is applied to your pet.

Sometimes the sensor will stay in place for up to 14 days, and your veterinarian can change the insulin dose 1-2 times (if it is necessary) while the sensor is still in place, and they can evaluate the results of the dose change.

Please download the data from your phone or reader within 2 days of the sensor being applied on your pet, again at 7 days, and one final time once the sensor stops working. We will remove the sensor in the clinic for you if needed.

It is important that you notify your veterinarian how you will be sending data to the hospital BEFORE the sensor is activated on your pet, so you can take full advantage of the data. (Using the libre app on your phone or purchasing a reader from the drug store)

Important Information about Hypoglycemia

The flash systems are sometimes not as consistently reliable for pets as they are for humans. In general, our goal is to control the clinical signs of diabetes which means normal drinking, normal urination and maintaining weight. These signs are usually controlled when the glucose is below 15 at its highest and between 5 and 9 at its lowest. This is a guideline and if the reading says low on the free style libre and your pet is acting completely normal there is no need to panic, just continue to scan every half hour to see if levels start to increase. Do not give insulin.

If you are worried, call the clinic during normal business hours and we will check your pet's glucose with a standard veterinary glucometer.

Some owners feel comfortable themselves checking the blood glucose with their own traditional glucometers.

If your pet is having signs of hypoglycemia and the flash system is registering a low or normal glucose level, please offer your pet something sugary like corn syrup or maple syrup. It can be rubbed onto the gums if needed.

Flash glucose monitoring systems are a big step forward in managing diabetes in our pets. With these systems your veterinarian has vital information that can help them craft a treatment protocol that exactly fits your pet's metabolic needs.

Additional notes:

Patient Name:

_____

Insulin Type: _____

Concentration: 40 IU/ml ___ 100 IU/ml ___

Dose: ____ a.m. ____p.m.

Syringe Type: 40 IU/ml ____ 100 IU/ml ____

Syringe Volume: 3/10 ml____ 1.0 ml ____