The Diabetic Cat

Diabetes in cats is on the rise, largely due to a huge increase in feline obesity rates. Symptoms of diabetes include increased drinking and urination, weight loss, unhealthy fur, and even vomiting or changes in appetite. Diabetes is often a fairly straight forward diagnosis to make, involving bloodwork and urine analysis. Concurrent illness also needs to be ruled out or addressed. Certain medications, such as steroids, can contribute to the development of diabetes as well.

Despite the fact that almost all diabetic cats require insulin therapy, cats actually almost always have a *combination of type 1 and type 2 diabetes*. Type 1 diabetes means that the beta cells in the pancreas are *not producing enough* insulin. Type 2 diabetes means that despite adequate insulin levels, patients are *resistant* to insulin so their blood sugars do not regulate as they should. Because their cells are not responsive to insulin, the pancreas tries to produce more and more insulin to compensate. This leads to beta cell burnout, causing insulin production to drop off, leading to the development of type 1 diabetes on top of the existing type 2. Insulin is like a key that opens the doors on cells to allow glucose (sugar) to enter. Without this key (either enough keys – type 1 - or defective keys – type 2), glucose cannot enter cells, so cells are starved of sugar but sugar levels in the blood get high because the sugar has nowhere to go.

Cats often start as type 2 diabetics, owing to factors such as obesity or some medications. This means that they are strongly regulated by *diet*. Diabetic cats should eat a mostly *canned* diet of *high protein, low carbohydrate* food. The diet of choice is Purina DM. Cats should be meal fed morning and night *prior* to insulin administration. Small amounts of dry food can be left out for grazing in case the cat's blood sugar gets low, but this should be heavily restricted. Fresh water should be available at all times.

As mentioned, the vast majority of diabetic cats develop type 1 diabetes as well and require insulin injections under the skin twice daily. The current insulin of choice in cats is Glargine (Lantus). It is a relatively potent, long lasting insulin that helps to keep blood sugars as consistent as possible. Other insulin options are available for cases where cats do not control well on Glargine, but they tend not to work as well in most patients. Insulin must be *refrigerated* and *mixed gently* prior to administration. Different insulins have different types of syringes so it is essential to always confirm that the *correct syringe* is being used to avoid incorrect dosing. Insulin is to be given by injection under the skin (subcutaneous injection) exactly *12 hours apart*, with breakfast and dinner. It is essential to feed the cat *first* to ensure that they eat and do not vomit prior to deceiving their injection, as if they do not eat enough or keep it down their blood sugar might already not be very high so insulin administration may drive it down dangerously low. Never let your cat run out of insulin. Glargine can be purchased over the counter at human pharmacies, but most other insulins require prescription or are only available through veterinary clinics. Always call ahead to re-order when the vial is getting low. Glargine has a *3 month shelf life* if kept in the fridge – at that point any unused insulin should be discarded and a new vial should be purchased.

As previously mentioned, insulin allows sugar to enter cells and tissues, which in turn *decreases* the amount of sugar left in the blood stream (*it lowers blood sugar*). Signs of dangerously low blood sugar include shaking, salivation, weakness, and even seizures. It is always safer (in the short term) for blood sugar to be high rather than low, therefore, it is better to *skip a dose* of insulin if one is unsure. Reasons to skip an insulin dose include: noticing any of the aforementioned signs of hypoglycemia, cat not eating well, vomiting or profuse diarrhea, or listlessness. Skip the dose and call the vet for advice. If signs of hypoglycemia are noted, rub something sweet such as honey or corn syrup on the animal's gums and call the vet ASAP.

Close monitoring of diabetic patients is essential, as diabetes in cats often changes over time. Sometimes with insulin injections and weight loss the pancreas gets a rest and the beta cells start to produce more insulin again, meaning that some cats can even revert to being non-insulin dependent at times and need to *discontinue* insulin therapy. It is critical to know if and when this occurs, as continued insulin administration by owners will result in potentially dangerously low blood sugar levels. We monitor cats via clinical signs at home, tracking their body weight, bloodwork, and urine analysis. *Blood sugar monitoring is essential*, as most cats need adjustments in their insulin doses from time to time. Many owners are able to do this at home via the cat's ear vein and a hand-held glucometer. Human glucometers are often used, but can be slightly inaccurate. AlphaTrak glucometers are preferable, as they use very tiny blood samples and are calibrated specifically for cats, giving the most accurate results possible. *Never* adjust your cat's insulin dose without express instructions from your vet! If dosage adjustments are made, blood sugars should be monitored closely over the first 48 hours, and again 7-10 days later to assess response to the new dose. In situations where owners are unable to monitor blood sugars regularly at home, it is recommended that the cat come into clinic periodically for blood sugar curves (a full day of readings every 2 hours to track response to insulin) and fructosamine levels (a single blood test that gives us an average of how blood sugars have been at home over the past 4-6 weeks).

If diabetic patients are not well controlled and their blood sugar stays *high* for a prolonged period of time, they can go into a diabetic crisis called Diabetic Ketoacidosis, or DKA. This is a life threatening condition for which cats need immediate treatment. Symptoms include lethargy, loss of appetite, weight loss, and vomiting. Call your vet immediately if you note any of these signs.

Diabetic patients are also more vulnerable to infections, particularly bladder infections. Close monitoring of urination habits at home and regular urine analyses in hospital are important, as infections can fester and worsen if not treated promptly. Many diabetics will have "silent" urinary infections with no outward symptoms, making periodic urine assessment important.

Prognosis for feline diabetes is variable and depends greatly on the cat's age, response to insulin, and whether there is concurrent illness. "Simple" diabetics who are otherwise healthy can often do quite well if owners are diligent with care. It is, however, a long and potentially expensive road, so it is important to be realistic about treatment and whether this is something the family can commit to doing, either schedule-wise or financially. Speak to your veterinarian about any questions or concerns.