

# Diabetes Mellitus - Cats

## **Fast Facts:**

- **Clinical signs of diabetes includes excessive thirst, excessive urination, and/or excessive appetite despite unintentional weight loss.** Some cats will walk “flat footed” on their back feet due to diabetic neuropathy. Some owners notice diabetes early as the pet drinking more water or the pet starting to have accidents in the house. Other pets suddenly get very sick and develop diabetic ketoacidosis (explained later).
- Diabetes in cats is **similar to Type 2 Diabetes in humans**– insulin resistant diabetes leading to HIGH sugar levels- and IF STABLE can SOMETIMES go into remission without insulin injections and with weight control alone
- Diabetes is diagnosed based on high glucose (sugar) in the urine AND the blood. In cats we also monitor fructosamine (a sugar byproduct) levels.
- Diabetes in cats is from insulin resistance– this means we have to administer/inject excess insulin into your pet twice daily to help them overcome the resistance. **Insulin HAS to be given WITH FOOD.** Insulin must be kept refrigerated and gently rolled/shaken prior to use. Insulin will help regulate your cat faster.
- We start at low insulin doses and check every other week for regulation through glucose curves or more ideally through FreeStyle Libre devices. Giving too high of a dose will cause the blood sugar to decrease too much (hypoglycemia) and can be deadly. **It can take time (a few weeks to a few months) to find the right dose for your pet.**
- Signs of hypoglycemia (LOW sugar levels) from too much insulin include lethargy, drooling, vomiting/diarrhea, tremors, seizures or the patient could even be comatose. Too low of sugar levels can become deadly! This is why they must eat prior to giving their insulin injection. **If signs of low sugar levels are noted please take your pet to a Veterinary Emergency Hospital immediately.**
- If your pet has other diseases (infections, bad teeth, a urinary tract infection, urinary stones, hyperthyroidism..etc) then we may not be able to fully get your pet’s diabetes regulated until we get the other disease(s) under control as well
- A high quality consistent, twice daily/meal feeding scheduled diet with appropriate calorie count is most important to help regulate your pet. Though we may need to put them on a prescription diet.
- Our goal is to see less excessive drinking/urination and more activity.
- Diabetics are predisposed to getting urinary tract infections due to the excess sugar in the urine.
- Overweight cats are at high risk for diabetes. They are also at high risk for liver failure (hepatic lipidosis) if they go more than a couple days without eating. Contact your veterinarian immediately if your overweight cat suddenly stops eating.

***Diabetes can take time to regulate, but well regulated cats can live long happy lives once we get them stabilized and on their right dose! Cats can also go into remission!***

# Diabetes Overview- Cats

## What is Diabetes Mellitus?

Diabetes in cats is very similar to Type 2 Diabetes in humans, where the excess fat in their body causes insulin resistance. Without being able to use insulin, the body cannot utilize the glucose (sugar) in the bloodstream, because insulin is what allows the body to use/metabolize sugar. As glucose builds up in the bloodstream the kidneys start to filter out the excess and then glucose begins to build up in the urine as well. The excess glucose in the urine causes an osmotic gradient which leads to water following the glucose into the bladder— hence the excessive peeing we see. This excessive peeing causes overall water loss because they aren't retaining that water, and thus makes the pet feel thirsty. Therefore, they start drinking more to compensate.

With the body being unable to use the glucose available, the body starts to panic and burn up fat instead. This abnormal fat utilization causes pets to start losing weight but act ravenous because their bodies are not getting the sugar that they need. Utilizing the fat this way ends up producing dangerous byproducts called ketones. Ketones cause dehydration, electrolyte abnormalities and pH imbalances which can make pets very sick (called "Diabetic Ketoacidosis- DKA"). ***In early diabetes, the most common clinical signs owners may see are: accidents in the house, the pet drinking or peeing more, or even weight loss despite good appetite. If this goes a long time undiagnosed and DKA develops then the pet can become very lethargic, stop eating, and sometimes we see vomiting too.***

This generally warrants a urinalysis and full bloodwork to assess for excess sugar in the blood and urine. We also want to make sure that we aren't seeing any other illnesses like urinary tract infections, abnormal liver or kidney values, or abnormal electrolytes as these abnormalities can make your pet's diabetes more difficult to regulate. **It is not uncommon to see concurrent urinary tract infections in newly diagnosed diabetics as bacteria LOVES sugar** and a bladder full of sugar is a great environment for bacteria to grow in.

## What is Diabetic Ketoacidosis (DKA)?

Again, this is where the body starts to panic from not being able to use the sugars it needs and thus starts using too much fat and producing ketones. These ketones can cause low potassium levels, acidic blood, dehydration and are overall toxic to your pet. ***Clinical signs can be lethargy, not wanting to eat, and sometimes we see vomiting as well. These pets can start to get very sick fast if it's not addressed early.*** The goal with management is consistent fluid therapy at a 24-hour facility to flush out the ketones and restore electrolytes, with short acting insulin to help the pet start to utilize glucose again and stop producing ketones. This is the best way to get your pet stabilized and regulated the fastest. This also requires close monitoring of your pet's electrolytes, ketone levels and pH levels which means rechecking bloodwork multiple times to ensure that we are headed in the right direction. ***Even a stable diabetic can suddenly develop DKA if they develop something that destabilizes their diabetes*** (pancreatitis, urinary tract infection, hyperthyroidism, liver disease...etc).

# Diabetes Management- Cats

## Insulin

The most common product used in pets is “Vetsulin”- a pet specific insulin product. This product is dosed based on weight and slowly increased based on response to therapy and glucose levels. This can take time and multiple glucose curves before we find a good dose because starting at too high of a dose can bring their glucose down too low and be deadly. **Insulin needs to be refrigerated at all times**– and if used properly sometimes it can be safe to use for 3-6 months as long as no crystals/debris are forming in the bottle. **Each insulin requires a specific type of insulin syringe** (Vetsulin uses U-40 syringes) and cannot be used with a different kind of syringe, otherwise the dose is inaccurate. **Insulin must be given with food TWICE daily. This should be given as consistently as possible (every 12 hours +/- 1 hour).** If you need to change the time of day you give the insulin to your pet (which usually can be done slowly over time) work with your veterinarian to do this as safely as possible without messing up your pet’s regulation.

We recommend allowing the pet to eat a few bites and then injecting them while they are eating so that they are distracted. ***IF YOUR PET DOES NOT EAT THEN THEIR BLOOD SUGAR CAN GET TOO LOW.*** Thus, waiting until after they eat a little prior to injecting them is safer. ***If your pet skips a meal then it is safest to only give 1/2 of their insulin dose and monitor for signs of low blood sugar. Call your veterinarian if they skip two meals in a row. If you do not feel comfortable then it is ok to skip one dose and then contact your veterinarian as soon as possible.*** It is recommended to use a new needle for each injection and used syringes can be saved and returned to pharmacies or your veterinary office for proper disposal.

## Glucose Curves

In hospital glucose curves are not as accurate in cats because cats can get falsely high glucose from stress (and what cat is not stressed at a veterinary hospital?). ***Newer methods of monitoring include starting your pet on insulin and in two weeks placing a FreeStyle Libre on them.*** This is a device that is glued to the skin to collect glucose levels over 2 weeks. It takes glucose readings every 15 minutes and stores the data on a chip in the device. It can hold up to 8 hours of data before the readings must be transferred to an app on your phone or through one of their device readers that can be purchased. We recommend submitting the data to your veterinarian after placement on day 2, 7, and again at 14 days for analysis and to see if we can adjust insulin doses based on these readings. This device can be reinstalled every two weeks and can lead to faster and more accurate regulation. After they are regulated, many times we monitor cat diabetes via fructosamine levels (a glucose byproduct that only elevates if glucose has been elevated for >2 weeks) and urine glucose levels.

Typically, only if we are having trouble regulating do we need to resort back to glucose curves.

## Diet

In cats, high protein and low carbohydrate diets are best– these tend to be prescription diets. If this is not doable, then we recommend a high quality diet (Royal Canin, Hills Science Diet or Purina One/Pro Plan) with calorie moderation. Consistency is going to be key—we need a diet that we can keep your pet on. Changing diets frequently will only make your pet’s diabetes more difficult to manage and regulate.

# Diabetes Management- Cats

## **Monitor Your Pet For:**

- Sudden abnormal walking– wobbling or walking “flat footed” on their back feet.
- Lethargy, vomiting, diarrhea, tremors, seizures– all of which can be signs of their blood sugar getting too low (hypoglycemia) or diabetic ketoacidosis. ***This is a medical emergency and needs immediate medical attention! Please go to a veterinary emergency hospital immediately if these are noted!***
- Skipping a meal– this can be an early sign of blood sugar imbalance or a pet becoming unregulated, or the start of a different underlying illness. Overweight cats that do not eat can go into liver failure! Never let your overweight cat skip more than a few meals without notifying your veterinarian!
- Accidents in the house, peeing outside the litter box, excessive urination or drinking, sudden changes in appetite, sudden weight change or any other recurrent clinical signs
- Remember, your pet will be at risk for diabetic ketoacidosis if they suddenly become unregulated

## **Signs of “Diabetic Ketoacidosis”**

In a pet that has not yet been diagnosed with diabetes, we tend to see a history of peeing/drinking excessively combined with mild to severe lethargy, sometimes with loss of appetite and/or vomiting or diarrhea. Though most commonly, in both undiagnosed diabetics and regulated diabetics, there is a concurrent disease that triggers the DKA episode such as a urinary tract infection, kidney disease, pancreatitis (severe vomiting and/or diarrhea), or some sort of infection/illness. The goal will be stabilizing the pet, treating the concurrent disease and trying to re-regulate the diabetes as well.

## **Concurrent Diseases**

Many things can make diabetes difficult to regulate– severe dental disease, any sort of infection/illness, endocrine diseases like hyperthyroidism, kidney disease, progesterone from intact females...etc. If we are having a hard time regulating your pet (and we know that their dose and administration of insulin has been consistent) then we need to find out what else is going on preventing us from getting your pet regulated.

*This can be a difficult and frustrating disease to regulate and manage. Majority of diabetic pets can become regulated and have a good quality of life; however, this can become a terminal disease if left unregulated. If you feel their quality of life is not good at home– OR this is affecting your family’s quality of life too significantly, please do not be afraid to bring up these concerns with your veterinarian and we can talk about other humane options.*

**AS ALWAYS, IF YOU EVER HAVE ANY QUESTIONS OR CONCERNS PLEASE DO NOT HESITATE TO BRING THEM UP TO YOUR VETERINARIAN. THE INTERNET CAN BE FULL OF A LOT OF INFORMATION, BUT ONLY YOUR VETERINARIAN CAN HELP YOU SORT OUT THE GOOD AND BAD RESOURCES**