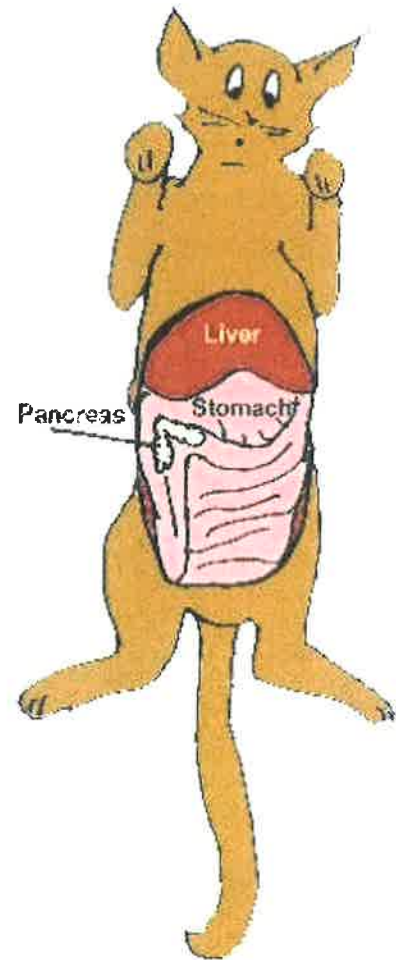




## Diabetes Mellitus and your Cat: Now what?

### What is Diabetes Mellitus?

- The most common form of Diabetes Mellitus in cats is Type II Diabetes characterized by insulin resistance, which means that your pet's body is making insulin but the cell receptors where the insulin acts are not functioning properly and do not "see" the insulin.
- The cells of the body require fuel in the form of fat or sugar for their daily activities. Some tissues can use either sugar or fat depending on circumstances and some tissues (such as brain and nervous system) depend almost exclusively on sugar as fuel.
- Insulin can be considered to be a key that unlocks the door, allowing sugar (glucose) in the bloodstream to enter the body's cells. Once inside the tissues, glucose can be burned for fuel or stored, but without insulin the sugar stays in the blood stream and cannot be used by the body.
- Insulin is produced by the pancreas. The body's initial response to high blood glucose is to make more insulin, which can eventually wear out the beta-islet cells of the pancreas so that they no longer produce insulin efficiently.



Clinical signs: What will you see?

- There is no way to remove glucose from the blood stream so blood sugar levels stay astronomically high. When the glucose stays high, it spills over into the urine. All this glucose in the urine pulls water with it and leads to excessive thirst and urination.
- The tissues of the body are unable to access any of the glucose they need for fuel and are basically starving. These patients show excessive appetite because the body is in a state of starvation. Because the body is rapidly mobilizing fat and muscle to try and help feed the tissues, weight loss is also a classic sign.
- The main symptoms of diabetes mellitus are excessive urination, excessive thirst, excessive appetite, and weight loss. Treatment should control these symptoms. Watching for these symptoms is the best way to know how your pet is doing.



LETAHRGY



INCREASED APPETITE



CONSTANT THIRST



**FELINE DIABETES  
SYMPTOMS**



OBSESITY



VOMITING



EXCESSIVE  
URINATION



### Treatment: How are we going to manage Diabetes?

- Giving insulin is the main way to treat diabetes mellitus. You will need to learn to give injections, which is daunting to some owners at first, but almost everyone quickly becomes an expert.
- First, an insulin type and dose need to be selected. There are several types of insulin and it is not possible to know exactly how much insulin your individual pet will require; trial and error is needed.
- Most pets require injections twice a day, approximately 12 hours apart, following a meal. An overdose of insulin is potentially a **medical emergency**; never give a dose of insulin if your pet has not eaten or appears lethargic (see information on Hypoglycemia).

### How to give an Insulin injection:

1. First, feed your cat. The blood sugar of a pet who has not eaten a normal meal but receives insulin may drop to a dangerously low level.
2. Pull up a handful of your pet's scruff. A triangle of skin is formed.
3. Aim your needle for the center of this triangle and stick the needle in. Do not be shy or the needle will not penetrate the thick skin in this area.\*
4. Pull back slightly on the syringe plunger to be sure you do not get blood back in the syringe. If you do see blood, pull the syringe out and start over. If you do not see blood, press the plunger forward and deliver the insulin.\*\*



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<https://www.vet.cornell.edu/departments-centers-and-institutes/cornell-feline-health-center/health-information/feline-health-topics/feline-diabetes>

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\*Vary the location with subsequent injections:

sometimes use the center of the scruff, and sometimes use the loose skin towards the sides or shoulders. By varying the location, you avoid creating scarring or fat deposits that could interfere with insulin absorption.

\*\* If there is struggling or your cat escapes, or for some reason you are not sure if your pet got the entire dose of insulin, DO NOT GIVE MORE. Simply wait until the next scheduled dose.

### Storing Insulin:

- As insulin prices increase, it is important to take good care of the bottle you have. Most forms of insulin used in pets need to be refrigerated, so check with your veterinarian.
- Do not use insulin that is past its expiration date.
- Regardless of whether the insulin is refrigerated, any color alteration could indicate contamination and if this is seen, the bottle should be discarded.
- Do not use insulin that has been frozen. Insulin is not normally frozen but accidents happen, especially in smaller refrigerators.
- Do not expose insulin to direct light or heat.

### Administration of Insulin by Syringe:

- There are two types of insulin syringes: U-40 (for insulin of the 40 units per cc concentration) and U-100 syringes (for the insulin of the 100 units per cc concentration).
- The types of syringes used **MUST** match the insulin used. Most human insulins (Lantus, Detemir, Humulin, etc.) are 100 units per cc while most veterinary insulins are more dilute at 40 units per cc (PZI and Vetsulin).
- When drawing up the insulin, roll the bottle gently between your hands 5-10 times to make sure there is an even concentration of insulin in the bottle. Do **NOT** shake the bottle of insulin.
- Always hold the bottle vertically to avoid unnecessary bubbles in the syringe. Since insulin is given under the skin, the presence of bubbles is not an enormous problem but we want to minimize the presence of bubbles for the sake of measurement accuracy.
- If you get bubbles in the syringe, flick the syringe with your fingers until the bubbles rise to the top and then simply push the air out of the syringe with the plunger.



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<https://veterinarypartner.vin.com/default.aspx?pid=19239&id=4951390>

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- Used syringes should be placed inside a thick plastic container (such as a liquid laundry detergent bottle or similar receptacle). If the needle is enclosed in such a container, the entire container can be closed up and disposed of in the regular trash at home.

### Monitoring Glucose Regulation in your Cat

- Monitoring is crucial to determining your pet's proper insulin dose. Much monitoring can be done at home and it is possible to save money by doing so; however, some tests must be done at the veterinarian's office.
- Clinical improvement: the hallmark signs of diabetes mellitus are excessive water consumption, excessive urination, excessive hunger and weight loss. Make a mental note about whether your pet's appetite, thirst, and urine production are normal, increased or decreased.
- Glucose monitoring: monitoring the blood glucose, or performing a glucose curve, indicates how long the dose of insulin is lasting and how high and low the glucose levels go. This information is important to determine if your pet is on the right type of insulin and if the prescribed dose is correct.
  - Initially curves are performed every 1-2 weeks until regulation of blood glucose is achieved.
  - It takes 1-2 weeks for a pet to adapt to a dose of insulin and that dose cannot be evaluated prior to that period of time.
- Methods of At-home Glucose monitoring: in a perfect world, glucose monitoring is performed at home. Pets are more comfortable at home and good glucose measures are not altered by stress. The following methods of At-home Glucose monitoring are available:
  - The Freestyle Libre Device- a human glucose monitoring system that can be adapted to cats. A round glucose sensor is implanted into the side of the pet and tissue glucose levels are monitored with a wireless scanner or a smart phone app.
  - Alphatrak Glucometer- a traditional form of glucometer that involved obtaining a small blood sample with a lancet device and doing so on a regular basis.

\*If you are interested in monitoring your pet's blood glucose at home, please ask your veterinarian and an appropriate system best for your and your pet can be determined.



*Freestyle Libre*

<https://veterinarypartner.vin.com/default.aspx?pid=19239&id=4952916>



*AlphaTRAK 2  
Glucometer*



### **Hypoglycemia and other Things to Watch for:**

- The most serious problem to watch for is hypoglycemia (low blood sugar). This results from a mismatch in food consumption and insulin dose. If the dose is too high you can get hypoglycemia. If the pet doesn't eat, you can get hypoglycemia.
- What you will see:
  - Appear tired, weak, or sleepy
  - When stimulated, your pet may seem drunken or may not be able to fully come to alertness
  - Severe hypoglycemia can lead to a comatose state where the pet is unresponsive
- This can be an **emergency** and can progress to seizures so it is good to know what to do at home to prevent disaster:
  1. First, try to get your pet to eat.
  2. If the pet will not eat, give light Karo syrup, honey, or even sugar-water at a dose of 1 tablespoon per 5 lbs of body weight. \*Sugar will absorb from the mouth, swallowing is not necessary.
  3. If no improvement occurs, immediately see a veterinarian for emergency treatment.
- When your pet is more stable, a glucose curve will be needed to determine why this happened and what a more appropriate insulin dose might be best.
- Other things to watch out for or to make an appointment with your veterinarian are:
  - If your pet seems to feel ill.
  - Your pet is losing weight.
  - Your pet has a ravenous appetite or loses its appetite.
  - The pet seems to be drinking or urinating excessively.
  - The pet becomes disoriented or groggy.

### **Educational Videos:**

1. How To Prepare an Insulin Syringe to Inject a Diabetic Cat
  - <https://www.youtube.com/watch?v=mbD2oAjPU0c>
2. How to administer insulin to your cat
  - <https://www.youtube.com/watch?v=c8rIOozAJ7o>