

## THE PET PHARMACY

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### **Insulin Administration in Cats**

Insulin is the injectable medication you use to control your diabetic cat's blood sugar. The goal is dosing once or twice a day - usually twice - to maintain blood sugar levels in an acceptable range over the course of the day. Keeping the sugars in the proper range will control the excessive urination and appetite that your cat suffers from, and it will require some trial and error experimentation to get the correct dose. A dose will be selected based on what research has shown to be a good starting point, and after a couple of weeks your cat will return for a glucose curve in which blood sugar levels will be mapped out over the course of a 10 to 24 hour period. The curve will show if the insulin lasts long enough and if the dose should be raised, lowered, or kept the same. Alternatively, you can learn how to monitor your cat's blood glucose levels yourself but if you are a beginner you may want to master giving the injections before moving on to taking blood samples.

Insulin is a simple molecule but it does differ slightly between species (i.e., cat insulin is different from dog insulin, which is different from human insulin). There are currently four insulins commonly in use for cats: Vetsulin (also marketed as Caninsulin® in other countries), PZI insulin (currently available as Prozinc® insulin), Lantus® insulin (also called Glargine insulin), and Humulin (genetically engineered human insulin available in several formulations with different durations of action).

PZI insulin is a long-acting insulin formerly available as a beef origin product. After its manufacturer exhausted its supply of beef pancreas it became unavailable, much to the consternation of many diabetic cat owners. Fortunately, a human origin PZI insulin (called Prozinc®) became available at the end of 2009. PZI is available through compounding pharmacies but these sources do not have batch to batch quality control, meaning the relative strength from batch to batch is not predictable. While pricing may be attractive, we recommend against purchasing compounded PZI insulin.

Lantus® insulin ([Glargine](#)) was marketed for human diabetics as a peakless insulin, meaning that it maintains glucoses in a narrow range. It is a long-acting insulin used in humans to provide a basis for glucose control, which is then fine-tuned with short-acting insulins. Lantus has proved effective for diabetic cats and is available at most regular drugstores.

Humulin was formerly available in several forms: N, L, R, and U, each with a different duration of action. Recently U and L have been discontinued.

Humulin R is fast acting and is similar to insulin secreted by one's body. This insulin acts too fast and lasts too short a time to be useful for pets in the home setting. It is often used

in the hospital setting to quickly reduce dangerously high blood glucoses in an emergency.

Humulin N is intermediate acting. These are the most commonly used forms of insulin and are usually used twice a day in pets. In general, this insulin is not long acting enough for feline use.

It is normal for a small white layer to settle in the bottle after it has been sitting. When getting ready to use the bottle, roll the bottle in your palms to mix in this layer. Do not shake the bottle.

**Be sure you understand the dose of insulin you are to use.  
Do not alter the dose on your own.**

### **Storing Insulin**

The bottle you are currently using need not be refrigerated although if you have a supply of insulin bottles, it is probably best to refrigerate the bottles that are not in use.

- Do not use insulin that is past its expiration date. In fact, it is a good idea to change to a fresh bottle every 6 to 8 weeks. Lantus® insulin can be kept for up to 6 months if refrigerated. 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.

### **Syringes**

There are two types of insulin syringes: U-40 (for insulin of the 40 units per cc concentration) and U-100 syringes (for insulin of the 100 units per cc concentration). The type of syringes used must match the insulin used. Most human insulins (Lantus® and Humulin®) are 100 units per cc while most veterinary insulins (PZI and Vetsulin) are more dilute at 40 units per cc.

Insulin syringes may be available through your veterinarian's office or through your regular drugstore but do not be surprised if a prescription is needed from your drugstore. Insulin purchased at the drugstore may or may not require prescription. Insulin is considered an over-the-counter medication for humans but when it is used in pets, it is technically off-label so prescription may be needed.

Insulin syringes are made extra fine so that human diabetics will not feel them. Veterinary syringes are similarly fine and your pet should not object to injections.

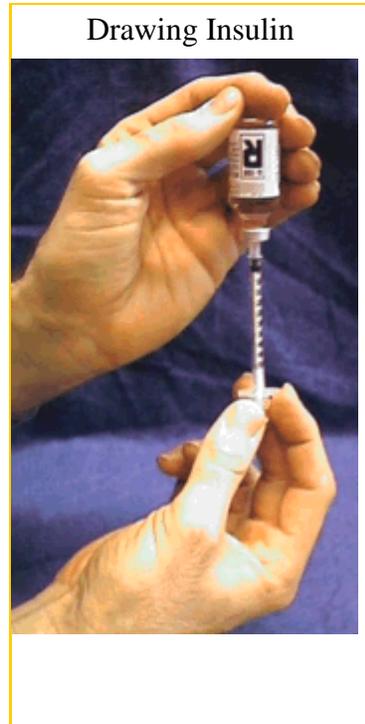
Syringes come in 0.5 cc volumes and 0.3 cc volumes. The syringes are graded in units. The smaller the volume, the easier it will be to read the tiny unit gradations. We recommend the 0.3 cc size for cats as it is easier to read the gradations, especially with U-100 syringes.

When drawing up the insulin, always hold the bottle vertically to avoid unnecessary bubbles in the syringe. Since insulin is being given under the skin, bubbles are not an enormous problem (as it would be with an intravenous injection) but we still want to minimize bubbles. If you get bubbles in the syringe, flick the syringe with your fingers until the bubble rises to the top and then simply push the air out of the syringe with the plunger.

**Before injecting your pet, practice drawing up the correct amount of insulin and feel comfortable handling the bottle and the syringes.**

View a [video guide](#) demonstrating how to draw up insulin. (The video is made on behalf of Prozac® insulin, but the procedures are the same for any of the insulin vials.)

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. Specific containers can be purchased for needle disposal or the used syringes can be returned to the veterinary hospital for disposal.

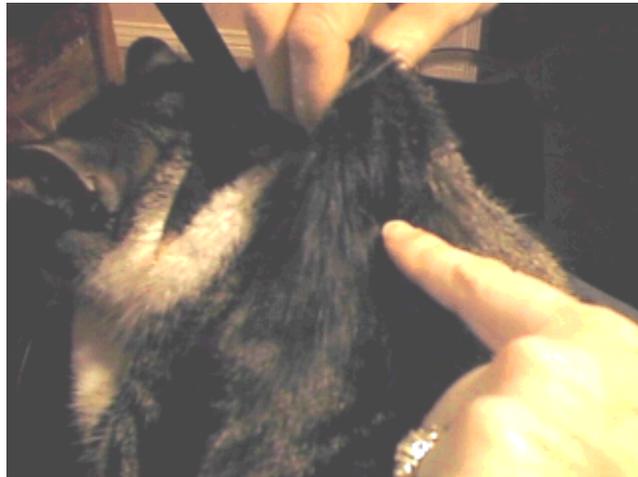


## How to Give the Injections



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. If your cat is not eating, this could indicate a need for a checkup with your veterinarian. After your cat has eaten, you are ready to give the injection.

Pull up a handful of your cat's scruff. A triangle of skin is formed. 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. 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.



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.

Boehringer Ingelheim, the makers of Prozac insulin, put together a [video on giving insulin](#) to your cat. (Again, these steps would be the same for injecting any insulin.)

### What to Watch for

It is not unusual for a pet's insulin requirement to change over time. When this happens, you will notice a return in weight loss, excessive appetite, and excessive thirst and urination. This is an indicator that your cat needs a glucose curve to re-adjust the insulin dose.

It is our policy not to give dosing information over the Internet.

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