

# Insulin

Humilin®, Iletin®, Novolin®, Vetsulin®, ProZinc®, Detemir, Levemir®, glargine and Lantus® are other names for this medication. Insulin is available in different forms according to its potency and length of effect.

## How Is This Medication Useful?

- Insulin is a protein (a chain of amino acids) produced by the pancreas that helps regulate blood sugar. Different kinds of insulin can be injected to control the blood sugar levels of diabetic animals.
- Because insulin drives potassium back into the blood cells, it is sometimes given to non-diabetic animals that have high potassium levels, for emergency treatment of that condition.
- Forms of insulin in increasing length of action are:
  - Regular (Lispro®)
  - NPH (Novolin®, Humulin-N®)
  - Lente (Vetsulin®)
  - ProZinc® (protamine zinc insulin)
  - Glargine insulin (Lantus®), Detemir (Levemir®)
- Insulin is slightly different depending on its source (cattle, pigs, human). Your veterinarian will select the most appropriate insulin available for your pet.

## Are There Times When Its Use Might Cause More Harm Than Good?

- If your pet's blood sugar is less than 100mg/dl then you should not administer insulin.
- If you check your pet's blood sugar at home, and it falls below 100, please call your vet to ask whether to skip a dose or use a reduced dose of insulin.

## What Side Effects Can Be Seen With Its Use?

- Hypoglycemia (low blood sugar) is the most common side effect of insulin. Hypoglycemia can be life-threatening if severe enough. If your pet shows signs of weakness, wobbling, head tilting, shivering, sleepiness, glassy eyes, hunger or confusion, you should check blood sugar at home if possible, and call your vet if below 100. If below 50, immediately administer Karo syrup to the gums and get your pet to a veterinarian for emergency treatment. If your pet is having seizures from hypoglycemia, you should not stick Karo syrup or your fingers into its mouth and get it to a veterinary clinic as fast as possible.
- Sometimes animals can develop a skin reaction to the insulin at the injection site. Rotating the injection site should decrease the likelihood of this adverse effect.

## How Should It Be Given?

- Not only is each insulin different, but the onset, peak and duration times will be different for individual animals. There are many different types of insulin available and if a pet is not responding well to one type of insulin, there are others to choose from. It may take a few tries before a veterinarian finds the one that is best for a particular animal.
- It may take even longer to reach the ideal dose. For some animals, ideal dose changes frequently. Your vet will supervise adjustments in dose as needed.
- Ideally, animals are started on an insulin that has about a 12 hour duration. This allows the owner to administer two injections daily and not have the activity from the first dose overlap the activity of the second dose. During each of these 12-hour cycles, the insulin will have an onset, peak, and duration. All these times depend on the individual pet and on the type of insulin being used.
- with some pets, the insulin duration is close to 24 hours, so only one shot is given each day.
- How fast and how well insulin is absorbed into the blood depends upon where it is injected. Insulin should be injected subcutaneously (under the skin) and into the fatty layer that lies beneath the skin to obtain the best results. Injections into muscle, skin or vein may adversely affect your pet's blood sugar control.
- Always double-check the dose in the syringe before you inject your pet. Overdoses can usually be managed, but may be potentially fatal if undetected and untreated.
- When starting a new bottle of insulin, or when changing the insulin dose as instructed by your veterinarian, it's best to do it on a day when you can be home to observe your pet. The new bottle of

insulin might be slightly stronger than the old one - especially if you used your old bottle for several months. And an increased dose requires observation for signs of hypoglycemia.

- Keep two vials of insulin in your house. You may break one, or you may run out over a holiday weekend and not be able to get a new vial right away. You may ask your pharmacist to divide your insulin refill into two separate vials.
- If you have two diabetic pets that use different types of insulin, double check to be sure you are giving each pet the correct insulin.
- The successful outcome of your animal's treatment with this medication depends upon your commitment and ability to administer it exactly as the veterinarian has prescribed. Please do not skip doses or stop giving the medication. If you have difficulty giving doses consult your veterinarian or pharmacist who can offer administration techniques or change the dosage form to a type of medication that may be more acceptable to you and your animal.
- If you miss a dose of this medication you should give it as soon as you remember it, but if it is within a few hours of the regularly scheduled dose, wait and give it at the regular time. Do not double a dose as this can be very toxic to your pet.
- If you are not sure whether an injection actually went into your pet, do not re-dose. It is much better to occasionally skip a dose of insulin than to double dose. Not more than one dose per week should be missed.
- Some other drugs can interact with this medication so tell your veterinarian about any drugs or foods that you currently give your animal. Do not give new foods or medications without first asking your veterinarian.
- Dogs and Cats: Dogs and cats usually receive insulin injections twice daily just after meals.

### **What Other Information Is Important About This Medication?**

- Always store insulin in the refrigerator, as its shelf life will be much longer.
- Never let it be exposed to freezing or high temperatures. Insulin is not ruined by being left out of the refrigerator for a day or two, as long as it is not frozen or overheated.
- It is okay to leave the insulin out at room temperature just prior to injection, or for short periods of time.
- Never shake Vetsulin® or NPH Insulin. This can destroy the fragile insulin molecule as well as introduce air bubbles into the insulin which will break it down. Air bubbles also make it more difficult to measure an accurate dose in the syringe. Always roll the vial gently between the palms of the hand. This prevents the formation of bubbles and also slightly warms the insulin making it more comfortable for your pet when injected. The manufacturer of ProZinc® insulin recommends shaking the insulin vigorously before administration. Lantus® and Detemir insulins are clear and do not settle out, so they do not need to be shaken or rolled prior to administration.
- Have your pet wear an identification tag that indicates it is a diabetic. You can add more information like the veterinarian's name and phone number.
- Know whom to contact in case of emergencies.
- If you take your pet out of the house, never leave home without sugar. This means when you're out on walks, going to the store, groomer, veterinarian, anywhere. Some people keep packets of honey or a small plastic bottle of corn syrup (Karo) in their purse or in the glove box of the car. You can also purchase liquid glucose packets at the pharmacy. It's better to have a liquid sugar, but even little packets of table sugar would work. In an emergency, you don't want to spend valuable time trying to find some sugar.
- Many pets do not show any physical signs of hypoglycemia (low blood sugar). So, suspect hypoglycemia whenever your pet is not acting normally. Become very aware of your pet's "normal" behaviors. Knowing how your pet acts when it is healthy may help you determine when something is wrong.
- A significant number of newly diagnosed diabetic cats will decrease insulin dose or even come off insulin altogether if fed a high protein, low carbohydrate diet. Always look for signs of hypoglycemia.
- Your diabetic pet will need regular check-ups in order to stay healthy. They may seem expensive at first, but they are usually much more cost effective than allowing illness which needs to be treated by hospitalization.