

Insulin NPH (Neutral Protamine Hagedorn)

inn-suh-linn N-P-H

Description:

Hormone replacement for diabetic animals

Other Names for this Medication:

Isophane, Humulin[®] N, Humulin[®] N KwikPen[®], Novolin[®] N, Novolin[®] FlexPen[®]

Common Dosage Forms:

Veterinary: None. **Human:** 100 Units/mL in 3 mL and 10 mL vials, and 3 mL pens.

This information sheet does not contain all available information for this medication and has not been reviewed by FDA Center for Veterinary Medicine. This sheet can help answer commonly asked questions but is not a substitute for medical advice. If you have other questions or need more information about this medication, contact your veterinarian or pharmacist.

Key Information

- Insulin NPH is used in dogs and cats to treat diabetes mellitus and should only be administered by injections under the skin.
- This is an **intermediate-acting insulin** that is given every 12 hours.
- Insulin doses should be given at the same time(s) each day and administered with or immediately after meals.
- Never give insulin if your pet is not eating.
- Only use U100 insulin syringes with this insulin. If using an insulin pen, only use with needles designed for the device.
- Double-check the dose in the syringe before administering it. **Overdoses can be fatal.** Learn the signs that indicate your animal's blood sugar is low (eg, weakness, low energy level, seizures), and keep a sugar source (eg, corn syrup [*Karo*[®]], honey) available at all times in case of emergency.
- There are many insulin products, and it is important that you do not switch between them unless instructed to do so by your veterinarian. Only use the product your veterinarian has prescribed.

How is this medication useful?

Insulin NPH (also known as isophane) is used to lower blood sugar levels in animals with diabetes mellitus. NPH is an intermediate-acting insulin that is FDA-approved for use in humans. The FDA allows veterinarians to prescribe and use these products in animals. You and your veterinarian can discuss why this insulin is the most appropriate choice.

What should I tell my veterinarian to see if this medication can be safely given?

Many things might affect how well this drug will work in your animal. Be sure to discuss the following with your veterinarian so together you can make the best treatment decisions.

- Other medicines can interact with this medication, so be sure to tell your veterinarian and pharmacist what medications (including vitamins, supplements, or herbal therapies) you give your animal, including the amount and time you give each.
- Tell your veterinarian about any conditions or diseases your animal may have now or has had in the past.
- If your animal has been treated for the same disease or condition in the past, tell your veterinarian about the treatment and how well it did or didn't work.

If your animal is pregnant or nursing, talk to your veterinarian about the risks of using this medicine.

Tell your veterinarian and pharmacist about any medication side effects (including allergic reactions, lack of appetite, diarrhea, hair loss) your animal has developed in the past.

How long until I will know if this medication is working, and how long will the effects of this medication last?

Insulin NPH is an intermediate-acting insulin, with effects lasting for 6 to 12 hours. This medication should start having blood sugar lowering effects within 30 minutes to 2 hours; however, you may not see the effects of this medication outwardly.

When should this medication not be used or be used very carefully?

No medicine is 100% safe in all patients, but your veterinarian will discuss with you any specific concerns about using this medicine in your animal.

This medicine **SHOULD NOT** be used in animals:

- That are allergic to NPH
- That are not eating
- That have low blood sugar (*hypoglycemia*)

If your animal has any of these conditions, talk to your veterinarian about the potential risks versus benefits.

What are the side effects of this medication?

Side effects that usually are not serious include:

- Skin reactions (eg, lumps or thickening of the skin) at the injection sites. Rotate injections sites to decrease the likelihood of skin reactions. If a skin reaction is severe, worsens, or continues to be a problem, contact your veterinarian.
- **HIGH blood sugar** (*high blood glucose; HYPERglycemia*) may cause excessive thirst, increased frequency of urination, or increased appetite. Contact your veterinarian if you see any of these signs.

Side effects that may be serious or indicate a serious problem:

- **LOW blood sugar** (*low blood glucose; HYPOglycemia*) may cause weakness, depression, lack of energy, sluggishness, staggering gait (stumbling) when walking, behavior changes, muscle twitching, seizures (convulsions), or coma. Contact your veterinarian **immediately** if you see any of these signs.
- Systemic allergic reactions (rare). If your animal develops hives, a swollen head or neck, noisy breathing, or is having trouble breathing, contact your veterinarian immediately.

If my animal gets too much of this medication (an overdose), what should I do?

If you witness or suspect an overdose, immediately contact your veterinarian or a veterinary emergency clinic. It is helpful to have the insulin package insert and the prescription label available when calling for treatment advice. **An overdose of insulin can cause a lifethreatening drop in your animal's blood sugar.** Signs of low blood sugar include weakness, depression, lack of energy, sluggishness, staggering gait (stumbling) when walking, behavior changes, muscle twitching, seizures (convulsions), or coma. Some animals may not show any obvious physical signs of low blood sugar.

If your animal is unconscious or having a seizure, this is a medical emergency. Take your animal to the veterinarian immediately.

If your animal is conscious and able to swallow, rub approximately 1 tablespoon of corn syrup or honey on your animal's gums until it is alert enough to eat. Once your animal is alert enough to eat, feed a meal and contact your veterinarian for recommendations. Do not give more insulin until instructed to do so by a veterinarian.

How should this medication be given?

For this medication to work safely, give the insulin *exactly* as your veterinarian has prescribed. Always double-check the dose in the syringe before you inject your animal. **Overdoses may be fatal.**

- Your veterinarian or pharmacist will teach you how to administer insulin injections. Be sure you understand these instructions completely. Initially, insulin administration will be easier with 1 person preparing and administering the insulin and 1 person holding the animal. With practice, insulin administration can often be done by 1 person.

- If you have difficulty getting your animal to accept the injections, contact your veterinarian or pharmacist for tips to help with dosing and to reduce the stress of medication time.
- In addition to the instructions listed below, reference the insulin package insert to understand how to safely give the insulin to your animal.

For NPH vials:

- Wash your hands. Retrieve the insulin vial, U100 insulin syringes, alcohol wipes, and a sharps container.
- **NPH requires U100 syringes.** Use of any other type of syringe could result in a life-threatening overdose.
- Make sure to use a new needle/syringe for each injection.
- Mix the insulin vial by gently rolling it between your hands 10 times until the suspension appear uniformly white and cloudy. **DO NOT SHAKE** the insulin as this action can damage the insulin and create bubbles in the vial which can reduce the effectiveness of the insulin and cause the wrong dose to be drawn up.
- The insulin vial should be visually inspected prior to use. The medication should have a uniformly milky appearance when completely mixed. Do not use if the suspension is discolored or if particles remain after gentle mixing; contact your veterinarian or pharmacist if this occurs.
- Wipe the rubber top (the area you will insert the needle) with an alcohol wipe; allow the alcohol to dry completely. When using a vial for the first time, the vial cap/cover must be peeled off before a dose can be withdrawn.
- Check the prescription label for the amount of insulin to give before drawing it up.
- Carefully remove the cap that covers the needle. Pull the plunger back equal to the number of units to be given. Insert the needle into the vial and inject the small amount of air.
- Turn the vial, with the syringe attached, upside down. Draw the plunger back a few units beyond the number of units needed, while making sure the tip of the needle is fully immersed in insulin in the vial. If there are air bubbles, tap the syringe gently with your finger to raise the air bubbles to the top of the needle. Then slowly push the plunger to the correct unit marking for your animal's dose.
- Remove the needle/syringe from the vial. Do not set the needle/syringe down; it should not touch anything. Be careful to not stick yourself.
- Select the injection site. There are 4 general areas along your animal's back that are best for injection. In the shoulder area, aim for the space between the spine and the left/right shoulder blade. In the hip area, aim between the spine and the left/right hip bone. Rotate injection site locations for each injection to prevent skin reactions at the injection site. Avoid injecting into skin that is scarred, pitted, thickened, hardened, lumpy, irritated, red, scaly, or tender.
- Find a quiet place to do the injections. Smaller animals may be easier to dose if lifted up on to a table. Stand behind the animal with their head facing away from you.
- **Prior to injection, always double-check that you are using the correct syringe and are injecting the correct number of units.**

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Performing the injection: Use your nondominant hand to pinch a fold of skin into a tent. Hold the syringe in your dominant hand and puncture straight (at a perpendicular, or 90-degree angle) into the lifted skin. While the needle is in the skin, draw back the plunger slightly to check for blood. If you see blood in the syringe, the needle has entered into a blood vessel. Remove the needle and try a different area. If you pull back on the syringe and it fills with air which remains in the syringe after you release the plunger, you have injected through the skin (and are not under the skin). You will need to remove the needle and try again. If no blood enters the syringe and no air remains in the syringe, you can inject the insulin by gently pressing the plunger all the way down to deliver the full dose.

- Withdraw the needle. Do not rub the injection site after injecting.
- Immediately dispose of the needle/syringe in your sharps container. Do not recap the needle to prevent an accidental needlestick. Needles and syringes should not be reused.

For NPH pen devices:

- Wash your hands. Retrieve the NPH pen, pen needles, alcohol wipes, and a sharps container.
- Use a new needle for each injection.
- Prepare the pen by holding it horizontally and then gently rolling it between your hands 10 times, then turn the pen up and down another 10 times to carefully mix the insulin suspension so that you give the right dose.
- The liquid inside the pen should be visually inspected prior to use. NPH insulin should have a uniformly milky appearance when completely mixed. If the suspension is discolored or particles remain after mixing, do **NOT** give it and contact your veterinarian or pharmacist.
- Clean the rubber stopper area with an alcohol wipe. Attach the appropriate pen needle. Make sure the needle is securely tightened to the pen. Carefully remove the outer cap to the needle; be sure to save the cap as it will be needed to remove the needle once the injection is complete. Then remove the inner needle cap and throw it away.
- **Prime the pen device before each injection:** Rotate the dose dial to 2 units, then hold the pen upright to check for bubbles. If bubbles are present, gently tap the pen to push the bubbles to the top then push the dispensing button. If insulin flows freely from the needle, the pen is working properly and is ready for use.
- Rotate the dose dial to the prescribed number of units. **NOTE:** The pen cannot be dialed to dispense in half units. Always doublecheck the dose prior to administration.
- Select the injection site. There are 4 general areas along your animal's back that are best for injection. In the shoulder area, aim for the space between the spine and the left/right shoulder blade. In the hip, aim between the spine and the left/right hip bone. Rotate injection sites for each injection to prevent skin reactions at the injection site. Avoid injecting into skin that is scarred, pitted, thickened, hardened, lumpy, irritated, red, scaly or tender.
- **Performing the injection:** Use your nondominant hand to pinch a fold of skin into a tent. Hold the device like a pen in your dominant hand and puncture straight (at a perpendicular, or 90-degree angle) into the lifted skin. While the needle is under the skin, press the dispensing button on the bottom of the pen until the dial resets to zero, then slowly count to 5 before removing the needle. This ensures your animal gets the full dose.
- Withdraw the needle. Do not rub the injection site after injecting.
- Carefully remove the needle from the pen device, and immediately dispose of it in your sharps container. Needles should not be reused.

What should I do if I miss giving a dose of this medication?

A single missed dose can cause temporary signs such as excessive thirst and a greater need to urinate, but it is not life-threatening. Contact your veterinarian as soon as possible for advice on when to give your animal's next dose. Do not double-up on doses as this will cause an overdose. If you cannot reach your veterinarian and your animal is eating and acting normally, give your animal the usual dose at the next regularly scheduled time.

How should I store this medication?

- *Unopened* NPH vials should be stored in an upright position in the refrigerator (36°F-46°F [2°C-8°C]), protected from light and heat sources. Do not freeze. Once in use, NPH vials should be stored in the refrigerator or at room temperature, protected from heat

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and light sources, for up to 31 to 42 days (always check the label of your product as storage temperatures and expiration may vary by manufacturer).

Unopened NPH pen devices should be stored in refrigeration at 36°F to 46°F (2°C-8°C), protected from light and heat sources. Do not freeze. Once in use, NPH pen devices should be stored at room temperature, protected from heat and light sources, for up to 14 to 28 days. **Do not refrigerate pen devices once opened.**

- **Always follow specific storage instructions listed on the label as recommendations may vary by manufacturer.** Be sure you understand how long your animal's insulin vial may be used.
- If your veterinarian or pharmacist has made (compounded) a special formulation for your animal, follow the storage recommendations and expiration date for the product.
- Keep insulin vials and pens, syringes, and needles away from other animals and children.

Can handling this medication be hazardous to me, my family, or other animals?

There are no specific precautions required when handling this medication unless you are allergic to it. Wash your hands after handling any medication. Keep this and all drugs out of reach of children.

How should I dispose of this medication if I don't use it all?

- Do not flush the contents of these products down the toilet or wash it down the sink. If a community drug "take-back" program is available, use this option. If there is no take-back program, mix the drug with coffee grounds or cat litter (to make it undesirable to children and animals and unrecognizable to people who might go through your trash), place the mixture in a sealable plastic bag to keep it from leaking out, and throw the bag out with the regular trash.
- Do not save leftover product for future use or give it to others to use.
- Your veterinarian or pharmacist will help you obtain sharps containers. Keep containers out of reach of children and animals. Once the disposal container is about three-quarters full, dispose of containers according to your community guidelines. Check with your local trash removal services or health department (listed online and in the city or county government [blue] pages in your phone book) to see which disposal methods are available in your area.

What other information is important for this medication?

- Patients are usually on this medication for an extended period—often for the remainder of the animal's life. Give this medication according to the label's instructions and obtain refills as needed. Do not stop this medication unless instructed to do so by your veterinarian.
- Dose adjustments are common over time. Your veterinarian will discuss any necessary dosage changes with you. Do NOT make any dosage changes without discussing with your veterinarian first.
- Maintaining a healthy, consistent diet and body weight while also providing daily exercise for your animal is just as important for diabetes management as insulin therapy. Do not change your animal's diet or exercise routine without first discussing with your veterinarian.
- Follow-up examinations and blood sugar checks (ie, glucose curves) are important for treatment of your animal's condition. Do not miss these important follow-up visits.
- If your animal is not acting normally, contact your veterinarian to make sure your animal's blood sugar levels are in a safe range.
- When starting a new bottle of insulin, or when increasing the insulin dose, it is best to do so on a day when you will be home to observe your animal for side effects. The new bottle of insulin might be slightly more potent than the old one.
- Consider keeping 2 vials of insulin at home in case one is broken or you are not able to get a new vial right away.
- **Always be prepared for an unexpected hypoglycemic event.** Never leave home without a source of real sugar (eg, packets of honey or real table sugar, liquid glucose packets [available at pharmacies], small plastic bottles of corn syrup) in case your animal's blood sugar drops. **Do NOT give your animal sugar substitutes (eg, xylitol, aspartame) as these may be toxic to your animal.**

Hypoglycemia (Low Blood Sugar) Management:

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- **If your animal is unconscious or having a seizure, this is a medical emergency.** Take your animal to the veterinarian immediately. **If your animal is conscious and able to swallow,** rub approximately 1 tablespoon of corn syrup or honey on your animal's gums until it is alert enough to eat. Once alert, feed a meal and contact your veterinarian for recommendations.
- Your animal's identification tag should indicate the animal has diabetes; be sure to include your veterinarian's name and phone number on the identification tag.
- Use of this drug may not be allowed in certain animal competitions. Check rules and regulations before entering your animal in a competition while this medication is being administered.

If you have any other questions about this medication, contact your veterinarian or pharmacist.