

## PREPARING THE INJECTION

- Clean your hands and the injection site with soap and water or with alcohol. Wipe the rubber stopper with an alcohol swab. (Note: Remove the tamper-resistant cap at first use. If the cap has already been removed, do not use this product, return it to your pharmacy.)
- For insulin suspensions, roll the vial of insulin gently in your hands to mix it. Vigorous shaking immediately before the dose is drawn into the syringe may result in the formation of bubbles or froth which could cause dosage errors.
- Pull back the plunger until the black tip reaches the marking for the number of units you will inject.
- Push the needle through the rubber stopper into the vial.
- Push the plunger all the way in. This inserts air into the bottle.
- Turn the vial and syringe upside down and slowly pull the plunger back to a few units beyond the correct dose.
- If there are air bubbles flick the syringe firmly with your finger to raise the air bubbles to the needle, then slowly push the plunger to the correct unit marking.
- Lift the vial off the syringe.

## GIVING THE INJECTION

- The following areas are suitable for subcutaneous insulin injection: thighs, upper arms, buttocks, abdomen. Do not change areas without consulting your physician. The actual point of injection should be changed each time; injection sites should be about an inch apart.
- The injection site should be clean and dry. Pinch up skin area to be injected and hold it firmly.
- Hold the syringe like a pencil and push the needle quickly and firmly into the pinched-up area.
- Release the skin and push plunger all the way in to inject insulin beneath the skin. To ensure that all the insulin is injected keep the needle in the skin for several seconds after injection with your finger on the plunger. Do not inject into a muscle unless your physician has advised it. You should never inject insulin into a vein.
- Remove needle. If slight bleeding occurs, press lightly with a dry cotton swab for a few seconds - **do not rub**.

**Note:** The dose should be injected over 2-4 seconds. Preparations of insulin suspensions which are injected slowly may clog the tip of the needle, resulting in an inability to complete the injection. Syringe plugging does not occur when the drug is injected more rapidly. Use the injection technique recommended by your physician.

## MIXING TWO TYPES OF INSULIN

Different insulins should be mixed only under instruction from a physician. Hypodermic syringes may vary in the amount of space between the bottom line and the needle ("dead space"), so if you are mixing two types of insulin be sure to discuss any change in the model and brand of syringe you are using with your physician or pharmacist. When you are mixing two types of insulin, always draw the Regular (clear) insulin into the syringe first.

## USAGE IN PREGNANCY

It is particularly important to maintain good control of your diabetes during pregnancy and special attention must be paid to your diet, exercise and insulin regimens. If you are pregnant or nursing a baby, consult your physician or nurse educator.

## INSULIN REACTION AND SHOCK

Insulin reaction "hypoglycemia" occurs when the blood glucose falls very low. This can happen if you take too much insulin, miss or delay a meal, exercise more than usual or work too hard without eating, or become ill (especially with vomiting or fever). Hypoglycemia can also happen if you combine insulin therapy and other medications that lower blood glucose, such as oral antidiabetic agents or other prescription and over-the-counter drugs. The first symptoms of an insulin reaction usually come on suddenly. They may include a cold sweat, fatigue, nervousness or shakiness, rapid heartbeat, or nausea. Personality change or confusion may also occur. If you drink or eat something right away (a glass of milk or orange juice, or several sugar candies), you can often stop the progression of symptoms. If symptoms persist, call your physician - an insulin reaction can lead to unconsciousness. If a reaction results in loss of consciousness, emergency medical care should be obtained immediately. If you have had repeated reactions or if an insulin reaction has led to a loss of consciousness, contact your physician. Severe hypoglycemia can result in temporary or permanent impairment of brain function and death.

**In certain cases, the nature and intensity of the warning symptoms of hypoglycemia may change. A few patients have reported that after being transferred to human insulin, the early warning symptoms of hypoglycemia were less pronounced than they had been with animal-source insulin.**

## DIABETIC KETOACIDOSIS AND COMA

Diabetic ketoacidosis may develop if your body has too little insulin. The most common causes are acute illness or infection or failure to take enough insulin by injection. If you are ill you should check your urine for ketones. The symptoms of diabetic ketoacidosis usually come on gradually, over a period of hours or days, and include a drowsy feeling, flushed face, thirst and loss of appetite. Notify your physician right away if the urine test is positive for ketones (acetone) or if you have any of these symptoms. Fast, heavy breathing and rapid pulse are more severe symptoms and you should have medical attention right away. Severe, sustained hyperglycemia may result in diabetic coma and death.

## ADVERSE REACTIONS

A few people with diabetes develop red, swollen and itchy skin where the insulin has been injected. This is called a "local reaction" and it may occur if the injection is not properly made, if the skin is sensitive to the cleansing solution, or if you are allergic to the insulin being used. If you have a local reaction, tell your physician.

Generalized insulin allergy occurs rarely, but when it does it may cause a serious reaction, including skin rash over the body, shortness of breath, fast pulse, sweating, and a drop in blood pressure. If any of these symptoms develop, you should seek emergency medical care.

If severe allergic reactions to insulin have occurred (i.e., generalized rash, swelling or breathing difficulties) you should be skin-tested with **each** new insulin preparation before it is used.

## IMPORTANT NOTES

- A change in the type, strength, species or purity of insulin could require a dosage adjustment. Any change in insulin should be made under medical supervision.
- You may have learned how to test your urine or your blood for glucose. It is important to do these tests regularly and to record the results for review with your physician or nurse educator.
- If you have an acute illness, especially with vomiting or fever, continue taking your insulin. If possible, stay on your regular diet. If you have trouble eating, drink fruit juices, regular soft drinks, or clear soups; if you can, eat small amounts of bland foods. Test your urine for glucose and ketones and, if possible, test your blood glucose. Note the results and contact your physician for possible insulin dose adjustment. If you have severe and prolonged vomiting, seek emergency medical care.
- You should always carry identification which states that you have diabetes.
- Always ask your physician or pharmacist before taking any drug.

**Always consult your physician if you have any questions about your condition or the use of insulin.**

Helpful information for people with diabetes is published by American Diabetes Association, 1660 Duke Street, Alexandria, VA 22314

Information for the patient who uses

# Novolin® N

NPH,  
Human Insulin  
Isophane Suspension (recombinant DNA origin)

**100** units/mL

Please read this leaflet carefully

## WARNING

**ANY CHANGE OF INSULIN SHOULD BE MADE CAUTIOUSLY AND ONLY UNDER MEDICAL SUPERVISION. CHANGES IN PURITY, STRENGTH, BRAND (MANUFACTURER), TYPE (REGULAR, NPH, LENTE®, ETC.), SPECIES (BEEF, PORK, BEEF-PORK, HUMAN), AND/OR METHOD OF MANUFACTURE (RECOMBINANT DNA VERSUS ANIMAL-SOURCE INSULIN) MAY RESULT IN THE NEED FOR A CHANGE IN DOSAGE.**

**SPECIAL CARE SHOULD BE TAKEN WHEN THE TRANSFER IS FROM A STANDARD BEEF OR MIXED SPECIES INSULIN TO A PURIFIED PORK OR HUMAN INSULIN. IF A DOSAGE ADJUSTMENT IS NEEDED, IT WILL USUALLY BECOME APPARENT EITHER IN THE FIRST FEW DAYS OR OVER A PERIOD OF SEVERAL WEEKS. ANY CHANGE IN TREATMENT SHOULD BE CAREFULLY MONITORED. PLEASE READ THE SECTIONS "INSULIN REACTION AND SHOCK" AND "DIABETIC KETOACIDOSIS AND COMA" FOR SYMPTOMS OF HYPOGLYCEMIA (LOW BLOOD GLUCOSE) AND HYPERGLYCEMIA (HIGH BLOOD GLUCOSE).**

## INSULIN USE IN DIABETES

Your physician has explained that you have diabetes and that your treatment involves injections of insulin or insulin therapy combined with an oral antidiabetic medicine. Insulin is normally produced by the pancreas, a gland that lies behind the stomach. Without insulin, glucose (a simple sugar made from digested food) is trapped in the bloodstream and cannot enter the cells of the body. Some patients who don't make enough of their own insulin, or who cannot use the insulin they do make properly, must take insulin by injection in order to control their blood glucose levels.

Each case of diabetes is different and requires direct and continued medical supervision. Your physician has told you the type, strength and amount of insulin you should use and the time(s) at which you should inject it, and has also discussed with you a diet and exercise schedule. You should contact your physician if you experience any difficulties or if you have questions.

## TYPES OF INSULINS

Standard and purified animal insulins as well as human insulins are available. Standard and purified insulins differ in their degree of purification and content of noninsulin material. Standard and purified insulins also vary in species source; they may be of beef, pork, or mixed beef and pork origin. Human insulin is identical in structure to the insulin produced by the human pancreas, and thus differs from animal insulins. Insulins vary in time of action and in strength; see PRODUCT DESCRIPTION and SYRINGES for additional information. Your physician has prescribed the insulin that is right for you; be sure you have purchased the correct insulin and check it carefully before you use it.

## PRODUCT DESCRIPTION

This vial contains **Novolin® N** commonly known as NPH, Human Insulin Isophane Suspension (recombinant DNA origin). The concentration of this product is 100 units of insulin per milliliter. It is a cloudy or milky suspension of human insulin with protamine and zinc. The insulin substance (the cloudy material) settles at the bottom of the vial, therefore, the vial must be gently agitated or rotated so that the contents are uniformly mixed before a dose is withdrawn. **Novolin® N** has an intermediate duration of action. The effect of **Novolin® N** begins approximately 1½ hours after injection. The effect is maximal between 4 and 12 hours. The full duration of action may last up to 24 hours after injection.

The time course of action of any insulin may vary considerably in different individuals, or at different times in the same individual. Because of this variation, the time periods listed here should be considered as general guidelines only.

This human insulin (recombinant DNA origin) is structurally identical to the insulin produced by the human pancreas. This human insulin is produced by recombinant DNA technology utilizing *Saccharomyces cerevisiae* (bakers' yeast) as the production organism.

## STORAGE

Insulin should be stored in a cold place, preferably in a refrigerator, but not in the freezing compartment. **Do not let it freeze.** Keep the insulin vial in its carton so that it will stay clean and protected from light. If refrigeration is not possible, the bottle of insulin which you are currently using can be kept unrefrigerated as long as it is kept as cool as possible and away from heat and sunlight.

Never use **Novolin® N** if the precipitate (the white deposit at the bottom of the vial) has become lumpy or granular in appearance or has formed a deposit of solid particles on the wall of the vial. This insulin should not be used if the liquid in the vial remains clear after the vial has been gently agitated.

**Never use insulin after the expiration date which is printed on the vial label and carton.**

## SYRINGES

### Use the Correct Syringe

Doses of insulin are measured in units. Some insulins are available in two strengths: U-100 and U-40. One milliliter (mL) of U-100 contains 100 units of insulin. One milliliter (mL) of U-40 contains 40 units of insulin. Be sure to use the proper syringe for the strength of the insulin prescribed for you. Syringes are clearly marked "**For use with U-100 insulin**" or "**For use with U-40 insulin**". Low dose U-100 syringes are also available. Failure to use the proper syringes can lead to mistakes in dosage. Novo Nordisk insulin vials are intended for use with standard insulin syringes. Novo Nordisk has not evaluated the use of these vials with other devices for insulin delivery or with devices intended to aid in giving injections. Consult your doctor and the manufacturer of these devices before use with this product.

### Disposable Syringes

Disposable syringes and needles require no sterilization provided the package is intact.

They should be used only once and discarded.

### Reusable Syringes

Reusable syringes and needles must be sterilized before each use.

1. Boil the syringe parts and needles in a pan of water for at least five minutes. Keep a special pan for this purpose. Heavily chlorinated water should not be used; distilled water is preferable.

If boiling is not possible, the syringe parts and needles may be sterilized by immersion in 70% ethyl alcohol or 91% isopropyl alcohol for at least five minutes. **Do not use bathing, rubbing or medicated alcohol for sterilization.**

2. Assemble the syringe and fit the needle on the tip of the syringe being careful not to touch the surface of the plunger or needle.

3. Push the plunger in and out several times until the water (or alcohol) has been completely expelled. (The syringe should be thoroughly dried before its use.)

## IMPORTANT

Failure to comply with the above and following antiseptic measures may lead to infections at the injection site.