

## Patient Handout

### How to Adjust Your Insulin Dosages

Prepared by Susan Renda, MS, CRNP, CDE

Diabetes means your body is unable to produce enough insulin to keep your blood sugar (glucose) at the proper levels. If you have type 1 diabetes mellitus (DM), you will need to use insulin right from the start. Often, if you have type 2 DM, you will also need insulin because your diabetes is progressive or there may be times of stress or illness that require insulin. In type 2 DM, the pancreas becomes “tired” and is no longer able to meet the requirements to keep blood sugar in control. No matter how your diabetes progresses or what medications are needed, the important thing is to control your blood sugar so that you feel well and avoid complications. Several different types of insulin are available for use. Some of the most common are as follows:

---

For meal coverage or to bring the blood sugar down quickly:

Rapid acting	Aspart (NovoLog®*) Glulisine (Apidra®†) Lispro (Humalog®‡)
Short acting	Regular insulin

---

For more sustained action or to help with fasting sugar:

Intermediate	Neutral protamine Hagedorn (NPH)
Basal	Detemir (Levemir®§) Glargine (Lantus®  )

---

Fixed combinations of insulin to cover meals and in between without having to mix insulin (often given twice daily):

70% intermediate + 30% short acting	Novolin® 70/30¶ or Humulin® 70/30#
75% intermediate + 25% rapid acting	Humalog® Mix75/25**
70% intermediate + 30% rapid acting	NovoLog® Mix 70/30††

The starting dose, type of insulin, and dosing schedule will be based on your type of diabetes and your individual needs. “One size fits all” does not apply to insulin dosing. You may need 5 or 10 units of insulin or more than 100 units to control your blood glucose. Your dosage may vary considerably from that of a friend’s or a family member’s. Everyone is different, and so are their insulin dosages.

When fixed combinations are used, the dosage is individualized based on your needs and meal patterns. When you eat at regular intervals, this insulin will “peak” or be working the hardest at mealtime when you need help to control the blood sugar. Often, two thirds of the dosage is given before the morning meal to cover breakfast and lunch, and one third is given before the dinner to cover the evening meal and a snack.

With type 2 DM, you may begin with glargine, a 24-hour basal insulin, or intermediate insulin (NPH), which is often added at bedtime. The starting dosage is often 10 or 15 units of insulin given once a day at approximately the same time. Check your fasting blood sugar (first thing in the morning before eating anything) to help determine the dosage needed. Your health care provider will direct the adjustment, or titration, of your insulin dosages. Examples of titration schedules are given on the next page.

---

\*NovoLog® (insulin aspart [rDNA origin] injection) is a registered trademark of Novo Nordisk A/S, Bagsvaerd, Denmark.

†Apidra® (insulin glulisine [rDNA origin] injection) is a registered trademark of Aventis Pharmaceuticals Inc., Kansas City, Missouri.

‡Humalog® (insulin lispro [rDNA origin] injection) is a registered trademark of Eli Lilly and Company, Indianapolis, Indiana.

§Levemir® (insulin detemir [rDNA origin] injection) is a registered trademark of Novo Nordisk A/S, Bagsvaerd, Denmark.

||Lantus® (insulin glargine [rDNA origin] injection) is a registered trademark of Aventis Pharmaceuticals Inc., Kansas City, Missouri.

¶Novolin® 70/30 (70% NPH, human insulin isophane suspension and 30% regular, human insulin injection [rDNA origin]) is a registered trademark of Novo Nordisk A/S, Bagsvaerd, Denmark.

#Humulin® 70/30 (70% human insulin isophane suspension and 30% human insulin injection [rDNA origin]) is a registered trademark of Eli Lilly and Company, Indianapolis, Indiana.

\*\*Humalog® Mix75/25 (75% insulin lispro protamine suspension and 25% insulin lispro injection [rDNA origin]) is a registered trademark of Eli Lilly and Company, Indianapolis, Indiana.

††NovoLog® Mix 70/30 (70% insulin aspart protamine suspension and 30% insulin aspart injection [rDNA origin]) is a registered trademark of Novo Nordisk A/S, Bagsvaerd, Denmark.

**I. Adjust your dosage weekly based on your morning fasting blood sugars and communication with your health care provider until your blood sugar approaches the goal determined by you and your provider.**

A common fasting blood glucose goal is 100 mg/dL. Do not increase your dosage if the blood sugar is between 80 and 100 mg/dL or if you have an episode of hypoglycemia (low blood sugar) less than 70 mg/dL during the week.

**II. With insulin glargine or NPH, check your fasting blood sugar and increase the insulin by 2 units every 3 days until your fasting blood sugar is 80 to 100 mg/dL.**

**III. Titration also can be individualized by your health care provider.** If your fasting blood sugar is greater than \_\_\_ for \_\_\_ days in a row, increase your insulin dosage by \_\_\_ units until your fasting blood sugar is between \_\_\_ and \_\_\_ mg/dL.

Do not be discouraged if you have to repeatedly increase the dosage. Finding your ideal dosage may happen right away or may take some patience. When you have questions, call your health care provider or your diabetes educator for guidance. Ideally, your blood sugar should be within the goal ranges, but you should be aware of the signs of low blood sugar (hypoglycemia) and be prepared to treat an episode if it were to occur (take 15 g of a rapidly absorbing carbohydrate such as 4 oz juice, 6 oz nondiet soda, 3–4 glucose tablets, a small box of raisins, or 3–4 hard candies). Remember, the goal is to have blood sugar in control so you can feel good and avoid problems from diabetes.

Sometimes you may reach your fasting blood sugar goal, but your average blood sugar (glycosylated hemoglobin, or A1C) may remain high. You may be having problems with your postprandial (postmeal) blood sugar. If oral medicine is not able to lower the postmeal blood sugar, your health care provider may prescribe a rapid-acting insulin (eg, aspart, glulisine, lispro) to help cover your meal. You may start by adding 5 or 10 units to your largest meal, often your dinner. You can check your blood sugar 2 hours later or at bedtime. If bedtime blood sugar is more than 140 mg/dL, you may be directed to add an additional unit of the rapid-acting insulin every few days until your bedtime blood sugar is between 100 and 140 mg/dL.

Eventually, you may need rapid-acting insulin with each meal. By using the 24-hour insulin glargine to control fasting blood sugar and the rapid-acting insulin to control postmeal blood sugar, you can have freedom to match your rapid-acting insulin to your mealtimes and make adjustments to control blood sugar. Checking your blood sugar and having good communication with your health care provider can ensure success in using insulin and are positive steps in controlling diabetes.

**IV. For people using 70/30 or 75/25 fixed combinations:**

If bedtime or morning fasting blood sugar is:	If predinner or lunch blood sugar is:
Too high—increase the evening dosage	Too high—increase the morning dosage
Too low—decrease the evening dosage	Too low—decrease the morning dosage

Along with adjustments in insulin dosage, the timing and amount of food at meals and snacks can have a large impact on the highs and lows of blood sugar. Being consistent can help level out your blood sugar.

**For people using mixes of intermediate (N) and regular (R) insulin:**

If you mix N and R insulins in a syringe and use before breakfast and before dinner, you would adjust the dosage based on the following:

Blood sugar before breakfast:	Blood sugar before dinner:
Too high—increase dinnertime N	Too high—increase morning N
Too low—decrease dinnertime N	Too low—decrease morning N
Blood sugar before lunch:	Blood sugar before bed:
Too high—increase morning R	Too high—increase dinnertime R
Too low—decrease morning R	Too low—decrease dinnertime R

Titration of mixed dosages can get complicated. Communicate any questions with your health care provider and/or diabetes educator.

*Insulin* grants permission to reproduce this Patient Handout for the purpose of patient education. Visit [www.InsulinJournal.com](http://www.InsulinJournal.com) if you wish to download copies of this material.