

Diabetes and Insulin

Insulin is a natural hormone made by your body that helps turn the sugar you eat from food into energy. Insulin's main job is to help move sugar from your blood into the small cells that make up your body.



People with **type 1 diabetes** do not make their own insulin, and so they must take insulin shots to control their blood sugar.

People with **type 2 diabetes** either do not make enough insulin or the insulin their body makes does not work as well as it should. They must take pills, insulin shots, or different injectable medicines to treat their diabetes and stay healthy.



There are many different kinds of insulin. Some last a long time in the body and help to control your blood sugar when you do not eat. Other types of insulin work fast and help to control your blood sugar after a meal, but they do not last very long.

Most types of insulin need to be injected with:



syringes and needles



insulin pens



insulin pumps

This chart lists the different types of insulin that can be used to treat diabetes.

Type of insulin	Starts working within...	Highest strength in...	Lasts...	Clear or cloudy?
Rapid/very fast-acting ^{1,2} Glulisine (Apidra®) Lispro (Humalog®) Aspart (NovoLog®)	15 minutes	1 hour	2-4 hours	Clear
Aspart (Fiasp®) ³	15-20 minutes	2 hours	5-7 hours	Clear
Inhaled (Afrezza®) ¹	12-15 minutes	30 minutes	3 hours	Contained in a cartridge
Short/fast-acting ¹ Regular (Humulin® R, Novolin® R)	30 minutes	2-3 hours	3-6 hours	Clear
Intermediate-acting ¹ NPH (Humulin® N, Novolin® N)	2-4 hours	4-12 hours	12-18 hours	Cloudy
Long-acting Detemir (Levemir®) ^{1,4} Glargine (Basaglar®, Lantus®) ^{1,5,6}	1-2 hours	No peak	24 hours	Clear
Glargine (Toujeo®) ⁷	6 hours	No peak	24-36 hours	Clear
Degludec (Tresiba®) ⁸	1 hour	No peak	42 hours	Clear

You may need to take the same amount of insulin every day, or you may take different amounts depending on your blood sugar results. In some cases, you may use a mixture of different types of insulin, such as both **short/fast-acting** and **long-acting insulins**.

Some types of insulin come in pre-mixed bottles or pens. Your doctor will decide the type and amount of insulin, and how often you need to take insulin.

It is important to **check your blood sugar level** every day using a blood glucose (sugar) meter to make sure that the insulin you take is working.



Your diet and blood sugar levels will be important in deciding if any changes are needed in your insulin dose.

Adding Insulin to a Syringe

1

Always add the clear insulin to the syringe first, before the cloudy insulin

2

Mix the cloudy insulin by rolling it gently between your hands before adding it to the syringe

3

Do not shake the insulin

4

Check the labels on the bottle to make sure you are using the right type of insulin

Storing Insulin



An open insulin bottle or pen can be kept at room temperature



If the insulin will not be used within 30 days, store it in the refrigerator



Throw away any insulin that has been kept at room temperature longer than 30 days



Never share your insulin or needles with others



Do not store insulin in the freezer or in hot places, like your car or on the windowsill, because it might lose its strength and not work as well



If clear insulin has turned cloudy or has clumps in it, throw it away



Always have an extra bottle or pen on hand for each type of insulin you use

It is important to eat regular meals when you take insulin. Taking insulin helps your blood sugar levels stay normal, but if you take too much insulin or have not eaten, your blood sugar can drop too low.

Check the drug information sheet or contact the drug manufacturer for recommended storage and use of your medicine. To avoid clogging and/or contamination of the syringe needle, do not store medicine inside the syringe.

Ask your doctor or other healthcare provider if you have any questions about insulin.

1. American Diabetes Association. Insulin Basics. <http://www.diabetes.org/living-with-diabetes/treatment-and-care/medication/insulin/insulin-basics.html>. Updated March 26, 2019. Accessed March 27, 2019.
2. Donner T, Sarkar S. Insulin – Pharmacology, Therapeutic Regimens, and Principles of Intensive Insulin Therapy. In: Feingold KR, et al., eds. Endotext [Internet]. U.S. National Library of Medicine, 23 Feb. 2019. www.ncbi.nlm.nih.gov/books/NBK278938/.
3. Fiasp® (insulin aspart injection), for subcutaneous or intravenous use [package insert]. Plainsboro, NJ: Novo Nordisk, Inc.; pp.2,4
4. Levemir® (insulin detemir injection), for subcutaneous use [package insert]. Plainsboro, NJ: Novo Nordisk, Inc.
5. Basaglar® (insulin glargine injection), for subcutaneous use [package insert]. Indianapolis, IN: Eli Lilly and Company.
6. Lantus® (insulin glargine injection), for subcutaneous injection [package insert]. Bridgewater, NJ: Sanofi-Aventis, U.S. LLC.
7. Toujeo® (insulin glargine injection) U-300, for subcutaneous use [package insert]. Bridgewater, NJ: Sanofi-Aventis, U.S. LLC.
8. Tresiba® (insulin degludec injection), for subcutaneous use [package insert]. Plainsboro, NJ: Novo Nordisk, Inc.