# Mealtime Insulin:
# What You Need to Know

**Diabetes is a health condition in which your body doesn't make enough of a hormone called insulin to meet its needs. Carbohydrates in the foods you eat are broken down into blood glucose (sugar) for the energy your body needs.**

**In order to use the glucose in your bloodstream, your body needs insulin to "unlock" the cells so glucose can enter them. Unless your body can use the glucose, it can build up in the bloodstream and cause other serious health problems.**

## DIABETES AND INSULIN

There are two main types of diabetes. In people with type 1 diabetes, their bodies make no insulin whatsoever, and they must take insulin the rest of their lives. People with type 2 diabetes usually still make some (but not enough) insulin, and often also have what is known as insulin resistance—where their bodies require more insulin to allow glucose to properly enter into their cells. Another important type of diabetes is called gestational diabetes—when the condition starts during pregnancy and may improve after delivery. Keeping mom's blood sugars normal is very important for baby. Other conditions, like cystic fibrosis or disorders requiring steroid therapy, may also have diabetes associated with them.

Typically, people with diabetes must take medicines to keep their blood sugar from rising too high. For patients with type 1 diabetes, only insulin therapy will work. For patients with type 2 diabetes, there are several types of oral medicine available to help keep blood glucose in a healthy range. For some type 2 patients, an oral medication is enough to achieve this goal. But many people need more help to do this. For them, a form of insulin is the answer.

People who take insulin must inject it (or inhale it) because it would break down in the stomach if taken orally.

## TYPES OF INSULIN

Insulin is classified according to three factors: how long it takes to start working (onset), when it peaks, and how long it lasts (duration). There are two main categories: Background (basal) insulin, which tends to last longer and delivers a steady dose of insulin; and mealtime (bolus) insulin, which tends to have a shorter duration but delivers a greater amount of insulin to handle spikes in blood glucose after mealtimes.

Here are the types of insulin:

| Category | Type | Names | Onset | Peak | Duration |
|---|---|---|---|---|---|
| Background (basal) insulin | Long-acting insulin | Insulin detemir (Levemir)<br>Insulin glargine (Lantus, Basaglar, Toujeo)<br>Insulin degludec (Tresiba) | About 30 to 90 minutes | N/A | About 18 to 26 hours (up to 42 hours in Degludec) |
| | Intermediate-acting insulin | NPH (Humulin N, Novolin N) | About 2 to 4 hours | About 4 to 12 hours | About 12 to 18 hours |
| Mealtime (bolus) insulin | Short-acting (regular) insulin | Regular (Humulin R, Novolin R) | About 30 minutes | About 2 to 3 hours | About 3 to 6 hours |
| | Rapid-acting insulin | Insulin glulisine (Apidra)<br>Insulin lispro (Humalog)<br>Insulin aspart (NovoLog) | About 15 minutes | About 1 hour | About 2 to 4 hours |
| | | Inhaled insulin human (Afrezza) | About 15 minutes | About 30-60 minutes | About 1½ to 5 hours |
| | Fast-acting insulin | Faster-acting insulin aspart (Flasp) | About 3 minutes | About 30-60 minutes | About 3 to 5 hours |

**Visit hormone.org for more information**

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# TWO APPROACHES TO COMBINING BACKGROUND AND MEALTIME INSULIN

**People who take a background insulin along with a mealtime insulin have two options:**

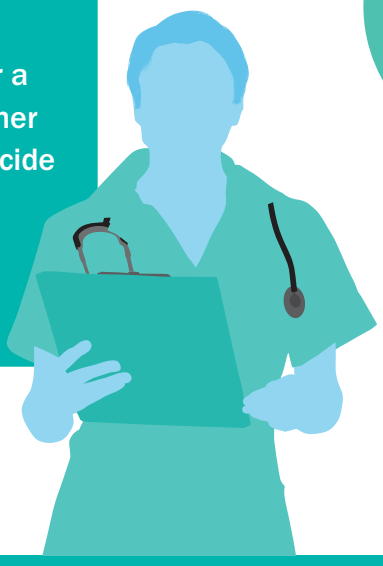
- Take the background insulin once or twice a day, as prescribed, and take the mealtime insulin just before eating a meal, also as prescribed.
- Take a premixed insulin, which, as the name implies, combines a background insulin with a mealtime insulin in one vial.

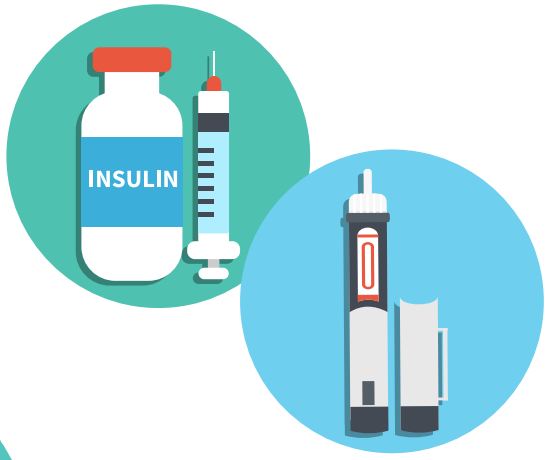
**There are pros and cons to both approaches to combining the two main categories of insulin:**

| Approach | Pros | Cons |
|---|---|---|
| **Add rapid-acting insulin to background insulin** | ■ Works well with less regular eating schedules—don't have to eat at certain times<br>■ Easier transition for patients already taking background insulin<br>■ Can be used alone or with oral medicines<br>■ Can vary the types and quantities of food you eat | ■ You must take your mealtime insulin with you, so you can take it before you eat<br>■ You may need to take 2-5 injections per day, depending on your eating schedule<br>■ You pay for two types of insulin—one for background, one for mealtime |
| **Premixed insulin** | ■ Only one copay<br>■ Fewer shots (typically 1-2 per day)<br>■ Can be used alone or with oral medicines<br>■ May need to eat extra food/snacks to avoid hypoglycemia (low blood sugar) | ■ You must eat regular meals or you will get hypoglycemia (low blood sugar)<br>■ You are more likely to get hypoglycemia at night<br>■ Both types of insulin are in one bottle, so you can't adjust one without adjusting the other |

## Which approach makes the most sense for you?

That depends on a number of factors, such as how high your blood glucose spikes after a meal, how high it is between meals, and other considerations. Work with your doctor to decide upon the right treatment plan for you.






**2-5 vs. 1-2 injections per day**

**Patients have questions. We have answers.**

The Hormone Health Network is your trusted source for endocrine patient education.

Our free, online resources are available at hormone.org

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