Intermountain® Healthcare

# Diabetes Medications: *insulin*

Insulin is used to treat diabetes. It's taken by injection (shot) or with an insulin pump. As with other diabetes medications, it works best when you're following the rest of your treatment plan. This means checking your blood glucose regularly, following your meal plan, and exercising every day.

## What does insulin do?

In general, insulin works just like the insulin made in a normal pancreas: it helps move glucose (sugar) out of your bloodstream and into your body's cells.

There are many types of insulin. Some work right away and don't last very long. Others act more slowly, over a longer period of time. Your doctor will explain which type you use and how to take it properly. Page 2 has a table that lists types of insulin and how they work in your body.

## Why is insulin important for my health?

- If you have type 1 diabetes, you already know you need insulin to live every day. Without insulin, your body can't get fuel from food.
- If you have type 2 diabetes or gestational diabetes, your doctor has determined that your body needs extra help processing glucose. Adding insulin to your treatment plan will do this. Like your other diabetes medications, it helps control your blood glucose and lowers the chance that your diabetes will cause serious problems.

## Why can't I just take a pill?

So far, pill forms of insulin haven't worked. Since insulin is a protein, stomach acids tend to digest it just like they do the protein in foods. This destroys the insulin before it has a chance to work.

Right now the most common ways to take insulin are by injection with a needle and syringe or with a disposable insulin pen. **This handout provides instructions for using these devices**. (It doesn't explain how to use an insulin pump, which is another way of taking insulin.)

*In the U.S., nearly half of the 18 million adults with diagnosed diabetes — type 1 or type 2 — use insulin every day.*

## General guidelines for taking insulin

Follow your doctor's specific instructions for taking insulin. Here some general rules that will probably apply to you:

- **If your symptoms go away, or you decide you "feel fine" now,** don't stop taking your insulin. You need it to stay well.
- **If you don't follow your meal plan** — for example, you overeat or skip a meal — don't adjust your insulin dose unless your doctor has given you specific instructions to do so.
- **If you're sick,** most of the time you should keep taking your insulin as prescribed. But check your blood glucose more often. Sometimes illness increases your need for insulin — sometimes it decreases your need. Only monitoring will tell you whether you should adjust your dose.
- **If you have ongoing vomiting or have had a 101°F fever for more than 8 hours,** call your doctor for advice.

| INSULIN type | name (generic, brand) | onset (when it starts to work) | peak (when its effect is strongest) | duration (how long it works) | usually taken... |
|---|---|---|---|---|---|
| **Rapid-acting** | aspart (NovoLog)<br>glulisine (Apidra)<br>lispro (Humalog) | 10 to 20 minutes | 1 to 2 hours | 3 to 5 hours | 3 times a day<br>insulin effect / time |
| **Short-acting (regular)** | Novolin R<br>Humulin R | 30 to 60 minutes | 2 to 4 hours | 4 to 8 hours | 3 times a day<br>insulin effect / time |
| **Intermediate-acting** | NPH (Novolin N)<br>NPH (Humulin N) | 1 to 3 hours | 4 to 10 hours | 10 to 18 hours | 2 times a day<br>effect / time |
| **Peakless** | glargine (Lantus) | 2 to 3 hours | peakless | 24+ hours | 1 time a day<br>effect / time |
| | detemir (Levemir) | 1 hour | peakless | 18 to 24 hours | |
| **Insulin mixes** | 70/30 (NovoLog Mix), 75/25 (Humalog Mix), 50/50 (Humalog Mix) | | | | 2 times a day |

## My insulin regimen

**Insulin type and name** _____ **when to take** _____ **dose**_____

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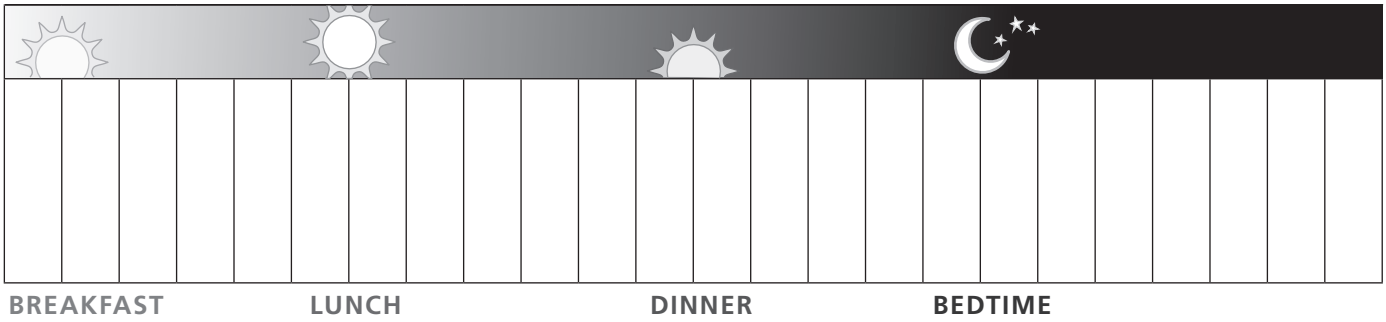
**My day looks like...** *(note when to take insulin)*




**If I accidentally miss a dose I should:** _____

**Correction dose, other instructions:** _____

## What are the side effects?

The most common side effect of insulin is **hypoglycemia (low blood glucose)**. Hypoglycemia can come on suddenly, making you feel **shaky, sweaty, weak, cranky, hungry,** or **dizzy**. Be sure that you and your family know these symptoms. They're your signal to take in some quick-acting sugar. Good sources are a half-cup of fruit juice or regular soda, or a heaping tablespoon of sugar. To help avoid this side effect, monitor your blood glucose regularly. This will allow you to take action if your blood glucose begins to fall too low.

## How do I take my insulin?

Your insulin regimen (plan) depends on your age, weight, and other factors. Your doctor will tell you what type of insulin to take, when to take it, and how much to take. Use the chart above to write down details and create a visual record.

## What is a correction dose?

If your blood glucose is too high, you may need to add extra rapid-acting insulin to "correct" your high blood glucose. Correction doses are usually given as needed at meal times and bedtime, and shouldn't be given more often than every 3 to 4 hours.

## Call your doctor or diabetes educator when...

- **You have questions about how to take your insulin.**
- **You're considering stopping insulin or changing some other part of your treatment plan. (Never change your treatment without talking to your medical team first.)**
- **You're ill and having trouble controlling your blood glucose.**
- **You frequently have hypoglycemia (low blood glucose).**

*Doctor's name, phone:*_____

*Educator's name, phone:* _____

## Insulin syringes

To inject your insulin, you may use disposable syringes. The syringe needles are short, thin, and very sharp. This helps the needles go in easily.

There are several different brands of insulin syringes. There are syringes with different needle lengths and different widths (gauges). Your doctor or diabetes educator will give you some syringes to take home. Eventually, you'll need to buy more. For now, you only need to keep the following in mind:

- **LOOK at the lines and numbers on the barrel of the syringe.** These show the amount amount (dose) of insulin for each injection.
- **DON'T re-use your insulin syringes.** This helps ensure that the syringe is sterile (clean) and that the needle is very sharp every time.
- **DO throw them away in a red sharps container or another heavy container** that the needles won't poke through — like an empty coffee can or a plastic bleach container.

## How to draw up insulin

"Drawing up insulin" means putting the insulin in the syringe for an injection. To get the right dose and to reduce the pain of the injection, follow these steps.

1. **Get everything you need: insulin bottle, syringe, and alcohol wipe.** If you match your insulin dose to your carbohydrate intake, also get your daily record log and write down the dose you're taking.
2. **Wash your hands with soap and water.**
3. **Check the insulin.** First, make sure you've got the right bottle (the right type of insulin). Second, check the insulin for any discoloration, cloudiness, or sediment (stuff sitting on the bottom or floating around inside). If you see any of these, throw the insulin away and use new insulin.
4. **Wipe the top of the bottle with an alcohol wipe.**
5. **Pull back the plunger on the syringe to draw in enough air to equal your insulin dose** (use the lines and numbers on the barrel of the syringe), **then push the needle into the bottle and inject the air into the bottle.** This prevents the vacuum inside the bottle from sucking the insulin back out of the syringe.
6. **With the needle in the bottle, turn the bottle and syringe upside down.** First draw up insulin past your correct dose. Then, slowly push on the plunger to the line of your correct dose of insulin.

7. **Before withdrawing the needle from the bottle, check for air bubbles.** If you notice any, tap the syringe so that the bubbles float to the top. Pull the plunger past your dose again and slowly push in the plunger until all bubbles are gone. Repeat as needed to get rid of air bubbles, then withdraw the needle from the bottle.
8. **If the insulin has been stored in the refrigerator, warm the syringe by holding it in your closed hand for a minute or so.** Injections hurt less if the insulin is warm.
9. **Inject the insulin**, following the instructions on the next page.

## How to give an injection

You need to inject insulin just below the skin, into the fat layer — not into a muscle or a blood vessel. This is called a **subcutaneous, or "sub-Q", injection.** Here are the basic steps for an insulin injection:

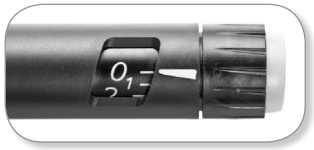
1. **Choose the place on your body where you will inject the insulin.** This area is called the injection site. Use a different site each time — see the picture at right for some good sites.
2. **Make sure the area is clean.** If it isn't, wash it with soap and water. As a general rule, don't use alcohol to clean the site. This dries and toughens the skin.
3. **Lift up (pinch) about an inch of the skin and fat tissue with your thumb and fingers.**
4. **Holding the syringe like a pencil, touch the needle to the skin, then push it into the skin.** Push it straight in, not at an angle — and make sure the needle is in all the way. You might feel a sting.

5. **Once the needle is in the skin, let go of the pinch of skin.**
6. **Push the plunger of the syringe down slowly and steadily,** all the way.
7. **When the plunger is all the way down, count to 5 slowly before removing the needle.** This helps prevent insulin from leaking out of the site.
8. **Press your finger over the site for a few seconds.** This helps stop any bleeding that can happen when you pull out the needle.

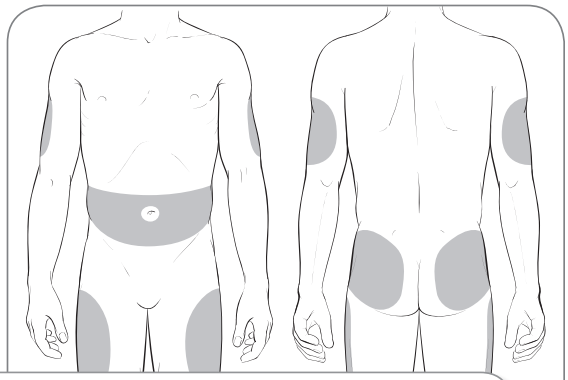
## How to use an insulin pen

Your doctor may have you use an insulin pen to inject insulin. Insulin pens can be more convenient to use. But you have to use them correctly to make sure you're getting the right amount of insulin. Here are the steps to follow.

1. **Check the pen before you use it.**



   - Make sure the dosage dial turns easily.
   - Look at the amount of insulin in the cartridge — is there enough for your dose?



The shaded areas above are suitable for insulin injections — notice that each area has room for several different injection sites. Switch between different areas and sites on your body to prevent scar tissue buildup, which can toughen the skin. Also, avoid the area close to your navel.

   - Check the insulin for any discoloration, cloudiness, or sediment (stuff sitting on the bottom or floating around inside). If you see any of these, throw the pen or cartridge away and use another.
2. **Attach a new needle to the pen.** Using a new needle every time helps make sure you get the right amount of insulin. (A re-used needle can clog, and leaving the needle in the pen between injections can cause leaking and air bubbles.)
3. **Prime the pen — this is important!**
   - Dial up 2 to 4 units of insulin, remove the needle cover, and point the pen upward.
   - Tap the cartridge until any bubbles rise to the top.
   - Prime the pen by pressing the injection button down all the way. If you don't see a stream of insulin, repeat until insulin does come out of the needle.
4. **Inject the insulin following steps 1 through 5 on the previous list of steps:** choose your injection site, clean the site, pinch up some skin, insert the needle straight into the fatty tissue, and let go of the pinch of skin.
5. **Press the injection button down all the way, counting to 5 slowly before removing the needle.** For larger doses of insulin, you may need to count to 10 before removing the needle. In general, it takes a bit longer for insulin to come out of a pen than out of syringe. If there's insulin dripping from the needle when you pull it out, that's a clue that you need to leave it in longer next time.

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