

## Insulin Pens

### *Basic facts*

*This handout explains what insulin is, the different types of insulin, how to store it, how to give an injection with an insulin pen, and other important information.*

### What is insulin?

Insulin is made by the pancreas and then released into the bloodstream. We need insulin to move glucose (sugar) from our blood into our body's cells. Our cells use glucose for the energy they need to keep our bodies working.

The pancreas of someone with type 1 diabetes makes little or no insulin. They must take insulin injections (shots) every day.

Sometimes people with type 2 diabetes also need to give themselves insulin injections to control their blood glucose.

### What are the different types of insulin?

Insulin must be given by injection. It cannot be taken as a pill because the acids in the stomach would destroy it.

There are different types of insulin. All insulin used today is *synthetic* (man-made) human insulin. The types of insulin differ in:

- *Onset* (how soon they start to work)
- *Peak* (when they reach their greatest effect)
- *Duration* (how long they work)

*Basal* insulin is long-acting and controls blood glucose when you are not eating. *Prandial* insulin is taken before eating. It works more quickly than basal insulin but does not last as long. Many people with diabetes need both basal and prandial insulin to control their blood glucose.



*Talk with your diabetes care provider if you have any questions about insulin.*

## Basal Insulin

This table shows the usual number of basal injections per day that most people with diabetes give themselves. Your provider may advise you to take your basal insulin more or less often.

Type of Insulin	How It Looks	Onset (hours)	Peak (hours)	Duration (hours)	Injections per Day
NPH	Cloudy	2 to 3	4 to 5	8 to 12	2 or 3
Glargine (Lantus)	Clear	1 to 2	None	About 24	1 or 2
Detemir (Levemir)	Clear	1 to 2	None	Up to 24	1 or 2

## Prandial Insulin

This table shows the usual number of prandial injections per day that most people with diabetes give themselves. Your provider may advise you to take your prandial insulin more or less often.

Type of Insulin	Onset (minutes)	Peak (hours)	Duration (hours)	Injections per Day
Regular	30 to 60	2 to 3	6 to 8	2 or 3
Lispro (Humalog)	less than 15	1 to 1.5	4	3 or 4
Aspart (Novolog)	less than 15	1 to 1.5	less than 5	3 or 4
Glulisine (Apidra)	less than 15	1.5	5	3 or 4

You must take prandial insulin before eating so that it is ready to do its job when you eat. Ask your diabetes care provider about the timing for your type of prandial insulin. The onset of your prandial insulin will determine how soon before eating you should take it.

Other important things about prandial insulin:

- If you skip a meal, do **not** take your prandial insulin.
- If you have a large snack, you may need to take some prandial insulin. Ask your diabetes care provider what to do when you eat a large snack.
- All prandial insulin should be clear. Check your insulin before using it to make sure it is clear and not cloudy.

## How do I store insulin?

- All **unopened** insulin containers should be kept in the refrigerator (**do not freeze**). This includes:
  - Bottles
  - Insulin pen cartridges
  - Disposable pens
- Insulin is good to use until the expiration date marked on the bottle, cartridge, or pen.
- Once you are using it, all insulin should be stored at room temperature (less than 85° F or 29.4° C). Check with your pharmacist or diabetes care provider about how long you should use an open bottle, pen cartridge, or disposable pen.
- Each time you use your insulin, make sure clear insulin is still clear, and cloudy insulin is evenly cloudy. Throw away any insulin that doesn't look right and use a fresh bottle, cartridge, or pen.
- Always keep a spare of each kind of insulin you use on hand for emergencies.

### Types of Needles

	Gauge	Length
Original	29	12.7 mm
Short	31	8 mm
Mini	31	5 mm
Nano	32	4 mm

## What are the different types of pen needles?

The diameter, or thickness, of the needle is called its *gauge*. A needle with a smaller diameter has a larger gauge number. Needles also come in different lengths, which are measured in millimeters (mm).

The different types of needles are called original, short, mini, and nano. The table on the left side of this page gives the gauge and length of each needle type.



**Figure 1:** Sites for insulin injections are in black.

## Where should I inject my insulin?

Insulin is injected into the *subcutaneous tissue* (fat layer just under the skin). Here are some sites to use (see Figure 1):

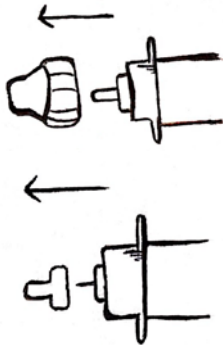
- Back of your upper arms
- Your abdomen (around your navel)
- Front and side area of your thighs
- In your back, just above your waist
- Your buttocks

### Injection Tips

- Stay 2 inches away from your navel or scars.
- Do **not** use sites that are bruised, tender, or swollen.



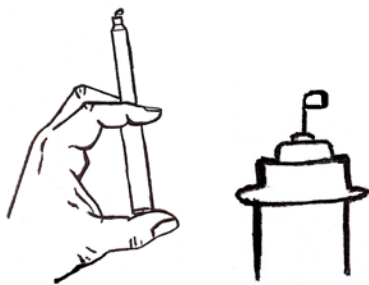
**Figure 2:** Roll NPH insulin between your hands to mix it evenly.



**Figure 3:** First, remove the outer cap. Then remove the inner plastic cover that is over the needle.



**Figure 4:** Turn the pen dial to 2 units.



**Figure 5:** Push the plunger of the pen until you see a drop of insulin.

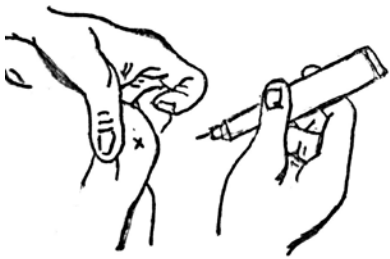
## Giving an Insulin Injection

### How do I prepare my insulin pen?

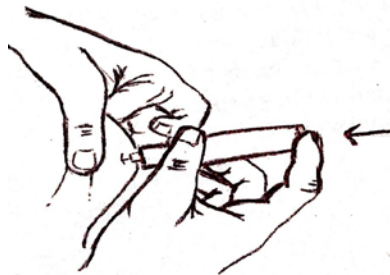
1. Gather your supplies:
  - Insulin pen
  - Needle
2. Wash your hands with soap and water. Dry your hands well.
3. If you are using NPH insulin, make sure it is evenly cloudy (mixed) by rolling the pen between the palms of your hands (see Figure 2) and by turning it end to end. **Do not shake the insulin pen.**
4. Attach a disposable needle onto the insulin pen:
  - First, peel back the foil cover from the end of the needle. Screw the needle onto the pen.
  - Remove the larger outer needle cover. **SAVE** it to use after the injection when you dispose of the needle.
5. Then remove the smaller inner needle plastic cover (see Figure 3). Throw away this cover.
6. Release air out of the insulin pen (this is called “priming”):
  - Turn the pen dial to 2 units (see Figure 4).
  - With the needle pointing up, push the plunger of the pen all the way in, until you see a drop of insulin (see Figure 5).
7. To set your dose of insulin, turn the dial clockwise until you see the number for your insulin dose. If you dial too much, turn the dial back to the correct number.

### How do I inject the insulin?

1. **If your pen needle is 5 mm long or less:** Skip to step 3. You do not need to pinch your skin.
2. **If your pen needle is longer than 5 mm:** Gently pinch your skin and fat tissue at the injection site between your thumb and middle finger (see Figure 6 on the next page).
3. Push the needle straight through your skin. Push it all the way in. **The needle should be at a right angle to your injection site** (see Figure 7 on the next page).
4. If you pinched your skin, let go of the pinched tissue.
5. Inject the insulin by slowly pushing in the plunger all the way (see Figure 8 on the next page). Leave the needle in and slowly count to 5. This will keep insulin from leaking out of the injection site.

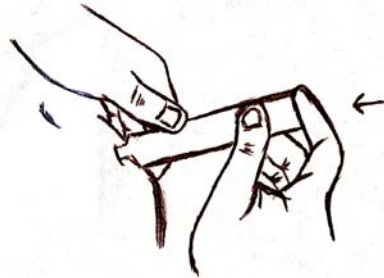


**Figure 6:** If you are using a longer needle, gently pinch your skin and fat tissue between your thumb and middle finger. Try **not** to pinch any muscle.

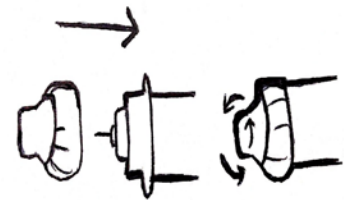


**Figure 7:** Push the needle straight through your skin. Push it all the way in. The needle should be at a right angle to your injection site.

6. Remove the pen from your tissue.
7. Before you take the needle off the pen, put the larger plastic cover that you saved over the needle. Then unscrew it off the insulin pen (see Figure 9).
8. Dispose of all needles in a “sharps” container (see Figure 10).



**Figure 8:** If you pinched, let go of the pinched tissue. Inject the insulin by slowly pushing the plunger in. Leave the needle in and slowly count to 5.



**Figure 9:** Recap the needle and unscrew the cap off the insulin pen.



**Figure 10:** Dispose of all needles in a “sharps” container.

## Tips to Reduce Injection Pain

- Inject insulin that is at room temperature.
- Prime the insulin pen (see step 6, page 4, in the section “How do I prepare my insulin pen?”).
- Do not change the angle of the needle as you are putting it in or removing it.
- Do not reuse needles.
- If you use a longer needle and pinch your tissue, do not pinch too tightly.

### Questions?

Your questions are important. Call your health care provider if you have questions or concerns.

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