



INSULIN INJECTION **KNOW-HOW**

Learning How to Inject Insulin

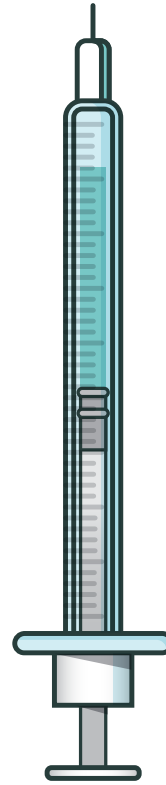
Now that you've made the move to insulin therapy, it won't be long before you start enjoying better blood glucose (blood sugar) management, more energy and a host of other benefits.

The prospect of taking insulin injections may have you feeling a bit anxious. That's OK! Just about everyone feels that way. Just know that your anxiety will vanish soon enough. Here are some valuable facts and tips to help make your transition to insulin smooth and easy.

WAYS TO GIVE INSULIN

Because insulin is broken down by digestive enzymes, it cannot be taken in pill form. Instead, it is delivered with a syringe into the layer of fat below the skin, also called the "subcutaneous" tissue. The layer of fat on the stomach, hips, thighs, buttocks and backs of the arms are common sites for injecting insulin. From there, the insulin absorbs into the bloodstream where it circulates to the cells throughout the body.

The really good news about delivering insulin into the layer of fat below the skin is that there are no



nerve endings in this area, so injections are usually painless. There are a number of options for administering insulin:

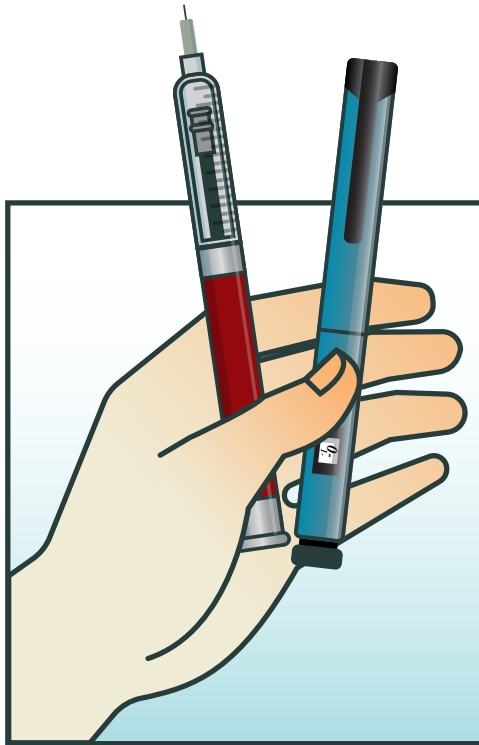
SYRINGES

Disposable plastic insulin syringes are still widely used, but the popularity of pens and pumps (see next page) is growing. Syringes vary in terms of

how much insulin they hold as well as the length and thickness of the needle. Syringes can be used to deliver insulin directly into the layer of fat below the skin, or they can inject insulin into a temporary "port" that sits on the skin. The port, which is changed every 2-3 days, features a small flexible plastic tube that sits below the skin. A needle is used to place the tube under the skin, so only one needle stick is required every 2-3 days when a port is used.

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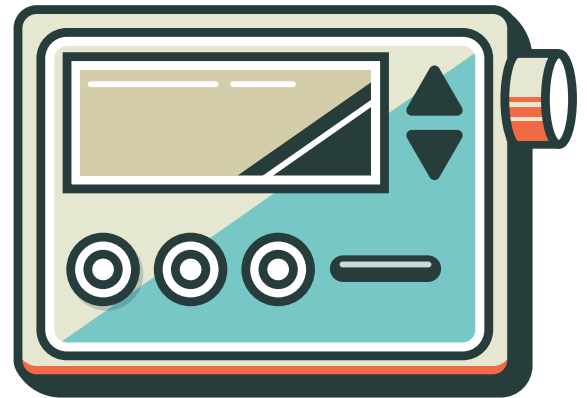


PENS

Insulin pens got their name because they are about the size and shape of a writing pen. They contain insulin (instead of ink) and have a dial for setting the dose. A disposable pen needle is attached to the end of the pen prior to injecting. As was the case with syringes, pen needles are available in a variety of lengths and thicknesses. Because they cut down on medical waste and are considered by most to be more convenient, accurate and easy to use than syringes, insulin pens are growing in popularity among people of all ages.

PUMPS

Insulin pumps are electronic devices that are worn continuously and deliver insulin into the fat layer below the skin by way of a flexible plastic tube (similar to the “port” described above). Insulin pumps are popular among those who require multiple daily injections of insulin. Safe and successful use of a pump requires considerable education and training, and their cost can be relatively high. Insulin pumps are not typically used by those who are new to insulin, but can be an effective option once you have a bit more experience.



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CHOOSING AN INJECTION DEVICE

The decision to use syringes or pens is a personal one. If you have an opportunity to sample both at your healthcare provider's office, certainly do so. It is best to speak with your healthcare provider and check with your diabetes care team to find out what is covered under your plan.

Most pens hold 300 units of insulin and allow delivery of up to 60 to 80 units at a time. "Prefilled" disposable pens deliver in single-unit increments. "Durable" pens utilize replaceable/ insulin cartridges, and may deliver insulin in 1/2 unit increments. Pens can be used to deliver a variety of long-acting and rapid-acting insulin types, as well as premixed insulin formulations.

Disposable syringes hold up to 100 units per injection. If you decide to use syringes, select a type that holds enough to cover your largest dose with a little room to spare. The markings on a syringe allow dosing in 2-unit, 1-unit, or 1/2-unit increments. Once you have a size that meets your needs, select a type that allows you to dose as precisely as possible.

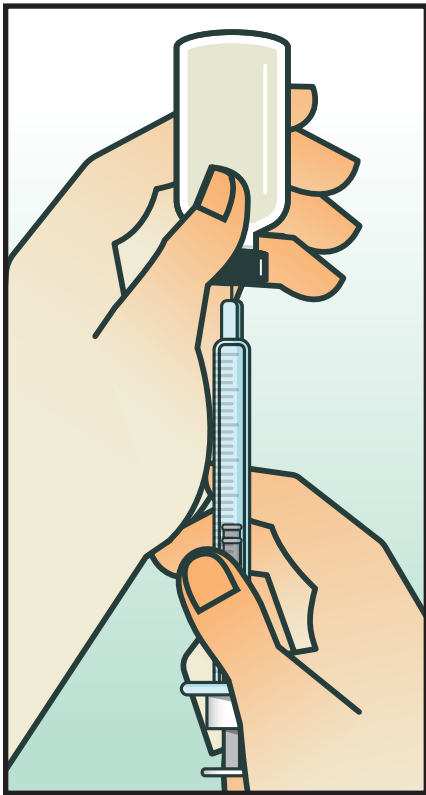
The needles on syringes vary as well. Syringe and pen needles as short as 4mm and as long as 12.7mm are available. Thickness is measured in gauge. The higher the gauge, the thinner the needle. Gauges as high as 32 and as low as 28-gauge can be obtained. In general, it is best to use the shortest, thinnest (highest gauge) needles available. Skin thickness doesn't vary much from person to person. Even if you are considered overweight or obese, it is unlikely that you will need a needle longer than 6mm. Needles that are too long may produce painful intra-muscular injections, with insulin absorbing faster than it should.

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INJECTION TECHNIQUE

Technique is everything when it comes to making insulin injections easy.



TO DRAW ONE TYPE OF INSULIN INTO A SYRINGE:

- ★ **Gather your insulin supplies:** Get your insulin vial and a fresh syringe. Check the insulin vial to make sure it is the right kind of insulin and that there are no clumps or particles in it. Also make sure the insulin is not being used past its expiration date.
- ★ **Gently stir intermediate or premixed insulin:** Turn the bottle on its side and roll it between the palms of your hands. Clear (fast-acting, long-acting) insulin generally does not need to be mixed.
- ★ **Prepare the insulin bottle:** If the insulin bottle is new, remove the cap. It is not necessary to wipe the top of the bottle with alcohol as long as it is clean.
- ★ **Pull air into the syringe:** Remove the cap from the needle. Pull back the plunger on the syringe to draw in an

amount of air that is equal to your insulin dose. The TIP of the black plunger should correspond to the number on the syringe.

- ★ **Inject air into the vial:** Hold the syringe like a pencil and insert the needle into the rubber stopper on the top of the vial. Push the plunger down until all of the air is in the bottle. This helps to keep the right amount of pressure in the bottle and makes it easier to draw up the insulin.
- ★ **Draw up the insulin into the syringe:** With the needle still in the vial, turn the bottle and syringe upside down (vial above syringe). Pull the plunger to fill the syringe to the desired amount.
- ★ **Check the syringe for air bubbles:** If you see any large bubbles, push the plunger until the air is purged out of the syringe. Pull the plunger back down to the desired dose.
- ★ **Remove the needle from the bottle:** Be careful to not let the needle touch anything until you are ready to inject!

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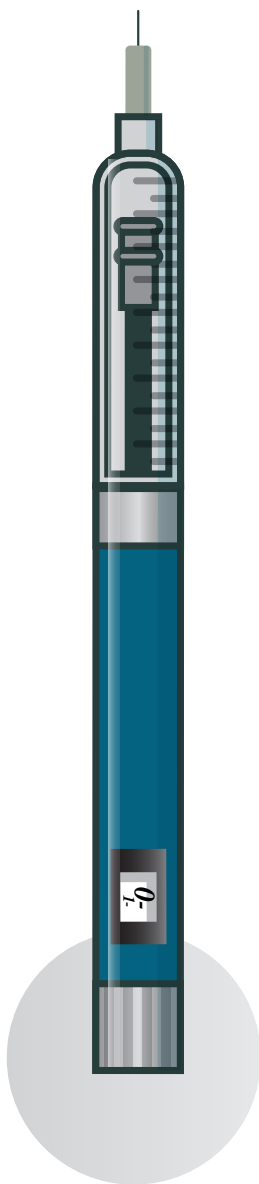


WHEN COMBINING TWO TYPES OF INSULIN (INTERMEDIATE AND RAPID) IN THE SAME SYRINGE:

- ★ **Gather your insulin supplies:** Get your insulin vial and a fresh syringe. Check the insulin vial to make sure it is the right kind of insulin and that there are no clumps or particles in it, and that the expiration date has not passed.
- ★ **Gently stir intermediate or premixed insulin:** Turn the vial on its side and roll it between the palms of your hands. Clear (fast-acting, long-acting) insulin generally does not need to be mixed.
- ★ **Prepare the insulin vials:** If the insulin vial is new, remove the cap. It is not necessary to wipe the top of the bottle with alcohol as long as it is clean.
- ★ **Inject air into the intermediate insulin vial:** Remove the cap from the needle. With the vial of insulin below the syringe, inject an amount of air equal to the dose of intermediate insulin that you will be taking. Do not draw out the insulin into the syringe yet. Remove the needle from the vial.
- ★ **Inject air into the rapid-acting insulin vial:** Only inject an amount equal to the rapid-acting insulin dose. Leave the needle in the vial.
- ★ **Draw up the rapid-acting insulin:** With the needle still in the vial, turn the vial upside down (vial above the syringe) and pull the plunger to fill the syringe with the desired dose.
- ★ **Check the syringe for air bubbles:** If you see any large bubbles, push the plunger until the air is purged out of the syringe. Pull the plunger back down to the desired dose.
- ★ **Remove the needle from the vial:** Recheck your dose.
- ★ **Draw up the intermediate-acting insulin:** Insert the needle into the vial of cloudy insulin. Turn the vial upside down (vial above syringe) and pull the plunger to draw the dose of intermediate-acting

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insulin. Because the short-acting insulin is already in the syringe, pull the plunger to the total number of units you need. Do not inject any of the insulin back into the vial, since the syringe now contains a mixture of intermediate and rapid-acting insulin.

- ★ **Remove the needle from the vial:** Be careful to not let the needle touch anything until you are ready to inject!

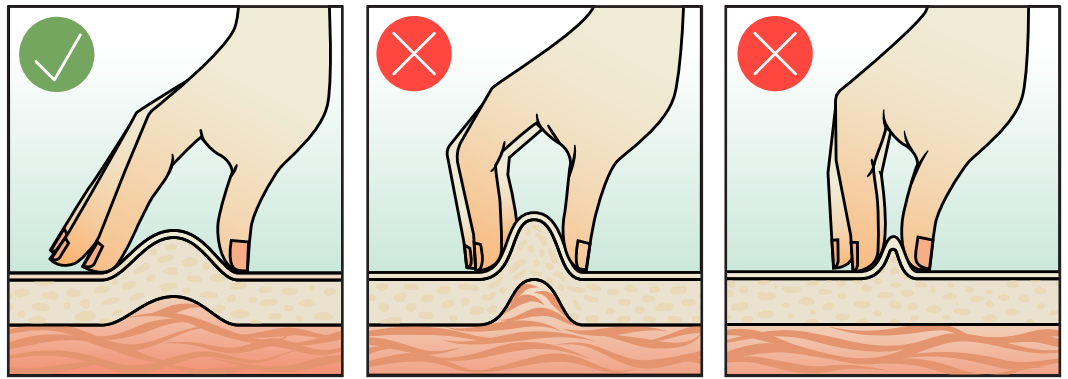
PREPARING A PEN FOR INJECTION:

- ★ **Check the pen:** Ensure that it contains the proper type of insulin and contains enough to cover your full dose. Also check to make sure that the expiration date has not passed.
- ★ **Gently stir intermediate or premixed insulin:** Turn the pen on its side and roll it between the palms of your hands. Clear (fast-acting, long-acting) insulin generally does not need to be mixed.

- ★ **Attach a fresh pen needle:** Screw or click the needle securely in place according to the manufacturer's instructions. Remove the cap(s) from the pen needle to expose the needle.
- ★ **Prime the pen:** Pointing the needle up in the air, dial one or two units on the pen and press the plunger fully with your thumb. Repeat until a drop appears.
- ★ **Dial your dose:** Turn the dial on the pen to your prescribed dose.

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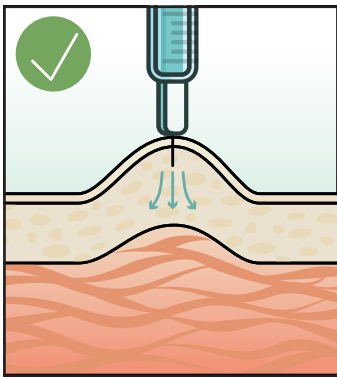
Correct (left) and incorrect (right) ways of performing the skin fold.

DELIVERING AN INJECTION:

- ★ **Select a site:** Choose a spot on your skin that you can see and reach. It is important to not “overuse” any particular area of skin. See the information below on “rotating” injection sites.
- ★ **Make sure skin is clean:** It is generally not necessary to wipe the skin with alcohol before injecting. Those at a high risk of infection should discuss site-preparation procedures with their healthcare team.
- ★ **Pinch the skin:** For those with limited body fat, it may be necessary to pinch a one-to-two-inch portion of skin and fat between your thumb and first finger.
- ★ **Push the needle into the skin:** With your other hand, hold the syringe or pen like a pencil at a 90-degree angle to the skin and insert the needle with one quick motion. Make sure the needle is all the way in.
- ★ **Inject the insulin:** Let go of the skin pinch before you inject the insulin. Push the plunger with your thumb at a moderate, steady pace until the insulin is

fully injected. If using a syringe, keep the needle in the skin for 5 seconds. If using a pen, keep the needle in the skin for 10 seconds.

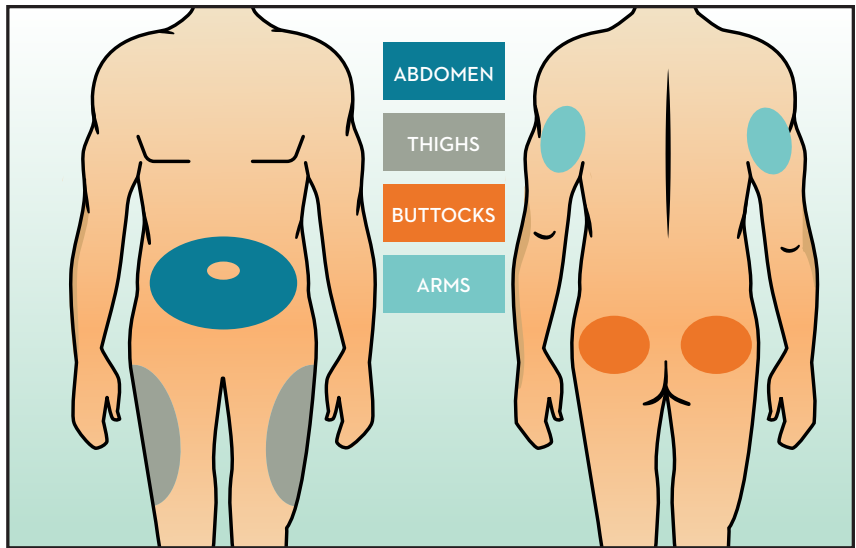
- ★ **Pull out the needle:** Remove at the same 90-degree angle at which you inserted the needle. Press your injection site with your finger for 5-10 seconds to keep insulin from leaking out.
- ★ **Remove the needle:** If using a pen, remove the needle from the pen by replacing the large cover and unscrewing. Leaving the needle on the pen can result in leakage or air bubbles.
- ★ **Dispose of your used needle:** It is important to protect yourself, your loved ones, sanitation workers and pets from accidental needle sticks. Do not recap syringes before throwing them away. Place used syringes and pen needles in a thick plastic container (sharps container, detergent bottle, etc.). When nearly full, close the container tightly with a screw-on cap and tape closed. Dispose according to standards set forth by your local department of sanitation.



The correct angle of injection when lifting a skin fold is 90°

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ROTATING (CHANGING) INJECTION SITES:

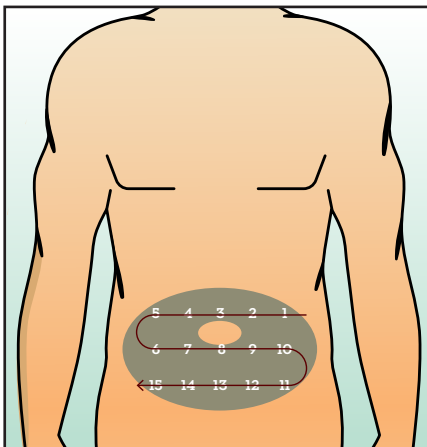
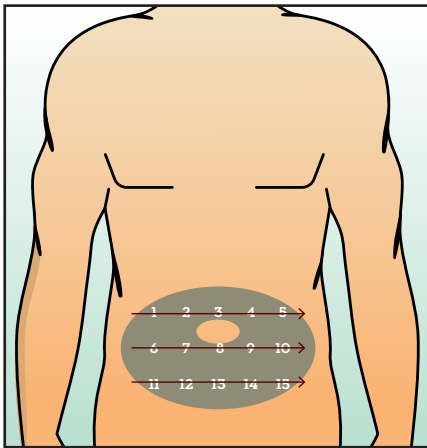
Insulin is injected into the fat layer below the skin on the abdomen (staying two fingers or a few inches away from the belly button), outer thighs, hips, buttocks, or backs of the arms. Although insulin injections are usually painless, injecting the same spot repeatedly can cause inflammation or fat tissue breakdown. Lipodystrophy, as this is called, can cause lumps/swelling and thickened skin, and it may keep insulin from absorbing properly. Nearly half of all people who take insulin develop lipodystrophy, particularly when injection sites are not changed often.

Most forms of rapid and long-acting insulin absorb consistently from just about any body part, so feel free to use a variety of body parts for your injections, and use a variety of spots within each body part.

Intermediate-acting (cloudy) insulin and premixed insulin absorb differently in different body parts. It is best to inject intermediate-acting insulin into one part of the body consistently, but use a variety of spots within that body part.

NEEDLE RE-USE

Use of a new, fresh syringe or pen needle for each injection is the best way to minimize discomfort and ensure the accuracy/effectiveness of the insulin dose. Using someone else's needle puts you at danger of contracting Hepatitis and HIV.



Recommended way to rotate injection sites.