

Insulin Injection Technique

Medication Information Leaflet

What is Insulin?

Insulin is a hormone produced by the pancreas that allows the body to use blood sugar for energy. Carbohydrates, a type of nutrient found in starchy foods such as bread, noodles, potatoes and rice, are converted into sugar and absorbed into the bloodstream. Insulin allows sugar from the bloodstream to enter the body cells and be used to create energy or be stored for future use.

People with diabetes are unable to fully use the sugar in their bloodstream either because their bodies do not make enough insulin or the cells do not respond well to insulin, a situation known as insulin resistance. Hence, they would need more insulin to get the same effects.

Insulin Devices

Syringes

Syringes are used to deliver the correct and accurate insulin doses to patients. Choose a suitable syringe that best matches the number of units required.

A 0.3mL syringe should be used for doses up to 30 units. A 0.5mL syringe should be used for doses up to 50 units. A 1mL syringe can be used for doses up to 100 units.

Do not reuse insulin syringes. Throw away the syringe after every injection.

Insulin Pens

Insulin pens combine both the insulin cartridge and measuring dial into one device. Some insulin pens are disposable whereas some are reusable. Thus, insulin injections become more convenient as you do not have to carry syringes and insulin vials separately with you.

Insulin Pumps

The insulin pump is a small computerised device that pumps insulin continuously through a fine plastic tube into a site under the skin throughout the day.

Pump users have to monitor their blood sugar frequently so as to make adjustments to the amount of insulin delivered. The insulin pump generally gives you better control and more

meal flexibility but is more expensive and requires more frequent blood sugar monitoring.

How to Inject Insulin

Knowing where to inject your insulin will make the injection easier, safer and more comfortable. Insulin is injected into the fatty tissue that is between the skin and muscle layer. After insulin is injected, it is absorbed into the blood and is used by your body.

There are three main areas of injection:

- Abdomen — insulin is absorbed fastest here into the blood
- Arm
- Thigh and buttocks — insulin is absorbed slowest here into the blood

Your doctor or nurse will advise you on the best area to inject. You should keep to the same injection area (abdomen OR arm OR thigh/buttock) to ensure consistent insulin absorption.


You should rotate the injection site within the same area to prevent your body from forming lipodystrophy (a small lump or dent in the skin that forms when a person repeatedly injects in the same spot).




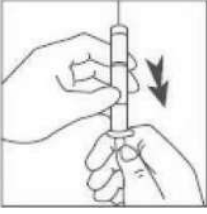

- Insulin injected into these hardened areas may not be absorbed well.
- Check your injection areas every few days by pressing gently and running your fingertips across the skin.
- Inform your healthcare professionals if there are any lumps, painful spots or change in colour anywhere.
- Avoid using these areas until they have recovered.

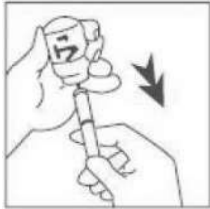

If you are injecting into the abdomen area, inject at least two inches away (two fingers) from the belly button and avoid areas with scars or bruises.

A. Insulin vial (small cylindrical glass container)



i. How to Withdraw a Single Type of Insulin from an Insulin Vial



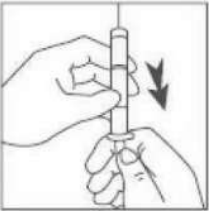

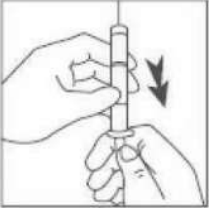

1.	Wash and dry your hands.	
----	--------------------------	---

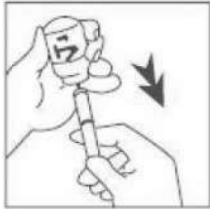


2.	Roll the insulin vial gently between the palms of your hand. This mixes the insulin and warms it to body temperature to reduce the pain when you inject.	
3.	If you're using a new vial of insulin, remove the coloured cap. Clean the rubber stopper on the insulin vial with an alcohol swab.	
4.	Remove the cap from the syringe.	
5.	Draw air into the syringe by pulling the plunger down. The amount of air you draw in should be the same as the amount of insulin prescribed.	
6.	Place the insulin vial upright and insert the needle into the rubber stopper on the vial. Push the plunger down. This pushes air into the vial and makes it easier to withdraw insulin out of the vial.	

7.	<p>Turn the vial and syringe upside down. Slowly pull the plunger down to withdraw insulin to the level of the prescribed dose.</p> <ul style="list-style-type: none"> • Check for any air bubbles in the syringe. If you see air bubbles in the syringe, gently tap the syringe to move the air bubbles to the top. Push the plunger to expel the air bubbles • It is important to remove the air bubbles so that you receive the correct amount of insulin. 	
8.	<p>Remove the syringe from the vial. You are now ready to give the injection.</p>	

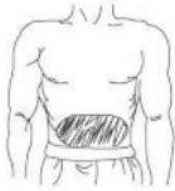


ii. Insulin Mixing: How to Withdraw Two Types of Insulin from Insulin Vials

1.	<p>Wash and dry your hands.</p>	
2.	<p>Roll the insulin vial gently between the palms of your hand. This mixes the insulin and warms it to body temperature to reduce the pain when you inject.</p>	

3.	Remove the coloured cap of a new vial. Clean the rubber stopper on the insulin vial with an alcohol swab.	
4.	Remove the cap from the syringe.	
5.	Draw air into the syringe by pulling the plunger down. The amount of air you draw in should be equal to the amount of cloudy insulin prescribed.	
6.	Insert the needle into the cloudy insulin and inject the air into the cloudy insulin vial. Do not draw out the cloudy insulin yet. Remove the empty syringe from the cloudy insulin vial.	
7.	Using the same syringe, draw in air equal to the amount of clear insulin you need.	
8.	Insert the needle into the clear insulin vial and inject the air into the clear insulin vial.	


<p>9.</p>	<p>Without removing the syringe from the clear insulin vial, turn the vial and syringe upside down. Withdraw the amount of clear insulin you need.</p> <ul style="list-style-type: none"> • Check for any air bubbles in the syringe. If you see air bubbles in the syringe, gently tap the syringe to move the air bubbles to the top. Push the plunger to expel the air bubbles • It is important to remove the air bubbles so that you receive the correct amount of insulin. 	
<p>10.</p>	<p>Remove the needle and insert the needle into the vial of cloudy insulin.</p> <ul style="list-style-type: none"> • Do not push the plunger in as this would inject clear insulin into the cloudy insulin vial. • Add up the amount of clear and cloudy insulin you need. This is the total number of insulin units you need for your injection. Take note of this amount. • To prevent air bubbles from forming, slowly pull back the plunger to the total number of insulin units you need. 	
<p>11.</p>	<p>Remove the syringe from the vial. You are now ready to give the injection.</p>	

How to inject insulin with a syringe

1.	Select an injection site and clean the area with an alcohol swab. Wait for the alcohol to dry before moving to step 2.	
2.	Firmly pinch up a large area of skin at the selected injection site with your thumb and index finger. Hold the insulin syringe with your other hand (keeping fingers off the plunger). Push the needle all the way in, at an angle of 90 degrees to the skin.	
3.	Inject the insulin by pushing the plunger all the way down slowly with your index finger. Remove the needle and release the pinched skin.	
4.	If slight bleeding occurs, gently press over the injection site for a few seconds. Do not rub the injected area as this may cause the insulin to be absorbed too quickly.	
5.	Discard the syringe into a metal tin, glass jar or a thick plastic container (eg. detergent bottles) to prevent any needle stick injury.	

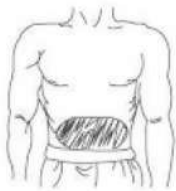
B. Insulin pen

How to prepare your insulin pen for injection

1.	Wash and dry your hands.	
2.	<p>Only for cloudy insulin (Skip to step 3 if you are using a clear insulin):</p> <p>Roll the insulin pen gently between the palms of your hands. This mixes the insulin and warms it to body temperature to reduce the pain when you inject.</p> <p>Move the pen up and down gently so that the glass ball moves from one end of the cartridge to the other.</p> <p>Repeat rolling and moving the pen until the liquid appears uniformly white and cloudy.</p>	
3.	<p>Clean the rubber membrane on the insulin pen with an alcohol swab. Allow it to dry and attach the pen needle onto the insulin pen. Do not remove the outer and inner cap from the new pen needle while attaching the pen needle.</p>	
4.	<p>Remove the outer and inner cap of the needle.</p>	
5.	<p>Dial 2 units by turning the dose selector.</p>	
6.	<p>Hold the insulin pen with the needle upwards and tap the cartridge gently with your finger a few times to let air bubbles collect at the top of the cartridge.</p>	

7.	<p>With the insulin pen still pointing upwards, press the push button all the way in.</p> <p>The dose selector should return to '0' and a drop of insulin should appear at the needle tip.</p> <p>If no insulin comes out:</p> <ul style="list-style-type: none"> • Check for air bubbles and repeat the above step two more times to remove them. • If still no insulin comes out, the needle may be blocked. Change the needle and try again. • If no insulin comes out after changing the needle, your insulin pen may be damaged. Use a new insulin pen.
8.	Select the dose of insulin you need.

How to inject insulin with an insulin pen

1.	<p>Select an injection site to inject and clean the area with an alcohol swab. Wait for the alcohol to dry before moving to step 2.</p>	
2.	<p>Firmly pinch up a large area of skin at the selected injection site with your thumb and index finger. Hold the insulin pen with your other hand. Push the needle all the way in, at an angle of 90 degrees to the skin.</p>	
3.	<p>Inject the insulin by pressing the push button all the way until '0'. Keep the push button down fully for at least 10 seconds (to ensure the full dose has been injected).</p> <p>Withdraw the needle and release the pinched skin.</p>	
4.	<p>If slight bleeding occurs, gently press over the injection site for a few seconds. Do not rub the injected area as this may cause the insulin to be absorbed too quickly.</p>	

5.	Place the outer needle cap on the table. Direct the needle tip into the outer needle cap without holding onto it (to prevent needle-stick injury).
6.	Unscrew and dispose of the used needle into a metal tin, glass jar or thick plastic container (eg. detergent bottles) that will not be punctured easily.

Also available in [中文](#) | [Melayu](#) | [தமிழ்](#)

Disclaimers

Please take note that the above is not a complete list of all possible side effects. If you have any concerns about your medication or if you have other side effects that you think are caused by this medication, please consult your doctor or pharmacist.

If you take more than the recommended dose, please seek medical advice immediately. The information provided on this page does not replace information from your healthcare professional. Please consult your healthcare professional for more information.

This article is jointly developed by members of the National Medication Information workgroup, and supported by the Ministry of Health. The workgroup consists of cluster partners (National Healthcare Group, National University Health System and SingHealth), community pharmacies (Guardian, Unity and Watsons) and Pharmaceutical Society of Singapore. The content does not reflect drug availability and supply information in pharmacies and healthcare institutions. You are advised to check with the respective institutions for such information.

Please visit www.moh.gov.sg/knowyourmeds and www.ndf.gov.sg for more information on medication.

Last updated on May 2023