

*Getting started with
Insulin Injections*



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Introduction

This “Getting Started with Insulin Injections” booklet aims to help you with practical information about insulin injections and good injection technique. It will reinforce the information given to you when you were diagnosed or when you started taking insulin.

Your diabetes nurse educator will have taken you through this “Getting Started with Insulin Injections” booklet explaining your daily routine,

showing you how to use your injection device and helping you with your injection technique.

Once you are at home, refer to this booklet and the notes that have been made to remind yourself of any aspect of your care.

Insulin Injection Devices

Each device has its own advantages and drawbacks. Ask your healthcare professional for advice on which device (pen or syringe) best suits you.

1 - Insulin syringes to be used with insulin vials

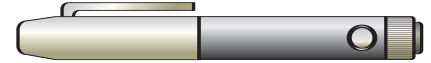


2 - Reuseable insulin pens to be used with insulin cartridges



Note: *not all insulin cartridges can be used with all insulin pens.*

3 - Pre-filled insulin pens, these are disposable



Some insulin treatments combine an insulin pen for one type of insulin and an insulin syringe for another type or may require two insulin pens for two different insulin types.

Choosing a syringe

Insulin syringes are available by prescription in 3 sizes: 0.3 ml, 0.5 ml and 1 ml. Choose a syringe size based on the dose (units) of insulin you require. It is easier and more accurate to measure smaller doses with a smaller volume syringe.

- **0.3 ml insulin syringes**

These syringes are graduated in 1-unit intervals and are ideal for doses under 30 units because of their discrete size and easy 1 unit adjustment.



- **0.5 ml insulin syringes**

These syringes are graduated in 1-unit intervals and are ideal for doses between 30 units and 50 units.



- **1 ml insulin syringes**

These syringes are graduated in 2-unit intervals and are ideal for doses over 50 units.



Preparing a dose of insulin

Using proper technique to prepare an insulin dose helps ensure that you are receiving accurate insulin injections.



Gently roll vial of **cloudy** insulin (premixed, intermediate- or long-acting insulin) between your hands 20 times to mix evenly. Never shake.

Note: Always check the label on the insulin vial for any special instructions and the expiry date.



Remove the white cap covering the plunger, then carefully twist and remove the orange needle cap without touching the needle.

Draw air into the syringe equal to the number of units of insulin needed.



With the vial standing upright, insert the needle straight through the centre of the rubber cap of the insulin vial and push the plunger down.

This injects air into the vial, making it easier for you to draw out the insulin.

Preparing a dose of insulin



Hold the vial and syringe upside down. Make sure that the point of the needle inside the vial is well beneath the surface of the insulin. Slowly pull the plunger, drawing the correct amount of insulin, plus a little extra, into the syringe.



Check for bubbles. Tap syringe. Expel any bubbles and the extra insulin. Check that you have the correct amount for your dose.

Note: Although air bubbles are not dangerous if injected, they may affect the accuracy of your insulin dose. If air bubbles remain, inject all of the insulin back into the vial and start again.



Remove the needle from the vial and perform your injection.

Safely dispose of your needle and syringe using the techniques described on page 18 of this booklet.

Mixing insulin in a syringe



Remove the white cap covering the plunger, then carefully twist and remove the orange needle cap without touching the needle. Draw air into the syringe equal to the number of units of **cloudy** (intermediate acting insulin) needed.

With the vial standing upright, insert the needle straight through the centre of the rubber cap of the **cloudy** insulin vial and push the plunger down. This injects air into the vial, making it easier for you to draw the insulin out of the bottle later. Remove the needle **without drawing any insulin into the syringe.**

Draw air into the syringe equal to the number of units of clear insulin needed. Insert the needle through the centre of the rubber cap of the **clear** (rapid acting analogue or fast-acting insulin) vial and inject the air.

Mixing insulin in a syringe

When mixing two types of insulin within one syringe, **it is important to draw up your clear rapid-acting analogue or fast-acting insulin before your cloudy intermediate-acting insulin.**



Hold vial and syringe upside down and keep the point of the needle well beneath the surface of the insulin. Slowly pull the plunger, drawing the correct amount of **clear** insulin, plus a little extra, into the syringe. Check for bubbles. Tap syringe. Expel any bubbles and the extra insulin. Check that you have the correct amount for your **clear** insulin dose. Remove the needle from the vial.



Gently roll the vial of **cloudy** intermediate- or long-acting insulin between your hands 20 times to mix evenly. Never shake. Insert the needle straight through the centre of the rubber cap of the **cloudy** insulin vial and turn it upside down. Slowly and carefully pull the plunger, until you have the **TOTAL** number of units needed (cloudy + clear).

Note: If you accidentally draw up too much cloudy insulin, discard the mixture and begin again. Do not re-inject back into the vial since it has been mixed with the clear insulin.



Remove the needle from the vial and perform your injection.

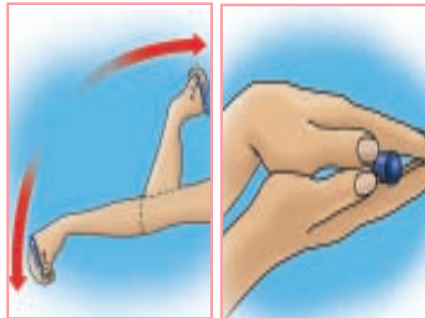
Safely dispose of your needle and syringe using the techniques described on page 18 of this booklet.

Preparing a dose of insulin

Not all insulin cartridges can be used in all insulin pens (please refer to the insulin manufacturer's instructions).



Consult your manual for instructions on how to properly refill your insulin pen. Insert a new insulin cartridge if required (refillable).



Quickly but gently, bend and extend your arm 20 times to mix insulin (premixed, intermediate- or long-acting insulin) evenly. Never shake. If insulin does not look thoroughly mixed, roll the pen 10 times between your hands.



Take off the cap of your insulin pen. Screw a new needle onto your pen.

Preparing a dose of insulin



Check insulin flow (prime). Using the dial found on the end of your pen, dial 2 units. Hold the pen with the needle pointing upwards and slowly press down on the injection button. A drop of insulin should appear; repeat this step until a drop appears.



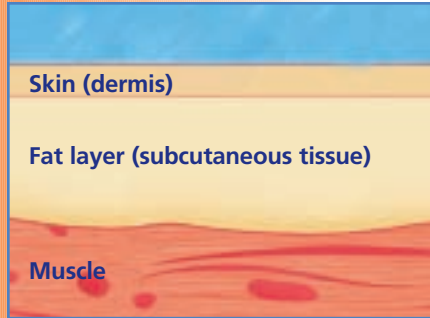
Set your dose using the dial and perform your injection.



Always remove the needle after each injection and safely dispose of your needle and syringe using the techniques described on page 18 of this booklet.

Insulin injection

Proper insulin absorption occurs when it is delivered to the fat layer (subcutaneous tissue) found between your skin (dermis) and your muscle.

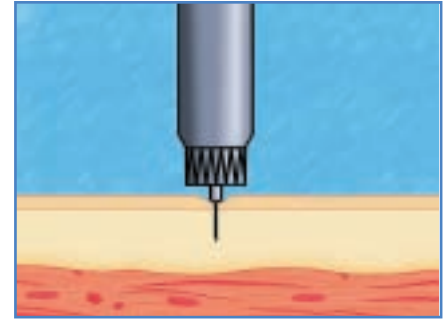


The depth of the subcutaneous tissue may be different between individuals and from one injection site to another. Talk to your healthcare professional about the injection technique that is best for you. Ask questions and have him/her walk you through your injection technique on a regular basis.



Lifting your skin into a fold before injecting with an 8 mm or 12.7 mm needle will help you avoid delivering insulin into your muscle by accident.

Use only the thumb, index and middle finger to perform a correct lifted skin fold.



Lifting the skin may not be required if you are using a very short needle, such as the 5 mm pen needle.

Needle length


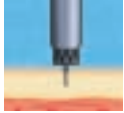




Your healthcare professional can recommend a needle length and injection technique that is most appropriate for you.

5mm mini

8mm short

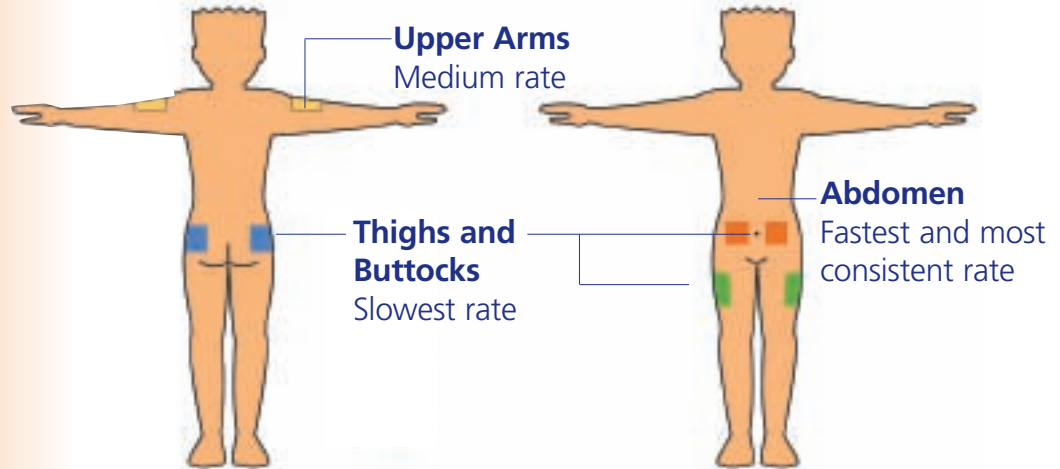
12.7mm original

Follow these general recommendations to ensure proper insulin absorption and to avoid an intramuscular injection:

Needle length	Injection technique recommendations	Choose the right pen needle
5mm 	 <p>90° without a lifted skin fold</p>	<p>Choose the BD Ultra-Fine™ III Mini Pen Needle if you:</p> <ul style="list-style-type: none"> • want the shortest pen needle available • are muscular or have low to moderate body fat • are selecting the pen needle for a child • don't want to pinch up
8mm 	 <p>90° with a lifted skin fold</p>	<p>Choose the BD Ultra-Fine™ III Short Pen Needle if you:</p> <ul style="list-style-type: none"> • are like most patients – it's a size that's appropriate for many people
12.7mm 	 <p>90° with a lifted skin fold</p>	<p>Choose the BD Ultra-Fine™ Original Pen Needle if you:</p> <ul style="list-style-type: none"> • take large doses of insulin • have dexterity issues

Injection sites

Rate of insulin absorption varies between injection areas



Amount and speed of absorption may differ between areas, which may affect your glycemic levels. Remain within one area (e.g. abdomen) as much as possible. Follow a site rotation pattern to avoid injecting the same site too often.

Injection sites



The abdomen is the best area for insulin absorption. Avoid injecting within two inches of your belly button.



The upper arms are the next best area for insulin absorption. This site is harder to reach, which makes it more difficult to inject yourself correctly.



The outer thighs and buttocks do not absorb insulin quickly. Exercise may affect the rate of absorption. This site should not be used often.



Repeatedly using the same site for insulin injections may lead to the development of fatty lumps or “lipos” caused by “lipodystrophy.” “Lipos” can be disfiguring, and may lead to **improper insulin absorption.**

Hyperglycemia

Changes and imbalances in your health, diet, exercise, or medications may cause your blood sugar levels to rise or fall. If you learn how to recognize the first signs, you can treat yourself quickly or get help before your condition worsens.

Hyperglycemia (High Blood Glucose)

Blood glucose levels above 11 mmol/L

Causes

- Stress from an illness (e.g. infections, fevers)
- Emotional stress (e.g. conflicts with family, problems at school or work)
- Pregnancy
- Eating too much food
- Not exercising as much as planned
- Not enough insulin (type I diabetes)
- Insulin is not effective (type II diabetes)

First signs

- Increased thirst
- Urinating more often
- Tiredness

Signs of severe high blood glucose (ketoacidosis)

- Heavy, laboured breathing
- Breath that smells fruity
- Very dry mouth
- High levels of ketones in the urine
- Nausea, vomiting or abdominal pain

What to do

- Test blood glucose level frequently.
- If it is over 13.3 mmol/L, test your urine for ketones.
- If blood glucose is under 13.3 mmol/L and there are no ketones in your urine, try exercising.
- If ketones are present, do not exercise.
- Call your healthcare professional immediately.
- Drink fluids without sugar if you are able to swallow.

Hypoglycemia

Hypoglycemia (Low Blood Glucose)

Blood glucose levels below 4 mmol/L

Causes

- Not eating enough food
- Missed or delayed meal
- Exercising without taking precautions
- Exercising more than usual
- Taking too much insulin

First signs

- Sweating
- Headache
- Heart beating quickly
- Hunger
- Shakiness, light-headedness and weakness
- Fatigue
- Mood changes

Signs of severe low blood glucose

- Confusion or disorientation
- Unconsciousness
- Seizures

What to do

- Test your blood glucose level.
- Eat or drink a form of sugar.
 - 2-3 BD™ Glucose Tablets*
 - ¾ cup of juice or pop*
 - 1 tbsp of honey*
- Wait 10-15 minutes, then test again.
- Repeat if it remains too low.

Tell friends and family what to do if you become unconscious:

- Call your healthcare professional.
- Never give you fluids or food by mouth.
- Give Glucagon according to package instructions.

Proper needle use



New needle



Tip damage
caused by re-use



Use needles only once

Thin-wall needle technology has made it possible to develop thinner needles with the same rate of insulin flow, which are easier and more comfortable to use. These newer needles, however, are more fragile and are designed for single use only.

There are no benefits to re-using needles, only risks.

Inaccurate doses: Reused needles can leak fluid or allow air into the cartridge. This can affect the concentration of insulin and lead to inaccurate doses.

Painful injections: New needles have a silicone coating, which is removed with use. Without this layer of lubrication, injection can be painful.

Broken needles: Thin needles are weakened by reuse and can actually break, leaving fragments of metal in the skin.

Avoid injecting through clothes

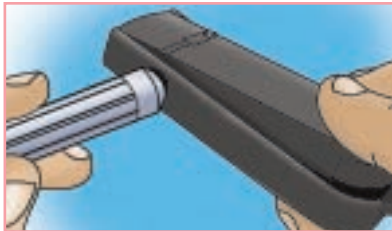
Injecting insulin through clothing using a syringe or pen is not advised.

- It is difficult to perform a correct lifted skin fold when injecting through clothes.
- Clothing fabric removes the silicone coating and can damage the needle tip, which increases pain and discomfort when injecting.
- It is not possible to inspect the injection site for bleeding, insulin leakage or infection when injecting through clothes.

Proper disposal of your sharps

Contact your local garbage removal office or health department for information on safe disposal. The following guidelines may be helpful:

Remove the needle from your syringe or pen using a BD Safe-Clip™, which stores one year's supply of needles.



Never throw used syringes, syringe needles, pen needles or lancets in the regular garbage.

Put your used syringes, needles and lancets into a BD™ Sharps Container or a hard plastic or metal container with a screw-on lid. When the container is full, seal the lid securely and dispose of it following your city's guidelines.

Keep this container away from children.

Do not put the filled container into or near your recycling bin.

For more information on how to dispose of syringes, needles or lancets, call BD toll-free at 1-888-BD-CARES (232-2737).

Never handle someone else's syringe or pen needle unless you have been trained by a healthcare professional in proper injection technique, handling methods and disposal.

Accidental needle stick injuries may cause serious infections.

Insulin care and storage

For better comfort and insulin efficiency, take insulin out of the refrigerator at least one hour before your injection; cold insulin may sting and slows insulin absorption rates.

Unopened insulin vials or cartridges should be stored in the refrigerator between 2°C and 8°C. Opened insulin vials or cartridges can be safely stored at room temperature for up to one month (please refer to insulin manufacturer's recommendations).

Never use insulin after the expiry date and avoid exposure to extreme temperatures.



Below 0°C Insulin is destroyed



Above 30°C Insulin's effectiveness begins to decrease

Patient Information

Name: _____ Date of Birth: _____

Address: _____

_____ Telephone Number: _____

Name of insulin(s): _____

Insulin dose: _____

Useful numbers

Diabetes specialist nurse: _____ Telephone: _____

Hospital consultant: _____ Telephone: _____

GP / Practice Nurse: _____ Telephone: _____

Pharmacy: _____ Telephone: _____

_____ Telephone: _____

_____ Telephone: _____

Notes

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