

All insulin penfill cartridges and prefilled pens must be used with pen needle. Insulin must not be drawn from the penfill cartridge or prefilled pen into a syringe. Never reuse needles or syringes.

### What is low blood sugar?

Low blood sugar is a potential side effect of insulin or medications which lower blood sugar. Patients may develop the following symptoms: headache, dizziness, pale face, increased heart rate, shivering, cold sweating, inability to concentrate, blurred vision, nausea, vomiting, fatigue, hunger, etc. Low blood sugar may lead to serious consequences if not managed promptly.

Patients should take note of the following points:

1. Inform your doctor if symptoms of low blood sugar level occur frequently.
2. Always carry some sugary food or drink e.g. candies or sugar cubes. Take them immediately upon occurrence of symptoms of low blood sugar level. Patients who are confused or unconscious should be sent to Accident & Emergency Department immediately. Do not force-feed an unconscious patient with food or drink.
3. To prevent low blood sugar, patients should:
  - ※ Use the medications as directed.
  - ※ Ensure adequate food intake and regular meal time. Avoid delaying or skipping meals.

- ※ Avoid over-exercising.
- ※ Attend follow-up consultation to monitor the disease progress.

### What if I miss a dose?

Record the missed dose for healthcare professional's reference. Seek advice from healthcare professional regarding the missed dose management of insulin injection.

Do not double the dose.

### Pharmacist's advice

1. To effectively control the disease, patient should:
  - ※ Mix and inject insulin as directed.
  - ※ Keep record of the blood glucose or urine glucose level monitoring for healthcare provider's reference.
  - ※ Maintain a balanced and regular diet.
  - ※ Exercise regularly.
2. Use the medications as directed. Do not stop using the medications or change the dose or frequency unless directed by your doctor.
3. If you have history of drug allergy, consult your doctor or pharmacist before using the medications.

4. Tell your doctor and pharmacist if you are pregnant, planning to become pregnant, or breastfeeding.
5. Avoid drinking alcohol. Alcohol can increase the risk of side effects from medications and cause low blood sugar.
6. Over-the-counter (OTC) medications (such as cold remedies) may contain alcohol or sugar. Consult your doctor before using any other medications, including health supplements, Traditional Chinese Medicines, Proprietary Chinese Medicines and OTC medications.
7. Please consult your doctor or pharmacist if you encounter any difficulties in using the medications.
8. Please consult your doctor if symptoms persist or worsen after using the medications.
9. Diabetic patients are more prone to bacterial infection. Special attention should be paid to personal hygiene especially foot care and pedicure. Patients should inspect their foot regularly and consult your doctor for any wounds or infections. Do not apply any topical medications (e.g. medication for corns) on feet without medical advice.



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# Medications for Diabetes Mellitus – Insulin Injections



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## What is Diabetes Mellitus



Sugar level in the human body is mainly regulated by insulin secreted from the pancreas. Blood sugar level rises when the body does not produce sufficient insulin or utilise the insulin very well. Excess sugar in the blood is excreted in urine. Diabetes mellitus is a type of disease in which the blood sugar level becomes persistently high. When this happens, various body organs (e.g. heart and kidneys) may be affected. Complications of diabetes mellitus include impaired vision, stroke, heart attack, kidney failure, gangrene, etc. Severe gangrene of the limbs may lead to amputation. Therefore, diabetic patients should receive long term medical treatment to control blood sugar levels and other cardiovascular risk factors (e.g. blood pressure, blood lipid level) in order to reduce the risk of developing complications.

### There are two main types of diabetes mellitus:

#### Type 1 Diabetes Mellitus

Its development is more frequent in children and adolescents when the patients cannot produce insulin. Life-long insulin injections are usually required.

#### Type 2 Diabetes Mellitus

It is commonly seen in older adults and obese patients, when the body does not produce enough insulin, or the insulin action is impeded. The condition can usually be treated by medications which lower blood sugar. In some cases, insulin may be required for adequate control.

## Uses and types of insulin injections

Insulin injection lowers blood sugar level by supplementing the insulin in diabetic patients. Insulin should not be taken orally as it would be degraded in the stomach.

Insulin injection is usually classified into five types according to how quickly and for how long the insulin works (See Table).

| Types of insulin injections   | Precautions – refer to the manufacturers' product information for further details   |
|---|---|
| <b>Rapid-acting</b><br>Apidra®<br>Humalog®<br>Novorapid®  | <ul style="list-style-type: none"> <li>Inspect your medication every time before use. It should be clear and colourless. Do not use if it becomes cloudy.</li> <li>Take note of the injection and meal time:                             <ul style="list-style-type: none"> <li>– Apidra®, Humalog® and Novorapid® are to be injected with meal.</li> </ul> </li> <li>After insulin injection, do not delay meal time to prevent low blood sugar.</li> </ul>  |
| <b>Short-acting</b><br>Actrapid®<br>Humulin R®  | <ul style="list-style-type: none"> <li>Inspect your medication every time before use. It should be clear and colourless. Do not use if it becomes cloudy.</li> <li>Take note of the injection and meal time:                             <ul style="list-style-type: none"> <li>– Humulin R® and Actrapid® are to be injected 30 minutes before meal.</li> </ul> </li> <li>After insulin injection, do not delay meal time to prevent low blood sugar.</li> </ul>   |
| <b>Intermediate-acting</b><br>Humulin N®<br>Protaphane®   | <ul style="list-style-type: none"> <li>Just before use, mix your medication well. Do not use if solid particles are found or if there is a change of colour.                             <ul style="list-style-type: none"> <li>– In case of vial, roll it gently between the palms.</li> <li>– In case of penfill cartridge, turn it up and down for at least 10 times until the solution disperses uniformly.</li> </ul> </li> <li>Avoid vigorous shaking and generation of bubbles.</li> <li>Inject insulin at regular time every day to prevent low blood sugar.</li> </ul>   |
| <b>Pre-mixed combination</b><br>Humalog Mix®<br>Humulin 70/30®<br>Mixtard®<br>Novomix®<br>Ryzodeg®  | <ul style="list-style-type: none"> <li>Just before use, mix your medication well.                             <ul style="list-style-type: none"> <li>– In case of vial, roll it gently between the palms.</li> <li>– In case of penfill cartridge, turn it up and down for at least 10 times until the solution disperses uniformly.</li> </ul> </li> <li>Avoid vigorous shaking and generation of bubbles.</li> <li>Take note of the injection and meal time:                             <ul style="list-style-type: none"> <li>– Humalog Mix®, Novomix® and Ryzodeg® are to be injected with meal.</li> <li>– Humulin 70/30® and Mixtard® are to be injected 30 minutes before meal.</li> </ul> </li> <li>After insulin injection, do not delay meal time to prevent low blood sugar.</li> </ul> |
| <b>Long-acting</b><br>Lantus®<br>Toujeo®<br>Levemir®<br>Tresiba®  | <ul style="list-style-type: none"> <li>Inspect your medication every time before use. It should be clear and colourless. Do not use if it becomes cloudy.</li> <li>Inject insulin at regular time every day.</li> </ul>   |
| <b>Long acting + GLP1 receptor agonist</b><br>Soliqua®<br>Xultophy®   | <ul style="list-style-type: none"> <li>Inspect your medication every time before use. It should be clear and colourless. Do not use if it becomes cloudy.</li> <li>Inject insulin at regular time every day.                             <ul style="list-style-type: none"> <li>– Soliqua: to be injected once a day within one hour before a meal.</li> <li>– Xultophy: to be injected with or without meal.</li> </ul> </li> </ul>  |
| If you notice any allergic reactions like skin itchiness, face or hand swelling, breathing difficulty, etc., consult your doctor immediately. |   |

Different manufacturers may have different recommendations on the time of injection in relation to mealtime. Patients should read the drug label or manufacturer's printed information leaflet from the pack, as well as following the dosing regimen and mealtime instruction strictly as prescribed by your doctor and advised by healthcare professionals, or to follow the manufacturer's recommendations if appropriate.

### Precautions for handling insulin injection

#### How to store?

- The insulin preparations are available in vials, penfill cartridges or prefilled pens.
- Unopened vials, penfill cartridges or prefilled pens of insulin should be stored at 2-8°C in refrigerator. Do not store any insulin in the freezer compartment.
- Check the expiration date on the vial, penfill cartridge or prefilled pen of insulin before use. Do not use after the expiration date.
- Storage and in use shelf life of the vial, penfill cartridge and prefilled pen of insulin after the first opening as below:

| Types of insulin injections  | At room temperature (cool dry place) | Store in a refrigerator (2-8°C) Do not freeze |
|--|--------------------------------------|---|
| Penfill cartridge<br>Prefilled pen   | 4 to 8 weeks*<br>Xultophy: 3 weeks   | In general, not recommended*                  |
| Vial   | 4 to 6 weeks*                        |   |
| * Please refer to the instructions of individual insulin preparation for details |                                      |   |

- Patient should mark the seal opening date on the vial, penfill cartridge or prefilled pen of insulin. Check the date marked every time before administration. Do not use after the in use shelf life.
- Insulin must be protected from excessive heat, such as inside a car or too close to the body (e.g. trousers pocket), as it will be denatured under high temperature.
- Keep out of reach of children.
- Discard all medications that are no longer required.
- Do not share the injection device, needle / syringe or medication with other people.

#### How to use?

Insulin should always be injected into subcutaneous (beneath the skin) fat. Do not inject directly into your muscles.

The common sites of insulin injections include:

- Abdomen: both lateral sides of the navel
- Lateral side of upper arms
- Anterior and lateral aspects of thighs
- Buttocks

As the rate of insulin absorption differs in various parts of the body (e.g. abdomen, upper arms, thighs or buttocks), it is best to inject insulin into the same part of the body consistently. On the other hand, in order to prevent local inflammation and the formation of lumps / swelling and thickened skin due to repeated injections into the same spot, the patient should rotate the injection spot within the same part of the body.