

## Diabetes and insulin

Insulin is a hormone made by special cells, called beta cells, in the pancreas. When we eat, insulin is released into the bloodstream where it helps to move glucose from the food we have eaten into cells to be used as energy. Insulin also helps store excess glucose in the liver.

Insulin injections are needed when the body doesn't produce insulin, as with type 1 diabetes. Some people with type 2 diabetes may also need insulin. This is usually when diabetes tablets together with healthy eating and regular physical activity is not enough to control blood glucose levels.

Insulin can't be given in tablet form as the stomach would digest it, just as it digests food. While ways of taking insulin by mouth, or as a nasal spray are being developed, they are not readily available.

### Starting on insulin

People with type 1 diabetes must inject insulin every day. Sometimes people with type 2 diabetes also need to begin using insulin when diet, physical activity and tablets no longer effectively control their blood glucose levels.

Starting on insulin can be a difficult and frightening experience. However, the many injecting devices and tiny needles available today make injecting insulin much easier than most people imagine. In fact, many people say they can feel the finger prick for monitoring blood glucose more than they can feel the needle used to inject insulin.

When starting on insulin, your doctor and diabetes educator will help you adjust to the new routine. You may find that, even with their help, it takes a while to find exactly the right dose to reduce your blood glucose to acceptable levels and to suit your particular lifestyle.

### Five different types of insulin

Insulin is classified according to how long it works in the body. There are five different types of insulin, ranging from short to long acting. Some insulin looks clear, while others are cloudy. Often, people need varying amounts of both a short and longer acting insulin. However, everyone is different and will respond differently to the insulin they take. The five types of insulin include:

- Rapid onset-fast acting insulin
- Short acting insulin
- Intermediate acting insulin
- Mixed insulin
- Long acting insulin.

### Insulin injection devices

There are many different devices available to inject insulin. The main choices include:

- Insulin syringes
- Insulin delivery pens
- Insulin pump.

### Injection sites

Insulin is injected through the skin into the fatty tissue known as the subcutaneous layer. It doesn't go into muscle or directly into the blood. Absorption of insulin varies depending on where in the body it's injected. The abdomen absorbs insulin the fastest and is used by most people. The upper arms, buttocks and thighs are also commonly used. While it is essential to give each injection in a slightly different spot within the one site (such as the abdomen), you should not change sites without discussing it with your doctor or diabetes educator.

## Factors that speed insulin absorption

Variation in absorption can cause changes in blood glucose levels. Insulin absorption is increased by:

- Injecting into an exercised area such as the thigh
- High temperatures, for example, shower, bath, hot water bottle, spa or sauna
- Massaging the area around the injection site
- Injecting into muscle – the deeper the injection into muscle, the faster the insulin will be absorbed.

## Factors that delay insulin absorption

Variation in absorption can cause changes in blood glucose levels. Insulin absorption can be delayed by:

- Cigarette smoking.
- Over-use of the same injection site, which causes the flesh to become hard, lumpy or scarred, and leads to erratic absorption of insulin.
- Cold insulin, for example, injecting immediately after taking the insulin from the fridge.

## Disposal of used syringes

Used syringes, pen needles and lancets must be disposed of in an Australian Safety Standards-approved sharps container which is puncture proof and has a secure lid. These containers are usually yellow in colour and are available through pharmacies, councils and Diabetes Australia - Victoria. Procedures to dispose of sharps containers vary from State to State. Contact the following organisations for information and assistance

- Diabetes Australia - Victoria
- State Department of Health
- Local council.

## Insulin storage suggestions

Suggestions to store insulin include:

- Keep unopened insulin bottles or pen cartridges on their side in the fridge.
- Insulin must not be allowed to freeze.
- Once opened, insulin may only be kept at room temperature (less than 30C) for one month and then thrown away.
- Insulin can be safely carried in your handbag or pocket.
- Extreme temperatures may damage insulin. It must not be left where temperatures are over 30C. It can easily get this hot, or even hotter, in the glove box of your car.
- Don't keep insulin in direct sunlight.

## Insulin safety issues

Don't use insulin if:

- The clear insulin has turned cloudy
- The expiry date has been reached
- The insulin has been frozen or exposed to high temperatures
- Lumps or flakes are suspended in the insulin

- Deposits of insulin are seen on the inside of the vial and can't be dissolved by gently rotating the vial
- The vial has been opened for longer than one month.

## Where to get help

- Your doctor
- A diabetes educator
- Local community health service
- Diabetes Australia Victoria Tel. 13 RISK (13 7475)
- Baker IDI Heart and Diabetes Institute Tel. (03) 8532 1111

## Things to remember

- Even with the help of your doctor and diabetes educator, it still may take a while to find exactly the right insulin dose to reduce your blood glucose to acceptable levels and to suit your particular lifestyle.
- Insulin is injected through the skin into the fatty tissue known as the subcutaneous layer, not into muscle or directly into the bloodstream.
- While it is essential to give each injection in a slightly different spot within the one site (such as the abdomen), it is not advisable to change sites without first discussing it with your doctor or diabetes educator.

**This page has been produced in consultation with, and approved by:**

Diabetes Australia Victoria

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