

Diabetes - insulin choices

Insulin is classified according to how long it works in the body. There are five different types of insulin, ranging from fast to long acting. Some insulins are clear in appearance, while others are cloudy.

Often people need varying amounts of both fast and longer-acting insulin. Everyone is different and will respond differently, so the types and doses of insulin need to be individualised.

Various devices are available to inject insulin. Discuss the options with your doctor or diabetes educator. Methods of taking insulin by mouth are still in development.

Types of insulin

The five types of insulin include:

- Very rapid acting insulin
- Short-acting insulin
- Intermediate-acting insulin
- Long-acting insulin
- Pre-mixed insulin.

Very rapid acting insulin

Very rapid acting insulin always looks clear. It is fast acting and starts to work within one to 20 minutes after injection. It peaks about one hour later and lasts from three to five hours. When you use this type of insulin, you must eat immediately after you inject.

The three rapid acting insulin types currently available are:

- NovoRapid (insulin aspart)
- Humalog (insulin lispro)
- Apidra (insulin glulisine).

Short-acting insulin

Short-acting insulins always look clear. They begin to lower blood glucose levels within half an hour, so you need to have your injection half an hour before eating.

Short-acting insulin has maximum effect two to four hours after injection, and lasts for between six and eight hours. Short-acting insulin brands currently available include:

- Actrapid
- Humulin R
- Hypurin Neutral (bovine – highly purified beef insulin).

Intermediate-acting insulin

Intermediate-acting insulins always look cloudy. They have either protamine or zinc added to delay their action. These insulins begin to work about 90 minutes after injection, peak at four to 12 hours and last for 16 to 24 hours.

Intermediate-acting insulins currently available are isophane insulins (with protamine added), including Protaphane, Humulin NPH and Hypurin Isophane (bovine).

Long-acting insulin

There are two types of long-acting insulin and they both have a clear appearance. They are:

- **Lantus (glargine insulin)** – has no pronounced peak action, which means the insulin is released into the bloodstream at a relatively constant rate. One injection can last up to 24 hours. This is usually given once per day.
- **Levemir (detemir insulin)** – also has no pronounced peak, can last up to 24 hours and may be given once or twice daily.

Mixed insulin

Mixed insulin always looks cloudy. It contains a pre-mixed combination of either a very rapid acting or a short-acting insulin and intermediate-acting insulin.

If the insulin is '30/70' then it contains 30 per cent of quick acting and 70 per cent of intermediate acting insulin. '50/50' means 50 per cent of each.

The mixed insulins currently available include:

- **With rapid acting insulin** – NovoMix 30 (30% Rapid, 70% Intermediate), Humalog Mix 25 (25% Rapid, 75% Intermediate NPH), Humalog Mix 50 (50% Rapid, 50% Intermediate NPH)
- **With short-acting insulin** – Mixtard 30/70, Mixtard 50/50 and Humulin 30/70.

Before injecting a cloudy insulin, the vial must be gently rolled to make sure the insulin is evenly distributed in the solution.

Insulin injection devices

Insulin injection devices include insulin syringes, insulin delivery pens and insulin pumps.

Insulin syringes

Points to consider include:

- Syringes are manufactured in 30 unit (0.3ml), 50 unit (0.5ml) and 100 unit (1.0ml) measures. The size of syringe will depend on the insulin dose; for example, it is easier to measure a 10 unit dose in a 30 unit syringe and 55 units in a 100 unit syringe.
- Needles on the syringes are available in different lengths, ranging from 8mm to 13mm. Your doctor or diabetes educator will help you decide which syringe is right for you.
- Use each syringe once only.
- Syringes are free for people registered with the National Diabetes Service Scheme (NDSS).

Insulin 'pen' delivery devices

Points to consider include:

- Each 'pen' device is specific to its own brand of insulin. Devices are either disposable or reusable. Disposable devices are pre-filled with insulin and the whole device is disposed when empty. Reusable devices require insertion of an insulin cartridge (3ml, containing 300 units of insulin). When finished, a new cartridge is inserted. Your doctor or diabetes educator will advise you about the right type for your needs.
- NovoPen 3 Demi and HumaPen Luxura HD dial up the insulin dose in ½ unit increments.
- Many people find pen devices easier and more convenient than syringes.
- Those who have difficulties with their sight or arthritis may find the InnoLet pre-filled device easier to use, however this is only available with Protaphane and Mixtard 30/70 insulins. Discuss this with your doctor or diabetes educator.

- Pen needles vary in length from 4mm to 12.7mm. They also vary in thickness or gauge from 28G to 32G. The higher the number, the finer the needle.
- It is recommended that the pen needle be changed with each injection.
- Pen needles are free for people registered with the National Diabetes Service Scheme (NDSS).

Table: Insulin brand and type of pens that can be used

Insulin brand	Reusable pens	Disposable pens
Novo Nordisk insulins	NovoPen 4 NovoPen 3 Demi	FlexPen InnoLet
Lilly insulins	HumaPen Luxura HumaPen Luxura HD HumaPen Memoir	KwikPen
Sanofi Aventis Insulin	ClikSTAR	SoloStar

Insulin pumps

Points to consider include:

- The insulin pump is a small programmable device that holds a reservoir of insulin. The pump is programmed to deliver insulin into the body through thin plastic tubing known as the infusion set or giving set.
- The pump is worn outside the body – in a pouch, on your belt or in your bra. The infusion set has a fine needle or flexible cannula that is inserted just below the skin (usually on the abdomen) where it stays in place for two to three days.
- Only fast or rapid acting insulin is used in the pump. Whenever food is eaten, the pump is manually programmed to deliver an amount of insulin into the body, similar to the way the pancreas does in people without diabetes. Between meals, a small and steady rate of insulin is delivered.
- The insulin pump isn't suitable for everyone. If you're considering using one, you must discuss it first with your diabetes healthcare team.
- The cost of an insulin pump is generally covered by private health insurance for people with type 1 diabetes (a waiting period applies). Some children (under the age of 18) are eligible for an insulin pump subsidy (see the Juvenile Diabetes Research Foundation's website). The consumables required for use (such as cannulas, lines and reservoirs) are subsidised by the National Diabetes Service Scheme (NDSS) and cost approximately \$25 per month.

Where to get help

- Your doctor
- Diabetes specialist
- An Accredited Practising Dietitian, contact the Dietitians Association of Australia.
- Diabetes Australia – Vic Tel. 1300 136 588
- Baker IDI Heart & Diabetes Institute Tel. (03) 8532 1111

Things to remember

- There are five different types of insulin, ranging from fast to long acting.
- Insulin injection devices include insulin syringes, insulin delivery pens and the insulin pump.
- Syringes and pen needles are free for people registered with the National Diabetes Service Scheme (NDSS).

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

Diabetes Australia Victoria

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