

# Insulin

Insulin is a hormone that allows glucose to move from the bloodstream into the body's cells, where it can be used for energy. When you have diabetes, your pancreas either can't make any or enough insulin, or the insulin it makes doesn't work properly. This results in too much glucose in the bloodstream.

## When you have type 1 diabetes

When you have type 1 diabetes, your body can no longer make insulin, as the cells in the pancreas have been destroyed by the immune system. To compensate for the insulin that your body can no longer make, you will need insulin injections several times a day, or insulin via an insulin pump.



## When you have type 2 diabetes

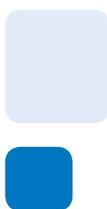
When you have type 2 diabetes, the pancreas can still make insulin but not enough to keep your blood glucose levels in the target range. If the insulin being produced does not work properly – or if there is not enough insulin – your blood glucose levels will rise.

Type 2 diabetes is managed through healthy eating and regular physical activity. You may also need glucose lowering medications such as tablets. As type 2 diabetes progresses, you may also need injectable medications (insulin and non-insulin types) to help keep your blood glucose levels in the target range.

## When you have gestational diabetes

Gestational diabetes is a type of diabetes that can occur during pregnancy. During pregnancy, some of the hormones that the placenta produces make it more difficult for insulin to work properly. The pancreas then needs to produce extra insulin to keep blood glucose levels in the target range. If the pancreas is unable to produce enough insulin, blood glucose levels rise and gestational diabetes develops.

Gestational diabetes is managed by following a healthy eating plan, doing regular physical activity and monitoring blood glucose levels. You may also need medication or insulin injections to help manage gestational diabetes.



## Starting insulin

Starting insulin can be challenging, and it's understandable if you feel anxious. At the beginning, you will need to be in regular contact with your doctor and credentialed diabetes educator (CDE) to help work out the right dose for you.

It can also take time to adjust to using insulin injections (or an insulin pump) and your new routine. Your diabetes health professionals and your family and friends can provide the support you need.

## Types of insulin

Different people need different types of insulin, so your treatment needs to be tailored to suit you. Your GP – or an endocrinologist – will prescribe the insulin that best suits your lifestyle and blood glucose level targets and advise you on how to use this insulin properly.

The different types of insulin are grouped together based on how long the insulin works in the body. There are five types of insulin (see table below). Insulin can be given as a basal or bolus dose. Basal insulin is a background insulin (intermediate or long acting). Bolus insulin is an ultra-short or short-acting insulin that is usually given with meals.

You may be prescribed more than one type of insulin depending on the type of diabetes you have and your individual management plan. Your insulin needs can also change over time, so it's important to have regular reviews of your diabetes management with your GP or CDE.



## Tips for taking insulin

Insulin works best when it's injected into the fatty layer just beneath the skin and above the muscle. It's recommended that insulin is injected in the abdomen (tummy). In some cases, the thigh or buttocks may be used. The length of the needle is important. Talk to a CDE about injection sites and what needle length is right for you.

### When you inject insulin, you should:

- use a new needle every time
- check you are giving the right type and dose of insulin
- prime the needle every time to remove air and start the flow of insulin (also known as an “air shot”)
- insert the needle at 90 degrees (a right angle), unless advised otherwise by your health professional
- after injecting the insulin, hold the needle under the skin for 10 seconds to make sure you get the full dose
- rotate injection sites so that you use a different site every time to avoid developing fatty lumps
- if using an insulin pen, remove the needle from the pen after each injection
- dispose of all sharps safely.

### Do not:

- use the insulin after the expiry date
- use the insulin if it doesn't look the way it should, or if it has been frozen or exposed to extreme heat
- shake the insulin too hard
- inject in areas where there are scars, stretch marks or lumps
- inject through your clothes.

## Types of insulin

Type of insulin	Description	Brand names
Ultra-short-acting insulin	<ul style="list-style-type: none"> <li>» Clear insulin</li> <li>» Starts to work within 15–20 minutes after injecting</li> <li>» It's important to eat within 15 minutes of taking this insulin to avoid hypoglycemia (hypo)</li> <li>» Given as a bolus dose to help keep your blood glucose level within your target range after a meal</li> <li>» Has a peak action 1-2 hours after being injected but continues to lower blood glucose levels for up to another 4-5 hours.</li> </ul>	<ul style="list-style-type: none"> <li>» NOVORAPID®</li> <li>» HUMALOG®</li> <li>» APIDRA®</li> </ul>
Short-acting insulin	<ul style="list-style-type: none"> <li>» Clear insulin</li> <li>» Starts to work about 30 minutes after injecting</li> <li>» It's important to eat 20–30 minutes after taking this insulin</li> <li>» Given as a bolus dose to help keep your blood glucose level within your target range after a meal</li> <li>» Has a peak action 3–5 hours after being injected but continues to lower blood glucose levels for another 6–8 hours.</li> </ul>	<ul style="list-style-type: none"> <li>» ACTRAPID®</li> <li>» HUMULIN R®</li> </ul>
Intermediate-acting insulin	<ul style="list-style-type: none"> <li>» Cloudy insulin</li> <li>» Should be gently shaken or rotated to ensure the insulin will work effectively</li> <li>» Starts to work about 1½ hrs after injecting</li> <li>» Is usually given once or twice a day to help keep your blood glucose levels within your target range in the morning or before the evening meal</li> <li>» Has a peak action 4–12 hours after being injected and lasts for 16–24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>» PROTAPHANE®</li> <li>» HUMULIN NPH®</li> </ul>
Long-acting insulin	<ul style="list-style-type: none"> <li>» Clear insulin</li> <li>» Provides a constant slow release of insulin over 24 hours</li> <li>» Is usually given once a day to help keep your blood glucose levels within your target range in the morning on waking</li> <li>» Should be injected at the same time every day.</li> </ul>	<ul style="list-style-type: none"> <li>» LANTUS®</li> <li>» LEVEMIR®</li> <li>» TOUJEO®</li> </ul>
Mixed insulin	<ul style="list-style-type: none"> <li>» Cloudy insulin</li> <li>» Allows two insulin types in the one injection: an intermediate-acting insulin combined with either an ultra-short or a short-acting-insulin</li> <li>» Should be gently shaken or rotated to ensure the insulin will work effectively</li> <li>» Check with your GP about how soon to eat after injecting: it will be either immediately after or 20–30 minutes after, depending on the insulin you are taking</li> <li>» Continues to lower your blood glucose level for 24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>» NOVOMIX 30®</li> <li>» HUMALOG MIX 25®</li> <li>» HUMALOG MIX 50®</li> <li>» MIXTARD 30/70®</li> <li>» MIXTARD 50/50®</li> <li>» HUMULIN 30/70®</li> </ul>

## Storing insulin

It's important to store insulin correctly:

- » Store your unopened insulin in the fridge (away from the freezer/chiller section). Don't let your insulin freeze.
- » Keep the insulin you are using at room temperature (below 25 degrees Celsius). Once insulin has been opened, it can stay at this temperature for up to 28 days.
- » It's fine to keep your current insulin pen in your handbag or bag.
- » Don't keep it in a place where it might get hot, like in your car or near a window.
- » Once open, dispose after 28 days.

## Community sharps disposal

Sharps include syringes, pen needles, lancets (finger prickers) and needles used for insulin pumps and continuous glucose monitors.

Make sure you dispose of sharps safely by placing them in a strong, Australian-standard approved plastic container. Australian standard sharps containers are available from NDSS Access Points (usually a community pharmacy). Don't use glass or cardboard containers, tins or plastic bottles.

You can dispose of sharps containers at some public hospitals, participating pharmacies, community sharps disposal bins and some councils.



### More information

For more information, and to locate community sharps disposal facilities across Australia, go to [safesharps.com.au](https://safesharps.com.au)

You can also call the NDSS Helpline on 1300 136 588 or call your local council for more information.



Make sure you dispose of sharps safely by placing them in a sharps container.

## The NDSS and you

A wide range of services and support is available through the NDSS to help you manage your diabetes. This includes information on diabetes management through the NDSS Helpline and website. The products, services and education programs available can help you stay on top of your diabetes.

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