



## Insulin and Sharps Disposal

### What is insulin?

Insulin is a hormone made by the pancreas. Insulin enables glucose in the blood to be transported into the body cells. The glucose can be converted into energy, stored in the liver ready for later use, or excessive glucose is stored as fat. Insulin cannot be given in tablet form, as the stomach would digest it, just as it digests food.

### Types of insulin

Some insulins available in Australia are called human insulin. They are synthetically engineered so that it is identical to human insulin. Some insulins are called analogue insulin. They are made to be different to human insulin to create different actions. Everyone is different and will need insulins with different types of action. Insulin is grouped according to its speed of action or how quickly it works in the body.

### Rapid acting insulin (clear)

These types of insulin are rapid acting with an onset of action between 0-20 minutes, a peak effect at approximately 1-1 ½ hours and duration of 3 - 5 hours. The three rapid acting insulins currently available in Australia are Apidra, Humalog and NovoRapid. It is important when using these types of insulin to inject and then eat immediately (within 10 minutes). For further information on the timing of rapid acting insulin contact your specialist, GP or diabetes educator.

### Short acting insulin (clear)

Short acting insulins are clear insulins and begin to take effect approximately 30 minutes after injection. These have a peak effect at two to four hours and duration of six to eight

hours. Currently available short acting insulins are Actrapid, Humulin R and Hypurin Neutral (beef). These should be given 20 to 30 minutes before a meal. For further information on the timing of short acting insulin contact your specialist, GP or diabetes educator.

### Intermediate acting insulin (cloudy)

Intermediate acting insulins are cloudy insulins. These insulins must be gently shaken/rotated before use. They begin to take effect approximately 1 ½ hours after injection, peak at 4 - 10 hours and last for up to 12-24 hours.

Intermediate acting insulins currently available in Australia are Protaphane, Humulin NPH and Hypurin Isophane (beef).

### Pre-Mixed insulin (cloudy)

There are two groups of pre-mixed insulins.

#### Rapid/Longer Acting Premixed

The insulins in the first group contain rapid acting insulin and modified rapid acting insulin which acts more slowly. This pre-mixed insulin should be injected immediately before you eat (within 10 minutes). For further information on the timing of rapid premixed insulin contact your specialist, GP or diabetes educator. These insulins must be **gently** shaken/rotated before use.

There are three insulins in this group; they are Humalog Mix 25, Humalog Mix 50 and NovoMix30. For further information on the timing of these insulins contact your specialist, GP or diabetes educator.

## Short Acting/Intermediate Acting Premixed

The second group of insulins are a combination of short acting and intermediate acting insulins. There are now three premixed insulins, in this group, they are Humulin 30/70, Mixtard 30/70 and Mixtard 50/50. The fraction indicates the ratio of short acting (30%) to intermediate acting insulin (70%). These premixed insulins should be injected 20-30 minutes before eating. Gently shake/rotate this insulin before use.

## Long acting Insulin (clear)

There are two long acting insulins available in Australia at present. These insulins have either no peak in their action or a slight peak and have duration of up to 24 hours. Currently available are Lantus (Glargine) and Levemir (Detemir).

Lantus begins to take effect approximately ½ hour from injection and lasts for 24 hours. Levemir begins to take effect at approximately 1 – 2 hours and has a slight peak at 6 – 12 hours and lasts for 20 – 24 hours.

## Beef Insulin

Prior to the development of synthetic insulin, beef insulin was used. Synthetic insulin is closer in structure to the insulin that humans produce, however beef insulin is still available on prescription if required, but its use is very limited today.

## How is insulin given?

Insulin can be given a number of ways:

- An insulin pen with a fine needle. Some pens are disposable, others are reusable.
- The reusable pens are provided by the insulin companies free of charge
- An insulin pump
- A syringe with a fine needle

## Where should insulin be injected?

Into the subcutaneous or fatty layer under the skin of the abdomen, thigh or buttock. Absorption rate varies with each site. Each injection should be given in a slightly different spot to ensure even distribution and to avoid local lumps at the site.

This is called rotating sites.

For rapid, short and long acting insulin the preferred site is the abdomen

For intermediate acting insulin the thighs or buttocks may be an alternative site, particularly for a bedtime injection. This should be discussed with your specialist or diabetes educator.

## What factors affect the absorption of insulin?

Rapid absorption of insulin may contribute to hypoglycaemia.

Absorption is **sped up** by:

- Heat applied to site e.g. shower, bath, hot water bottle, spa and sauna massage around the injection site
- Accidental injection into muscle (a deeper injection into the muscle will result in a faster absorption rate as there are more blood vessels to absorb insulin)
- Exercise, which increases blood circulation to the area

Absorption can be **delayed** by:

- Smoking
- Scarring/lumps at injection site
- Cold insulin
- Action of rapid/short acting insulin can be delayed if Lantus is injected too close to the rapid /short acting injection site

Absorption can be either **sped up or delayed** by:

- Injection site
- Needle length
- Injection angle

## Some important points

For cloudy insulins **gently** shake/rotate the insulin device e.g. pen or the vial of insulin.

Ensure that your skin is clean. There is no need to use alcohol swabs on the injection site.

Keep the insulin pen or syringe as still as possible whilst under the skin as movement can cause lumps, bruises and pain.

Apply pressure to the site for a short time. This helps to prevent bruising and subsequent fibrous lumps. Do not rub or massage the site.

If mixing intermediate/cloudy and short acting types of insulin contact your doctor or diabetes educator to be shown how to mix these insulins

Needles have been designed as one use only to give painless or near painless injections, therefore use a new needle each time.

If using Lantus and rapid acting insulin at the same time, they cannot be given at the same site. Inject in sites away from each other, e.g. either side of the abdomen. Consider dividing your abdomen into **Left** for Lantus and **Right** for Rapid/Short acting to keep the sites separate from each other. Continue to rotate injection sites for each side

### How should insulin be stored?

Insulin not in use:

Unopened pen fill cartridges, disposable insulin devices or insulin vials should be stored on their side in the fridge between 2°C and 8°C.

**Do not allow insulin to freeze**

Use by the expiry date

Do not inject cold insulin. Use at room temperature. Injecting cold insulin can be painful.

Insulin in use:

In use includes opened insulin and unopened insulin that has not been stored between 2°C and 8°C even for a short period of time

Insulin considered **in use** must be discarded after 28 days.

Insulin pens can be safely carried in your handbag or pocket; do not keep non disposable pens in the fridge.

Insulin must be kept away from excessive heat (e.g. left in the car for long periods) or direct sunlight.

Insulin may be damaged by excessive vibration.

Do not 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 seen in the insulin.

Deposits of insulin are seen on the inside of the vial which cannot be dissolved with gentle shaking/rotation.

The vial has been open for longer than one month.

How can I help others in need of insulin?

Third world countries need insulin. If you have spare **in-date insulin in unopened packages**, which have at least 3 months before expiry, please donate to your nearest NDSS subagent. If it has less than 3 months until expiry or it has expired, take the insulin to your local pharmacy for correct disposal.

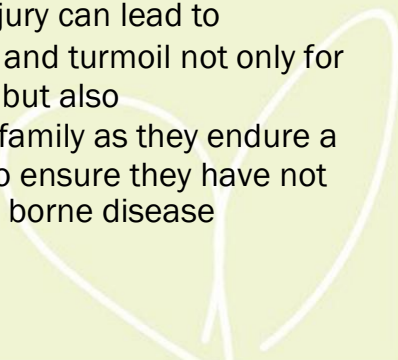
### Sharps Disposal

Sharps are objects or devices having acute rigid corners, edges, points or protuberances capable of cutting or penetrating the skin e.g. hypodermic needles, pen needles and finger pricking lancets.

### Why should I use a sharps container?

If you use sharps either a needle for insulin or a lancet for blood glucose monitoring then you **are** responsible for the correct disposal of those sharps. You must protect council workers and others from needle stick injuries.

Needle stick injuries is the term used for anyone sustaining an injury from a 'sharps'. Having a sharps injury can lead to emotional distress and turmoil not only for the person injured but also their partners and family as they endure a three month wait to ensure they have not contracted a blood borne disease



## What diseases can spread from used needles?

Hepatitis B and C

HIV

## Who is at risk of accidentally pricking their fingers or feet?

Children and families in playgrounds and public areas, who accidentally prick their fingers or feet

Council workers employed for waste disposal duties

Relatives

Health care workers

## What happens to your sharps if you don't dispose of them correctly?

If you dispose of sharps in your household rubbish and a council worker injures themselves, the council has the right to refuse rubbish collection

Sharps in household rubbish are disposed in landfill areas. This continues to present a danger to council workers and members of the public using landfill areas. It is important to remember that heavy earth moving equipment can rupture containers exposing needles

## What is the correct way to dispose of sharps?

In an approved SHARPS container that is: labelled SHARPS

Displays the Bio-Hazard symbol

A non penetrable plastic that is yellow in colour

One port entry that cannot be removed and can be sealed when the container is  $\frac{3}{4}$  full.

## How do I dispose of my sharps container?

Check with your local council and how they accept sharps containers for disposal

Check with your local hospital, particularly if you are in a rural/remote area

Check with your local pharmacy

Check with your local community health centres

Diabetes WA has a limited size range of containers for mail order and can receive full sharps containers for disposal

## Any Problems

Sharps Disposal is a long standing issue that can lead to confusion. If you have difficulties with the disposal of your sharps container, please contact your local Federal Member of Parliament. You can find your local member's contact details through [www.aph.gov.au/house/members/mi-elctr.asp](http://www.aph.gov.au/house/members/mi-elctr.asp)

Or

[www.aph.gov.au/senate/senators/homepages/index.asp?sort=state](http://www.aph.gov.au/senate/senators/homepages/index.asp?sort=state)

While this issue is often at a Local Government level, it is believed that sharps disposal is a nation wide issue then the Commonwealth Government may be able to assist removing the confusion from this issue. It is also more than an issue for diabetes as there are more and more people with medical conditions that will need to be able to dispose of sharps correctly.

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