

# All about insulin pumps

Insulin pump therapy or continuous subcutaneous insulin infusion is an alternative to multiple daily insulin injections. It is designed to provide a continuous flow of insulin to the body across the day.

If you are interested in starting an insulin pump it is important to speak to your diabetes team and for you to research the different insulin pumps on the market to find the one you think is right for you.

## Insulin pump therapy requires;



Motivation



Trust in technology



Continuous glucose monitoring system **OR**  
Frequent self blood glucose monitoring



Carbohydrate counting

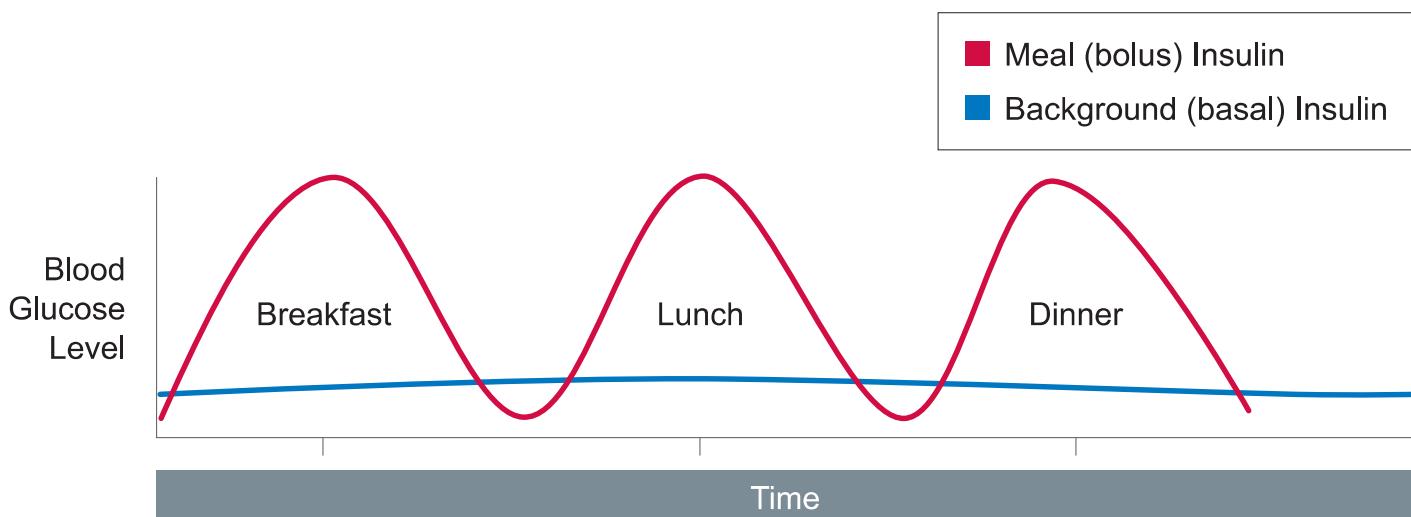
## Insulin pump overview

### What is an insulin pump?

An insulin pump is a battery operated device that contains an insulin filled reservoir which is inserted into the pump and attached to the body via a cannula and infusion set. The pump is controlled by you, within the settings programmed into the pump.

The insulin pump delivers insulin through a cannula that is inserted under the skin. It delivers rapid acting insulin continuously. Background insulin delivered is known as basal insulin. When carbohydrates are eaten these are counted in grams and entered into the pump. The pump then delivers extra insulin for meals called bolus insulin.

The insulin pump will also deliver extra insulin if glucose levels are too high. These are known as corrections.



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## The benefits of insulin pump therapy

### ✓ Improved glucose control

The use of rapid acting insulin delivered on a continuous basis eliminates the need for long acting insulin, which has different rates of absorption.

### ✓ Greater flexibility

An insulin pump allows greater flexibility with meal times and lifestyle. For example, meals can be eaten when convenient, and not dictated by injected insulin. This eliminates the need to eat to avoid low glucose levels.

### ✓ Fewer episodes of hypoglycaemia

Insulin delivery can be adjusted more accurately according to individual insulin requirements throughout the day and overnight.

### ✓ Improved quality of life

Individuals who have difficulty with managing their glucose levels can use insulin pump therapy to improve management and restore confidence.

### ✓ Hybrid-closed loop system

Individuals using an insulin pump and continuous glucose monitoring also have the option of using the hybrid closed loop system. This allows the continuous glucose monitoring system to send glucose readings to your insulin pump, which will then alter your basal insulin dose accordingly.

### ✓ Improved exercise management

An insulin pump can be programmed to reduce the amount of basal insulin being delivered to compensate for activities such as exercise.

### ✓ Improved sick day management

During illness, it is common to require more insulin. A pump can be programmed to deliver an increased basal rate of insulin throughout the period of illness.

### ✓ Improved glucose levels in gastroparesis

This condition can result in delayed stomach emptying and digestion and therefore varied post meal glucose levels. A pump can be programmed to delay the delivery of a bolus to better match delayed digestion thus assisting in managing variable.

### ✓ Safe during pregnancy

Insulin requirements can vary during pregnancy.

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## What are the challenges of using an insulin pump?

### **⚠ Potential for diabetic ketoacidosis (DKA)**

As insulin pumps use only rapid-acting insulin, any disruption to insulin delivery for more than a few hours will cause blood glucose levels to rise quickly. This can result in ketone production.

### **⚠ Frequent blood glucose monitoring if not using CGMS**

If you are not using continuous glucose monitoring you need to check your blood glucose levels at least four times per day. When commencing and stabilising a pump for the first time this will be up to eight times.

### **⚠ Skin infections**

A variety of cannulas, featuring hypoallergenic adhesives, are available to minimise skin reactions. Correct cannula insertion technique must be followed to prevent skin infections. Infusion sets must be changed every three days. Reactions are still possible and should be discussed with your diabetes educator.

### **⚠ Skills required for pump alarms and alerts**

The programming and daily use of insulin pumps is designed to be user-friendly, however it still requires a certain level of skill to manage. Alerts and alarms are apart of pump therapy and these are designed to ensure you take action where action is needed for your diabetes management and safety. This can be challenging when you first start pump therapy.

### **⚠ Managing the technology**

Intensive training sessions are required so that you are confident that you can use an insulin pump safely. Pre-reading and online practice tools can help prepare you for your pump start.

### **⚠ Staying connected**

Being attached to an insulin pump 24 hours a day may be a concern for some people. The device is worn externally which may be visible to others, however they are small and can be hidden in clothing. Insulin pumps can be disconnected for short periods of time for activities such as showering, swimming, sports or sex.



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## What are the costs involved?

To purchase a pump without private health insurance would cost approximately \$8,000-\$10,000.

- Insulin pumps are covered by Schedule 5 (prosthetic list) under basic hospital cover and therefore most private health insurance funds will rebate the full cost of an insulin pump.
- 'Extras' cover is generally not required. Discuss with your insurance the appropriate level of cover and qualifying periods. Most private health insurance companies have a qualifying period of at least 12 months.
- Pump consumables (infusion sets and reservoirs/cartridges) are subsidised (in type 1 diabetes) under the National Diabetes Services Scheme (NDSS). Continuous glucose monitoring is also subsidised through NDSS. The out of pocket costs for both of these is approximately \$70-\$80 per month.

## Which pump should I use?

Deciding on which pump is right for you is an important personal decision. There are currently a variety of insulin pumps available in Australia. It is important you consider your lifestyle and the features that you are looking for in an insulin pump when making your decision. You will need to discuss this with your health care team and also do your own research when making your final decision.

Pumps available in the Australian market are subject to approval from the Therapeutics Good Administration. As these are updated regularly, speak with your diabetes educator for more information.

## Carbohydrate counting for pump use

Carbohydrate counting on an insulin pump is required with all meals and snacks to ensure the insulin pump delivers the correct amount of insulin. It involves being able to identify all of the carbohydrate in your meals, snacks and beverages and count them in grams of carbohydrate. The grams of carbohydrate are then entered into your pump to calculate your bolus insulin dose.

### Prior to using a pump, a dietitian will teach you:

- What foods contain carbohydrate and how to identify any commonly 'forgotten' sources of carbohydrate.
- How to read food labels, weigh and measure foods and beverages to accurately calculate carbohydrate.
- How to select and use reliable online data bases, apps and paper-based resources to assist carbohydrate counting.
- Tips for carbohydrate counting when eating out and for calculating carbohydrate in home cooked recipes.



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## Carbohydrate counting for pump use

### Carbohydrate counting records

- You will be encouraged to practice carbohydrate counting at home to build your knowledge and skills and complete a food diary recording the grams of carbohydrate consumed.
- The carbohydrate counting record requires review by a dietitian before commencing insulin pump therapy.

### Review of carbohydrate counting

- Once you are using your insulin pump, a dietitian will review your carbohydrate counting and answer any questions.



### Where to from here?

If you and your specialist agree that insulin pump therapy is a good option for you, then you will need a series of appointments with a diabetes educator to prepare. These will be paced to suit your requirements and provide you with the knowledge and skills to prepare you for using a pump.

Other requirements:

- Referral to a dietitian to assist you in developing skills in carbohydrate counting. These sessions are paced to suit your learning needs.
- After you have commenced on a pump, regular one to one appointments with a diabetes educator for several weeks, to test and fine tune your pump settings. These appointments may be conducted remotely (via phone or email) and are reliant on you making your data and reports available to the team via Internet based software platforms. This enables the diabetes educator to review your pump report and make recommendations for changes.

In time, you may become comfortable with reviewing your own reports and making changes, however your health care team is always there to guide you.

### More information

-  Call us on **(03) 8532 1800** or
-  visit **[www.baker.edu.au/insulin-pumps](http://www.baker.edu.au/insulin-pumps)**



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Review date: 2025.