

An Introduction to Insulin Pump Therapy

Insulin pump therapy for people with Type 1 Diabetes

What is an insulin pump?

An insulin pump is a small electronic device that delivers insulin continuously throughout the day and night via a tiny tube called a cannula which sits just under the skin. An insulin pump allows you greater flexibility to match your insulin requirements to your lifestyle.

An insulin pump uses fast/rapid acting insulin to deliver a steady basal rate of insulin across a 24 hour period and can be programmed to deliver different amounts of insulin at different times of the day or night. When you eat, you deliver a bolus dose of insulin via the pump to cover the carbohydrate content in each meal or snack.

What is a hybrid closed loop insulin pump?

A hybrid closed loop insulin pump is designed to automatically adjust insulin delivery based on blood glucose level. It combines the features of a continuous glucose monitoring (CGM) system and an insulin pump to provide more precise and personalised diabetes management. The system consists of a sensor that continuously measures glucose levels, an insulin pump that delivers insulin, and a computer algorithm that controls insulin delivery based on glucose readings. The algorithm calculates how much insulin is needed to maintain glucose levels within target range, taking into account factors such as meal consumption, exercise, and insulin sensitivity. With a hybrid closed loop system, the person with diabetes still needs to manually input information such as carbohydrate intake and exercise, but the system will automatically adjust insulin delivery based on this information and the individual's glucose readings.

Hybrid closed loop insulin pumps have been shown to improve glucose control and reduce the risk of hypoglycaemia, making them a valuable tool for managing diabetes. However, they are not a cure for diabetes and require ongoing monitoring and adjustments to ensure optimal glucose control.

Hybrid closed loop insulin pumps are available to all patients with Type 1 Diabetes in NHS Forth Valley.

There are 2 types of insulin pump, a tethered pump and a patch pump.

A tethered pump (tubed pump) is attached to your cannula by a small tube and can be carried in your pocket, worn on your belt or under your clothes. The pump itself can vary in size and features.

A patch pump is attached directly on to your body (usually legs, arms or stomach) and has no extra tubing therefore is controlled using a remote.

Your diabetes team would be happy to talk to you about what type of insulin pump might work best for you. Information regarding the current pumps offered by NHS Forth Valley can be found on the following websites:

Omnipod 5 System (Patch pump)

[Omnipod® 5 Automated Insulin Delivery System](#)



You can order a free Pod Experience Kit to trial via the website

Links with a Dexcom G6 sensor to work as a hybrid closed-loop system.

Ypsomed (Tethered pump)

[YpsoPump with mylife Loop - mylife Diabetescare – International \(mylife-diabetescare.com\)](#)



Links with Dexcom G6 sensor or Freestyle Libre 3 and CamAPS® FX, the hybrid closed-loop app

Download the **mylife CamAPS FX app** from the Google Play Store (Not yet available for iPhone)

Tandem t:slim X2 (Tethered pump)

<https://www.makingdiabeteseasier.com/uk/>



You can download the t:simulator app below.



Links with a Dexcom G6 sensor using Control-IQ advanced hybrid closed-loop technology.

Medtronic 780G (Tethered pump)

[MiniMed™ 780G system | Medtronic Diabetes \(medtronic-diabetes.com\)](#)



Works with a Guardian 4 sensor and SmartGuard automation as a Hybrid closed-loop system.

Advantages and Disadvantages of insulin pump therapy

Advantages

- Can improve variability in blood glucose levels and HbA1c
- Increased time in range
- Reduce number of hypos
- Reduce the burden of T1 diabetes decisions and improve quality of life
- Can deliver insulin in much smaller amounts than injections
- No need for multiple injections as you only need to change the infusion cannula or patch pump every 2-3 days

Disadvantages

- You still need to count carbohydrates and input into the pump
- You will be attached to the pump almost all of the time
- If there is a problem with the cannula or the pump fails, no insulin will be delivered so you are at increased risk of diabetes ketoacidosis (DKA)
- Pumps can be difficult to hide under tight/fitted clothing
- If you leave the infusion set in more than 3 days there is a chance of skin infections

Who benefits from an insulin pump?

Starting an insulin pump requires a great deal of commitment, however if you put in the time and effort it can allow greater flexibility and improved diabetes control. If you have type 1 diabetes, and meet the criteria detailed below you can be considered for an insulin pump.

1. Type 1 Diabetes and manage your diabetes using a basal bolus/multiple daily injection (MDI) insulin regimen ✓
2. Regular attendance at scheduled clinic appointments ✓
3. Are committed to close monitoring of your glucose levels either via flash glucose monitoring or CGM and be willing to share data with your diabetes team ✓
4. Having some knowledge of carbohydrate counting will help you to get the most from your hybrid closed loop insulin pump system however this is not an essential criteria ✓

What do I need to do next?

If you require any support with carbohydrate counting before proceeding with insulin pump therapy please contact the diabetes dietitians on fv.fvdiabetesdietitians@nhs.scot or 01324 566626.

Further information regarding insulin pump therapy can be found on the following websites:

<https://nhsforthvalley.com/health-services/az-of-services/diabetes/pump-therapy/>

[DTN-UK Education: Expert views on devices | ABCD \(Diabetes Care\) Ltd](#)

Keen to proceed?

If you feel an insulin pump is for you please email the pump team on fv.diabetespumpserv@nhs.scot. You will be asked to complete a food diary and attend an insulin pump assessment appointment with a member of the team in order to discuss your requirements in more detail.