NHS
West Hertfordshire Teaching Hospitals
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A guide to...

Insulin Pump Therapy

Patient information

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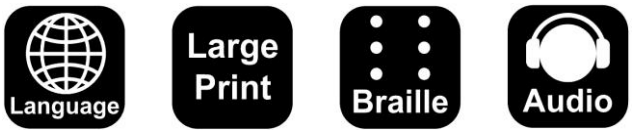
If you need this leaflet in another language, large print, Braille or audio version, please call **01923 217 198** or email **westherts.pals@whht.nhs.uk**



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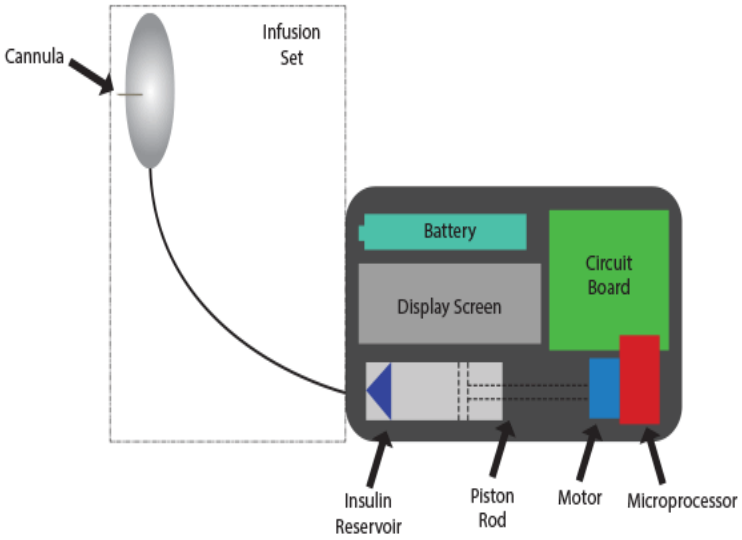
What is insulin pump therapy?

An insulin pump is a small device that delivers fast-acting insulin into the body either via an infusion set - a thin plastic tube ending in a small, flexible plastic cannula or a very thin needle, or via a patch (pod) pump.

How the system works:



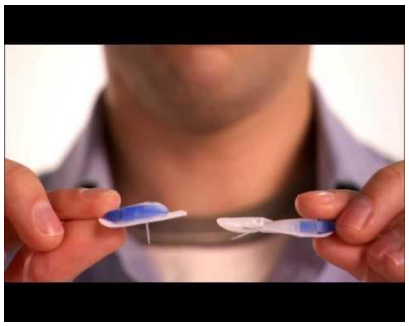
Infusion set and cannula:

Patch (pod) pump:

You/ your parent/ guardian inserts the cannula beneath the skin at the infusion/ pod site, usually in your abdomen, arm, thigh or upper buttock. You/ your child keeps the infusion set/ pod in place for two to three days and then moves it to a new location to reduce the risk of lumpy sites (lipohypertrophy).

Patch (pod) pump:

Cannula:



Places on the body you can put a patch (pod) pump or cannula:

All insulin is delivered through the infusion set/ pod.

A pump is worn ALL the time, as your body needs insulin ALL the time. If you choose a tubed pump and it is not waterproof you will have to remove it for swimming, and you may wish to for contact sports. If you remove your pump for sport, it must only be for one hour maximum per day. A patch (pod) pump can be worn all the time and cannot be removed for contact sport.

Wearing an insulin pump still requires you to tell the pump how much you are eating in grams of carbohydrate. You will need to learn how to use the pump to deliver extra insulin when your glucose levels are high, how to adjust settings, and how to manage sport/ activity.

What is a Hybrid closed loop (HCL) pump system?

A pump can be used in manual mode, when it delivers a small amount of insulin on a regular pre-programmed basis. Hybrid closed loop (HCL) systems use a mathematical algorithm to deliver insulin automatically in response to continuously monitored tissue fluid glucose levels. They use a combination of real-time glucose monitoring from a continuous glucose monitor (CGM) device and a control algorithm to direct insulin delivery through the pump. The HCL systems have been shown to help people with Type 1 diabetes achieve improved HbA1c results.

Wearing an HCL insulin pump still requires you to tell the pump how much you are eating in grams of carbohydrate.

Who can have an insulin pump?

The NICE Technical Appraisal Guidance - TA943 (Published 19 December 2023) recommended HCL systems as an option for managing blood glucose levels in all young people with Type 1 diabetes. **NICE Guidance: www.nice.org.uk/guidance**

The websites listed below will help you chose your preferred system. You can also discuss the options with your Key Worker or in clinic, to determine the best option for your child. The eligibility for specific HCL systems varies according to age and the commissioning guidelines of the Integrated Care Board (ICB) who fund the insulin pump systems. The options available for your child will vary as new technology is released and commissioning guidelines updated.

Tubed HCL pumps:

CamAPS FX with Dana or Ypsomed pump + Dexcom G6
Medtronic 780G + Guardian 4 sensors
Tandem t:slim + Dexcom G6 and G7

Non-tubed HCL pumps:

Omnipod 5 + Dexcom G6

Before starting on pump therapy we will give you a workbook to complete to demonstrate the following management skills and to identify any areas that need additional training to enable a successful pump start.

- Carbohydrate counting and insulin adjustment
- Bolusing 15 minutes before meals if using Novorapid insulin
- Use of correction doses to lower blood glucose levels
- Be able to adjust insulin doses according to blood glucose levels and activity patterns
- If blood glucose monitoring, testing at least five different times a day
- Sharing your diabetes data (insulin doses, pump settings and glucose levels) with the diabetes team via Glooko.com

The next step

Before considering an insulin pump we suggest you speak to other families about life on an insulin pump.

Consider wearing a demo pump (that doesn't contain insulin) so you can experience what pump therapy is like. You can do this by contacting the pump company directly for a demo Omnipod and by contacting the diabetes team for any pump with tubing.

In order to start insulin pump therapy, we agree criteria to ensure the child or young person with diabetes can measure the success of the treatment in relation to:

- Reduction of HbA1c.
- Reduction in the frequency and severity of hypoglycaemia or the impact of hypoglycaemia on the lives of the children and young people.

These criteria are reassessed regularly at Diabetes Clinic to ensure continuing success of insulin pump therapy for the child or young person.

Occasionally, we negotiate with the children and young people, and their families, about stopping insulin pump therapy, if by not adhering to diabetes treatment advice puts them at risk of becoming unwell. Children and young people, and their families, agree a treatment plan with the team, but if they cannot follow the treatment plan the pump may be withdrawn, in the interest of your/ your child's safety due to the risks of diabetic ketoacidosis and significant hypoglycaemia.

Are you pump ready?

The answer to this question is yes if:

- You are managing your diabetes using the management skills listed
- You and your parents are willing to use the pump
- You are working towards using all injection sites
- You are able to attend all the education sessions and check glucose levels regularly (at least five times through the day and night in the first few weeks)
- You will be able to support school and other family members with pump use

Further information

For more information on different brands see table below or you can visit the following websites:

https://camdiab.com/

https://www.medtronic-diabetes.com/en-gb/insulin-pump-therapy/minimed-780g-system

https://www.mylife-diabetescare.com/en-GB/mylife-loop.html

https://www.omnipod.com/en-gb/what-is-omnipod/omnipod-5

https://www.tandemdiabetes.com/en-gb/home

Make and model:	Medtronic 740G	Medtronic 780G	Omnipod 5	Tandem t:slim x 2	CamAPS FX and Dana pump	CamAPS FX and Ypsomed pump
Age:	From birth	From 7 years old	From 2 years old	From 6 years old	From 1 year old	From 2 years old
Pump type:	With tubing	With tubing	Patch	With tubing	With tubing	With tubing
Pump weight:	102g	102g	25g (pod only)	112g	86g (with battery)	83g (with battery & full cartridge)
Data sharing:	Automatic via Carelink Connect app. **Smart phone required*	Automatic via Carelink Connect app. **Smart phone required*	Automatic to Glooko **Smart phone required*	Via Glooko using charging cable connected to laptop **Laptop required*	Automatic via CamAPS app to Glooko.com **Smart phone required*	Automatic once Ypsomed mylife account is connected to Glooko.com **Smart phone required*
Linked CGM system:	Yes – Guardian sensor & transmitter	Yes – Guardian/ Simplera sensor & transmitter	Yes – Dexcom G6	Yes – Basal IQ with Dexcom G6 & G7	Yes – Dexcom G6	Yes – Dexcom G6
Does the pump respond to the linked CGM:	Yes - predictive low glucose suspend	Yes – hybrid closed loop system with basal adjustment and auto correction boluses	Yes – hybrid closed loop system with basal adjustment and auto correction boluses	Yes – hybrid closed loop system with basal adjustment and auto correction boluses	Yes – hybrid closed loop system with basal adjustment and auto correction boluses	Yes – hybrid closed loop system with basal adjustment and auto correction boluses
Cannula options:	20-45° Teflon 30° Teflon 90° Teflon (+ 7 day option) 90° Steel	20-45° Teflon 30° Teflon 90° Teflon (+ 7 day option) 90° Steel	45° Soft	30° Soft 90° Soft Variable angled 90° Steel	Soft release 90° Teflon Easy release 90° Steel	90° Soft 90° Steel 360° rotating connector
Cannula insertion:	Choice of both Steel manual only	Choice of both Steel manual only	Automatic	Choice of both Steel manual only	Choice of both	Choice of both
Cannula disconnect/ reconnect:	Yes	Yes	No - needs replacing if disconnected	Yes	Yes	Yes
Remote control/ handset:	No	No	Yes - the only way to give boluses and commands	No	Yes - boluses can be delivered via the pump or via the CamAPS app on mobile phone	Yes - boluses can be delivered via the pump or via the CamAPS app on mobile phone
Bolus calculator:	Yes	Yes	Yes	Yes	Yes	Yes
Linked blood glucose meter:	Yes – wireless linked BG meter (Accu-Chek™ Guide Link meter)	Yes – wireless linked BG meter (Accu-Chek™ Guide Link meter)	No – uses sensor glucose	No – uses sensor glucose	No – uses sensor glucose	No – uses sensor glucose
Waterproof:	Yes	Yes	Yes (pod only)	No - splash proof only	Yes	Yes