NHS
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Hybrid closed loop enabled insulin pump therapy

This leaflet explains what hybrid closed loop (HCL) enabled insulin pump therapy is, how it works, including some of the benefits and risks.

What is HCL enabled insulin pump therapy?

It is a way of administering insulin to people with Type 1 diabetes without the need for injections. Fast acting insulin is delivered in the form of an infusion (drip) through a cannula (fine tube) inserted under the skin, which is connected to the pump by a plastic tube. The pump is of approximately the same size, shape and weight as a mobile phone. It has to remain attached via the tubing to the cannula on your skin at all times. Some insulin pumps are tubeless.

The HCL system links continuous glucose monitoring (CGM) with insulin pump technology to monitor blood glucose and automatically adjust the amount of insulin given through the pump.

HCL can eliminate finger-prick tests and prevent life-threatening hypoglycaemic and hyperglycaemia attacks. In the Royal Berkshire NHS Foundation Trust Diabetes Department, we usually recommend an HCL enabled pump for suitable people newly diagnosed with Type 1 diabetes. The benefit of the HCL is that your insulin pump can receive additional information from a continuous glucose monitor, which can then increase or decrease the amount of insulin delivered accordingly.

Who is it for?

NICE (National Institute for Health and Care Excellence) recommends the use of insulin pump/HCL therapy for appropriate people with Type 1 diabetes. For example, this might be someone who has difficulty achieving good diabetic control despite taking multiple injections every day, or someone who has frequent, disabling episodes of hypoglycaemia (hypos = low blood glucose) despite other changes to their insulin. In those circumstances, HCL enabled insulin pump therapy could be beneficial.

How does it work?

The pump has been designed to imitate the way your pancreas would have worked to provide insulin. Insulin is delivered by continuous infusion – this means insulin is given directly into your bloodstream, usually over a prolonged period of time. The rate of infusion is programmed through the pump and, with HCL, uses input from a glucose sensor to control how much insulin is delivered.

You can also deliver bolus (fast acting) insulin when having food or when you need to lower glucose if they are high (known as a ‘correction dose’). You need to instruct the pump ahead of a meal, on the amount of carbohydrate you are planning to eat, so that the pump can release an appropriate amount of insulin.

What are the risks of using the pump?

The pump delivers fast acting insulin only. There is no need to take long acting insulin. However, this means that if the pump fails for any reason, there is no store of insulin available in your body. Therefore, understanding the mechanisms of the pump and being able to take care of it are extremely important.

The cannula that you insert under your skin has to be changed every 2-3 days to avoid an infection developing and changes to the skin around the area.

What are the benefits of using the pump?

HCL enabled insulin pump therapy is useful:

- If you are trying to keep good control of your diabetes but keep suffering from severe hypos or requiring someone else's help to recover.
- If your diabetic control is so erratic that you have lost the ability to tell when your blood glucoses are dropping too low (loss of hypoglycaemia awareness).
- If you struggle to get good diabetes control.

How can I show I am suitable for pump therapy?

- Ideally you are already practising carbohydrate counting competently when using a four or five times a day insulin regime.
- You will need to show that you will not have difficulty coping with the level of commitment required to manage the pump successfully.

The NICE guidance (see link to guidance at the end of this leaflet) on pump selection criteria helps determine who will benefit from HCL enabled insulin pump therapy and when it can be offered to patients. **People on HCL enabled insulin pump therapy who do not follow the above commitments are at risk of being quickly hospitalised with diabetic ketoacidosis, which is a major acute life-threatening complication and is to be avoided at all costs.**

What happens next?

When you have been referred by the diabetes team for consideration of HCL enabled insulin pump therapy, you will receive an appointment to be assessed in a clinic run by a diabetes nurse specialist and a specialist dietitian. You will then be given a date to attend the training sessions to start on an HCL enabled insulin pump. You will be expected to keep regular clinic appointments.

Important points

The pump and consumables are provided by the NHS free of cost to you. In return we would expect you to attend all the clinic appointments made for you, because **regular review is essential to maintain stable diabetic control and address any issues related to the functioning of the pump**.

If you move out of the area, you must notify us because it would have implications on continuing funding of pump-related expenses.

Further reading

- Overview | Hybrid closed loop systems for managing blood glucose levels in type 1 diabetes | Guidance | NICE
- Hybrid Closed Loops (HCL) Educational Videos | The Association of British Clinical Diabetologists

If you have any questions about this leaflet, please contact:

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To find out more about our Trust visit www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

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