

Hybrid closed loop systems for managing blood glucose levels in type 1 diabetes

The Cheshire and Merseyside Area Prescribing Group recommends the use of hybrid closed loop systems for managing blood glucose levels in type 1 diabetes, by specialists only, in accordance with NICE TA943.

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[NICE technology appraisal \(TA\) 943](#) (19 December 2023 recommends hybrid closed loop (HCL) systems as an option for managing blood glucose levels in type 1 diabetes.^[1] See below for recommendations for each patient group.

HCL systems are only recommended if they are procured at a cost-effective price agreed by the companies and NHS England, and implemented following [NHS England's and NHS Wales' implementation plans](#).^[1]

HCL systems should only be used with the support of a trained multidisciplinary team experienced in continuous subcutaneous insulin infusion (CSII) and continuous glucose monitoring in type 1 diabetes, and only if the person or their carer:

- > is able to use them, **and**
- > is offered approved face-to-face or digital structured education programmes, **or**
- > is competent in insulin dosing and adjustments.^[1]

Adults

HCL systems are recommended as an option for managing blood glucose levels in type 1 diabetes for adults who have an HbA1c of 58 mmol/mol (7.5%) or more, or have disabling hypoglycaemia, despite best possible management with at least 1 of the following:

- > continuous subcutaneous insulin infusion (CSII)
- > real-time continuous glucose monitoring
- > intermittently scanned continuous glucose monitoring.^[1]

Use in pregnancy

HCL systems are recommended as an option for managing blood glucose levels in type 1 diabetes for women, trans men and non-binary people who are pregnant or planning to become pregnant.^[1]

Children and young people

HCL systems are recommended as an option for managing blood glucose levels in type 1 diabetes for children and young people.^[1]

Background

HCL systems use a mathematical algorithm to deliver insulin automatically in response to continuously monitored interstitial 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 CSII.^[1]

Note: Patients who are not eligible for treatment under this statement may be considered on an individual basis where their GP or consultant believes exceptional circumstances exist that warrant deviation from the rule of this policy. In this situation, follow locally defined processes.

Implementation

The NICE TA implementation period has been extended to 5 years for this technology. Based on the commercial framework and the recommendations in this guidance, NHS England will develop a 5-year national strategy with advice and guidance to NHS providers on the phased uptake approach. The strategy will centre on improving health outcomes and reducing health inequalities. The phased rollout will initially start with:

- > children
- > young people
- > women, trans men and non-binary people who are pregnant or planning to become pregnant and
- > adults who already use pumps who want to transition to an HCL system (over time, this will be extended to people who want to start using a pump for the first time).^[1]

Effectiveness

Clinical trial and real-world evidence shows that HCL systems are more effective than standard care at maintaining blood glucose levels within a healthy range. NICE states that there is uncertainty in the economic model, so the systems need to be procured at a cost effective price agreed by the companies who manufacture HCL systems and NHS England. This will mean the HCL systems are likely to be cost effective for adults who have an HbA1c level of 58 mmol/mol (7.5%) or more, or have disabling hypoglycaemia (when hypoglycaemia occurs frequently or without warning, so the person is constantly anxious about having hypoglycaemic episodes). So, HCL systems are recommended for these people. HCL systems are likely to be more cost effective for children and young people than adults, so they are also recommended for children and young people irrespective of their HbA1c level. Blood glucose levels are harder to manage in pregnancy, so they are also recommended for women, trans men and non-binary people with type 1 diabetes who are pregnant or planning to become pregnant.

References

1. National Institute for Health and Care Excellence. Technology Appraisal 943; [Hybrid closed loop systems for managing blood glucose levels in type 1 diabetes](#), 20 December 2023. Accessed 08 January 2024.