Research Update to compliment HCL Webinar

Your Diabetes Specialist Group Research Officers have some up to date reading to support learning and implementation following this webinar. If you have any comments or discussion points on some of the studies or guidelines discussed below please get in touch with any of our research officers Apigott@cardiffmet.ac.uk/ Paula.Chincilla@nhs.net/ Mellord@aston.ac.uk; evanwyk@nhs.net

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Useful studies

Ng et al, 2024: Long-term assessment of the NHS hybrid closed-loop real-world study on glycaemic outcomes, time-in-range, and quality of life in children and young people with type 1 diabetes. 2024 Available from https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-024-03396-x

This real world study of 251 children and young people with diabetes aimed to assess the efficacy of HCLs at 12 months post-initiation on glycated haemoglobin (HbA1c), time-in-range (TIR), hypoglycaemia frequency, and quality of life measures among children and young people (CYP) with type 1 diabetes mellitus (T1DM) and their caregivers in a real-world setting. Results demonstrated significant improvements in HbA1c , time-in-range (TIR) , hypoglycaemia frequency, hypoglycaemia fear, and quality of sleep among CYP over a 12-month period of HCL usage.

Discussion: Most (89% of the sample) were white and the lack of diversity may be a limitation of the study

Implications for clinical practice: HCL offers an opportunity for improving glycaemic control and quality of life for CYP with T1D and their families

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Petrvovski et al, 2023: Simplified Meal Announcement Versus Precise Carbohydrate Counting in Adolescents With Type 1 Diabetes Using the MiniMed 780G Advanced Hybrid Closed Loop System: A Randomized Controlled Trial Comparing Glucose Control. Available from:https://pubmed.ncbi.nlm.nih.gov/36598841/

Adolescents using the MiniMed 780G system with a preset of three personalized fixed carbohydrate amounts can reach international targets of glycemic control. Therefore, it may be a valuable alternative to precise carbohydrate counting in users who are challenged by precise carbohydrate counting. Accurate carbohydrate counting does further improves outcomes, these skills remain important for MiniMed 780G users **Discussion:** The development of personalized carbohydrate amount required dietetic input and support, but there is limited detail about how these were calculated from food diary's.**Implications for clinical practice:** Personalised carbohydrate amounts (small, medium and large meal amounts adjusted to individual eating and meal sizes) may be an a useful, appropriate and safe alternative for some young people with diabetes.

Michael S. Hughes, Ryan S. Kingman, Liana Hsu, Rayhan A. Lal, Bruce A. Buckingham, Dessi P. Zaharieva; Swimming With the Omnipod 5 Automated Insulin Delivery System: Connectivity in the Water. *Diabetes Care* 1 August 2023

Available from: https://diabetesjournals.org/care/article/46/8/e148/151533/Swimming-With-the-Omnipod-5-Automated-Insulin

Swimming poses additional challenges for glycemic management with continuous glucose monitoring (CGM) and AID devices. Waterproof reliability is crucial, but accumulated cracks or leaks can compromise water-resistant integrity over time. The Omnipod 5 Automated Insulin Delivery System addresses this with a waterproof "Pod" (ingress protection rating 28, up to 25 feet for 60 min), which is replaced every 3 days. However, submersion in water also attenuates Bluetooth signal strength, even with robust antennas.

Discussion and implications for practice: Onbody testing showed that communication success rates dropped off quickly with interdevice distances >13 cm. Those who wish to obtain optimal interdevice communication in the water should attempt to place the CGM and Pod within a 13-cm (5.1-inch) line-of-sight distance, with 10 cm being optimal.

Recent training booklets guidelines

Omnipod 5: https://www.a-c-d-c.org/wp-content/uploads/2012/08/omnipod-5-hybrid-closed-loop-training-booklet-1.pdf

T-Slim: https://www.a-c-d-c.org/wp-content/uploads/2012/08/T-slim-Control-IQ-hybrid-closed-loop-training-booklet-2.pdf

CAM-APS https://www.a-c-d-c.org/wp-content/uploads/2012/08/CamAPS-FX-hybrid-closed-loop-training-booklet-2.pdf

Medtronic https://www.a-c-d-c.org/wp-content/uploads/2012/08/Medtronic-MiniMed780G-hybrid-closed-loop-training-booklet-2.pdf

Link to "The Glucose Never Lies" AID Study Day
https://theglucoseneverlies.com/worlds-finest-automated-insulin-delivery-aid-study-day-probably/

UK's Association of British Clinical Diabetologist's Diabetes Technology Network (ABCD-DTN): Best practice guide for hybrid closed-loop therapy:

https://onlinelibrary.wiley.com/doi/10.1111/dme.15078