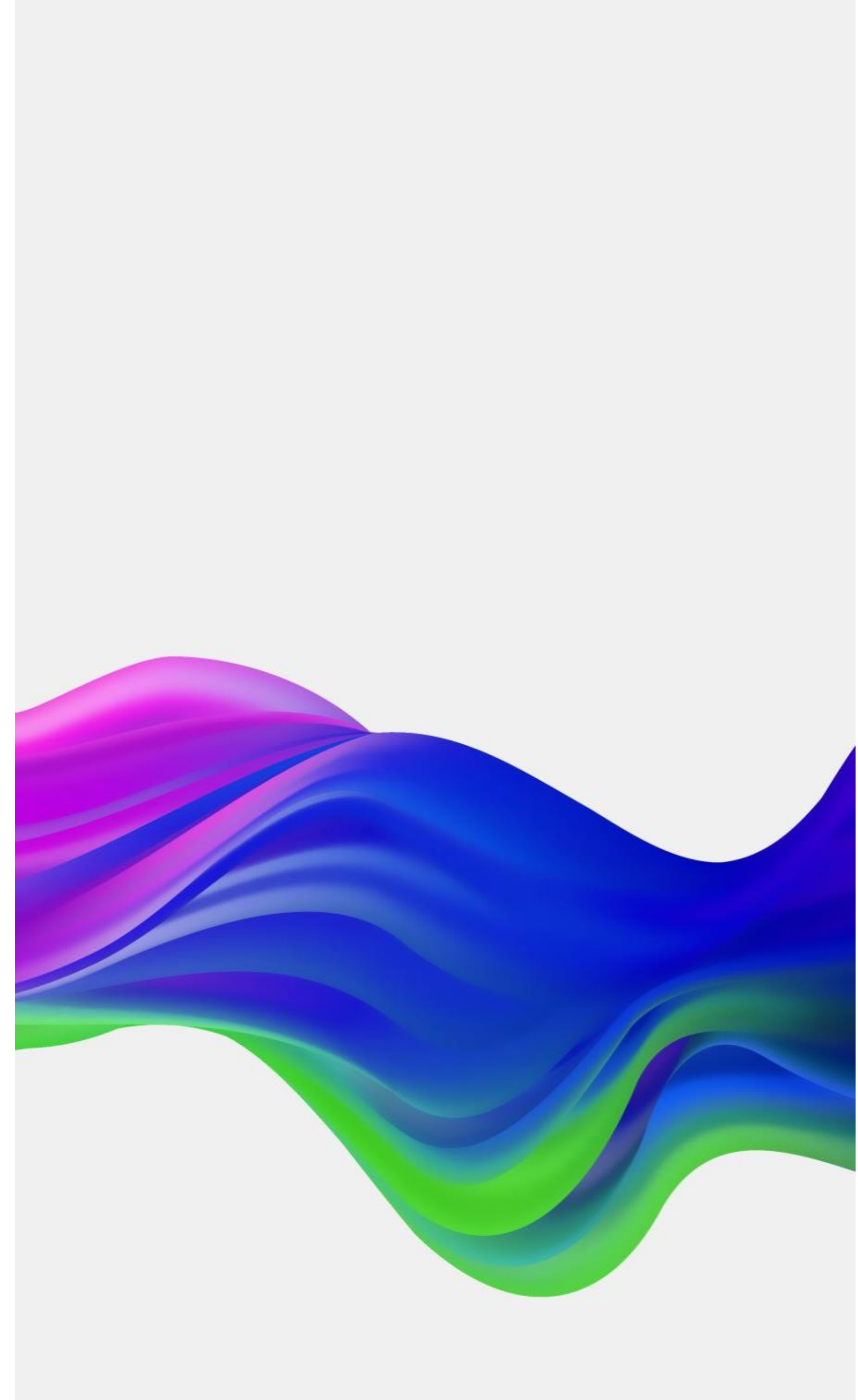
# Type 1 and disordered eating and Hybrid Close Loop System

Anne Wooding

DSN Cheshire and Merseyside T1DE Pilot Site



# Hybrid Closed Loop Insulin Pump

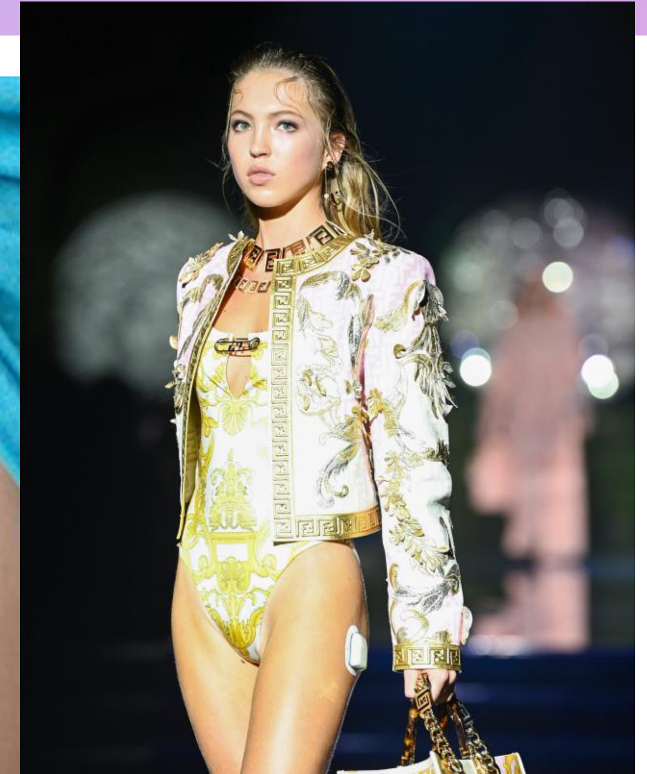
The new kid on the block!

Also known as the artificial pancreas.

Using various algorithms', the blood glucose sensor and pump delivers quick acting insulin continuously depending on glucose sensor levels and how much carbohydrate you are having with the meal.

You can get tubed and untubed pumps.

Needs carb counting and extensive education and support.



Lila Moss (Kate Moss' Daughter)

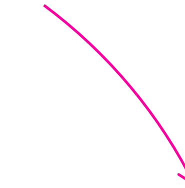
# Why are patients with Type 1 Diabetes at risk developing an eating disorder?

# What increases a persons risk?

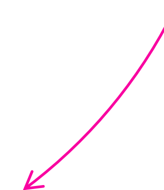
| | |
|---|---|
| • Need to carefully read food labels<br>• Focus on weight at clinic appointments<br>• Need to eat to treat hypoglycaemia, which can cause weight gain and can sometimes be counterintuitive (e.g. having to eat when not hungry), both contributing to feelings of guilt<br>• Constant awareness of carbohydrates or calories in food<br>• Feeling of shame over perceived ability to manage diabetes which may be influenced and reinforced by health care professionals' responses to efforts at diabetes management<br>• Social Media | • A poor relationship with the health care team<br>• Difficulty maintaining a desired weight<br>• Significant weight loss at diagnosis and regain on starting insulin<br>• Others' scrutiny of and assumptions about diet and diabetes management, e.g. family, friends and colleagues<br>• Language and technology can categorise people with diabetes into black and white thinking re diabetes management, e.g. 'failure vs success', 'controlled vs uncontrolled'<br>• Difficult to always eat intuitively – hunger/satiety signals overridden by hypoglycaemia treatment/fear |

Partridge H et al Type 1 diabetes and disordered eating (T1DE): the ComPASSION Project – Wessex.. Practical Diabetes 2020; 37, Issue 4 (7) 127-132

Women with Type 1 Diabetes are 2.4 times more likely to develop disordered eating

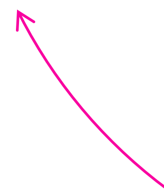


2-40% restrict insulin for weight control

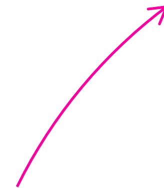


# Risks

the use of insulin restriction as a purging behaviour gives rise to an increased rate of both acute and chronic diabetes complications



Insulin restriction and eating disorders leads to 3 – 6 fold increase in all – cause mortality.

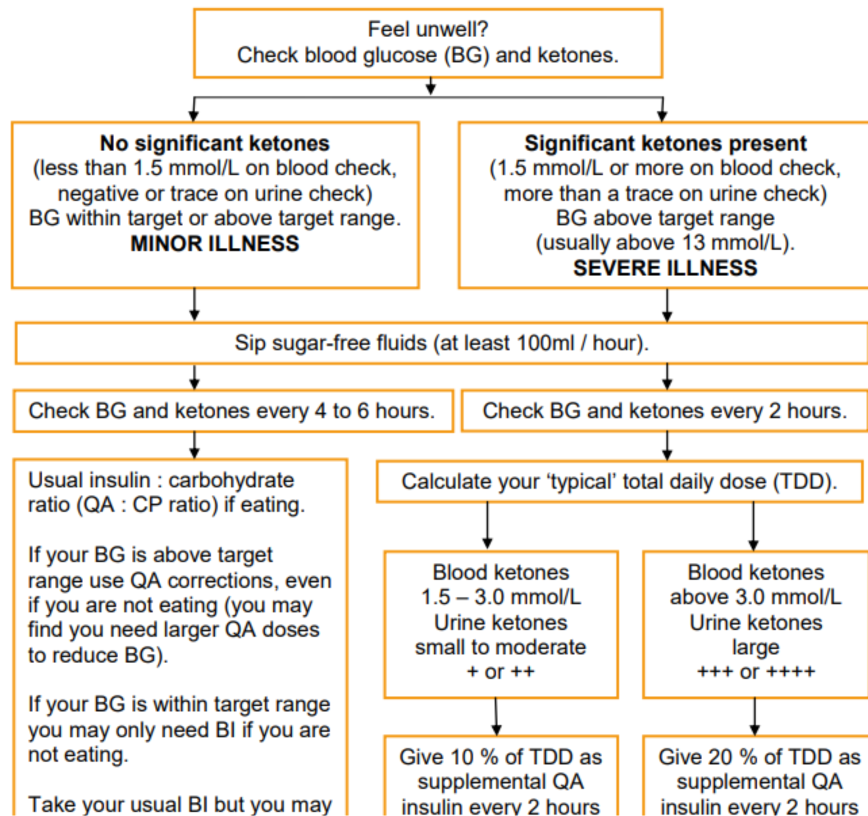


NHS
Cheshire and Wirral Partnership
NHS Foundation Trust

Helping people to be
the best they can be

NHS
Liverpool University Hospitals
NHS Foundation Trust

# Safety netting in T1DE



Type 1 Diabetes: Less guesswork.
More freedom. Better health.

DAFNE®

**Sick day rules for standard DAFNE**

**Not suitable for people taking SGLT tablets (ending in –gliflozin) refer to the guidance provided by your local hospital.**

**Disclaimer**

This guidance is developed for use by people with type 1 diabetes who have completed a 5-day face to face DAFNE course[1] and understand the principles of accurate carbohydrate counting and of insulin dose adjustment, so that their daily insulin doses are already balanced prior to following this guidance.
The DAFNE programme assumes no responsibility or liability for any injury, loss, damage or expense that may be caused by any action, or lack of action, that may be taken as a result of using this guidance.

[1] delivered by appropriately trained and certified DAFNE educators.

Feel unwell?
Check blood glucose (BG) and ketones.

**No significant ketones**
(less than 1.5 mmol/L on blood check, negative or trace on urine check)
BG within target or above target range.
**MINOR ILLNESS**

**Significant ketones present**
(1.5 mmol/L or more on blood check, more than a trace on urine check)
BG above target range
(usually above 13 mmol/L).
**SEVERE ILLNESS**

Sip sugar-free fluids (at least 100ml / hour).

Check BG and ketones every 4 to 6 hours.

Check BG and ketones every 2 hours.

Usual insulin : carbohydrate ratio (QA : CP ratio) if eating.

If your BG is above target range use QA corrections, even if you are not eating (you may find you need larger QA doses to reduce BG).

If your BG is within target range you may only need BI if you are not eating.

Take your usual BI but you may

Calculate your 'typical' total daily dose (TDD).

Blood ketones
1.5 – 3.0 mmol/L
Urine ketones
small to moderate
+ or ++

Blood ketones
above 3.0 mmol/L
Urine ketones
large
+++ or ++++

Give 10 % of TDD as supplemental QA insulin every 2 hours

Give 20 % of TDD as supplemental QA insulin every 2 hours

- Risk associated with Insulin restriction is high blood glucose levels. This can lead to a high HbA1c can lead to long term complications. In the short term risk there is a risk of diabetes ketoacidosis (DKA) which requires hospital treatment
- Encouraging patients to take their background insulin daily
- To ensure they have a blood monitor to check for Ketones
- They have advice from their diabetes team about 'sick day rules'
- They have regular contact with their DSN

# Treating T1DE

**There is an emerging but limited evidence base regarding the psychological interventions effective in treating eating disorders in type 1 diabetes. Compassion project found;**

Developing a picture of how the problems have developed and are being maintained (capturing the interplay between the eating disorder and psychological difficulties of living with diabetes)

Psychoeducation

Enhancing self-efficacy

Building sense of importance and confidence around making change

Cognitive restructuring (e.g. body image and diabetes management.

Mood regulation, including understanding and coping with strong emotions

Developing compassion for oneself

Building acceptance (e.g. of diabetes as a long-term health condition)

Identifying and living in line with personal values

Understanding and planning for high risk situations as part of relapse prevention work

# Some themes encountered: specific to T1DE

Tight control needed and assumed. Dismissive attitude encountered from professionals of struggles to do this: "non compliant".

Exactly the opposite advice to the advice we would give in EDS – checking everything and monitoring everything. Need to know the numbers. Enhances (? requires) an obsessive relationship with food.

Constant dilemmas "comfort zone" versus "go out and do things" "fitting in" versus "being different"

Explaining to others, and managing their assumptions and misconceptions

"I used to be in control, now it takes control over me"

"The tiredness that you get- every fibre of you is completely exhausted"

The ongoing legacy of irreversible problems even if glycemic control improves.

Interaction with chronic pain and disability – loss (life more limited; identity changed)

Past relationship with these concepts and past understanding of them, eg blaming, judging others who had ME / fibromyalgia

Rapid weight regain following diagnosis and insulin management – can be scary and enhance feelings of being out of control

# HCL and T1DE

- Use of HCL can reduce DKA admissions.
- Use of HCL can reduce fear of hypos
- Can help reduce long term complications.
- Can reduce the need to make the decisions on insulin management.
- Reduce injections and lipohypertrophy

# Negatives of HCL and T1DE

- Use of diabetes tech – sensors/pumps/phones
- Fear of weight gain with better glycaemic control.
- Having to count carbs / having to think about calories.(all the opposite education to eating disorders)

# Getting to HCL

- Work with home diabetes team – attend Pump Mdt for patient.
- As a T1DE team we can support clients to make change – able to spend more time, more regular appt on work up.
- Be truthful about weight / tech.
- Can plan with clients, home team and us milestones to meet to reach a successful pump conclusion.

An ideal HbA1c level is 48mmol/mol or below

# Early results

| Pt no | Referred | Baseline HbA1c | HbA1C | Most Recent | Baseline weight | | Most Recent Weight | |
|---|---|---|---|---|---|---|---|---|
| 1 | 30/03/2023 | 70 | 67 | 61 | 58.4kg | 64.4kg | 67.2kg | Hybrid close loop |
| 2 | 29/03/2023 | 154 | 70 | 56 | 73.0kg | 75.5kg | 80.7kg | Hybrid closed loop |
| 3 | 17/05/2023 | 134 | 120 | | 47.5kg | 44.5kg | | |
| 4 | 30/03/2023 | 72 | 48 | 52 | 72.8kg | 77.2kg | 77.8kg | Hybrid closed loop |
| 5 | 18/05/2023 | 69 | 78 | | 44.1kg | 50.0kg | | |
| 6 | 01/06/2023 | 84 | 69 | | 48.1kg | 69.8kg | | |
| 7 | 15/08/2023 | 96 | 74 | 63 | 54.5kg | 57.4kg | 62kg | Hybrid closed loop |

## Contact Details

Address: Springview, Clatterbridge Health Park, Clatterbridge Road, Bebington CH63 4JY

Telephone No: 0151 343 5594

Email: cwp.wirral-t1de@nhs.net

## Resources

Chapter 8 - Eating problems | Diabetes UK

- Eating disorders | JDRF **(service user stories)**
- Medical Emergencies in Eating Disorders (MEED) guidelines: ANNEX 3 Type 1 diabetes and Eating Disorders college-report-cr233---annexe-3.pdf (rcpsych.ac.uk)
- **PODCAST episodes:** The T1DE Podcast | thet1depodcast (podbean.com

# What we are seeing

- Not so much weight gain as worked to reduce Hba1c before starting HCL/
- Improved mental health – less anxiety, Less food noise.
- Good improvement in HbA1c.
- Body image/ weight restoration tolerable!
- More confident with Diabetes /dietary intake.