

HCL – what's next?

An update from ATTD

Innovations and Advancements in Diabetes Technology



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TV CYPDN Chair

EXTOD Chair



Anne Marie Frohock ✓ • You

Advanced Paediatric Diabetes Dietitian Specialist interest in Sports N...

3mo • 🌐



And that's a wrap [#ATTD2026](#)

What a conference you have been!

Spending time with my amazing international colleagues, being inspired and invigorated by research and things to come.. my top take homes keep it real

1. Exercise management for T1D shouldn't be an 'add on' to education or diabetes technology development. It should be the norm and something that is expected and enabled
2. Fully closed loop is coming.. but it's got a long way yet to go with managing glycaemia around exercise. They need to do better
3. I want a digital twin like the ones being used to test new algorithms that I can send to clean my house and do my washing while I go an ride my bike 🎡. In seriousness - being able to test in silico and big data is mind blowing and powerful and giving us real world insights that may challenge what we know from the lab

Today

- Fully Closed Loop
- The rise of Artificial Intelligence in diabetes management
- Big Data –
 - Optimising settings
 - How it's challenging evidence from the lab
- What's coming next in the UK?

Disclosures

Speaker payments from Dexcom, Insulet, Abbott, and SBK

EXTOD Chair

Consultancy for Insulet

Freelance Sports Dietitian

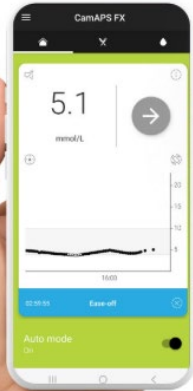
Fully Closed Loop

Definition?

“a system requiring no user intervention for meals or exercise”



The worlds first **fully closed-loop. Coming Soon.**



CamAPS Liberty®
When activated, users will not need to count carbohydrates and deliver a pre-meal insulin bolus.
Android and iOS compatible



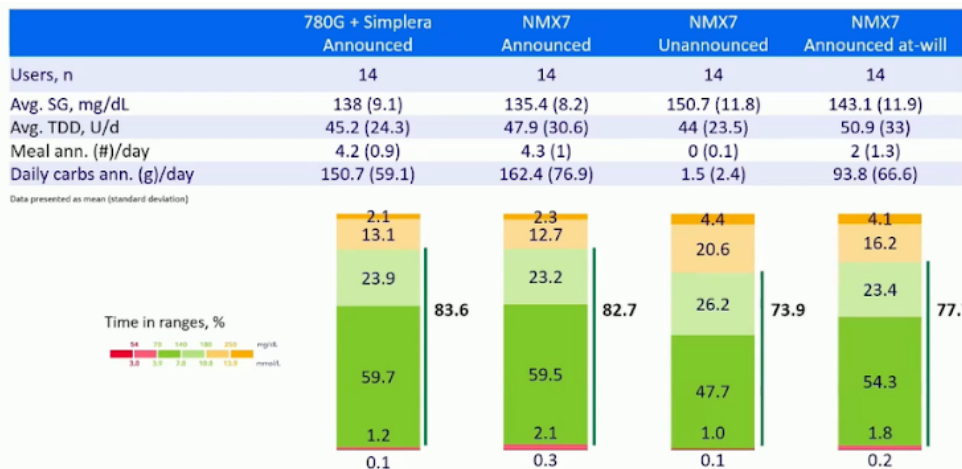
Minimed Vivera (Flex series)

First Results of new Vivera algorithm

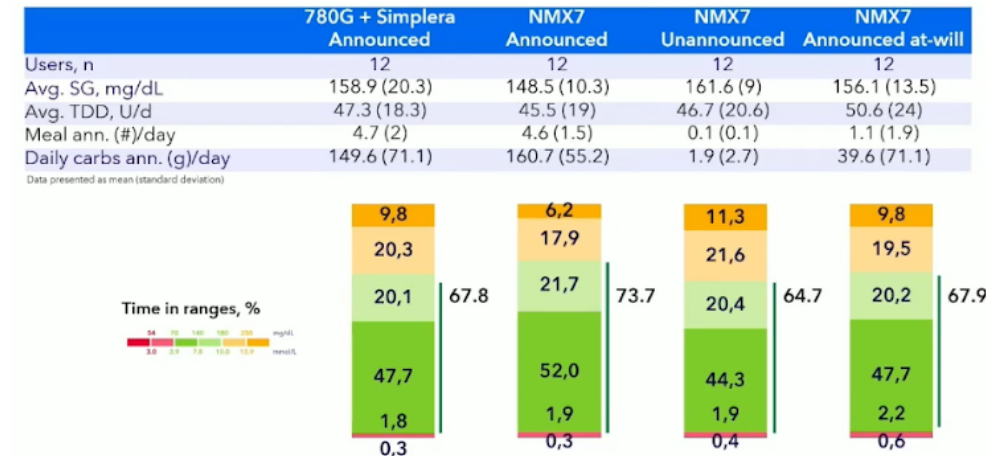
- No more 24-hours warmup
- New glucose target of 90 mg/dl (5 mmol/l)
- Active insulin time no longer influences the algorithm
- Auto-adaptation of the algorithm
- Seamless transition between announced and unannounced meals



Feasibility trial in n=14 adults with T1D



Feasibility trial in n=12 adolescents (7-17 years) with T1D



CamAPS Liberty

“When activated, it enables a fully closed-loop mode in which users are not required to count carbohydrates or manually deliver a pre-meal insulin bolus.”

“Powered by a more proactive version of the algorithm that anticipates and responds to glucose changes while maintaining established safety boundaries”

Using CamAPS Liberty

CamAPS Liberty is intended to be an option for people with type 1 diabetes, reducing the decision burden associated with diabetes management at key moments in their life-long journey with type 1 diabetes.



Existing users with type 1 diabetes



13 years and older



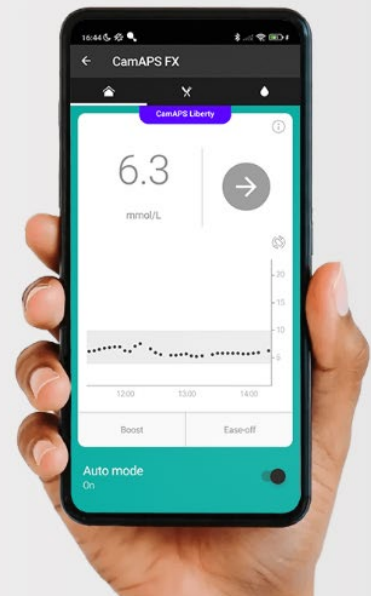
Pregnant

The world's first fully proactive closed-loop system.

Users do not need to deliver a pre-meal bolus.



Android and iOS compatible



Omnipod Evolve (Type 2)

EVOLUTION 2 Delivers Breakthrough Outcomes: +24% TIR Improvement Without Bolusing

A Multicentre Feasibility Study of 24 Participants With T2D



Results shown as mean for TIR and median for TBR.

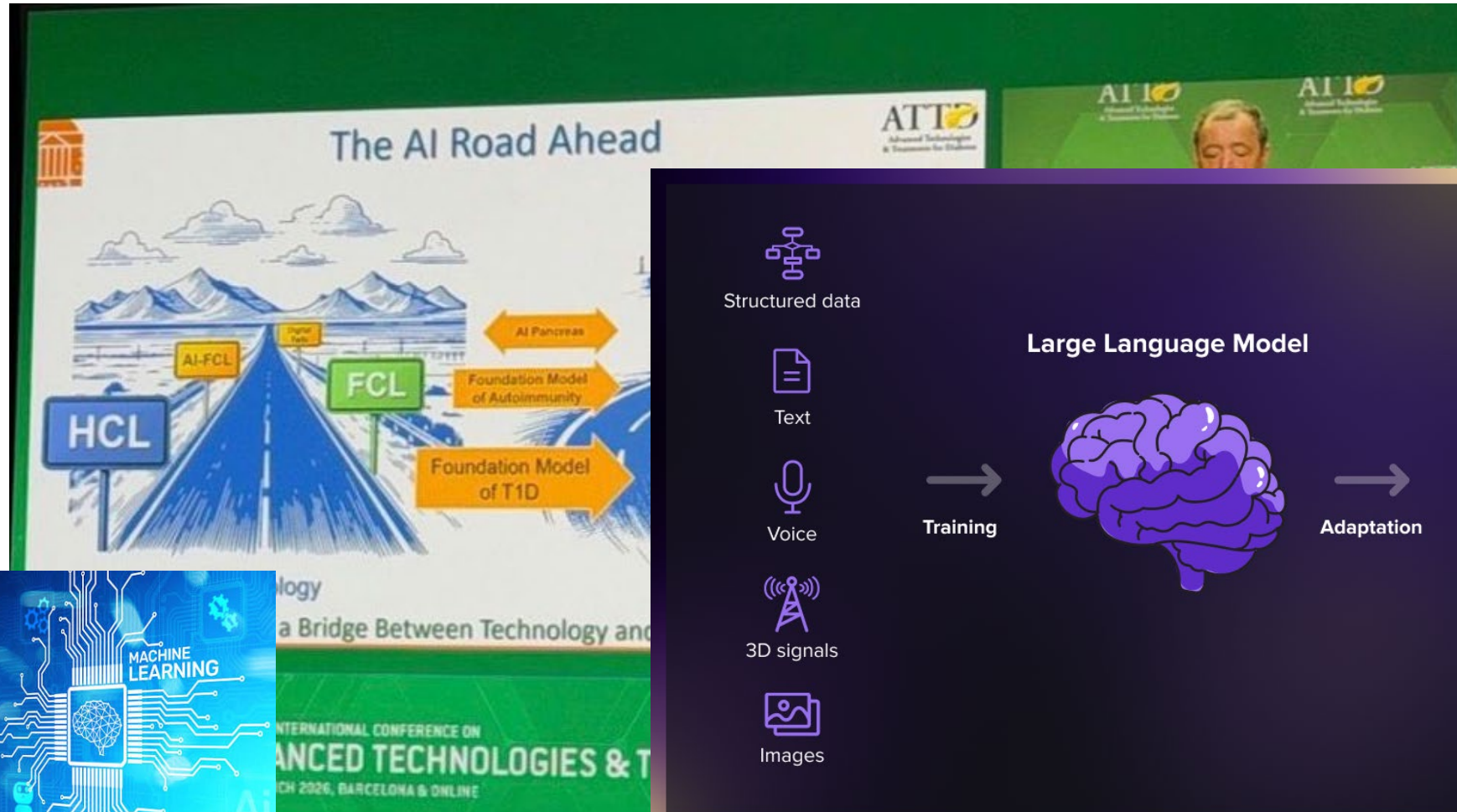
Insulet

Fully Closed Loop.... *reflections*

- Do any current offerings meet the definition of fully closed loop?
 - *Exercise? Meals announced at will?*
- Trials have included small numbers of participants
- TiR or TiNG?
- Can findings really be translated into real world data?
- Is the hype warranted given current evidence base?



Artificial Intelligence





AI and Diabetes ...?

AID systems

Self-management tools/apps

CGMs

Carb counting

Chatbots

Big data analysis – real-world data

Risk prediction

LLMs can:

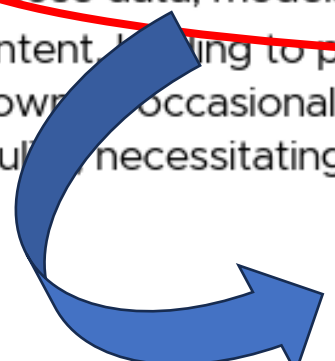
- Draft patient education materials
- Summarize research papers
- Assist with documentation

Digital twins

DTN-UK statement on Large Language Models

Generic Large Language Models (LLMs) such as ChatGPT or Grok, offer potential as supplementary tools for diabetes management by assisting with tasks like initial carb estimation from food images and identifying patterns in glucose data, however, it is paramount that healthcare professionals and people living with diabetes understand these systems are not a substitute for medical expertise and cannot safely provide definitive medical advice or insulin dosing recommendations.

Everyone should be aware of several critical limitations. Generic LLMs demonstrate significant variability and unreliability in visual carb counting, often misinterpreting food items or providing vastly disparate estimates. When analysing personal glucose data, models can misinterpret images or misrepresent data duration and content, leading to potentially misleading analyses. Furthermore, LLMs have been shown to occasionally provide erroneous or dangerous advice (e.g., freezing insulin), necessitating extreme caution.



Advise people to always verify AI-generated information against reliable real-world data.

AI Tools for carb counting



Features

How it Works

Testimonials

FAQ

Carbs & Cals

Main Interest

Please choose...



Introducing the F
in a s



Simple

Carbs Precision

al, and CarbScanner instantly tells you
mmended insulin dose, making
fortless.



ChatGPT

No more guesswork around meals

Count carbs by snapping a picture and get insights on your glucose levels after meals.



Get the SNAQ diabetes food and glucose tracker!

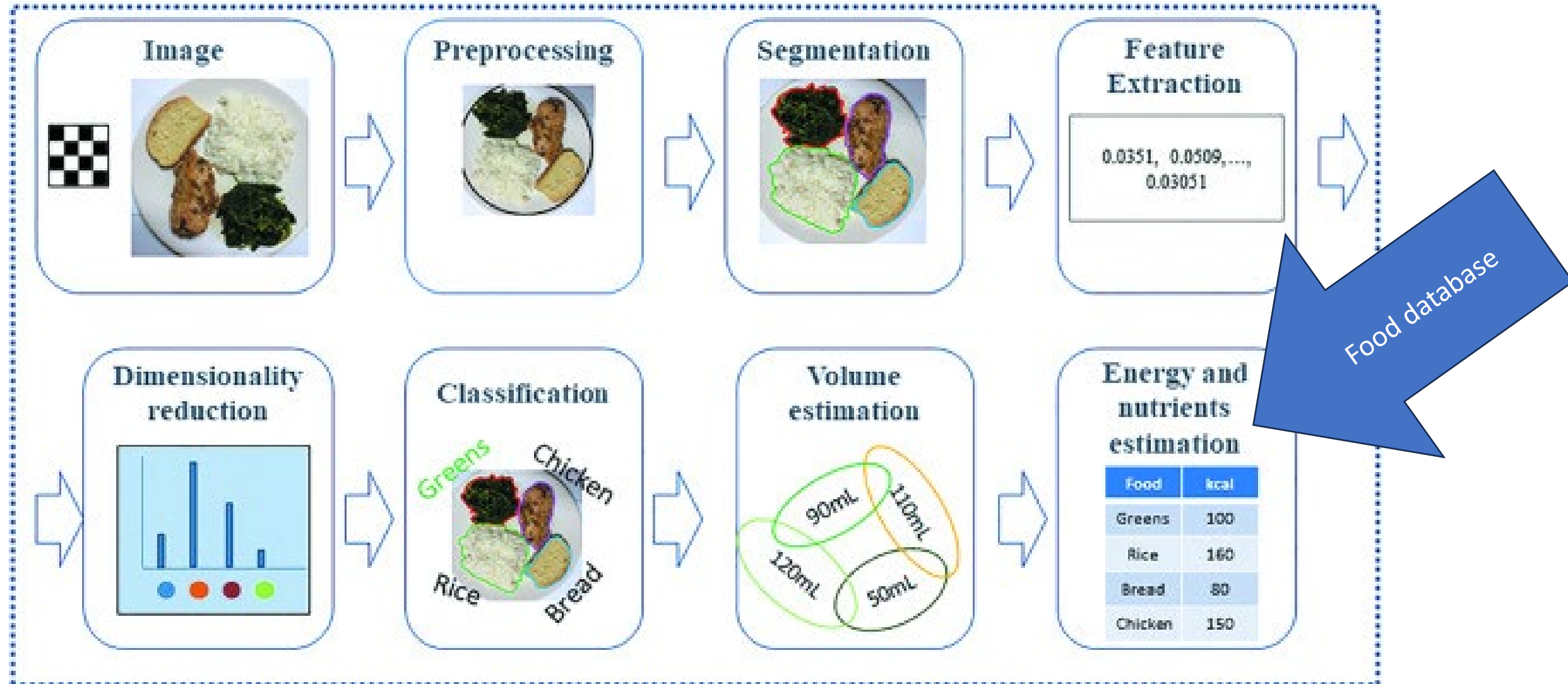


RxFood for Patients

RxFood and Dexcom CGM makes it easy to understand how the food you're eating affects your glucose response.

With just a photo, RxFood's AI powered technology estimates portion sizes and carbohydrate counts*. Combined with Dexcom's CGM, you can see how food, exercise, and insulin impact your glucose.

How food scanners work



Carbohydrate Estimation Accuracy of Two Commercially Available Smartphone Applications vs Estimation by Individuals With Type 1 Diabetes: A Comparative Study

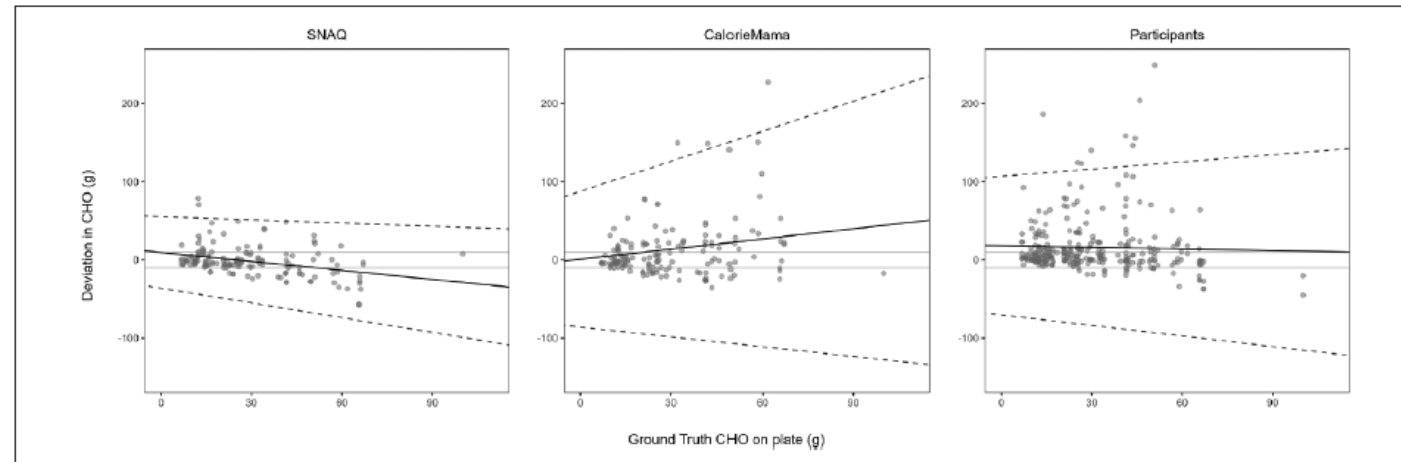
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and Lia Bally, MD, PhD^{1*}

How accurate are AI tools?

Method	Absolute error		Bias		LoA	Estimation error > 10 g CHO
	Absolute value, g, mean (SD)	Relative value, %, mean (SD)	Absolute value, g, mean (SD)	Relative value, %, mean (SD)		
Participants	21.0 (21.5)	71 (72.7)	15.7 (16.2)	53.1 (54.8)	(-72.8, 104.2)	45.0
Calorie Mama	24.0 (36.5)	81.2 (123.4)	13.6 (16.6)	46 (56.1)	(-91.9, 119.1)	60.4
SNAQ	13.1 (11.3)	44.3 (38.2)	-1.8 (16.5)	-6.1 (55.8)	(-52.1, 48.5)	37.7

LoA: 95% limits of agreement; SD: standard deviation.



- SNAQ outperformed participants (71% vs 44% within 10g)
- Participants and AI still miscalculate carbs outside of clinically relevant estimation errors (10g) - ?Impact on glycaemia
- SNAQ required smartphone camera with embedded depth sensor technology for volume estimation
- CalorieMama requires users to input a portion size

Is it our role with AI, or AI's role with ours?

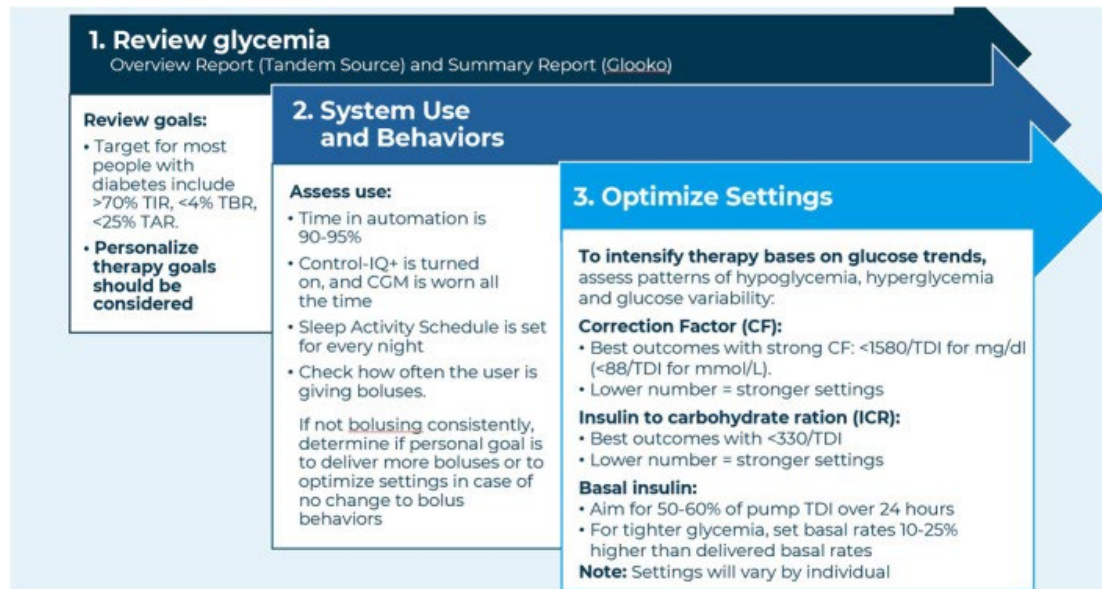
Where does the human sit in the automation?

- AI should be seen as an assistant, not the boss.
- Users should be taught how to interact with it to reduce the risk of erroneous outputs or hallucinations
- Quality data in = quality data out



Optimised settings

Control IQ+



* Likely to need adjustment for paed

ALSO consider running sleep mode 24/7

Omnipod 5

Setting	Optimised Value (mmol/L)	Impact
1. Target Glucose	6.1 mmol/L (lowest setting)	Maximizes algorithm responsiveness
2. Insulin-to-Carbohydrate Ratio	$\leq 350 \div \text{TDI}$ (g carbohydrate per unit insulin)	Optimises postprandial glycaemia
3. Correction Factor (ISF)	$\leq 83 \div \text{TDI}$ (mmol/L per unit insulin)	Improves efficacy of user-initiated correction boluses
4. Behaviours	90% Time in Auto mode	3 or more boluses a day

Exercise in type 1 diabetes: Real-world data on glucose levels and hypoglycaemia risk from over 420,000 exercise sessions

$n(\text{subjects}) = 3248$ $n(\text{exercise sessions}) = 428,058$



WALK
 $n(s) = 2485$
 $n(es) = 215,441$



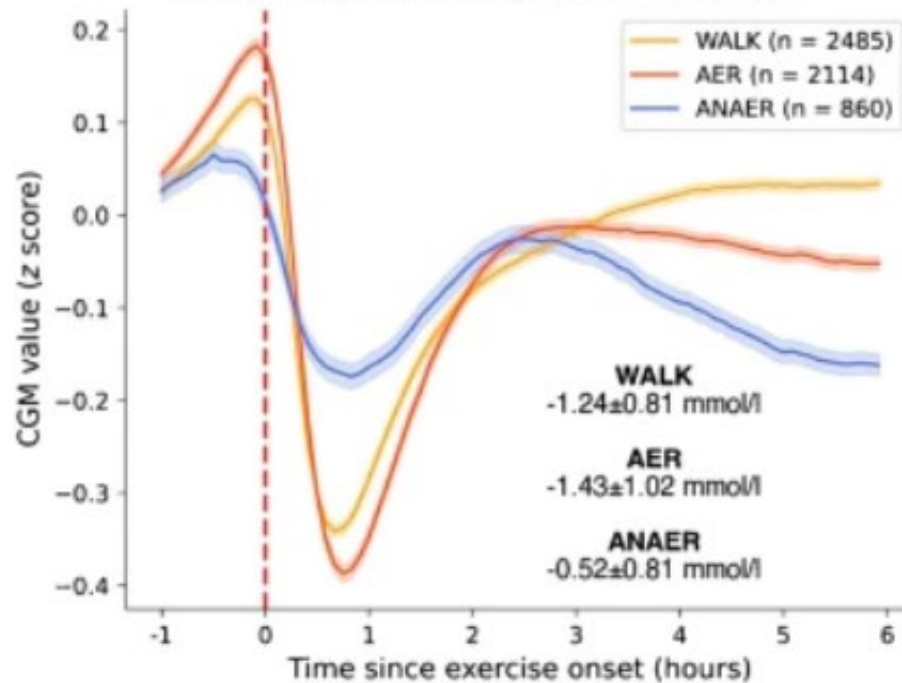
AER
 $n(s) = 2114$
 $n(es) = 168,442$



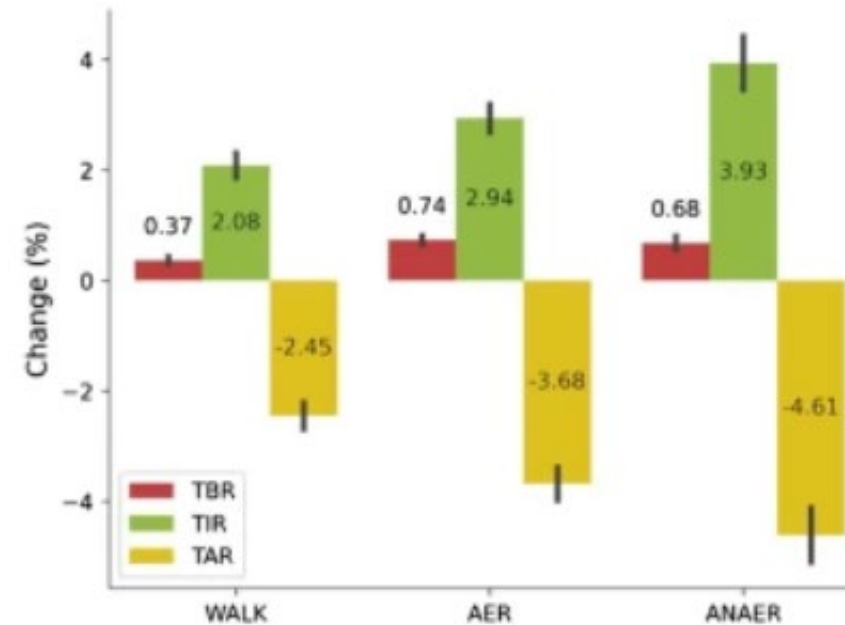
ANAER
 $n(s) = 860$
 $n(es) = 44,175$

- aged ≥ 18 (mean age 41.23 ± 12.25)
- physically active (≥ 5 exercise events per month)
- 90% monthly CGM wear time
- digital health app users

Acute effects on glucose levels



24-hour effects on glucose levels



GlucoseGo: A Simple Tool to Predict Hypoglycaemia During Exercise in Type 1 Diabetes



Fear of hypoglycaemia
major barrier to exercise
for people with type 1
diabetes

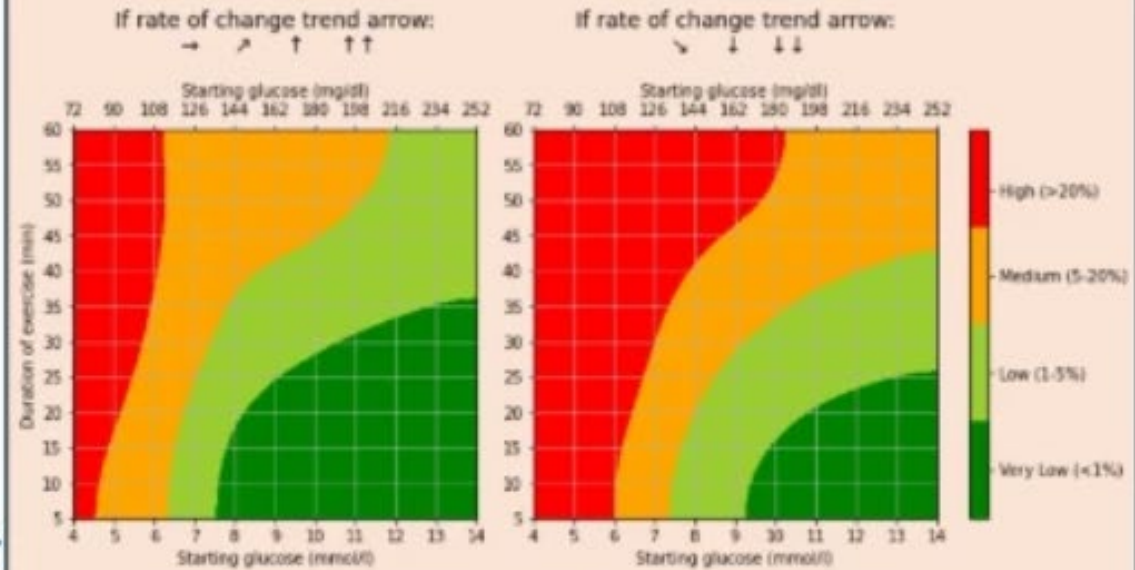


Machine Learning
identified 3 key variables
for prediction:

1. Starting glucose
2. Duration of exercise
3. Glucose trend arrows



GlucoseGo Heatmap



Accurate



Simple, usable tool



Coming soon to the UK....

Tandem Mobi



MiniMed

Instinct
sensor



Flex
(800 series)



"Fit" Patch
pump



Insulet



Already available internationally...

Beta Bionics

Illet Pump (“bionic pancreas”
Can only be used in AID!!



Diabeloop- Kaleido



Sequel TWIIST
Tidepool (Diabeloop)



Small pumps on the horizon..

Modular Medical



- Pivot pump- 300 unit

- BetaBionics

- 200 unit



- Pharmasense
Niia pump



- 300U
 - “Essential”
 - “Advanced”
 - “Signature” = combined CGM and pump



Thank you

