Diabetes Technology Network UK

Collaborate • Evolve • Support

Emerging Topics in HCL-Workshop 2026

Geraldine Gallen

Discussion….

- Basal Insulin/ Unteathered
- GLP1
- Concentrated Insulin


WARNING

Basal Insulin….

- DKA risk
- Omnipod 5- TDD >60 units
- Untethered Insulin Regiman/ exercise

Basal Insulin – DKA Risk

AACE Endocrinology and Diabetes
www.endocrinologydiabetes.org

Original Research Article

A Novel Approach to Treating Adults With Type 1 Diabetes and Recurrent Diabetic Ketoacidosis: Once-Daily Subcutaneous Basal Insulin With Hybrid Closed-Loop Insulin Pump Therapy

Jaspreet Batth, MBBS [1], Benjamin Langworthy, PhD [2], Anjali Kumar, PA-C [1], Alison B. Alvear, PA-C [1], Lisa S. Chow, MD, MS [1], Jacob D. Kohlenberg, MD [1,*]

- Retrospective – T1D adults, recurrent DKA - 1 year
- Small cohort- 5 adults (3 women, 2 men; mean age 39.4 ± 10.8 years)
- Once-daily subcutaneous basal insulin- degludec or glargine and Omnipod 5
- Mean HbA1c decreased from 9.3% (79 mmol/mol) to 8.2% (66 mmol/mol)
- Frequency of DKA-related hospitalizations decreased - mean of 2.0 events per person
- X1 discontinued- recurrent level 1 hypoglycaemia
- Conclusion: Potential to reduce DKA-related hospitalizations and improve glycaemic outcomes
- Small cohort, further research is needed to rigorously evaluate this approach.

Kings DKA case

Oct 2024-

- 28 year old Male
- Discontinued pump therapy in YAC following recurrent DKA
- Severe hypoglycaemia
- Developing diabetes complications
  - Gastroparesis
  - Renal (x1 Kidney)
  - Maculopathy
- Anxiety disorder
- HbA1c- 97mmol/mol (11%)
- Tresiba 18 units
- Novorapid:
  - CHO - 1 unit-5 grams
  - ISF- 1 unit-3.0mmol/l

Kings DKA case

Optimisation:

- Aim to get HbA1c <10%
- Medtronic- Smart MDI
- Simplified meal estimation
- MDT approach- Eyes/Gastro/Psych
- Engagement/Trust/Expectations

HCL start- May 2025

- TDD 28 units (connected pen data)
- Tresiba 15 units – 5 units under pump)

GLUCOSE STATISTICS AND TARGETS

27 September 2024 - 10 October 2024	14 Days
Time sensor active:	95%

Ranges And Targets For	Type 1 or Type 2 Diabetes
Glucose Ranges	**Targets** % of Readings (Time/Day)
Target Range 3.9-10.0 mmol/L	Greater than 70% (16h 48min)
Below 3.9 mmol/L	Less than 4% (58min)
Below 3.0 mmol/L	Less than 1% (14min)
Above 10.0 mmol/L	Less than 25% (6h)
Above 13.9 mmol/L	Less than 5% (1h 12min)

Each 5% increase in time in range (3.9-10.0 mmol/L) is clinically beneficial.

Average Glucose	**13.3** mmol/L
Glucose Management Indicator (GMI)	**9.1% or 75 mmol/mol**
Glucose Variability	**36.7%**

Defined as percent coefficient of variation (%CV); target ≤36%

TIME IN RANGES

Very High	>13.9 mmol/L	41% (9h 50min)
High	10.1 - 13.9 mmol/L	32% (7h 41min)
Target Range	3.9 - 10.0 mmol/L	27% (6h 29min)
Low	3.0 - 3.8 mmol/L	0% (0min)
Very Low	<3.0 mmol/L	0% (0min)

13.9
10.0
3.9
3.0

00:00 03:00 06:00 09:00 12:00 15:00 18:00 21:00 00:00

DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the date displayed in the top-left corner.

Friday Saturday Sunday Monday Tuesday Wednesday Thursday

27 28 29 30 1 2 3

10.0
3.9

00:00 12:00 00:00 12:00 00:00 12:00 00:00 12:00 00:00 12:00 00:00 12:00 00:00 12:00 00:00

4 5 6 7 8 9 10

10.0
3.9

Jan 2026

- More confident and happier
- Tresiba stopped after 3 months
- G-POEM
- Moving from monthly diabetes review to 4-6 months

Omnipod 5 >60 units

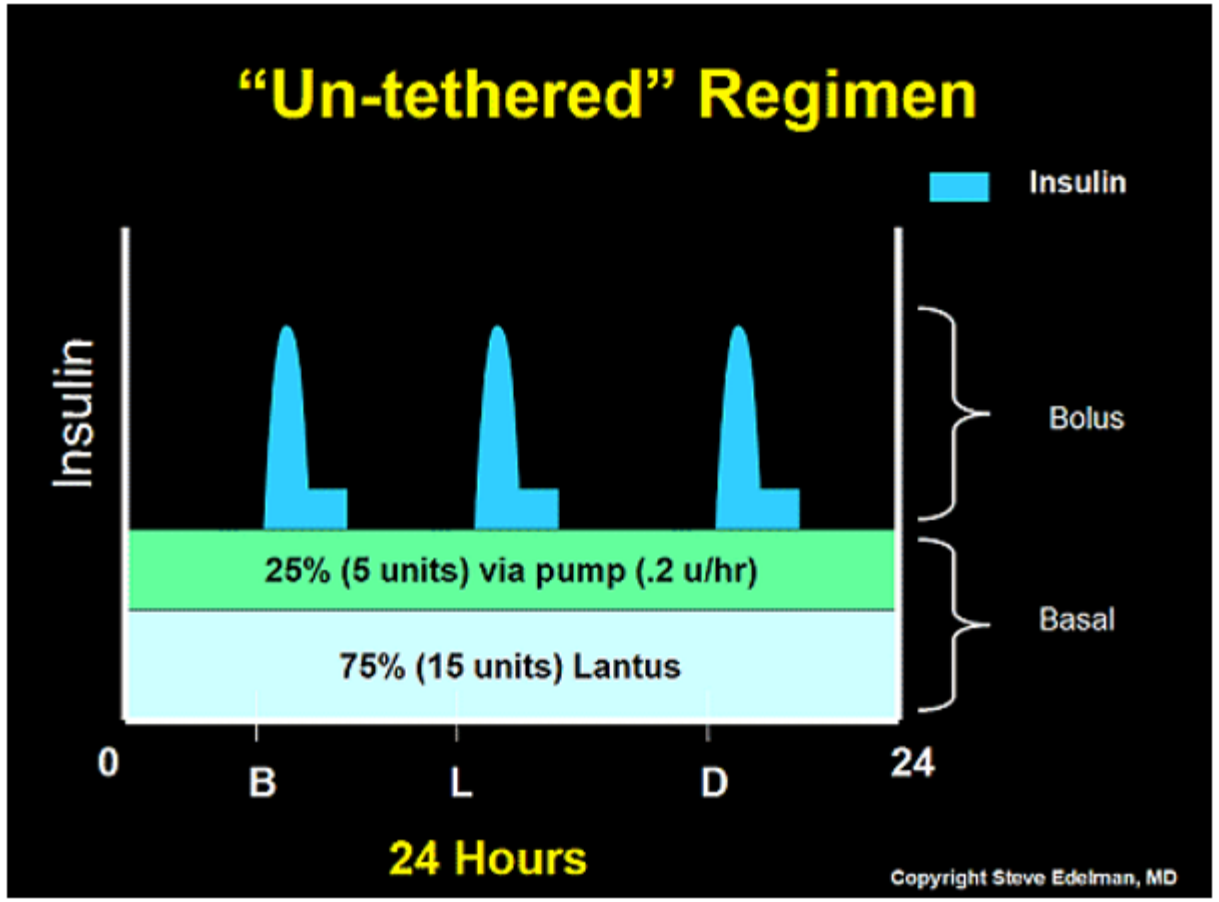
What is your local policy and experience?

Untethered Insulin Regiman

Has anyone heard of this?

Untethered…..

- Enables users to remove their insulin pump for extended periods (swimming, sports) without significant hyperglycemia risk.
- Moving to manual mode with daily long-acting basal injection (e.g. Lantus/Degludec) alongside boluses via the pump
- Addresses the limitation of needing to reconnect within usually <60 min to avoid hyperglycaemia or ketones.
- Can work for active individuals- removal for hours or even a whole day during weekends or days of intense activity.



FIT Study 2019

- **Flexible Insulin Therapy: Untethered Insulin Regimen Using Insulin Degludec and Continuous Subcutaneous Insulin Infusion (CSII) in Avidly Exercising Patients with T1D: FIT Untethered Study (2019)**

- Safety and efficacy of an “Untethered”
- 43 people T1D and using CSII who often remove their pump before extended periods of exercise
- Single-centre, open-label, proof-of-concept, randomised crossover trial
- 50% Pump and 50% once daily Degludec
- moderate-high-intensity in-clinic exercise sessions over 3 weeks
- Pumps were suspended 60 min before exercise and reconnected immediately after
- Participants on the untethered regimen had significantly longer TIR and significantly lower TAR (moderate and high intensity exercise)
- No difference in TBR

Potential indicators for use…..

- Prolonged physical activity
- Water based activities (surfing/scuba diving)
- Lifestyle interruptions (weekend pump holidays/ medical procedures/no carer support at weekends/psychological)
- Both ADA and ISPAD stress individualised assessment due to the lack of exercise.

Surfer:

Regiman- Omnipod 5 HCL- Monday- Friday
Friday night- Lantus 20 units
TIR improved by 13%

“I am very active on the weekends and like to go surfing, play Sunday football and soak in our Jacuzzi at home. The pump seemed to always get in the way and cause havoc with my blood sugars whenever I took it off for more than 45 minutes. This is the down side with having fast acting in the pump in that the disconnection time must be brief. Whenever I tried to compensate for long disruptions I would have to test a lot and take several small boluses of Humalog. It was a rare event when I did it just right avoiding hyper or hypoglycaemia. I was also continuing to experience sudden, unexpected, and aggravating episodes of severe hyperglycaemia and pre-DKA because of infusion line disruptions from being in the water and surf suit”

GLP1 and HCL

How many of you are now using GLP1 as a regular treatment offering in T1D?

Efficacy and Safety of Tirzepatide in Adults With Type 1 Diabetes: A Proof of Concept Observational Study

Halis Kaan Akturk, MD[1], Fran Dong, MS[1], Janet K. Snell-Bergeon, PhD[1], Kagan Ege Karakus, MD[1], and Viral N. Shah, MD[2]

Journal of Diabetes Science and Technology
1–5

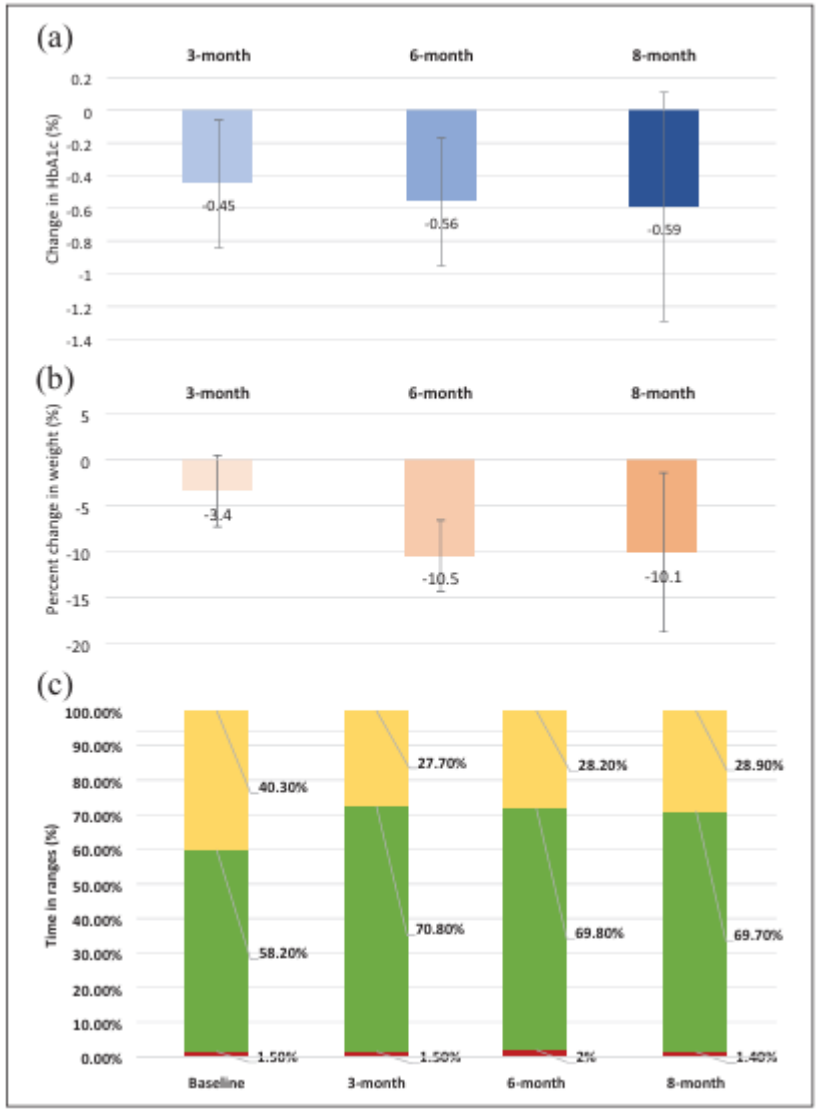
DOI: 10.1177/19322968231223991

Table 1. Baseline Characteristics of the Participants (n = 26).

Age, y	42 ± 8 (28-56)
HbA1c, %	7.3 ± 0.7 (6.1-8.6)
Weight, kg	108.1 ± 21.2 (74.4-158.8)
BMI, kg/m^2	36.7 ± 5.3 (24.9-44.7)
Total daily insulin dose (units/day)[a]	83.9 ± 44.7 (36-174)
Race/ethnicity	
Non-Hispanic white	20 (77%)
Other	6 (33%)
Female sex	14 (54%)
Insulin delivery method, n (%)	
MDI	7 (27%)
Insulin pump[b]	19 (73%)
CGM use, n (%)	25 (96%)

Data are presented as mean ± SD and range (min-max) or frequency (%).
Abbreviations: BMI, body mass index; CGM, continuous glucose monitoring.
[a]Baseline insulin data for 12 participants were missing.
[b]Three participants were using MDI at baseline but transitioned to insulin pump during the follow-up.

TDD fell by 21.6%
Discontinued in 2 patients (SH and constipation)
No DKA



Diabetes Ther (2024) 15:1647–1655
https://doi.org/10.1007/s13300-024-01592-9

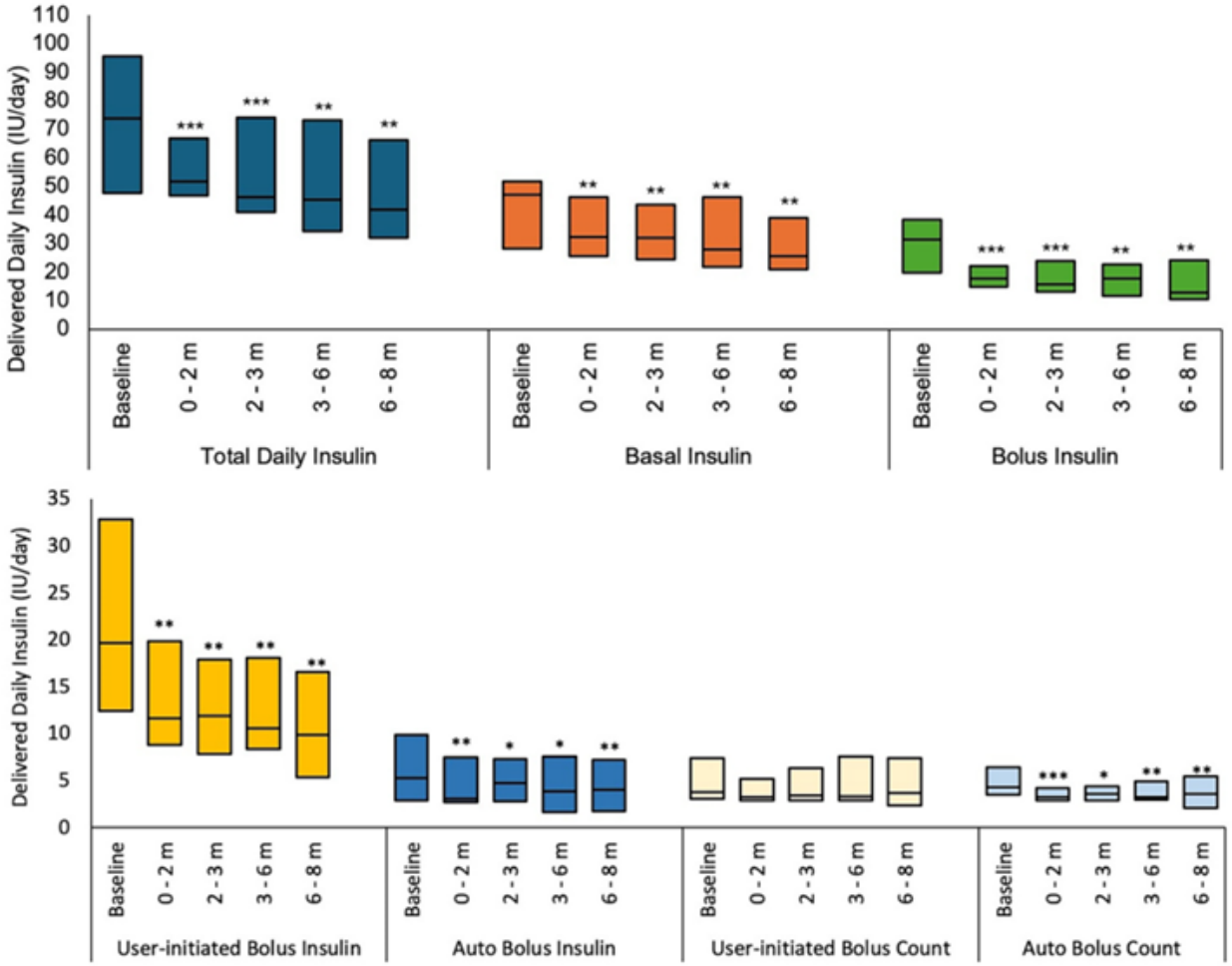
BRIEF REPORT

Changes in Basal and Bolus Insulin Requirements with Tirzepatide as an Adjunctive Therapy in Adults with Type 1 Diabetes Using Tandem Control-IQ

Kagan E. Karakus · Matthew P. Klein · Halis K. Akturk · Viral N. Shah

Table 1 Baseline characteristics of the participants

	Median (interquartile range), *n* = 11
Age (years), median (min–max)	37 (34–49)
Sex (female), *n* (%)	7 (63.6)
Race/ethnicity (non-Hispanic White), *n* (%)	10 (90.9)
Diabetes duration (years), median (min–max)	24 (15–35)
A1c (%)	7.0 (6.7–7.4)
Weight (kg)	114.3 (94.8–129.3)
Body mass index (kg/m^2)	39.6 (35.6–40.7)
Total daily insulin dose (IU/day)	63.7 (43.2–114)
Total daily insulin dose per kilogram (IU/day/kg)	0.58 (0.46–1.00)



30% reduction TDD observed

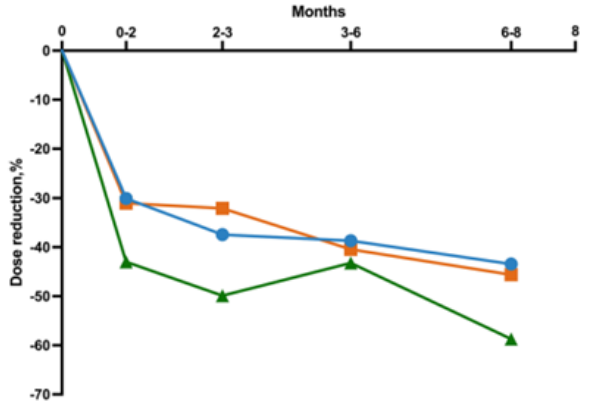


Fig. 2 Percent dose reduction for median total daily insulin (*blue solid line*), basal insulin (*orange line*), bolus insulin (*green line*) after tirzepatide treatment at 0–2, 2–3, 3–6, and 6–8-month time intervals

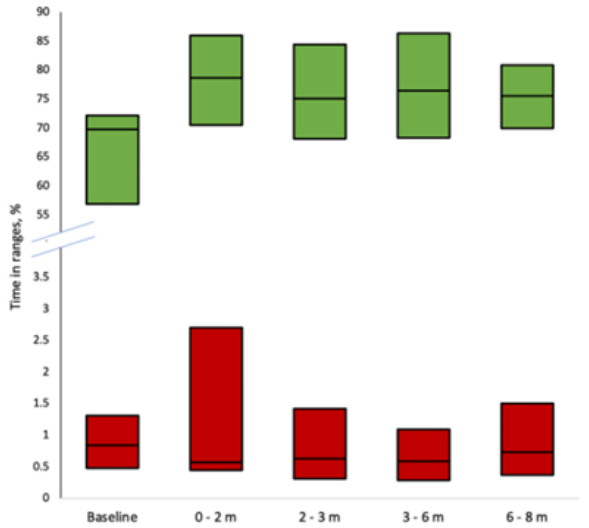


Fig. 3 Time in range (70–180 mg/dl) (*green*) and time below range (< 70 mg/dl) (*red*) at baseline, 0–2, 2–3, 3–6, 6–8 months. All timepoints were compared to baseline. Median and quartile values are shown with *boxes*. One person is missing at the last two timepoints. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

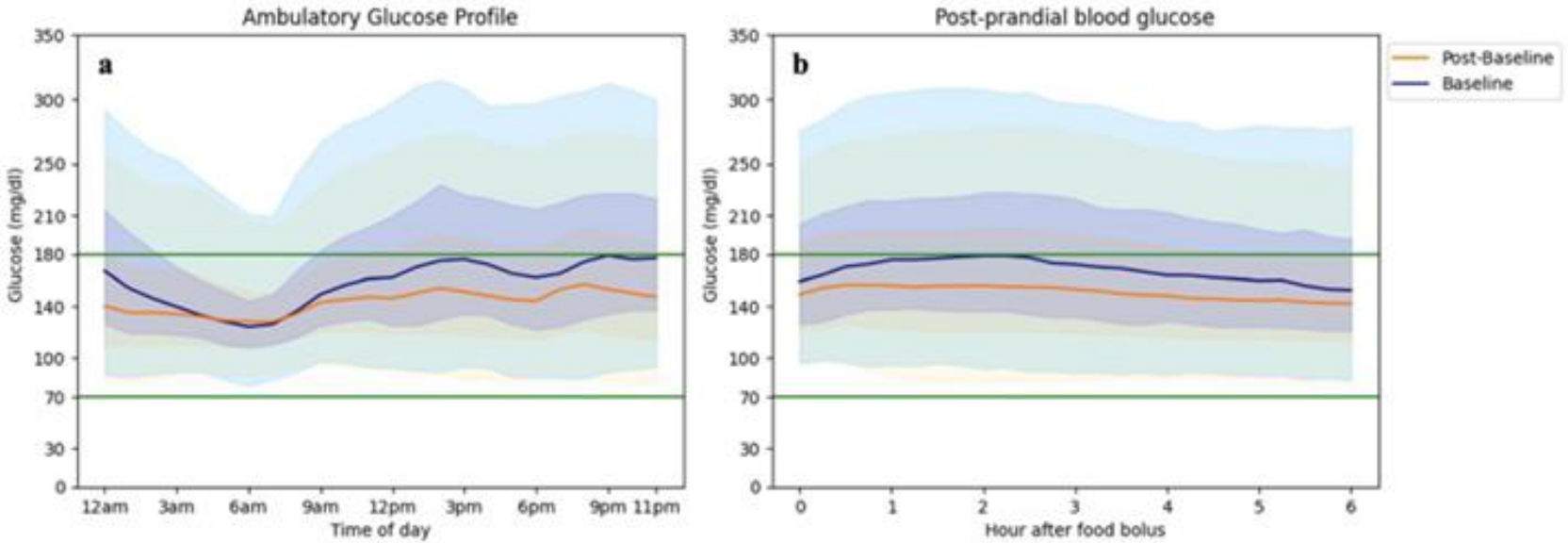


Fig. 4 Ambulatory glucose profiles at the baseline (*dark blue solid line*) and after tirzepatide treatment (post-baseline) (*orange solid line*). **a** 24-h glucose course. **b** Glucose course following user-initiated boluses via carbohydrate entry to the pump

Recommend 20-30% reduction in basal and bolus within 1st month, additional 5-10% reduction with subsequent months.
Need to update weight and TDD for Control IQ

DIABETES TECHNOLOGY & THERAPEUTICS
Volume 26, Number 6, 2024

DOI: 10.1089/dia.2024.0050

TDD reduced by 0.33 units/kg/day

Efficacy and Safety of Tirzepatide in Overweight and Obese Adult Patients with Type 1 Diabetes

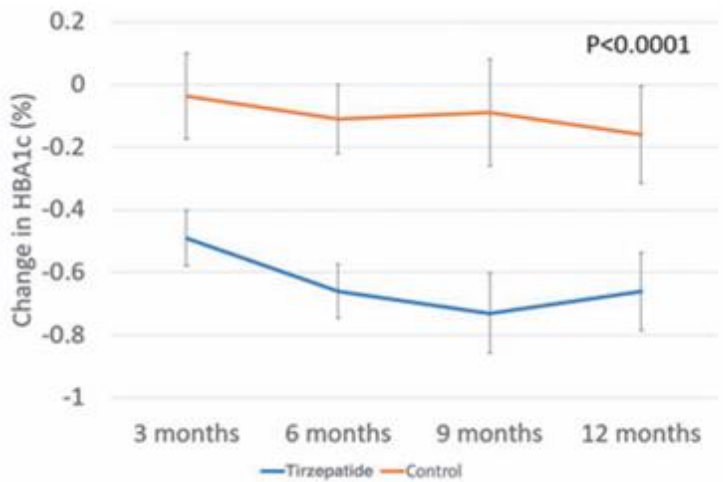
Satish K. Garg, MD, Halis K. Akturk, MD, Gurleen Kaur, BS, Christie Beatson, RD, and Janet Snell-Bergeon, PhD

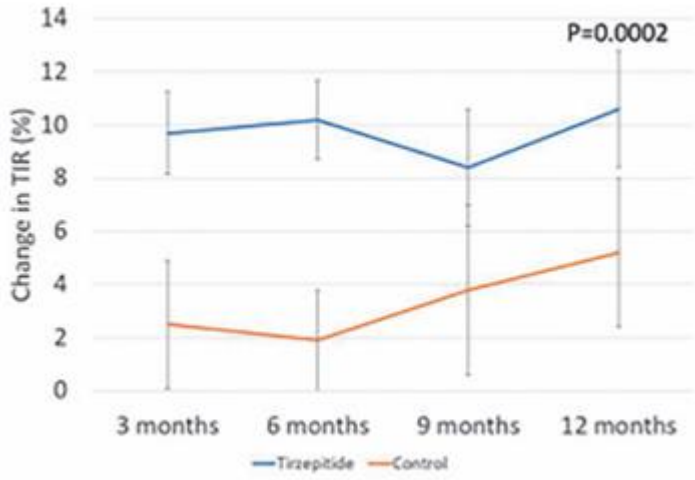
TABLE 1. BASELINE CHARACTERISTICS BY TREATMENT GROUP

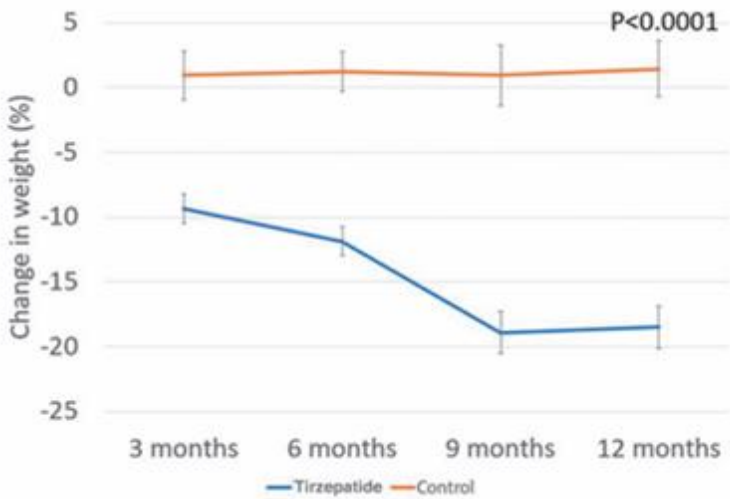
	Tirzepatide (n = *62*)	*Control* (n = *37*)	P
Age (years)	40 ± 10	41 ± 10	0.4544
Diabetes duration (years)	24 ± 13	27 ± 13	0.2462
Gender (% [*n*] male)	27 (17)	27 (10)	0.9662
Non-Hispanic White % [*n*])	89 (55)	97 (36)	0.1018
BMI (kg/m^2)	35.6 ± 5.5	32.8 ± 3.7	0.0037
Weight (lbs)	228.9 ± 42.9	208.7 ± 31.9	0.0146
HbA1c (%)	7.0 ± 0.9	6.7 ± 0.7	0.1124
Insulin dose (U/day)			
Total	76 ± 40	61 ± 25	0.0263
Basal	40 ± 17	33 ± 16	0.0396
Bolus	36 ± 27	28 ± 16	0.0879
Tirzepatide dose (mg)			
Initial	2.5		
3 Months	5.6 ± 1.9		
6 Months	8.6 ± 3.0		
9 Months	8.8 ± 2.9		
12 Months	9.7 ± 3.3		

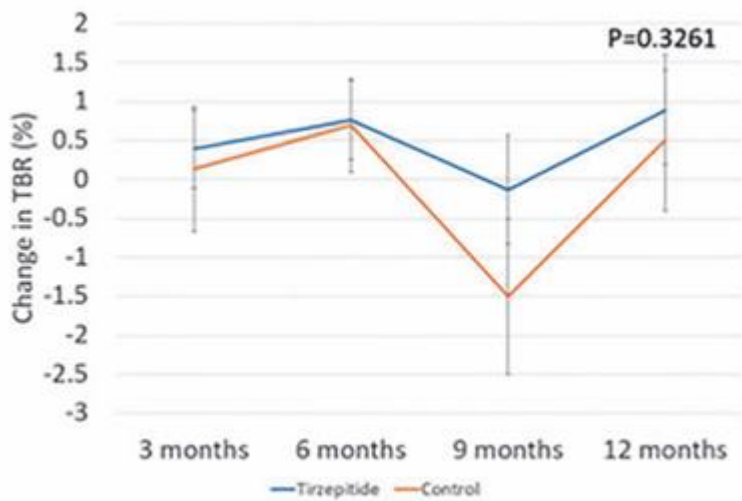
Baseline demographics were similar in the two groups. However, mean baseline BMI, weight, and total and basal insulin dosages were higher in the tirzepatide-treated group. Tirzepatide initiating dose was 2.5 mg weekly that increased to 5.6 ± 1.9 and 9.7 ± 3.3 mg weekly at 3 and 12 months, respectively.

BMI, body mass index; HbA1c, glycosylated hemoglobin.

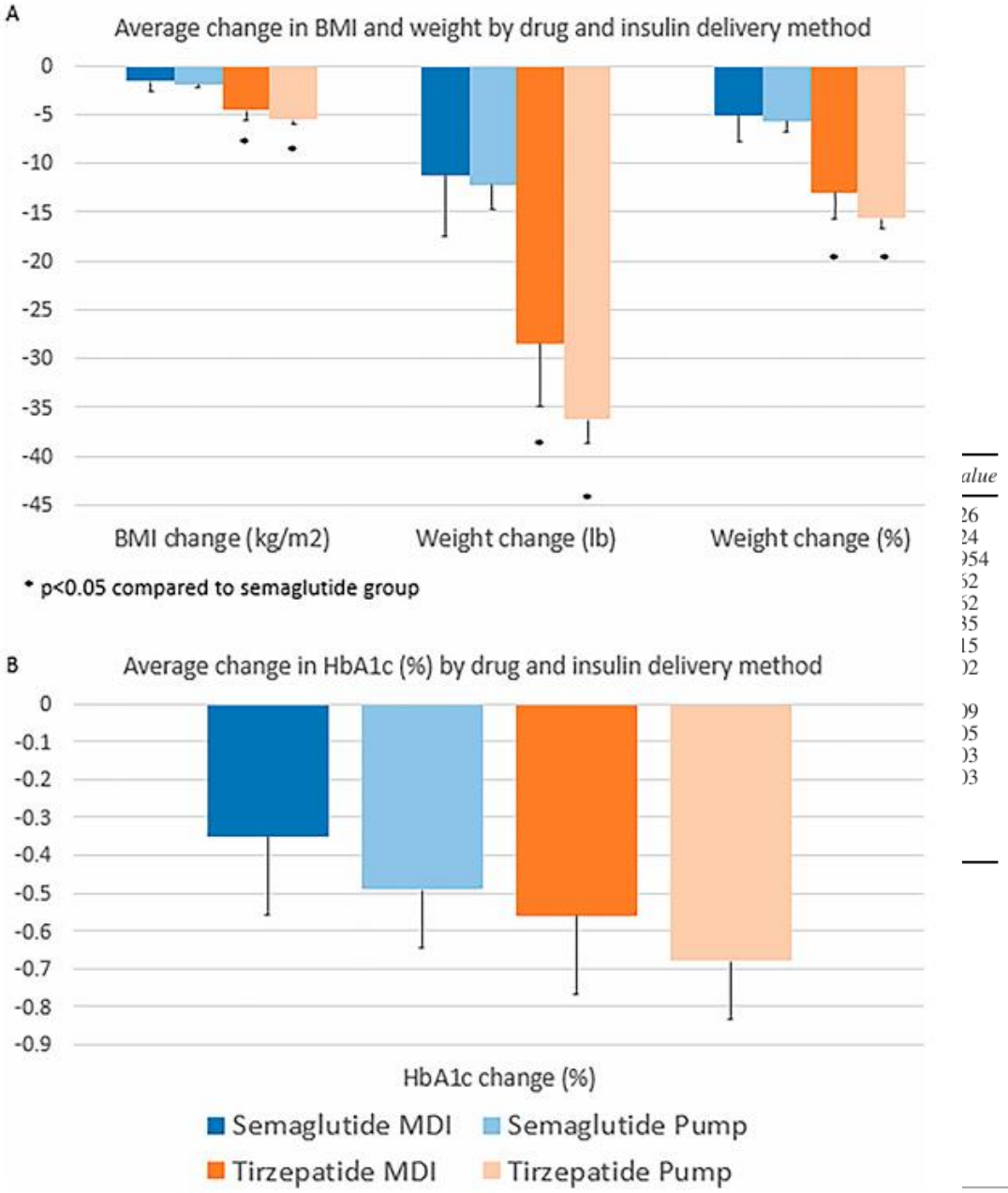


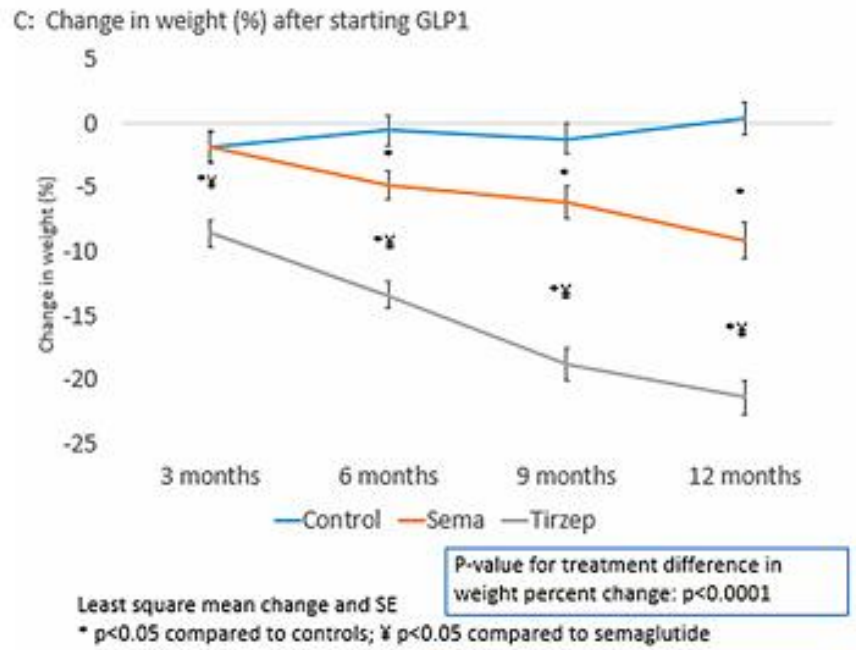


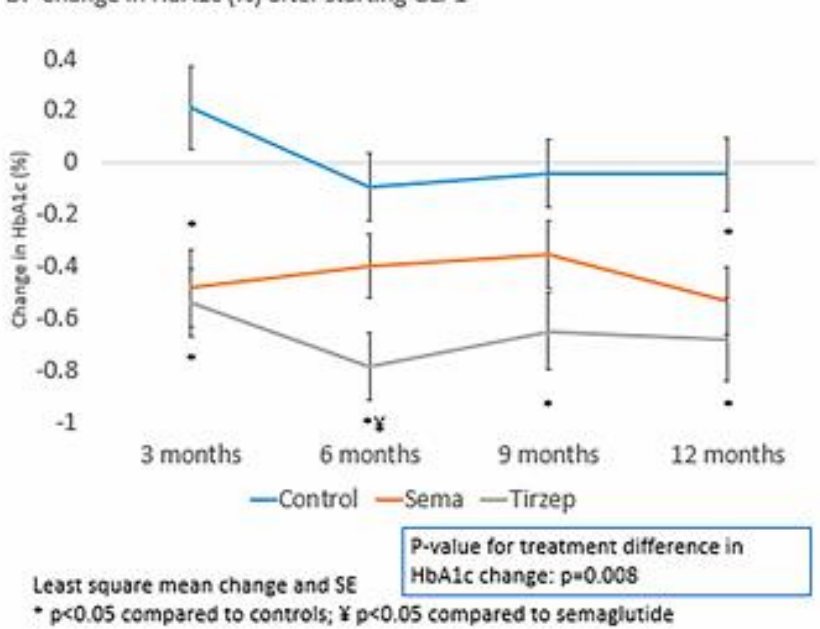




KIND RESPECTFUL TEAM


A
Average change in BMI and weight by drug and insulin delivery method
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
BMI change (kg/m2)
Weight change (lb)
Weight change (%)
* p<0.05 compared to semaglutide group
B
Average change in HbA1c (%) by drug and insulin delivery method
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.6
-0.7
-0.8
-0.9
HbA1c change (%)
Semaglutide MDI
Semaglutide Pump
Tirzepatide MDI
Tirzepatide Pump


C: Change in weight (%) after starting GLP1
Change in weight (%)
5
0
-5
-10
-15
-20
-25
3 months
6 months
9 months
12 months
Control
Sema
Tirzep
P-value for treatment difference in weight percent change: p<0.0001
Least square mean change and SE
* p<0.05 compared to controls; ¥ p<0.05 compared to semaglutide


D: Change in HbA1c (%) after starting GLP1
Change in HbA1c (%)
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
3 months
6 months
9 months
12 months
Control
Sema
Tirzep
P-value for treatment difference in HbA1c change: p=0.008
Least square mean change and SE
* p<0.05 compared to controls; ¥ p<0.05 compared to semaglutide

GLP-1 RA in T1D with AID consensus report

Review Article

Journal of Diabetes Science and Technology
1–26

DOI: 10.1177/19322968241291512
journals.sagepub.com/home/dst
Sage

Consensus Report on Glucagon-Like Peptide-1 Receptor Agonists as Adjunctive Treatment for Individuals With Type 1 Diabetes Using an Automated Insulin Delivery System

Viral N. Shah, MD[1], Anne L. Peters, MD[2], Guillermo E. Umpierrez, MD, CDCES, FACE, MACP[3], Jennifer L. Sherr, MD, PhD[4], Halis Kaan Akturk, MD[5], Grazia Aleppo, MD[6], Lia Bally, MD, PhD[7], Eda Cengiz, MD, MHS[8], Ali Cinar, PhD[9], Kathleen Dungan, MD, MPH[10], Chiara Fabris, PhD[11], Peter G. Jacobs, PhD[12], Rayhan A. Lal, MD[13,14], Julia K. Mader, MD[15], Umesh Masharani, MB, BS[16], Priya Prahalad, MD, PhD[14], Signe Schmidt, MD, PhD[17], Eric Zijlstra, PhD[18], Cindy N. Ho, BA[19], Alessandra T. Ayers, BA[19], Tiffany Tian, BA[19], Rachel E. Aaron, BA[19], David C. Klonoff, MD, FACP, FRCP (Edin), Fellow AIMBE[20]

GLP-1 RA in T1D with AID consensus report

Table 5. Consensus Recommendations on GLP-1RAs as Adjunctive Treatment for Individuals With T1D Using an AID System by the Consensus Panel.

Physiology of GLP-1RA Therapy in T1D

Strong Recommendations

- GLP-1RAs should be used in persons with T1D because they address several pathophysiological mechanisms without increasing the risk of hypoglycemia.
- People with T1D are unable to suppress glucagon during meals, which contributes to postprandial hyperglycemia, and this defect may be improved with GLP-1RA therapy.
- GLP-1RAs delay gastric emptying and might have GI side effects; thus, strategies to mitigate side effects (eating smaller portions, management of sickness/vomiting) should be discussed prior to the initiation of treatment. This is particularly true for people with gastroparesis.
- Tachyphylaxis to the effects on gastric emptying may occur, but the magnitude of this effect as well as potential remedies are not well understood.

Outcomes of GLP-1RA Therapy in T1D

Strong Recommendations

- GLP-1RAs can be beneficial in individuals with T1D to reduce the total daily insulin dose.
- GLP-1RAs can improve postprandial glycemic excursions in T1D.
- GLP-1RAs can improve HbA1c in T1D.
- Because GLP-1RAs have been shown to reduce postprandial peaks and mean glucose when used in conjunction with an AID system, there may be an opportunity to significantly improve glucose outcomes, as measured by a continuous glucose monitor, if AID systems and GLP-1RAs can be integrated in therapy.

What is Lacking in AID Systems Therapy in T1D: Better Sensors

Strong Recommendation

- GI side effects of GLP-1RAs can share symptoms with those of DKA. People using GLP-1RAs along with an AID system should be reminded that ketone monitoring for suspected DKA is standard of care independent of GLP-1RA use.

What is Lacking in AID Systems Therapy in T1D: Better Algorithms

Strong Recommendations

- Individualized titration of GLP-1RAs (e.g. lower dose and slow titration) for people with T1D using an AID system could be considered to minimize side effects, risk for hypoglycemia, and discontinuation.
- AID systems may provide a platform to safely test/initiate the use of GLP-1RA adjunct therapy in people with T1D. Further investigations in the optimal adaptations of the mathematical algorithm for use with specific GLP-1RAs are needed.
- AID algorithms that automatically detect and dose for meal events may benefit from the delayed gastric emptying caused by GLP-1RAs such that the peak insulin action of the meal insulin dosed after the meal event may align with the delayed peak of the carbohydrate absorption.

Mild Recommendation

- Various ML algorithms with different levels of accuracy and computational load should be used with AID systems. The use of GLP-1RAs will create opportunities to develop new algorithms.

Mild Recommendations

- AID systems need to automatically detect and modify insulin dosing in response to exercise, and glucose outcomes during exercise and GLP-1RA usage need to be studied.
- During uptitration of GLP-1RAs, AID system settings such as glucose targets, carbohydrate to insulin ratios, basal rate or correction factors depend on AID system functionality to minimize the risk of hypoglycemia.

What is Lacking in AID Systems Therapy in T1D: Better Insulin

Strong Recommendation

- GLP-1RAs might be useful if combined with faster acting insulin analogs for people with T1D who prefer to receive bolus doses immediately before a meal. The use of faster insulins in combination with GLP-1RAs also presents an opportunity to improve AID performance by potentially eliminating the need for meal announcements. However, since the GLP-1RAs delay gastric emptying, it would be necessary to study how the kinetics of faster mealtime insulins align with the delayed kinetics of carbohydrate absorption.

GLP-1 RA in T1D with AID consensus report

Table 5. (Continued)

How will GLP-1RA Therapy as Adjuvant Therapy with AID Systems Improve Performance in T1D and Which Patients are Most Likely to Benefit?

Strong Recommendations

- GLP-1RA-based therapies should be considered as adjunctive therapy in specific populations of people with T1D, such as adults with overweight and obesity, insulin resistance, or higher insulin requirements, who are unable to achieve optimal glycemic outcomes.
- GLP-1RA-based therapies should be considered in people with T1D using an AID system who experience post prandial hyperglycemia despite optimization of meal plans.
- The use of GLP-1RA-based therapies could facilitate practical use of AID systems where severe insulin resistance is a barrier.
- Adjunct therapy might be particularly helpful for people at high risk of CVD/CKD or other existing comorbidities.
- Consider a diagnosis of T1D in the emerging frameworks of fair GLP-1RA allocation, especially if overweight or obesity are present.
- Reduction in insulin requirements could be seen in individuals with T1D using an AID system with adjunct GLP-1RA therapy, allowing those whose daily insulin needs exceed the capability of their AID system to deliver a necessary total daily insulin dose or a necessary bolus dose and to avoid the need for frequent refills of their reservoir.

What are the Knowledge Gaps, Controversies, and Recommendations for Research in the Use of GLP-1RAs as Adjuvant Therapy with AID Systems in T1D?

Strong Recommendations

- Manufacturers of weekly GLP-1RAs should test these products in people with T1D using AID systems. By doing so, the evidence base will be strengthened, and regulatory approval can be sought if these agents prove to be safe and effective.
- Future studies of GLP-1RA use by people with T1D using an AID system should address mitigation strategies for DKA and hypoglycemia.
- Phase 3 regulatory trials of GLP-1RAs are highly desired and encouraged for an adjunct indication in managing T1D. We call on pharmaceutical manufacturers of weekly GLP-1RAs to test these products in people with T1D using an AID system, so that these individuals may have an opportunity to use these drugs if the products prove to be safe and effective upon review by regulatory bodies.

What should be the Role of GLP-1RAs with AID systems in T1D?

Strong Recommendations

- Evaluation of GLP-1RA therapy for T1D users of AID systems should include assessment of which T1D patients benefit the most.
- An AID system can accommodate a reduction in insulin requirement induced by GLP-1RA therapy, thereby reducing the risk of hypoglycemia.
- When using GLP-1RAs in people with T1D, clinicians should consider adjusting not only insulin doses but also other medications for comorbidities that are administered based on (1) body weight (e.g., levothyroxine for hypothyroidism) if weight loss occurs and (2) the person's underlying condition where their effects or side effects may be additive with those of the GLP-1RA.
- With availability of AID systems that enable achievement of glycemic goals, treatment focus in GLP-1RA users with T1D should also be on comorbidities, such as CVD and CKD.
- For AID systems to accommodate current formulations of GLP-1RA drugs, treatment would be a combination of manual (GLP-1RA therapy) and automated (AID) interventions.
- Given the independent benefits of GLP-1RAs, clinicians should consider complementing AID therapy in T1D with a GLP-1RA. Conversely, for people with T1D on GLP-1RA therapy, clinicians should consider switching from other insulin regimens to AID therapy.

Type 1 diabetes

BMI > 25 kg/m² (> 23 kg/m² for South Asians)

BMI ≤ 25 kg/m² (≤ 23 kg/m² for South Asians): No adjunctive diabetes medication indicated

Consider off label Metformin if no contraindications if wanting to improve blood glucose control while minimising effective insulin dose (NICE NG17, 1.7.26)
- eGFR 30-44 ml/min: maximum dose 1g per day
- eGFR ≥ 45 ml/min: maximum dose 2g per day

May need to reduce insulin doses based on glucose levels
Consider monitoring Vitamin B12 every 5 years

If Orlistat or GLP-1 receptor agonist initiated, ensure appropriate dietary, exercise and sick day rule advice has been provided
Diabetes medicines: GLP-1 agonists - Overview | Guy's and St Thomas' NHS Foundation Trust

BMI ≥ 28 kg/m²

Consider Orlistat 120 mg up to 3 times per day, immediately before, during or up to 1 hour after each main meal. Continue treatment beyond 12 weeks only if weight loss observed. If a meal I smised / contains no fat, dose of orlistat should be omitted.
Contraindications: cholestasis, chronic malabsorption, breast feeding. Caution: CKD / volume depletion / pregnancy

BMI ≥ 35 kg/m² (≥ 32.5 kg/m² for minority ethnic groups) and high insulin resistance (≥ 1 unit/kg body weight or 100 units total daily insulin per day)

BMI < 35 kg/m² (< 32.5 kg/m² for minority ethnic groups) and:
- High insulin resistance (≥ 1 unit/kg body weight or 100 units total daily insulin per day) or
- Needing to lose weight for:
  - Surgical procedure e.g. organ transplantation
  - Off load feet at high risk of diabetic foot disease e.g. Charcot neuropathy

Consider diabetes indicated GLP-1 receptor agonist for off-label use if:
- Patient appropriately counselled of off-label use
- Retinal screening: no retinopathy / stable mild non proliferative diabetic retinopathy
- No severe hypoglycaemia
- Gold score ≤3
- eGFR > 30 ml/min
- No history of eating disorders (to be used at discretion of T1DE team in presence of eating disorders only)
- No history of recurrent pancreatitis or active biliary tract disorders
- GP practice has agreed to continue prescribing this after initiation

May need to reduce bolus / quick acting insulin by 20-30% and basal / background insulin by 20% when starting treatment depending on starting glycaemia. Stop Orlistat if using this.
- At 6 months, only continue if has lost at least 3% of initial body weight.

BMI ≥ 40 kg/m² (≥ 37.5 kg/m² for minority ethnic groups)

Consider referral to Tier 3 and Tier 4 weight management services (KCH / GSTT if based in SE London)

GLP-1 receptor agonists

Diabetes indication (Amber):
- Dulaglutide (Trulicity®)
- Liraglutide (Victoza ®)
- Semaglutide (Ozempic ®)
- Semaglutide (Rybelsus ®)
- Tirzepatide (Mounjaro ®)

Initiation and minimum one month supply by a diabetes specialist (Consultant or GPwER or appropriately trained diabetes specialist practitioner)

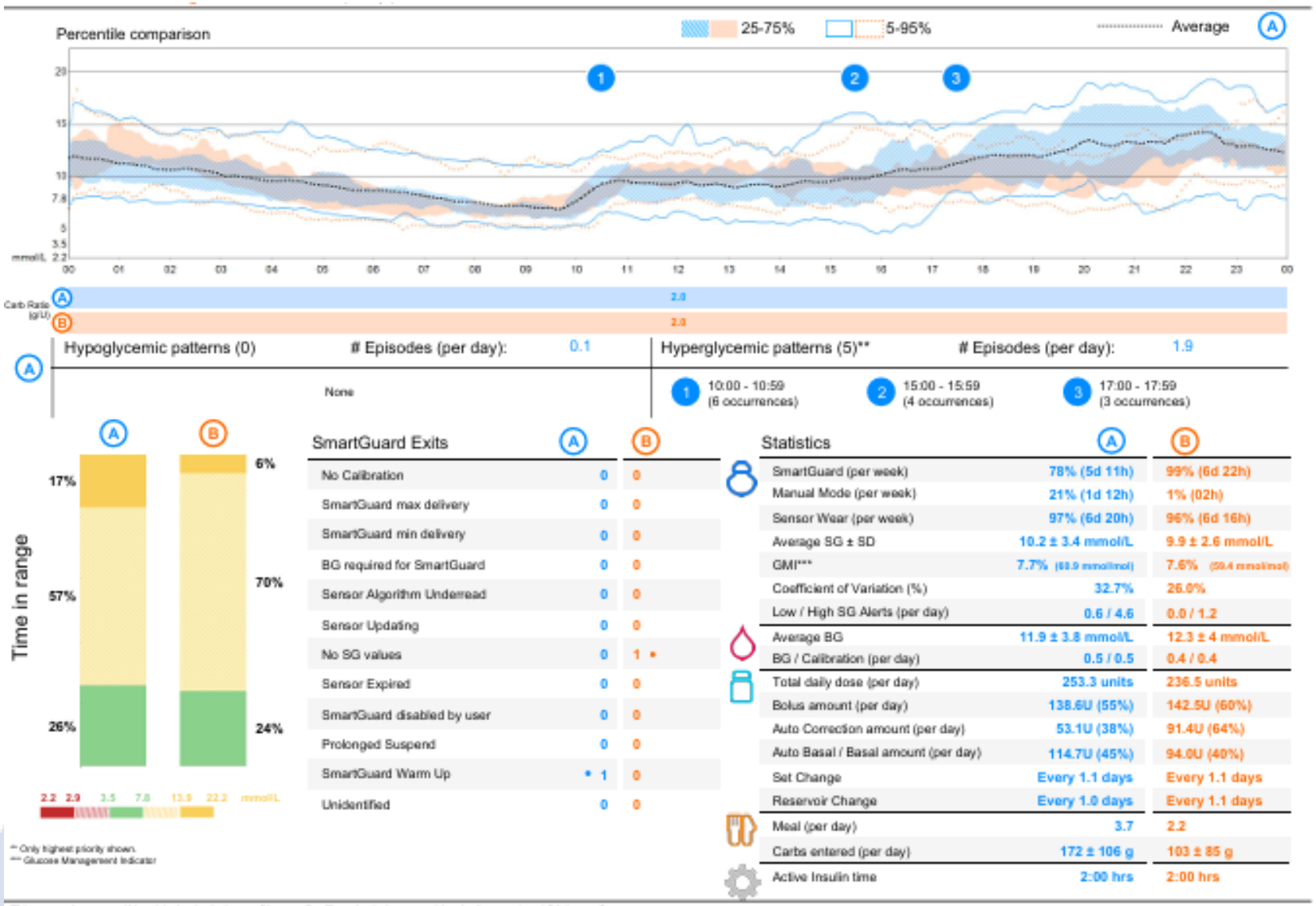
Obesity indication (Red):
- Liraglultide (Saxenda ®)
- Semaglutide (Wegovy ®)
- Tirzepatide (Mounjaro ®)

Red listed, for prescribing in specialist weight management services only (Tier 3 and Tier 4 bariatric teams only). KCH diabetes team is not a specialist weight management service

Version 1.0 03.07.2025

GLP1 RA with HCL Kings Case

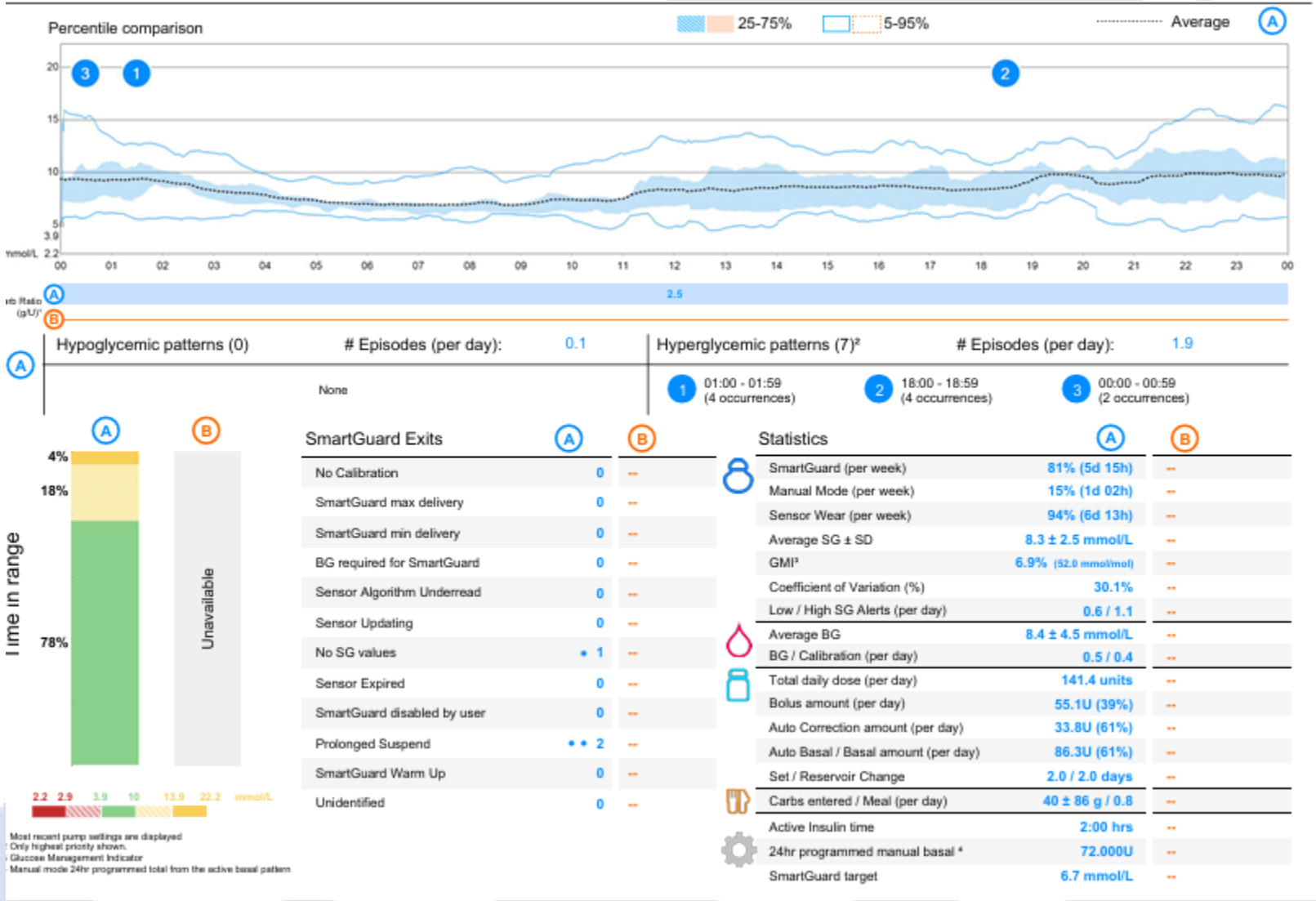
- 56 male T1D
- Needle phobic
- Advanced complications
  - Gastroparesis
  - Maculopathy- laser
  - Autonomic Neuropathy
    - ED
    - Foot ulcers
  - Depression
- Weight 125kg
- TDD >250 units- kicked out of HCL
- TIR reducing 56% → 26%
- Daily burden +++



GLP1 RA with HCL Kings Case

Jan 2026

- Monjaro 15mg
- TDD = 141 units
- Weight -94Kg



Concentrated insulin in HCL

Any experience ?

Concentrated insulin

- New formulas available exceeding U100 concentration (both rapid and basal insulin)
- Commercially available insulin pumps are not calibrated for use with concentrated insulins and not approved
- Several retrospective studies U500 have reported the use of pumps in people requiring large doses of insulin T1D/T2D
- The availability of concentrated insulins could lead to development of more compact pumps with smaller reservoirs
- Use of concentrated insulin is off-label.
- Patients would have to convert insulin doses themselves- potentially dangerous

Real-World Safety and Effectiveness of U200 Insulin Use in Automated Insulin Delivery Systems in Adolescents and Young Adults with Type 1 Diabetes

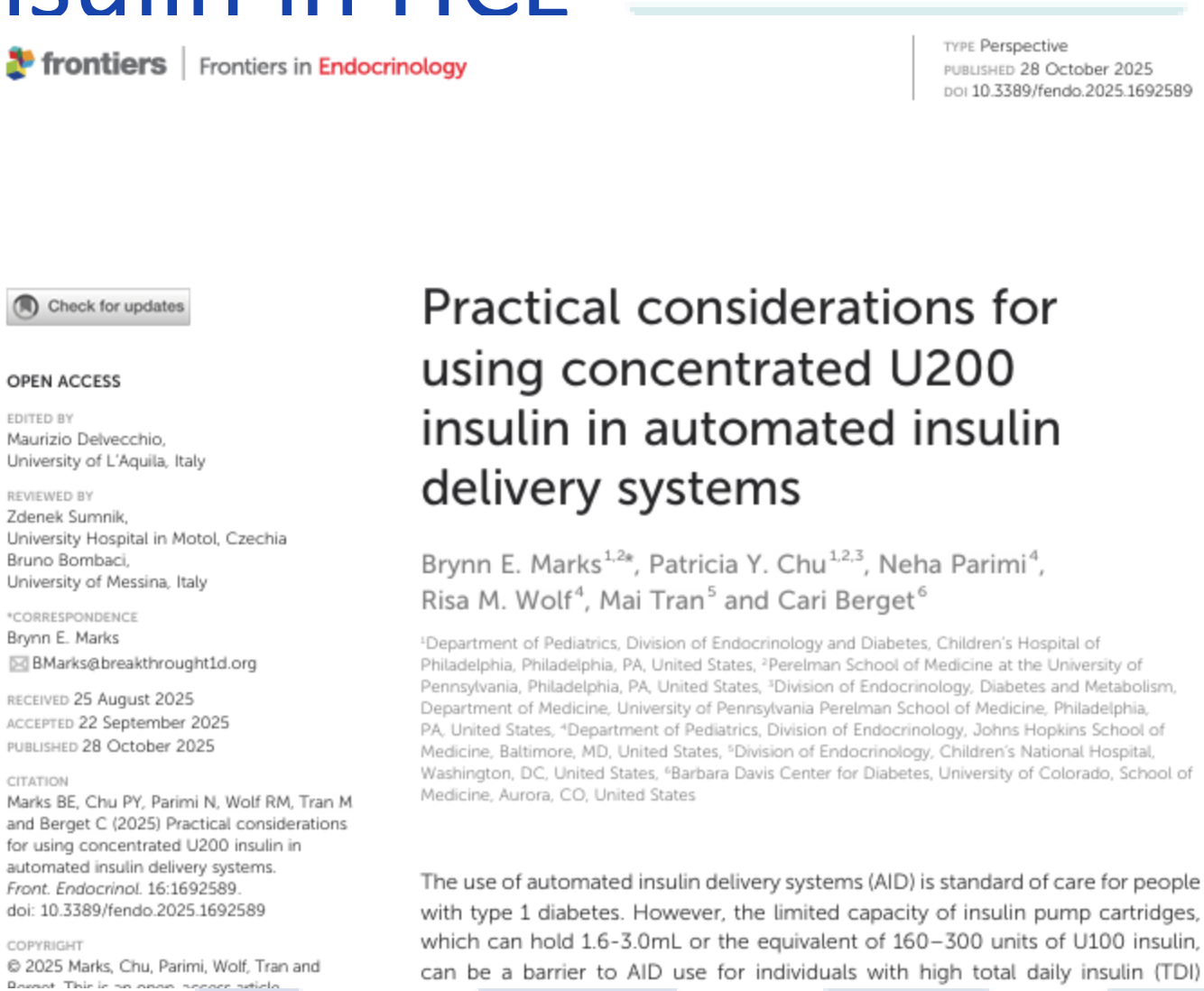
Patricia Y. Chu, MD, MHSc, MSCE[1,2,3], Neha Parimi, MD, MPH[4], Risa M. Wolf, MD[4], Elizabeth Brown, MPH[4], Andrea Kelly, MD, MSCE[1,3,4], Brynn E. Marks, MD, MSHPEd[1,3,4]

- Real-world safety and effectiveness of U200 concentrated insulin use.
- Two-center, retrospective cohort study
- Assessing glycemia, pump utilisation, and safety outcomes pre-/post-U200-AID.
- Among 50 patients initiating U200-AID (age 15.4 years, T1D duration 5.5 years, HbA1c 8.5%)
  - TIR increased (44.6±12.6% vs. 48.9±11.4%, p=0.012)
  - TBR unchanged
  - Days between cartridge changes increased (2.2±0.5 vs. 3.0±0.5 days, p<0.001)
  - Increased TDD (102.6±23.5 vs. 125.8±38.9 U100 insulin units, p<0.001)
  - No severe hypoglycaemia or DKA
- U200-AID is a viable option for individuals with T1D and high insulin requirements

Concentrated insulin in HCL

This paper provides practical considerations and guidance on U200-AID use.

- Emphasis on patient education and methods to support safe use
- Real-world data provide preliminary evidence for safe use of U200 in AID
- Further prospective research and consideration by regulatory authorities are needed



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Practical considerations for using concentrated U200 insulin in automated insulin delivery systems

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The use of automated insulin delivery systems (AID) is standard of care for people with type 1 diabetes. However, the limited capacity of insulin pump cartridges, which can hold 1.6-3.0mL or the equivalent of 160–300 units of U100 insulin, can be a barrier to AID use for individuals with high total daily insulin (TDI)

TABLE 1 Suggested AID setting changes when transitioning from U100 to U200 insulin in an AID system.

	Beta Bionics iLet		Medtronic 780G with Smart Guard		Insulet Omnipod 5		Tandem t:slim X2 and Mobi with Control-IQ	
	U100 Settings	U200 Settings	U100 Settings	U200 Settings	U100 Settings	U200 Settings	U100 Settings	U200 Settings
Factory reset needed when switching between insulin formulations?	Yes- algorithm is driven by TDI history		Yes- algorithm is driven by TDI history. Note: only one reset possible per pump lifetime		Yes- algorithm is driven by TDI history		No- Software Versions 7.9 and up does not reset TDI	
Weight (with examples)	Enter half of actual weight when switching to U200		n/a		n/a		No change needed- weight does not significantly impact insulin delivery	
	200lb	100lb						
Total Daily Insulin Dose (with examples)	n/a		n/a		n/a		Enter half of the total daily insulin dose when switching to U200	
							120 units	60 units
Basal rate (with examples)	n/a		Enter half the basal rate when switching to U200					
			e.g., 3.0 units/hr (U100), change to 1-1.5 units/hr (U200)					
Carbohydrate Ratio (with examples)	n/a		Double carbohyrate ratio when switching to U200					
			e.g., 1 unit per 5g carbohydrate (U100), change to 1 unit per 10-15g (U200)					
Correction/ Sensitivity Factor (with examples)	n/a		Double the sensitivity when switching to U200					
			e.g., 1 unit per 10 mg/dL (U100), change to 1 unit per 20-30 mg/dL (U200)					
AID System-Specific Safety Settings *	n/a		Max Basal: when using U200 program half of the user's U100 max basal (e.g. if U100 max basal was 4 units/hr, U200 max basal should be 2 units/hr) Max Bolus: when using U200 program 1/3 of the U200 TDI, 1/6 of the U100 TDI, or personalize according to typical U200 bolus amounts (e.g. if U100 TDI is 120 units and U200					

Concentrated insulin in HCL- systems specific

Medtronic 780g

TDD history must be reset when switching from U100 to U200- can only be cleared once. If 'Clear Active Insulin' does not display in the 'Mange Settings' menu, it is because the active insulin has previously been cleared and cannot be cleared again.

Omnipod 5

Algorithm uses TDD history to drive basal automation (Adaptive basal rates)- calculated as 50% of the TDD using average from the last 4–5 pods.

The controller/App must be reset when changing between U100 and U200 to ensure the algorithm is not dosing according to previous TDI history.

Control IQ

TDD- lesser extent of impact to automated delivery, advisable to update settings (minimum and maximum insulin delivery constraints in the algorithm).

Software versions upgrade to Control-IQ+ do not reset TDD - factory reset is needed. When using U200, halve the individual's TDD

Two personal profiles should be programmed for U100 and U200

Concentrated insulin in HCL- Omnipod 5

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Looping with Omnipod using U200

The potential benefits of using U200 lispro instead of U100 rapid insulins are

1) making your patch pod last the full full 3 days if your total daily dose (TDD) of rapid is > 66 units (the Omnipod reservoir holds only 2 ml = 200 U of U100)
2) the smaller insulin volume may be somewhat less prone to bolus leakage
3) there may be a reduction in pain at the infusion site.

The downside of U200 rapid insulin in Omnipods includes

4) U200 is not a BC Pharmacare benefit (we are working on changing this…)
5) U200 is not approved for use in Omnipod pumps by both Health Canada and the US.
6) conversion of AID basal, carb ratio and ISF settings are required to safely reflect the double-strength insulin concentration.

Read on for BCDiabetes' guide to safely making these changes for both Loop & iAPS users (AAPS changes are analogous to iAPS). Please note, the switch from U100 to U200 should only be made under the supervision of a diabetes specialist. Credit for this how-to is due Dr. Kate Hawke, BCDiabetes's visiting technology Fellow, 2023-2024.

U200 switch on Loop

All settings need to be made "half strength" when switching to U200 insulin, i.e.

- Basals must be halved
- ICR & ISF numbers must be "doubled" (makes them half as strong)
- Delivery limits must be halved

Example settings switch:

	U100 settings	U200 settings
Glucose safety limit	3.9	3.9
Correction range	5.5 – 5.5	5.5 – 5.5
Pre-meal range	4.5 – 4.5	4.5 – 4.5
Carb ratios	00:00 : 5 05:00 : 3 11:00 : 3.5 22:00 : 5	00:00 : 10 05:00 : 6 11:00 : 7 22:00 : 10
Basal rates	00:00 : 1.3 07:00 : 1.3 15:00 : 1.2	00:00 : 0.65 07:00 : 0.65 15:00 : 0.6
Delivery limits – max basal rate	4.8	2.4

Anything Else???