

EPV151 / #882

E-Poster Viewing Topic: A505. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes**THE CHILD DISABILITY ALLOWANCE IS USED TO SUBSIDIZE CGM IN NEW ZEALAND**

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Background and Aims: In New Zealand (NZ) the Child Disability Allowance (CDA) is available to families with a child with T1D under the age of 18 to support their financial needs. This study aimed to identify how these families use the CDA and the potential impacts of losing funding when their child turns 18.

Methods: An online survey with 40 items was promoted with NZ online diabetes social media groups and distributed electronically to parents with children <18 years with T1D enrolled in three regional diabetes clinics in. Chi square and Kruskal-Wallis tests were conducted to assess for associations at a significance level of $p < 0.05$.

Results: A total of 134 surveys were completed. Most respondents were female (94%). Median household income was \$120,000 (IQR \$74,00-180,000). CGM, insulin pumps and AID were used by 94.8%, 69.2% and 60.2% of children respectively. Overall, 83.4% of respondents indicated that losing access to the CDA would significantly or moderately negatively impact their child's use of CGM. Lower median household income was associated with a negative impact on CGM usage ($p = 0.05$), diabetes-related medication use ($p = 0.031$), and quality of groceries ($p < 0.01$).

Conclusions: The CDA is used to subsidise a wide range of diabetes-related costs. With all families losing access to the CDA when their child turns 18, families with lower median incomes report being more likely to be negatively impacted by this loss of funding. Most notably, this includes losing access to CGM, which were not publicly funded in NZ during this study.

EPV152 / #824

E-Poster Viewing Topic: A505. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes**VARIABLES INFLUENCING THE OPTIMAL SAMPLING DURATION OF INTERMITTENTLY-SCANNED CONTINUOUS GLUCOSE MONITORING TO ASSESS 90 DAYS OF GLYCEMIA RISK INDEX. FINDINGS FROM A MULTICENTRIC REAL-WORLD STUDY**

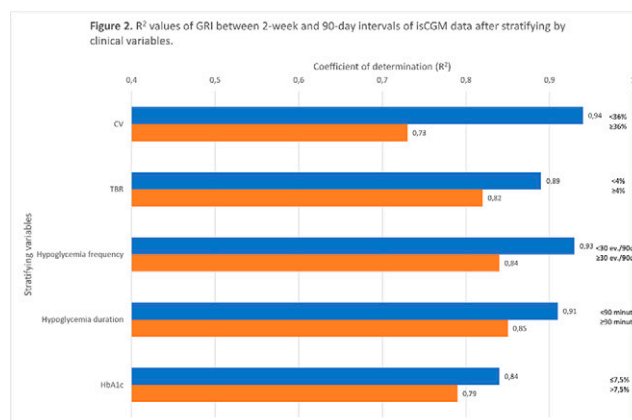
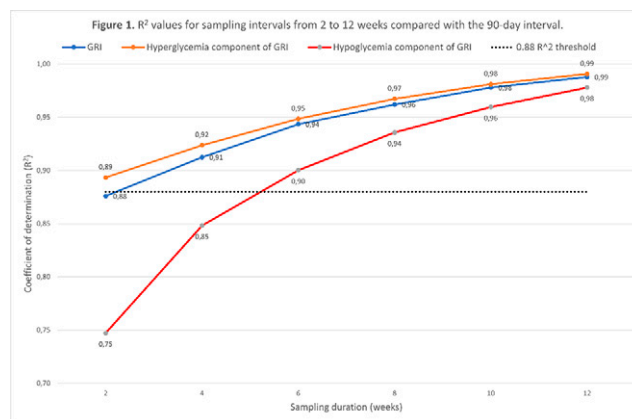
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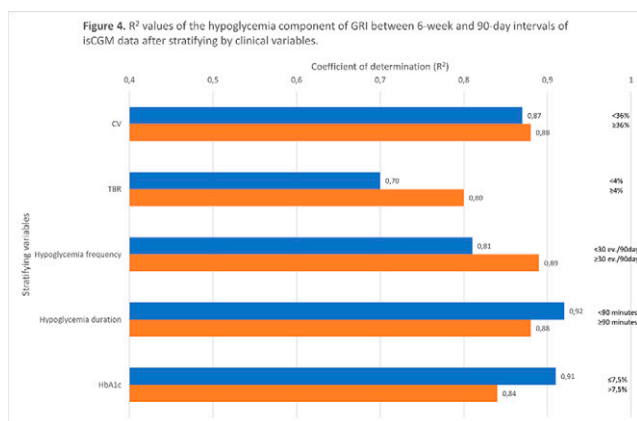
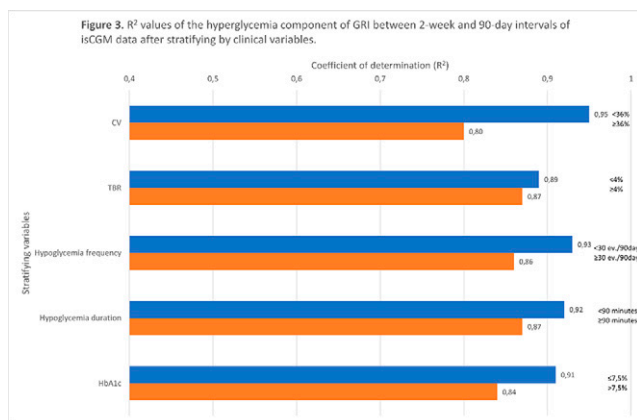
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Background and Aims: The glycemia risk index (GRI) is a novel composite score to evaluate the quality of glucose monitoring profiles. Our study investigated which variables might affect the optimal sampling duration for the assessment of GRI through 90 days of intermittently-scanned continuous glucose monitoring (isCGM).

Methods: This real-world, retrospective study included 539 90-day isCGM-data from 367 adults with type 1 diabetes (T1D) on multiple daily injection (MDI) therapy (F/M 164/203, age 42 ± 16 years, diabetes duration 21 ± 14 years). Coefficients of determination (R^2) for GRI and its hyper- and hypoglycemia components were computed for sampling periods from 2 to 12 weeks versus the whole 90-day intervals. Correlations were considered strong for $R^2 \geq 0.88$.

Results: Strong correlations with 90 days were found for GRI and for its hyperglycemia component with 2-week-long data samplings ($R^2 = 0.88$ and 0.89 , respectively), while 6 weeks were needed to achieve a significant correlation for the hypoglycemia component ($R^2 = 0.90$). When stratifying by clinical variables, higher R^2 values for GRI and for its hyperglycemia component were found with lower coefficient of variation ($< 36\%$), lower time below range (TBR) ($< 4\%$), lower frequency of hypoglycemic episodes (< 30 episodes/90days) and lower mean hypoglycemia duration (< 90 minutes); in contrast, the hypoglycemia component showed stronger correlations with higher TBR, lower HbA1c ($\leq 7.5\%$) and higher frequency of hypoglycemia.





Conclusions: Two-week-long isCGM data could provide an effective estimation of GRI through 90 days; however, HbA1c, glycemic variability (expressed as CV), TBR and frequency and mean duration of hypoglycemic episodes might affect the accuracy of the chosen sampling duration.

EPV153 / #855

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

SOTAGLIFLOZIN IMPROVES TIME IN RANGE (TIR) IN PATIENTS WITH TYPE 1 DIABETES AND CHRONIC KIDNEY DISEASE

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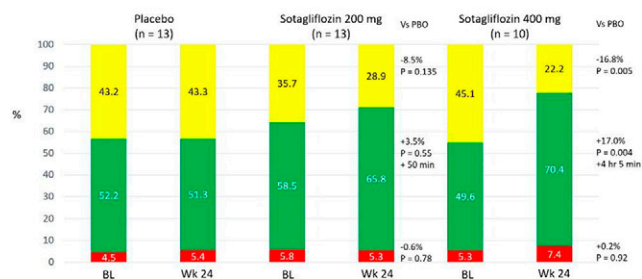
Background and Aims: In addition to A1C, time in range (TIR) is considered an important glycemic metric and is positively associated with long-term clinical benefits. Sotagliflozin was shown to improve TIR in patients with type 1 diabetes (T1D). In a *post hoc* analysis, the effect of sotagliflozin on TIR was evaluated in patients with T1D and CKD.

Methods: In two identically designed, 24-week, placebo-controlled trials in patients with T1D, a subset was included in a masked continuous glucose monitoring (CGM) substudy. In the present analysis, the effect of sotagliflozin 200 and 400 mg daily added to optimized insulin therapy was evaluated for TIR (blood glucose 70 to 180 mg/dL [3.9 to 10 mmol/L]), time above range

(TAR: blood glucose >180 mg/dL [>10 mmol/L]), and time below range (TBR: blood glucose <70 mg/dL [3.9 mmol/L]) in a subgroup of patients with T1D and CKD defined as estimated glomerular filtration rate 45 to <60 mL/min/1.73 m² and/or urinary albumin to creatinine ratio ≥30 mg/g.

Results: In the small subset of patients with T1D and CKD, baseline TIR was 50 to 59%. At 24 weeks, treatment with sotagliflozin increased TIR by 3.5% and 17%, with a significantly larger effect observed with sotagliflozin 400 mg (Figure). The improvement in TIR was associated with a significant reduction in TAR without an increase in TBR.

Effect of Sotagliflozin on TIR, TAR, and TBR at Week 24



Conclusions: In patients with T1D and CKD, treatment with sotagliflozin 400 mg significantly improved TIR by more than 4 hours at week 24.

EPV154 / #836

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

ASSESSING THE EFFECTS OF CGM PREDICTIVE FEATURE USAGE ON GLYCEMIC CONTROL AND MENTAL BURDEN IN PATIENTS WITH TYPE 1 DIABETES

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Background and Aims: Predictive alert features in Continuous Glucose Monitors (CGMs) provide advanced notice of potential adverse glycemic events; however, research on their impact on overall diabetes management remains limited. This study evaluates the effects of CGM predictive features on glycemic control and mental well-being in patients with Type 1 diabetes (T1D).

Methods: From April-May 2024, 800 T1Ds using CGMs on multiple daily injection therapy in France, Germany, Italy, the Netherlands, Spain, Sweden, and the UK completed an online survey. Respondents who used their CGM for 6+ months reported their usage of predictive alerts, along with recent HbA1c, estimated time-in-range, and satisfaction with their diabetes management. Mental well-being was assessed using the World Health Organization's well-being index and by evaluating agreement with the impact of CGM use on the burden of diabetes management.

Results: 21% of T1Ds are on CGMs with predictive alert capabilities, of which 88% utilize them (n=800). T1Ds utilizing these alerts spent significantly more time-in-range (69%vs.63%, p=0.005), and significantly more predictive alert users had an

HbA1c $\leq$ 7% (65%vs.53%, $p=0.010$). However, no significant differences were found by predictive alert usage on respondents' mental well-being, satisfaction with diabetes management, or perceived effects of CGM use on the burden of diabetes management.

Conclusions: Although CGM predictive alert usage significantly aids glycemic control in patients with T1D, these benefits may be outweighed by the information overload associated with constant data monitoring and CGM alerts. The lack of improvement in psychological outcomes suggests a balanced approach in diabetes management is necessary and CGM users may benefit from more customization.

EPV155 / #1174

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

BLOOD GLUCOSE PREDICTION IN TYPE 1 DIABETES USING A HYBRID DEEP LEARNING MODEL WITH CNN AND TRANSFORMER

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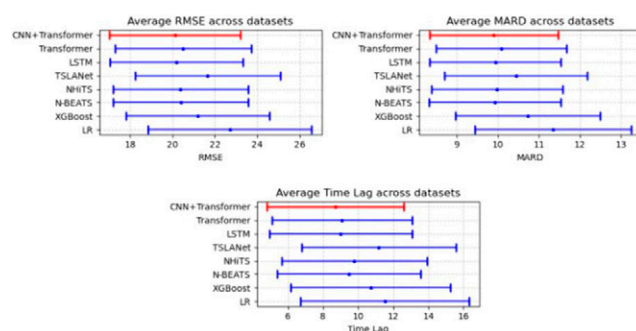
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Background and Aims: Blood glucose (BG) prediction is crucial in automated insulin delivery (AID) systems to avoid hyperglycemia and hypoglycemia. However, BG prediction is challenging due to the extensive inter- and intra-individual variability in glucose levels. Population-based deep learning models are able to address these difficulties by learning patterns from a broad dataset of multiple individuals.

Methods: We propose a hybrid population model with Convolutional Neural Network (CNN) and Transformer architecture to capture both local and global dependencies in BG sequences. The prediction horizon (PH) has been set as 30-minutes given 2 hours history. The proposed model compared with previously published baseline models (Linear Regression (LR), XGBoost, N-BEATS, NHiTS, TSLANet and LSTM). The models have been evaluated on OhioT1DM, Replace-BG, CTR-3 and DCLP-3 public datasets using Root mean square (RMSE), mean absolute relative difference (MARD), and time lag metrics.

Results: The proposed model outperforms other models across multiple datasets, particularly excelling in reducing time lag. The proposed model achieved RMSE of 19.54, MARD of 9.09, time lag of 5.25 on OhioT1DM; RMSE of 20.25, MARD of 10.35, and time lag of 9.62 on Replace-BG; RMSE of 20.84, MARD of 10.27, time lag of 8.21 on CTR3; and RMSE of 20.10, MARD of 9.67, a time lag of 11.74 on DCLP-3.

Summary of Average Results Across Dataset - Prediction Horizon 30



Conclusions: Our proposed model exhibits robust performance, providing practical benefits for real-time control, enhanced safety, timely interventions, and improved quality of life in type 1 diabetes across multiple datasets for blood glucose prediction.

EPV156 / #799

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

FAST-ACTING INSULIN ASPART INCREASES MAINLY THE TIME IN TIGHT RANGE AMONG T1DM INDIVIDUALS USING AN AUTOMATIC INSULIN PUMP

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Background and Aims: Compared to previously marketed insulins, the effect of fast-acting insulin aspart develops earlier and wears off sooner, thanks to its pharmacodynamics, which is closer to natural insulin. We set out to investigate how this affects the sensor data, especially the Time in a tight range (TITR) value (glucose range 3.9–7.8 mmol/L) among T1DM individuals using an automatic insulin pump.

Methods: We analyzed CGM data for regular insulin aspart and fast-acting insulin aspart in individuals living with T1DM and using a Medtronic Minimed 780 G insulin pump and Guardian 4 sensor (N=22).

Results: After switching from regular insulin aspart to fast-acting insulin aspart, TIR, TAR, and TBR values improved significantly. The TIR (Time in the range 3.9-10.0 mmol/l) increased from 70 to 76% ($p<0.001$), the moderately high TAR (Time above range) (10.0- 13.9 mmol/l) decreased from 21.2% to 18.2%, the exceptionally high TIR (> 13.9 mmol/l) dropped from 5.2% to 2.8%. (in both cases, $p < 0.01$). The very low TBR (Time below range) (< 3.0 mmol/l) decreased from 0.5% to 0.18%; the moderately low TBR (3.0-3.9 mmol/l) decreased from 2.6% to 2.1% (in both cases $p < 0.01$). TITR's value increased from 41.6% to 47.5% ($p<0.01$).

Conclusions: Both TIR and TITR improved by 6-6%. The improvement in CGM data was mainly due to an increase in TITR, i.e., an increase in the time spent in normoglycemia.

EPV157 / #19

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

LONG-TERM EFFICACY OF CONTINUOUS SUBCUTANEOUS INSULIN INFUSION OVER MORE THAN TEN YEARS IN PATIENTS WITH TYPE 1 AND TYPE 2 DIABETES: A REAL-LIFE RETROSPECTIVE STUDY

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Background and Aims: To evaluate in real-life conditions the effect of the insulin pump on glycemic control in a population of patients with type 1 and 2 diabetes (T1DM and T2DM).

Methods: 295 patients treated with insulin pump, were exhaustively included on November 21, 2021 for retrospective analysis on medical file since the installation of the insulin pump. Evolution of glycated hemoglobin (HbA1c), BMI and insulin dose over 10 years of treatment were compared to the initial values before pump. Potential predictive markers of efficacy on glycemic control under insulin pump were evaluated.

Results: HbA1c was significantly reduced throughout the follow-up period in the total group ($8.43 \pm 0.09\%$ initially, $7.81 \pm 0.08\%$ ($p < 0.0001$) at 6 months and $7.90 \pm 0.09\%$ ($p < 0.0001$) at 10 years. The percentage of patients with an HbA1c $< 7.5\%$ increased significantly throughout the follow-up period (28.5% initially and 45.2% at 6 months ($p = 0.00019$)). Patients who started pump treatment between 45 and 65 years presented with best results. The decrease in HbA1c was correlated with age and HbA1c at baseline. No difference was found according to the type of pump, infusion set, type of continuous measurement glucose or home healthcare providers.

Conclusions: The insulin pump improves glycemic control regardless of the type of material and organization. Some predictive markers seem to be the age at insulin pump initiation and the HbA1c at baseline. This would allow the clinician to refocus the improvement of glycemic control on the patient and not the technology. However, it will be interesting to evaluate the evolution under closed loop.

EPV158 / #917

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

WHAT PREDICTS MICROVASCULAR COMPLICATIONS IN TYPE 1 DIABETES? 'HIGH GLYCATION' IS NOT ASSOCIATED WITH PREVALENT RETINOPATHY OR MICROALBUMINURIA

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Background and Aims: Discordance between HbA1c and average glucose metrics on CGM have been suggested as a potential risk factor for microvascular complications. We sought to assess associations between indices of glycation and prevalent retinopathy and microalbuminuria.

Methods: Cross-sectional study assessing 9023 paired CGM and HbA1c measurements in 2721 adults with type 1 diabetes. Discordance between HbA1c and GMI was assessed by glycation ratio ($GR = GMI/HbA1c$) and haemoglobin glycation index ($HGI = HbA1c - GMI$). Associations with retinopathy ($n = 1323$) and microalbuminuria (at least 3 values > 3.0) ($n = 1371$) were assessed. To be included, individuals had to have at least 3 paired CGM and HbA1c episodes and the mean of all episodes was used for the HbA1c and CGM metrics reported.

Results: 59% had a history of retinopathy and 35% had a history of microalbuminuria. Associations with retinopathy and microalbuminuria are presented in the table. HGI ($R = 0.553$, $P < 0.001$) and GR (-0.542 , $P < 0.001$) are strongly associated with HbA1c. Despite this, GR and HGI were not associated with

retinopathy (associations with microalbuminuria did not persist in logistic regression). Logistic regression identified GMI, BMI, duration, CV glucose, deprivation and lower glycation (by HGI) as independent predictors of retinopathy. GMI, CV glucose, duration and female sex were independent predictors of microalbuminuria.

	Any retinopathy (n = 776)	No retinopathy (n = 547)	P	Elevated ACR (n = 478)	ACR not elevated (n = 933)	P
HbA1c (mmol/mol)	62 (55–71)	60 (53–69)	0.002	64 (58–72)	60 (54–69)	<0.001
GMI (mmol/mol)	60 (55–68)	59 (53–65)	<0.001	61 (55–68)	59 (53–66)	<0.001
Average glucose (mM)	10.2 (9.0–11.6)	9.8 (8.6–11.2)	<0.001	10.3 (9.0–11.8)	9.9 (8.7–11.3)	<0.001
TBR (%)	2.5 (1.3–5.0)	2.0 (0.8–4.5)	<0.001	2.4 (1.1–5.0)	2.3 (1.0–4.8)	0.335
TIR (%)	48 (38–60)	53 (40–68)	<0.001	48 (37–59)	52 (40–65)	<0.001
TAR (%)	47 (36–60)	43 (28–57)	<0.001	48 (36–61)	45 (31–58)	<0.001
CV glucose (%)	38 (34–41)	36 (31–39)	<0.001	38 (34–42)	37 (32–41)	<0.001
Glycation ratio	0.98 (0.92–1.04)	0.98 (0.92–1.03)	0.375	0.96 (0.91–1.02)	0.98 (0.93–1.04)	<0.001
Hb glycation index (mmol/mol)	1.3 (2.2–5.4)	1.5 (1.7–5.3)	0.431	2.4 (1.5–6.6)	1.0 (2.0–4.7)	<0.001
BMI (kg/m ²)	27.6 (24.4–32.3)	26.9 (23.9–30.2)	0.003	27.2 (24.0–32.0)	27.4 (24.2–31.2)	0.932
Duration of diabetes (years)	24 (17–32)	11 (4–21)	<0.001	24 (15–34)	17 (8–27)	<0.001
Deprivation quintile	Most deprived 72% Least deprived 53%	Most deprived 28% Least deprived 47%	0.005	Most deprived 46% Least deprived 34%	Most deprived 54% Least deprived 66%	0.057
Sex	Female 56% Male 62%	Female 46% Male 40%	0.046	Female 40% Male 30%	Female 60% Male 70%	<0.001
Smoking history	Ever 61% Never 57%	Ever 39% Never 43%	0.220	Ever 41% Never 31%	Ever 59% Never 69%	<0.001

Conclusions: These data suggest that indices of 'high glycation' are not strongly associated with microvascular complications. Indeed, the risk of retinopathy was independently associated with 'low glycation', perhaps due to falsely reassuring HbA1c in people with high average glucose exposure.

EPV159 / #569

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

A COHORT STUDY INVESTIGATING THE IMPACT OF FRAILTY ON GLYCAEMIC CONTROL IN OLDER ADULTS WITH TYPE 1 DIABETES

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Background and Aims: Frailty describes the age-related physiological decline across organ systems, increasing vulnerability to stressors. The type 1 diabetes (T1DM) population is growing older. Hypoglycaemia increases the risk of falls, hospitalisations and mortality in older adults. This study assesses whether frailty is associated with increased hypoglycaemia in older adults with T1DM.

Methods: Participants were over 65, with established T1DM. Those lacking capacity to consent were excluded. C-peptide was measured in each participant. Frailty was categorized as robust, prefrail, or frail as per Fried Frailty Phenotype, assessing gait speed, weight loss, hand-grip strength, exhaustion and physical activity. Blinded continuous glucose monitors (CGM), Dexcom G6/G7, were worn for 10 days. CGM metrics were compared between frailty categories, focussing on percentage time below range (%TBR).

Results: 86 participants were recruited. 87% used CGM. One was excluded due to raised c-peptide. 39 were robust, 30 prefrail and 16 frail. Frail participants were older, with more comorbidities and diabetes complications. Frailty was associated with higher HbA1c ($p = 0.022$) and lower cognitive performance assessed using Montreal Cognitive Assessment ($p = 0.003$). There

was no difference between any CGM-derived glycaemic parameter across the frailty spectrum, including %TBR.

Conclusions: While frailty in type 2 diabetes is associated with hypoglycaemia, this was not demonstrated in our T1DM cohort. Raised HbA1c levels with frailty may reflect recommendations to relax glucose levels with advancing frailty. However, despite relaxed glycaemia, there was no difference in the amount of hypoglycaemia as frailty progresses. Frailty specific CGM treatment targets are urgently needed, alongside further research into frailty in people living with T1DM.

EPV160 / #1011

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

OVERWEIGHT AND OBESITY IN TYPE 1 DIABETES ADULTS AND CGM METRICS IN ARGENTINA

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Background and Aims: Overweight and obesity in adults with type 1 diabetes is increasing. However, the relationship between body weight and CGM metrics is lacking.

Methods: A retrospective data analysis was conducted using the Libreview platform for adults (≥ 18 years) who were sharing data with our two centers in Argentina, up to September 2024. BMI and HbA1c were obtained from clinical records.

Results: data from 103 adults with T1D FreeStyle Libre 1 users, treated with MDI were studied. Mean age: 35,8; female: 43%; mean HbA1c 8,26% (SD 1,55) and mean BMI 25,05 kg/m² (SD 3,71). CGM metrics: mean TIR: 44,7%; mean TBR 5,95%, mean GMI 7,78% (SD 1,14) and CV 40,6% (SD 8,16). When the studied cohort was categorized into three BMI groups: ≤ 24 (53 p), 25-29 (39 p) o ≥ 30 kg/m² (11 p), each group met TIR $>70\%$ 9,4%; 10,26 and 9,09% respectively (p NS). When we compare those with BMI ≥ 25 (vs ≤ 24) we found lower HbA1c 7,89% (vs 8,61) p 0,02. However, the data did not show significant differences in TIR, TBR, GMI, and CV.

Conclusions: Conclusion: In this sample, the data did not show significant differences in CGM metrics in relation to body weight.

EPV161 / #620

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

EVALUATION OF USERS SATISFACTION WITH GLUCOSE MONITORING AFTER UPGRADING TO A NEW GENERATION CGM SYSTEM

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Background and Aims: Diabetes technology advances, and new devices continuously emerge. The use of continuous

glucose monitoring (CGM) has become standard practice in type 1 diabetes (T1D) management. The evaluation of user satisfaction is crucial to optimise the implementation of CGM. The aim of the study was to assess user experience after upgrading from a previous generation to a next generation CGM system in adults with T1D.

Methods: A prospective analysis was performed. Subjects with T1D on MDI who upgraded from Dexcom G6 to Dexcom G7 were included. The Glucose Monitoring Experiences questionnaire (GME-Q), which specifically evaluates satisfaction with glucose monitoring and was translated into Spanish and linguistically validated by our group, was completed by the participants before upgrading and after 3 months of use of Dexcom G7. This questionnaire includes 23 items with a 5-point Likert scale to produce a total satisfaction score and three subscale scores: effectiveness, convenience, and intrusiveness.

Results: 30 subjects were included: age 40 ± 11 years, 60% males. Each evaluation was performed by an independent researcher, none of whom were involved with the patient treatment. The score resulting from the question asking specifically about the avoidance of daytime hypoglycaemia episodes was improved from $3.8 \pm 0,83$ to $4.9 \pm 0,72$ ($p < 0.005$) with Dexcom G7.

Table 1. GME questionnaire scores

	Baseline (Dexcom G6)	3 months (Dexcom G7)	P
Effectiveness subscale	4.40 $\pm$ 0.48	4.98 $\pm$ 0.44	<0.01
Convenience subscale	3.87 $\pm$ 0.49	4.98 $\pm$ 0.81	<0.01
Intrusiveness subscale	2.52 $\pm$ 0.76	1.21 $\pm$ 0.30	<0.01
Total satisfaction score	3.98 $\pm$ 0.42	4.93 $\pm$ 0.09	<0.01

n=30. GME-Q (Glucose Monitoring experience questionnaire): Higher scores reflected a higher satisfaction level except for in the intrusiveness domain, where higher scores reflected a lower satisfaction level

Conclusions: A higher user's satisfaction was shown with Dexcom G7 compared to Dexcom G6, regarding overall satisfaction, effectiveness and convenience. Additionally, Dexcom G7 was considered less intrusive for the people with diabetes than Dexcom G6 and an additional benefit in hypoglycaemia avoidance was shown.

EPV162 / #307

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

ACUTE EFFECTS OF DAILY LIFE SPONTANEOUS AND STRUCTURED PHYSICAL ACTIVITY ON GLYCEMIA IN CHILDREN WITH TYPE 1 DIABETES

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Background and Aims: In type 1 diabetes, glycemia management is rendered complex through the confounding influence

of spontaneous physical activity (PA), particularly frequent in children. We aim to understand the glycemic effects of self-reported PA and cumulative spontaneous PA in their everyday life, controlling for carbohydrate intake and insulin.

Methods: In this 7-day observational study, 45 children/adolescents (21 females, 11.7 ± 3.4 years) wore a continuous glucose monitoring system and accelerometer, completing diaries about PA, diet, insulin. Types of PA included (i) self-reported PA and its characteristics (duration, subjective intensity) and conditions (previous sessions, timing and pre-exercise carbohydrate intake, insulin-on-board, glycemia), (ii) spontaneous cumulative PA (accelerometry) adjusted for sedentary time.

Results: Accumulating moderate-to-vigorous PA ($e > -0.18$, $P < 0.05$) or reducing sedentary time ($OR = 1.01$, $P < 0.01$) decreased day time spent $> 13.9 \text{ mmol.L}^{-1}$. Time spent $> 10.0 \text{ mmol.L}^{-1}$ during self-reported PA decreased when children consumed less high-glycemic-index carbohydrates the previous hour ($e = +0.49$, $P < 0.05$) or were physically active before the session ($e = -11.57$, $P < 0.05$). PA conditions did not influence hypoglycemia. Time spent $< 3.9 \text{ mmol.L}^{-1}$ during sessions increased with their duration ($OR = 1.02$, $P < 0.005$). Risk of nocturnal time $< 3.0 \text{ mmol.L}^{-1}$ increased when children performed longer duration structured PA ($OR = 1.02$, $P < 0.05$) or accumulated more afternoon vigorous-intensity PA ($OR = 1.07$, $P < 0.01$).

Conclusions: Increasing spontaneous active behavior could help reduce day-time level 2 hyperglycemia. Hyperglycemia during exercise could be limited by multiplying daily PA sessions or avoiding excessive pre-exercise carbohydrate intake. However, as only sessions characteristics, especially duration, predicted time $< 3.9 \text{ mmol.L}^{-1}$ during PA and $< 3.0 \text{ mmol.L}^{-1}$ the following night, simplified guidelines (not considering PA conditions) on hypoglycemic risk could be developed.

EPV163 / #904

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

STRING ENCODING OF CGM DATA IMPROVES MEAL DETECTION

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Background and Aims: Accurate meal detection is crucial in diabetes management, as it allows for timely insulin administration and better glucose control. This study introduced the encoding of CGM data into strings of letters and compared the encoded CGM versus the original CGM traces to determine their efficacy in detecting meal events.

Methods: Daily CGM profile data from iDCL—Protocol 3 (DCLP3), a 6-month trial involving 168 adults with T1D (average HbA1c 7.4%, average age 33, 50% female), was encoded into a CGM string using a 9-letter alphabet and clinically accepted cutoffs. A meal profile was created, indicating meals every 5 minutes (0 for no meal, 1 for meal) and categorized into low, moderate, and high based on percentiles. The DCLP3 data also included meal announcements and insulin delivery. A 5-layer LSTM model was trained with one-hot encoding of the

CGM string and meal categories, alongside a similar model using actual CGM traces. Data was split into training (85%), testing (15%), and a 7-day validation set.

Results: Figure 1 shows that the model trained on the CGM string for 14 days (24 meals) achieved 90% average accuracy. Figure 2 indicates that the CGM string outperforms the original CGM trace in identifying meal categories, with string-based performance improving after 21 meal announcements (about 7 days), while CGM-based performance declined.

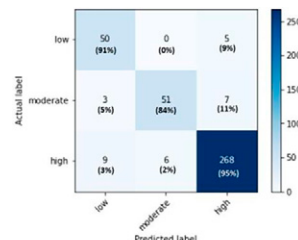


Fig. 1. Performance of the CGM string in identifying different categories of meal occurrences

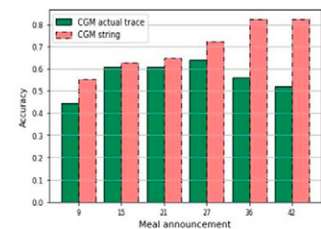


Fig. 2. Comparison of accuracy between the actual CGM trace and the categorical CGM string for identifying different categories of meal occurrences

Conclusions: The study demonstrates that encoding CGM into a string significantly enhances meal detection compared to the original CGM traces, likely due to suppression of CGM noise during the compression process.

EPV164 / #872

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

COST-EFFECTIVENESS OF A STEPPED-CARE APPROACH COMPARED TO IMMEDIATE CONTINUOUS GLUCOSE MONITORING IN HYPOGLYCEMIA-PRONE INDIVIDUALS WITH TYPE 1 DIABETES

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Background and Aims: In hypoglycemia-prone individuals with type 1 diabetes (T1D), stepped-care, consisting of the HypoAware reeducation program followed by continuous glucose monitoring (CGM) as needed, was less effective in reducing severe hypoglycemic events (SHEs) and attaining glycemic targets compared to immediate CGM. This study aims to evaluate the cost-effectiveness of stepped care versus immediate CGM.

Methods: Analyses were conducted from a societal perspective over a 12-month horizon using data from the Ecspect-Hypo randomized clinical trial. This trial included 52 individuals with T1D and impaired awareness of hypoglycemia (IAH) or history of recent SHEs (mean age 51 years; 56% female). Costs were derived from Tic-P questionnaires. Clinical outcomes included

SHes, restored IAH (Gold score <4), and quality-adjusted life years (QALYs) based on the EuroQol questionnaire. Differences in costs and effects between groups were estimated using linear regression with bootstrapping. Incremental cost-effectiveness ratios (ICERs) were calculated to assess cost-effectiveness.

Results: After 12 months, compared to immediate CGM, participants in the stepped care group experienced statistically significantly more SHEs (mean difference 0.33, 95% CI 0.056 to 0.60) and statistically significantly less QALYs (mean difference -0.12, 95% CI -0.23 to -0.0045). Differences in restored IAH (mean difference 0.12, 95% CI -0.22 to 0.46) and societal costs (mean difference €-252, 95% CI -921 to 656) were not statistically significant. The ICER per QALY gained was €5518, for preventing a SHE €769, and for restored IAH €-2092.

Conclusions: Over 12 months, stepped care was not cost-effective compared to immediate CGM use in hypoglycemia-prone individuals with T1D.

EPV165 / #1235

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

NEW CGM METRICS-REBOUND HIGH, REBOUND LOW, EXTENDED HIGH, EXTENDED LOW METRICS PRIOR TO SEVERE HYPOGLYCEMIA

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Background and Aims: Rebound high (Rhigh) events are sensor glucose values <70mg/dL followed by glucose values >180mg/dL within 2 hours and Rebound low (Rlow) events are sensor glucose values >180mg/dL followed by glucose values <70mg/dL within 2 hours. Extended high (Ehigh) and low (Elow) events are glucose values >180mg/dL and <70mg/dL for >120 minutes. We evaluated if these new metrics change prior to severe hypoglycemia in people with type 1 diabetes (T1D).

Methods: In this retrospective study, adults with T1D who reported SH events that required emergency visits were recruited in Barbara Davis Center for Diabetes. Their CGM reports were downloaded 7-days, 14-days, and 30-days prior to SH event. As control, each individual's 30-days SH event-free periods were included. CGM metrics prior to SH event were compared with SH-free period by Wilcoxon signed rank test. Continuous variables are reported as median(IQR).

Table 1: Rebound low, Rebound high, Extended low, and Extended high events prior to severe hypoglycemia event

	SH-free control period	30 days prior to SH	14 days prior to SH	7 days prior to SH	p-values for SH-free period vs. SH
		30 days	14 days	7 days	
Rebound low (180 to 70 mg/dL within 120 min)					
Number of events/week	0.93 (0.35 - 3.62)	1.4 (0.47 - 3.27)	2 (0.5 - 8.5)	2 (0 - 4)	0.538 0.986 0.788
Mean duration of events (minutes)	36.1 (23.3 - 47.2)	35.9 (28.5 - 56.7)	37.4 (25.8 - 52.4)	35.8 (0 - 48.3)	0.171 0.557 0.852
Mean AUC	2030 (1365 - 2712)	2069 (1683 - 3335)	2357 (1625 - 3125)	2133 (0 - 3832)	0.102 0.438 1.000
Rebound high (70 to 180 mg/dL within 120 min)					
Number of events/week	1.4 (0.12 - 4.2)	2.1 (0.94 - 3.73)	2.5 (1 - 4.25)	2 (1 - 5)	0.624 0.267 0.205
Mean duration of events (minutes)	110 (13 - 175)	149 (106 - 222)	149 (88 - 250)	124 (66 - 250)	0.207 0.167 0.368
Mean AUC	29559 (2610 - 41925)	36623 (22892 - 56113)	36004 (18793 - 67271)	30851 (14642 - 71772)	0.241 0.207 0.449
Extended high (>120 min above 180 mg/dL)					
Number of events/week	7.7 (6.3 - 11.7)	8.63 (4.2 - 10.6)	9 (4.3 - 10.8)	7 (4 - 11)	0.310 0.297 0.263
Mean duration of events (minutes)	223 (199 - 279)	225 (196 - 318)	224 (201 - 305)	216 (194 - 342)	0.710 0.749 0.590
Mean AUC	51825 (46835 - 60849)	53076 (45976 - 73991)	50096 (46165 - 72141)	54975 (44067 - 87709)	0.572 0.581 0.144
Extended low (>120 min below 70 mg/dL)					
Number of events/week	0 (0 - 0.23)	0 (0 - 0.7)	0 (0 - 1)	0 (0 - 1)	0.157 0.125 0.401
Mean duration of events (minutes)	0 (0 - 173)	0 (0 - 173)	0 (0 - 171)	0 (0 - 142)	0.727 0.634 0.286
Mean AUC	0 (0 - 18465)	0 (0 - 10050)	0 (0 - 9867)	0 (0 - 7736)	0.653 0.812 0.341

CGM metrics were compared prior to SH event and SH-free period with Wilcoxon matched-pairs signed rank test. Data are shown as median (IQR).

Results: There were 32 patients with 41 SH events with complete CGM data at 7-days, 14-days, and 30-days prior to SH event and 30-days SH-free periods. Rlow, Rhigh, Ehigh, and Elow were similar between SH-free control period and periods prior to SH event (Table 1). Rlow and Rhigh events occurred 1 to 2 times/week with 0.5- and 2-hours durations, respectively. While Ehigh events were prevalent (8-9 events/week) with median 3.5 hours duration, Elow were infrequent (SH-free period: 0(0-0.23), 7-days and 14-days prior to SH: 0(0-1)).

Conclusions: Ehigh was the most prevalent event as occurred approximately 8 times/week, Rlow and Rhigh events occurred once or twice/week, Elow was infrequent in people with high-SH risk.

EPV166 / #891

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

ASSOCIATION BETWEEN TIME IN TIGHT RANGE AND RISK OF ALBUMINURIA AMONG INDIVIDUALS WITH TYPE 1 DIABETES

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Background and Aims: This study aimed to investigate the association between time in tight range (TITR) and the risk of albuminuria in type 1 diabetes.

Methods: A total of 615 individuals with type 1 diabetes were included in the analysis. TITR was calculated as the percentage of values within the 70–140 mg/dL range using 14-day continuous glucose monitoring tracings with a sensor wear time of ≥70%. Albuminuria was defined as a spot urine albumin-to-creatinine ratio ≥30 mg/g. The association between albuminuria and TITR was estimated using the Cochran-Armitage trend test and logistic regression analysis.

Results: The overall prevalence of albuminuria was 16.4% (N=101). Mean HbA1c and time in range (TIR, 70–180 mg/dL) were 6.8 ± 1.1% and 66.8 ± 18.8%, respectively. TITR was significantly lower in patients with albuminuria than those without (38.5 ± 18.1% vs. 45.0 ± 18.1%, p=0.001). As the TITR decile increased, the prevalence of albuminuria decreased significantly (p for trend=0.002). In logistic regression analysis, the adjusted odds ratio for albuminuria per 10% increase in TITR was 0.98 (95% confidence interval 0.97–0.99, p=0.006) after adjusting for clinical factors affecting albuminuria. The association was significant even in individuals with an HbA1c level of less than 6.5%.

Conclusions: TITR is significantly associated with albuminuria in individuals with type 1 diabetes, even in those who have achieved low HbA1c levels of less than 6.5%.

EPV167 / #1329

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

GLYCEMIC OUTCOMES WITH EARLY INITIATION OF CONTINUOUS GLUCOSE MONITORING SYSTEM AMONG PEDIATRIC PATIENTS WITH TYPE 1 DIABETES MELLITUS: 3-YEAR FOLLOW-UP STUDY

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Background and Aims: Continuous glucose monitoring (CGM) improves glycated hemoglobin (HbA1c) and reduces hypoglycemia in children and adolescents with type 1 diabetes (T1D). Initiation of CGM soon after T1D diagnosis results in short-term improvements in HbA1c. We evaluated glycemic outcomes of CGM initiation within the first month of T1D diagnosis among children and adolescents with T1D over 3 years of follow-up.

Methods: Differences in HbA1c for 3 years among non CGM users (n=16), early CGM users (initiated CGM within a month of diagnosis, n=25) and new CGM users (initiated CGM more than a month after diagnosis, n=18) were studied among 59 newly diagnosed pediatric patients with T1D (33.9% males, mean age 8.8±4.1 years) diagnosed at Seoul National University Bundang Hospital between May 2009 and August 2021. Linear mixed models were used to examine HbA1c values by eight-time points (at diagnosis, 3-month, 6-month, 1-year, 18-month, 2-year, 30-month, 3-year) and by the three CGM groups.

Results: The HbA1c levels in the non-CGM group were higher than those in the early-CGM and new-CGM groups. At the 3-months after diagnosis, HbA1c levels were 8.0%, 6.5%, and 6.4% for each group, respectively, and at the 3-year after diagnosis, they were 8.6%, 7.0%, and 6.6%, respectively. The change in HbA1c over 3 years was statistically significantly greater in the new-CGM group adjusting for age at diagnosis, sex, BMI, and insulin delivery methods (p<0.05).

Conclusions: Irrespective of insulin delivery methods, CGM initiation within first month of T1D diagnosis results in good glycemic outcome in pediatric patients during 3 years following diagnosis.

EPV168 / #1140

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

DIABETES CAMPS AS GUIDING TOOL FOR TREATMENT CHOICES

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Background and Aims: The use of various metrics for glycemic control can feel like being trapped in a spiders web, from the outside we see the logic, shapes but being caught up in it, might feel like a chaos. In the last 14 years children and adolescents with type 1 diabetes have the opportunity to attend our

recreational therapeutic camps with the support of a well established medical team.

Methods: Forty participants with type 1 diabetes (10-17years) attended in the 2024 diabetes camp for five days. We recorded their medical background, anthropometric measures, they filled out an educational and a health related QoL questionnaire. We provided carb counting, 24h supervision and we assessed their glucose variability and glucose patterns according to their HbA1c, insulin and carbohydrates requirements. An uniform glucose monitoring system (CGMdexcom one+) with a receiver was used, **excluding smartphones**.

Results: The mean age was 14.5years, twenty three (57.5%) were female. Prior the camp eleven (27.5%) used insulin pump with CGM, 24(60%) CGM with MDI and 5(12.5%) MDI with SMBG. According to HbA1c, CV, TIR the campers with MDI+SMBG had the better results (7.2%, 36.2%, 71%) and spent an average 16.4 hours with CV below 28%. Campers with HbA1c above 7.5% (19) needed a higher number of correction bolus and this was associated with a higher CV and TAR during night time, improvement (by13.7%) achieved by recalculating insulin doses and carbs according to their IMC and activity.

Conclusions: Diabetes recreational therapeutic camps focus on both outcomes; social and medical, being an important and integrative part of diabetes management, and not using smartphones for five days we enhanced their social and relationship skills.

EPV169 / #502

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

CIRCULATING PRESEPSIN LEVELS CORRELATE WITH CONTINUOUS GLUCOSE MONITORING METRICS IN INFECTION-FREE INDIVIDUALS WITH TYPE 1 DIABETES

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Background and Aims: Gut dysbiosis observed in type 1 diabetes (T1D) has been shown to result in elevated circulating levels of Gram-negative lipopolysaccharide (LPS) through the impaired epithelial barrier and increased intestinal permeability. Presepsin is expressed on the surface of monocytes and macrophages and is involved in the recognition of pathogen ligands, including LPS. We assumed that presepsin values correlate with glycemic control, as expressed by continuous glucose monitoring (CGM) metrics in individuals with T1D even in the absence of infection.

Methods: We recruited 20 subjects with T1D (mean age 35.5 years) who were free of infections and other inflammatory disorders. Based on their glycated hemoglobin (HbA1c)

values, the participants were classified into well-controlled (HbA1c < 7%) and uncontrolled ($\geq 7\%$) groups. Presepsin was determined in serum using an ELISA kit. The last 14-day CGM recordings were extracted.

Results: There were no significant differences in presepsin levels between the well-controlled and poor-controlled groups [2.22 (4.20) vs 2.48 (4.04) ng/ml, $p=0.43$]. Presepsin levels presented a positive correlation with Glucose Management Indicator values ($r=0.575$) and a negative correlation with Time in Range values ($r=-0.525$) which in both cases marginally missed statistical significance ($p=0.06$ and $p=0.07$, respectively).

Conclusions: To our knowledge, this is the first study in the literature investigating the relationship between presepsin levels and CGM metrics in people with T1D. Our findings support the notion that intestinal dysbiosis is related to inadequate metabolic control in T1D. The pilot character of the study renders its findings hypothesis generating, warranting additional confirmation in larger samples.

EPV170 / #796

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

USING REAL WORLD EVIDENCE TO INVESTIGATE HEALTH EQUITY IN EFFECTIVENESS OF CONTINUOUS GLUCOSE MONITOR USE AMONG CHILDREN WITH TYPE 1 DIABETES

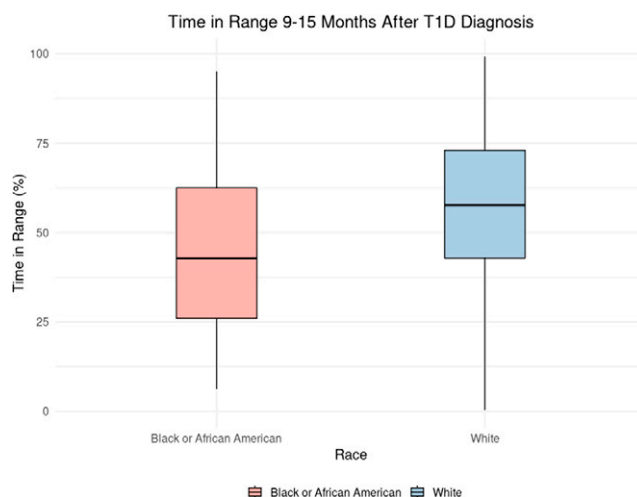
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Background and Aims: Real-time Continuous Glucose Monitor (rtCGM) use has been shown to improve glycemic outcomes for patients with type 1 diabetes (T1D) in adults and in smaller pediatric studies. The aim of this study is to utilize Real World Evidence (RWE) to study the effectiveness of rtCGM in improving glycemic outcomes in a racially and ethnically diverse pediatric population.

Methods: Demographic data for 409 T1D patients (age 2-18) diagnosed between January 2020 and June 2023 from the electronic health record (EHR) were linked to rtCGM usage data obtained from a commercial rtCGM portal. This preliminary analysis focuses on Black or African American ($n=62$) and White patients ($n=422$). The Wilcoxon rank-sum test was used for comparisons.

Results: The median time between T1D diagnosis and initial rtCGM utilization was 40 days longer for Black patients (median=64 days, IQR=4-228) than White patients (24, 3-65; $p<0.001$). White patients had significantly higher TIR rates 9-15 months after T1D diagnosis compared to Black patients (Figure 1; 58% (43-73) vs. 43% (26-63; $p<0.001$)). In the first 12 months after CGM start, Black patients had CGM readings for a median 44% (17-84%) time compared to 92% (68-97%) among White patients ($p<0.001$).



Conclusions: This study illustrates the RWE that rtCGM usage after initiation and glycemic control are significantly lower in Black patients compared to White patients, highlighting potential racial disparities in rtCGM access, utilization, and efficacy. Future analyses will explore clinical and social determinants of health using multivariate analyses to identify predictors of rtCGM use and glycemic control.

EPV171 / #758

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

GLYCAEMIC OUTCOMES OF CONTINUOUS GLUCOSE MONITORING VIA DEXCOM IN PATIENTS WITH T1DM

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Background and Aims: Current guidelines recommend offering real-time or intermittently scanned continuous glucose monitoring to all patients with T1DM. We evaluated the effects of using CGM DEXCOM on glycaemic outcomes in patients with T1DM.

Methods: We undertook a retrospective audit of 493 patients with T1DM. Inclusion criteria: Age >16 years, CGM use >6 months, regular follow up at the diabetes clinic. Data was extracted by accessing electronic patient records and included demographics, DEXCOM trends (TIR, TAR, TBR, GMI), and HbA1c. Data on co-morbidities, diabetes-related complications, and HCL system usage was also recorded. Data was analyzed using SPSS version 29.

Results: The mean age for our cohort was 38.3(13) years. Compared to men, women had an earlier age of diagnosis (16.9yrs vs 19.5yrs; $p=0.02$), a higher prevalence of autoimmune disorders (15.1% vs 6.3%; $p=0.003$), and hypoglycaemia unawareness (12.7% vs 6.3%; $p=0.023$). Over the observation period, there was an improvement in most of the glycaemic parameters. TIR improved from 51% to 56% (mean difference 5.3%; $p<0.001$) and TAR decreased from 34% to 30% (mean

difference 4%; $p < 0.001$). Glucose variability decreased by 0.155. Mean HbA1c decreased from 69.9mmol to 62.4mmol (mean difference 7.4mmol; $p < 0.001$). TBR and GMI notably did not change significantly. The magnitude of reduction in HbA1c was greater in those with shorter duration of diabetes (9.1mmol vs 6.6mmol) compared to those with longer duration.

Conclusions: Use of DEXCOM CGM in patients with T1DM is associated with significant improvement in most glycaemic outcomes. Reducing hypoglycaemia, however, remains a considerable challenge.

EPV172 / #635

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

SELF-REPORTED SEVERE HYPOGLYCEMIA AFTER SWITCHING FROM REAL-TIME CGM WITH PREDICTIVE ALARMS TO INTERMITTENTLY-SCANNED CGM IN PEOPLE WITH TYPE 1 DIABETES IN SWEDEN

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Background and Aims: The study assessed the impact of switching from real-time continuous glucose monitoring (rtCGM) with predictive alarms to intermittently-scanned CGM (isCGM) on person-reported severe hypoglycaemia episodes (SHEs) in adults with type 1 diabetes (T1D) in Sweden.

Methods: The REFLECT study is a retrospective cohort analysis using data extracted from the Swedish National Diabetes Register (NDR). It included adults with T1D with a first-recorded reimbursement for isCGM after June 1, 2017 (index date). This subgroup analysis included people previously recorded in the NDR as users of rtCGM with predictive alarms. Outcomes measured included person-reported SHEs at 36 months before/after the index date.

Results: In 660 adults with T1D and prior use of rtCGM with predictive alarms, the rate of person-reported SHEs per 100 person-years of follow up decreased from 11.56 (95% CI 10.44, 12.77) during the 36 months before the isCGM index date to 8.90 (95% CI 7.48, 10.50) in the 36 months after the index date ($p = 0.007$). Among individuals at higher risk of SHEs ($n = 260$; baseline HbA1c $< 7.5\%$), a more pronounced decrease was observed, from 15.01 events per 100 person-years (95% CI 13.05, 17.19) to 10.81 (95% CI 8.21, 13.97; $p = 0.0261$).

Conclusions: This analysis indicated that isCGM users with T1D reported fewer SHEs after switching from rtCGM systems, independent of the predictive alarm functionality.

EPV173 / #651

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

PERCENT TIME BELOW RANGE (TBR) IS STRONGLY ASSOCIATED WITH THE INCIDENCE OF CLINICALLY SIGNIFICANT LEVEL 2 OR 3 HYPOGLYCAEMIA EVENTS IN TYPE 1 DIABETES (T1D)

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Background and Aims: CGM TBR targets ($< 4\%$ T < 70 , Level 1 and $< 1\%$ T < 54 mg/dL, Level 2 [L2]) are used for clinical management in individuals with T1D. However, clinically significant hypoglycaemic event rates are also important to patients/caregivers. This analysis describes the associations between TBR and L2 and Level 3 severe hypoglycaemia (L3/SH) event rates in individuals with T1D using self-monitoring blood glucose (SMBG), real-time CGM and automated insulin delivery systems (AID).

Methods: Associations between TBR and hypoglycaemia event rates, measured using CGM (L2 events < 54 mg/dL glucose for ≥ 15 minutes) or L3 events, were examined from 8 clinical trials of glucose sensing over 3-6 months in participants stratified by age and technology use.

Results: In $N = 1542$ individuals aged 6-17 ($N = 446$) or ≥ 18 years old ($N = 1096$), 14%, 43% and 43% used SMBG, CGM, and AID, respectively. T < 54 was correlated with L2 hypoglycaemic event rates across all strata ($r \geq 0.87$). Those not meeting the T < 54 target had a 99% chance of developing ≥ 1 L2 hypoglycaemic events/week while for those meeting target, these odds varied by technology use with 40%, 33% and 23% for SMBG, CGM or AID users, respectively. Not meeting (compared to meeting) the T < 54 target was also associated with a higher SH incidence rate (2.6X overall), and absolute and relative increase in SH rates varied by technology use. Similar associations for hypoglycaemia event rates were observed with the T < 70 target.

Conclusions: Percent T < 70 or T < 54 are highly associated with the number of clinically significant (L2/L3) events in adults and adolescents with T1D, independent of technology use.

EPV174 / #1269

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

GLUTEN-FREE DIET AFFECT POST-PRANDIAL GLUCOSE CONTROL IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES AND CELIAC DISEASE

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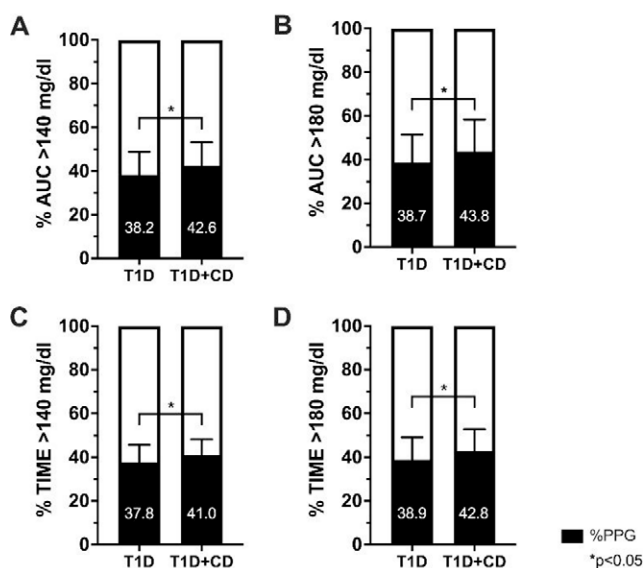
Background and Aims: Gluten-free diets (GFD) are considered to have a high glycemic index and/or high content of saturated fats; this could affect post-prandial glucose (PPG) control in subjects with both type 1 diabetes (T1D) and celiac disease (CD). Our objective was to analyze PPG metrics with CGM systems in youths with T1D and CD, compared to ones with T1D only.

Methods: This observational case-control study compares subjects aged 8-18 years with T1D and CD with peers with T1D only. The degree of maintaining GFD was assessed through anti-TTG antibodies and dietary interviews. PPG metrics were calculated from CGM data. Differences between groups of continuous variables were analyzed with the student's t-test for paired samples. The significance of the test is fixed at $p < 0.05$.

Results: A total of 56 youths with T1D and CD and 66 with T1D only were enrolled. All the patients with CD were considered adherent to GFD. The percentage of time spent >140 mg/dl and >180 mg/dl due to PPG was higher in subjects with T1D and CD vs. people with T1D only ($41.0 \pm 7.2\%$ vs. $37.8 \pm 7.9\%$, $p < 0.05$ and $42.8 \pm 9.9\%$ vs. $38.9 \pm 10.2\%$, $p < 0.05$, respectively). The same was true for the percentage of the Area Under the Curve (AUC) >140 mg/dl and >180 mg/dl: the % PPG-AUC was higher in subjects with T1D and CD vs T1D only (Figure 1).

Conclusions: In subjects with T1D and CD, the time and the AUC spent in hyperglycemia due to the PPG was higher vs people with T1D only.

Figure 1



EPV175 / #798

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

IMPROVEMENT IN NEWLY DEFINED CGM METRICS, EXTENDED HYPOGLYCEMIA AND EXTENDED HYPERGLYCEMIA WITH AUTOMATED INSULIN DELIVERY INITIATION IN PATIENTS WITH TYPE 1 DIABETES

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Background and Aims: Extended Hypoglycemia (Ehypo) and Extended hyperglycemia (Ehyper) are recently defined CGM metrics by the International Consensus for clinical trials as secondary endpoints for continuous outcomes. This study aims to evaluate the changes in Ehypo and Ehyper before and after automated insulin delivery (AID) initiation in patients with type 1 diabetes (T1D).

Methods: This was a retrospective single center study that evaluated Ehypo and Ehyper in addition to other CGM metrics in 154 patients that initiated an AID system. Metrics were compared before and after AID initiation by Wilcoxon signed rank test.

Results: Median (interquartile range) Ehypo (<70 mg/dL) events/week decreased from 0.1 (0-0.4) to 0 (0-0.1) and Ehyper (>250 mg/dL) events/week decreased from 2.2 (0.9-4.5) to 0.8 (0.3-1.7) (both $p < 0.001$) after AID initiation compared to before AID initiation. All other CGM metrics improved after AID initiation. There was a strong positive correlation between Ehyper (>250 mg/dL) and mean glucose ($r = 0.945$, $r = 0.852$), GMI ($r = 0.944$, $r = 0.849$), TAR ($r = 0.937$, $r = 0.866$) and a strong positive correlation between Ehypo (<70 mg/dL) and TBR (<54 mg/dL) ($r = 0.938$, $r = 0.932$) before and after AID initiation respectively.

Conclusions: AID initiation significantly improved Ehypo and Ehyper metrics. Ehypo and Ehyper had a strong positive correlation with TBR and TAR, respectively. Ehypo and Ehyper events can be used in addition to TBR and TAR metrics in clinical studies as secondary outcomes.

EPV176 / #1308

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

CONTINUOUS GLUCOSE MONITORING SERVES AS A PSYCHOLOGICAL SUPPORT TOOL - INITIAL CGM IMPLEMENTATION IN ADULTS OVER 26 WITH TYPE 1 DIABETES

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Background and Aims: January 2023 marked a significant breakthrough for type 1 diabetes treatment in Poland, as the reimbursed of flash/continuous glucose monitoring (FGM/CGM) was initiated for patients aged 26 and above. The aim of our study was to evaluate metabolic control and selected psychological parameters after 3 months of implementing a FGM/CGM system in Polish patients with T1DM above 26 years of age who have no prior experience with this type of glucose monitoring.

Methods: The study involved 57 patients with type 1 diabetes from five Polish diabetology centers. Patients completed a set of validated questionnaires: FSH-II; DDS; PSS10; DTSQs; WHO-5; PAID; DBQ, and sociodemographic survey, downloaded 14-day pump/glucometer data, and underwent HbA1c measurement during visits. After 3 months of CGM use, patients repeated assessments, CGM reports were also re-evaluated.

Results: After 3 months of using CGM, patients reported higher treatment satisfaction measured by DTSQs ($p=0.01$) and less frequently experienced unacceptably high glycemia ($p<0.001$). Well-being assessment according to WHO-5 was also higher ($p=0.04$), and the level of diabetes burnout measured by DBQ ($p<0.001$), fear of hypoglycemia assessed by HFS-II ($p=0.03$) significantly decreased. Diabetic distress measured by means of total score of DDS lowered ($p=0.001$). Regarding glycemic control, the percentage of HbA1c after three months of using the system was significantly lower ($p=0.01$).

Conclusions: The use of FGM/CGM, even during relatively short observation, leads to improved quality of life, reduced fear of hypoglycemia and diabetes burnout, and lower HbA1c levels in patients with type 1 diabetes over the age of 26 who were naïve to this technology.

EPV177 / #333

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

CGM DATA SHARING RELATIONSHIPS AMONG EMERGING ADULTS WITH TYPE 1 DIABETES

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Background and Aims: Emerging adults (age 18-24) with T1D face elevated A1c, increased diabetes distress, and

changing social relationships. CGM technology allows data sharing with friends/family's device and users may also share with their own device. We examined the impact of data sharing relationships on CGM use characteristics and diabetes outcomes.

Methods: We assessed CGM data sharing and satisfaction with sharing relationships among emerging adults with T1D using CGM at RCT enrollment, then examined cross-sectional nonparametric bivariate associations with CGM use characteristics (breaks, frequency of checking and responding, user satisfaction, barriers) and outcomes (A1c, diabetes distress, and diabetes self-care).

Results: Participants (N=152) were 58% female (5% nonbinary), 61% non-Hispanic White, 24% Hispanic, mean (SD) age 21.1 (2.2), and mean A1c 7.7% (1.3%). In the prior 3 months, 80% shared their CGM data at least one way ("sharers"); 29% gave access to another, 18% shared with their own device, and 53% did both. Sharers had lower A1c (7.5% vs. 8.5%, $p < .01$) and reported an average of 2.7 (1.9) share partners. Higher satisfaction with sharing relationships [mean 3.4 (0.7), range 1-5, $\alpha=0.74$] was associated with more frequent response to out-of-range values, greater user satisfaction, and fewer barriers ($\rho=0.23-0.29$, $p<.05$), and with less diabetes distress and more self-care ($\rho=0.31-0.38$, $p<.001$).

Conclusions: CGM data sharing is common among emerging adults with T1D and sharers have lower A1c. Satisfaction with data sharing relationships is associated with more optimal CGM use, better self-care, and less diabetes distress. Enhancing data sharing relationships could improve outcomes during this higher-risk phase.

EPV178 / #811

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

CHARACTERISTICS OF CGM USE AND ASSOCIATIONS WITH OUTCOMES AMONG EMERGING ADULTS WITH TYPE 1 DIABETES

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Background and Aims: Emerging adults (age 18-24) with T1D experience lower CGM use, elevated A1c, and increased diabetes distress. Little is known about experiences with CGM and associations with diabetes outcomes during this phase.

Methods: Among emerging adults with T1D enrolled in an RCT, we assessed CGM use characteristics (frequency of breaks, checks, and responding to out-of-range values; user satisfaction; and use barriers including glucose and social barriers). Multivariable regression models examined cross-sectional associations ($p < .05$) between all CGM use characteristics and outcomes, with separate models predicting diabetes self-care, A1c, and diabetes distress.

Results: Participants (N=190) were 58% female (5% nonbinary), 57% non-Hispanic White, 26% Hispanic, mean age 21.2 (SD=2.2), and mean A1c 7.9% (SD=1.5) and 80% used CGM. Using CGM was associated with lower A1c (7.7% vs. 9.1%, $p=0.007$) but not with diabetes self-care or diabetes distress. Among CGM users, 57% reported taking breaks >24 hours (21% lasting over a week; <25% planned/on purpose). More diabetes self-care was independently associated with fewer CGM breaks and more frequently responding to out-of-range values. Lower A1c was independently associated with fewer CGM breaks, more frequent CGM checks, and fewer glucose-related barriers. Lower diabetes distress was independently associated with more frequently responding to out-of-range values, more user satisfaction, and fewer social-related barriers.

Conclusions: Using a CGM (vs. not) has been linked to diabetes outcomes, but experiences using CGM also affect diabetes outcomes. Different CGM use characteristics predict self-management (breaks, checks, glucose-related barriers) versus diabetes distress (responding to out-of-range values, user satisfaction, social-related barriers).

EPV179 / #687

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

PREDICTORS OF TIME IN TIGHT RANGE IN PATIENTS WITH DIABETES MELLITUS AND ADEQUATE GLYCAEMIC CONTROL: A RETROSPECTIVE STUDY FROM AN INSULIN PUMP CLINIC

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Background and Aims: Time in tight range (TITR) is an emerging metric for diabetes mellitus (DM) management, aiming for $\geq 50\%$. However, data on TITR predictors, particularly in patients with time in range (TIR) $\geq 70\%$, remains scarce. This study evaluates TITR in patients with adequate glycaemic control and identifies predictors for reaching a TITR $\geq 50\%$.

Methods: A retrospective cohort study was conducted in a tertiary hospital's insulin pump clinic, including paediatric and adult patients with DM due to β -cell dysfunction. Inclusion criteria were continuous glucose monitoring use and TIR $\geq 70\%$. Participants were categorized into TITR $< 50\%$ and TITR $\geq 50\%$ groups. Demographic, clinical, and device-related data were analyzed, including insulin pump and ambulatory glucose profile reports.

Results: The study included 80 patients (51.2% female) with a median age of 26.5 (14.5-37.0) years. Of these, 97.5% had type 1 DM and 72.6% used insulin pumps. The

median TITR was 53.0 (48.0-59.5)%, with 65% of patients achieving TITR $\geq 50\%$. Younger age was associated with higher odds of achieving TITR $\geq 50\%$ (OR=0.97, 95%CI: 0.94-0.99, $p=0.028$). Significant predictors for TITR $\geq 50\%$ included glycated haemoglobin, TIR, time above range, glucose management indicator ($p<0.001$), regardless of age. No significant differences were found in time below range (TBR) ($p=0.115$). A TIR threshold of 74.5% predicted TITR $\geq 50\%$ with 78.8% sensitivity and 82.1% specificity.

Conclusions: Improved TITR was not linked to increased hypoglycaemia, as TBR remained stable. Younger patients had higher odds of achieving TITR $\geq 50\%$, potentially due to parental assistance in the management of DM. A TIR cut-off of 74.5% may aid in predicting TITR $\geq 50\%$ in clinical practice.

EPV180 / #1051

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

EXPLORING CONTINUOUS GLUCOSE MONITORING SYSTEMS IN A PEDIATRIC POPULATION

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Background and Aims: Continuous glucose monitoring systems (CGMs) represent a very useful tool for glycemic control in patients with type 1 diabetes (T1DM), particularly in children and adolescents.

Methods: 65 children with T1DM, aged between 1 and 17 years (51% under 12 years); 32 boys (49%); with real time CGMs (rt-CGMS) usage for at least 6 months, were included, and we compared the first 3 months of sensor usage with the latest 3 months.

Results: The adherence to sensor wear was better in the first 3 months: 77.51% vs. 67.58%. Comparable values were noted for the coefficient of variation (36.37% vs. 36.74%). These values correlated with slightly lower mean values for time below range (TBR) and for the number of hypoglycemic episodes. We noted a very low incidence for the nocturnal hypoglycemic events. Time in range (TIR) decreased from 55.74% to 54.49%. Time above range (TAR) (high) >10 mmol/L was 27.58% vs. 26.78%. TAR (very high) >13.9 mmol/L, was 13.43%, respectively 14.49%. These data were concordant with HbA1c values, respectively 7.48% vs. 7.85%. Only 38.5% of patients had a HbA1c $< 7\%$ in the first period as compared to 21.5% in the latest period. TIR was significantly higher in children above 12 years of old (60% vs. 51%, respectively 60% vs. 49%).

Conclusions: Attaining a good metabolic control is difficult in the pediatric population, even when CGMS are used, and a good programme of education and periodic follow-ups are needed in order to obtain and especially maintain adherence to CGMs wear and to improve CGMs metrics.

EPV181 / #1314

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes**METABOLOMIC PROFILE IN PATIENTS WITH TYPE 1 DIABETES WITH DIFFERENT DEGREE OF CONTROL DERIVED FROM CONTINUOUS GLUCOSE MONITORING**

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Background and Aims: While dysregulated metabolism contributes to T1D complications, the associations between serum metabolomic profiles, glycoproteins, and continuous glucose monitoring (CGM) metrics are not well characterized. This study evaluates serum metabolomic profile in relation to CGM metrics in T1D.

Methods: Cross-sectional study with 307 patients with T1D and data derived from 14-day CGM recordings. Patients were grouped by glycemic control according to clinical targets (TIR >70%, CV <36%, and TBR <5%) into “on-target” and “off-target” groups. Serum metabolites, as well as glycan-related proteins such as N-acetylglucosamine/galactosamine (GlycA) and sialic acid (GlycB), were quantified by proton nuclear magnetic resonance spectroscopy (¹H-NMR).

Results: Of the 307 participants (44% female, mean age 46±13 years, diabetes duration 25±12 years), 24% used closed-loop systems. Among these, 75% met glycemic targets, compared to only 24% of those on multiple daily injections (P<0.001). The “off-target” group showed elevated A_{1c}, GlycA, GlycB, alanine, glutamate, and lactate levels compared to the “on-target” group. TIR inversely correlated with GlycA (r -0.147, P = 0.016), GlycB (r -0.145, P = 0.017), and lactate (r -0.166, P = 0.07). CV correlated with GlycA (r = 0.128, P=0.038), glutamate (r = 0.127, P = 0.041), and lactate (r = 0.332, P < 0.001). In a logistic regression (R² = 0.241, P < 0.001) the main determinants of “on target” group included age [Exp(β)=1.022 (95%CI 1.001; 1.043)], glutamate levels [Exp(β)=0.983 (95%CI 0.969; 0.997)], and A_{1c} [Exp(β)=0.369 (95%CI 0.259; 0.524)].

Conclusions: Our findings suggest an association between metabolic profiles and MCG metrics in individuals with T1D. These findings underscore the need to further investigate molecular pathways involved in T1D complications.

EPV182 / #1342

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes**EVALUATING THE EFFICACY AND HYPOGLYCEMIA RISK OF A 50% TITR TARGET IN PATIENTS WITH TYPE 1 DIABETES USING MULTIPLE DAILY INSULIN INJECTIONS**

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Background and Aims: Recently, a new glycemic control target called TITR 70-140mg/dL has emerged. Previous research suggested that TITR target above 50% could be a treatment goal for individuals with type 1 diabetes (T1DM) using automated insulin delivery. However, research on the TITR target for patients with T1DM using multiple daily insulin injections (MDI) remains limited.

Methods: We utilized data from an ongoing prospective observational cohort study of patients with T1DM at Samsung Medical Center, a tertiary hospital in Seoul, Republic of Korea. We involved 191 individuals with T1DM who used real-time CGM in conjunction with MDI. A total of 798 CGM profiles were analyzed over a median follow-up period of 749 days (451.5-1228.5 days). We performed ROC analysis focusing on patients with mean glucose levels ≤154 mg/dL (GMI ≤7.0%) to investigate the feasibility of applying the more stringent TITR targets to those who have already achieved recommended GMI levels.

Results: The mean age of the participants was 42±14 years with a predominance of males (61%). Among individuals who had already achieved the recommended GMI targets, an optimal Glycemic Risk Index (GRI) cut-off of 21.188 and a CV cut-off of 33.4% were identified to achieve TITR ≥ 50% and %TBR<70 mg/dL below 4. When comparing the percentages of achieving TITR ≥ 50% and %TBR<70 mg/dL below 4, CV < 33% group and GRI A (≤20) group showed significantly higher achievement.

Conclusions: In conclusion, for patients with T1DM using MDI, applying a TITR target of 50% can be considered for those in the GRI≤20 or with a CV≤33%.

EPV183 / #209

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes**AN EVALUATION OF SYSTEMATIC INTENSIVE THERAPY FOR PERSONS WITH TYPE 1 DIABETES TREATED WITH CONTINUOUS GLUCOSE MONITORING (SIT-CGM) -AN RCT**

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Background and Aims: Almost all adults with T1D in Sweden use CGM/isCGM but only about a third reach the recommended glycaemic control. We aimed to evaluate if intensive distance counselling using CGM data could improve glucose control, short and long term.

Methods: 117 adults, HbA1c ≥ 58 mmol/mol, already using CGM/isCGM with insulin treatment by multiple daily injections or pump were included at 8 sites and randomised for systematic intensive therapy (SIT) or conventional therapy. The SIT group received regular distance counselling, including CGM interpretation, if mean glucose was ≥ 8.4 mmol/L, for 18 weeks, the control group had two clinical visits. Thereafter, both groups had two clinical visits. Primary endpoint was change in HbA1c after 18 weeks.

Results: After 18 weeks, the SIT group decreased their HbA1c by 10.7 mmol/mol whilst the control group decreased by 2.4 mmol/mol, mean difference -8.3 mmol/L, $p < 0.001$. The following endpoints also improved significantly: HbA1c at 32 weeks, time in range, mean glucose, time above range at 18 and 32 weeks and mean glucose at week 52. After one year mean glucose was still significantly lower in the intensive group $p = 0.043$ and HbA1c reduction showed a similar tendency ($p = 0.053$) (Figure 1).

Figure 1. The effect of 18-weeks systematic intensive therapy vs conventional therapy on glycaemic endpoints after 18, 32 and 52 weeks.

Endpoint	Systematic intensive therapy (n=59)	Conventional therapy (n=58)	Adjusted mean difference (95% CI)	p-value
<i>Change from baseline to 18 weeks</i>				
HbA1c (mmol/mol)	-10.7 (9.4)	-2.4 (8.4)	-8.3 (-11.2, -5.5)	<0.001
Mean glucose (mmol/L)	-1.4 (1.6)	-0.05 (1.4)	-1.3 (-1.8, -0.8)	<0.001
Time in range (%)	11.9 (13.5)	1.24 (13.7)	10.1 (5.3, 14.8)	<0.001
Time above range (%)	-13.2 (14.8)	-1.7 (14.7)	-11.2 (-16.4, -6.0)	<0.001
<i>Change from baseline to 32 weeks</i>				
HbA1c (mmol/mol)	-7.6 (9.3)	-3.6 (9.4)	-4.1 (-7.2, -0.9)	0.012
Mean glucose (mmol/L)	-0.8 (1.8)	0.04 (1.3)	-0.8 (-1.3, -0.2)	0.006
Time in range (%)	7.4 (13.9)	-0.03 (11.3)	6.9 (2.4, 11.5)	0.003
Time above range (%)	-8.0 (15.9)	-0.5 (12.1)	-7.3 (-12.4, -2.2)	0.006
<i>Change from baseline to 52 weeks</i>				
HbA1c (mmol/mol)	-6.2 (10.5)	-2.2 (12.3)	-4.1 (-8.2, 0.1)	0.053
Mean glucose (mmol/L)	-0.5 (1.8)	0.2 (1.5)	-0.7 (-1.3, -0.0)	0.043
Time in range (%)	6.0 (14.4)	0.5 (13.3)	5.2 (-0.2, 10.5)	0.060
Time above range (%)	-6.3 (16.6)	-0.7 (14.0)	-5.4 (-11.3, 0.5)	0.074

Conclusions: SIT leads to major improvements in glycaemic control for persons with T1D using CGM/isCGM and not reaching the recommended glycaemic targets. The frequency of these contacts needs to be studied further to obtain optimal long-term effects.

EPV184 / #1228

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

GLYCEMIC SUCCESS IN TYPE 1 DIABETES: A COMPARATIVE STUDY OF PATIENTS MEETING TIME IN RANGE VS HBA1C TARGETS

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Background and Aims: Current guidelines recommend achieving both HbA1c <7% and time in range (TIR, 70-180 mg/dL) >70% as glycemic targets. This study aims to evaluate the proportion of patients with type 1 diabetes (T1D) who meet either or both targets and identify patient characteristics differentiating those who achieve these goals.

Methods: The population consisted of T1D patients from two academic centers in Greece. Ninety days of Continuous Glucose Monitoring (CGM) data were uploaded for each patient, and a blood sample was collected on the same day for HbA1c assessment.

Results: A total of 216 patients were included (median age [IQR]: 19 years [12-42 years], 52.8% adults). Of these, 48.7% achieved the TIR goal but not the HbA1c goal, while 8.3% met the HbA1c goal but not the TIR goal. Both goals were achieved by 12.2%, and 30.8% failed to achieve either. Patients achieving only the TIR target spent significantly less time in both hyperglycemic and hypoglycemic ranges compared to those who only met the HbA1c target: 22% (19%-25%) vs 30% (25%-35%), $p < 0.001$ for hyperglycemia, and 2% (1%-4%) vs 6.5% (2%-10%), $p = 0.002$ for hypoglycemia. Additionally, patients achieving the TIR target showed a trend toward lower glycemic variability compared to those meeting the HbA1c target (coefficient of variation: $33\% \pm 4.2$ vs $40.6\% \pm 6$, $p = 0.063$).

Conclusions: This study revealed that achieving the TIR goal (70-180 mg/dL) is associated with less time in hyper- and hypoglycemic ranges than having HbA1c <7%. Further studies are needed to assess the impact on diabetic complications and quality of life.

EPV185 / #332

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

DURATION OF PHYSICAL ACTIVITY REQUIRED TO AMELIORATE HYPERGLYCEMIA WITHOUT CAUSING HYPOGLYCEMIA IN TYPE 1 DIABETES

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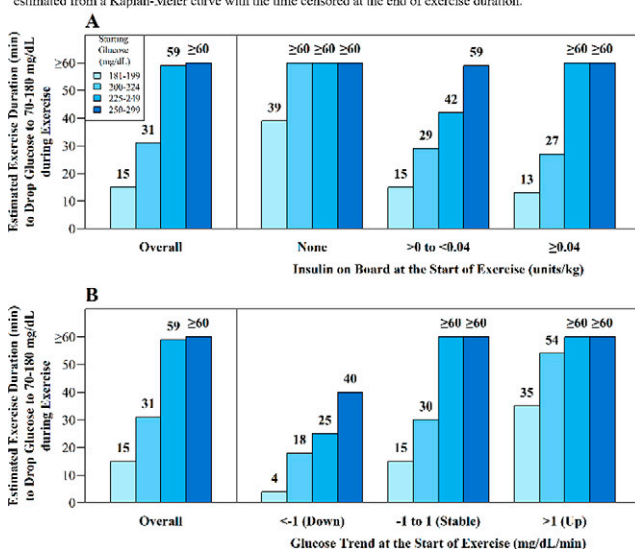
Background and Aims: Physical activity in individuals with type 1 diabetes (T1D) is often shown to reduce glucose levels. In this combined analysis of T1DEXI and T1DEXIP data, our objective is to demonstrate the effectiveness of activity in reducing glucose levels from a hyperglycemic level >180 mg/dL to a glycemic level within target range 70-180 mg/dL (TIR).

Methods: A total of 1,902 activity sessions with a 10 to 60-minute duration and starting glucose level between 181 and 300

mg/dL from 404 adult (≥ 18 yr) and 159 pediatric (< 18 yr) study participants were included. The projected duration of activity needed to lower glucose levels from > 180 mg/dL to target range during activity was assessed through Kaplan-Meier curves with time censored at the end of activity.

Results: An overall starting glucose value of 181-199, 200-224, 225-249, and 250-300 mg/dL required an estimated activity duration of 15, 31, 59, and ≥ 60 minutes, respectively, to have a 50% chance of reducing glucose to be within target range during activity, with a 0-11% incidence of hypoglycaemia in the hour after activity. Activity duration requirements were increased across all starting glucose levels when glucose was trending upwards before activity and when bolus insulin on board was zero at the start of exercise. Results within the adult and pediatric cohorts were similar.

Figure 1. Bar plot of activity duration estimated to have a 50% probability of reducing glucose levels > 180 mg/dL to be within target range 70-180 mg/dL during exercise by glucose level at the start of exercise and A) insulin on board at the start of exercise, and B) glucose trend at the start of exercise. Exercise durations projected to have a 50% probability of dropping glucose level to 70-180 mg/dL during exercise are displayed above the bars and are estimated from a Kaplan-Meier curve with the time censored at the end of exercise duration.



Conclusions: Time-limited activity is an effective way to bring glucose back in range when hyperglycemia exists in adolescents and adults with T1D.

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E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

GAMIFICATION TOOLS FOR LEARNING THROUGH PLAY: “TYPE 1 DIABETES EXPLORERS”

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Background and Aims: Therapeutic education for the self-management of T1D in children and adolescents is essential to improve decision-making. However, they are often taught in a monotonous manner, generating a lack adherence. Objective: To describe the changes linked to diabetes control metrics from the download of CGM data from a structured and gamified educational intervention called “Diabetes explorers”, that promotes the acquisition of learning and empowerment using gamification tools.

Methods: “Diabetes explorers program” consisted of a meeting that took place on September 2023 in the city of Corrientes Argentina. The participants received a “Diabetes Explorer’s Manual”, prepared by the health professionals (<https://diabetes.org.ar/2020/wp-content/uploads/2024/02/MANUAL-DEL-EXPLORADOR-EN-DIABETES-SAD.pdf>). Children and adolescents with T1D who used CGM, were invited to participate. All control metrics were analyzed before and after the educational meeting.

Results: N= 35. Average age of 12.1 years, duration of diabetes of 3.7 years. Univariate analysis: there was a statistically significant difference between the values from the PRE and POST intervention: TIR (33 vs 40%), TAR (66 vs 58%), average glucose (227 vs 202 mg%), number of scans (7 vs 10) and GMI (8.7 vs 8.2). Multivariate analysis: The strongest association found were: the variation of TAR with the variation of blood glucose and GMI, the % active sensor time with the number of scans, the variation of the TIR with the variation of glucose and GMI, and the variation of the TIR with the variation of TAR.

Conclusions: In this project that included playful gamification tools, positive results were obtained, with improvements in T1D diabetes control metrics, evaluated by the CGM.

EPV187 / #666

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

INTERMITTENTLY SCANNED CONTINUOUS GLUCOSE MONITORING IN PATIENTS OVER 80 YEARS OLD WITH TYPE 1 DIABETES

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Background and Aims: In our society, the elderly population is increasing. Within this group, approximately 30% have diabetes (DM) under treatment with basal-bolus insulin therapy. In this group, the main objective is to reduce hypoglycemic events due to the comorbidity it may entail. New glucose monitoring devices are beneficial for improving glycemic control and reducing these hypoglycemic events.

Methods: We selected patients over 80 years old with type 1 diabetes (T1D) and intermittently scanned glucose monitoring

(isCGM) followed up in our unit. The evolution of CGM parameters was evaluated, as well as HbA1c at 6 and 12 months after isCGM implementation. Statistical analysis was performed using SPSS.

Results: 17 patients. Mean duration of T1D: 30,11 ± 21,74 years. Mean age: 83.87±2,51 years. 13 women.

	6 months	12 months	p
Lectures	14,88±5,19	17,12±9,20	NS
% active time	88,94±14,17	94,41±12,36	NS
Mean glucose	166,88±25,91	158,12±34,24	NS
GMI	7,1±0,62	7,3±0,82	NS
CV	34,22±4,02	32,84±5,32	NS
Time > 250 mg/dL	7,94±8,77	11,97±11,2	NS
Time 180 mg/dL -250 mg/dL	22,76±8,92	24,24±12,45	NS
TIR	66,53±14,96	62,29±19,84	NS
TBR (Time < 70 mg/dL)	2,76±3,47	1,82±3,62	NS
Hypoglycemic events	5,29±0,48	5,12±0,48	NS
HbA1c	7,42±1,3	7,61±1,02	NS

Conclusions: In our sample, there is a trend towards improvement in isCGM parameters, although none reached statistical significance. Given the importance of controlling hypoglycemia in this group, it is noteworthy to highlight the reduction in the number of hypoglycemic events, as well as the improvement in TBR. Larger studies are needed to confirm the improvement in these parameters.

EPV188 / #500

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

INSULIN OMISSION (IO) BUT NOT EATING DISORDERS (ED) DETERIORATES CGM PROFILES IN PERSONS LIVING WITH TYPE 1 DIABETES (PWT1D)

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Background and Aims: ED and IO in pwT1d are associated with increased complications, mortality and A1c. The study aimed to evaluate the impact of either/or ED-IO on CGM in the adult cohort SFDT1.

Methods: In a French prospective cohort evaluating cardiovascular risk (ongoing recruitment of 10,000 pwT1d), ED was detected with the SCOFF questionnaire; IO with the question: “Do you take less insulin than you should?”. PwT1d were separated into IO only, ED only, ED and IO, and controls (without IO or ED). Comparisons were performed with non-parametric tests.

Results: We included the first 1,113 adults with CGM : median age 38 years (IQR 29, 50), 49% women, 46% on insulin pump therapy, and 17% on automated insulin delivery. Prevalences were 11.1% ED, 15.9% IO, and 4.9% ED+IO. Taking controls as reference, no CGM parameter differed in ED only, whereas IO displayed significant differences (table, all P<0.001). IO was significantly negatively associated with TIR (OR (95% CI) 0.95 (0.94; 0.96)) and TBR (0.95 (0.92, 0.99)) and positively with A1c (1.78 (1.50; 2.10). The association remained after stratifying by fear of hypoglycemia.

CGM %	Controls	ED	IO	ED+IO
TIR	62 (16)	62 (15)	48 (16)	49 (17)
TBR	3 (1-6)	3 (1-6)	2 (1-5)	0 (2-3)
TAR	33 (16)	34 (15)	48 (16)	49 (17)
GMI	7.2 (0.8)	7.2 (0.8)	7.9 (0.8)	7,9 (0.8)

Conclusions: In pwT1d, IO can occur without ED and is associated with poorer CGM parameters, while no such effect can be seen in ED.

EPV189 / #42

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

RELATIONSHIP BETWEEN EMOTIONS AND GLYCEMIC METRICS IN PERSONS WITH TYPE 1 DIABETES

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Background and Aims: There is no clear evidence on the influence of DM on emotions, and how they can influence people with DM type 1. With technological advances in diabetes control we have greater knowledge of glycemic behavior.

Methods: CGM metrics and emotions were gathered in an adult population with type 1 diabetes ($n = 50$) from the health area of Lugo, Spain, in a prospective observational study. The relationship between CGM data and emotions was analyzed using a linear regression model.

Results: For each episode of the following emotions, the corresponding effects on CGM glucose parameters were found: Confidence: mean glucose (MG) decreased by 3.8 mg/dL ($p=0.020$), time in range (TIR =70-180 mg/dL) by 2.1% ($p=0.003$), and time above range (TAR > 180 mg/dL) by 2.5% ($p=0.002$). Happiness: MG and TAR decreased 6.1 mg/dL ($p=0.014$) and 3.6% ($p=0.003$) respectively. TIR increased by 3.6% ($p=0.001$) Fear: MG increased by 4.9 mg/dL ($p=0.004$) and TAR by 2.6% ($p=0.002$). TIR decreased by 2.2% ($p=0.003$). Anger: MG increased by 8.1 mg/dL ($p=0.001$) and TAR by 3.8% in TAR ($p=0.001$). TIR decreased by 3.2% ($p=0.002$). Sadness: MG and TAR increased by 5.4 mg/dL ($p=0.017$) and 2.9% ($p=0.008$) respectively. Mean amplitude of glycemic excursions increased by 4.3 points increased in sadness ($p=0.032$). TIR decreased by 2.4% ($p=0.013$).

Conclusions: Pleasant emotions (confidence and happiness) are linked to a reduction of MG values, TAR and with an increase in TIR. The association of unpleasant emotions (fear, anger, and sadness) with CGM glucose metrics has an effect on worsening glucose control.

EPV190 / #819

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

THE LONGER, THE BETTER: GLYCEMIC OUTCOMES OF CHILDREN WITH TYPE 1 DIABETES WHO SPEND ON CGM 70-89% AND $\geq 90\%$

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Background and Aims: The recommended threshold for the time spent on continuous glucose monitoring (CGM) is established at 70%. However, glucose outcomes in children with type 1 diabetes (CwD) using CGM for a different proportion of time within this threshold have not been evaluated yet. The study aims to compare glycemic parameters among CwD who spent 70-89% and $\geq 90\%$ on CGM using the population-wide data from the Czech national pediatric diabetes registry ČENDA.

Methods: CwD aged <19 years who used real-time CGM >70% of the time and did not change the type of therapy throughout the year 2023 were divided into two groups based on the time they spent on CGM - 70-89% vs. $\geq 90\%$. HbA1c, times in glycemic ranges, mean glucose, and coefficient of variability (CV) were compared.

Results: Data from 2065 CwD (1078 males and 987 females) were evaluated. Among them, 425 participants (20.6%) used CGM 70-89% of the time, and 1640 participants (79.4%) $\geq 90\%$ of the time. Compared to the 70-89% group, the $\geq 90\%$ CGM users achieved significantly lower HbA1c levels (51 mmol/mol,

6.8% vs 57 mmol/mol, 7.4%, $P < 0.001$), higher time in range (72% vs 60%, $P < 0.001$) and lower mean glucose and CV (8.1 mmol/L vs. 9.1 mmol/L and 37% vs. 40%, respectively, both $P < 0.001$).

Conclusions: CGM use for $\geq 90\%$ is associated with tighter glycemic control compared to 70-89% use. Therefore, it is essential to motivate CwD to use CGM for the longest possible time and search for suitable options to overcome barriers in uninterrupted CGM monitoring.

EPV191 / #231

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

THE VARIABILITY OF GLYCEMIC COMPLEXITY

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Background and Aims: Glycemic variability (GV) exhibits temporal patterns over different days of the week, and months. While GV metrics mostly consider amplitudes of glucose measurements and use linear analyses, complexity metrics add time components and use non-linear analyses. People with diabetes have decreased complexity of glucose measurements, indicating impaired glucose regulation, which is mainly affected by intrinsic factors/ β -cell function. The aim of this research was to study whether complexity is also subject to temporal variation.

Methods: Data from continuous glucose monitors were collected over the year 2023 in 349 people with type 1 diabetes. Poincaré plot analysis was performed to analyse the shape (SFE) and area of the fitting ellipse (AFE). Refined composite multi-scale entropy (RCMSE) analysis was performed with the summed RCMSE metric as outcome measure. All metrics were calculated per day and grouped per day of the week and per month. One-way ANOVA was performed to test for differences.

Results: Complexity metrics varied significantly per day of the week and per month ($p < 0.001$ for all groups and metrics). SFE was the highest on Sundays (2.65 ± 0.0097) and in December (2.77 ± 0.013) and AFE was the highest on Saturdays ($23.3 \text{ mmol}^2/\text{L}^2 \pm 0.13 \text{ mmol}^2/\text{L}^2$) and in April ($23.2 \text{ mmol}^2/\text{L}^2 \pm 0.18 \text{ mmol}^2/\text{L}^2$). The summed RCMSE metric was the lowest on Sundays (3.95 ± 0.012) and in January (3.94 ± 0.016).

Conclusions: Complexity metrics are subject to changes due to the days of the week, and months, similarly as GV metrics. The differences between the complexity metrics may indicate different glucose regulatory patterns.

EPV192 / #1160

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

IMPACT OF RECENT REAL-LIFE EXPOSURE TO HYPOGLYCEMIA ON COGNITIVE FUNCTION IN THE HYPO-RESOLVE CLAMP STUDY IN PEOPLE WITH TYPE 1 DIABETES

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Background and Aims: Cognitive impairment during hypoglycemia is a well-known risk for people with type 1 diabetes, potentially hindering the person from self-treating the episode (severe hypoglycemia). However, whether recurrent real-life hypoglycemia affects cognitive function during subsequent hypoglycemia is unclear. With data from the Hypo-RESOLVE clamp study, we investigated the association between recent real-life continuous glucose monitoring (CGM)-recorded hypoglycemia and cognitive function during a hypoglycemic clamp.

Methods: We applied open intermittently scanned CGM (Freestyle Libre 1®) to 42 people with type 1 diabetes to capture real-life hypoglycemia for one week before participating in a hyperinsulinemic-euglycemic-hypoglycemic clamp. Cognitive function was assessed at baseline and during hypoglycemia (mean $\pm$ SD) (2.8 ± 0.1 mmol/L) using four validated tests: Paced Auditory Serial Addition Test (PASAT) and three subtasks of Test of Attentional Performance (TAP)—Alertness, Working Memory, and Verbal Flexibility.

Results: Median (IQR) hypoglycemia exposure (<3.9 mmol/L) in the week before clamp was 5.8 (3.1-8.8) events/week. For the whole group, the cognitive function declined when applying PASAT and the TAP subtasks ($p < 0.01$). No associations were identified between CGM-hypoglycemia exposure (hypoglycemic events/week and time below range) prior to clamp and cognitive function during the clamp procedure when adjusting for sex, age, diabetes duration, HbA1c, severe hypoglycemia history in the past year, awareness status, and total symptom score in linear regression analyses.

Conclusions: Our findings indicate that recent real-life CGM-hypoglycemia is not associated with cognitive impairment during clamped hypoglycemia in people with type 1 diabetes. This supports that cognitive impairment in response to hypoglycemia may not be susceptible to habituation.

EPV193 / #594

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

AI BASED CARBOHYDRATE ESTIMATION FROM CGM DATA WITH AND WITHOUT REFERENCE CALIBRATION MEAL DATA FOR T1D PATIENTS

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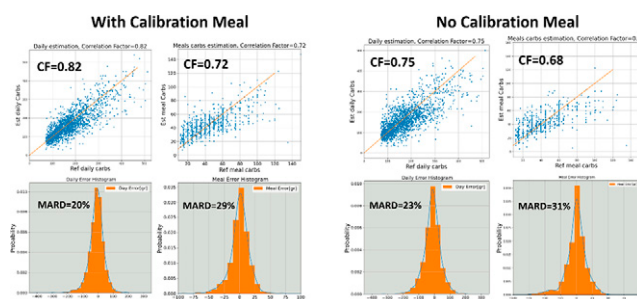
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Background and Aims: Accurate carbohydrate assessment is key in diabetes management. With current methods, meal logging and carbohydrate self-estimation are challenging and inaccurate (error>40%) [Meade et al., 2016]. At ATTD2024 MakeSense introduced an algorithm for automatic and accurate carbohydrate tracking using CGM data [Poster#1366]. Previously, this technology required the initial consumption of a known reference meal, limiting its applicability in real-world

scenarios and retrospective analyses. Leveraging Machine Learning tools and a sufficiently large training dataset, we evaluate the performance of the algorithm without a reference meal.

Methods: We conducted a retrospective analysis using data from the T1DEXI study including 488 participants with T1D [Riddell et al. 2023]. The study collected insulin doses and meal logs over 28 days. The meals' reported carbohydrate content served as a reference for accuracy evaluation. Two analyses were performed: one based on personalization using a reference meal and another using a nearest-neighbor algorithm. The latter averaged parameters from similar individuals out of 487 participants, considering demographic, physical, medical, and glycemic factors.

Results: For the 88 participants on MDI treatment, we estimated total daily and per-meal carbohydrates. The daily MARD was 20% using calibration meal and 23% without it. Per meal, MARD was 29% and 31% respectively.



Conclusions: MakeSense's carbohydrate monitoring algorithm enables carbohydrate intake estimations without meal logging, and with error, lower than what people with diabetes achieve. It can be personalized without a reference meal, with only a minor performance tradeoff. This approach reduces user burden and enables healthcare professionals to personalize insulin titration, with continuous and accurate carbohydrate information.

EPV194 / #268

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

THE LINK BETWEEN CGM-DERIVED GLUCOSE PARAMETERS AND CHRONIC COMPLICATIONS IN TYPE 1 DIABETES: A 5-YEAR FOLLOW-UP STUDY (GLUCOM)

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Background and Aims: HbA1c is linked to chronic diabetic complications. TIR (70-180mg/dL) measured by CGM offers complementary insights. We investigated the link between TIR and the 5-year risk of microvascular complications.

Methods: Data from CGM-using adults with T1D were analyzed over a 5-year period. Diabetic eye disease was scored positive if proliferative retinopathy was present, nephropathy if albuminuria $\geq 20\mu\text{g}/\text{min}$ or eGFR $< 60\text{ml}/\text{min}$, and neuropathy if monofilament scored $< 6/6$.

Results: 315 adults (54% men) with T1D were included with a median age of 46y (31-58y), diabetes duration: 27y (16-37y),

HbA1c: 7.50% (6.9-8.1%), mean TIR: 50.0±14.2%. At inclusion 9.7% had retinopathy, 17.0% nephropathy and 15.6% peripheral neuropathy. After 5 years complications evolved to 22.9%, 13.3% and 7.3% respectively, and glucometrics improved: HbA1c 7.15 (6.6-7.6%) and TIR 61.5±15.2%. Adults with composite complications at 5 years were older (55 vs 42y, $p<0.001$), had a longer diabetes duration (35 vs 23y, $p<0.001$), a higher HbA1c (7.7 vs 7.4%, $p=0.036$), lower TIR at 5 years (63.0 vs 58.4%, $p=0.022$), higher diastolic blood pressure ($p<0.001$), and triglycerides ($p=0.028$), and similar BMI. Logistic regression identified diabetes duration ($p<0.001$), HbA1c at start ($p<0.001$), Δ HbA1c ($p<0.001$) as independently associated with complications. In the model using TIR instead of HbA1c, diabetes duration ($p<0.001$), TIR at start ($p<0.001$) and Δ TIR ($p=0.002$) were significant. AUC-ROC and AIC showed that HbA1c was a stronger predictor of complications than TIR.

Conclusions: Diabetes duration, and both baseline and delta HbA1c and TIR were independent risk factors for complications at 5 years. The link with complications was stronger for HbA1c than for TIR.

EPV195 / #1243

E-Poster Viewing Topic: AS05. Continuous Glucose Monitoring (CGM) in Practice in Type 1 Diabetes

CONTINUOUS BLOOD GLUCOSE MONITORING, LEVEL OF EDUCATION AND HEALTH RELATED QUALITY OF LIFE IN ADOLESCENTS WITH TYPE 1 DIABETES DURING A THERAPEUTIC CAMP

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Background and Aims: Education is a crucial component of diabetes management with direct implication on glucose control and quality of life. Experience-based therapeutic camps provide valuable information on glycemic status, previous education and psihosocial background of participants.

Methods: This descriptive, interventional study involved 40 adolescents (10-17 years) with type 1 diabetes, who participated in a therapeutic camp between 18 - 22 August in 2024, at Vârșag, Romania. Key features of the camp: use of Dexcom One + sensors, six fixed meals/day, a standardized insulin correction and hypoglycemia protocol, pre-planned therapeutic activities and designated physical exercise. We analysed sensor data collected over 4 days and performed a 12-item Educational Questionnaire and KINDL Questionnaire.

Results: Of the 40 adolescents, 23 were female (57.5%), with an average age of 14.6 years and BMI percentile of 54.3±25.6th. 11 participants (27.5%) used insulin pumps, and 27 (81.81 %) were already using CGM before the camp. Pre-camp HbA1c was 7.76 % (±1.01 %, min 6 %, Max 10.1%). TIR of the participants was 63.87 % (±14.79 %, min 20 %, Max 93%), TBR 3.96 ±3.58 % and TAR 32.75±15.47% with a CV of 37.42±5.85 %. Education mean score was 6.30 ±2.28 points and KINDL Questionnaire score was 87.57±9.14. Both scores were highly correlated with pre-camp HbA1c levels, TIR; TBR, CV levels and BMI percentile ($p<0.001$).

Conclusions: In adolescents with type 1 diabetes during a therapeutic camp experience anthropometric measures and CGM parameters were highly correlated with level of education and health related quality of life.

EPV196 / #986

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

CHANGES IN CGM METRICS FOR PEOPLE WITH T2D SWITCHING FROM DULAGLUTIDE OR SEMAGLUTIDE TO TIRZEPATIDE 5MG A SUB-ANALYSIS OF THE SURPASS-SWITCH-2 STUDY

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Background and Aims: This sub-analysis of the SURPASS-SWITCH-2 study aimed to describe changes in continuous glucose monitoring (CGM) metrics after switching from dulaglutide/semaglutide to tirzepatide 5mg in adults with T2D.

Methods: Eligible participants had HbA1c $\geq 6.5\%$ to $\leq 9.0\%$ and were on a stable dose of dulaglutide/semaglutide for ≥ 3 months, whereafter tirzepatide 5mg QW was initiated for 12 weeks. Participants wore a blinded CGM device for 14 days at baseline, week 4, and week 12.

Results: Baseline characteristics of the dulaglutide and semaglutide subgroups are outlined in Table 1, with more favourable baseline CGM metrics in the dulaglutide group. From baseline to week 12, changes in CGM metrics were greater in the dulaglutide subgroup (Table 1).

Table 1. Baseline Characteristics and Change in CGM Metrics

Baseline Characteristics (Mean±SD, mITT)	Dulaglutide (N=63)	Semaglutide (N=84)
Age (years)	58.4±10.3	57.6±10.0
Females (n, %)	32 (50.8%)	48 (57.1%)
BMI (kg/m ²)	34.7±6.5	35.4±7.2
Waist Circumference (cm)	114.7±16.8	113.3±17.3
HbA1c (%)	7.5±0.7	7.4±0.7
FSG (mg/dL)	140.8±29.3	141.3±37.5
CGM Metrics (mean % of time per day)		
Time Above Range (TAR, >180 mg/dL)	21.4±20.8	23.6±21.9
Time In Range (TIR, 71-180 mg/dL)	77.6±20.6	74.9±21.2
Time Below Range (TBR, ≤70 mg/dL)	1.0±2.3	1.6±5.1
Time In Tight Range (TITR, 71-140 mg/dL)	49.4±25.4	44.6±23.7
Change in CGM Metrics to Week 12 (LSMean±SE, Efficacy Analysis Set)	(N=57)	(N=75)
TAR	-9.0±2.3***	-6.7±2.1**
TIR	+6.3±2.6*	+5.0±2.1*
TBR	+3.0±1.6	+1.8±1.0
TITR	+14.0±3.9***	+11.4±3.1***

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Conclusions: Switching from dulaglutide/semaglutide to tirzepatide 5mg was associated with improved CGM metrics, with improvements more pronounced in the dulaglutide subgroup.

EPV197 / #37

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes**EFFECTIVENESS OF USING HYBRID CARE MODELS WITH CONTINUOUS GLUCOSE MONITORING IN PATIENTS WITH DIABETES DURING RAMADAN**

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Background and Aims: Ramadan fasting mandates abstinence from food and drink from dawn to dusk, with exemptions for those with serious medical conditions like diabetes. Fasting diabetics should be closely monitored. CGMs track glucose levels, but require self-management. GluCare.Health utilizes a hybrid care model, streamlining clinical and psychological support. This study evaluates the effectiveness of this hybrid care model during Ramadan fasting.

Methods: In an observational study, 24 diabetic patients were managed under GluCare.Health were assessed using the DAR risk score. Medication adjustments were made, and patients fasted for 27-30 days. The hybrid model provided app access for continuous physician communication, CGM data analysis, and personalized feedback from diabetic educators and dietitians.

Results: Participants averaged 43.08 years old, with an HbA1c of 7.58 ± 1.50 and diabetes duration of 8.14 years. Of them, 79.2% were male, with 41.7% having T1D and 58.3% T2D. For T2D, TIR improved from 83.1 to 85.1, TAR decreased from 15.5 to 14.6, and GMI improved from 6.7 to 6.5, compared to 61.8% with standard care in Ramadan fasting (1). For T1D, TIR increased from 65.1 to 70.5, TAR decreased from 33.0 to 27.5, and GMI from 5.9 to 6.9. Engagement interactions averaged 10.23 inbound and 12.64 outbound, with significant CGM improvements seen in patients with ≥ 5 virtual interactions (TIR: $+5.0 \pm 25.3$, TAR: -6.0 ± 24.9 , and GMI: -0.14 ± 0.32) compared to patients with < 5 (TIR: -1.57 ± 3.10 , TAR: 1.0 ± 2.6 , GMI: 1.02 ± 3.5).

Conclusions: Close monitoring and personalized care via the GluCare hybrid care model can improve glucose management for diabetic patients during Ramadan fasting.

EPV198 / #957

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes**COST-EFFECTIVENESS OF REAL-TIME CGM IN PEOPLE WITH TYPE 2 DIABETES ON INTENSIVE INSULIN THERAPY IN ITALY**

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Background and Aims: RT-CGM systems improve glycemic outcomes and reduce healthcare resource utilization. Our study aims to evaluate the economic value of RT-CGM from an Italian healthcare payer perspective.

Methods: Our analysis projects lifetime outcomes and costs comparing RT-CGM to IS-CGM and SMBG using the IQVIA Core Diabetes Model v9.5+. Cohort characteristics and clinical data were sourced from DIAMOND T2D (RT-CGM), REPLACE (IS-CGM), and Karter 2021 (SMBG). HbA1c reductions favored RT-CGM by -0.33% vs. IS-CGM and -0.56% vs. SMBG. Severe hypoglycemic event rates were 0.014 PPY for IS-CGM, 0.040 for SMBG, and 0 for RT-CGM. Diabetic ketoacidosis rates, estimated via CGM-measured Time Above Range (> 180 mg/dL), were 0.031 PPY for IS-CGM, 0.025 for SMBG, and 0 for RT-CGM. CGM system costs were based on Dexcom ONE+ and FreeStyle Libre 2, with a reduction in fear of hypoglycemia attributed to RT-CGM.

Results: RT-CGM was cost-saving (dominant) compared to IS-CGM, with incremental quality-adjusted life years (QALYs) of 0.433 and cost savings of €1,143. Compared to SMBG, RT-CGM was also dominant, with cost savings of €3,856 and incremental QALYs of 0.909. RT-CGM reduced the cumulative incidence of diabetes-related complications, including renal, eye, neuropathy, and cardiovascular issues, by 7.55%, 5.30%, 2.26%, and 2.69%, respectively, compared with IS-CGM, and by 19.31%, 16.13%, 7.08%, and 6.63%, compared with SMBG.

Conclusions: Our analysis suggests that RT-CGM is cost-saving compared to IS-CGM and SMBG in people with T2D on intensive insulin therapy in Italy. These findings could inform Italian healthcare payers regarding the economic value of RT-CGM systems.

EPV199 / #1152

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes**EPISODIC CONTINUOUS GLUCOSE MONITORING FOR THE EVALUATION OF THE GLYCEMIC CONTROL AND HYPOGLYCEMIA OF OUTPATIENT REGIMENS IN OLDER PATIENTS WITH TYPE 2 DIABETES MELLITUS AND COMORBIDITIES**

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Background and Aims: Older adults with diabetes are under-represented in clinical trials. Current guidelines for those type of patients, seem to adopt a more conservative approach regarding glycemic control, in order to avoid hypoglycaemia events. In this study, glycemic control and risk of hypoglycaemia of older patients with type 2 diabetes mellitus (T2DM), were evaluated based on combination of results from Blood Glucose Monitoring (BGM), episodic continuous glucose monitor (CGM) and HbA1c.

Methods: Volunteer patients with T2DM, over 60 years old with comorbidities, on insulin regimen, were provided with a real time CGM (rtCGM) or an intermittently scanned CGM

(isCGM), depending on their preference and ability to use it, after training. The study was approved by the Institutional Review Board and patients signed an informed consent. Patients' descriptive characteristics are presented in Figure 1.

Patients' descriptive characteristics	Figure 1.
Gender (men/women)	49% (20) / 51% (21)
Age (years)	67.76 ± 9.59
Weight (kg)	76.77 ± 18.01
Height (cm)	1.63 ± 0.12
BMI (kg/cm ²)	28.93 ± 5.63
Waist circumference (cm)	103.83 ± 16.88
HbA1c (%)	7.44 ± 1.14
Creatinine (mg/dL)	2.57 ± 2.51

Data are presented in the form of mean ± standard deviation.

Results: 16 out of 41 patients used the *rtCGM* for a monitoring period of 10-19 days, and the remaining 25 patients used the (*isCGM*) system for a monitoring period of 8-28 days. Figure 2 and Figure 3 describe the Ambulatory Glucose Profile (AGP) Report statistics with "Time below Range < 70 mg/dL" and "Time below Range < 54 mg/dL" being ~2.68% and ~0.64%, respectively. Moreover, 6 out of 41 patients were excluded due to a significant percentage (>50%) of missing values in their CGM data.

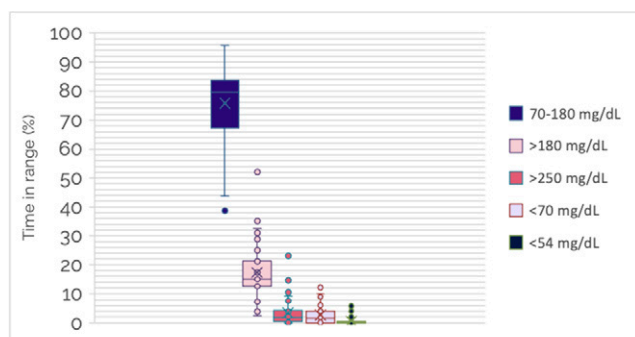


Figure 2. The Ambulatory Glucose Profile (AGP) report.

Figure 3. Glucose statistics based on the AGP Report.

Glucose Statistics	Mean
Average Glucose	146.05 ± 22.69
Glucose Management Indicator (GMI)	6.80 ± 0.54
Glucose Variability	31.75 ± 7.30

Data are presented in the form of mean ± standard deviation.

Conclusions: Outpatient regimens of older patients with T2DM, could combine episodic CGM for the evaluation of glycemic control and hypoglycaemia events.

EPV200 / #621

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

EXAMINING THE AI-DERIVED POSTPRANDIAL NORTHEAST GLUCOSE DRIFT IN INDIVIDUALS WITH OR AT RISK FOR TYPE 2 DIABETES

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Background and Aims: Prior research indicates a correlation between postprandial glucose response (PPGR) elevations and HbA1c in individuals with prediabetes and non-insulin-treated type 2 diabetes (T2D). However, previous studies were largely conducted in-clinic with test meals and timed blood draws. We combined continuous glucose monitoring (CGM) data and an AI algorithm to characterize PPGRs in detail in a free-living study.

Methods: We analyzed baseline data from the Personal Diet Study, a 6-month randomized controlled trial comparing a low-fat diet and a personalized diet's effects on weight loss and glycemic measures in adults with prediabetes or non-insulin-treated T2D. Participants wore Freestyle Libre Pro CGMs for up to 2 weeks at baseline. The largest morning PPGR (5am-noon) each day was identified using a random forest AI framework, characterized using four parameters (baseline glucose, height of peak, time to peak, and 3-hr area under the curve), aggregated per participant and compared to HbA1c. Participants were also grouped into three HbA1c categories for subgroup analysis: normal (<5.7%), prediabetes (5.7-6.4%), and T2D (>6.4%).

Results: 152 participants had at least one day of CGM data with a discernible morning PPGR. The morning PPGR showed a distinct northeast drift with increasing HbA1c (Figure 1). All PPGR parameters significantly correlated with HbA1c, including baseline glucose (r=0.41), height of peak (r=0.26), time to peak (r=0.28), and 3-hr AUC (r=0.34).

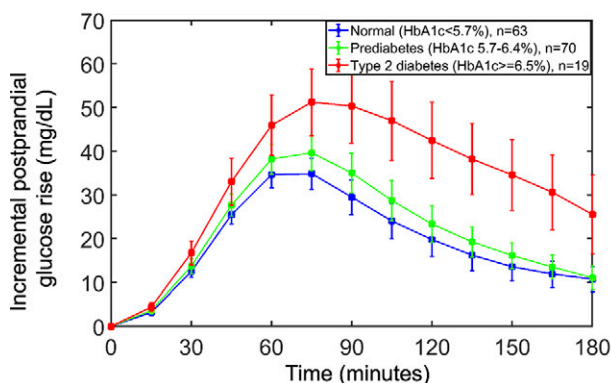


Figure 1: The northeast PPGR drift with increasing HbA1c risk category. Each curve represents the average 3-hour morning PPGR for the three HbA1c categories. Error bars represent standard error of the mean. PPGR: Postprandial glucose response. (n=152)

Conclusions: An AI framework identified a northeast drift in morning PPGRs in individuals with or at risk for non-insulin-treated T2D, highlighting its potential as a CGM-based diabetes risk assessment tool to complement in-clinic postprandial glucose testing.

EPV201 / #1175

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

FEASIBILITY STUDY WITH FREESTYLE-LIBRE-3 CONTINUOUS GLUCOSE MONITORING SYSTEM (CGM) IN RESIDENTIAL HOMES FOR DISABLED PEOPLE

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Background and Aims: Since the possibility of using a follower-App in CGM-technology helps patients to improve their values. The use in homes for disabled people who are not able to manage their diabetes themselves isn't examined.

Methods: We started a project to equip disabled people with the freestyle-libre-3+app on the cellphone. Also the wardroom was equipped with a follower-app-recipient-cell-phone. The hypoglycemia-alarm was activated. We collected data about the patients HbA1c, insulin dose and CGM values every 3month for one year.

Results: Study population: n=12(6women/6men), median-age 44y, median-diabetes-duration 21y (3 type 1-diabetes, 8 type 2-diabetes, one pancreoprivic-diabetes). Two patients down-syndrome, 5 severe intellectual-disability, 3 moderate intellectual-disability, 1 early-childhood-brain-damage living in 4 different homes for disabled/ 8 different wards. 3 had used freestyle-libre-CGM with a reading-device before. The HbA1c raised from 7,34% to 7,61%, 7,9%, 7,68%, the Time-in-range went from 61,4% to 56,4% to 55,4%. But Time-below-range went from 6,8% to 4,5%, to 2,5%. The insulin dosis dropped from 55,8IE/d to 47,4IE/d (p=0,07), to 47,5IE/d(p=0,057), to 44,5IE/d(p=0,025). Only in one patient the insulin dose was raised, in another patient it stayed stable, in all the other patients the insulin dose was decreased. No hospitalization because of hypoglycemia was reported during the project. The main problem in this project was the lack of WiFi in the residential-homes for disabled-people. Also, in two cases the insurance refused to continue paying for the CGM after the project because the patients aren't able to treat their diabetes themselves.

Conclusions: Use of CGM+follower-app leads to less hypoglycemia in residential-homes for disabled people.

EPV202 / #720

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

ASSOCIATION OF FREESTYLE LIBRE CONTINUOUS GLUCOSE MONITORING UTILIZATION AND GLP-1 RECEPTOR AGONIST DISCONTINUATION: A REAL WORLD STUDY

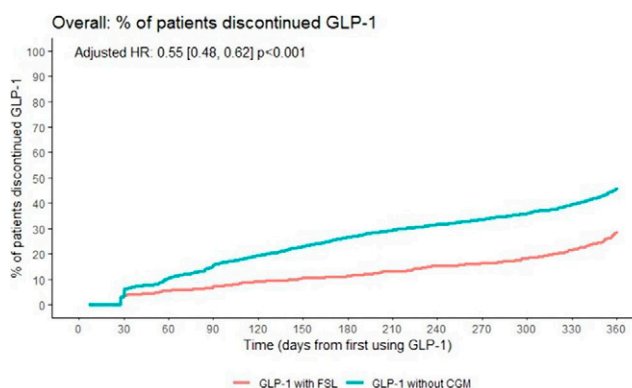
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Background and Aims: FreeStyle Libre (FSL) continuous glucose monitoring (CGM) and glucagon-like peptide-1 receptor agonists (GLP-1) when used jointly is associated with significant improvement in glycemic outcomes. However, it is unknown if using FSL enhances GLP-1 adherence. This study assesses the relationship between consistent FSL utilization and GLP-1 discontinuation among people living with type 2 diabetes (T2D) on non-intensive therapy.

Methods: This retrospective matched-cohort study analyzed data from Inovalon Insights administrative claims from March 1, 2017, to April 30, 2024, adults ≥ 18 years old, diagnosed with T2D, on basal insulin or non-insulin therapy, and CGM-naïve before starting GLP-1. Consistent FSL utilization was defined as having proportion of days covered ≥ 0.8 within one-year post GLP-1 initiation. FSL users were matched with non-CGM users based on age, sex, race/ethnicity, and basal insulin/non-insulin therapy. The primary outcome was GLP-1 discontinuation, defined as a gap of ≥ 90 days without GLP-1 supply. Multivariate Cox proportional hazards model was used to estimate the time to discontinuation.

Results: We matched 878 consistent FSL users with 3512 non-CGM users. One year post GLP-1 initiation, 31.1% of consistent FSL users discontinued GLP-1, compared to 48.4% of non-CGM users. After adjusting for covariates, consistent FSL user were significantly less likely to discontinue GLP-1 compared to non-CGM users (HR: 0.55, 95% CI: [0.48, 0.62], $p < 0.001$).



Conclusions: This study suggests that regardless of therapy type, consistent FSL use is associated with a significantly lower risk of GLP-1 discontinuation, potentially enhancing adherence, and improving long-term glycemic control in people living with T2D on non-intensive therapy.

EPV203 / #725

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

DIGITAL PERSONALISED NUTRITION INTERVENTION SIGNIFICANTLY IMPROVES GLYCEMIC CONTROL IN POORLY CONTROLLED TYPE 2 DIABETES MELLITUS: REAL WORLD DATA ANALYSIS OF A 12-WEEK CGM-BASED INTERVENTION

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Background and Aims: Management of Type 2 Diabetes Mellitus (T2DM) requires consistent self-care and periodic glycemic monitoring all or not combined with medication, yet traditional interventions often fall short. Digital health interventions, particularly those that personalise care, offer new opportunities for improved outcomes. This study assessed effectiveness of a personalised, glucometry-driven nutritional intervention in T2DM patients, focussing on the role of app engagement in driving clinical improvements.

Methods: A pre-post intervention analysis was conducted on 638 T2DM patients in a 12-week digital nutrition intervention. This included a digital food diary (app), 2 episodes with a CGM (Freestyle Libre), and real-time dietitian feedback. Estimated HbA1c (eHbA1c) was assessed at baseline (sensor 1) and post-intervention (sensor 2). Time in Range (TIR) and app engagement metrics were analysed to identify predictors of glycemic improvement.

Results: Of 140 patients with complete data, baseline glucose averaged 8.25 mmol/L (SD = 2.06). Overall, a modest eHbA1c reduction of 0.078 mmol/L was seen. However, patients with poor initial control (HbA1c > 48 mmol/mol) saw greater improvements, with a mean eHbA1c reduction of -3.0 mmol/mol and -10.1 mmol/mol for those who improved glycemic control. Significant predictors of eHbA1c reduction included TIR on sensor 2 ($b = -0.276$, $p < 0.001$) and app session frequency ($b = -1.456$, $p = 0.005$).

Conclusions: A personalised, glucometry-based intervention significantly improved glycemic control in 2 out of 3 poorly controlled T2DM patients. Frequent app interactions, rather than time spent, were critical for success. In digital health interventions data visualisation and brief, regular app-engagements should be prioritised to optimise health outcomes.

EPV204 / #688

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

ASSOCIATION BETWEEN TIME IN TIGHT RANGE AND RISK OF ALL-CAUSE MORTALITY IN PATIENTS WITH TYPE 2 DIABETES: A PROSPECTIVE COHORT STUDY

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Background and Aims: The evidence regarding time in target range (TITR) and long-term adverse outcomes of diabetes is limited currently. This study aimed to explore the relationship between TITR and the risk of all-cause mortality in patients with type 2 diabetes.

Methods: Data of 6061 adult inpatients with type 2 diabetes included from January 2005 to December 2015 in a single center was analyzed. TITR was measured with continuous glucose monitoring (CGM) at baseline and was defined as the percentage of time in the target glucose range of 3.9-7.8 mmol/L (70-140 mg/dL) during a 24-hour period. Cox proportion hazard regression models were used to examine the association between different levels of TITR and the risk of all-cause mortality.

Results: During a median follow-up period of 10.9 years, 1898 (31.3%) patients died. Multivariate Cox regression model showed that the decrease of TITR was related to a higher risk of all-cause mortality (P for trend < 0.001). Meanwhile, an inverse association was revealed between TITR and all-cause mortality risk (P for linearity < 0.001) through the restricted cubic spline. Further subgroup analysis showed that the linear relationship between TITR and all-cause mortality risk was remained in patients with glycated hemoglobin A1c (HbA1c) < 7.0%.

Conclusions: Lower TITR is related to an increased risk of all-cause mortality in patients with type 2 diabetes, indicating that a tight glucose target range may be reasonable to reduce long-term mortality risk, especially in those with seemingly well-controlled diabetes.

EPV205 / #331

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

ASSESSMENT OF GLYCEMIC PROFILES USING CONTINUOUS GLUCOSE MONITORING IN END-STAGE RENAL DISEASE PATIENTS TREATED WITH AUTOMATED PERITONEAL DIALYSIS

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Background and Aims: Glycemic control is necessary for effective ultrafiltration in peritoneal dialysis. Automated peritoneal dialysis (APD) requires a short indwelling time of dialysates but may result in significant glycemic excursions and variability. This study aims to assess glycemic profiles in ESRD patients undergoing APD using continuous glucose monitoring (CGM).

Methods: Thirty participants were enrolled, including 10 non-diabetics, 10 diabetics without insulin use and 10 diabetics with insulin use. The Medtronic Guardian4 CGM sensor was applied for 7 days while participants continued their usual APD regimen, mealtimes, medications and insulin therapy. Glycemic profiles were assessed using mean glucose, area under the curve (AUC) of glucose and mean amplitude of glucose excursions (MAGE).

Results: The mean age was 65.2 ± 17.7 years old. Diabetic patients with insulin use were given at least 1 injection of basal insulin during APD period. Mean glucose, AUC of glucose and MAGE during APD and non-APD periods did not differ within each group. However, during APD period, all glycemic profiles of diabetic patients were significantly higher than those of non-diabetics, with corrected AUC of glucose of 184.6 mg/dL (157.4, 251.4) vs 136.5 (123.5, 143.2) mg/dL ($p=0.002$) and MAGE of 86.1 (65.3, 164.2) vs 59.7(44.5, 74.4) mg/dL ($p=0.01$). These differences were observed only in diabetics with insulin use.

Conclusions: Glycemic profiles during APD and non-APD periods were not different within groups including diabetic patients with insulin use. Once-daily basal insulin might be sufficient for glycemic control in diabetic patients on insulin therapy.

EPV206 / #946

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

IMPACT OF DEXCOM G7 ON GLYCEMIC CONTROL AND PATIENT SATISFACTION IN NON-INSULIN-TREATED TYPE 2 DIABETES

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Background and Aims: Uncontrolled type 2 diabetes (T2D) can have serious health consequences. Lifestyle adjustments are essential, but understanding how to make changes can be difficult. Here, we look at the effect of Dexcom G7 on participants with T2D.

Methods: We enrolled individuals with T2DM not on insulin (n=8). The study consisted of three wear periods (WP), each ~10 days, with WP 1 consisting of blinded sensor wear and WPs 2 and 3 consisting of unblinded Dexcom G7. There were no medication changes during the study. Glycemic metrics were compared between the blinded and unblinded WPs. Participant-reported outcomes (PROs) were collected at baseline and study-end. Semi-structured interviews were also conducted at study-end in a subset of participants (n=4).

Results: Unblinded Dexcom G7 wear resulted in significant glycemic improvements compared to blinded wear including significant improvement in time in range (70-180 mg/dL), time in tight range (70-140 mg/dL), and time spent above range (>180 mg/dL and >250 mg/dL) as shown in Table 1. PROs reflected significantly improved satisfaction with glucose monitoring, including reduced behavioral burden of diabetes and increased perceived worthwhileness of glucose monitoring (p <0.05). Interviews highlighted the crucial role of real-time glucose data in empowering behavior change and improving psychosocial health in T2D.

Table 1: Glycemic metrics between unblinded and blinded wear periods (N=8)

	Blinded WP 1	Unblinded WP 2	Unblinded WP 3	Difference Mean WP 1 to WP 3 (95% CI)	Difference Median WP 1 to WP 3 (q1,q3)	P-value
Number of subjects	8	8	8	8	8	
Average Glucose, mg/dL*	192.3 (54.5)	158.8 (27.4)	148.2 (27.7)	-44.1 (-91.3, 3.0)	-21.6 (-62.7, -10.7)	0.0156
CV, %	26.1 (7.6)	25.1 (5.3)	24.9 (5.9)	-1.2 (-4.5, 2.0)	-0.5 (-3.6, 1.9)	0.4005
TIR 70-180 mg/dL, %	52.8 (31.9)	71.2 (21.2)	80.3 (19.7)	27.5 (2.6, 52.4)	15.6 (7.4, 54.3)	0.0350
T1TR 70-140 mg/dL, %*	28.9 (24.7)	39.6 (23.8)	53.2 (21.6)	24.3 (3.1, 45.5)	14.5 (9.1, 36.3)	0.0078
TAR >180 mg/dL, %	47.0 (31.9)	28.6 (21.2)	19.4 (19.8)	-27.6 (-52.6, -2.5)	-15.8 (-54.3, -7.4)	0.0352
TAR >250 mg/dL, %*	18.3 (24.0)	4.6 (6.9)	4.6 (9.1)	-13.7 (-34.0, 6.6)	-3.4 (-20.6, -0.2)	0.1094

*Not normally distributed data, Wilcoxon Signed-Ranks Test was used, Mean (95% CI) is for information only.
TIR: Time in Range; T1TR: Time in Tight Range; TAR: Time Above Range; WP: Wear Period.

Conclusions: The short-term use of real-time CGM appears to improve glycemic management rapidly in adults with T2DM who are not on insulin, likely by fostering empowerment and guidance on disease self-management behaviors.

EPV207 / #40

E-Poster Viewing Topic: A506. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

OPTIMISING IMPACT OF CGM IN A RESOURCE CONSTRAINED SETTING TO IMPROVE OUTCOMES FOR INDIGENOUS PEOPLE WITH TYPE 2 DIABETES MANAGED IN PRIMARY CARE

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Background and Aims: Evidence supporting use of continuous glucose monitoring (CGM) in the management of Type 2

diabetes (T2D) is building. However, little is known about how to optimise the benefits of CGM, particularly in under-served populations and resource constrained settings. This pilot study explores the intermittent use of CGM within a culturally-informed wrap-around primary care service for Indigenous patients with T2D in New Zealand.

Methods: Patients with an HbA1c of ≥ 80 mmol/mol [9.5%] and enrolled with an Indigenous Healthcare Provider were recruited. Participants were provided with CGM at weeks 1-4 weeks and again at 12-13 weeks. Cultural support workers visited every 2-3 days during these periods to provide diabetes self-care education alongside CGM data review. Medications were optimised including use of newly funded SGLT2i and GLP1RA agents. HbA1c, lipids and psychometric tests were measured at 0, 3, 6 and 12 months.

Results: Twenty-three patients with T2D participated (of which 21 identified as Indigenous). Mean ($\pm$ SD) HbA1c significantly decreased from 93.4 ± 15.7 mmol/mol at baseline to 76.5 ± 14.8 mmol/mol at 3 months, with reductions maintained by the majority of participants at 6 and 12 months (all $P < 0.001$ vs baseline). Diabetes self-management scores and LDL-cholesterol measures also improved significantly at 3 and 12 months, respectively.

Conclusions: Intermittent CGM use embedded within culturally-informed primary healthcare appears to support sustained improvements in glycaemia in a high-risk, Indigenous population. A large funded three-arm RCT is currently underway to better understand the impacts of CGM, medication optimisation and cultural support.

EPV208 / #1097

E-Poster Viewing Topic: A506. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

EFFECT OF IGLARLIXI IN TIME IN RANGE USING FLASH CGM IN A MEXICAN COHORT OF ADULTS WITH SUBOPTIMAL CONTROLLED TYPE 2 DIABETES

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Background and Aims: Information is required in relation to the effectiveness of IGLARLIXI in time in range (TIR) using Flash continuous glucose monitor (CGM) in the real-world setting. Therefore, the primary aim of this study was to evaluate the change in TIR using iGlarLixi through a 3-month follow-up. Our secondary aim was to evaluate the effect in A1c.

Methods: This was a real life, retrospective study in patients with uncontrolled type 2 diabetes in two centers: one in Northern and another in Central Mexico. Patients that were treated with IGLarLixi during 2023 who had ambulatory glucose report of 14 days of CGM (FreeStyle Libre) before and after 3 months the treatment was analyzed. Wilcoxon test and Fisher exact test were performed.

Results: Twenty subjects were analyzed. The median starting dose of iGlarLixi (glargine U/lixisenatide mcg) was 25.27/10.83, and 3 months after: 25.94/11.48. The median (IQR) age was 53 (19) years; 18(66%) were men. Initially a median (IQR) of TIR was 50% (27) and after 3 months 78% (23), $p < 0.001$. TIR between 70-180 was 14.8% initially and 66.6% after three months, $p < 0.001$ after. Initially 48.1 % of subjects had TIR $< 69\%$ and 3 months after 22.2%, $p < 0.001$. Initial median (IQR) A1c was 9 (2)% and after 3 months 7(2)%.

Conclusions: The treatment with iGlarLixi increased by 28% the TIR at 12 weeks. There was a reduction in the percentage of time in hypoglycemia and a decrease of A1c of 2%.

EPV209 / #1109

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

INTERMITTENTLY-SCANNED CGM TO MOTIVATE DIABETES SELF CARE IN LOW-INCOME BLACK WOMEN WITH T2D WHO DO NOT USE INSULIN: A PROOF OF CONCEPT STUDY

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Background and Aims: T2DM disproportionately affects low-income Black adults. They are less likely to have received diabetes education, have poorer glucose control, and seldom monitor glucose levels if they do not use insulin, so are unable to connect their dietary choices and physical activity (PA) to BG levels. Periodic use of intermittently scanned continuous glucose monitoring (iCGM) may motivate changing eating and PA behaviors. We used Freestyle iCGM (with reader) and Fitbits to examine temporal associations between daily number of times iCGM glucose data were viewed, and daily mean BG and PA in 8 Black women with non-insulin-requiring T2DM.

Methods: Participants wore a Freestyle iCGM (with reader) and Fitbit for 14 days. They received education about the effects of PA and diet on glucose levels. We used multilevel VAR (Vector Autoregressive Regression) models to estimate the within-person, temporal dynamic associations between daily mean glucose, number of daily swipes, and daily mean PA (steps). VAR is useful for capturing relationships between multiple variables as they change over time. The estimation was done with R_mIVAR 0.5.2 version.

Results: Estimation results showed individual-specific temporal patterns between daily swipes, glucose, and PA levels. In some cases, more frequent swipes predicted lower mean glucose, directly or indirectly through increased PA. In others, more swipes predicted higher mean glucose. We found bidirectional relationships between swipes and activity and between swipes and mean glucose levels.

Conclusions: Diverse temporal patterns may help identify individuals for whom iCGM-based self-care improves glucose and PA levels. Effects would likely be more pronounced in a larger sample with higher A1c levels.

EPV210 / #762

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

USEFULNESS OF CGM TO EXPLORE GLYCEMIC PATTERNS IN TYPE 2 DIABETES PATIENTS WITH END-STAGE KIDNEY DISEASE

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Background and Aims: Patients with T2D and end-stage kidney disease (ESKD) undergoing hemodialysis (HD) experience significant glycemic variability. Although a pattern of hypoglycemia followed by hyperglycemia after HD sessions have been described, no studies addressed which clinical variables and HD parameters are related with these glycemic fluctuations using CGM information. Aim: to assess glycemic excursions with CGM in T2D patients and ESKD-HD, incorporating parameters of HD quality.

Methods: Prospective observational study among 26 T2D patients with ESKD-HD: 16 insulin-treated (IT) and 10 non-insulin-treated (non-IT). Clinical and HD variables were collected. CGM (Dexcom one plus[®]) was conducted for 21 days. HD quality was defined by a flow rate (Qb) $> 350\text{ml/min}$.

Results: No differences in clinical variables (age, sex, duration of diabetes, time in HD and HbA1c values) were found between groups. IT patients exhibited higher nocturnal glycemia post-HD (193.89 ± 52.53 vs 154.11 ± 21.77 mg/dL; $p=0.04$) and more glycemic variability (CV $31.47 \pm 6.23\%$ vs $25.68 \pm 3.64\%$; $p=0.027$) than non-IT patients. Remarkably, all patients (IT and non-IT) significantly improved the glycemic control during HD days (mean glucose days off HD 173.11 ± 38.35 mg/dL vs 169.97 ± 30.25 the HD days, $p < 0.001$), especially those subjects with better HD quality. However, a better HD quality increases the risk of hypoglycemia in IT subjects the day of HD session (TBR 1.9% vs 0.42 ; $p=0.016$).

Conclusions: Treatment with insulin and HD quality are the main factors associated with an increase in glycemia variability (hyper- and hypoglycemia) in subjects with T2D under HD treatment.

EPV211 / #266

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

COST-ANALYSIS OF FREESTYLE LIBRE DEVICES FROM THE NATIONAL HEALTH SYSTEM PERSPECTIVE IN PATIENTS WITH T2D ON BASAL INSULIN TREATMENT AND POOR GLYCEMIC CONTROL IN SPAIN

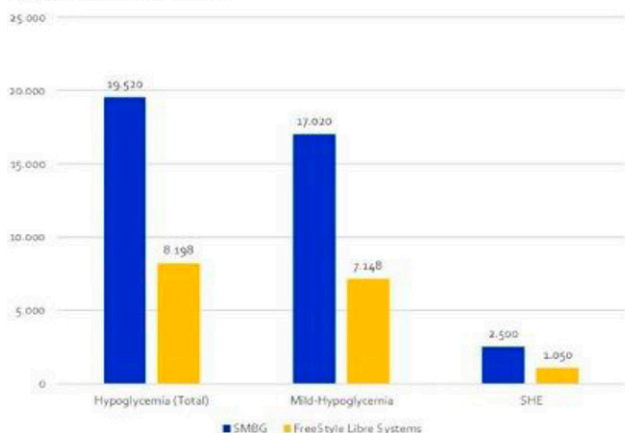
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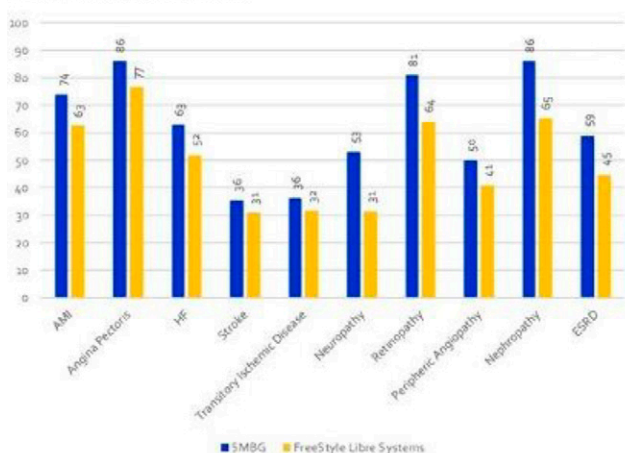
Background and Aims: The FreeStyle Libre® (FSL) system has been shown to improve glycemic control in Type 2 diabetes (T2D) and may reduce healthcare costs. This cost-analysis evaluates the use of FSL versus self-monitoring blood glucose (SMBG) in T2D patients on basal insulin with poor glycemic control (HbA1c>8%) in Spain

Figure 1. Number of health events per 1,000 patients with T2D on basal insulin and with poor glycemic control

A) Hypoglycemic events *



B) Chronic complications



AMI: Acute Myocardial Infarct; DKA: Diabetic Ketoacidosis; ESRD: End-Stage Renal Disease; HF: Heart Failure; SHE: Severe Hypoglycemic Event; SMBG: Self-Monitoring Blood Glucose.

* Acute event concerning DKA: 0 events were estimated for the FreeStyle Libre Systems cohort and 3 events for the SMBG cohort.

Methods: A model was used to estimate annual costs associated with glucose monitoring, resource consumption, and management of acute (mild hypoglycemia, severe hypoglycemic events [SHEs], and diabetic ketoacidosis [DKA]) and chronic complications. Event rates (per person-year) and costs per event (€2024) were derived from published studies (mild-hypoglycemia=17.02/€17.40; SHE=2.5/€2,508.97; DKA=0.0025/€6.14; AMI=0.074/€1,214.44; angina pectoris=0.086/€669.92; HF=0.063/€1,481.65; stroke=0.0356/€3,101.09; transitory ischemic disease=0.0364/€2,773.90; neuropathy=0.053/€3,961.01; retinopathy=0.081/€3,844.98; peripheral angiopathy=0.05/€1,085.66; nephropathy=0.086/€1,883.87; ESRD=0.059/€41,592.79). Reductions in acute events (mild hypoglycemia/SHEs=-58%; DKA=-68%) and HbA1c (-1.1%) with FSL use were based on real-world evidence. Chronic complications were projected by their reduction per 1% decrease in HbA1c. For SMBG users, daily consumption of 2.5 strips (€0.55/unit) and 2.5 lancets (€0.14/unit) was estimated. FSL users reduced an 83% the strips/lancets usage (26 sensors/year; €3.00/day). Sensitivity analyses (SA) considered various clinical scenarios.

Results: Annual costs/patient were €6,853.87 for SMBG and €5,075.58 for FSL. In a 1,000-patients cohort, FSL use would prevent 11,323 acute (Figure 1A) and 124 chronic events (Figure 1B), reducing costs by €1,778,289 (mild-hypoglycemia=-€37,617; SHEs=-€1,455,204; DKA=-€4,174; chronic complications=-€855,141). All SAs confirmed cost-savings with FSL.

Conclusions: Compared to SMBG, FSL reduces acute and chronic complications in poorly controlled (HbA1c>8%) patients with T2D on basal insulin, leading to significant cost-savings for the Spanish Health System.

EPV212 / #11

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

THE RELATIONSHIP BETWEEN ILLNESS PERCEPTION AND CLINICAL MEASURES TO PSYCHOLOGICAL WELL-BEING AMONG TYPE 2 DIABETES PATIENTS IN THE COMMUNITY

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Background and Aims: Type 2 diabetes mellitus (T2DM) is a global epidemic that is increasing in severity. Clinical measures such as BMI and glycated hemoglobin (HbA1c) are used to assess disease severity and monitor its progression. It is argued that higher clinical measures are associated with a perception of more severe illness. So far, the level of psychological well-being and its relationship to clinical symptoms has not been examined among diabetes patients.

Objectives: To examine the relationship between illness perception components, clinical measures, and psychological well-being among T2DM patients in the community.

Methods: This quantitative cross-sectional study included 81 T2DM patients, receiving treatment in community clinics. Research data were collected using a self-report questionnaire

which included: a sociodemographic questionnaire, a psychological well-being questionnaire, and an illness perception questionnaire.

Results: A correlation was found between the psychological well-being of diabetes patients and the following illness perception components: disease identity ($r=-0.45$, $p<0.01$), and perceived symptom burden ($r=-0.35$, $p<0.01$). Additionally, higher HbA1c levels were associated with a perception of more severe disease ($r=-0.54$, $p<0.01$) and lower psychological well-being ($r=-0.25$, $p<0.05$).

Conclusions: Low psychological well-being among T2DM patients appears to be related to a perception of more severe disease and poorer diabetes control (HbA1c). The perception of T2DM among patients encompasses various aspects, some of which relate to clinical symptoms and patient age. Healthcare providers can address this aspect of patients' illness perception by emphasizing behavioral strategies in managing T2DM. It is crucial to educate patients about the significance of dietary control in effectively managing T2DM.

EPV213 / #888

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

SELF-MANAGEMENT PRACTICES AND GLYCEMIC CONTROL AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS IN RURAL AREAS

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Background and Aims: Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia subsequent to deficiencies in insulin excretion, insulin activity, or both. Uncontrolled blood sugar increases the risk of complications. Self-care management is one approach to avoiding issues. This study aims to analyze the correlation between self-care management practices and glycemic control of type 2 diabetes mellitus patients in rural areas.

Methods: A cross-sectional study was conducted in rural areas of Kedaton Cirebon, Indonesia, in July 2024. 158 respondents were selected using consecutive sampling. The data on self-care management were gathered using the Diabetes Self-Management Questionnaire (DMSQ). A Spearman test was performed to assess correlation.

Results: Of the 158 respondents, 62.0% have poor self-care management practices. The majority of respondents have an uncontrolled blood sugar level (83.5%). The Spearman correlation test showed a significant correlation between self-care management and glycemic control among type 2 diabetes mellitus patients in the rural area of Kedaton ($p = 0.002$).

Conclusions: This study provides evidence on the self-care management of T2DM patients in rural areas of Indonesia. The low level of self-care management in the research indicates that patients do not understand the seriousness of type 2 diabetes or its potential consequences.

EPV214 / #299

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

IMPACT ASSESSMENT OF CME SYMPOSIUM AT IMPROVING CLINICIANS' KNOWLEDGE AND CONFIDENCE RELATED TO USE OF CGM IN PRACTICE

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Background and Aims: We sought to measure the impact of a hybrid symposium (live in-person, live-streamed, and social media simulcast) on clinicians' competence and confidence related to use of real-time CGM in practice.

Methods: A live, in-person, and live-streamed symposium as part of ADA was available to conference attendees/participants as well as the Medscape Education membership. Questions were asked before and after the symposium to assess changes in knowledge and confidence. Absolute improvements were calculated for pre/post questions.

Results: Learners for live symposium: in-person N= 215, live-stream N=221, social media simulcast N=1,055 Demographics: 43% specialized in diabetes/endocrinology, 19% primary care, and 18% nursing/pharmacy Impact of the content on competence/confidence: 97% declare the content from the activity promotes improvement in competence 98% declare the content from the activity promotes improvement in confidence Changes in confidence after the symposium: 19% increase in those who reported being very or mostly confident in implementing rt-CGM in your practice in new patients 25% increase in those who reported being very or mostly confident in using rt-CGM in patients with T2D who are on incretin therapy Dedication to improving care: After the symposium, 98% reported that the content will impact their practice and 87% reported being committed/very committed to implementing practice changes Enduring Learners to date (August 28, 2024): 14,428.

Conclusions: The outcomes gathered are a strong indicator that hybrid (live in person, livestreamed, and social simulcast) CME symposia are successful at improving competence and confidence related to rt-CGHM use in practice and show signs of promoting improvements in clinical practice.

EPV215 / #879

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

IMPACT OF CONTINUOUS GLUCOSE MONITORING ITSELF ON GLYCEMIC METRICS IN NON-INSULIN-TREATED TYPE2 DIABETES PATIENTS WITHOUT ANY INTERVENTIONS

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Background and Aims: This study evaluates the differential impact of blinded versus unblinded continuous glucose monitoring (CGM) use, without other interventions, on glycemic metrics among non-insulin-treated type 2 diabetes (T2D) patients.

Methods: We recruited non-insulin-treated T2D patients, applying blinded CGMs (Freestyle Libre with a sealed smartphone) for 1-2 weeks, followed by unblinded CGMs (Dexcom G6 or Freestyle Libre) for another 1-2 weeks, starting within 3 days. Anti-diabetic medications remained unchanged three months before and during the study, and no other intervention was applied. We analyzed the data using paired t-tests and Wilcoxon signed-rank tests for parametric and non-parametric outcomes, respectively.

Results: Among 29 subjects (average age 55.8 ± 10.9 years; HbA1c $7.1 \pm 0.6\%$), time in range (TIR, 70-180 mg/dL) tended to increase from $73.2 \pm 17.0\%$ with blinded use to $76.4 \pm 13.7\%$ with unblinded use ($p=0.111$). Time in tight range (70-140 mg/dL) remained similar at $48.0 \pm 19.5\%$ and $47.0 \pm 17.8\%$ ($p=0.574$). Significant improvements were noted in time above range (TAR) >250 mg/dL (from $6.0 \pm 7.7\%$ to $3.7 \pm 5.8\%$, $p=0.047$), in the coefficient of variation (from $29.0 \pm 4.7\%$ to $27.1 \pm 4.9\%$, $p=0.003$), and in the standard deviation (from $45.0 \pm 10.9\%$ to 41.3 ± 8.9 mg/dL, $p=0.013$). No significant changes were observed in time below range.

Figure 1. the differential impact of blinded versus unblinded continuous glucose monitoring (CGM) use on glycemic metrics

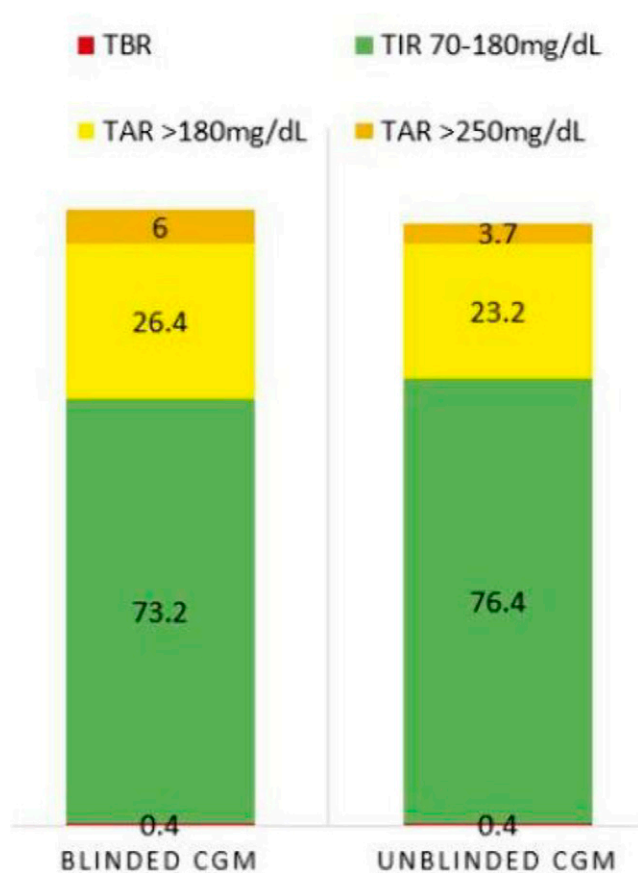


Table 1. the differential impact of blinded versus unblinded continuous glucose monitoring (CGM) use on glycemic metrics

Variable	Blinded_Mean	Unblinded_Mean	P-value	
			Paired T test	Wilcoxon
TBR (<70)	0.4 ± 1.0	0.4 ± 0.7	0.913	0.695
TIR (70-140)	48.0 ± 19.5	47.0 ± 17.8	0.703	0.574
TIR (70-180)	73.2 ± 17.0	76.4 ± 13.7	0.111	0.18
TAR (>180)	26.4 ± 17.2	23.2 ± 13.9	0.12	0.194
TAR (>250)	6.0 ± 7.7	3.7 ± 5.8	0.047	0.054
SD	45.0 ± 10.9	41.3 ± 8.9	0.01	0.013
CV	29.0 ± 4.7	27.1 ± 4.9	0.004	0.003

TBR, time below range; TIR, time in tight range; TIR, time in range; TAR, time above range, SD, standard deviation, CV, coefficient of variation.
In the adjustment, non-insulin treated Type 2 diabetes patients were included

Conclusions: Unblinded CGM use significantly improved TAR >250 mg/dL and glycemic variability among non-insulin-treated T2D patients, without necessitating additional interventions. Although improvements in TIR were not statistically significant, there was a noticeable positive trend. These findings suggest potential benefits of CGM use without any advice as a lifestyle modification tool for managing extreme glucose fluctuations, underscoring its utility in the management of non-insulin-treated T2D.

EPV216 / #1303

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

IMPACT OF FREESTYLE LIBRE 3 ON GLYCEMIC CONTROL AND ENGAGEMENT WITH DIABETES SELF-MANAGEMENT AS MEASURED BY THE IGMSS: A RANDOMIZED CONTROLLED TRIAL

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Background and Aims: Type 2 diabetes (T2DM) is a burdensome chronic disease that requires significant engagement to achieve optimal outcomes. This study investigated the impact of Freestyle Libre 3 (FSL3) compared to blood glucose monitoring (BGM) on engagement with diabetes self-management and HbA1c among adults with T2DM.

Methods: This U.S.-based randomized controlled trial assigned adults with T2DM on basal or non-insulin treatment to either new use of FSL3 or BGM. At baseline and 3 months, the Impact of Glucose Monitoring on Self-Management Scale (IGMSS) was administered to assess T2DM engagement and an HbA1c test was completed. The IGMSS measures the impact of one's glucose monitoring device use on their capability, motivation, and opportunity to engage in self-management. Paired sample T-tests assessed pre-post changes within each group.

Results: N=110 adults were enrolled (54 FSL3, 56 BGM) with 47 FSL3 and 46 BGM completing follow-up. Baseline characteristics including age, gender, and diabetes medication type were similar across groups ($p > .05$). Mean total IGMSS increased from 3.9 (SD=0.8) to 4.4 (SD=0.4; $p<.001$) for FSL3 and remained stable (3.6 (SD=0.9) to 3.7 (SD=0.9), $p=.485$) for BGM. HbA1c decreased from 9.2% (SD=1.6) to 8.3% (SD=1.7)

for FSL3 ($p<.001$) and 8.9% (SD=1.6) to 8.4% (SD=1.5; $p=.065$) for BGM.

Conclusions: This randomized controlled trial demonstrates improvements in T2DM engagement scores and HbA1c for new users of FSL3 compared to BGM, among T2DM patients on basal or non-insulin treatment. These results suggest that FSL3 may positively impact engagement with diabetes self-management and improve glycemic control.

EPV217 / #737

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

PREDICTORS FOR ACHIEVING GLYCEMIC TARGETS WITH CONTINUOUS GLUCOSE MONITORING IN ADULTS WITH INSULIN-TREATED TYPE 2 DIABETES - A POST HOC ANALYSIS OF THE STENO2TECH STUDY

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Background and Aims: The Steno2tech Study and others have demonstrated the beneficial impact of continuous glucose monitoring (CGM) on glycemic parameters in insulin-treated adults with type 2 diabetes (T2D). This post hoc analysis aimed to identify baseline predictors for achieving optimal HbA1c and time in range (TIR).

Methods: Data from the randomized controlled Steno2tech Study, which demonstrated a 15.2% increase in TIR and a 9.4 mmol/mol (0.9%) reduction in HbA1c 12 months after initiating CGM (compared with blood glucose monitoring) were analyzed post hoc. Baseline characteristics such as demographics, glycemic status, and self-reported health behavior were examined for their predictive value.

Results: No significant predictors for achieving target TIR (>70%) were detected. However, at baseline, a lower HbA1c, a lower total daily dose of insulin (TDD), and higher self-reported physical activity were associated with achieving target HbA1c < 53 mmol/mol (7%).

Conclusions: Although, no specific baseline characteristics significantly predicted achieving target TIR after initiating CGM, baseline HbA1c, TDD, and physical activity were predictive of optimal HbA1c outcomes. These findings support offering CGM to all individuals with insulin-treated T2D to potentially enhance glycemic management and encourage lifestyle improvements.

EPV218 / #913

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

INTEGRATION OF CONTINUOUS GLUCOSE MONITORING DYNAMICS INTO AN AI-BASED MODEL FOR THERAPEUTIC DECISION MAKING IN TYPE 2 DIABETES

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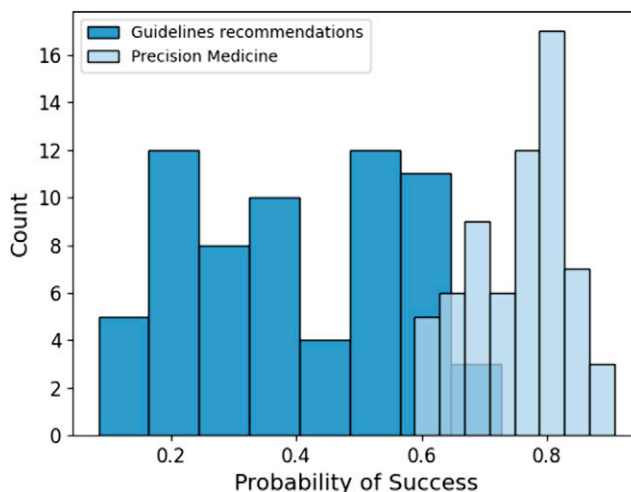
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Background and Aims: Emerging technologies have the potential to aid complex pharmacotherapy choices that are optimally tailored to individual needs. Here we propose a precision medicine approach to support decision-making while simultaneously managing glucose and body weight.

Methods: Artificial intelligence (AI) has first been trained on a rule-based model and later optimized on routine care data, targeting an absolute -0.2% reduction in HbA1c over 6.5% without weight gain for a BMI over 28 kg/m². In a second step, CGM-derived indices from a gluco-regulatory model were added to phenotypic markers, to evaluate the performance. Electronic health records of 626 patients were split into N=595 treatment regimens for training and 255 for testing, with 90 and 29 regimens including CGM data in each set.

Results: The dual HbA1c/body weight optimization target was achieved for actual clinical practice in 49% (N=127) cases. In cases where clinical guidelines were followed, the target was achieved in 50% (N=26) of cases. In comparison, the AI-model achieved 50% (N=24) without CGM data and 63% (N=19) when trained with CGM data.



Conclusions: While the number of patients remains small to evaluate a complex set of decisions, we demonstrate that an AI can achieve superior outcomes using CGM-derived glucoregulatory phenotypic markers. The AI identifies 22% (N=56) statistically significant alternatives in presence of CGM and 10% (N=25) in the absence of CGM suggesting further potential for our methodology. Acknowledgements: Innosuisse 101.082 IP-LS.

EPV219 / #689

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

GLYCEMIC PERFORMANCE UTILIZING REAL-TIME CONTINUOUS GLUCOSE MONITORING IN CHINA: A LARGE-SCALE NATIONWIDE OBSERVATIONAL STUDY

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Background and Aims: This study explores the real-world use of continuous glucose monitoring (CGM) in users accessing CGM devices through national health insurance or out-of-pocket payments in China.

Methods: A nationwide observational study was conducted among Sibionics GS1 CGM users from January 1 to December 31, 2022. CGM profiles with at least 10 days of data were included. Demographic information such as age, gender, diabetes duration, type of diabetes, and medications was self-reported.

Results: The study analyzed 71,566 users, with an average of 2.1 sensors per user. Of these, 45,118 (63.0%) were male and 26,448 (37.0%) were female, with a mean age of 48.5 years. The cohort included 9,468 users with type 1 diabetes (13.2%), 45,893 with type 2 diabetes (64.1%), 1,852 with gestational diabetes (2.6%), and 14,353 previously undiagnosed individuals (20.1%). Type 1 diabetes users had a median Time in Range (TIR, 3.9–10 mmol/L) of 72.3% and a median Time Below Range (TBR, <3.9 mmol/L) of 5.4%, with 55.1% achieving TIR>70% and 37.0% achieving TBR<4%. A total of 18.7% met both targets. Type 2 diabetes users had a median TIR of 86.8% and a median TBR of 0.6%, with 74.9% and 89.2% achieving the respective targets, and 66.5% meeting both. Gestational diabetes users had a median TIR (3.5–7.8 mmol/L) of 94.7%, while non-diabetic users had a median Time in Tight Range (TITR, 3.9–7.8 mmol/L) of 88.9%.

Conclusions: CGM use is prevalent among type 2 diabetes and previously undiagnosed individuals in China, highlighting its potential for wider use in diabetes and public health management.

EPV220 / #1153

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

INITIATING GLUCOSE MONITORING IN PERSONS WITH TYPE 2 DIABETES MELLITUS. A RANDOMIZED CONTROL TRIAL COMPARING FSL2 VS. CAPILLARY BLOOD GLUCOSE IN TERMS OF TREATMENT SATISFACTION

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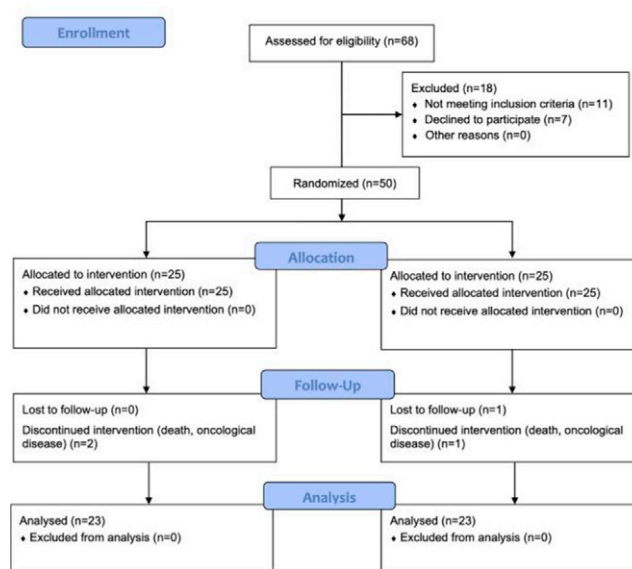
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Background and Aims: Information on the acceptability and effectiveness of intermittently-scanned continuous glucose monitoring (isCGM) when initiated in the setting of Endocrinology Day Hospital (EDH) is limited.

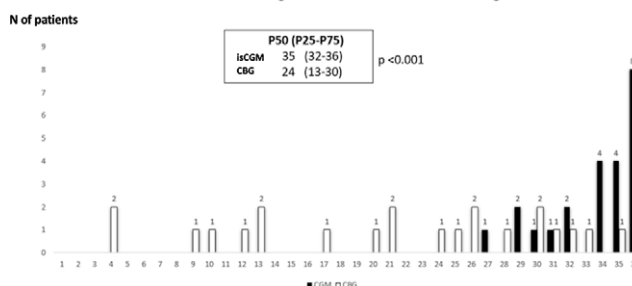
Methods: We performed an exploratory randomized controlled trial evaluating treatment satisfaction of persons with type 2 diabetes (PwT2DM) at 3 months of initiating glucose monitoring in EDH (N=50, 25 randomized to isCGM, 25 to capillary blood glucose (CBG)). Primary outcome was Diabetes Treatment Satisfaction Questionnaire (DTSQ) (range 0 to 36); 16 secondary variables were addressed. Statistical analysis: Mann-Whitney, chi-square; p<0.05.

Results: The flowchart illustrates the path of PwT2DM throughout the study. The characteristics of the study population at baseline were as follows: age 58 years, 74% men, 54% diabetes onset, 16% active oncological disease, body mass index 28.6 kg/m², HbA1c10.9%; groups only differed in body mass index (higher in FSL2). DTSQ reported by isCGM users was higher, with a clinically relevant difference: isCGM 35 (32-36) vs CBG 24 (13-30), p<0.01 (bar chart). Significant differences were observed in 6 DTSQ questions, favoring isCGM in 5 (Q1, satisfaction with treatment; Q4, treatment convenience; Q5, treatment flexibility; Q6 diabetes understanding; Q7, treatment recommendation; Q8, willingness to continue). The exception was Q2 (How often have you felt that your blood sugar was unacceptably high?), where PwT2DM randomized to FSL2 reported higher scores. HbA1c at three months (6.5%) did not differ between groups.

Trial profile



DTSQ score according to the method of monitoring



Conclusions: isCGM offers superior satisfaction and patient experience, appearing as a preferable option for PwT2DM needing to initiate glucose monitoring in a EDH setting or similar scenario. (NCT 06624553).

EPV221 / #733

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

EFFICACY OF PERIODIC SHORT-TERM USE OF INTERMITTENTLY SCANNED CGM WITH AI-FOOD CAMERA IN NON-INSULIN-TREATED TYPE 2 DIABETES: A RANDOMIZED CLINICAL TRIAL

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Background and Aims: This study aimed to evaluate the efficacy of periodic short-term use of intermittently scanned continuous glucose monitoring (isCGM) with an artificial intelligence (AI)-powered Food Camera in non-insulin-treated type 2 diabetes (T2D) patients.

Methods: In this randomized clinical trial, 120 participants were randomly assigned in a 1:1:1 ratio to three groups: treatment group 1 (one session of isCGM + AI-Food Camera), treatment group 2 (two sessions of isCGM + AI-Food Camera with a three-month interval between sessions), and a control group (two sessions of self-monitoring blood glucose [SMBG] + manual food diary). All participants received diet education once based on their data. Blinded continuous glucose monitoring (CGM) was additionally applied for 1 to 2 weeks before the 6-month visit. The primary outcome was change in HbA1c at 6 months.

Results: Among 120 participants (baseline HbA1c 7.5±0.7%), 40 participants were allocated to each group. Ninety-nine subjects (34, 33, and 32 for control, treatment 1, and treatment 2 groups, respectively) were included in the analysis of the primary outcome. At three months, no significant HbA1c reduction was observed in treatment group 1 (adjusted difference = -0.09%, P=0.515) or treatment group 2 (adjusted difference = -0.11%, P=0.468) compared to the control group. At six months, treatment group 2 achieved significant HbA1c reduction (adjusted difference = -0.34%, P=0.041), but treatment group 1 did not (adjusted difference = 0.19%, P=0.216).

Conclusions: In non-insulin-treated T2D patients, intermittent short-term use of isCGM with AI-Food Camera was an effective method for glucose control when repeated after three months.

EPV222 / #1253

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

EFFECTIVENESS OF SGLT2 INHIBITORS IN COMBINATION WITH INSULIN THERAPY ON METABOLIC AND GLUCOMETRIC PARAMETERS IN TYPE 2 DIABETES

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Background and Aims: In Type 2 Diabetes (T2D) the use of SGLT2 inhibitors (SGLT2i) in combination with basal-bolus insulin therapy is progressively more common. The insulin-independent effects of SGLT2i on glucose regulation may have a role in ameliorating glucose variability, however, up-to-date, information on the effect of this combination on glucometric parameters is still lacking. We aimed to compare the effectiveness of SGLT2i as add-on to insulin therapy compared to insulin alone on major metabolic and glucometric parameters from continuous or flash glucose monitoring (FGM).

Methods: This observational, retrospective, real-world study included 196 insulin treated T2D subjects observed over a 12-months observation period, separated into two groups: Group 1 included 96 subjects treated with SGLT2 inhibitors and insulin therapy, Group 2 included 99 subjects treated with insulin only.

Table: Baseline characteristics of the population stratified by therapy

	Group 1 Insulin + SGLT2i	Group 2 Insulin Only	p-value
n	96	99	
Sex (M) (n%)	62 (64.58)	69 (69.7)	0.512
Years (n)	67.44 ± 9.76	67.99 ± 10.81	0.709
Years of disease (n)	16.74 ± 11.75	17.89 ± 1.32	0.496
HbA1c (%)	8.63 ± 1.49	8.01 ± 1.62	0.044*
HbA1c < 7% (n, %)	6 (6.25)	17 (17.17)	0.025*
Fasting Glucose (mg/dL)	188.62 ± 52.52	184.15 ± 75.33	0.750
LDL-c (mg/dL)	88.86 ± 39.23	78.57 ± 38.31	0.194
LDL-c < 55 mg/dL (%)	10 (10.42)	20 (20.2)	0.833
eGFR (ml/min)	67.60 ± 24.67	69.54 ± 27.36	0.707
eGFR < 60 ml/min (%)	24 (25)	24 (24.24)	0.423
Albuminuria (n, %)	6 (6.25)	13 (13.13)	0.841
Unit of Insulin/Day	54.13 ± 31.15	51.08 ± 40.33	0.61

Results: After 12-months of observation, Group 1 showed significant improvements in HbA1c (-0.81%, p<0.01), and LDL-C levels (p=0.014), and higher achievement of targets for HbA1c (< 7%, p=0.06) compared with the baseline values. These differences were not observed in Group 2. Moreover, the percentage of subjects achieving the recommended target for TIR > 70% and TAR < 25% was significantly higher in Group 1 compared to Group 2 (16% vs 10%; p=0.011).

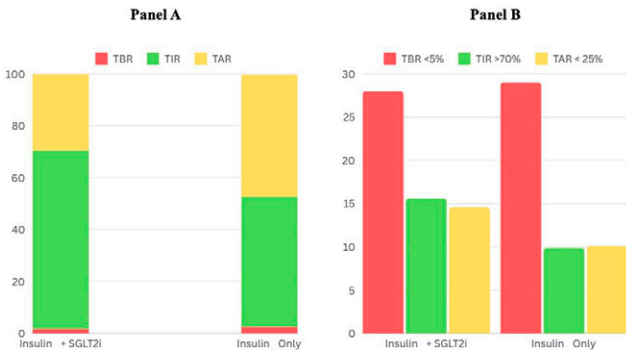
Table 1: Changes in the metabolic parameters in the two study groups at follow-up

	Group 1 Insulin + SGLT2i	p-value (vs basal)	Group 2 Insulin Only	p-value (vs basal)	p-value
HbA1c (%)	7.82 ± 1.13	<0.01*	7.90 ± 1.32	0.335	0.712
HbA1c < 7% (n, %)	18 (18.75)	0.061	16 (16.16)	0.293	0.743
Fasting Glucose (mg/dL)	148.42 ± 50.81	0.04*	177.11 ± 55.87	0.046*	0.015*
LDL-c (mg/dL)	72.65 ± 33.95	0.014*	80.71 ± 38.10	0.366	0.174
LDL-c < 55 mg/dL (%)	20 (20.83)	0.451	25 (25.25)	0.383	0.682
eGFR (ml/min)	66.71 ± 23.29	0.419	65.89 ± 26.24	0.233	0.847
eGFR < 60 ml/min (%)	35 (36.46)	0.289	26 (26.26)	0.416	0.926
Albuminuria (n, %)	7 (7.29)	0.266	11 (11.11)	0.500	0.604
Unit of Insulin/day	52.18 ± 29.10	0.35	55.42 ± 36.10	0.05*	0.55

Table 2: Glucometric parameters at flash glucose monitoring (FGM) in the two study groups at the follow-up evaluation

	Insulin + SGLT2i	Insulin only	p-value
TIR	68.76% ± 21.36%	50.15% ± 23.87%	0.001*
TIR >70% (n, %)	15 (15.63)	9 (9.9)	0.011*
TAR	29.45% ± 20.90%	42.50% ± 22.25%	0.016*
TAR <25% (n, %)	14 (14.58)	10 (10.1)	0.046*
TBR	1.70% ± 3.36%	2.53% ± 3.49%	0.324
TBR <5% (n, %)	27 (28.13)	29 (29.3)	0.139

Figure 1: Mean TIR, TAR and TBR in the two study groups at follow-up evaluation (Panel A) and achievement of the recommended TIR, TAR and TBR values in the two study groups (Panel B).



Conclusions: Our findings confirm the beneficial effects of the add-on of SGLT2i to insulin-treated T2D subjects, also expanding these benefits to glucometric measures such as TIR and TAR.

EPV223 / #695

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

CONTINUOUS GLUCOSE MONITORING IN CRITICALLY ILL ADULT PATIENTS: RESULTS OF A PILOT STUDY IN GREECE

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Background and Aims: Continuous Glucose Monitoring has emerged as a promising tool in managing glycemic control for patients with Type 2 diabetes admitted to the Intensive Care Unit. This paper comprehensively reviews the potential benefits, challenges, and implications associated with CGM utilization in ICU settings for T2DM patients.

Methods: In this prospective observational study, continuous glucose monitoring (CGM) systems were used on adult ICU patients in two medical centers. Seventy-four patients were randomly assigned to two groups: one with a CGM system and one with standard glucose monitoring using arterial blood gas. The study compared the glucose levels between the two groups.

Results: Glucose measurements with CGM and the standard method were in almost total agreement.

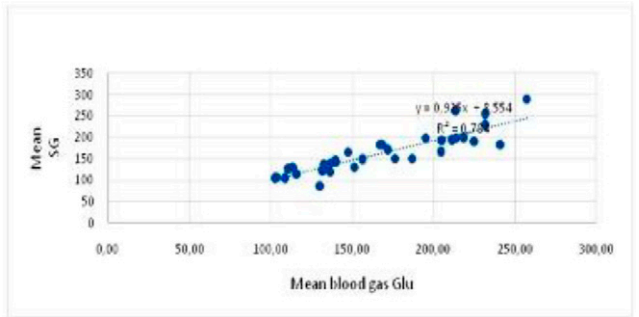
Table 1. Descriptive sample statistics of sensor glucose and blood gas values.

n=74	(mean ± Sd)	Range (min-max)
Blood sugar (blood gas measurement)	159.9 ± 43.9	(102.6-307.8)
Average Sensor Glucose	161.2 ± 46.7	(88-289)

Table 2. Differences in glycemic control depend on the glucose measurement system.

	HbA1c	Estimated HbA1c	p
	7.1 ± 1.4	7.1 ± 1.4	0.510
	CGM (Sensor glucose)	Blood gas (glucose)	
Average glucose level	165.1 ± 45.6	154.7 ± 42.1	0.317

Figure 1. Scatter plot of sensor glucose and blood gas values.



Conclusions: While CGM benefits may allow a more personalized therapeutic strategy, further research is necessary to evaluate its implications in the ICU setting.

EPV224 / #787

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

REAL-TIME CGM USE IS ASSOCIATED WITH IMPROVED GLYCEMIC CONTROL COMPARED TO CGM NON-USERS IN COMMERCIALLY INSURED PEOPLE WITH TYPE 2 DIABETES ON SEMAGLUTIDE AND INSULIN

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Background and Aims: Previous research demonstrated adding glucagon-like peptide-1 receptor agonist (GLP-1 RA) to an insulin regimen helped people with type 2 diabetes (PWT2D) improve glycemic control. Additionally, continuous glucose monitoring (CGM) is beneficial for glycemic management

alongside medications. This study evaluated the added benefit of using a real-time CGM (rtCGM) in PWT2D on insulin therapy (basal and/or bolus) and a GLP-1 RA (semaglutide) compared to CGM non-users.

Methods: A retrospective analysis using Optum Clinformatics[®] de-identified US administrative claims data was conducted. CGM-naïve PWT2D, age ≥ 30 years using insulin and semaglutide were identified. Index date was first claim for rtCGM (Dexcom G-series) or a random date for CGM non-users between 1/1/2019 and 06/30/2023. Continuous health plan enrollment was required 6-months pre-(baseline) and post-(follow-up) index date. At least one laboratory HbA1c value was required during baseline and follow-up to calculate the HbA1c change. Multivariate linear regression was used to analyze HbA1c change by cohorts, controlling for age, gender, baseline HbA1c, comorbidity, race, and region.

Results: A total of 1,582 PWT2D taking insulin and semaglutide (rtCGM users, n=205; CGM non-users, n=1,377) were identified. Overall, a significantly greater HbA1c reduction was observed among rtCGM users compared to CGM non-users (difference-in-differences: -0.81%, $p < 0.0001$; Table). After adjusting for covariates, CGM use was associated with a -0.44% ($p < 0.0001$) greater reduction in HbA1c compared to CGM non-users.

Table

Cohort	HbA1c (%) mean (SD)			Difference-in-differences (SE)	Confidence Interval	P
	Baseline	Follow-up	Difference*			
rtCGM (n=205)	8.70 (1.82)	7.47 (1.34)	-1.23 (1.78)	-0.81 (0.16)	-1.13 to -0.49	<0.0001
CGM non-users (n=1,377)	8.05 (1.60)	7.63 (1.47)	-0.42 (1.39)			

*Difference is calculated as follow-up HbA1c value minus baseline HbA1c; SD = standard deviation; SE = standard error; rtCGM = real-time continuous glucose monitoring

Conclusions: Dexcom rtCGM use was associated with significantly greater reductions in HbA1c compared to CGM non-use. Findings suggest rtCGM use provides additive glycemic benefit in PWT2D taking both insulin and a GLP-1 RA (semaglutide).

EPV225 / #1036

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

ASSOCIATIONS BETWEEN ADHERENCE, HBA1C IMPROVEMENT AND, CONTINUOUS GLUCOSE MONITORING (CGM) BRAND IN PEOPLE WITH TYPE 2 DIABETES (PWT2D) ON BASAL INSULIN

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Background and Aims: CGM choice may be determined by factors such as brand perceptions and loyalty, and these factors may also influence adherence to using a CGM over time. CGM adherence has been shown to be related to changes in glycemic control for people on intensive insulin therapy. This study assessed CGM adherence in the basal insulin population.

Methods: A retrospective analysis of Merative MarketScan[®] US administrative claims data was conducted. The cohort

included CGM-naïve adults (≥ 30 years) with T2D on basal insulin. The index date was first claim for a CGM sensor (Dexcom or Abbott Libre) between 1/1/2020 and 9/30/2022. CGM adherence over six months was defined as ≥ 0.8 proportion of days covered (PDC) determined from sensor pharmacy claims. The association between adherence and HbA1c change was tested in a sub-cohort with available laboratory data.

Results: In a cohort of 7,520 basal insulin users (Dexcom, n=3,125; Libre, n=4,395) the mean(SD) PDC was 0.74(0.27) for Dexcom and 0.63(0.31) for Libre ($p < 0.0001$). A total of 59.2% of the Dexcom users and 43.3% of the Libre users were adherent to CGM (PDC ≥ 0.8 , $p < 0.0001$). Regardless of device brand, adherent users had a greater HbA1c decrease [-1.4% (1.89)] compared to those not meeting the adherence criterion [-0.79% (1.55)] (DiD estimate Δ HbA1c; -0.61%; C.I., -1.08 to -0.13; $p = 0.01$; Table).

Table

Sub-Cohort with HbA1c N=400	HbA1c (%) mean (SD)			Difference-in-differences (SE)	Confidence Interval	P
	Baseline	Follow-up	Difference*			
Adherent users (n=199)	9.02 (1.86)	7.62 (1.24)	-1.40 (1.89)	-0.61 (0.24)	-1.08 to -0.13	0.0123
Non-Adherent users (n=201)	9.11 (1.97)	8.32 (1.70)	-0.79 (1.56)			

*Difference is calculated as follow-up HbA1c value minus baseline HbA1c; SD = standard deviation; SE = standard error; Adherent user has proportion of days covered (PDC) for sensors ≥ 0.8 ; Non-Adherent user has PDC < 0.8

Conclusions: These findings indicate for PWT2D using basal insulin, adherence rates were higher for Dexcom CGM systems than Libre systems. Higher CGM adherence in general was associated with greater HbA1c reductions suggesting consistent use of CGM can improve glycemic control.

EPV226 / #1069

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

HOW THE INTRODUCTION OF CGM USE IN ADULTS WITH T2D INFLUENCES PSYCHOSOCIAL, BEHAVIORAL AND GLYCEMIC OUTCOMES

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Background and Aims: CGM use has been linked to glycemic benefits in T2D populations, but little is known about potential psychosocial and behavioral benefits. This prospective study surveyed adults with T2D at CGM initiation and at 3 months, examining changes over time in psychosocial, self-care behavior and glycemic outcomes.

Methods: In this single-arm, real-world project, 115 adults with T2D were recruited to begin CGM (Dexcom G7) and completed a baseline set of questionnaires, which included demographic data, T2D history, current self-care behaviors and validated scales examining diabetes distress (T2-DDAS Core), diabetes quality of life (DIDP), overall well-being (WHO-5).

Participant completed the questionnaires again at 3 months. HbA1c was collected at both time points.

Results: At 3 months, 103 participants completed the second survey (89.6%); mean age 58 years, 42.6% female, 84.3% Non-Hispanic White, and 19.1% college graduates. For all, T2D duration was < 5 years and the majority (54.8%) were insulin naïve. Over the study period, mean A1C fell 2.1% (from 9.4% to 7.3%; $p < .001$). Mean BMI dropped ($p < .01$) and participants reported gains in healthy eating behaviors, physical activity and medication adherence (all, $p < .05$). Significant psychosocial benefits were observed, including improved well-being ($p < .005$) and lower diabetes distress ($p < .005$).

Conclusions: After 3 months of real-world CGM use, adults with T2D achieved dramatic improvements in glycemic control along with weight loss and notable gains in quality-of-life outcomes. Benefits were likely linked to participants' positive changes in self-management, including healthier eating behaviors, greater physical activity and enhanced medication adherence.

EPV227 / #1375

E-Poster Viewing Topic: A506. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

GLUCOSE SENSORS FOR PREGNANT WOMEN WITH TYPE 2 DIABETES - NATIONAL TRIAL WITH GLUCOSE SENSORS FOR DANISH TYPE 2 DIABETES PATIENTS

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Background and Aims: Pregnant women with type 2 diabetes (T2D) face an increased risk of pregnancy complications and adverse birth outcomes. The aim of this project is to evaluate the use of glucose sensors as home-monitoring devices for pregnant women with T2D. Secondary aim is to improve glycaemic control, enhance self-care, increase patient satisfaction, and potentially reduce pregnancy complications and improve birth outcomes.

Methods: This clinical intervention study is part of a national trial, initiated to test the use of glucose sensors for adults with T2D (insulin-treated), including pregnant women, and general practice. This study focuses on pregnant women, who will receive a glucose sensor from the start of pregnancy until 4-6 weeks postpartum. The trial will run from March 2025 to December 2026. Women are recruited continuously through the four national specialized clinics for diabetes and pregnancy, and are eligible to participate if they are no later than week 28 of their pregnancy.

Results: Data will be collected from medical records (HbA1c weight gain, pregnancy and birth complications), glucose sensors, and online questionnaires on treatment satisfaction (Glucose Monitoring Satisfaction Survey) and health behaviors (PAID5, SF12). The evaluation will include changes in HbA1c, mean blood glucose levels, birth weight, pregnancy complications, well-being and satisfaction with care.

Conclusions: The study will provide new insights into the use of glucose sensors during pregnancy and may contribute to

better pregnancy and birth outcomes, and an increased sense of security and satisfaction with patients' diabetes treatment.

Acknowledgement: We wish to acknowledge The DDBR2 Study Group for their involvement in the project.

EPV228 / #927

E-Poster Viewing Topic: A506. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

REAL-WORLD SAFETY AND EFFICACY OF EMPAGLIFLOZIN WITH (DIAMPA-M[®]) OR WITHOUT METFORMIN (DIAMPA[®]) IN TYPE II DIABETES MELLITUS: A MULTINATIONAL, MULTI-CENTRIC POST-MARKETING SURVEILLANCE STUDY

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Background and Aims: Empagliflozin, an SGLT2 inhibitor, is effective in managing Type II Diabetes Mellitus (T2DM), but real-world data on its use, alone or with metformin, is limited. This study evaluates the safety and tolerability of empagliflozin with or without metformin in T2DM patients.

Methods: An open-label, prospective, multi-center, post-marketing surveillance study involving 2,028 patients across 49 sites in four countries: Pakistan, Sri Lanka, Afghanistan, and Kenya. Eligible participants were aged 18 to 65, diagnosed with T2DM, had an HbA1c level between 7 to 10%, and an eGFR >60 mL/min/1.73 m². All subjects were previously uncontrolled on other oral hypoglycemic agents for at least 3 months and were naïve to empagliflozin at the time of enrollment. Adverse events, treatment adherence, change in HbA1c levels, weight reduction, and BMI were recorded for a study period of six months.

Results: Diampa-M[®] was associated with higher incidences of UTI (11.70% vs 8.51%) and decreased dehydration (10.34% vs 11.49%) compared to Diampa[®]. However, Diampa-M[®] had lower rates of hypoglycemia (3.15% vs 3.45%) and fungal infections (2.07% vs 2.99%) compared to Diampa[®]. Both treatments showed good tolerability, with Diampa-M[®] slightly ahead (96.24% vs 95.03%) compared to Diampa[®]. Diampa[®] demonstrated a more significant reduction in BMI (0.55% vs 0.35%) and a greater decrease in weight (1.86 ± 0.20 kg vs 1.43 ± 0.22 kg) compared to Diampa-M[®]. Conversely, Diampa-M[®]

was more effective in reducing HbA1c levels, (-1.32% vs -1.08%) compared to Diampa®.

Conclusions: Diampa® and Diampa-M® both are safe, effective and well-tolerated for management of Type II Diabetes Mellitus.

EPV229 / #55

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

PROGRESSION OF DIABETES TREATMENT AMONG PATIENTS WITH T2DM USING FREESTYLE LIBRE-2 BLOOD GLUCOSE MONITORING SYSTEM

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Background and Aims: An accurate blood glucose measurement is important for effective diabetes management and blood sugar control. The innovative technology has transformed diabetes self-management and enabled individuals to make timely adjustments to their treatment plan. Studies have shown that CGM leads to decreased HbA1c levels through the intensification of treatment. There are very few observational studies focusing on treatment intensification with the use of FSL, especially in Saudi Arabia. This study aims to investigate the use of the FreeStyle Libre system in patients with T2DM in Saudi Arabia. The study will evaluate the impact of CGM on diabetes management intensification post FSL monitoring system in primary health care setting.

Methods: Retrospective study included adults with T2DM on MDI since 8-2022 till 2023 to evaluate the progression of diabetes management among users of FSL and glucometer.

Results: The addition of medication was significantly more common in the FreeStyle Libre group compared to the glucometer group. Approximately 23% of patients used correction doses and 64% had medication addition. Empagliflozin was added in 40% of the patients, Semaglutide was introduced in 22% of the cases, Linagliptin was added for 19% of the patients. The use of correction doses was significantly more common in the FreeStyle Libre group compared to the glucometer group. The addition of Semaglutide was significantly more often in the FreeStyle Libre group compared to the glucometer group.

Conclusions: FreeStyle libre system showed significant association with treatment intensification and adjustment resulting in significant reduction of HbA1c levels at three months compared to glucometers.

EPV230 / #1065

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

SHORT-TERM BENEFITS OF AN EXERCISE PRESCRIPTION WITH A NOVEL GLUCOSE BIOSENSOR ON GLYCEMIA IN MEN AND WOMEN WITH NON-INSULIN-TREATED TYPE 2 DIABETES

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Background and Aims: Regular exercise and glucose monitoring are both important for individuals living with type 2 diabetes (T2D), but many with the disease fail to appreciate how a single exercise session can influence their meal-related glycemia. This study examined how a real-time or blinded novel Dexcom glucose biosensor, plus a prescription of intensive pre-meal exercise and post-meal walking (ExerciseRx), influenced meal-related glycemia in adults with non-insulin-requiring T2D.

Methods: Thirteen adults with T2D (4 female), participated in a 20-day, two Dexcom glucose biosensor wear-period study – one blinded and one unblinded. During each wear-period, participants attended two in-clinic sessions where they: 1) consumed a dinner meal with ~60 grams of carbohydrates or 2) performed an ExerciseRx with the same Meal. The ExerciseRx was 45-minutes of high-intensity interval walking before the meal followed by a 30-minutes of walking post meal. CGM metrics were analyzed before and after each meal.

Results: Meal-related glucose excursions were less when the individuals were unblinded to the Dexcom glucose biosensor compared to blinded (Figure 1). In both wear-periods, ExerciseRx was associated with a lower pre-meal glucose concentration (mean±SD; blinded: 124±29 mg/dL vs 146±52 mg/dL, unblinded: 122±30 mg/dL vs 129±48 mg/dL; p<0.05) and a lower two-hour post-meal glucose level (blinded: 168±45 mg/dL vs 194±55 mg/dL, unblinded: 152±26 mg/dL vs 170±44 mg/dL; p<0.05) compared with no ExerciseRx.

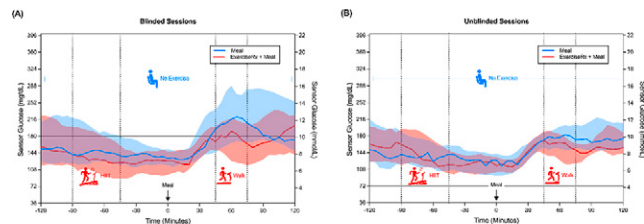


Figure 1: Sensor glucose measurements for (A) blinded sessions, and (B) unblinded sessions from 2-hr before to 2-hr after the meal. Median sensor glucose measurements are shown for meal only (blue) and meal and exercise (red), with shaded areas indicating the IQR for each condition. The 45-minute high-intensity interval training and 30-minute walk are indicated by orange vertical bars. Meal is the arrow indicator at time point 0.

Conclusions: These data highlight that an ExerciseRx with a real-time viewable CGM using integrated exercise metrics may help improve meal-related glycemia in adults with non-insulin-requiring T2D.

EPV231 / #1154

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

REAL-WORLD IMPACT OF CONTINUOUS GLUCOSE MONITORING ON GLYCEMIC MANAGEMENT AND QUALITY OF LIFE IN PEOPLE WITH TYPE 2 DIABETES

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Background and Aims: Continuous glucose monitoring (CGM) can improve glycemic management and quality of life (QoL) in type 1 diabetes. This study aimed to evaluate the real-world impact of CGM in people with type 2 diabetes (T2D) on multiple daily injection insulin therapy (MDI) following the introduction of a reimbursement program in Belgium.

Methods: People with T2D using MDI at three centers were offered CGM (FreeStyle Libre or Dexcom One) in routine clinical care between July 2023 and August 2024. Data were collected from electronic medical records, unblinded CGM and questionnaires at start of CGM and after 6 months (6M). The primary endpoint was change in HbA1c. Secondary outcomes included achievement of CGM consensus targets. Data are reported as median (IQR) or least-squares mean (95% CI).

Results: At the time of this interim analysis, 192 participants had initiated CGM, of whom 129 had completed the 6M-visit. Most participants (64.1%) were men, 65.4 (57-74) years of age and a T2D duration of 20.3 (11.7-26.3) years. HbA1c decreased from 7.6% (7.5-7.8) to 7.3% (7.2-7.4) ($p<0.001$), with more reduction in those with suboptimal glycemic management at start (fig. 1). At 6M, 59% of people spent >70% Time-In-Range (70-180mg/dL), and 95% achieved <4% Time-Below-Range. Participants reported improved Hypoglycemia Fear Survey scores (17.6 [14.6-20.5] vs 14.5 points [11.0-18.0], $p=0.045$) and SF-36 questionnaire's General Health component (50.6 [47.6-53.5] vs 54.4 points [51.5-57.4], $p=0.002$).

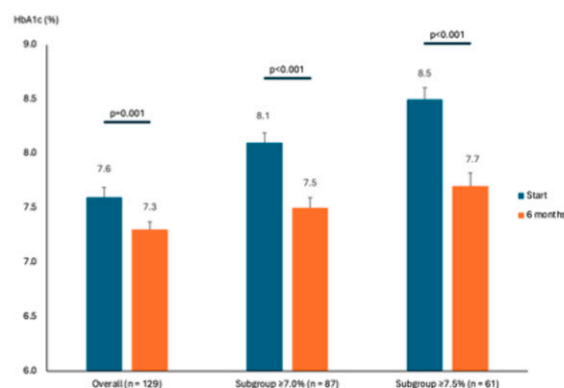


Figure 1. HbA1c levels at start of CGM and after 6 months in the overall study population and in subgroups with HbA1c ≥7.0% and HbA1c ≥7.5% at start. Data are represented as least-squares mean with standard error bars; paired Student's t-test.

Conclusions: This study suggests that people with T2D, particularly those with suboptimal glycemic management at start, gained significant benefits from CGM in terms of glycemic management, hypoglycemia fear and QoL.

EPV232 / #578

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

A FOCUS GROUP STUDY TO UNDERSTAND BARRIERS AND FACILITATORS TO CONTINUOUS GLUCOSE MONITOR (CGM) USE AMONG HISPANIC INDIVIDUALS WITH INSULIN-TREATED TYPE 2 DIABETES

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Background and Aims: Hispanic individuals face a higher prevalence of type 2 diabetes (T2D) and encounter disparities in access to diabetes technology. The adoption of continuous glucose monitoring (CGM) among Hispanic adults with insulin-treated T2D is limited. This study uses a social ecological model (SEM) to explicate barriers and facilitators to CGM use at the individual, interpersonal/community, and system-level.

Methods: Four focus groups were conducted in Spanish among insulin-treated Hispanic adults with T2D (n=16), including a "young/middle-aged" (18-65 years) and "elderly" (≥65 years) subgroup. The initial focus group was conducted to identify barriers to CGM access. After this, participants received DexCom G7 CGMs for 30 days of use. The same participants returned for a follow-up focus group to explore factors related to CGM acceptance. Focus groups were analyzed using thematic analysis, including the SEM framework of individual, interpersonal/community and system-level barriers. Two coders systematically identified themes and categorized key concepts expressed by participants and had an average inter-rater reliability (IRR) of 91%.

Results: Individual-level barriers included: 1) limited awareness of CGM existence, 2) concerns about device functionality and comfort, and 3) poor self-advocacy skills. Interpersonal/community barriers were limited but having Hispanic/Latino healthcare providers with shared cultural understanding was identified as a facilitator for overall diabetes management. System-level barriers encompassed 1) high costs, 2) insurance limitations, and 3) insufficient information exchange during provider visits.

Conclusions: This pilot study provides unique insight into CGM barriers and facilitators for Hispanic adults with T2D. Tailored interventions addressing these barriers are crucial for improving CGM utilization.

EPV233 / #692

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

ASSOCIATION BETWEEN TIME IN TIGHT RANGE AND INCIDENT DIABETIC RETINOPATHY IN ADULTS WITH TYPE 2 DIABETES: A COHORT STUDY

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Background and Aims: There has been a recent debate about whether to instead emphasize time in target range of 70-140 mg/dL (time in tight range, TITR). We aimed to assess the

association between TITR and incident diabetic retinopathy in adults with type 2 diabetes.

Methods: This is a dynamic cohort study conducted in a tertiary hospital. A total of 2,518 adults with type 2 diabetes without diabetic retinopathy at baseline were included. TITR was obtained from continuous glucose monitoring data at baseline. Cox proportion hazard regression analysis was performed to assess the relationships of TITR, TIR with the risk of incident diabetic retinopathy.

Results: During a mean follow-up of 5.43 years, 646 patients developed retinopathy. The multivariable-adjusted hazard ratios (HRs) for incident retinopathy across descending TITR quartiles (Q4: >58% [reference], Q3: 38~57%, Q2: 19~37% and Q1: <19%) were 1.00, 1.47 (95%CI 1.16, 1.86), 1.53 (95%CI 1.21, 1.94) and 1.96 (95%CI 1.55, 2.47), respectively. For per 10% decrease in TITR, the risk of diabetic retinopathy was increased by 9% (HR=1.09, 95%CI 1.06, 1.13) after full adjustment for covariates. In the TIR>70% subgroup, the significant association between TIR, as a continuous variable, and the risk of incident retinopathy disappeared, whereas TITR remains significantly associated with the outcome. Similar results were observed in the TIR>80% and TIR> 90% subgroups.

Conclusions: TITR is inversely associated with the incidence of diabetic retinopathy in people with type 2 diabetes. Among people with well-controlled TIR (70% or higher), TITR may provide added value regarding glucose control.

EPV234 / #775

E-Poster Viewing Topic: AS06. Continuous Glucose Monitoring (CGM) in Practice in Type 2 Diabetes

FEASIBILITY AND IMPACT OF CGM IN PRIMARY CARE FOR NON-INSULIN TREATED T2DM

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Background and Aims: Early glycemic control in Type 2 diabetes mellitus (T2DM) is crucial for preventing complications. This study investigated the feasibility and impact of continuous glucose monitoring (CGM) for non-insulin treated (NIT) T2DM patients in general practice.

Methods: Sixteen NIT T2DM patients aged between 40 and 74 years and T2DM duration between 1 and 14 years used CGM for two weeks under GP supervision. Outcomes included GP interviews on feasibility and patient HbA1c at debut, at baseline and at 3 months after CGM use.

Results: The GP reported the intervention as feasible, highlighting increased patient engagement and proactive medication adjustments. Six of 13 patients with 3-month follow-up showed HbA1c reductions >4 mmol/mol (range: 4-14 mmol/mol), primarily in those with baseline HbA1c ≥60 mmol/mol. Six patients showed HbA1c changes of ≤2 mmol/mol, primarily in those with baseline HbA1c ≤50 mmol/mol. No obvious pattern related to age or disease duration was observed. Patients found visualizing glucose responses to lifestyle choices enlightening. The GP recommended quarterly CGM use as optimal for reinforcing lifestyle modifications.

Conclusions: CGM implementation for NIT T2DM in primary care is feasible and led to improved HbA1c in over one-third of patients after a two-week period. This approach may empower patients in making informed lifestyle decisions and

enhance glycemic control. Limitations: Small sample size and short follow-up period. Future research should investigate long-term outcomes and cost-effectiveness of CGM in primary care NIT T2DM management. Implications: CGM could be a valuable tool in primary care for personalizing NIT T2DM management and improving patient outcomes.

EPV235 / #1047

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

DIABETES EDUCATION THROUGH VIRTUAL REALITY IN THE METAVERSE

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Background and Aims: Diabetes education is crucial for effective self-management. This study aims to assess the impact of immersive virtual reality on patient knowledge and device usability in diabetes education programs.

Methods: A pilot study was conducted including eight recently diagnosed patients with T1DM and T2DM who were admitted to the University Hospital of Leon during June, July, and August 2024. All patients completed the DKQ-2 questionnaire before and after a diabetes education session, which was delivered using immersive virtual reality glasses. To evaluate the usability of the glasses, a Likert scale was used to measure various aspects such as ease of use, comfort, intuitiveness, and overall satisfaction with the device during the educational intervention.

Results: The median age of participants was 22.3 years (28.8-48.1), with 60% being women. 80% of the patients were diagnosed with T1DM and 20% with T2DM. A significant increase in DKQ-2 scores was observed after the educational intervention, with a median of 17.5 (18.7-22.3) before the intervention, increasing to 26.3 (24.1-27.3) after the intervention (p = 0.003). The average score obtained from the Likert scale questionnaire was 85.5 out of 90 points.

Conclusions: Immersive virtual reality significantly improved patient knowledge on managing T1DM and T2DM, as reflected by the DKQ-2 questionnaire. Usability assessments showed high satisfaction with the device's ease of use, comfort, and intuitiveness. These findings suggest that virtual reality is an effective tool for diabetes education and self-care, supporting its use in larger programs.

EPV236 / #1100

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

A COMBINED SYSTEM FOR DIABETES MANAGEMENT AND PREDICTION OF VARIOUS HEALTH RISKS – EXPERIENCE FROM THE WARIFA PROJECT FUNDED BY EUROPEAN UNION'S HORIZON 2020 PROGRAMME

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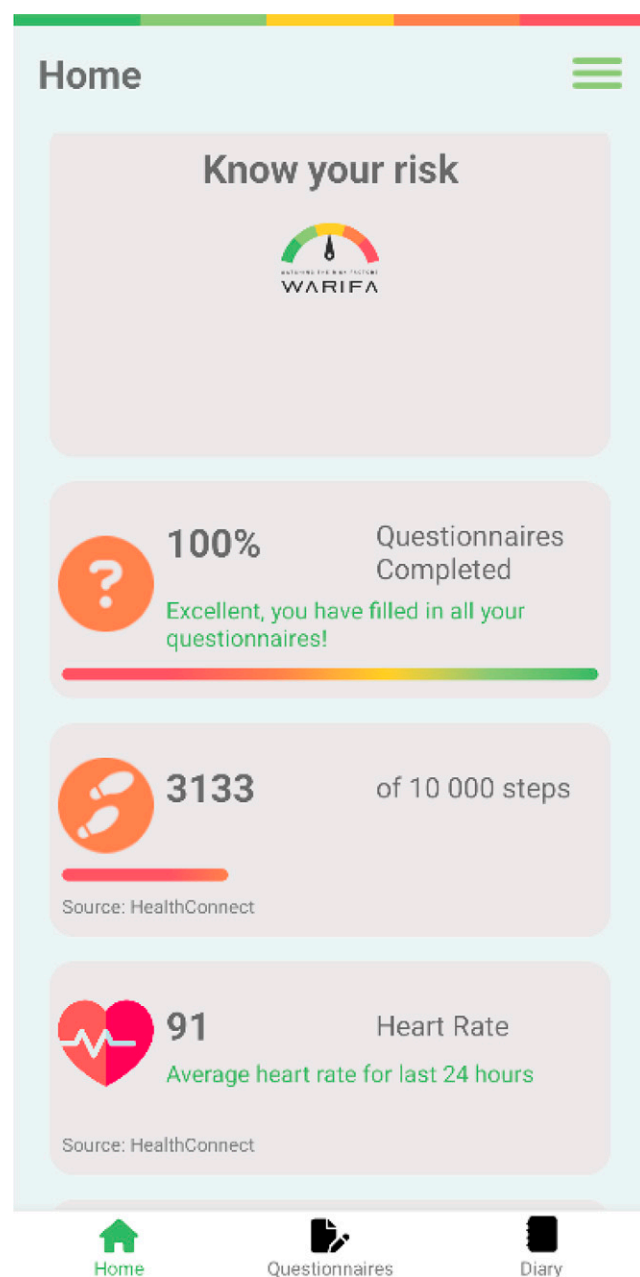
Background and Aims: Proper diabetes management presents significant challenges, as well as reducing the risks of chronic diseases in general, increasingly important due to more elderly, urbanization and increase in unhealthy lifestyles. The aim of the WARIFA project (grant No. 101017385) is to support diabetes management and identify the risk factors associated with other chronic diseases.

Methods: The complexity of understanding diabetes and various chronic diseases, coupled with the technological possibilities and limitations, as well as the market potential for solutions like this, required the collaboration of experts from many fields. This led to the formation of a consortium of 12 institutions and

companies. Achieving the aim requires a lot of data from the targeted users, made possible by designing a system consisting of an advanced back-end server, questionnaire platform, and front-end app.

Results: The designed system can collect a wide range of health-related variables (~ 50) tailored to individual users' challenges and focus areas. However, policy and security regulations currently restrict automatic collection of certain data (e.g., blood glucose, heart rate), jeopardizing the usability of such systems. Adapting to sensors from e.g., Fitbit, Google, and CGM manufacturers has proven to be difficult. Risk prediction for several health issues has been demonstrated, but further work is needed.

Conclusions: The system enables the collection of a large amount of diabetes- and health-related data, through an app-interface which has functionalities beyond diabetes management. We anticipate that manufacturers of health sensors will become more open to share data – data that individuals have collected themselves and should own.



EPV237 / #995

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

SYSTEMATIC REVIEW OF THE LITERATURE ON DIABETES-RELATED MOBILE APPS, A MIXED METHODS APPROACH

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Background and Aims: Exploring the current diabetes mobile applications underscores the importance of behavioral change, complementing conventional treatments, and the promise of digital therapeutics. Even with swift technological progress, challenges persist due to individual response variability. Regulatory frameworks in the EU and U.S. are in flux, yet the identification of advantageous apps is still not supported by strong clinical evidence. Our aim was to assess the landscape using an evidence-based approach.

Methods: We conducted a systematic search in PubMed (24.02.2024) using keywords: mobile application, m-Health, smartphone application, AI application, and diabetes. We also reviewed resources from ADA, EASD, IDF, JDRF, Diabetes UK, and the Endocrine Society. Our inclusion criteria focused on peer-reviewed efficacy studies addressing glycaemic control, apps available in Apple/Google stores within EU countries, and studies involving adults with diabetes.

Results: From over 1,000 publications, we identified 33 studies on glycaemic efficacy, categorizing mobile apps into three groups: 7 data tracking/integration platforms (57% showed benefit), 12 coaching and behavioral education platforms (42% showed benefit), and 8 decision support platforms (50% showed benefit). Most behavioral coaching apps demonstrated low levels of evidence, with only 25% supported by positive studies rated

level 2 or above. In contrast, decision support apps, though fewer in number, exhibited a higher percentage (38%) of positive outcomes in studies rated level 2 or above for evidence quality.

Conclusions: Evidence is lacking for many marketed apps. Higher intervention levels tend to come with stronger evidence while coaching may enhance efficacy. AI enabled and high risk applications should be rigorously evaluated for clinical evidence similar to drug development while a regularly updated registry is crucial to keep up with technology advances.

EPV238 / #1085

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

THE IMPACT OF NOVEL DIGITAL THERAPEUTICS PRODUCT ON GLYCEMIC CONTROL AMONG SAUDI PATIENTS WITH DIABETES: A REAL-WORLD OBSERVATIONAL STUDY

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Background and Aims: Suboptimal glycemic control presents major healthcare challenges, particularly in adapting patient education for the digital age. Our study assessed the efficacy of a diabetes education program delivered through the digital therapeutics product "Ithnain®" in improving glycemic control among individuals with diabetes.

Methods: A three-month education program was provided by a team of diabetes educators. The platform facilitated interactive learning and personal coaching, with data collected via the digital platform. The primary outcomes measured were changes in HbA1C and body weight over 12 weeks.

Results: Of the 232 participants, 58.2% were female, with a majority being adolescents (29.3%) and adults aged 25-64 years (37.1%). The average BMI was 23.4 (SD 6.27), (81.5%) had type 1 diabetes, with an average A1C of 8.34% (SD 1.58). Approximately 56.0% attended high session groups (8-12 sessions). Post-education, A1C levels significantly decreased (from 8.33 to 7.88, $p < .001$, moderate effect size; Cohen's $d = 0.435$), while weight reduction was minimal and marginally significant (from 55.69 kg to 54.62 kg, $p = 0.05$, small effect size; Cohen's $d = 0.13$). Correlation analysis showed a weak but significant positive relationship between session attendance and A1C reduction ($r = 0.141$, $p = 0.035$), with no significant correlation for weight reduction ($r = 0.045$, $p = 0.497$).

Conclusions: Given the reported clinical effect, access, and nominal cost of this digital therapeutic product, it is likely to be effective at the population level. Further studies are required to

reveal the efficacy for specific diabetes types and to observe effects beyond 12 weeks.

EPV239 / #549

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

EMERGENCY TELEPHONE SERVICE FOR T1DM PATIENTS: USE, EFFECTIVENESS AND SATISFACTION

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Background and Aims: ETS is a key resource to support at-home management of T1DM. The primary aim of this study was to evaluate the effectiveness of the ETS in reducing Emergency Department (ED) visits for T1DM-related issues.

Methods: All contacts on the ETS and details about the inquiries were recorded over a 12-month period. Type of inquiry was assessed as "proper use" (issues related to T1DM management) or "improper use" (requests for prescriptions/certifications, plan/reschedule appointments, technical problem with sensors or pumps). A questionnaire about the use of this service was sent out to patients or their caregivers.

Results: Among the 1024 contacts recorded, the 497 proper inquiries were most frequently related to hyperglycaemia (12.7%), general advice on T1DM management (9.5%), pump breakdown (4.9%) and hypoglycaemia (3.8%). Thanks to the questionnaire, it was estimated that 63 to 232 patients would have gone to the ED without ETS availability, whereas 57% of the respondents would have requested an out-patient visit.

Conclusions: Our data highlights an extensive use of the ETS, figure that may still increase consequently to the growing use of AHCL. Given the impact on patients and families and the healthcare costs that can be avoided (ED or out-patient visit), it is essential to make data available on the effectiveness of the ETS service to better define and institutionalize such an important service which is recommended by ISPAD guidelines.

EPV240 / #448

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

BLOOD PRESSURE REDUCTION IN A DIGITAL TYPE 2 DIABETES REMISSION PROGRAMME: 12-MONTH RESULTS FROM A REMOTE INTERVENTION

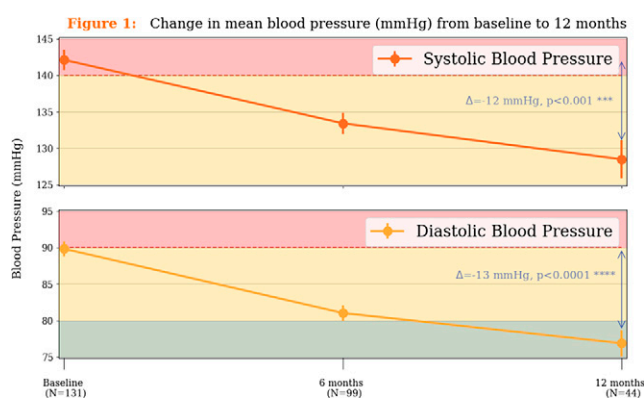
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Background and Aims: The UK National Health Service Type 2 Diabetes Remission (T2DR) Programme for patients with type 2 diabetes (T2D) and obesity consists of 12 weeks 900 kcal total diet replacement, 6 weeks food reintroduction, and 8 months of behavioural support. Liva delivers the programme digitally, led by a specialist health coach via the Liva smartphone app. As hypertension often co-exists with T2D, this study investigates blood pressure (BP) reduction in T2DR participants with hypertension as a secondary outcome. Both diabetes and hypertension medications are de-prescribed at the start of the programme according to clinical guidelines.

Methods: A service evaluation was conducted using patient-reported data. Change in BP for participants who had a diagnosis of hypertension and recorded values at both baseline and 12 months was analysed using a paired, single-sided t-test.

Results: Between June 2022 and September 2024, 131 participants with co-existent T2D and hypertension enrolled on the programme and registered a baseline BP. Mean baseline BP was 142/90. At present, 44 participants have completed the programme and registered a 12 month BP. For these participants, the mean baseline BP was 141/90 and the mean reduction in systolic and diastolic BP at 12 months was -12 mmHg ($t=-3.7$, $p<0.0001$) and -13 mmHg ($t=-5.3$, $p<0.0001$), respectively.



Conclusions: Liva's digital T2DR Programme demonstrates promising reductions in BP for patients with coexistent T2D and hypertension at 12 months, despite de-prescribing BP medication at programme start. Further research is required for full programme evaluation comprising the entire cohort.

EPV241 / #1041

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

SELF-MANAGEMENT MOBILE APPLICATIONS FOCUSING ON IMPROVING PSYCHOLOGICAL WELLBEING AMONG PEOPLE LIVING WITH TYPE 1 DIABETES: A SYSTEMATIC REVIEW OF FEATURES, FUNCTIONS AND DATA COLLECTION APPROACHES

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Background and Aims: People living with Type 1 Diabetes (T1D) are at a greater risk of psychological well-being

challenges, due to the demanding self-care regimen required to manage the condition. These challenges can negatively impact their quality of life, increasing the likelihood of developing complications. As mobile health (mHealth) apps grow in popularity, they present a promising, accessible, and affordable solution to support patients in the management of their condition and their psychological well-being. Therefore, this systematic review aims to identify key features, functions, and data collection methods from mHealth apps used to improve the psychological well-being of individuals with T1D.

Methods: A comprehensive search of PubMed, EMBASE, Web of Science, PsycINFO, and Scopus was conducted up to March 2024. Studies were included if they focused on people with T1D, reported psychological well-being outcomes using validated questionnaires at two or more time points, and utilised a mHealth app intervention.

Results: Of the 2165 articles, 5 met the inclusion criteria and were included in the review. Psychoeducation, chat with peers with T1D and management tips were some of the most common features identified within these app. However, the impact on psychological well-being varied, with some studies showing significant improvements while others reported no significant changes.

Conclusions: This review highlights a significant research gap in the field, with limited studies focusing on psychological well-being. However, the insights gained from existing research provide valuable guidance for the development of new mHealth apps aimed at supporting the psychological well-being of people with T1D.

EPV242 / #1180

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

A MODEL TO ASSESS THE FINANCIAL SUSTAINABILITY OF A VIRTUAL CLINIC PROVIDING COMPREHENSIVE DIABETES CARE

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Background and Aims: The Virtual Diabetes Specialty Clinic (VDiSC) study demonstrated the feasibility of a fully virtual clinic model of comprehensive diabetes care combining virtual visits with remote patient monitoring (RPM), as defined by Medicare. As continuous glucose monitoring and RPM are increasingly used in patient care, there is a growing need to articulate payment models of financial sustainability. We developed a financial model to estimate the variable costs and revenues of virtual diabetes care using the VDiSC study data.

Methods: Data from the VDiSC study (n=234 patients with type 1 or type 2 diabetes) encompassed virtual visits with certified diabetes care and education specialists, endocrinologists, and behavioral health coaches, as well as RPM services and algorithm-enabled treatment recommendations. We created a customizable financial model to estimate the utilization of care per member, per month (PMPM), the expected variable costs, and the potential reimbursement revenue. We quantified the resulting gross profit margin of the virtual care model (i.e., the gross profit divided by revenue). We performed two-way sensitivity analyses on key model parameters.

Results: The gross profit margin of the care model is estimated to be around 70% PMPM. This result was sensitive to the proportion of privately-insured patients, the provider cost-to-charge ratio, and the commercial-to-Medicare price ratio.

Conclusions: We assessed the financial stability of the VDiSC care model. Costs were significantly less than the potential revenue. Our customizable model can be adapted to a wide range of provider and payor environments and may serve as a financial-planning tool for other virtual clinics providing comprehensive care.

EPV243 / #716

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

IMPROVEMENTS IN GLYCAEMIC CONTROL WITH A DIABETES APP: COMPARISON OF REAL-WORLD DATA WITH A RANDOMISED CONTROLLED TRIAL

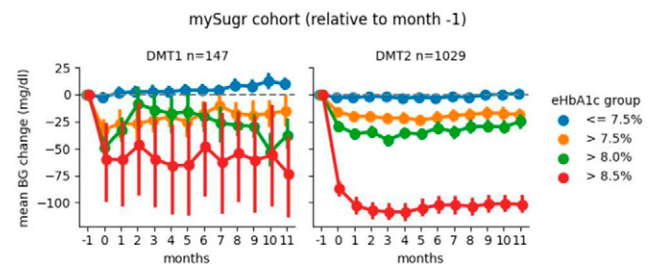
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Background and Aims: A digital logbook (mySugr[®] PRO app) was evaluated in a randomized controlled trial (RCT). We performed sub-analyses of the RCT data regarding improved glycaemic control and compared it to real-world data.

Methods: Data from 342 participants of the RCT with type 1 and type 2 diabetes were analysed. Robust logistic regression analysis was used to assess the difference in proportion of participants achieving an HbA1c $\leq 6.5\%$ at 3-month follow-up (intervention vs. control group), while controlling for baseline HbA1c. Existing real-world users (n=147 type 1 diabetes, n=1029 type 2 diabetes) were matched to RCT participants (propensity score matching) and analysed regarding changes in mean blood glucose before using the app (baseline) and the following 12 months after app use.

Results: The RCT data showed that the chance to achieve optimal glycaemic control was nearly doubled in the intervention group compared to the control group (OR=2.24; 95% CI 1.12-4.47; p=0.022). Real-world data showed that those with an estimated HbA1c $>8.5\%$ at baseline were able to reduce their mean blood glucose compared to baseline by -59.7 ± 91.1 mg/dl (type 1, p<0.01) and -87.4 ± 66.3 mg/dl (type 2, p<0.0001) 30 days after using the app. This reduction was maintained or even increased across the 12-month period (Figure 1).



Conclusions: Sub-analysis of the RCT revealed a significant effect of the mySugr PRO app on the chance to reach optimal glycaemic control. This result was substantiated by real-world data indicating rather large reductions in mean blood glucose shortly after starting to use the app and maintained for 12 months.

EPV244 / #1001

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

FULL DATA TRANSMISSION (CLINICAL AND PROMS) FROM THE PATIENT'S HOME TO THE HOSPITAL TO THE NATIONAL IT-INFRASTRUCTURE AND BACK AGAIN: INDIVIDUALLY AND POPULATION-BASED

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Background and Aims: Reporting on behalf of the VBHC-PROMS Research Team at Aalborg University Hospital, Steno Diabetes Center North Denmark, Denmark. Advancing delivery of person-centered and individualized diabetes care to improve outcomes and care for individuals with diabetes. Develop a seamless digital platform. Deliver tools for improvement of quality of health care delivery and decision support at all levels. Our VBHC-PROMS research team identified a significant need to advance delivery of person-centered and individualized diabetes care to improve outcomes, care for vulnerable and all people with diabetes and reduce the burden of diabetes.

Methods: Through 2017-2021 we undertook a participatory multi-stakeholder research design process with systematic involvement of > 70 PWD and > 16 relatives using interviews, workshops, clinical & qualitative research, and through 2019-2021 our research team chaired a real-world 10-site PROMS study including 434 PWD and 34 HCPs showed high acceptability and demonstrating benefits related to the active engagement of PWDs focusing on person-centred individual diabetes care.

Results: We developed a scalable and efficient IT-solution to assist healthcare professionals (HCPs) and people with diabetes (PWD) work together to individualize medical diabetes management and integrate psychosocial and behavioral aspects of diabetes in a humanistic and person-centred way. Fully implemented all four hospitals in our region, 600.000 citizens and 36.000 PwD. Now +4700 answers. Response rate 72%.

Conclusions: It is feasible to implement a national digital PROMS questionnaire and a seamless intuitively and user-friendly national IT-platform, securing individualized treatment, delivering dynamic real-time individual data, assisting healthcare professionals and supporting data-driven management at all levels in the healthcare system.

EPV245 / #1006

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

GIVING THE CHILD WITH DIABETES, 4-12 YEARS, A CLEAR VOICE IN OWN TREATMENT. WE REPORT ON THE FIRST PATIENT REPORTED OUTCOMES DATA FROM THE PROKIDSDIA-PROJECT

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Background and Aims: Our aim of the ProKidsDia- project is to develop and clinically implement a national Danish digital, diabetes specific Patient Reported Outcomes (PROMS) measurement instrument and dialogue tool for children with Type 1 diabetes aged 4-12 (CwD) to detect specific needs, pave the way for action planning and set up a scalable digital platform coupling the child's home directly with the national Danish IT-infrastructure.

Methods: The specific aims of this first study were to obtain the perspectives of CwD and caregivers on the psychological, social, and physical impact of diabetes and to establish a minimal set of PROMS domains. Subsequent steps included adaption of the animated Child Health Rating Inventories (CHRIS) to a Danish module (CHRIS-DM).

Results: We identified and described a minimal set of specific domains of specific individual value to CwD, parents, teachers, and HCP, encompassing 1) Social aspects, 2) Thoughts and feelings, 3) Body and treatment. These detailed data are now undergoing stringent psychometric analysis utilizing NVivo and will be presented with respect to weighted impact of each domain on individuals and cohorts.

Conclusions: This project builds on prior work done at UC-Irvine in the US and is now being adapted to reflect Danish culture. It is the first project of this nature and magnitude, involving full and exclusive involvement of children with diabetes (4-12 years of age) and their caregivers describing their individual robust and representative diabetes-specific value-base areas.

This foundation will allow formation of relevant individualized action plans for CwD and aiming for a national Danish PROMS instrument for CwD.

EPV246 / #1063

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

NON-INVASIVE ELECTROCARDIOGRAM DETERMINATION OF HbA1C

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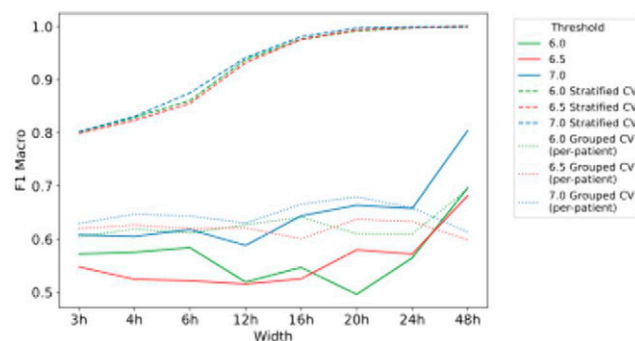
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Background and Aims: This research aims to determine whether heart rate variability (HRV) measured by an electrocardiogram (ECG) can estimate the ability to control glucose measured by glycated hemoglobin A1c (HbA1c). The main challenge remains to find the HRV calculation methods that reveal the best ML classification model.

Methods: Data was collected from datasets within three different clinical studies for measuring ECG from wearable sensors and correlated with lab measurements of HbA1c. The experiments included test cases with HbA1c values of 6, 6.5, and 7. HRV calculation included time-domain parameters of the standard deviation of heartbeat intervals (SDNN) and heart-rates (SDBPM) and root mean square of successive differences between heartbeat intervals (RMSSDNN) and heart-rates (RMSSDBPM) up to 48 hours using a sliding window approach. Exclusion criteria eliminate ectopic beats and short sequences to extract clean intervals and calculate concatenated (C), averaged (A), and standard deviation (S) HRV values.

Results: Our research revealed a robust correlation between long-term HRV measurements and HbA1c, with $r > 0.45$ and $p = 0$. Further, we developed several machine learning (ML) models to predict good or poor glucose control. The best model for 24-hour measurement showed sensitivity, prediction, and F1 scores of 90.14%, 96.75%, and 93.33%, achieved for the multi-layer perceptron model with optimized backward feature selection, 25/75 inter-quartile range outlier removal, 90/10 patient data split, and HbA1c value of 7.



Conclusions: Measurements show that the ability to control glucose levels through HbA1c can be determined non-invasively by ECG measurements from wearable sensors. A_SDNN, S_SDNN, and S_SDBPM are more significant HRV features than concatenated values.

EPV247 / #748

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

EVALUATING DIACTIVE-1: A PERSONALIZED MHEALTH SOLUTION FOR EXERCISE AND EDUCATION IN YOUTH WITH TYPE 1 DIABETES

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Background and Aims: Type 1 diabetes mellitus (T1DM) affects over 1.2 million youths globally, and poor glycemic control can lead to severe complications. Regular physical activity, especially muscle-strengthening exercises, is recommended, but fear of hypoglycemia often hinders participation. This study evaluated the usability and adherence of the Diactive-1 app in young T1DM patients over 24 weeks, following international pediatric diabetes care guidelines.

Methods: Twenty-seven T1DM patients aged 8 to 18 were randomly selected from the Pediatric Endocrinology Unit at the University Hospital of Navarra, Spain. Diactive-1 is an innovative mHealth app that personalizes exercise sessions based on each user's physical condition and real-time glucose levels, enhancing both safety and effectiveness. Its integration with monitoring devices and use of gamification promote adherence, while personalized training options and interactive avatars make the experience more engaging and accessible for young people with T1DM. The Polar Verity Sense monitored heart rate and ensured session completion. Usability was evaluated using the User Version of the Mobile Application Rating Scale (uMARS).

Results: Participants completed an average of 3.13 sessions per week (SD=1.40). The Diactive-1 app received high usability ratings, with an overall score of 4.33 out of 5.00, excelling in functionality (4.52) and aesthetics (4.43). Confidence in managing glucose during exercise increased, though personalization features were rated lower (3.94).

Conclusions: The Diactive-1 app shows potential for integrating muscle-strengthening exercises into T1DM management. Its high usability and positive feedback suggest it could be a cost-effective tool, though improvements in personalization features could enhance its effectiveness.

EPV248 / #696

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

INCIDENCE RATE AND RISK FACTORS FOR HYPOGLYCEMIA AMONG TYPE 1 DIABETES OR TYPE 2 DIABETES RECEIVING INSULIN TREATMENT IN CHINA: A PROSPECTIVE, MULTICENTER, OBSERVATIONAL STUDY

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Background and Aims: We investigated the real-world incidence of hypoglycemic events among patients with type 1 or type 2 diabetes receiving insulin in routine clinical practice in China.

Methods: In this observational study, data were collected electronically via the Lilly Connected Care Program (LCCP), which is a national diabetes care and support program designed to use internet technology to deliver diabetes education and services. Adults with type 1 diabetes or type 2 diabetes, who had registered on LCCP between 1 February 2019 and 31 January 2022 and had used insulin for a full 12-week period following registration, were included in this study. Incidence rates of level 1 and level 2 hypoglycemia were assessed during the 12 weeks following registration.

Results: In total, 22,752 patients were enrolled. Among patients with monitoring data, level 1 and 2 hypoglycemia were experienced by 48.8% and 25.9% of patients with type 1 diabetes, and 26.5% and 13.9% of patients with type 2 diabetes, over the 12-week study period. The proportion of patients treated with oral anti-diabetes drugs capable of producing hypoglycemia (sulfonylurea or glinide) was 1.3% in type 1 diabetes and 1.6% in type 2 diabetes, respectively. Questionnaire data revealed that up to 92.5% of hypoglycemic events occurred outside of hospital and 18.6% were serious.

Conclusions: These real-world data collected from Chinese patients with diabetes receiving insulin treatment reveal a relatively high percentage of patients experiencing hypoglycemia, with around one quarter of these events classified as severe and as many as 92.5% occurring outside of a hospital or clinic.

EPV249 / #909

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

THE IMPACT OF DIABETES TELE MANAGEMENT SYSTEM (DTMS[®]) ON REDUCING COMPLICATIONS IN TYPE 2 DIABETES MELLITUS: A CROSS-SECTIONAL ANALYTICAL STUDY

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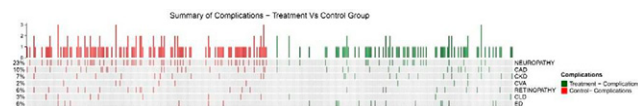
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Background and Aims: The Diabetes Tele Management System (DTMS[®]), introduced in 1997, integrates telemedicine with conventional diabetes care to enhance follow-up and treatment outcomes. This study aimed to assess whether telemedicine as an add-on to conventional care (TCC) reduces diabetes-related complications more effectively than conventional care (CC) alone in individuals with Type 2 diabetes mellitus (T2DM).

Methods: A cross-sectional analytical study was conducted over six months from December 2023 to May 2024, involving 360 participants (180 in each group) with T2DM. The CC group received a minimum of three in-person visits annually, while the TCC group received the same, plus at least two telemedicine consultations per month. Both groups were provided standard diabetes management. Primary outcomes included the incidence of complications and metabolic control measures, including HbA1c, lipid profile, and blood pressure.

Results: TCC group demonstrated a lower incidence of complications (37.7% vs. 57%, $p < 0.001$), along with better metabolic control, including lower HbA1c (7.2% vs. 8.3%, $p < 0.001$), LDL (65.9 vs. 80.35 mg/dL, $p < 0.001$), and triglycerides (127.24 vs. 147.13 mg/dL, $p = 0.004$). The TCC group also exhibited fewer complications such as neuropathy (12.6% vs. 33.5%, $p < 0.001$) and retinopathy (4.4% vs. 7.6%, $p < 0.001$).



Conclusions: Our findings suggest that adding telemedicine to conventional diabetes care significantly reduces complications and improves metabolic control in people with T2DM. We strongly suggest including telemedicine consultations to be included along with conventional physical visits in the diabetes clinical treatment guidelines.

EPV250 / #1273

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

A QUANTITATIVE FRAMEWORK FOR EVALUATING THE PERFORMANCE OF ALGORITHM-DIRECTED WHOLE-POPULATION REMOTE PATIENT MONITORING FOR TYPE 1 DIABETES CARE

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Background and Aims: Clinics continue to adopt remote patient monitoring for type 1 diabetes (T1D) and care models shaped by the algorithmic analysis of CGM data. No clinic-facing quantitative framework is available for tracking how such algorithm-directed care impacts patient outcomes and clinical workload.

Methods: We used data from the 4T (Teamwork, Targets, Technology and Tight control) Pilot (n=133) and Study 1 (n=135), in which algorithms analyze CGM data and direct clinician attention to patients with deteriorating glucose management. We iteratively analyzed data and interviewed diabetes educators and clinicians to identify metrics for reviewing clinical workloads, glucose management, and timeliness of care. Using these metrics, we developed an interactive dashboard to provide clinical and administrative leaders with an overview of the program. At program leadership meetings, we presented the metrics, used them to identify and facilitate data-driven discussions of potential challenges, and collected feedback from the entire clinical team.

Results: The metrics to track clinical workload were the total number of youths: (1) in the program, (2) in each study, and (3) cared for by each clinician. The metrics to track glucose management were the number of youths meeting each criterion for review: (4) in total, (5) for each clinician, and (6) for each study. The metric to track the timeliness of care was (7) the number of days since the most recent day of meeting clinical review criteria.

Conclusions: We propose a novel quantitative framework for diabetes care teams to supervise and enhance algorithm-directed whole-population T1D care.

EPV251 / #287

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

ASSESSMENT OF CLINICAL PRACTICE GAPS RELATED TO KETONE MONITORING IN PEOPLE WITH DIABETES

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Background and Aims: Understanding physician gaps related to ketone monitoring is critical to improve education and training that will ultimately improve practice.

Methods: A survey of 25 multiple choice, knowledge- and case-based questions allowed participants to assess their clinical knowledge related to ketone monitoring. Data collection occurred May to July, 2024.

Results: In total, 32 diabetologists and endocrinologists (D/Es) and 179 primary care physicians (PCPs) completed the assessment. Physicians demonstrated gaps in the following areas, which may contribute to clinical inertia in practice:

Topic	Gaps Measured with Incorrect Responses (%)	
	D/Es (N=32)	PCPs (N=179)
Knowledge		
Recognition of > 1.6 mmol/L as ketone level at which DKA begins to increase	59%	65%
Recognition of BHB as predominate ketone body in DKA	22%	50%
Knowledge of prevalence of DKA in T2D	41%	42%
Guideline-Based Clinical Decision-Making		
When to monitor ketones	22%	66%
Frequency of monitoring in sick-day management	31%	56%
Real-World Practices in Ketone Monitoring		
Gaps in ketone monitoring	22%	46%
Current limitations of urine ketone monitoring	37%	46%
Current limitations of blood ketone monitoring	59%	65%
Currently available methods for continuous ketone monitoring (CKM)	66%	79%
Future of Ketone Monitoring		
Potential use of CKM in combination with diabetes devices	50%	74%
Confidence		
Self-reported confidence in understanding the CMK evidence	66% not confident	86% not confident

Conclusions: This assessment yielded important insights into gaps related to ketone monitoring. As expected, PCP baseline knowledge was lower than D/Es, with both groups demonstrating clinical practice gaps that can be addressed with education. Future education will address these gaps and measure impact of the education.

EPV252 / #1395

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

CORRELATION OF LEAN MASS AND BONE DENSITY IN ELDERLY USING AI-BASED ANALYSIS OF DEXA MEASUREMENTS

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Background and Aims: Aging populations face increased fracture risk due to reductions in bone mineral density (BMD) and lean mass. This study utilizes artificial intelligence (AI) to assess correlations between lean mass and BMD in patients aged 75 and older, using Dual-Energy X-ray Absorptiometry (DEXA) data.

Methods: We analyzed data from 178 patient DEXA scans (mean age: 79.6 years), selecting 59 patients with both body

composition and bone measurements. Variables included body mass index (BMI), lean mass, fat mass, visceral adipose tissue (VAT), and BMD of the femur and lumbar spine. Correlation analyses were performed to examine associations between lean mass and BMD in the femoral and spinal regions.

Results: Positive correlations were observed between lean mass and BMD. Significant associations were identified in the femur, particularly with trochanter BMD ($r = 0.464$) and total femur BMD ($r = 0.344$). Spinal BMD showed stronger correlations with lean mass, notably at L2 ($r = 0.509$) and L1-L4 ($r = 0.487$), suggesting a robust link between muscle mass and spinal bone density.

Conclusions: The findings indicate that maintaining lean mass may enhance bone density, especially in spinal regions, potentially reducing fracture risk in elderly populations. AI-driven analysis of DEXA data highlights the importance of lean mass as a therapeutic target in geriatric care. Future studies should explore interventions to preserve lean mass for bone health optimization.

EPV253 / #551

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

EMPOWERING PATIENTS WITH DIABETES USING PROFILING AND TARGETED FEEDBACKS DELIVERED THROUGH SMARTPHONE APP AND WEARABLE (EMPOWER): A RANDOMIZED CONTROLLED TRIAL

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Background and Aims: Mobile health interventions may improve diabetes self-management. The aim of this study is to investigate the effectiveness of personalized educational and behavioural interventions delivered through the EMPOWER mobile application (app) among patients with diabetes.

Methods: In this parallel two-arm randomized controlled trial, patients with diabetes were allocated to intervention or control group. The intervention group received personalized educational and behavioural interventions through the EMPOWER app, Fitbit smartwatch, and usual care. The control group received usual care and Fitbit smartwatch but did not have access to the EMPOWER app. Primary outcome was patient activation score at 12 months. Secondary outcomes included quality of life, medication adherence and HbA1c.

Results: We recruited 1000 participants with diabetes. No significant difference in patient activation score was observed between intervention group (mean score at 12 months= 62.0, with SD= 16.1) and control group (mean score at 12 months= 61.8, with SD= 16.1) ($p=0.64$). There was significant difference between intervention group and control group in extent of medication non-adherence (-0.054 , 95% CI= -0.105 , -0.002) ($p=0.04$). Improvement in HbA1c was observed among all participants over 12 months, although there was no evidence of difference between groups (0.072 , 95% CI= -0.034 , 0.178) ($p=0.19$). There was significant difference between groups for

change in hba1c from baseline at 3 months (mean difference of -0.181, 95% CI= -0.314, -0.048) (p= 0.008) and 6 months (mean difference of -0.175, 95% CI= -0.341, -0.009) (p=0.039).

Conclusions: This study demonstrates that the EMPOWER app may help to improve medication adherence and glycemic control among patients with diabetes.

EPV254 / #1107

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

PORTABLE HARDWARE ACCELERATION FOR BLOOD GLUCOSE PREDICTION

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Background and Aims: Continuous glucose monitoring (CGM) systems are essential for diabetes management. However, traditional systems often lack the computational efficiency required for real-time analysis. This study aims to study the performance of a predictive model using Long Short-Term Memory (LSTM) neural networks optimized through hardware acceleration evaluating time and power consumption.

Methods: A LSTM is trained based on a dataset of historical glucose levels, preprocessed with normalization techniques. The model was initially run on a conventional CPU, followed by optimization on GPU and deployment on a Jetson Nano platform. The performance in terms of inference speed, resource consumption, and prediction accuracy was compared across these architectures.

Results: GPU-optimized implementation resulted into a considerable reduction in inference time compared to the CPU, with significant improvements in energy efficiency. Additionally, the Jetson Nano platform enabled decentralized, real-time monitoring with minimal resource consumption, highlighting its potential for wearable diabetes management solutions.

Conclusions: Hardware acceleration and edge computing technologies, such as those implemented in this study, offer a promising path toward more efficient and scalable continuous glucose monitoring systems. The use of LSTM models for predictive analysis can improve the accuracy and timeliness of glucose monitoring, potentially reducing complications related to diabetes management in portable devices.

EPV255 / #877

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

BODY COMPOSITION-RELATED CARDIOMETABOLIC RISK AMONG YOUNG ADULTS WITH NEWLY DIAGNOSED TYPE 1 DIABETES - SECONDARY DATA ANALYSIS OF THE PROSPECTIVE COHORT INLIPODIAB1 STUDY

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Background and Aims: Body composition is understudied in type 1 diabetes (T1D). Bioelectrical Impedance Analysis (BIA) allows us to calculate the fat mass-to-muscle ratio (FMR), which may help identify early cardiometabolic risks in T1D. The study aims to explore changes in FMR over time in the cohort of adults with newly diagnosed T1D.

Methods: A complete-case, secondary analysis of data collected from the N=142 participants recruited to the InLipoDiab1 (Insulin Therapy and Lipoproteins Profile in Type 1 Diabetes) study. We used the Tanita(R) BI analyser to calculate the FMR at baseline (V0) and follow-up visits after 12 and 24 months (V12, V24, respectively). We fitted mixed-effect linear regression models to explore factors associated with FMR over the observation period.

Results: Baseline characteristics: female/male:80/62; age:30.3±6.2 years; BMI:22.1±3.7 kg/m²; HbA1c:11.2±2.1%; WHR:0.8±0.1, eGDR:6.53±2.26 mg*kg; BMI>=25kg/m2:20%, MetS:31.9%. FMR was significantly smaller in men than women over the study period (beta: -0.2(95%CI:-0.24, -0.14), p<0.0001), with no association between FMR and age at baseline (p=0.953). The FMR remained stable over the first two years of treatment (p=0.342 for ANOVA, comparing means for V0, V12, V24). The FMR was significantly inversely associated with HbA1c (beta: -0.009(95%CI:-0.012, -0.007), p<0.0001), LDL-cholesterol (beta: -0.045(95%CI:-0.068, -0.020), p=0.0001) and non-HDL cholesterol (beta [mg/dl]: -0.001(95% CI:-0.0016, -0.00049), p<0.0001) during the observation period. Male sex significantly modified the association (p for the interaction terms: HbA1c*male sex: 0.000245; LDL-cho*male sex: 0.003, non-HDL chol*male sex: 0.0004).

Conclusions: Our data indicate an association between FMR and important measures of cardiometabolic risk in the population of young adults with a short history of T1DM treatment.

EPV256 / #1256

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

DIABETES PROM INSTRUMENT (DIAPROFIL): DIFFERENCES BETWEEN TYPE 1 AND TYPE 2 DIABETES IN NORTHERN DENMARK

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Background and Aims: In 2021, the national PROM Diabetes questionnaire was digitally visualized and implemented as DiaProfil in the North Denmark Region (NDR). This dialogue tool is used in all diabetes clinics across the NDR. This study aims to investigate potential differences in responses between individuals with type 1 diabetes and those with type 2 diabetes.

Methods: This project includes 6,145 responses from 3,525 individuals with diabetes, collected between May 1, 2021, and October 1, 2024, from the DiaProfil database in NDR. A descriptive statistical analysis was conducted to identify differences in responses between individuals with type 1 and type 2 diabetes, followed by further analyses to uncover significant causal relationships and potential associations.

Results: The results reveal differences across various domains of the DiaProfil tool. Notably, in the mental well-being domain, individuals with type 1 diabetes are at a higher risk of poor mental well-being compared to those with type 2 diabetes ($p < 0.05$). Additionally, significant differences exist in the topics both groups wish to discuss at their upcoming consultations. Individuals with type 1 diabetes prioritize blood sugar regulation, daily life and long-term complications, while individuals with type 2 diabetes focus on long-term complications, medication and eating habits. A more detailed analysis will be presented at the conference.

Conclusions: DiaProfil reveals significant differences between individuals with type 1 and type 2 diabetes, both in terms of the various domains assessed and the topics they wish to discuss during consultations.

EPV257 / #446

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

BAYESIAN CLUSTERING METHOD BASED ON RANDOM WALK MODELS TO CHARACTERIZE TEMPORAL SEQUENCES OF GLYCEMIC RISK INDEX

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Background and Aims: Effective pattern detection in CGM signals could facilitate long-term patient monitoring. A crucial aspect is related to identifying glycemic profiles associated with hyperglycemic and hypoglycemic episodes. In this context, the Glycemic Risk Index (GRI) has been recently proposed to summarise segments of the CGM signals. Here, we show how GRI time sequences can be used to identify groups of glycemic risk patterns that can effectively describe the temporal sequence of glycemic events.

Methods: We analyzed 880 weekly CGM signals, aligned from Monday to Sunday, collected from 21 diabetic patients at the Istituti Clinici Scientifici Maugeri hospital in Pavia, Italy, and computed the daily GRI value. The Random Walk Bayesian Clustering (RWBC) method was applied to the obtained GRI weekly profiles. RWBC exploits a correlation-based agglomerative strategy and automatically identifies the optimal number of clusters relying on the Bayesian Information Criterion. We used Kruskal-Wallis and Dunn's post hoc tests to compare the distributions of state-of-the-art glycemic variability metrics (CV, J-index, Conga, LI, BGRI, GRADE) among clusters. To characterize each cluster, the area under the median GRI weekly profile was used as an indicator of the pattern severity.

Results: The application of RWBC resulted in 16 clusters, exhibiting clear differences in their temporal behaviours and showing

statistically significant differences (p -value < 0.05) for most glucose variability indicators. We identified 5 clusters characterized by elevated AUC, which show high-risk profiles in terms of glucose variability.

Conclusions: We identified a risk-related sub-grouping of weekly GRI patterns, which provides an informative description of the glycemic profile over time.

EPV258 / #1031

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

USABILITY OF AN EMOTIONAL REGULATION MOBILE APP FOR THE TREATMENT OF CHILDREN WITH TYPE 1 DIABETES

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Background and Aims: Type 1 diabetes (T1D) is one of the most common endocrine and metabolic disorders among children. Due to the importance of emotional self-regulation in chronic conditions care, psychological interventions are being designed for this population. The aim of this study was to examine how children and adolescents with T1D used a mobile application (app) as a part of a 2-months cognitive-behavioral intervention aimed at training them in emotional regulation and self-efficacy.

Methods: Following the ethics committee's approval and the legal guardians' signature on the consent form, twenty-eight T1D patients aged 6 to 18 years started the intervention program. Of these, nineteen (7 males) used the app. The sessions were conducted in groups of up to ten participants, in both face-to-face and online modalities. On their smartphones or tablets, users had the app installed, which gave them access to various resources and exercises related to the development of the self-efficacy and emotional regulation skills.

Results: The app obtained good feasibility indexes, including learning and usability factors.

Conclusions: This is one of the first studies to examine and design the feasibility of an app to improve the mental health of children with type 1 diabetes. The findings demonstrated that the app is a viable tool with excellent levels of usability and ease of learning that can improve patient well-being.

EPV259 / #32

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

CAN YOU HEAR ME? DID YOU KNOW THERE'S A RELATIONSHIP BETWEEN DIABETES AND HEARING LOSS?

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Background and Aims: We all know that there are direct correlations between prolonged hyperglycemia and microvascular complications. Healthcare providers and people with diabetes need to understand that one of the undiscussed complications is hearing loss. Over 50% of people with diabetes and 30% of people with pre-diabetes suffer from hearing loss, which is often confused for cognitive loss.

Methods: Clinicians must include in their workflow a screening tool through The Audiology Project to identify and screen for hearing issues. Then, clinicians must make connections with audiologists in their communities to refer PWD when necessary. The ADA SOC indicate that audiology referrals must be implemented when risk is identified.

Results: Identified and treated hearing loss improves quality of life, improves overall outcomes-decreases A1c, blood pressure, etc. and improves social anxiety, fatigue and more!

Conclusions: Healthcare providers must be educated on the need for screenings at diagnosis, and annual if recommended by an audiologist for hearing loss. This session will discuss how to practically implement this into the workflow of an endocrinology practice or diabetes self-management education and support program.

EPV260 / #1139

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

THE ARGONAUT CGM PROJECT BRINGS CGM DATA TO EHRs

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Background and Aims: FHIR (Fast Healthcare Interoperability Resources) is a standard developed by Health Level Seven International (HL7) for exchanging healthcare information electronically. The Argonaut Project is an industry collaboration within HL7 focused on enhancing standards-based interoperability among electronic health record systems through the development of FHIR implementation guides and APIs for key healthcare use cases, and serves as a model for HL7's larger Accelerator Program. The Argonaut CGM project aims to standardize continuous glucose monitoring (CGM) data exchange in electronic health records (EHRs). It focuses on developing a FHIR implementation guide capable of communicating the iCoDE 2022 "Core Data Set". This effort seeks to enable seamless integration of CGM data into EHRs, benefiting healthcare providers and patients across different platforms and devices.

Methods: The project began with interviews of healthcare integration vendors, glucose management platform developers, and individuals with diabetes. This was followed by a consensus-building exercise involving over 35 participants from diverse backgrounds, including academic researchers, EHR vendors, glucose management platforms, and hardware manufacturers. The process included a series of eight teleconference calls and asynchronous collaboration.

Results: A draft version 0.1.0 of the implementation guide discusses user stories, actors, and workflows related to transfer of CGM data. It also includes technical specifications and proposed new LOINC codes. The implementation guide is scheduled for testing at a connectathon in November 2024.

Conclusions: The FHIR community is making continuous progress to get diabetes data into EHRs, in order to streamline workflows for healthcare professionals and enable use of algorithms and AI in care for the patients.

EPV261 / #747

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

ANALYSIS OF THE IMPACT ON A DIABETES UNIT OF A REMOTE MONITORING TOOL FOR PATIENTS USING A 780G[®] HYBRID SYSTEM

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Background and Aims: The treatment by using hybrid CSII is becoming the "standard of care" among subjects with type 1 diabetes. Careconnect[®] is a remote monitoring tool for patients using the Medtronic 780G[®] system. The objective of the study is to evaluate the impact of the implementation of this solution on glucometric results and the care load in a Diabetes Unit.

Methods: Prospective, observational study of 6 months duration. CareConnect[®] allows to filter patient discharge reports by classifying them (green, yellow or red) and also to easily provide patients with feedback through a mobile app. Data regarding metabolic control and number of visits was analyzed comparing with the 6 months period prior the initiation of the CareConnect[®].

Results: 54 T1D users of 780G[®] participated in the study. Metabolic control improved significantly: HbA1c was reduced from $7.1\% \pm 0.8$ to 6.8 ± 0.8 ($p < 0.001$), CV from $32.1\% \pm 4.2$ to $30.9\% \pm 4.9$ ($p = 0.02$), time in grade 2 hyperglycemia from $17.9\% \pm 9.3$ to $2.9\% \pm 3.3$ ($p < 0.001$), time in grade 1 hyperglycemia $20\% \pm 1$ to $17.9\% \pm 9.3$ ($p = 0.04$) and TIR was increased from $77.8\% \pm 9.8$ to 79.8 ± 9 ($p = 0.05$). No significant changes in the rate of hypoglycemia was observed. In addition, the number of medical and nurse visits were significantly reduced.

Conclusions: CareConnect[®] remote monitoring program has improved the metabolic control of patients using 780G[®]. Additionally, medical and nursing visits decreased significantly.

EPV262 / #1156

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

OPTIMAL BASAL INSULIN TITRATION IN TYPE 2 DIABETES: RESULTS OF THE FIRST EFFECTIVENESS AND SAFETY RANDOMIZED CONTROLLED TRIAL OF INSULTRATE - A DIGITAL TITRATION APPLICATION

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Background and Aims: Insultrate, a titration module in a digital mobile application Health2Sync (H2S) designed to help people with type 2 diabetes (PwT2D) to titrate their basal insulin (BI) based on personalized titration plan prescribed by physicians. This study is the first randomized controlled trial evaluating Insultrate effectiveness in glycemic control and safety.

Methods: An open-label, multi-centered study (WHO: U1111-1266-5860), conducted from Feb23-Jun24 in insulin-naïve or on BI PwT2D who were uncontrolled with antidiabetic therapy and aged ≥ 20 year from Taiwan. Participants were randomized 1:1 to Insultrate or usual-care group. Primary endpoint was change in HbA1c from baseline to week 24.

Results: Total 191 participants were evaluated (Insultrate: n=93 and usual-care: n=98) in the study. At week 24, statistically significant change in mean HbA1c was seen in Insultrate group vs usual-care group (Mean $\pm$ SD: -0.87 ± 1.2 vs -0.43 ± 1.2 , $p=0.0068$), similarly significant change in mean fasting self-monitoring blood glucose (fSMBG) was reported (-56.4 ± 62.4 vs -45.1 ± 54.7 , $p=0.0124$) (Table). No significant differences were reported in time to first reach fSMBG target range (Weeks: 2.2 vs 2.9, $p=0.2701$), and in proportion of participants reaching HbA1c target and fSMBG target range without severe and/or

confirmed hypoglycemic events. No hospitalizations due to hypoglycemic events was reported in the study. Treatment emergent adverse events (TEAEs) were less in Insultrate group vs usual-care group [n (%): 15 (16.1) vs 20 (20.4)]. No serious adverse events or deaths were reported in this study.

Conclusions: Insultrate is an effective digital mobile application helping PwT2D to titrate their BI with fewer TEAEs and without increased risk of hypoglycemic events.

EPV263 / #1066

E-Poster Viewing Topic: AS07. Informatics in the Service of Medicine; Telemedicine, Software and Other Technologies

EXPLORING FEDERATED LEARNING FOR SECURE HEALTH DATA UTILIZATION ON PERSONAL DEVICES

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Background and Aims: Federated learning provides a method that ensures data privacy and individual rights while enabling statistical analysis, making it feasible to conduct training on personal devices such as smartphones. The government of the Republic of Korea operates the MyHealthWay platform, which allows citizens to access and utilize their health examination records. This paper explores a federated learning approach that leverages individually owned health examination records.

Methods: In this study, we developed a federated learning server, a mobile app, and essential components for federated learning implementation using the Flower framework, with machine learning tasks performed via TensorFlow and TensorFlow Lite. The basic Federated Averaging (FedAvg) strategy was employed to enable effective model updates based on locally trained models.

Results: Users can access and download their health examination records via the MyHealthWay-connected "My Health Records" app. After loading these records into the federated learning mobile app, the initial model is deployed for local training. The results are then communicated to the federated learning server for central model updates, enhancing overall predictive accuracy.

Conclusions: This study demonstrated the feasibility of utilizing health data from personal mobile devices via the MyHealthWay platform for federated learning. This approach holds significant potential for broader applications in the healthcare domain, where data privacy is paramount. Future efforts could focus on optimizing learning algorithms and enhancing the effectiveness and scalability of federated learning systems.

Table: Effectiveness and safety outcomes of Insultrate® in people with T2D

Demographics and baseline	Insultrate group (n=93)	Usual-care group (n=98)	Total (N=191)
Age, years, mean $\pm$ SD	55.9 $\pm$ 11.3	57.4 $\pm$ 12.5	56.7 $\pm$ 11.9
Female, n (%)	44 (47.3)	43 (43.9)	87 (45.6)
BMI, Kg/m ²	27.9 $\pm$ 4.8	28.2 $\pm$ 4.8	28.0 $\pm$ 4.7
Duration of diabetes, years, mean $\pm$ SD	12.0 $\pm$ 7.5	12.9 $\pm$ 7.9	12.5 $\pm$ 7.7
Insulin History, n (%)			
Yes	83 (89.3)	88 (89.8)	171 (89.5)
No	10 (10.8)	10 (10.2)	20 (10.5)
Basal Insulin			
Insulin Degludec 100 U/mL, n (%)	42 (45.2)	45 (45.9)	87 (45.6)
Insulin Glargine 300 U/mL, n (%)	51 (54.8)	53 (54.1)	104 (54.5)
Effectiveness outcomes			
HbA1c			
Baseline HbA1c (%), n / mean $\pm$ SD	93 / 8.8 $\pm$ 0.9	98 / 8.7 $\pm$ 0.8	
HbA1c at Week 12 (%), n / mean $\pm$ SD	90 / 8.0 $\pm$ 1.1	96 / 8.3 $\pm$ 1.1	
HbA1c at Week 24 (%), n / mean $\pm$ SD	90 / 7.9 $\pm$ 1.1	97 / 8.3 $\pm$ 1.2	
Mean change in HbA1c (%) at Week 24*	-0.87 $\pm$ 1.2	-0.43 $\pm$ 1.2	$p=0.0068$
fSMBG			
Baseline fSMBG (mg/dL), n / mean $\pm$ SD	93 / 187.6 $\pm$ 59.7	93 / 187.0 $\pm$ 46.4	
fSMBG at Week 24 (mg/dL), n / mean $\pm$ SD	93 / 131.2 $\pm$ 31.3	98 / 141.6 $\pm$ 35.8	
Mean change in fSMBG (mg/dL) at Week 24**	-56.4 $\pm$ 62.4	-45.1 $\pm$ 54.7	$p=0.0124$
Safety outcomes, events/n (%)			
TEAE	23/ 15 (16.1%)	34/ 20 (20.4)	57/ 35 (18.3)
TESAE	3/ 3 (3.2)	5/ 5 (5.1)	8/ 8 (4.2)
AESI	1/1 (1.1)	0	1/1 (0.5)
TEAEs leading to permanent discontinuation from study	0	0	0

*Primary endpoint. **secondary endpoints. ¹Health2Sync (H2S) is a digital health technology platform designed to coach PwT2D via H2S App for patients and H2S HCP platform. It can also connect with Bluetooth connected blood glucose meter (BGM) to collect self-monitoring of blood glucose (SMBG) data. One of the key functions in H2S, Insultrate, is a basal insulin titration adjustment plan designed to assist HCPs and patients with diabetes to manage their insulin titration automatically based on prescription of the physician. Insultrate provides the patient insulin dose suggestion according to the fasting blood glucose and insulin dose record the patient entered. In this trial, patients in the usual-care group did not have access to H2S or Insultrate.

AESI was defined as symptomatic overdose (serious or nonserious) with non-investigational medicinal product (NIMP), including basal insulin. Abbreviations: AESI, adverse event of special interest; BMI, body mass index; fSMBG, fasting self-monitoring blood glucose; HbA1c, glycated hemoglobin A1c; SD, standard deviation; TEAE, treatment-emergent adverse events; TESAE, treatment-emergent serious adverse events.

EPV264 / #784

E-Poster Viewing Topic: AS08. Insulin Pumps

THE IMPACT OF INSULIN DELIVERY MODALITY ON GLYCEMIC CONTROL AND FEAR OF HYPOGLYCEMIA AMONG PEOPLE WITH TYPE 1 DIABETES: A MULTICENTER STUDY FROM SAUDI ARABIA

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Background and Aims: There is little evidence from the Middle East and North Africa (MENA) regarding the impact of various treatment modalities of type 1 diabetes (T1D) on glycemic control and fear of hypoglycemia (FH). Here, we present the first real-world study from the MENA simultaneously comparing glycemic control and FH among people with T1D (PwT1D) who use four distinct insulin delivery modalities.

Methods: We recruited 411 adolescents and adults with T1D, using a continuous glucose monitor (CGM), (8 centers; 5 Saudi Arabian regions). Glycemic metrics and FH were compared across four treatment groups: multiple daily injections (MDI)+CGM (n=210), AID (n=156), sensor-unintegrated pump (SUP) (n=36), and sensor-augmented pump (SAP) with predictive-low-glucose suspend (PLGS) (n=9).

Results: AID users had the highest time in range (TIR) and lowest glucose management indicator, time above range (TAR), time below range (TBR), glycemia risk index, and glucose coefficient of variation compared to the other groups. The double target of TIR >70% and TBR <4% was attained by 65.77% of AID users, 28.57% of SAP users, 11.54% of SUP users, and 8.23% of MDI+CGM users (overall p<0.01). While the overall FH score did not significantly differ across the four groups (overall p>0.05), AID users had the lowest score on the behavior sub-scale of the FH survey compared to the other groups including the MDI+CGM group (AID: 1.23 versus MDI: 1.63; p<0.01).

Conclusions: Users of AID systems, compared to MDI, SAP, and SUP, in Saudi Arabia have the best glycemic control and least frequent hypoglycemia avoidance behaviors.

EPV265 / #1261

E-Poster Viewing Topic: AS08. Insulin Pumps

HYBRID CLOSED-LOOP SYSTEM IN DIABETES; A CENTER'S EXPERIENCE

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Background and Aims: Hybrid closed-loop systems (HCLS) are widely used in diabetes management, improving patients' glycemic control and facilitating their life. Here we present the effect of HCLS in the real world setting of our clinic.

Methods: 39 patients with T1DM (20/39males,19/39females) attending our outpatient clinic were studied and from the CGS metrics time in range(TIR), above range (TAR;180-250mg/dl, TAR250;>250mg/dl) and below range (TBR;54-70mg/dl, TBR54;<54mg/dl) at baseline and three months after the initiation of HCLS were compared. Patients divided in two groups according to their previous diabetes management; GroupA on multiple diabetes insulin injections(MDI) and GroupB on subcutaneous continuous insulin infusion(SCII).

Results: 28/39 (71,79%) were on GroupA (15/28males, 13/28females), mean age 38,10±13,16 years old and mean diabetes duration 18,00±10,82 years. On MDI they had mean TIR 65,82±15,43%, TAR 23,71±10,19%, TAR250 6,92±7,99%, TBR 2,75±2,68% and TBR54 0,78±1,81%. Three months after using HCL they had mean increase in TIR 19,28±14,98% (r=0,264,p=0,175), and mean decrease in TAR, TAR250, TBR and TBR54 10,92±9,42%(r=0,397,p=0,037), 5,64±7,98% (r=0,094,p=0,634), 2,07±2,43%(r=0,438,p=0,020) and 0,71±1,65% (r=0,657,p=0,000) respectively. 11/39(28,2%) were on GroupB (5/11males, 6/11females), mean age 43,63±16,39 years old and mean diabetes duration 18,54±10,64 years. On SCII they had baseline mean TIR 58,81±13,16%, TAR 27,72±7,9%, TAR250 10,06±7,58%, TBR 1,81±1,88% and TBR54 0,60±1,07%. Three months on HCL they had mean increase in TIR 19,36±10,54%(r=0,605, p=0,049), and mean decrease in TAR, TAR250 and TBR 10,45±5,71%(r=0,697,p=0,017), 7,54±7,39% (r=0,294,p=0,380) and 0,81±1,53%(r=0,583, p=0,060) respectively.

Conclusions: HCLS seem to improve TAR and TBR in both groups, and TIR in Group B. GroupA had also improved TBR54. Longer observation is needed to see if these results are maintained over time.

EPV266 / #792

E-Poster Viewing Topic: AS08. Insulin Pumps

THE MINIMED™ 780G SYSTEM PROVIDES GLYCEMIC CONTROL TO BOTH FEMALES AND MALES: A REAL-WORLD ANALYSIS OF OVER 100,000 USERS

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Background and Aims: Disparities in glucose control among people with type 1 diabetes are frequently reported, with women, often experiencing worse outcomes. Automated insulin delivery (AID) systems have been shown to dramatically improve glycemic outcomes in previously poorly controlled

individuals. However, their effectiveness in addressing sex differences in glycemic outcomes remains to be determined. This study compares glycemic outcomes between males and females using the MiniMed 780G advanced hybrid closed-loop system in a large real-world cohort.

Methods: Carelink data from users of the MiniMed 780G system was analyzed for the period ranging from 1st of September 2023 to 31st of August 2024. Glycemic endpoints and insulin outcomes were calculated and compared between males and females per age group.

Results: are shown in table 1. Mean time in range (TIR) was $72.3 \pm 11.5\%$ in males and $72.3 \pm 11.2\%$ in females. Time in tight range (TITR) was $47.4 \pm 11.6\%$ in males and $47.1 \pm 11.3\%$ in females. No differences in time in hypoglycemia or hyperglycemia were observed either. While TIR increased per age group, with older users having higher TIR, there were no differences in glycemic outcomes between sexes within age groups.

Table 1. Real-world performance between male and female users of the MiniMed 780G system.

	Females	Males
General		
N	134*497	124*150
Glycemic control		
Sensor glucose, mg/dL	153.6 ± 18.1	153.6 ± 18.4
Standard deviation of SG, mg/dl	51.6 ± 11.3	52.0 ± 12.1
Glucose management indicator, %	6.98 ± 0.43	6.98 ± 0.44
Time in ranges, % of time		
Time below 54 mg/dL	0.34 ± 0.51	0.30 ± 0.45
Time below 70 mg/dL	1.69 ± 1.68	1.67 ± 1.61
Time between 70-140 mg/dL	47.1 ± 11.3	47.4 ± 11.6
Time between 70-180 mg/dL	72.3 ± 11.2	72.3 ± 11.5
Time above 180 mg/dL	26.0 ± 11.5	26.00 ± 11.8
Time above 250 mg/dL	6.23 ± 6.16	6.4 ± 6.33
Users reaching targets, % of users		
TIR>70%	62.6	61.3
TB70<4%	91.7	91.8
GMI<7%	56.8	56.7
Insulin		
Carbohydrates, g/d	138.3 ± 64.7	176 ± 85.8
Insulin to carbs, ratio	9.17 ± 4.95	8.91 ± 5.25
Total daily insulin dose, U/d	47.3 ± 27.3	60.6 ± 32.7
Insulin delivery, % of TDD		
Autobasal	44.4 ± 9.04	43.1 ± 8.98
Autocorrection bolus	18.2 ± 7.84	18.1 ± 8.05
Manual bolus	37.3 ± 12.7	38.9 ± 13.1

Values are represented as mean ± SD or as percentages/N, population size/SG, sensor glucose/TIR, time in range/TB70, Time below 70/ GMI, glucose management indicator/ TDD, total daily dose.

Conclusions: Historically, women with T1D have had poorer glycemic outcomes than men. However, our study shows that these differences are not present with the use of the MiniMed 780G advanced hybrid closed-loop system.

EPV267 / #631

E-Poster Viewing Topic: AS08. Insulin Pumps

EVALUATION OF SAFETY AND EFFICACY OF TWO OFF-LABEL AHCL SYSTEMS IN CHILDREN AGED LESS THAN 7 YEARS: A SINGLE CENTRE RETROSPECTIVE STUDY

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Background and Aims: T1D management in younger children appears challenging, often resulting in poor glycemic control and in an overwhelming burden for families. Since 2019, AHCL systems created a paradigm shift in management and therapy of T1D but, currently, not all AHCL systems are available for younger children, who are expected to benefit most from this advanced technologies.

Methods: A retrospective study was conducted to evaluate safety and efficacy of off-label use of 2 AHCL systems in children aged less than 7 years. The safety of AHCL systems was evaluated in terms of severe hypoglycaemia (SH) and diabetic ketoacidosis (DKA) events in a 1-year period. Effectiveness was evaluated comparing CGM metrics at T0 (starting of AHCL system) and after 1, 3 and 12 months (T1, T2 and T3 respectively).

Results: Data on 41 children were analyzed. TIR (70-180 mg/dl) and TITR (70-140 mg/dl) showed a statistically significant improvement at 1-month, maintained at 3-months and after 1 year (from 56,91 at T0 to 66,65 at T3, p<0.001 for TIR and from 36,32 at T0 to 44,37 at T3, p=0,001 for TITR). No episodes of SH and 3 episode of DKA have been reported.

Conclusions: AHCL systems proved to be safe and effective in children with T1D aged less than 7 years, although they are not yet approved in this age group. More data on efficacy and safety of AHCL systems in younger children are essential to promote their use in such a challenging category of patients.

EPV268 / #1300

E-Poster Viewing Topic: AS08. Insulin Pumps

GLYCAEMIC CONTROL AFTER 3 MONTH OF STARTING ADVANCED HYBRID CLOSED-LOOP (PATCH PUMP NANO TOUCHCARE SYSTEM) IN TYPE 1 DIABETES MELLITUS PATIENTS

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Background and Aims: The aim was to evaluate effectiveness of the Advanced hybrid closed-loop (AHCL) (MED-TRUM NANO TOUCHCARE™) in glycaemic control in a group of patients with type 1 diabetes (T1D) during the first three month.

Methods: Longitudinal multicenter study in patients with T1D who started a AHCL between june and october 2024. Base-line characteristics and glucometric data like Time in Range (TIR), Time in Thight Range (TTIR), Time above rage (TAR), Time below range (TBR) were evaluated at the beginning of the treatment and during the three month's.

Results: 35 patients were studied, 30 (65%) female, 15 (25%) male. The median age 21.3 years and range (5-48). Type of training were on-site (20%), virtual (80%). The most frequent previous treatment were MDI-MCG (60%), Minimed 670G (28%), SOLO-MCG (12%). An increase was observed in TIR(70-180): 60.50% vs. 73.43% (P<0.0001) and TTIR(70-140): 37.5% vs. 51.3% (P<0.0001). A significantly decrease was observed in HbA1c: 7.47 vs.6.83(P 0.001) TAR 180: 24.7 vs.

16.8 (P 0.001) TAR 250: 11.3 vs. 7 (P 0.001). The CV decrease from 47 to 38 (P 0.001). Between ages were differences in TIR and TTIR, those under 14 years old improve significantly but the greatest improvement was in over 35 years of age. No differences were found in TBR 70 and 54. The 76,8% of patients reached above TIR and 59% reached above TTIR.

Variable	baseline		1 month		2 month		3 month		p Value
	Media	ED	Media	ED	Media	ED	Media	ED	
WEITH	52,90	20,15					53,06	16,56	0,736
HbA1c %	7,43	1,62					6,83	0,34	<0,001
CH DIARY	169,77	154,44	132,11	60,97	132,28	53,28	115,36	58,77	0,012
DDT UI	36,20	31,39	36,30	18,21	36,67	17,53	37,24	19,33	0,138
BASAL UI	49,84	16,12	16,86	7,68	16,8	7,71	17,41	9,68	<0,001
BOLO UI	46,6	13,83	19,40	8,64	19,40	8,35	19,65	11,24	<0,001
AUTOBOLO UI			5,80	13,01	5,80	13,79	8,48	14,76	0,763
Time 70-140%	37,50	8,34	50,12	11,29	50,12	10,64	51,31	9,82	0,658
Time 70-180%	60,50	17,19	74,12	12,12	72,40	9,18	73,43	8,79	<0,001
Above 180%	24,70	19,37	16,41	12,41	16,41	11,33	16,82	9,07	<0,001
Under 250%	11,30	4,3	6,61	1,79	7,89	1,76	7,0	1,6	<0,001
Under 70%	2,80	1,4	2,29	0,82	2,44	0,87	2,28	0,65	0,124
Under 54%	0,80	0,54	0,69	0,39	0,74	0,33	0,65	0,31	0,114
GLUC MED SENS	164	45,5	147	23,5	149	12,54	148,8	12,51	0,012
CV	47	7,6	39	2,10	39	2,01	38	1,98	0,001
IGG %			6,74	0,48	6,86	0,45	6,84	0,44	0,221
AUTOMODE %			98,7	7,88	88,40	8,56	95	8,34	0,634

Variable	Value TIR	bsaseline	1 Mo	2 Mo	3 Mo	P value
		%	%	%	%	
TIR	< 70 %	70,00	25,21	24,03	23,15	<0,001
70-180	> 70%	30,00	74,79	75,97	76,85	<0,001
TIR	< 50%	76,43	44,13	42,79	41,00	<0,001
70-140	> 50%	23,57	55,87	57,21	59,00	<0,001

Conclusions: With the AHCL Medtrum Nano TouchCare glycaemic outcomes improved with an increased in TIR, TTIR and a decreased in TAR and HbA1c. No sever hypoglycemia or CKD were reported.

EPV269 / #668

E-Poster Viewing Topic: AS08. Insulin Pumps

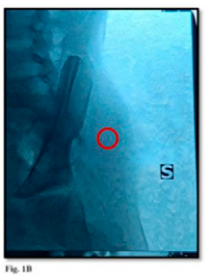
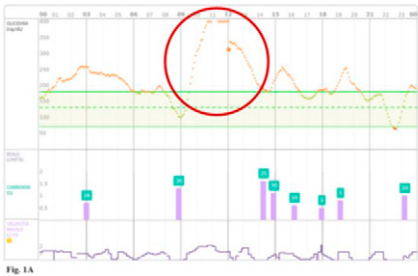
IT'S LIKE LOOKING FOR A NEEDLE IN A HAYSTACK: A CASE REPORT OF A RETAINED STEEL INSULIN PUMP INFUSION SET NEEDLE

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Background and Aims: In a 7 years old patient with type 1 diabetes mellitus a retained steel insulin pump infusion set needle was discovered. We report the management of this rare insulin pump adverse event.

Methods: Needle absence was noticed during the set infusion substitution, occurred before 3 days because of prolonged and apparently unexplained hyperglycemia with ketones presence (fig. 1A). The needle was identified and located by X-Ray imaging in the subcutaneous gluteal tissue (fig. 1B). The patient was asymptomatic, no spontaneous or induced by palpation or mobilization discomfort was reported. A systematic review of the literature regarding retained diabetes devices was considered^[1].



Results: The review described 16 cases of retained diabetes devices. 8 of them were infusion set needles. 6/8 of them were localized in the gluteal region. 4/8 length was 8 mm, 1/8 length was 6 mm and 3/8 length was not reported. 5/8 successfully operated and removed the needle (62.5%), 3/8 operated unsuccessfully (37.5%), because of difficult localization, leaving the needles in place.

Conclusions: Considering the small needle dimension (5.5 mm), which would have made localization extremely challenging, the risk/benefit ratio associated with a surgical procedure under general anesthesia appeared to be excessive. In agreement with the family, we opted for a watchful waiting approach, closely evaluating the patient clinically and instrumentally for any signs of late complications. After a 3-week follow-up, no complications were observed, and the radiographic picture appeared stable. [1] Xu NY, et al. Retained Diabetes Devices-A Literature Review. J Diabetes Sci Technol. 2023 Nov;17(6):1676-1685. doi: 10.1177/19322968221105895.

EPV270 / #981

E-Poster Viewing Topic: AS08. Insulin Pumps

USER SATISFACTION AND GLYCEMIC OUTCOMES IN PWT1D USING AN INNOVATIVE MICROPUMP: INTERIM ANALYSIS OF AN OBSERVATIONAL STUDY

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Background and Aims: This study examines changes in treatment satisfaction and glycemic outcomes in people with type 1 diabetes (PwT1D) transitioning from multiple daily injections to continuous subcutaneous insulin infusion (CSII) with an innovative patch micropump.

Methods: 100 CSII-naive PwT1D from Spain and Argentina were enrolled in a multi-center, prospective, single-armed study using the Accu-Chek® Solo micropump. This report shows outcomes at 13 weeks (Spain and Argentina) and up to 2 years (only Argentina). The primary outcome was the change in

treatment satisfaction assessed after 13 weeks using the Diabetes Technology Questionnaire (DTQ). Changes in DTQ after 1 and 2 years and HbA1c levels were reported from different study sites.

Results: After 13 weeks, changes in the “Impact and satisfaction” score from the DTQ were 99.3 ± 16.8 ($p=0.0077$, Spain, 47 participants) and 113.4 ± 16.7 ($p<0.0001$, Argentina, 50 participants) (mean $\pm$ SD, 90=non-change score). Improvement in satisfaction was sustained after 1 and 2 years (111.4 ± 14.4 , $p<0.0001$, and 107.8 ± 16.1 , $p=0.0005$, 45 and 43 participants, respectively). HbA1c decreased after 13 weeks from $7.3\% \pm 0.8\%$ to $7.1\% \pm 0.9\%$, $p=0.2103$ (Spain) and after 13 weeks, 1 and 2 years from $8.2\% \pm 1.3\%$ to $7.9\% \pm 1.2\%$, $p=0.0375$, to $7.9\% \pm 1.3\%$, $p=0.0467$ and to $8.0\% \pm 1.3\%$, $p=0.1716$, respectively (Argentina). A total of 3 hypoglycemic events and 1 case of diabetic ketoacidosis were reported.

Conclusions: Transitioning from MDI to CSII with this micropump resulted in a significant improvement of participants’ treatment satisfaction and a reduction of HbA1c levels, which was sustained for 2 years. These findings suggest that the micropump effectively reduces the disease burden for PwT1D.

EPV271 / #229

E-Poster Viewing Topic: AS08. Insulin Pumps

GLYCATED HEMOGLOBIN AND BETA CELL FUNCTION IMPROVED AFTER EMPAGLIFLOZIN ADDITION ON INSULIN PUMP TREATMENT IN TYPE 2 DIABETICS

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Background and Aims: Empagliflozin, a selective inhibitor of sodium-glucose cotransporter 2 (SGLT2), has been shown to improve glycaemic control, insulin resistance and insulin-associated weight gain in type 2 diabetes mellitus (T2DM) patients. Here the efficacy of insulin pump treatment with empagliflozin therapy is evaluated in this population.

Methods: This was a single-center retrospective observational study. A total of 58 patient, whose T2DM was controlled by insulin pump (Diabecare DANA-i, Sooil Development Co., Ltd. Republic of Korea), was assigned to receive 10mg/day of empagliflozin. The primary end point was change from baseline in HbA1c after insulin pump treatment and empagliflozin therapy, respectively. Secondary end points were changes from baseline in insulin dose, BMI, creatinine and c-peptidogenic index after insulin pump treatment and empagliflozin therapy, respectively.

Results: Data from 58 patients were analyzed. For the population, mean $\pm$ SD of T2DM duration was 13.29 ± 7.20 years, mean $\pm$ SD of insulin pump treatment duration was 4.76 ± 4.51 years and mean $\pm$ SD of analyzed empagliflozin therapy duration was 0.47 ± 0.06 and 0.98 ± 0.14 years. Mean $\pm$ SD of HbA1c was changed from $9.31 \pm 1.78\%$ at initial visit to $7.30 \pm 0.96\%$ after insulin pump treatment and $6.60 \pm 0.67\%$ and $6.68 \pm 0.54\%$ after 6 and 12 months empagliflozin therapy added to insulin pump treatment ($p<0.001$). Furthermore, the c-peptidogenic index was increased ($p<0.001$) and insulin dose was decreased ($p<0.001$) after empagliflozin

therapy added to insulin pump treatment. The BMI and creatinine were stable during insulin pump treatment and empagliflozin therapy.

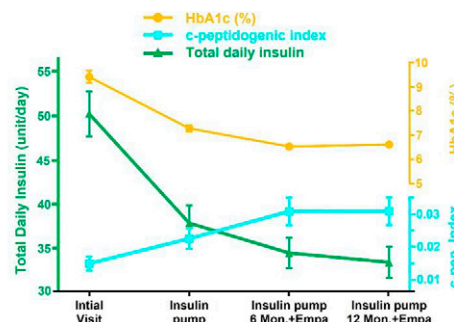


Figure 1. Empagliflozin added to insulin pump treatment improved glycaemic control ($p<0.001$), c-peptidogenic index ($p<0.001$) and insulin dosing ($p<0.001$).

Conclusions: Empagliflozin added to insulin pump treatment improved glycaemic control, c-peptidogenic index and insulin dosing in T2DM patients. Also, this therapy stabilized BMI and creatinine.

EPV272 / #1214

E-Poster Viewing Topic: AS08. Insulin Pumps

IMPROVED GLYCEMIC CONTROL WITH DEXCOM ONE CGM IN TYPE 1 DIABETES PATIENTS USING ACCU-CHEK SOLO MICRO PUMP: A MULTICENTER ARGENTINE STUDY

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Background and Aims: Introduction: Optimal management of type 1 diabetes requires tight glycaemic control. The combination of insulin pumps and continuous glucose monitoring (CGM) can enhance diabetes management. Objectives: To assess the changes in glycaemic parameters before and after at least 3 months of Dexcom One CGM use in type 1 diabetes patients on Accu-Chek Solo pump therapy.

Methods: This retrospective, multicenter study included 30 patients. Clarity data were analyzed, comparing the first 15 days vs. the last 15 days after 3+ months of CGM use. Parameters evaluated were Time in Range (TIR), Time Below Range (TBR), Time Above Range (TAR), Coefficient of Variation (CV), Glucose Management Indicator (GMI), and Mean Glucose.

Results: After 3 months, TIR increased from 52.4% to 64.1% ($p<0.01$), TAR decreased from 45.6% to 33.4% ($p<0.01$), and TBR remained stable at 2.9% vs 3.5%. GMI improved from 7.8% to 7.2% ($p<0.01$), CV decreased from 41.2% to 36.8% ($p<0.01$), and mean glucose decreased from 185.3 mg/dL to 167.9 mg/dL ($p<0.01$).

Conclusions: Using Dexcom One CGM with the Accu-Chek Solo pump improved glycaemic control, increasing time in range, reducing time above range, and decreasing mean glucose without increasing hypoglycemia. Future studies will help evaluate long-term changes and impact on quality of life.

EPV273 / #745

E-Poster Viewing Topic: AS08. Insulin Pumps

A REVIEW OF PATIENTS USING CONTINUOUS SUBCUTANEOUS INSULIN PUMP THERAPY (CSII) WITHIN THE NATIONAL SEVERE INSULIN RESISTANCE/LIPODYSTROPHY SERVICE (NSIRS)

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Background and Aims: Patients with diabetes secondary to lipodystrophy have associated severe insulin resistance and often require very high insulin doses. Reduced or complete lack of subcutaneous fat leads to discomfort on injecting large insulin volumes despite the use of concentrated insulins. We reviewed outcomes from 14 NSIRS patients who changed from multiple daily insulin injections to CSII.

Methods: Review of electronic medical notes, pump downloads and patient feedback.

Results: All insulin pumps were funded via individual funding requests. Reasons for exceptionality included high insulin doses, injection pain and absorption issues. U100 insulin was used in all patients. Pumps with larger volume capacity and steel/angled cannulas were used in all patients. Not all features of pump therapy were used. Most patients are using fixed mealtime boluses instead of carbohydrate counting. Two patients are using hybrid closed loop therapy with significant benefits. Insulin doses reduced from median pre-CSII 163 units/day (range 55-440U) to 127 units/day (range 30.5-200units/day) post commencing CSII. HbA1c reduced from median 57.5mmol/mol (range 39-133-mmol/mol) pre-CSII to 53mmol/mol (range 38-84mmol/mol) post commencing CSII. Patients reported improvement in quality of life and high treatment satisfaction. 2/14 patients have now stopped using CSII – one due to repeated cannula failures and one due to the frequency of blood glucose testing required. There were no serious adverse events directly related to CSII use.

Conclusions: CSII is beneficial for patients with lipodystrophy attending the NSIR service in reducing injection discomfort, improved quality of life, reduction in insulin doses and improved metabolic control.

EPV274 / #439

E-Poster Viewing Topic: AS08. Insulin Pumps

TUNING OPTIMIZATION FOR THE INSULET OMNIPOD 5 AMONG NEW PEDIATRIC USERS WITH TYPE 1 DIABETES

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Background and Aims: Type 1 Diabetes (T1D) is the most common form of diabetes among youth and young adults,

affecting over a million people in the U.S. The Insulet Omnipod 5 Automated Insulin Delivery system has demonstrated improved glycemic control for youth with T1D, however, this system is still dependent on provider and user tuning. This analysis aimed to understand parameter adjustments in a cohort of youth beginning OP5 therapy at a single center to see if patterns were correlated with improvements in TIR metrics.

Methods: Analysis was conducted for 53 youth (age 2-17 years) diagnosed with T1D, who started the OP5 AID system for routine diabetes management at Barbara Davis Center between January-November 2020. Multiple linear regression was used to evaluate the statistical relationship between adjustments made to one of the four OP5 AID system settings (I:C Ratio, Target Glucose Changes, CF Changes, and AIT Changes), with TIR and TBR recorded between two follow-up visits.

Results: Decreasing the target glucose was associated with a significant change in TIR (+6.4%; CI 0.03-13%; p=0.049). Raising the glucose target was not associated with a significant change in TIR. Strengthening or weakening the I:C ratio or the CF was not associated with a significant change in TIR. Neither increasing the glucose target nor decreasing the glucose target was associated with a significant change in TBR.

Conclusions: This analysis indicates that lowering the glucose target may help improve TIR without impacting TBR. Focus on this setting may aid OP5 users and their providers in optimizing performance of this AID system.

EPV275 / #1222

E-Poster Viewing Topic: AS08. Insulin Pumps

GLYCEMIC CONTROL IN PEOPLE LIVING WITH TYPE 1 DIABETES USING THE MEDTRONIC MINIMED™ 780 SYSTEM: RESULTS FROM THE GALAXY SERVICE IN GREECE

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Background and Aims: Background: The Galaxy project supports healthcare providers in managing clinical and device data for people with diabetes.

Objective: This analysis examines glycemic control, insulin use, and device settings in adults with Type 1 Diabetes (T1D) using the MiniMed™ 780G system across three hospitals in Greece.

Methods: Device data from the two weeks preceding the most recent clinic visit were used. Sensor usage below 70%

excluded subjects from the analysis. Subgroups were formed based on pump settings, and comparative analyses were applied.

Results: Data from 99 adults were analyzed (age 43.6 ± 14.8 years, 66.7% female). Mean HbA1c was $7.2 \pm 1.5\%$, with 43.5% having HbA1c $<7\%$. Mean Glucose Management Indicator (GMI) was 6.9 ± 0.5 . Median Time in Range (TIR) was 76.3 (69.9-83.0)% and Time Below Range was 1.2 (0.6-2.0)% (Figure 1). No significant differences in glycemic metrics were observed in subgroup analysis by age, sex, BMI, diabetes duration, or presence of complications. However, the optimal pump settings group (glucose target=100mg/dL and Active Insulin Time=2 hours) had lower GMI and higher Time in Tight Range ($6.7 \pm 0.2\%$ vs. $7.0 \pm 0.3\%$, $p=0.032$, 54.1% vs. 46.3%, $p=0.009$) without significant TBR difference. TIR was higher in the optimal settings group (81 [74.8-82.8]% vs. 76 [71.7-84.5]%), though the difference was not statistically significant ($p=0.2$).

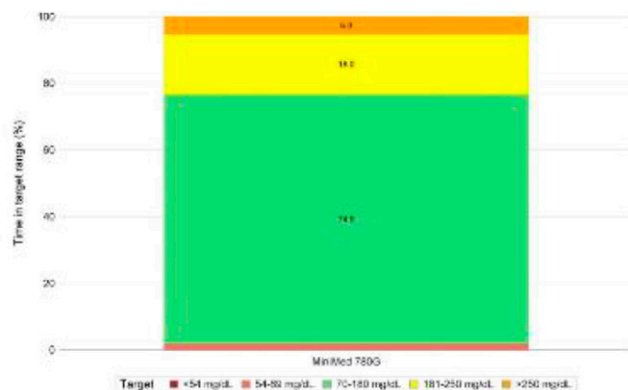


Figure 1.

Conclusions: These findings provide a comprehensive overview of the demographics, clinical profiles, and glycemic control of MiniMed™ 780G users in Greece and they are essential for understanding the impact of the system on type 1 diabetes management.

EPV276 / #1101

E-Poster Viewing Topic: AS08. Insulin Pumps

METRICS, SLEEP QUALITY AND HYPOGLYCEMIA AVOIDANCE BEHAVIORS IN TYPE 1 DIABETIC PATIENTS WITH DIFFERENT INSULIN THERAPIES

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Background and Aims: Glycemic variability is gaining greater relevance as a means to assess treatment effectiveness and quality of life in type 1 diabetic patients. Aim of the study was to evaluate the quality of glycemic control and its relationship with sleep, evaluated by Pittsburg Sleep Quality Index (PSQI) and hypoglycemia avoidance behaviours evaluated by HFS-II (hypoglycemia fear survey).

Methods: Cross-sectional observational study, 130 type 1 patients (68 females, 62 males, 43.77 ± 12.81 years, BMI

24.95 ± 4.57 kg/m², disease duration 23.23 ± 12.39 years, HbA1c $7.04 \pm 0.92\%$), divided in three groups: 1. Multiple daily injections (45 patients); 2. Traditional pumps (35 patients); 3. Advanced hybrid closed-loop systems (50 patients). Kruskal-Wallis test for independent samples was used to compare continuous variables among the groups. Fisher's exact test was used for categorical variables.

Results: Differences were observed for HbA1c ($p=0.03$), GRI ($p<0.001$), TIR ($p=0.004$), TBR54-69 ($p=0.048$), TAR ($p=0.05$), TAR>250 ($p=0.041$), TBR ($p=0.018$), CV ($p=0.012$), DS ($p=0.01$) the AHCL group showing better results. No differences were observed in the global score of PSQI and HFS-II among the groups. Daytime dysfunctions were positively correlated with GRI ($p=0.029$), GMI ($p=0.038$) and TAR ($p=0.033$). Habitual sleep efficiency was negatively correlated with TBR ($p=0.034$). As for sleep duration, a negative correlation with hypoglycemia was evidenced (TBR $p=0.002$; TBR54-69 $p=0.004$; TBR<54 $p=0.025$). Clinically relevant hypoglycemia avoidance behaviours showed a significant association with daytime dysfunctions ($p=0.01$).

Conclusions: Patients with worse glycemic control showed significantly higher daytime dysfunctions. AHCL systems were able to promote a reduction in daytime dysfunctions, hypoglycemia avoidance behaviours and metrics improvements.

EPV277 / #817

E-Poster Viewing Topic: AS08. Insulin Pumps

HIGH FAT-HIGH PROTEIN TOLERANCE IN ADOLESCENTS WITH TYPE 1 DIABETES USING AUTOMATED INSULIN DELIVERY SYSTEMS- PRELIMINARY RESULTS

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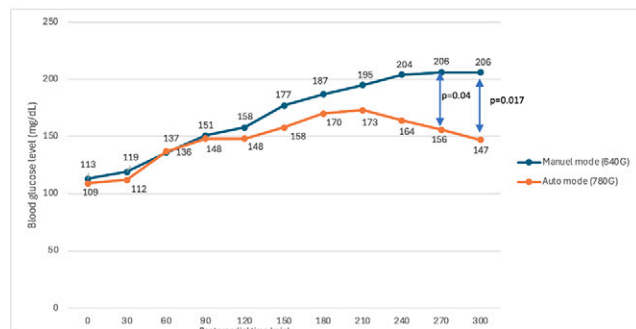
Background and Aims: AID systems contribute to metabolic control and manage glycemia in the absence of postprandial glucose excursions, however, factors related to nutrition, such as the accuracy of carbohydrate intake and protein and fat content of the meal, may cause postprandial hyperglycemia. This study aims to determine the ability of AID to manage the hyperglycemic response that may occur after high protein-high fat meals in adolescents with T1D.

Methods: This prospective cross-controlled study was conducted between January and September 2024 with 9 adolescents aged 9-18 years, with diabetes age ≥ 1 year, using the AID system for at least 6 months. In the study, participants consumed DrOetker Ristorante PizzaMista® containing 92 g carbohydrate, 33 g protein, 41 g fat as a test meal, twice manually and twice in automatic mode, and blood glucose values were monitored with a CGMS postprandial 5 hours.

Results: The median age of the subjects was 16.2, diabetes duration was 3.7 years. Baseline TIR of the participants was

78.6±8.7%,TAR was 19.6±9,TBR was 1.9±1.7,CV was 32.1±4.3%,insulin dose was 0.9±0.4 U/kg and basal insulin ratio was %38.2±5.8.As a result of the preliminary analysis of the CGMS data of postprandial 5 hours,there was no difference between manual and auto modes between 0-2.and 0-4.hours, while it was lower at 270th and 300th minutes in auto mode.

Figure 1: Postprandial blood glucose levels in manual and auto modes



Conclusions: Individuals with T1D using the AID may require strategies to manage the glycemic response after high-fat,high-protein meals, and recommendations may be specific to individuals with diabetes. Further research is needed to understand the adjustments that may be required and to help the diabetes team predict the hyperglycemic response that occurs after such meals.

EPV278 / #207

E-Poster Viewing Topic: AS08. Insulin Pumps

REAL-WORLD CSII DATA OF 13,827 FRENCH T1D USERS OF A PATCH PUMP SYSTEM FROM A CLOUD-BASED DATA MANAGEMENT PLATFORM

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Background and Aims: Exploring the use of insulin pumps and continuous glucose monitors (CGMs) in France, this study aimed to describe the use and performance of the Omnipod DASH[®] Insulin Management System, using data collected from the most widely used telemedecine platform in France.

Methods: Data from individuals with ≥90 days of Omnipod DASH[®] use uploaded to the MyDiabby Healthcare[®] platform since January 1, 2020, were collected. Glycemic parameters were analyzed when ≥15.5% of days contained ≥ 70% CGM data. Results are presented as median (IQR).

Results: Of the 15,643 users included, 13,827 (93.6%) had type 1 diabetes (T1D) (age 31 years [16-48], 55% female) and their data were analyzed. Users wore the system for 93.3% (78.3 - 99.7) of the time during a follow-up period of 534 (332-740) days. Daily insulin doses were 31.9 IU (22.4-41.9), with 67% (52-78) delivered as boluses over 4 injections per day (3-5). The insulin pod was replaced every 3.1 days (2.8-3.7). Time in

range (TIR, 70-180 mg/dL) was 53% (43-63) with 12.6% of users achieving the target of ≥70%. Users spent 3.7% (2.1-6.1) of the time below range (TBR <70 mg/dL). Glucose management indicator (GMI) was 7.5% (7.1-8.0) with 20.5% of users achieving the target GMI <7%.

Age Group, yrs.	Total	2-5	6-11	12-17	18-24	25-49	50-64	≥65
N (%)	13,827 (100%)	93 (0.7%)	1,437 (10.4%)	2,642 (19.1%)	1,502 (10.9%)	4,747 (34.3%)	2,305 (16.7%)	1,101 (8.0%)
Total use time, days	534.0 (332.0 - 740.0)	402.0 (265.0 - 624.0)	506.0 (315.0 - 744.0)	572.0 (355.0 - 786.0)	539.5 (330.0 - 737.0)	526.0 (329.0 - 726.0)	531.0 (335.0 - 730.0)	519.0 (333.0 - 721.0)
GMI, %	7.5 (7.1 - 8.0)	7.4 (7.1 - 8.0)	7.6 (7.3 - 8.0)	7.8 (7.3 - 8.2)	7.8 (7.3 - 8.3)	7.4 (7.0 - 7.9)	7.3 (7.0 - 7.7)	7.2 (6.9 - 7.6)
CGM time in range, %								
< 54 mg/dL, %	0.5 (0.2 - 1.1)	0.7 (0.3 - 1.4)	0.5 (0.2 - 0.9)	0.6 (0.3 - 1.2)	0.6 (0.3 - 1.2)	0.5 (0.2 - 1.1)	0.5 (0.2 - 1.0)	0.3 (0.1 - 0.8)
< 70 mg/dL, %	3.7 (2.1 - 6.1)	3.9 (2.8 - 5.8)	4.0 (2.4 - 6.1)	4.0 (2.3 - 6.4)	3.7 (2.1 - 6.1)	3.7 (2.0 - 6.2)	3.6 (2.0 - 5.8)	3.1 (1.7 - 5.2)
70-180 mg/dL, %	52.5 (43.4 - 62.5)	54.9 (41.9 - 64.0)	50.4 (43.5 - 58.3)	47.0 (39.7 - 55.8)	47.0 (38.0 - 57.4)	53.6 (44.5 - 63.7)	57.1 (48.6 - 65.8)	61.0 (53.2 - 69.6)
≥180 mg/dL, %	42.7 (32.4 - 52.2)	40.4 (31.8 - 52.6)	44.6 (36.2 - 52.0)	47.9 (38.9 - 56.6)	48.3 (37.4 - 58.0)	41.3 (30.7 - 51.4)	38.5 (29.3 - 47.6)	34.9 (26.0 - 43.6)
≥250 mg/dL, %	16.0 (8.9 - 24.9)	5.4 (9.5 - 28.5)	19.9 (13.4 - 26.8)	21.9 (14.3 - 30.1)	21.0 (12.2 - 31.4)	14.3 (7.8 - 22.7)	11.9 (6.8 - 18.9)	9.6 (5.2 - 15.3)
Total daily dose, U/day	31.9 (23.4 - 41.9)	10.5 (8.0 - 12.2)	18.8 (14.3 - 24.8)	37.4 (28.8 - 45.7)	36.0 (28.6 - 44.8)	32.0 (24.7 - 41.4)	32.0 (23.9 - 40.8)	29.7 (21.9 - 40.8)
Daily basal dose, U/day	9.1 (6.1 - 12.9)	2.5 (1.8 - 3.7)	5.1 (3.7 - 6.9)	10.8 (7.8 - 14.0)	11.1 (7.8 - 14.9)	9.7 (6.9 - 13.3)	9.2 (6.5 - 12.9)	7.3 (4.8 - 10.6)
Daily bolus dose, U/day	21.6 (14.9 - 29.9)	7.6 (5.7 - 8.8)	13.6 (10.0 - 18.0)	25.7 (19.1 - 32.1)	24.4 (17.6 - 29.4)	21.5 (15.1 - 28.4)	22.1 (15.2 - 30.4)	21.4 (15.3 - 29.9)
Daily boluses, N	4.3 (3.5 - 5.4)	5.5 (4.4 - 7.4)	5.0 (4.3 - 6.0)	4.2 (3.5 - 5.1)	3.8 (3.0 - 4.8)	4.2 (3.3 - 5.3)	4.3 (3.4 - 5.4)	4.3 (3.5 - 5.5)

Results are presented as median (IQR). CGM = continuous glucose monitor, Time in range = TIR; TBR = Time below range; TAR = Time above range

Conclusions: This first large real-world analysis of insulin pump use and CGM in France confirms sustained recommended use of Omnipod DASH[®] in individuals with T1D according to clinical guidelines. Tubeless insulin therapy with Omnipod DASH[®] provides and supports favorable glycemic control including among adolescents and elderly populations.

EPV279 / #876

E-Poster Viewing Topic: AS08. Insulin Pumps

REAL-WORLD CSII DATA OF 934 FRENCH T2D USERS OF A PATCH PUMP SYSTEM FROM A CLOUD-BASED DATA MANAGEMENT PLATFORM

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Background and Aims: Exploring the use of insulin pumps and continuous glucose monitors (CGMs) in France, this study aimed to describe the use and performance of the Omnipod DASH[®] Insulin Management System, using data collected from the most widely used telemedecine platform in France.

Methods: Data from individuals with ≥90 days of Omnipod DASH[®] use uploaded to the MyDiabby Healthcare[®] platform since January 1, 2020, were included. Glycemic parameters were analyzed when ≥15.5% of days contained ≥ 70% CGM data. Results are presented as median (IQR).

Results: Of the 15,643 included users, 934 (6.4%) had type 2 diabetes (T2D) (age 62 years [53-69], 43% female) and their data were analyzed. Users wore the system 93.0% (77.7 - 99.6) of the time during a follow-up period of 472 days (282-675).

Daily insulin doses were 36.7 IU (26.9-47.7), with 66.9% (52.7-78.4) delivered as boluses, across 3 injections (3-4) per day. The device was replaced every 3.1 days (2.9-3.8). Time in range (TIR, 70-180 mg/dL) was 66.8% (54.0-77.8) with 42.7% of users achieving the target of $\geq 70\%$. Users spent 1.5% (0.6-3.2) of the time below range (TBR<70 mg/dL). Glucose management indicator (GMI) was 7.1% (6.8-7.6), with 40.9% of users achieving the target GMI <7%.

Age Group, yrs.	Total	15-25	26-49	50-64	≥ 65
N (%)	934 4 (0.4%)	145 (15.5%)	368 (41.5%)	397 (42.5%)	397 (42.5%)
Total use time, days	485.0 (300.0 - 686.8)	470.0 (349.5 - 552.8)	379.0 (230.0 - 580.0)	500.0 (309.8 - 674.3)	521.0 (316.0 - 716.0)
Glucose management indicator (GMI), %	7.1 (6.8 - 7.6)	7.4 (7.0 - 8.0)	7.2 (6.8 - 7.7)	7.2 (6.8 - 7.6)	7.1 (6.8 - 7.5)
CGM Time in Range, %					
< 54 mg/dL, %	0.1 (0.0 - 0.4)	0.7 (0.1 - 1.8)	0.2 (0.0 - 0.4)	0.2 (0.1 - 0.4)	0.1 (0.0 - 0.4)
< 70 mg/dL, %	1.5 (0.6 - 3.2)	4.1 (1.2 - 6.8)	1.5 (0.6 - 3.1)	1.5 (0.7 - 3.3)	1.5 (0.6 - 3.2)
70-180 mg/dL, %	66.8 (54.0 - 77.8)	53.4 (43.4 - 63.2)	65.1 (51.6 - 78.0)	64.2 (53.3 - 76.7)	68.4 (57.0 - 78.8)
≥ 180 mg/dL, %	30.9 (20.5 - 43.3)	42.9 (31.4 - 54.3)	32.8 (20.6 - 47.1)	32.7 (22.1 - 44.3)	29.3 (19.2 - 40.8)
≥ 250 mg/dL, %	6.5 (2.5 - 14.0)	9.8 (5.9 - 18.8)	6.5 (2.1 - 17.7)	7.2 (3.1 - 14.8)	5.3 (1.9 - 12.0)
Total daily dose, U/day	36.9 (27.3 - 48.2)	41.1 (38.8 - 46.5)	39.2 (29.9 - 47.7)	35.8 (26.7 - 46.6)	37.5 (27.0 - 50.0)
Daily basal dose, U/day	11.7 (7.4 - 17.1)	14.9 (13.2 - 16.3)	12.5 (7.7 - 17.2)	12.1 (7.6 - 17.5)	11.0 (7.0 - 16.1)
Daily bolus dose, U/day	23.8 (14.2 - 33.4)	27.2 (26.5 - 30.3)	25.2 (17.0 - 33.2)	21.5 (13.0 - 31.6)	24.7 (14.8 - 35.0)
Daily boluses, N	3.1 (2.8 - 3.8)	3.1 (2.6 - 3.8)	3.2 (2.8 - 3.6)	3.0 (2.5 - 4.0)	3.0 (2.5 - 3.6)

Results are presented as median (IQR). CGM = continuous glucose monitor, Time in range = TIR; TBR = Time below range; TAR = Time above range

Conclusions: This first large real-world assessment of insulin patch pump use and CGM in France by people with T2D, including 42.5% elderly patients, confirms good glycemic control and persistent use according to clinical guidelines. Many T2D patients, require low insulin doses, suitable for patch pump therapy, with good metabolic control.

EPV280 / #1212

E-Poster Viewing Topic: AS08. Insulin Pumps

IMPACT OF AUTOMATED INSULIN DELIVERY SYSTEMS ON GLYCEMIC CONTROL IN T1DM: A 12-MONTH RETROSPECTIVE COHORT STUDY

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Background and Aims: Technological developments in T1DM have been growing exponentially. One of the latest advances is automated insulin delivery (AID) systems, which have been shown to improve glycemic control and quality of life. This study aimed to compare the glycemic control of patients with T1DM before and after the implementation of AID systems.

Methods: This retrospective cohort study included T1DM individuals who transitioned from traditional insulin pumps to the Medtronic MinimedTM 780G AID system, between January 2022 and January 2024. Glycemic control data were collected via LibreView and CareLinkSystem at baseline, and 3, 6, and 12 months after the transition.

Results: 38 patients were included (55.3% male, median age 34.26 $\pm$ 9.39 years). By 12 months, only 27 patients were analyzed, as 11 had the system for less than a year. All glycemic control parameters improved from baseline to 3, 6 and 12 months ($p < 0.05$). Interestingly, there were no statistically significant differences between the three time points. Overall, Time in Range (TIR) increased by $\sim 15\%$ and Time in Tight Range (TTIR) by $\sim 10-12\%$. Time Above Range (TAR) decreased by $\sim 12\%$,

level 2 hyperglycemia decreased $\sim 8\%$. Time Below Range (TBR) also dropped by $\sim 3-4\%$. The Glycemic Management Indicator (GMI) decreased by $\sim 0.3-0.4\%$ and the coefficient of variation had a $\sim 7\%$ reduction.

Conclusions: This study confirms the efficacy of AID systems in managing T1DM, showing improvements in all analyzed metrics, with statistical significance. It also demonstrated that the beneficial effects are prompt and sustained over time, for at least up to 1 year of follow-up.

EPV281 / #684

E-Poster Viewing Topic: AS08. Insulin Pumps

TEMPORAL TRENDS AND CONTEMPORARY USE OF INSULIN PUMP THERAPY FOR PATIENTS WITH TYPE 1 DIABETES IN JAPAN

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Background and Aims: Insulin pump and automated insulin delivery system were associated with better glycemic control and lower incidence of severe hypoglycemia, and, thus, are recommended for diabetic management in patients with type 1 diabetes (T1DM) in various guidelines. This study aimed to investigate the temporal trends and current situation in the use of insulin pump therapy in Japan.

Methods: We estimated the number of patients with T1DM using insulin pump therapy from fiscal years 2014 to 2022 using the National Database of Health Insurance Claims and Specific Health Checkups of Japan Open Data.

Results: The rate of patients using insulin pump therapy increased from 4.2% in 2014 to 8.1% in 2022. The highest rate was 44.3% in patients with age 10-19 years, followed by patients with age 0-9 years at 43.6%. In patients with age 20-29 years, the rate was only 20.4% and decreased gradually in older age groups. Among the patients with insulin pump therapy, the rate of sensor-augmented pump (SAP) increased from 33.1% in 2018 to 43.7% in 2022.

Conclusions: Since 2014, insulin pump use has continuously increased, especially in patients aged <20 years. SAP use has also risen. However, the rate of insulin pump use in patients with T1DM is still low in Japan compared with that in Western countries.

EPV282 / #1165

E-Poster Viewing Topic: AS08. Insulin Pumps

ADVANCES IN INSULIN THERAPY FOR JAPANESE PEDIATRIC AND ADOLESCENT TYPE 1 DIABETES REVEALED BY THE 2018 COHORTS OF JSGIT

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Background and Aims: In recent years, advances in insulin therapy for type 1 diabetes mellitus (T1D) have been seen. JSGIT is a multicenter prospective cohort study. This study identifies advances in the treatment of pediatric and adolescent T1D from the fifth cohort study conducted from 2018 to 2023.

Methods: A total of 1151 cases were enrolled from 71 centers. The mean age at onset was 6.8 years; the age at registration was 12.2 years. The cohort study consisted of 15 periods of follow-up over a 5-year period, with one period of 4 months. In this study, insulin administration method, blood glucose (BG) monitoring method, and HbA1c were examined from the first period (2018, 1151 cases) to the 15th period (2023, 731 cases).

Results: Insulin administration methods were pen injectors 759 (65.9%), CSII 234 (20.0%), and SAP 158 patients (13.7%) in the first period. In the 15th period 414 (56.6%), 189 (25.9%), and 128 (17.5%), respectively, with CSII and SAP increasing. According to BG monitoring methods, in the first period, 628 (57.4%) were conventional devices, 310 (28.3%) were intermittently scanned continuous glucose monitoring (isCGM), 0 were real-time continuous glucose monitoring (rtCGM), and 156 (14.3%) were SAP. In the 15th period, 276 (37.9%), 311 (42.7%), and 17 (2.3%), and 126 (17.3%), respectively, with a large increase in isCGM. The mean HbA1c did not change from 8.0±1.1% in period 1 to 8.1±1.2% in period 15.

Conclusions: The use of advanced therapies has become widespread over the past five years. We look forward to further progress in insulin therapy.

EPV283 / #807

E-Poster Viewing Topic: AS08. Insulin Pumps

CHANGES IN BODY MASS INDEX IN PERSONS WITH TYPE 1 DIABETES MELLITUS USING THE MINIMED 780G AID SYSTEM

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Background and Aims: Automated insulin delivery (AID) systems are dramatically improving glycemic control in persons with type 1 diabetes (PWDs). However, not much is known yet about the effects of AID systems use on weight. We aimed to evaluate changes in body mass index (BMI) of PWDs of all ages who started using the MiniMed 780G (MM780G) AID system at the Diabeter clinic.

Methods: Real-world retrospective study of PWDs with ≥1 year diabetes duration who started using the MM780G system from April 2022 at the Diabeter clinic. Clinical data was extracted from Diabeter's electronic health records and start of automode from CareLink Personal. Baseline BMI Z-scores (age <21 years) and BMI (age ≥21 years) before AID enrollment were compared with the last available BMI measurement within 1 year after starting on the MM780G system.

Results: Our study included 550 PWDs with median (IQR) age of 21.3 (16.3–26.2) years, 53% female. Mean (SD) changes were +0.20 (0.36) for the BMI z-score (<21y) and +0.43 (1.26) kg/m² in BMI (≥21y) groups. The table shows both age groups stratified for decreased, unchanged and increased BMI z-score and BMI, respectively and for sex.

	<21 years (n=225)			≥21 years (n=325)		
	Decreased BMI z-score (< -0.05)	No Change in BMI z-score (-0.05 to +0.05)	Increased BMI z-score (> +0.05)	Decreased BMI (< -0.2)	No Change in BMI (-0.2 to +0.2)	Increased BMI (> +0.2)
n (%)	43 (19)	34 (15)	148 (66)	4 (29)	62 (19)	169 (52)
Sex, % female	56	50	48	55	50	58
Age, years, median (IQR)	16.2 (12.0–17.4)	14.9 (11.8–17.9)	15.5 (12.7–17.4)	24.3 (22.0–31.1)	25.4 (21.7–31.0)	24.6 (22.5–29.8)
Age category <21 years, %						
<13 years	30	27	22	NR	NR	NR
≥13 years	70	73	78			
Age category ≥21 years, %						
<30 years	NR	NR	NR	67	71	74
≥30 years				33	29	26
BMI Z-score change (<21 years), mean (SD)	-0.27 (0.21)	0.00 (0.03)	0.33 (0.28)			
Male	-0.32 (0.28)	0.01 (0.03)	0.43 (0.31)			
Female	-0.23 (0.13)	-0.02 (0.03)	0.35 (0.24)	NR	NR	NR
<13 years	-0.24 (0.10)	0.02 (0.03)	0.38 (0.23)			
≥13 years	-0.28 (0.24)	0.00 (0.03)	0.38 (0.29)			
BMI change (≥21 years), mean (SD) kg/m ²				-0.87 (0.70)	0.01 (0.11)	1.30 (1.00)
Male				-0.79 (0.75)	0.03 (0.12)	1.30 (0.80)
Female	NR	NR	NR	-0.93 (0.66)	0.00 (0.11)	1.30 (1.13)
<30 years				-0.87 (0.70)	-0.02 (0.11)	1.41 (1.10)
≥30 years				-0.86 (0.71)	-0.04 (0.12)	1.00 (0.67)

NR: Not relevant

Conclusions: In both age groups at least half of the PWDs showed increased weight after initiation of AID. Since reduced hyperglycemia prevents loss of calories, future analyses should identify those individuals at risk and the factors associated with weight increase by assessing food behavior, diets as well as multiple variables associated with the therapy.

EPV284 / #1115

E-Poster Viewing Topic: AS08. Insulin Pumps

FIRST EXPERIENCES WITH MICROPUMPS IN BRAZIL: PILOT STUDY IN 11 ADULTS AND 5 PEDIATRIC T1PWD

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Background and Aims: The introduction of patch pumps and micropumps has contributed to breaking down barriers to CSII use. A heterogeneous group of patients, previously treated with MDI or durable pumps, started Accu-Chek SOLO (ACS) therapy. After 6 months, metabolic and satisfaction data were collected.

Methods: Data from 11 adult and 5 pediatric patients with T1D were analyzed, from March to October 2023. After 6 months of therapy, change in diabetes treatment satisfaction was measured by DTQ and DTSQ. Diabetes distress was measured by the PAID questionnaire. Changes in HbA1c and safety events were assessed during this period.

Results: At 6 months, the mean DTQ score was 4.09 ± 0.76 . The mean DTSQ treatment satisfaction score increased from 26.6 points at baseline to 33.1 points ($p = 0.006$). PAID score reduced - 4.5 points ($p = 0.13$). The mean HbA1c decreased from $7.11 \% \pm 1.45$ to $6.68 \% \pm 0.55$ (-0.43% pt, $p = 0.06$). No events of SH (assistance needed) and DKA were reported during this period.

Conclusions: The switch from previous therapy to ACS led to a significant improvement of subjects' treatment satisfaction and reduction of diabetes burden among people with T1D. Prospective studies should be done to confirm the findings.

EPV285 / #664

E-Poster Viewing Topic: AS08. Insulin Pumps

POSTPRANDIAL GLUCOSE RESPONSE TO SOLID VS. LIQUID MEALS WITH IDENTICAL MACRONUTRIENT COMPOSITION WITH AHCL SYSTEM

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Background and Aims: Meal composition significantly impacts glycemic control in type 1 diabetes (T1D). However, the effect of meal texture on postprandial glucose response in patients using advanced hybrid closed-loop systems remains unclear. This study aimed to compare postprandial glucose responses to solid and liquid meals with identical macronutrient composition in T1D patients using the Medtronic MM780G system.

Methods: Thirteen adults with T1D completed two meal challenges: a solid meal (sandwich) and a liquid meal (shake), each containing 50g carbohydrates, 14g protein, and 12g fat. Challenges were conducted on the same weekday morning after fasting. Postprandial glucose metrics were analyzed for 4 hours post-meal using the MM780G system.

Results: The liquid meal resulted in significantly higher glucose variability ($SD\ 42.3$ vs 29.1 mg/dL, $p=0.01$) compared to the solid meal. Peak glucose rise from baseline was higher for the liquid meal (109.1 vs 70.0 mg/dL, $p=0.04$). The 1-hour postprandial glucose increase was greater for the liquid meal (49.4 vs 12.8 mg/dL, $p=0.01$). Liquid meals led to larger postprandial area under the curve at 0-2 hours (6027.3 vs 2895.7 min $\times$ mg/dL, $p=0.01$) and 0-4 hours (13308.3 vs 6909.5 min $\times$ mg/dL, $p=0.002$). Time in range (70 - 180 mg/dL) was lower for liquid meals, though not statistically significant (54.1% vs 72.8% , $p=0.15$).

Conclusions: Despite identical macronutrient composition, liquid meals resulted in higher glucose excursions and variability compared to solid meals in T1D patients using advanced hybrid closed-loop systems. These findings suggest that meal texture significantly influences postprandial glucose response and should be considered in diabetes management strategies.

EPV286 / #198

E-Poster Viewing Topic: AS08. Insulin Pumps

LONG-TERM HEALTH ECONOMIC EVALUATION OF ADVANCED HYBRID CLOSED-LOOP SYSTEM COMPARED WITH ISCGM AND CSII IN A REAL-WORLD SETTING IN FINNISH INDIVIDUALS WITH TYPE 1 DIABETES

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Background and Aims: Use of advanced hybrid closed loop pumps (AHCL) correlates with improved glycemic control in people with type 1 diabetes (T1D). AHCL pumps are more expensive than other treatment modality in T1D. The aim of our study was to evaluate the long term cost-effectiveness of the (AHCL) Minimed 780G system versus intermittently scanned continuous glucose monitoring (isCGM) plus continuous subcutaneous insulin infusion (CSII) in people with T1D in Kuopio University Hospital, Finland.

Methods: Whole study included 336 patients (mean age = 26.7, SD = 15.9 years) and duration of diabetes was 16.6 years. Outcomes were projected in base case of 50 years using the IQVIA CORE Diabetes Model (v10.0). Clinical data were sourced from electronic health records, including changes in glycated hemoglobin and events of hypoglycemia and ketoacidosis. Costs were expressed in Euros (EUR).

Results: The Minimed 780G system was associated with improvement in quality-adjusted life expectancy of 2.3 quality-adjusted life years (QALYs) versus isCGM plus CSII. These benefits came from the delayed and reduced incidence of diabetes-related complications. Mean of the glycated hemoglobin improvement was 12.1 mmol/mol ($SD = 11.7$ mmol/mol) in AHCL group. Direct costs were estimated to be 26,076 EUR higher with the Minimed 780G, and it was associated with an incremental cost-effectiveness ratio (ICER) of 11,184 EUR per QALY gained.

Conclusions: Based on this study and the willingness-to-pay threshold of 50,000 EUR per QALY gained, the Minimed 780G system is cost-effective versus isCGM plus CSII for the treatment of T1D in a real-world setting in Finland.

EPV287 / #972

E-Poster Viewing Topic: AS08. Insulin Pumps

REAL-LIFE GLYCEMIC OUTCOMES TWO YEARS AFTER INITIATION OF MINIMED 780G CLOSED LOOP SYSTEM IN ADULTS WITH TYPE 1 DIABETES PREVIOUSLY USING MINIMED 640G

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Background and Aims: The objective is to evaluate the efficacy of MM780G compared to MM640G at 6, 12 and 24 months of treatment based on glycosylated hemoglobin (HbA1c) reduction and continuous glucose monitoring (CGM) outcomes.

Methods: Retrospective cross-sectional study. Data were collected from 72 patients at Hospital Clínico San Carlos with MM680G, previously treated with MM640G. Statistical analysis was performed using the SPSS program.

Results: 72 patients were included, being 49 women (68.1%). Mean age was 46.9 years (SD ± 13.1) with a median duration of diabetes of 32 years (IR 32-51). Mean HbA1c with MM640G was 7.4%; after 24 months with MM780G HbA1c was 6.9% (diff-0.5%). At 24 months with MM780G, 62% of patients had HbA1c <7%, while with MM640G, only 26% of patients reached this target. No severe hypoglycemia or ketoacidosis was observed. Also other glucometric variables were analyzed and all results showed statistically significant differences compared to MM640G.

Table 1. Results measured by 14-day GCM.

	MM640G	6 months	12 months	24 months
HbA1c% X, SD	7,4(± 0.7)	6,9($\pm 0,5$)	6,9($\pm 0,6$)	6,9($\pm 0,6$)
TIR X,SD	66(± 13)	79(± 9)	79(± 9)	80(± 7)
TBR1 Me, RI	2(1-4)	1(1-2)	1(1-2)	1(1-2)
TBR2 Me, RI	1(0-1)	1(0-1)	0(0-0)	0(0-0)
TAR1 X,SD	22(± 10)	15(± 7)	15(± 7)	15(± 7)
TAR2 Me, RI	6(2-10)	2(1-4)	2(1-5)	2(1-4)
CV X,SD	34,6($\pm 5,9$)	32,0($\pm 5,0$)	31,1($\pm 6,6$)	30,9($\pm 4,4$)
GMI X,SD	7,0($\pm 0,5$)	6,8($\pm 0,4$)	6,6($\pm 0,3$)	6,6($\pm 0,3$)

Conclusions: Patients who were changed from MM640G to MM780G showed a statistically significant improvement in HbA1c and glycemic parameters. Our findings are consistent with previous scientific literature.

EPV288 / #430

E-Poster Viewing Topic: AS08. Insulin Pumps

FAST-ACTING INSULIN ASPART IN ADULTS USING AN ADVANCED HYBRID CLOSED LOOP SYSTEM

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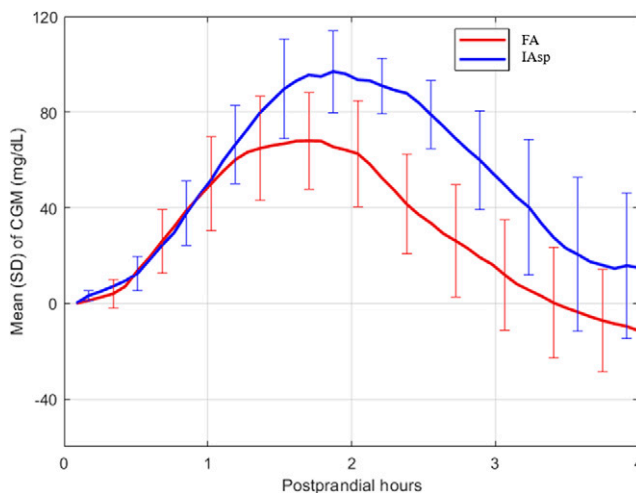
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Background and Aims: In T1D managed with manual insulin pumps, ultra-rapid acting insulin analogs provide improved glycemic control compared to rapid acting insulins, but less is known about how newer insulins perform in advanced hybrid closed loop (AHCL) systems.

Methods: In a study involving 14 adults with T1D, we evaluated glycemic control during two-week study phases comparing MiniMedTM 780G performance while utilizing fast-acting

insulin aspart (FA) insulin aspart (IAsp). Subjects were instructed to announce all meals with more than 80 g CHO and announce at will for smaller meals.

Results: Mean age was 45.7 $\pm$ 12.4 and ten participants were male (71%). Mean baseline HbA1c was 6.8% $\pm$ 1.2% and TIR⁷⁰⁻¹⁸⁰ 67.5% $\pm$ 16.7% on sensor augmented pump therapy. Comparing the FA to the IAsp phase, GMI was identical (6.7 $\pm$ 0.4%), and time in different glycemic ranges were similar, including TAR (19 $\pm$ 12% vs. 19 $\pm$ 11%, p = 0.94), TIR⁷⁰⁻¹⁸⁰ (78 $\pm$ 11% vs. 77 $\pm$ 10%, p=0.73), and TBR (2.8 $\pm$ 2.7% vs. 3.4 $\pm$ 2.6%, p=0.10). Yet there was a trend for less time in level 2 hypoglycemia in the FA vs. the IAsp phase (0.5 $\pm$ 0.7% vs. 0.7 $\pm$ 0.8%, p=0.058). Comparing 4-hour post-prandial glycemic excursions after a liquid meal with 47g CHO in the FA vs. the IAsp phase, there was no difference between post-prandial glucose peak from baseline (77 $\pm$ 47mg/dl vs. 100 $\pm$ 50mg/dl, p=0.24). Yet FA demonstrated significantly improved post-prandial glycemia, according to TIR⁷⁰⁻¹⁸⁰ of 80 $\pm$ 21% vs. 61 $\pm$ 20% with IAsp (p=0.049). Post-meal test glucose.



Conclusions: While FA is associated with similar overall glycemic control to IAsp in AHCL, its use corresponds to more TIR⁷⁰⁻¹⁸⁰ after a meal challenge.

EPV289 / #915

E-Poster Viewing Topic: AS08. Insulin Pumps

TREATMENT-INDUCED NEUROPATHY IN DIABETES POST USE OF HYBRID CLOSED LOOP CONTINUOUS SUBCUTANEOUS INSULIN INFUSION IN TYPE 1 DIABETES

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Background and Aims: Treatment-induced neuropathy in diabetes (TIND) is a transient, painful peripheral neuropathy, occasionally with autonomic component, occurring with rapid glycaemic improvement. Hybrid closed loop (HCL) continuous subcutaneous insulin infusion (CSII) in type 1 diabetes (T1D) can improve glucose levels rapidly.

Methods: Retrospective review of two cases. Case 1: 27-year-old male, T1D for 16years, disengagement, maculopathy, switched from basal-bolus insulin to HCL-CSII(Omnipod5-DexcomG6). Case 2: 44-year-old female, T1D for 42years, disengagement, laser treated retinopathy, neuropathy, toe amputation, switched from basal-bolus insulin to HCL-CSII(Omnipod5-DexcomG6).

Results: Case 1: Pre-HCL HbA1c107mmol/mol. 3months post HCL HbA1c 69mmol/mol. He reported neuropathic pain in lower limbs, commenced amitriptyline for 3months with resolution. He also developed proliferative retinopathy. Case 2: Pre-HCL HbA1c96mmol/mol improved to 54mmol/mol in 6months. She developed severe neuralgic pain in both feet, improved with Pregabalin for 3months. There was no deterioration in retinopathy.

Conclusions: TIND is more common in T1D, pathophysiology may be endoneurial ischaemia and microvascular changes due to relative hypoglycaemic state. Diagnostic criteria include (i)decrease in HbA1c by 2%(22mmol/mol) over 3months (ii)neuropathic pain and/or autonomic symptoms within 8weeks after decrease in HbA1c (iii)acute onset of neuropathic pain and/or autonomic dysfunction for more than 2weeks requiring medical attention. It is self-limiting, lasting from weeks to months. Symptomatic treatment include antiepileptics(pregabalin) and tricyclic antidepressants are effective. There are no reported cases of TIND with HCL-CSII in literature. Our two cases highlight TIND, like worsening retinopathy, is a potential complication of rapid improvement in glycaemic control with HCL-CSII in patients with pre-existing hyperglycaemia and patients' needs counselling about the potential short-term risks.

EPV290 / #928

E-Poster Viewing Topic: AS08. Insulin Pumps

IS THERE A CORRELATION BETWEEN HYBRID CLOSED LOOP(HCL) CONTINUOUS SUBCUTANEOUS INSULIN INFUSION(CSII) GLYCAEMIC IMPROVEMENT IN TYPE 1 DIABETES(T1D) AND WORSENING SENSORINEURAL HEARING LOSS?-A CASE REPORT

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Background and Aims: T1D is associated with various comorbidities, including sensorineural hearing loss (SNHL). HCL CSII treatment in T1D improves glucose levels rapidly. This may cause short-term worsening of retinopathy and neuropathy (treatment-induced neuropathy in diabetes). We present a case of T1D on HCL CSII with worsening hearing loss.

Methods: A 46-year-old gentleman with T1D for 30 years with pre- proliferative retinopathy had mild right sided tinnitus and sensorineural hearing loss (on pure tone audiometry) diagnosed 8 years ago. MRI internal auditory meatus was normal. He was commenced on HCL CSII (Omnipod 5 with Dexcom G6).

Results: Pre-HCL HbA1c was 75mmol/mol. Glucose management indicator (GMI) after 4weeks rapidly dropped to

53mmol/mol which further reduced to 48mmol/mol in 6months. He reported worsening of right sided tinnitus and hearing loss with development of new left sided tinnitus. He also developed maculopathy.

Conclusions: Approximately 9.2/1000 people with T1D develop debilitating SNHL every year. In people aged 40-60-years with T1D, hearing threshold in high frequencies(4,000–8,000Hz) was significantly higher (25-30dB) when compared to age-matched controls (5–10dB). The mechanisms are damage to outer and inner hair cells, loss of spiral ganglion neurons through apoptosis, thickening of basement membrane, and pathologies involving stria vascularis and spiral ligament of the cochlear lateral wall. Whilst causality cannot be inferred from this case, the temporal sequence of rapidly improved glycaemic control with worsening tinnitus and hearing loss raises a possibility of its association. This requires further study, preferably with pure tone audiometry, in a randomised clinical trial setting.

EPV291 / #973

E-Poster Viewing Topic: AS08. Insulin Pumps

EFFECTS OF TECHNICAL TELEASSISTANCE PROGRAM FOR PATIENTS WITH TYPE 1 DIABETES WITH ADVANCED HYBRID SYSTEM

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Background and Aims: Advanced hybrid systems represent the most technologically advanced therapy for type 1 diabetes, capable of making significant improvements in many metabolic and quality of life parameters. The achievement of these results is largely linked to the correct use of the system by the patient, and this is achieved with extensive training by the staff for the technical aspects and by the diabetologist for the insulin therapy settings. However, the complexity of these systems is difficult to deal with in depth during outpatient checks. The objective was to evaluate the effects of a structured technical teleassistance program applied to patients with the advanced hybrid systems.

Methods: 47 patients being treated with AIDs were involved. The patients underwent a technical teleassistance program on a regular basis (3 meetings for each patient every 3 weeks). We examined clinical characteristics, HbA1c and trends in glycemic metrics from the first to the last telehealth meeting carried out.

Results: We analyzed all glycaemic metrics; from the analysis of the data discharges TIR went from 71% to 73% (p=0.011), the TAR from 22% to 20% (p=0.018) and the TBR from 1 to 2% (p=0.115). The remote path was appreciated by the participating patients.

Conclusions: A structured technical teleassistance program can improve glycemic metrics of diabetic patients using AID systems. It is desirable to increase this type of re-training to optimize the use of the technology by patients, obtaining better results in terms of glycemic control. This could represent a advantageous model of telemedicine and teleassistance.

EPV292 / #58

E-Poster Viewing Topic: AS08. Insulin Pumps

HOW TO TRAIN ADOLESCENTS WITH TYPE 1 DIABETES TO USE SIMPLIFIED MEAL ANNOUNCEMENT WITH PRE-SETS OF THREE CARBOHYDRATE AMOUNTS USING MINIMED 780G?

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Background and Aims: Simplified carbohydrate meal announcement with specific training on using this methodology is important to ensure optimal glucose outcomes. Aim is to describe the training sessions used to develop a pre-set of three-fixed carbohydrate amounts with Minimed 780 system on glycaemic outcomes in adolescents with T1D.

Methods: 17 out of 34 participants (age 12.1 ± 3.1) with T1D were randomly assigned to use simplified fix carbohydrate method. Data was collected from patients for 7 days to which a formula (Petrovski et al, 2023) was used to calculate the three pre-set fix carbohydrate amounts (regular, large meal and snack). These fix carbohydrate amounts were explained to participants as part of 30 minute training.

Results: HbA1c and Time in ranges (70-180mg/dL) continued to show improvement during the study.

Figure 1: HbA1c, TIR and average carbohydrate amounts per meal

	Baseline	3 months	P	6months	P	9 months	P	12months	P
Glycaemic Control									
HbA1c, %	8.0±2.1	6.8±0.3	0.026	6.9±0.3	0.354	6.7±0.3	0.069	6.8±0.5	0.492
HbA1c, mmol/mol	64±26.2	51±3.3	0.026	52±3.3	0.354	50±3.3	0.069	51±5.5	0.492
Time in Range, 70-180 mg/dL	47.5±18.3	73.5±6.7	0.001	72.7±7.8	0.765	72.3±6.9	0.882	72.9±5.6	0.795
Average carbohydrate amounts per meal									
Regular meal, 50 gr	47.8±11.4	50.6±10.2	0.456	53.8±7.4	0.543	55.1±6.0	0.603	53.7±9.1	0.622
Large meal, 80 gr	75.6±12.4	79.4±11.9	0.369	82.4±8.1	0.424	81.4±7.2	0.720	84.1±6.5	0.290
Snack, 20 gr	20.0±3.2	19.6±3.1	0.582	19.2±4.4	1.000	19.4±3.1	1.000	19.8±5.6	1.000

TIR, time in range; gr, grams

Conclusions: Specific training on simplified meal announcement is needed in adolescents on Minimed 780G system to achieve optimal glucose outcomes.

EPV293 / #910

E-Poster Viewing Topic: AS08. Insulin Pumps

WORSENING DIABETIC RETINOPATHY WITH 6 YEAR FOLLOW-UP OF CONTINUOUS SUBCUTANEOUS INSULIN INFUSION THERAPY

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Background and Aims: The aim of this study was to look for worsening retinopathy and vision during 6 years of Continuous subcutaneous insulin infusion (CSII).

Methods: This was an observational, longitudinal, non-randomised retrospective study at Royal Derby Hospital, UK, conducted according to Helsinki Declaration tenants with informed consent. Retinopathy grades and LogMAR best-corrected visual acuity (BCVA) from Derbyshire Eye Screening Programme (DESP) or Retinal Clinic records and glycosylated haemoglobin (HbA1c) levels from clinical records were obtained. Worsening retinopathy (WR) was defined as an increase in retinopathy grade at 1 year. 6-year changes in HbA1c and BCVA from baseline were analysed by linear regression, comparisons between groups by ANOVA corrected for multiple comparisons and Chi squared analysis performed on retinopathy grades with and without WR. Missing data was accounted for by multiple imputation and data from the right eye only were used to avoid bias

Results: Of 110 people at baseline, mean age $\pm$ SEM was 39.4 ± 12.7 years, mean diabetes duration 16.3 ± 11.3 years, mean HbA1c 78.6 ± 20.5 mmol/mol and mean BCVA 0.04 ± 0.16 . WR developed in 18 eyes (16.4%). Baseline mean HbA1c was significantly higher in those developing WR (76.9 ± 21.0 vs 86.8 ± 16.6 mmol/mol $p=0.016$). Mean BCVA decreased to 0.08 ± 0.18 by 6 years, with male mean BCVA significantly better than females in years 1, 2, 3 and 6.

Conclusions: WR was associated with a higher HbA1c at baseline, but not the magnitude of HbA1c reduction. The 6-year risk of sight-threatening diabetic retinopathy was highest in those with WR in the first year and we would recommend closer observation and intervention in this group.

EPV294 / #1004

E-Poster Viewing Topic: AS08. Insulin Pumps

DESCRIPTIVE STUDY ON THE EVOLUTION OF GLYCEMIC CONTROL AFTER INITIATION OF THE MINIMED 780G HYBRID CLOSED-LOOP SYSTEM IN ADULTS WITH TYPE 1 DIABETES MELLITUS (T1DM)

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Background and Aims: To evaluate the long-term sustainability of glycemic control improvements with the MiniMed™ 780G (MM780G) system over two years in patients with Type 1 Diabetes Mellitus (T1DM) at a tertiary hospital in Madrid, Spain.

Methods: A retrospective analysis was conducted on attending 330 T1DM patients who transitioned to the MiniMed™ 780G (MM780G) from multiple daily injections (MDI) or other insulin pumps. The primary endpoint was the change in HbA1c after two years, alongside other glycemic metrics. Data were

analyzed using SPSS, with comparisons over time made via Student's t-test.

Results: Among 330 patients, 64.7% were women, with a mean age of 43.9 years (SD 13.5). HbA1c significantly decreased from 7.5% (SD 0.9) at baseline to 6.9% (SD 0.6) at 6 months, 12 months (-0.57%, $p<0.001$), and 6.8% (SD 0.6) at 24 months (-0.62%, $p<0.001$). Improvements were also seen in Time in Range (TIR), Time Above Range (TAR), Time Below Range (TBR), Coefficient of Variation (CV), and Glucose Management Indicator (GMI). Total daily insulin dose (TDD) per weight ratio significantly decreased at 6 months ($p=0.037$) compared to previous therapy. No correlation was found between age at diagnosis and TIR, nor between the type of insulin used and TIR. Patients on MDI prior to MM780G experienced greater TIR improvements (+19.7%) at 6 months compared to those previously using other insulin pumps (+10.4%) ($p<0.001$).

	Baseline	6 months	12 months	24 months
HbA1c $\pm$ standard deviation (SD)	7.5 % $\pm$ 0.9	6.9 % $\pm$ 0.6	6.9 % $\pm$ 0.6	6.8 % $\pm$ 0.7
TIR $\pm$ SD	63.9 $\pm$ 14.5	79.2 $\pm$ 9.4	78.5 $\pm$ 11.0	66.5 $\pm$ 29.0
TAR1 $\pm$ SD	23.1 $\pm$ 9.8	15.8 $\pm$ 7.5	15.9 $\pm$ 7.5	14.3 $\pm$ 8.9
TAR2 (interquartile range (IQR))	6.0 (IQR 2.0 – 12.0)	2.0 (IQR 1.0 – 4.0)	2.0 (IQR 1.0 – 4.0)	3.0 (IQR 1.0 – 7.0)
TBR1 (IQR)	2.0 (IQR 1.0 – 4.0)	1.0 (IQR 1.0 – 2.0)	1.0 (IQR 1.0 – 3.0)	1.0 (IQR 0.12 – 2.0)
TBR2 (IQR)	0.0 (IQR 0.0 – 1.0)	0.0 (0.0-0.0)	0.0 (IQR 0.0 – 1.0)	0.0 (IQR 0.0 – 1.0)
GMI $\pm$ SD	7.1 $\pm$ 0.6	6.7 $\pm$ 0.4	6.7 $\pm$ 0.3	6.7 $\pm$ 0.3
CV $\pm$ SD	34.9 $\pm$ 6.8	31.6 $\pm$ 4.3	31.5 $\pm$ 5.1	38.6 $\pm$ 18.1 *

* $p>0.05$

Conclusions: The MM780G system significantly enhances glycemic control in individuals living with T1DM, with these benefits being sustained for up to two years, irrespective of previous treatment modalities.

EPV295 / #788

E-Poster Viewing Topic: AS08. Insulin Pumps

GLYCEMIC CONTROL ACHIEVED BY MINIMED 780G USERS WITH SELF-REPORTED TYPE 2 DIABETES IS SUSTAINABLE FOR AT LEAST 6 MONTHS: A REAL-WORLD ANALYSIS ON 862 USERS

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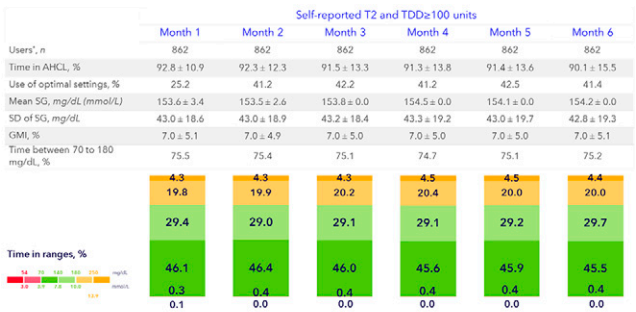
Background and Aims: The MiniMed 780G (MM780G) Advanced Hybrid Closed Loop (AHCL) System is currently indicated for people with type 1 diabetes but not yet for people with type 2 diabetes (PwT2D). Here, we present longitudinal (6 months) real-world data on the performance of the MM780G in 862 users with self-reported T2D and insulin resistance, as assessed by high average total daily insulin dose (TDD).

Methods: Carelink data (January 2020 to April 2024) of users living in Europe, Middle East or Africa were analyzed. This cohort consisted of users with self-reported T2D (off-label) and an average TDD > 100 U who had ≥ 10 days of CGM data in each month after AHCL initiation. Glycemic endpoints were

calculated for each month for all users in this cohort over a 6-month period.

Results: Are shown in Figure 1 and are consistent over the 6 months. Mean TIR ranged from 74.7%, to 75.5% and was stable over 6 months. Time below 70 mg/dL consistently remained $\leq 0.4\%$. Use of the recommended optimal settings (glucose target of 100 mg/dL; active insulin time of 2h) increased from 25.2% at month 1 to 41.2% from month 2 and onwards. Time using advanced hybrid closed loop remained above 90% throughout the whole period.

Figure 1: Glycemic outcomes of real-world MiniMed 780G system users with self-reported T2D and TDD ≥ 100 units over 6 months



Longitudinal data for those with self-reported T2D and TDD > 100U demonstrated that glycemic outcomes were consistent over at least 6 months. Data shown as Mean $\pm$ SD. TDD: total daily dose; AHCL: Advanced Hybrid Closed loop; SG: sensor glucose, GMI: Glucose Management Indicator.

Conclusions: Real-world data shows that PwT2D using the MM780G achieve international glycemic targets and maintain these improvements over a 6-month period.

EPV296 / #1249

E-Poster Viewing Topic: AS08. Insulin Pumps

EFFECTS OF INITIATING SENSOR AUGMENTED PUMP THERAPY ON DIABETES DISTRESS IN PEOPLE WITH TYPE 1 DIABETES

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Background and Aims: Previous observational studies reported decrease level of diabetes distress (DD) on insulin pump therapy compare to multiply daily injection, however, some studies report no differences. Study aimed to analyse the level of DD before and 12 months after initiating sensor augmented pump (SAP) therapy in people with type 1 diabetes (T1D).

Methods: A longitudinal study included 49 people with T1D who started SAP therapy. The 28-item T1-DDS was used to measure DD and DD scores were categorised as little or no distress (score <2.0), or high distress (score ≥ 2.0). We evaluated level of DD at beginning and 12 months after starting SAP. It has been analyzed demographic and anthropometric characteristics. Associations between metrics (time in range, time below range, time above range) and DD were assessed using linear regression.

Results: In our cohort mean age were 36 $\pm$ 6; BMI was 22.2 $\pm$ 1.4 kg/m² and duration of T1D was 23 $\pm$ 11 years. One

year using SAP therapy was associated with a lower T1-DDS score (-0.08 , 95% CI 0.16 to -0.03). Lower TIR was associated with a higher T1-DDS score (0.11 , 95% CI 0.05 to 0.18). Contrary, higher TBR was associated with a higher T1-DDS score (0.20 , 95% CI 0.11 to 0.29). No association was found between the level of TAR and DD.

Conclusions: Our results shown that the use of SAP therapy was associated with lower levels of DD, while lower TIR and higher TBR were associated with a higher levels of DD. In that context, DD should be assessed before initiating diabetes technology in people with T1D.

EPV297 / #1328

E-Poster Viewing Topic: AS08. Insulin Pumps

TRANSFORMATIVE IMPACT OF HYBRID ADVANCED CLOSED-LOOP INSULIN DELIVERY SYSTEMS ON TYPE 1 DIABETES MANAGEMENT IN PATIENTS WITH COMPLEX PSYCHIATRIC COMORBIDITIES: A CASE SERIES

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Background and Aims: Managing Type 1 diabetes in patients with psychiatric conditions and histories of substance abuse poses significant challenges. The Medtronic 780G hybrid advanced closed-loop insulin delivery system offers promising solutions by improving glycemic control and addressing psychosocial factors. This case series examines the transformative impact of this technology on patients with complex comorbidities.

Methods: We conducted a retrospective analysis of five patients with Type 1 diabetes and histories of substance abuse and psychiatric conditions. Medical records were reviewed to evaluate changes in glycemic metrics (HbA1c, time in range), substance use patterns, and psychosocial well-being following their transition to the Medtronic 780G system.

Results: All five patients demonstrated significant improvements in diabetes management, including reductions in HbA1c and increased time in range. Notable outcomes included reduced psychiatric hospitalizations, cessation or significant reduction in substance use, and enhanced psychosocial stability. Case highlights include a 50-year-old woman achieving weight loss and cessation of hospitalizations, a 40-year-old with cessation of cocaine use, and a 30-year-old stabilizing from heroin abuse with marked social improvements. Initial psychiatric exacerbation in one case was followed by substantial psychological and glycemic benefits.

Conclusions: The Medtronic 780G system offers a holistic approach to managing Type 1 diabetes in patients with complex psychiatric and substance abuse comorbidities. Beyond glycemic improvements, this technology fosters psychosocial well-being and supports substance use reduction. These findings highlight its transformative potential, warranting further research into its broader application in complex patient populations.

EPV298 / #1330

E-Poster Viewing Topic: AS08. Insulin Pumps

MANAGEMENT OF MILD AND MODERATE DIABETIC KETOACIDOSIS USING ADVANCED HYBRID CLOSED-LOOP SYSTEMS: CASE REPORTS OF THE MEDTRONIC 780G INSULIN PUMP

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Background and Aims: Diabetic ketoacidosis (DKA) is a serious complication of diabetes, traditionally managed with intravenous (IV) insulin in hospital settings. Subcutaneous insulin administration, including advanced hybrid closed-loop (AHCL) systems, may offer an effective alternative for mild to moderate DKA. However, direct use of these systems for DKA management has not been previously documented.

Methods: We present two cases of mild to moderate DKA managed with the AHCL system provided by the treating physician. The first case involved a 20-year-old farmer who refused hospitalization and was treated in an endocrinologist's office after 18 hours without insulin, presenting with unmeasurable glucose levels. Treatment included oral hydration (2–3 L), IV fluids (1 L NaCl), and a 5-unit IV insulin bolus. The physician-initiated pump was set to manual mode with a basal rate of 36 units/day. Glucose became measurable (370 mg/dL) within 3 hours, and euglycemia was achieved within 48 hours. The second case, a 20-year-old student admitted to the emergency department with severe hyperglycemia (550 mg/dL), venous pH 7.1, unfortunately received 10 IV insulin therapy, reducing glucose to 147 mg/dL. At this point, a 5% dextrose infusion was initiated alongside 3 L of NaCl over 12 hours. The AHCL was activated in manual mode with bolus adjustments for 12 hours before transitioning to SmartGuard mode, resolving DKA within 24 hours.

Results: Both patients achieved euglycemia using the AHCL pump and returned to their own devices for diabetes management.

Conclusions: These cases highlight the potential of AHCL systems for managing mild to moderate DKA in emergency settings.

EPV299 / #999

E-Poster Viewing Topic: AS09. New Insulin Delivery Systems: Inhaled, Transderma, Implanted Devices

RAPID INSULIN KINETICS FOLLOWING BOLUS INTO VASCULARIZED MICROCHAMBERS IMPLANTED SUBCUTANEOUSLY IN DIABETIC PIGS

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Background and Aims: Even with accurate glucose sensors, precision insulin pumps, and improved dosing algorithms the performance of a closed loop system in maintaining

normoglycemia depends upon timely, accurate insulin delivery. The weak link between pump and patient is a cannula, prone to complications and contributes to slow insulin uptake (even with ultra-fast formulations) and blood glucose dysregulation. In rodent studies, *regular insulin* infused through a 1.5cm² (planar surface area) microchamber, exhibited superior kinetics. Here, we report improved insulin pharmacodynamics of regular insulin into subcutaneous microchambers in diabetic minipigs.

Methods: Streptozotocin-induced Yuctan pigs (n=7) were diabetic (blood glucose >300mg/dL). Microchambers (Procyon LLC) of three surface areas (0.6cm², 1.5cm², and 3cm²) were implanted in the neck. Insulin tolerance tests (ITT) with 5U of HumulinR were performed under light anesthesia. ITT performed with syringe injection was control. Plasma [insulin] measured and time to peak calculated. Insulin profiles compared by ANOVA and blood glucose by linear regression. Microchambers were evaluated histologically for vascularization and fibrosis.

Results: All vascularized microchamber sizes unequivocally afforded superior pharmacokinetics to control- improving time to peak plasma insulin concentrations to 13±9min (control 116±66min). All microchambers increased the rate of glucose clearance compared to control ITT. Surprisingly, the 0.6cm² smallest microchamber exhibited superior pharmacokinetics compared to larger prototypes- reducing AUC for plasma [insulin].

Conclusions: Insulin bolus at clinically relevant dose through vascularized microchambers improved pharmacokinetics – with faster time to peak insulin and greater insulin clearance. The small footprint of the microchambers are compatible with existing insulin delivery systems thus practical for clinical use.

EPV300 / #890

E-Poster Viewing Topic: AS10. New Insulins

MICRO-AMOUNTS OF GLUCAGON PREMIXED IN FAST-ACTING INSULIN (LYUMJEV®); EFFECT ON INSULIN ABSORPTION AND GLUCOSE CONSUMPTION

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Background and Aims: Previously we have shown that small doses of glucagon enhance local SC blood flow in humans, and that when injected at the same site as insulin, micro-doses of glucagon enhances insulin absorption in anesthetized pigs. Recently we also found that a premixed solution of 5 ng glucagon per unit insulin significantly speeds up insulin absorption in anesthetized pigs. We observed that the AUC for insulin triples for the first 15 minutes and doubles for the first 30 minutes. We aim to investigate if adding ng-amounts of glucagon to a fast-acting insulin (Lyumjev®) speeds up insulin absorption and effect on glucose metabolism.

Methods: 30 patients with T1D will be included in a study with euglycemic clamp investigations on two separate days. They will meet fasting in the morning. One day they will receive and injection with Lyumjev® and the other day an injection with the same amount of Lyumjev® with 50 ng glucagon/unit insulin added. The primary outcomes will be AUC for glucose consumption for the time intervals 0-15 min, 0-30 min and 0-∞ min.

Secondary outcomes will be AUC for insulin for 0-15 min, 0-30 min and 0-∞ min.

Results: Result will be presented.

Conclusions: We expect to observe that premixing ng amounts of glucagon added to a fast-acting insulin speed up insulin absorption also in patients with T1D and enhances the effect on glucose metabolism. That will be a major achievement that potentially will benefit all patients with T1D. And it may make a fully automated artificial pancreas possible.

EPV301 / #905

E-Poster Viewing Topic: AS10. New Insulins

REAL-WORLD EFFECTIVENESS AND SAFETY OF IGLARLIXI IN ADULTS WITH TYPE 2 DIABETES IN GULF COUNTRIES: A SUB-ANALYSIS OF SUCCESS STUDY

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Background and Aims: By targeting both prandial and fasting plasma glucose (FPG), once daily injection of the fixed-ratio combination of insulin glargine 100U/mL and lixisenatide (iGlarLixi) has been shown to improve glycaemic control without increasing the risk of hypoglycaemia or weight gain. This sub-analysis assessed the real-world effectiveness and safety of iGlarLixi in adults with type 2 diabetes (T2D) from the Gulf region.

Methods: This international, prospective, single arm observational SUCCESS study enrolled adults with T2D who initiated iGlarLixi within 1 month (M) of study start. Primary endpoint was change in HbA1c at M6. Key secondary endpoints included changes in FPG and body weight, and achievement of individual HbA1c target at M6 and M12. Safety endpoints were also assessed.

Results: Out of 737 evaluable participants, 236 participants were from Gulf countries (mean age: 55.7±11.5 years; male: 60.2%; duration of diabetes, 11.6±6.1 years). The least squares mean change (LSMC) in HbA1c from baseline was -14.6 mmol/mol (-1.3%) at M6 and -18.2 mmol/mol (-1.7%)

Table: Key outcomes							
Characteristics	Baseline	Month 6	Change from BL to M6 LSM ± SE	95% CI	Month 12	Change from BL to M12 LSM ± SE	95% CI
HbA_{1c}							
%	9.3 ± 1.5	7.9 ± 1.2	-1.4 ± 1.7	-1.6 -1.1	7.5 ± 1.2	-1.7 ± 1.7	-1.8 -1.5
mmol/mol	77.9 ± 16.5	62.6 ± 13.4	-14.6 ± 0.9	-16.4 -12.7	58.4 ± 13.6	-18.2 ± 1.0	-20.9 -15.5
FPG							
mg/dL	176.5 ± 58.1	126.8 ± 24.9	-34.6 ± 2.3	-39.0 -30.1	124.6 ± 27.7	-37.4 ± 2.4	-42.2 -32.7
mmol/mol	9.8 ± 3.2	7.0 ± 1.4	-1.9 ± 0.1	-2.2 -1.7	6.9 ± 1.5	-2.1 ± 0.1	-2.3 -1.8
Body weight, kg	85.3 ± 13.2	84.1 ± 12.9	-1.4 ± 0.2	-1.9 -0.9	83.3 ± 13.3	-2.3 ± 0.3	-2.8 -1.8
Individual HbA _{1c} target achievement, n/N (%)	34/186 (18.3)			13.0: 24.6	57/173 (33.0)		36.0: 40.5
Individual HbA _{1c} target achievement without symptomatic confirmed/severe hypoglycaemia, n/N (%)	34/186 (18.3)			13.0: 24.6	56/173 (32.4)		25.5: 39.9
Individual HbA _{1c} target achievement without weight gain, n/N (%)	27/186 (14.5)			9.8: 20.4	55/173 (31.8)		25.0: 39.3
Individual HbA _{1c} target achievement without symptomatic confirmed/severe hypoglycaemia and weight gain, n/N (%)	27/186 (14.5)			9.8: 20.4	54/173 (31.2)		24.4: 38.7

BL, baseline; FPG, fasting plasma glucose; HbA_{1c}, glycated haemoglobin; LSM, least squares mean; M, month; n, number of participants reporting the event; N, total number of participants.

BL, baseline; FPG, fasting plasma glucose; HbA_{1c}, glycated haemoglobin; LSM, least squares mean; M, month; n, number of participants reporting the event; N, total number of participants; SE, standard deviation; SE, standard error.

at M12. At M12, LSMC in FPG was -2.1 mmol/L (-37.4 mg/dL) and for body weight it was -2.3 kg. Approximately, 18% and 33% of participants achieved their individual HbA1c target at M6 and M12, respectively (Table). Overall, the incidence of hypoglycaemia was low with iGlarLixi treatment.

Conclusions: This sub-analysis demonstrated effectiveness and safety of iGlarLixi in Gulf participants which are consistent with those observed in overall study population. Once daily iGlarLixi injection may be an efficacious and safe treatment option for adults with T2D in Gulf countries.

EPV302 / #974

E-Poster Viewing Topic: AS10. New Insulins

EFSITORA VS. DEGLUDEC IN INSULIN-NAÏVE ADULTS WITH TYPE 2 DIABETES (QWINT-2)

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Background and Aims: Insulin efsitora alfa (efsitora) is a novel basal insulin designed for once-weekly administration.

Methods: QWINT-2 was a randomised, open-label, phase 3 trial including 928 insulin-naïve adults with T2D inadequately controlled on glucose lowering agents. Participants were randomised to once-weekly efsitora or once-daily degludec. The primary endpoint was change in HbA1c from baseline to week 52. Secondary endpoints included Time in Range (TIR) (3.9-10.0 mmol/L [70-180 mg/dL]), fasting plasma glucose, and hypoglycaemic events. Safety assessments included treatment emergent adverse events (TEAEs) and serious adverse events (SAEs).

Results: Efsitora demonstrated noninferiority to degludec in HbA1c reduction from 8.21% at baseline to 6.97% at week 52, whilst degludec reduced from 8.24% to 7.05%. TIR at weeks 48-52 was 64.3% with efsitora vs. 61.2% with degludec (ETD, 3.1 percentage points [95% CI, 0.01 to 6.1]). During treatment, fasting glucose reduced by -3.4 mmol/L (-61.9 mg/dL) for efsitora and -3.2 mmol/L (-56.8 mg/dL) for degludec (ETD, -0.28 mmol/L (-5.09 mg/dL) [-9.15 to -1.02]). The rate of combined L2/L3 hypoglycaemic events was 0.58 and 0.45 events/PYE for efsitora and degludec, respectively (Rate Ratio, 1.30 [95% CI, 0.94 to 1.78]). Six cases of severe hypoglycaemia occurred, all among degludec participants. Safety profiles were similar, with comparable incidence of TEAEs or SAEs.

Conclusions: Once-weekly efsitora is as efficacious as once-daily degludec in reducing HbA1c in insulin-naïve adults with T2D. Efsitora offers less frequent dosing and overall low rates of combined L2/L3 hypoglycaemia, with a comparable safety profile. These findings support the potential of efsitora as an effective treatment option for T2D.

EPV303 / #665

E-Poster Viewing Topic: AS10. New Insulins

LOWER GLYCAEMIC VARIABILITY AND DEGLUDEC THERAPY ARE PROTECTIVE AGAINST ONSET OF HYPOGLYCAEMIA IN TYPE 1 DIABETES AND LADA

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Background and Aims: To examine the impact of diabetes (DM) type and insulin (INS) therapy on CGM metrics: time in range (TIR), time above range (TAR), high TAR, time below range (TBR), and glycemic variability (%CV).

Methods: Patients (198) with type 1 DM (DM1), type 2 DM (DM2) and LADA were included and treated with degludec and aspart (Th1) or rapid-acting aspart (Th2), glargine 100j/ml (Th3) or glargine 300j/ml (Th4) and short-acting INS, and BOT (Th5). Variables were tested at the beginning, after 12 and 24 mos. CGM metrics were obtained using the FreeStyle Libre System.

Results: Significant difference was determined for TBR and %CV according to the DM type ($F=4.64$; $p=0.012$ and $F=6.41$; $p=0.002$) and therapy ($F=3.05$; $p=0.021$ and $F=3.18$; $p=0.017$), but not between controls during the study. In all 3 controls TBR and %CV were significantly lower in patients with DM2 compared to DM1 and LADA, with no significant difference between DM1 and LADA. TBR and %CV were significantly higher in patients on Th3 compared to Th1 and Th2, with no significant difference between Th1 and Th2. TBR and %CV in patients on Th4 were higher in LADA compared to DM2. The statistically significant interaction between DM type and therapy indicates different behaviour of TBR and %CV according to DM type and therapy.

Conclusions: Lower %CV and TBR were observed in DM2 in comparison to DM1 and LADA, and in patients on degludec in comparison to other therapy options. The study confirmed glucovariability and choice of INS to be important for the onset of hypoglycaemia.

EPV304 / #1297

E-Poster Viewing Topic: AS10. New Insulins

INSULIN INITIATION AND ADHERENCE BEHAVIOURS: A CROSS-SECTIONAL SURVEY OF PEOPLE WITH TYPE 2 DIABETES AND HEALTHCARE PROVIDERS IN INDIA

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Background and Aims: Despite the availability of various insulins, insulin adoption in India is relatively low. This study aimed to understand the barriers to insulin use and adherence behaviours among people with type 2 diabetes (PwT2D) taking insulin and healthcare providers (HCPs).

Methods: A cross-sectional, online survey was conducted from 4 July to 14 August 2024 in India among PwT2D (self-reported diagnosis) who recently initiated insulin (in the past 12 months) and among primary care physicians, diabetologists, and endocrinologists. Descriptive statistical analyses were performed.

Results: 501 PwT2D taking insulin and 251 HCPs treating people with T2D completed the survey. Taking insulin at the same time of day was reported to be difficult for 49% of PwT2D and by 52% of HCPs; taking insulin daily was also considered difficult (37%, 38%, respectively). In addition to pain and fear of injections, PwT2D and HCPs agreed that barriers to initiating insulin included needing to administer it at the same time daily (85% and 88%), frequency of injections (83% and 96%), and technical difficulties in administering insulin (82% and 87%). Over half (58%) of PwT2D reported ever forgetting to take an insulin dose, which happened an average of 2.5 days in the past month. Reasons included skipping meals, travelling, and difficulty taking it at the same time daily.

Conclusions: Difficulties in daily dosing and taking insulin at the same time each day are key barriers to insulin initiation and adherence among PwT2D in India.

EPV305 / #800

E-Poster Viewing Topic: AS10. New Insulins

THE EFFICACY AND SAFETY OF SWITCHING FROM RAPID-ACTING INSULINS TO ULTRA-RAPID INSULIN LISPRO IN TYPE 1 DIABETES USING CONTINUOUS GLUCOSE MONITORING: A REAL-WORLD STUDY

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Background and Aims: To evaluate the efficacy and safety of switching from rapid-acting insulins to ultra-rapid insulin lispro (URLi) in a real-world practice in adults with type 1 diabetes (T1D) using intermittently scanned or real-time continuous glucose monitoring (isCGM or rtCGM respectively).

Methods: A real-world, prospective, multicentre, 12-month study was performed in patients with T1D who initiated URLi from January 2022 to January 2024. The primary objective was the evolution of time in range (70 – 180 mg/dL or 3.9 – 10.0 mmol/L) at 6 and 12 months.

Results: 34 patients were analysed with following characteristics: M/F 18/16; MDI/CSII 31/3; isCGM/rtCGM 27/7. TIR evolved from 56.4 ± 14.8% to 56.1 ± 17.5% at 12 months (p = 0.366). Time below 70 mg/dL (5.3 ± 4.9% at baseline) dropped significantly to 3.5 ± 2.9% and 3.8 ± 4.4% at 6 and 12 months (p = 0.049). A significant decrease was also found for time below 54 mg/dL from 1.7 ± 2.0% to 0.7 ± 1.1% and 1.0 ± 1.9% at 6 and 12 months (p = 0.002). Additionally, the number of hypoglycaemic events dropped significantly from 22 ± 16 to 17 ± 11 and 16 ± 14 at 6 and 12 months (p = 0.020).

Conclusions: Despite the small population, after switching to URLi, a reduction in TBR (< 70 mg/dL and < 54 mg/dL) with 1.5% and 0.7% respectively, corresponding to 22 and 10 minutes less time spent in hypoglycaemia, was observed without compromising TIR. Also the number of hypoglycaemic events improved.

EPV306 / #742

E-Poster Viewing Topic: AS10. New Insulins

EFFECTIVENESS AND SAFETY OF INSULIN GLARGINE 300 U/ML IN ELDERLY PEOPLE WITH TYPE 2 DIABETES: AN OBSERVATIONAL STUDY (ELDERLY-T)

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Background and Aims: Elderly people with type 2 diabetes (PwT2D) are underrepresented in clinical trials due to comorbidities that interfere with eligibility. The ELDERLY-T study evaluated effectiveness and safety of insulin glargine 300 U/ml (Gla-300) in elderly PwT2D in real-world setting.

Methods: ELDERLY-T was a prospective, non-interventional, multicentre, open-label, observational study in Germany and Switzerland, in elderly people aged ≥75 years whose T2D was uncontrolled with antidiabetic therapy. Primary endpoint was the proportion of participants achieving individual glycated haemoglobin (HbA1c) target within 6-months after initiation of basal insulin (BI) with Gla-300, or switch from another BI to Gla-300. Other endpoints evaluated the proportion of participants achieving fasting blood glucose (FBG) target, the changes in HbA1c and FBG, and the incidence of adverse events.

Results: Of 67 participants in the full analysis set, 35 (52.2%) were insulin naive (BI new) and 32 (47.8%) switched from existing basal insulin to Gla-300 (BI switch). Total 31.4% and 40.6% of participants achieved their individual target HbA1c at month 6 with a mean change of -1.4% and -1.2% in the BI new and BI switch groups, respectively. In both groups, nearly 25% of participants achieved their individual FBG target at month 6 with a mean change of -45.3 mg/dL and -19.9 mg/dL in the BI new and BI switch groups, respectively (Table). No serious adverse drug events or severe hypoglycaemia was reported (Table).

Table. Effectiveness and safety outcomes of elderly participants (≥75 years) with T2D.

Demographics	BI new (n=35)	BI switch (n=32)
Age, mean ± SD	81.6 ± 4.4	80.9 ± 4.2
Gender		
Female	18 (51.4%)	14 (43.8%)
BMI, kg/m ²	28.0 ± 4.3	30.5 ± 5.0
Years since initial diagnosis, mean ± SD	13.0 ± 9.1	19.5 ± 9.6
Effectiveness outcomes	BI new (n=35)	BI switch (n=32)
Proportion of participants achieving target HbA1c within 6 months, n (%) ^a	11 (31.4)	13 (40.6)
Baseline HbA1c (%), n / mean ± SD	35 / 9.0 ± 0.9	31 / 8.7 ± 0.7
HbA1c at month 3 (%), n / mean ± SD	33 / 7.8 ± 0.8	31 / 7.8 ± 0.8
HbA1c at month 6 (%), n / mean ± SD	34 / 7.7 ± 0.9	30 / 7.5 ± 0.9
Mean change in HbA1c (%) at month 3 / month 6	-1.2 / -1.4	-0.9 / -1.2
Proportion of participants achieving target FBG within 6 months, n (%) ^a	9 (25.7)	8 (25.0)
Baseline FBG (mg/dL), n / mean ± SD	21 / 225.0 ± 74.5	14 / 165.1 ± 41.8
FBG at month 3 (mg/dL), n / mean ± SD	25 / 174.4 ± 60.5	12 / 144.8 ± 49.8
FBG at month 6 (mg/dL), n / mean ± SD	23 / 167.4 ± 66.5	12 / 138.9 ± 27.6
Mean change in FBG (mg/dL) at month 3 / month 6	-48.5 / -45.3	-4.7 / -19.9
Safety outcomes	SAS (N = 76), N (%)	
Number of participants		
With at least one adverse event (AE)	4 (5.3%)	
With at least one fatal AE	2 (2.6%)	
With at least one serious adverse event (SAE)	2 (2.6%)	
With at least one fatal serious adverse event	2 (2.6%)	
With at least one related adverse drug reaction (ADR)	1 (1.3%)	
Symptomatic, unconfirmed hypoglycaemias	BI new (n=35), N (%)	BI switch (n=32), N (%)
Baseline	2 (5.7%)	1 (3.1%)
After 3 months	0	0
After 6 months	0	0

^aPrimary endpoints. ^bDay secondary endpoints.
BI, basal insulin; BMI, body mass index; FAS, full analysis set; FBG, fasting blood glucose; HbA1c, glycated haemoglobin; SAS, safety analysis set; SD, standard deviation; T2D, type 2 diabetes.

Conclusions: Initiating or switching to Gla-300 therapy provides a safe and effective therapeutic option for elderly people (≥75 years) living with T2D.

EPV307 / #1316

E-Poster Viewing Topic: *AS10. New Insulins*

PATIENT-REPORTED OUTCOMES (PROS) IN ELDERLY PEOPLE WITH TYPE 2 DIABETES USING INSULIN GLARGINE 300 U/ML (ELDERLY-T STUDY)

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Background and Aims: Although efficacy and safety of insulin glargine 300 U/ml (Gla-300) are well established, data on patient-reported outcomes (PROs) such as treatment satisfaction and quality of life (QoL) in elderly people with type 2 diabetes (T2D) are lacking. The current real-world study reports PROs in elderly people with T2D using Gla-300.

Methods: ELDERLY-T (NCT05607160) was a prospective, non-interventional, multicentre, open-label, observational study conducted in Germany and Switzerland from Oct-2022 to Dec-2023, in people aged ≥75 years with inadequately controlled T2D on antidiabetic therapy. Endpoints included absolute change from baseline to 6-months in total score of Diabetes Treatment Satisfaction Questionnaire (DTSQs), ELDERLY

Diabetes-Related QoL Questionnaire and Geriatric Depression Scale (GDS-4).

Results: Of 67 people, 35 (52.2%) were basal insulin-naïve (BI-new) and 32 (47.8%) switched from existing basal insulin to Gla-300 (BI-switch). In DTSQs questionnaire, statistically significant improvements were observed from baseline to 6-months of Gla-300 treatment, with an absolute change (mean ± SD) of 8.3 ± 6.9 and 8.0 ± 6.1 in BI-new and BI-switch groups, respectively. Diabetes-related QoL questionnaire showed statistically significant improvement from baseline to 6-months, with absolute mean change of 4.3 ± 5.7 in BI-new and 4.2 ± 4.4 in BI-switch. GDS-4 depression score from baseline to 6-months showed marginal improvement, with absolute mean reduction of -0.32 ± 1.2 and -0.38 ± 0.9, in BI-new and BI-switch respectively (Table).

Conclusions: Initiating or switching to Gla-300 therapy leads to improvements in diabetes-related quality of life, treatment satisfaction, and depression scores in elderly people with T2D.

Table. Patient-reported outcomes at baseline and after 6-months of treatment in elderly people (≥75 years) with T2D using Gla-300.

Parameters	BI-new (N=35)	BI-switch (N=32)	FAS ^a (N=67)
Demographics			
Age, years, mean ± SD	81.6 ± 4.4	81.0 ± 4.2	81.3 ± 4.3
Gender			
Female n (%)	18 (51.4)	14 (43.8)	32 (47.8)
BMI, kg/m ² , mean ± SD	28.0 ± 4.3	30.5 ± 5.0	29.2 ± 4.8
Years since initial diagnosis, mean ± SD	13.0 ± 9.1	19.5 ± 9.6	16.0 ± 9.8
Incidence of hypoglycaemia, n (%)	2 (5.7)	1 (3.1)	3 (4.5)
Diabetic retinopathy, n (%)	4 (11.4)	8 (25.0)	12 (17.9)
Diabetic neuropathy, n (%)	12 (34.3)	18 (56.3)	30 (44.8)
Diabetic nephropathy, n (%)	18 (51.4)	12 (37.5)	30 (44.8)
Patient reported outcomes	BI-new (N=35)	BI-switch (N=32)	
DTSQ, Questionnaire sum-of score			
Baseline, mean ± SD [95% CI] ^a	22.6 ± 8.0 [19.8; 25.4]	22.8 ± 6.4 [21.0; 25.1]	
Absolute change after approx. 6-months, mean ± SD [95% CI] ^a	8.3 ± 6.9 [5.8; 10.9]	8.0 ± 6.1 [5.7; 10.4]	
p-value	p<0.001	p=0.000	
ELDERLY Diabetes related QoL, Questionnaire sum-of score ^b			
Baseline, mean ± SD [95% CI] ^a	27.4 ± 7.3 [24.8; 29.9]	25.7 ± 7.6 [23.0; 28.4]	
Absolute change after approx. 6-months, mean ± SD [95% CI] ^a	4.3 ± 5.7 [2.3; 6.3]	4.2 ± 4.4 [2.5; 5.9]	
p-value	p<0.001	p<0.001	
GDS-4, sum-of score			
Baseline, mean ± SD [95% CI] ^a	1.2 ± 1.4 [0.7; 1.7]	0.6 ± 0.9 [0.3; 1.0]	
Absolute change after approx. 6-months, mean ± SD [95% CI] ^a	-0.32 ± 1.2 [-0.8; 0.1]	-0.38 ± 0.9 [-0.7; -0.05]	
p-value	p=0.140	p=0.025	

^aFor continuous variables, the 95% CI for the mean at baseline, post-baseline and change from baseline, as applicable, was calculated based on an assumed normal distribution.

^bFAS: all participants for whom all the inclusion criteria were fulfilled. The PRO parameters were analysed for the FAS. Exact (Copper-Pearson) 95% CI were given for the mentioned parameters.

^conly participants with values at baseline and after 6-months.

BI, basal insulin; BMI, body mass index; CI, confidence interval; DTSQs, Diabetes Treatment Satisfaction Questionnaire-status; FAS, full analysis set; GDS, Geriatric Depression Scale; QoL, quality of life; SD, standard deviation; T2D, type 2 diabetes.

EPV308 / #1332

E-Poster Viewing Topic: *AS10. New Insulins*

INSULIN TREATMENT SIMPLIFICATION WITH IGLARLIXI IN RELATIVELY WELL-CONTROLLED PATIENTS WITH TYPE 2 DIABETES

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Background and Aims: iGlarLixi is the fixed-ratio combination of insulin glargine and the short-acting glucagon-like peptide-1 receptor agonist lixisenatide. We studied the efficacy and safety of insulin treatment simplification with iGlarLixi in relatively well-controlled patients with type 2 diabetes (T2D).

Methods: It was a retrospective single-center database analysis. We evaluated real-world data of patients with a baseline HbA1c $\leq 7.5\%$ whose basal-bolus or premixed insulin regimens were replaced with iGlarLixi between January 2017 and June 2023 and had at least 1 follow-up visit.

Results: 67 patients with an HbA1c $\leq 7.5\%$ on complex insulin regimens were switched to iGlarLixi, of whom 59 individuals were eligible for the baseline analysis (47% men, mean $\pm$ SD age 69.8 ± 10.3 years, duration of diabetes 12.6 ± 10.2 years, total daily dose of insulin 38.4 ± 13.7 U). The first and second control visits (V1 and V2) performed 5 and 11 months on average after switching to iGlarLixi were completed by 59 and 41 patients. HbA1c $6.42 \pm 0.69\%$ at BV changed non-significantly to $6.31 \pm 0.77\%$ and $6.27 \pm 0.93\%$ at V1 and V2 ($p = 0.456$). Body weight at BV (87.1 ± 17 kg) decreased to 84.2 ± 17.6 kg ($p < 0.0001$) and 84.9 ± 19.2 kg ($p = 0.032$) at V1 and V2, respectively. The percentage of patients reporting at least one episode of hypoglycemia at BV, V1, and V2 was 52.5%, 30.5%, and 22%. The mean dose of iGlarLixi at V1 and V2 was 21.8 ± 8.3 and 22.1 ± 8.7 dose steps.

Conclusions: Replacing complex insulin regimens with iGlarLixi in relatively well-controlled patients with T2D results in similar or better glycemic control with lower insulin doses, fewer daily injections, less hypoglycemia and a favorable effect on body weight.

EPV309 / #893

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

DEVELOPMENT OF NONINVASIVE DIABETES MANAGEMENT METHOD USING GLYCATED ALBUMIN IN TEARS

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Background and Aims: Several clinical trials have demonstrated that strict glycemic control is important to minimize the risk of diabetic complications. Although frequent measurement of blood glucose levels by the invasive finger prick method is useful to achieve strict glycemic control, this method is invasive and burdensome to the patients. Glycated albumin (GA) is a biomarker which reflects the glycemic control status over the previous 2 weeks. We demonstrated GA levels in tears correlated those in blood. We hypothesized that regular GA tests in tears caused behavior change and improved glycemic control.

Methods: Participants with type 2 diabetes were recruited and randomly divided to two groups. One group (intervention group) was performed tear GA tests every 2 weeks and reported the results, while the other group (control group) was not. After 8 weeks of intervention, the two groups were compared. GA levels in tears were measured by Liquid Chromatography/Mass Spectrometry.

Results: We enrolled 56 participants to the study. Compared with the control group, the intervention group showed improvement in fasting blood glucose, HbA1c, GA, non-HDL cholesterol.

Conclusions: Levels of GA, as a diabetes-related biomarker, in tears can be measured noninvasively. Regular measurement of the

GA levels in tears could allow smoother management of diabetes mellitus and reduce the risk of complications noninvasively.

EPV310 / #1339

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

COMBINATION OF ICOVAMENIB AND GLP-1-BASED THERAPEUTIC AGENTS IMPROVES BETA CELL FUNCTION AND INSULIN SECRETION

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Background and Aims: Icovamenib (BMF-219) is an oral, small-molecule, covalent menin inhibitor, in clinical development for T1D and T2D. Icovamenib acts as an antagonist of menin, a scaffold protein and transcriptional regulator implicated in the regulation of beta cell proliferation and function. In preclinical studies, icovamenib: i) promoted selective and controlled proliferation of beta cells and improvement in beta cell function in ex vivo human islet cultures, in a glucose- and dose-dependent manner, and ii) enhanced glycemic control in animal models of diabetes.

Methods: Experiments were performed using cadaver-derived human donor islets. In brief, human islets were cultured under hyperglycemic conditions in the presence of vehicle or varying concentrations of icovamenib. Following the treatment, islets were tested for glucose stimulated insulin secretion in the presence of semaglutide (GLP-1 receptor agonist) or tirzepatide (GLP-1/GIP dual receptor agonist).

Results: Icovamenib induced a dose-dependent enhancement in insulin secretion potentiated by semaglutide or tirzepatide. The combination treatment enabled a greater pharmacodynamic effect with lower doses of the GLP-1 receptor agonists. These positive effects of the combination were reproducible in islets from multiple donors. Through inhibition of menin, icovamenib may have direct effects on the GLP-1 receptor expression and insulin secretion. Details into the mechanism will be presented.

Conclusions: These results highlight the complementary mechanisms of action: icovamenib increases beta-cell mass and function, while GLP-1-based therapies improve nutrient-stimulated insulin secretion and peripheral insulin sensitivity. Administering these agents as part of a combination regimen has the potential to provide a synergistic response, thereby enhancing the therapeutic window of GLP-1-based therapies.

EPV311 / #719

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

ETHNICITY-SPECIFIC CHANGES IN HBA1C AND USE OF GLUCOSE-LOWERING THERAPIES FOLLOWING INITIATION OF SGLT2I AND/OR GLP1RA

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Background and Aims: Since 2021, New Zealand has funded SGLT2i (empagliflozin) and GLP1RA (dulaglutide, (liraglutide from March 2023)) under 'special authority' for type 2 diabetes (T2D) with prioritisation for Māori, Pacific and those with high risk/established cardiovascular/renal disease (CVRD). Little is known about ethnicity-specific reductions in HbA1c and T2D medications following SGLT2i/GLP1RA use.

Methods: Using a New Zealand T2D primary care dataset (n=56,194; 302 general practice clinics; Feb 2021- December 2023) we reviewed recurrent users of SGLT2i/GLP1RA (≥ 2 dispensing events) and calculated change in HbA1c and T2D prescribing at 6 and 12 (± 3) months following initiation.

Results: Overall, 22,266 patients (7452 European, 5663 Māori, 3231 Asian and 5492 Pacific peoples) were included. Mean HbA1c decreased from 78.2 mmol/mol [9.3%] at baseline to 70.1 and 70.3 mmol/mol [8.6%] at 6 and 12 months. Unadjusted reductions in HbA1c were significantly greater at 12 months for Māori compared to European, Pacific or Asian (-8.8 vs -7.8, -7.7 and -7.8 mmol/mol; $P < 0.05$), but reductions in HbA1c were lower for Māori and Pacific compared to other ethnic groups after adjusting for baseline HbA1c and occurrence of CVRD ($P < 0.05$). At 12 months SGLT2i/GLP1RA use associated with significant reductions in T2D medication prescribing, but this differed by ethnicity and medication (e.g vildagliptin [-14.7% for Māori, -9.3% Pacific, -25.7% NZ European; $P < 0.01$], sulphonylureas [-40.0% for Māori, -31.3% Pacific, -33.8% Asian, -40.8% for NZ European]).

Conclusions: The impact of SGLT2i/GLP1RA on HbA1c levels and T2D medication use differs by ethnicity and is dependent on baseline HbA1c and CVRD status.

EPV312 / #357

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

CARDIO-HEPATIC PROTECTIVE EFFECTS OF THE DIPEPTIDYL PEPTIDASE-4 INHIBITOR AND GLYCAEMIA IMPROVEMENT IN ADOLESCENTS WITH TYPE 1 DIABETES AND NON-ALCOHOLIC STEATOHEPATITIS: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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Background and Aims: Many patients with type 1 diabetes mellitus (T1DM) met the histological criteria for non-alcoholic steatohepatitis (NASH) which leads to cardiovascular disease (CVD) morbidity and mortality. Matrix metalloproteinase-14

(MMP-14) is involved in CVD and atherosclerosis. To assess the impact of oral dipeptidyl peptidase-4 inhibitor, vildagliptin, as adjunctive therapy on NASH in adolescents with T1DM and its effect on glycemic control, MMP-14 levels and carotid intima media thickness (CIMT).

Methods: Sixty adolescents with T1DM and NASH were randomly assigned to receive oral vildagliptin (50 mg once daily) for six months or not. HbA1c, lipid profile, hepatic steatosis index, triglyceride glucose (TyG) index and MMP-14 levels were assessed. Transient elastography (TE) with controlled attenuation parameter (CAP) was performed together with measuring CIMT.

Results: By TE, 12 (20%) T1DM patients with NASH had elevated liver stiffness ≥ 7 kPa (F2 stage or higher). Baseline MMP-14 was positively correlated to insulin dose ($p = 0.016$), triglycerides and TyG index, CIMT, liver stiffness and CAP levels among the studied patients ($p < 0.001$ for all). After six months, T1DM patients on vildagliptin therapy had significantly lower HbA1c, lipid profile, hepatic steatosis index and TyG index as well as MMP-14 ($p < 0.001$). CIMT, liver stiffness and CAP were significantly decreased post-therapy compared with baseline levels and compared with the control group ($p < 0.001$). Vildagliptin was safe and well-tolerated.

Conclusions: Administration of vildagliptin for adolescents with T1DM and NASH improved glycemic control, dyslipidemia, MMP-14 levels and decreased liver stiffness and CIMT; hence, reducing subclinical atherosclerosis and disease progression.

EPV313 / #1354

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

ADIPONECTIN/LEPTIN RATIO INCREASE AFTER ENAVOGLIFLOZIN TREATMENT IN PATIENTS WITH TYPE 2 DIABETES

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Background and Aims: Enavogliflozin, a novel SGLT2 inhibitor, has shown remarkable glucose lowering effect and promotes weight loss in type 2 diabetes. This study investigates the effect of enavogliflozin on the ALR in patients with type 2 diabetes.

Methods: A randomized, double-blind, placebo-controlled trial involved 160 patients with type 2 diabetes (enavogliflozin 0.3 mg [n=82] or placebo [n=78]) for 24 weeks. Serum levels of adiponectin and leptin were measured at baseline and week 24. Analysis of covariance (ANCOVA) was used to assess changes in adiponectin, leptin, and the ALR, adjusting for baseline values, weight loss, and other stratification factors.

Results: The enavogliflozin group experienced significant changes in their adiponectin and leptin levels, resulting in a marked increase in the ALR. In the enavogliflozin group, the least squares (LS) mean difference for adiponectin levels was 0.98 mg/L compared to the placebo group ($p=0.061$), while

leptin levels showed a significant LS mean difference of -2.99 µg/L ($p < 0.0001$), resulting in a significant LS mean difference of 1.05 ($p = 0.0012$) in the ALR in favor of the enavogliflozin group. After further adjusting for the change in weight, enavogliflozin significantly reduced leptin levels compared to placebo in type 2 diabetes patients over 24 weeks ($p = 0.01$). However, changes in adiponectin levels and the ALR remained not statistically significant after adjusting for weight loss.

Conclusions: Enavogliflozin treatment significantly increased the ALR in patients with type 2 diabetes over 24 weeks, suggesting improved adipocyte dysfunction. These results highlight enavogliflozin's potential beyond glycemic control, offering additional benefits.

EPV314 / #1277

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

EFFECTS OF GLP-1 MEDICATIONS ON LEAN MASS INDEX, FAT MASS INDEX, VISCERAL FAT, AND APPENDICULAR LEAN MASS INDEX IN TYPE 2 DIABETES PATIENTS

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Background and Aims: GLP-1 receptor agonists (Tirzepatide, Semaglutide) are commonly used to manage Type 2 Diabetes (T2D). This study is aimed to evaluate the effects of these medications on body composition metrics, including Lean Mass Index (LMI), Fat Mass Index (FMI), Visceral Adipose Tissue (VAT Mass), and Appendicular Lean Mass Index (ALMI).

Methods: This retrospective study analyzed data from T2D patients on GLP-1/ GIP agonist therapies. Body composition was assessed using DEXA (Dual-Energy X-ray Absorptiometry) body composition scans, measuring total lean mass, fat mass, and visceral adipose tissue. LMI and FMI were calculated by dividing lean and fat mass (kg) by height (m^2), while ALMI was derived from appendicular lean mass (arms and legs). Visceral adipose tissue was estimated from DEXA scan outputs. We evaluated patients who have been on these therapies for at least six months. The evaluation was a cross sectional analysis of these patients data.

Results: Tirzepatide demonstrated superior outcomes, with the highest LMI ($15.2 \text{ kg}/m^2$) and ALMI ($8.6 \text{ kg}/m^2$), coupled with the lowest FMI ($7.5 \text{ kg}/m^2$) and VAT Mass (1.6 kg). Semaglutide showed moderate performance across these metrics.

Conclusions: Our data suggests that Tirzepatide appears most effective in promoting lean mass retention and reducing both fat mass and visceral adipose tissue, making it a superior option for patients aiming to optimize body composition. However further studies are needed to evaluate this finding through a perspective study.

EPV315 / #1202

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

IMPROVED GLYCEMIC CONTROL IN TYPE 1 DIABETES PATIENTS CARRYING HLA DR3-DQ2: FURTHER INSIGHTS FROM CONTINUOUS GLUCOSE MONITORING FROM THE PHASE 2B DIAGNODE-2 TESTING RHGAD65

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Background and Aims: The Phase 2b DIAGNODE-2 trial demonstrated the potential of rhGAD65 in preserving beta cell function in patients recently diagnosed with stage 3 T1D, carrying HLA DR3-DQ2. The present study analyzes continuous glucose monitoring (CGM) data to explore the relationship between preserved beta cell function, measured by stimulated C-peptide, and glycemic control, particularly meal-related glucose responses and hyperglycemic events.

Methods: Meal features were assessed using OneTwo Analytics' model for meal detection, and the study evaluated these features across morning, day, and evening meals using data from $n=285$ CGM data files (>90% files had >70% data points) collected using FreeStyle Libre PRO. Glycemic range features, including time spent in hypo- and hyperglycemic ranges, were calculated as a percentage of total time.

Results: Better meal-related glucose control, including significantly lower pre-prandial, peak-prandial and post-prandial glucose values were seen in patients carrying HLA DR3-DQ2 treated with rhGAD65 compared to placebo. In this group, rhGAD65 treated patients had more time in range (3.9-10 mmol/L) less time spent in severe hyperglycemic range ($>13.9 \text{ mmol}/L$) and shorter hyperglycemic episodes compared to placebo.

Conclusions: In addition to preserving beta cell function, treatment with rhGAD65 significantly improves glycemic control during meals and reduces the duration of hyperglycemic episodes in newly diagnosed T1D patients carrying HLA DR3-DQ2.

EPV316 / #15

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

PUTTING THE ADA STANDARDS OF MEDICAL CARE IN DIABETES INTO PRACTICE: HOW TO IMPLEMENT THE RECOMMENDATIONS

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Background and Aims: Every year the American Diabetes Association releases new Medical Standards of Care in diabetes. It's a huge and very overwhelming document that many people fail to read. It's important to understand how to review and implement these recommendations.

Methods: The ADA standards are separated by section. It's important for HCPs to look at the sections that are their areas of expertise. Then, investigate each new or revised recommendations to see if changes need to be made to the approach to care, screenings, treatment, etc.

Results: Once pertinent recommendations are identified, it's important to put those recommendations into practice in the appropriate settings. This decreases clinical inertia and improves the overall quality of care. It's the implementation of these recommendations that is key. So often HCPs review the standards but skip the implementation step. This is where inertia plays the biggest role. Technology, medications and behavioral changes are key to success and quality of life for the person with diabetes. It needs to start with the implementation of these standards.

Conclusions: This session will cover all the key edits and new recommendations, all new tables, algorithms and figures. We'll then discuss how to review the standards of medical care in diabetes and then how to implement them in practice!

EPV317 / #1231

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

TESTOSTERONE REPLACEMENT THERAPY IMPROVES GLYCAEMIC CONTROL AND SYMPTOMS OF HYPOGONADISM IN MEN WITH TYPE 2 DIABETES – THE ABCD WORLDWIDE AUDIT

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Background and Aims: - Symptomatic testosterone deficiency (hypogonadism) is common with a prevalence of ~40% in men with type 2 diabetes. Symptoms mainly consist of sexual, physical and psychological complaints, all of which all impact on patient well-being. HbA1c positively correlates with low testosterone. The aim of the Association of British Clinical Diabetologists (ABCD) worldwide audit is to analyse real world benefits and safety of testosterone replacement.

Methods: Anonymised routine patient data can be inserted prospectively or retrospectively in treated or untreated hypogonadal men. Individual centres that take part can audit their own clinical practice. The audit has collected data from 460 patients, mean age 70.9±9.19(SD)years, on symptoms, HbA1c, cardiometabolic risk factors/events and safety. The AMS (Aging Male Symptom Score for Hypogonadism) was used in patients. Score >26/85 positive in presence of testosterone <12nmol/l.

Results: – Baseline Total Testosterone 9.21±1.75nmol/l. AMS/HbA1c using paired sample t-Test equal variance - AMS Baseline (B) mean 55.86 and 3m 27.39 (p<0.001)[n=168], B 55.95 and 6m 27.3 (p<0.001)(n=202), B 54.5 and 12m 21.74 (p<0.001)[n=174], B 54.12 and 24m 19.09 (p<0.001)[n=159]. HbA1c before and after TRT (1) 6 months 70.51 to 64.96 (n=163)(p<0.001); (2) 12 months 70.82 to 61.06(n=145) (p<0.001); (3) 3 years 70.99 to 51.7(n=125)(p<0.001).

Conclusions: Data presented here demonstrates that testosterone therapy improves symptoms and wellbeing as well as glycaemic control in hypogonadal patients with Type 2 Diabetes sustained for at least 3 years. This audit shows that men with symptoms of testosterone deficiency should be investigated for hypogonadism. Any clinician managing diabetes patients can still join this ongoing audit (www.diabetologists-ABCD.org.uk/Testosterone/).

EPV318 / #449

E-Poster Viewing Topic: AS11. New Medications for Treatment of Diabetes

LOW-DOSE GLUCAGON AFTER FASTED EXERCISE FOLLOWING LOW VS. HIGH CARBOHYDRATE DIETS – A THREE-ARM RANDOMIZED CROSSOVER STUDY

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Background and Aims: Low-dose glucagon can be used for non-caloric prevention and/or treatment of mild hypoglycemia. However, a restricted intake of carbohydrates may impair the treatment effect. This study aimed to compare the glycemic response to a low dose of glucagon after fasted exercise following three isocaloric diets with low or high carbohydrate composition.

Methods: In random order, 12 individuals with type 1 diabetes followed three different diets for seven days: HCLFLP (energy provided by carbohydrate: 48%, fat: 33%, protein: 19%), LCHFLP (19%, 62%, 19%), and LCLFHP (19%, 57%, 24%). On day eight of each intervention period, participants performed 45 minutes of fasted cycling (60% of $\dot{V}O_{2peak}$) followed by 90 minutes of rest then a subcutaneous injection of 150 micrograms of native glucagon (GlucaGen®, Novo Nordisk). Basal insulin rates were temporarily reduced to 50% from 90 minutes before to immediately after exercise.

Results: Participant characteristics were: 4 females, median (range) age 50 (22–70) years, diabetes duration 25 (11–52) years, and HbA1c 57 (37–67) mmol/mol. Participants were treated with non-automated insulin pumps. Mean glucose concentrations before and peak glucose values after glucagon administration were significantly different between all three diets, but primarily driven by differences between HCLFLP and LCLFHP (Fig. 1). There were no significant differences in incremental peak values or incremental area under the glucose curve in the 2-hour observation period following glucagon administration.

Conclusions: The glycemic responses to a low dose of glucagon administered subcutaneously after fasted exercise were not significantly affected by the diet composition in the preceding seven days.

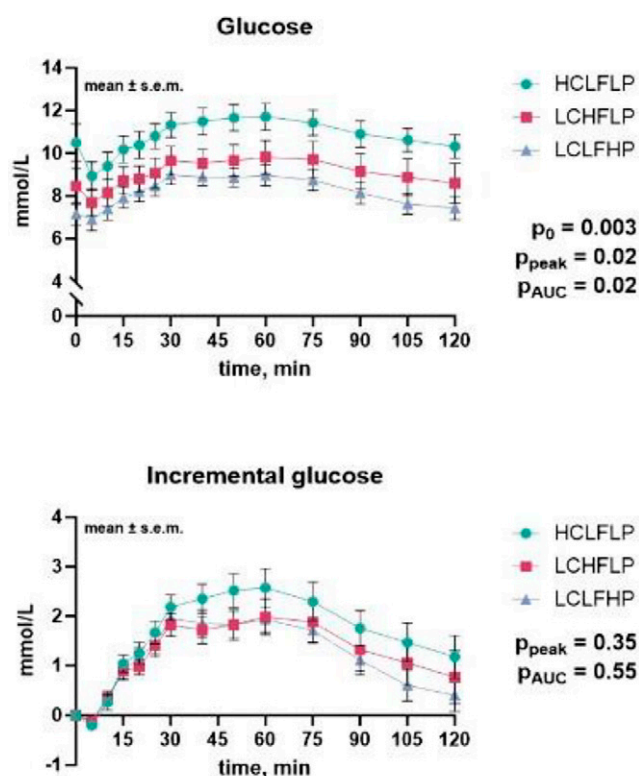


Figure 1.

Upper panel: Plasma glucose values after subcutaneous administration of 150 micrograms glucagon at time=0.

Lower panel: Incremental plasma glucose values after subcutaneous administration of 150 micrograms glucagon at time=0.
AUC: Area Under the Curve; HCLFLP: Energy provided by carbohydrate: 48%, fat: 33%, protein: 19% in the preceding seven days; LCHFLP: Energy provided by carbohydrate: 19%, fat: 62%, protein: 19% in the preceding seven days; LCLFHP: Energy provided by carbohydrate: 19%, fat: 57%, protein: 24% in the preceding seven days. s.e.m.: Standard Error of Mean.

EPV319 / #5

E-Poster Viewing Topic: *AS11. New Medications for Treatment of Diabetes*

SODIUM GLUCOSE CO-TRANSPORTER2 (SGLT2) INHIBITOR FOR MANAGEMENT OF REFRACTORY HYPOMAGNESEMIA IN MATURITY-ONSET DIABETES OF THE YOUNG TYPE 5 (MODY5)

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Background and Aims: Refractory hypomagnesemia is commonly observed in patients with MODY5 and SGLT2i had been reported to improve magnesium levels in patients with urinary magnesium wasting. Herein, we report an interesting case of dramatic improvement in serum magnesium levels after initiating SGLT2i in a patient with MODY5.

Methods: A 38-year-old Thai woman diagnosed with MODY5 (deletion of chromosome 17q12, including loss of HNF1B gene)

3 years ago presented to clinic for a routine follow-up with gradually worsening glycemic control (A1C from 6.7% to 7.7%) with normal estimated glomerular filtration. Over the course of 3 years, she has maintained compliance with her medications, taking only metformin at 2,000 mg/day and linagliptin 5 mg/day. Even though oral magnesium supplements were continued up to 1,500 mg/day, serum magnesium levels remained low at 1.1 mg/dL (normal 1.6-2.6 mg/dL). She experienced muscle cramps sometimes and increased migraine frequency.

Results: She was started on empagliflozin 10 mg/day for better glycemic control. Within 8 weeks, serum magnesium level rose to 1.6 mg/dL with improved glycemic control at A1C 6.4%. Fractional excretion of magnesium improved from 8.8% to 3.5%, suggesting enhanced tubular reabsorption of magnesium. Her serum magnesium levels remained in the acceptable levels over a 12-month period with reduced migraine frequency.

Conclusions: Our case demonstrated that SGLT2i can improve the management of refractory hypomagnesemia in patients with MODY5 by enhancing renal tubular reabsorption of magnesium. SGLT2i could represent a potent new tool in the management of hypomagnesemia-associated MODY5.

EPV320 / #329

E-Poster Viewing Topic: *AS11. New Medications for Treatment of Diabetes*

ONLINE MEDICAL EDUCATION ADVANCES PHYSICIANS' KNOWLEDGE ABOUT THE EVOLUTION OF INCRETIN-BASED THERAPIES IN HOLISTIC DIABETES MANAGEMENT

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Background and Aims: A holistic management approach for comprehensive cardiometabolic risk and weight control is recommended for patients with type 2 diabetes (T2D) by latest international guidelines. The goal of this activity was for learners to better understand the need for further comprehensive cardio-renal-metabolic risk control and weight loss beyond presently available therapies and be aware of emerging incretin-based therapies currently in clinical development.

Methods: Three diabetes experts joined a 30-minute online video discussion with synchronized slides. Educational effect was assessed using a repeated-pair design with pre-/post-assessment. Three multiple choice questions assessed knowledge, one question rated on a Likert-type scale assessed confidence. A paired samples t-test was conducted on overall average number of correct responses and for confidence rating, a McNemar's test was conducted at the question level.

Results: 46% of primary care physicians (PCP, n=164, P<.001) and 51% of diabetologists/endocrinologists (D/E, n=47, P<.001) improved their knowledge regarding the requirement for comprehensive cardiometabolic risk and weight control beyond presently available therapies and their awareness of novel incretin agonists in clinical development. Post education, 41% of PCP and 28% of D/E had greater confidence in their ability to provide comprehensive cardiometabolic risk control for their patients with T2D with a confidence shift of 62% (PCP, P<.001) and 53% (D/E P<.05), respectively.

Conclusions: Participation of PCP and D/E in an online video expert discussion improved their understanding of the requirement for comprehensive cardiometabolic risk and weight control in T2D management beyond presently available therapies and their awareness of emerging incretin agonists.

EPV321 / #1242

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

SCREENING FOR PRESYMPTOMATIC TYPE 1 DIABETES IN FIRST-DEGREE RELATIVES: A SINGLE-CENTER EXPERIENCE

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Background and Aims: Type 1 diabetes (T1D) is an autoimmune disorder marked by islet autoantibodies. First-degree relatives of individuals with T1D have a 10-15 times higher risk of developing the disease compared to the general population. Screening for four autoantibodies—anti glutamic acid decarboxylase (anti-GAD), anti-protein tyrosine phosphatase (anti-IA2), anti-insulin (IAA), and anti-zinc transporter 8 (anti-ZnT8)—enables early diagnosis of T1D and reduces the incidence of diabetic ketoacidosis at diagnosis. The presence of two or more positive autoantibodies confirms presymptomatic T1D, while one positive autoantibody identifies individuals 'at risk.' This study aimed to assess the prevalence of these autoantibodies in first-degree relatives of patients with T1D, excluding those already diagnosed with T1D.

Methods: A total of 228 first-degree relatives (ages 1–61) of pediatric T1D patients were screened, including 99 siblings and 129 parents (57% females). Autoantibodies (anti-GAD, anti-IA2, IAA, and anti-ZnT8) were measured. Participants with two or more autoantibodies underwent further evaluation, including HbA1c, fasting glucose, OGTT, and 14 days of continuous glucose monitoring (CGM).

Results: Of the 228 participants, 26 (11.4%) had one positive autoantibody, including 16 over 18 years of age and one diagnosed with impaired glucose tolerance. IAA (42%) and anti-GAD (35%) were the most common, followed by anti-ZnT8 (19%) and anti-IA2 (4%). Seven participants (3.1%) had two or more positive autoantibodies. None exhibited dysglycemia, leading to a diagnosis of stage 1 T1D.

Conclusions: Screening for T1D autoantibodies in first-degree relatives is effective for identifying individuals at risk and diagnosing presymptomatic T1D, enabling closer monitoring and access to clinical trials or preventive interventions.

EPV322 / #1082

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

PERFORMANCE OF A NEW PROTOTYPE ELISA FOR THE DETECTION OF AUTOANTIBODIES AGAINST GAD 65 IN PATIENTS WITH TYPE 1 DIABETES MELLITUS

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Background and Aims: Autoantibodies against the 65 kDa isoform of glutamic acid decarboxylase (GAD) are an important marker for diagnosis and prediction of new-onset type 1 diabetes mellitus (T1DM) and GAD65 antibody-associated neurological diseases, especially stiff-person syndrome. We developed a new prototype Anti-GAD ELISA that requires a lower amount of serum (5 µl) and has a shorter total incubation time (2h15min) compared to the established EUROIMMUN Anti-GAD ELISA (25 µl, 2h40min) and evaluated the performance of the prototype assay.

Methods: The clinical performance of the prototype ELISA was evaluated using a sensitivity panel comprising sera from 100 T1DM patients and 20 patients with a suspected neurological disorder, and a specificity panel comprising sera from 48 ANA-negative patients, 74 patients with suspected thyroid disorder, and 227 healthy donors. Agreement between the prototype and the established ELISA was analyzed using 36 sera from suspected T1DM patients. Agreement between the prototype and the Medipan CentAK anti-GAD₆₅ M radioimmunoassay (RIA) was analyzed using 100 sera from T1DM patients.

Results: The clinical sensitivity of the prototype ELISA was 86.7% at a specificity of 98.6%. The prototype and the established ELISA agreed 100% (Cohen's κ=1). The prototype ELISA and the RIA detected anti-GAD autoantibodies in 86% and 75% of T1DM patients, respectively (moderate agreement, κ=0.5).

Conclusions: The new Anti-GAD ELISA showed a promising performance compared to the established ELISA. Shorter processing time and a lower amount of serum reinforce the prototype's suitability to replace the established ELISA. Additionally, the new ELISA enables easier automation in conjunction with other ELISA on EUROIMMUN instruments.

EPV323 / #1083

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

EVALUATION OF A NEW PROTOTYPE ELISA FOR THE DETECTION OF AUTOANTIBODIES AGAINST IA2 IN PATIENTS WITH TYPE 1 DIABETES MELLITUS

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Background and Aims: Autoantibodies against insulinoma-associated antigen-2 (anti-IA2) are an important marker for diagnosis and prediction of new-onset type 1 diabetes mellitus (T1DM). Here, we report on a new prototype Anti-IA2 ELISA with shorter total incubation time (3h15min) compared to the established EUROIMMUN Anti-IA2 ELISA (minimum 17h40min). The study evaluates the performance of the prototype assay.

Methods: The clinical performance of the prototype ELISA was evaluated using a sensitivity panel comprising sera from 150 patients with confirmed T1DM, and a specificity panel consisting of sera from 90 control subjects and 210 healthy donors. Agreement between the prototype and the established ELISA was analyzed using sera from 50 T1DM patients and 90 controls. Agreement between the prototype ELISA and the Medipan CentAK anti-IA₂ M radioimmunoassay (RIA) was analyzed using 100 sera from T1DM patients.

Results: The clinical sensitivity of the prototype ELISA amounted to 70.0% (105/150) at a specificity of 98.3% (295/300). Method comparison revealed an overall agreement of the prototype of 94.3% (Cohen's $\kappa=0.9$) referring to the established ELISA and 90.0% (Cohen's $\kappa=0.8$) referring to the RIA.

Conclusions: The results suggest that the new Anti-IA2 ELISA will be a valuable tool in supporting diagnostics of T1DM. Reduction of the processing time to a few hours minimizes the time required for laboratory testing. Additionally, the new assay enables easier automation in conjunction with other ELISAs on the EUROIMMUN Analyzer I or EUROLabWorkstation ELISA.

EPV324 / #763

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

ADDRESSING BARRIERS TO TYPE 1 DIABETES MANAGEMENT: INSIGHTS FROM AN EXPLORATORY DESIGN PROCESS IN TANZANIA

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Background and Aims: Type 1 Diabetes Mellitus (T1DM) and the associated morbidity and mortality is a growing public health concern in Tanzania, with an estimated 84% of patients being diagnosed at diabetes ketoacidosis. This exploratory design process aimed to explore user needs and inform the

development of digital health solutions that could enhance early detection and management of T1DM in resource-constrained settings.

Methods: A User Centered Design (UCD) approach was utilized, involving a sequence of interviews and focus group discussions with patients, caregivers, healthcare providers and other stakeholders in Tanzania, Dar es Salaam region. This process sought to identify challenges in care and utility and desired functionalities of potential digital interventions for T1DM. Prototypes were developed, tested and iterated based on user insights.

Results: Key barriers identified included late diagnosis, poor linkage and retention in care, inadequate access to education resources and weak data management processes. Users expressed the need for integrated digital solutions to support service delivery, clinical decision support, patient education and data management. The prototypes were well-received, with feedback indicating potential for health worker adoption and increased patient engagement.

Conclusions: This User centered design (UCD) provided critical insights for the development of digital solutions tailored to the needs of individuals living with T1DM as well as health care providers in Tanzania. By addressing the key barriers identified, the digital tool shows potential in improving early detection, treatment adherence, and self-management for T1DM in similar low-resource settings.

EPV325 / #1218

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

HEMOGLOBIN GLYCATION INDEX: A USEFUL TOOL IN TYPE 1 DIABETES PATIENT'S FOLLOW-UP?

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Background and Aims: HbA1C is the most commonly used parameter to evaluate glycemic control in diabetes. However, its correlation with mean glucose levels is not always linear. Several studies suggest the existence of other markers, such as the hemoglobin glycation index(HGI), that might allow to stratify the patients at risk for chronic complications. This study aimed to correlate continuous glucose monitoring(CGM)-derived HGI with chronic kidney disease(CKD) and diabetic retinopathy(DR).

Methods: We conducted a retrospective observational study including CGM users with type 1 diabetes. HGI was calculated by subtracting the estimated glucose management indicator(GMI) from the measured HbA1C. The population was divided into two subgroups: low and high HGI(below and above the median HGI value, respectively). The presence of CKD or DR was compared between these subgroups.

Results: The study included 150 patients(51% males, mean age 36.28±16.12 years; 17.6±14.18 years mean duration of disease(DD). DR was present in 24 patients(16.1%), and 33(22.1%) had CKD(none in stage 5). The median HGI was 0.1, patients were divided in subgroups - low (≤ 0.1) and high HGI

(>0.1). Measured HbA1C was significantly higher in the high HGI group (8.1%vs7.1%; $p<0.01$), while GMI was similar between groups (7.5%vs7.4%, $p=0.39$). The incidence of DR was similar in both groups(21.1%). High HGI was associated with an increased risk of CKD (18.3%vs.15.5%), after adjusting for DD (OR: 0.95; 95%CI:0.92–0.98; $P=0.04$), although this was not statistically significant.

Conclusions: HGI calculated using CGM may be a useful marker for assessing the risk of microvascular complications. However, further studies are needed to establish a standardized value that can be applied in clinical practice.

EPV326 / #1118

E-Poster Viewing Topic: AS12. Screening for and Prevention of Type 1 Diabetes

CASE REPORT: THE PSYCHOLOGICAL IMPACT OF TYPE 1 DIABETES SCREENING ON PARENTS

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Background and Aims: In September 2023, the Italian Parliament approved a law (130/2023) introducing a nationwide screening program for type 1 diabetes and celiac disease in children and adolescents, aimed at identifying at-risk individuals within the healthy pediatric population for early intervention. The project involves primary care pediatricians conducting blood tests and, in the case of a positive result, initiating a care pathway through Reference Centers.

Methods: A case report was presented to describe the experiences of a family after enrolling their daughter in Italy’s screening program for diabetes and celiac disease.

Results: The discussions held during the interview with the parents reveal how anxiety and stress manifested, negatively impacting both their relationship and their daughter’s well-being.

Conclusions: While the primary objective of the screening is early diagnosis, this report highlights the importance of addressing the psychological impact of the program on parents. The case emphasizes the critical need for psychological support for parents during and after screening to help them manage emotional strain and ensure better outcomes for their child’s health and care.

EPV327 / #453

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

ASSESSING SOCIODEMOGRAPHIC DISPARITIES IN WEIGHT LOSS OUTCOMES: IMPLICATIONS FOR TAILORED DIGITAL HEALTH INTERVENTIONS IN LIVA’S 9-MONTH DIABETES PREVENTION PROGRAMME

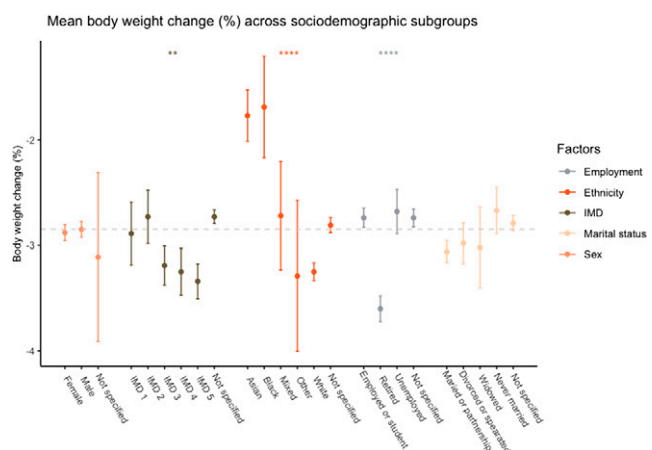
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Background and Aims: Technology has transformed health-care, offering accessible, scalable, and cost-effective services. However, there are concerns that widespread adoption may worsen existing health inequalities. Some studies show modest weight loss effects among ethnic minorities and low socioeconomic groups receiving digital weight management interventions. This retrospective study explores the relationship between sociodemographic factors and weight loss within Liva’s 9-month digital diabetes prevention programme.

Methods: Baseline surveys collected demographic data, including ethnicity, Index of Multiple Deprivation (IMD), employment status, and marital status. Weight was self-reported. A preliminary analysis assessed weight change independent of retention time. One-way analysis of variance was used to examine differences in weight loss across sociodemographic subgroups.

Results: A total of 13,902 individuals commencing the programme between May 2020 and November 2023 were included with baseline characteristics 56.6% female, mean age 57.5 years and mean start weight 89 kg. Mean weight change was -2.9% (6.4). Significant differences were observed by IMD, ethnicity, and employment status. Lower IMD was associated with smaller weight loss. “Asian” and “Black” ethnicities showed the lowest weight reduction, and “Other” and “White” the highest. Retired participants had the greatest weight loss amongst employment categories. No significant differences were observed by sex or marital status.



Conclusions: Results suggest that individuals from lower socioeconomic backgrounds and minority ethnicities may respond less effectively to digital health interventions, highlighting a need for tailored designs and efforts to better serve these populations and prevent widening of health inequalities. Future research should consider retention, starting weight, and BMI variations across ethnicities to further explore these associations.

EPV328 / #960

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

A BETA PANCREATIC METHYLATION BIOSIGNATURE FOR THE DIAGNOSIS & PREDICTION OF TYPE 2 DIABETES MELLITUS

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Background and Aims: The need for minimally invasive biomarkers of early diagnosis of type 2 diabetes (T2DM) and beta-pancreatic cell loss monitoring is emerging for timely and effective interventions to preserve significant beta-cell mass. We focus on studying the methylation fingerprint of circulating cell-free DNA (cfDNA) from liquid biopsies, to build accurate diagnostic/monitoring biosignatures for clinical application in diabetes.

Methods: The study group consisted of 353 T2DM patients, 164 individuals with prediabetes, and 279 healthy individuals. Plasma cfDNA levels were quantified directly via fluorometry and after extraction of ccfDNA, methylation analysis of INS (Insulin), IAPP (Islet Amyloid Polypeptide-Amylin) and GCK (Glucokinase) was performed by qMSP. Automated Machine Learning was used to build classifying biosignatures.

Results: cfDNA levels were found to be elevated in diabetes ($p<0.001$) and in prediabetes ($p=0.002$) as compared to health. A biosignature via Classification Random Forests algorithm, accurately discriminated diabetes from health (AUC 0.899, average precision: 0.919). External validation in two independent datasets exhibited high sensitivity but low specificity in both datasets. Moreover, the model could predict development of T2D in the prediabetic group with high PPV (0.810).

Conclusions: Our approach exploiting methylation, liquid biopsy and ad-hoc autoML, might lead to minimally-invasive solution for diabetes management and prevention.

EPV329 / #1203

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

NON-INVASIVE NEAR-INFRARED SYSTEM FOR SCREENING FOR DIABETES: THE RESULTS FROM ANODE03

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Background and Aims: Screening for diabetes should encompass rapid, non-invasive glycaemia assessment followed by diagnostic testing only for those not testing negative. Cloud-based prediction models targeting glycaemic biomarkers enables

sustainable test results' delivery designed for non-invasive mass-screening.

Methods: ANODE03 evaluated the accuracy, safety and performance of a miniaturised near-infrared spectroscopy System in delivery of test results via a mobile application in a two-part clinical investigation validating a rejection algorithm ($n=60$), after which the Final System (device, cradle and software) was tested in the intended use population. ANODE03 focused on detection of dichotomised diabetes risk status ($< \text{HbA1c } 6.5\%$ ³), specificity, sensitivity and negative/positive prediction values (NPV/PPV), with HbA1c as internal control. Any safety outcomes were to be listed.

Results: The population ($n=429$) was a female-dominant (73.4%), mostly non-smoking (80.3%), apparently healthy, normoglycaemic cohort (median HbA1c 5.3% (IQR: 5.1-5.5) with median age of 39 years (range: 18-90). Table 1 shows the results for the primary and secondary endpoints on two glycaemic cut-off levels. The sensitivity analysis was futile as only 0.9% ($n=4$) of the participants had HbA1c $\geq 6.5\%$. No adverse device-related events were being reported.

Table 1. Primary and secondary endpoints for accuracy of the NIR System in individuals with unknown diabetes risk status.

HbA1c (%) cut-off value	Specificity (%; 95% CI)	NPV (%; 95% CI)	Concordance (%)
Primary endpoint*			
6.5 (48 mmol/mol)	94.7 (92.6–96.9)	99.0 (98.0–100.0)	93.9
Secondary endpoint*			
6.0 (42mmol/mol)	83.7 (80.1–87.3)	96.8 (95.0–98.7)	81.8
* In modified full analysis set; mFAS, $n=429$			

Conclusions: Real-world studies will be needed to reveal the true rate of undiagnosed diabetes in general population outside controlled studies. Our results indicate clinical feasibility, high specificity, and NPV for non-invasive spectroscopy-based assessment of and cloud-based delivery of diabetes screening test results, as well as its potential for accurate delivery of negative results, and thus sustainable approach to mass-screening in any healthcare delivery settings.

EPV330 / #1206

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

ASSESSING IMPLEMENTATION OF NOVEL DIABETES SCREENING METHODS ACROSS DIFFERENT CARE DELIVERY SETTINGS

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Background and Aims: Screening for diabetes across different healthcare delivery settings often presents with mixed challenges, including differences in public health practice, resource allocation, accessibility to care and patient populations. The ANODE03 study, designed to explore the effectiveness and

feasibility of delivery of rapid, non-invasive diabetes screening method assessing glycated nail keratin was implemented in both primary and tertiary care settings. Therefore, we aimed to determine if any differences in practical application of a novel NIR method, screening outcomes and system usability existed.

Methods: A multi-centre pivotal clinical investigation was conducted in individuals with unknown diabetes status recruited in three primary and one tertiary care settings. Screening data from participants across care delivery settings were compared, with a focus on detection rates, ease of use and clinical workflow integration.

Results: The study demonstrated consistent screening accuracy across both primary and tertiary care settings, replicating the high accuracy and concordance as observed in the overall study. Minor differences were noted in workflow integration, with tertiary care setting reporting easier incorporation of the novel method into existing processes. Detection rates of potential cases with potential undiagnosed diabetes were low (0.9%) and comparable between the two settings. No adverse events or device-related events were reported.

Table 1. Diabetes screening accuracy in detection of those testing negative (below dichotomised cut-off value of HbA1c 48 mmol/mol) in primary care versus tertiary care delivery setting. Analysis results displayed in modified full analysis set, total n=429

Primary endpoint: HbA1c (%) cut-off value 6.5 (48 mmol/mol)	Specificity (%)	NPV (%)
Primary care sites (n= 209)	94.7	100.0
Tertiary care site (n=220)	94.9	98.1

Conclusions: Integration of the novel NIR method was effective and safe independent of the care delivery setting, with no significant differences in screening outcomes or feasibility of implementation. In primary care setting workflow integration may require additional adaptations while introduction of the non-invasive system demonstrated its value in both care delivery settings.

EPV331 / #1216

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

MACHINE LEARNING DIAGNOSTIC MODELS OF PREDIABETES AND TYPE 2 DIABETES USING CONTINUOUS GLUCOSE MONITORING DATA -

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Background and Aims: Increasing evidence supports continuous glucose monitoring (CGM) sensors adoption to monitor glycemia in populations beyond people with type 1 diabetes. Interestingly, analyzing collected data, CGM offers a cheap and minimally invasive way to diagnose states of dysglycemia as prediabetes and type 2 diabetes (T2D). To this aim, in this work we developed new machine learning tools to classify prediabetes and T2D from CGM data.

Methods: The dataset comprised ten days of glucose measurements recorded using Dexcom G4 and G6 CGM sensors from 325 individuals, including healthy subjects and people

diagnosed with prediabetes or T2D, based on measured A1c levels. None of the participants were under pharmacotherapy. CGM-derived features including glucose variability indices, time in ranges and time series complexity metrics, and demographics were extracted as feature set. This dataset was then split in a stratified 80-20 ratio for training and testing. We built a linear regression model with a posteriori classification (model A) and a cascade of two binary logistic regression classifiers (model B) to predict whether subjects were healthy, prediabetic, or T2D. For both models, feature selection was performed using Variance Inflation Factor (VIF) and Recursive Feature Elimination (RFE).

Results: Both models demonstrated satisfactory performance. Model A achieved balanced accuracy of 0.72 (VIF) and 0.69 (RFE), while Model B scored 0.69 (VIF) and 0.71 (RFE). In terms of weighted F1-score, Model A obtained 0.76 (VIF) and 0.74 (RFE), while Model B achieved 0.74 (VIF) and 0.76 (RFE).

Conclusions: This study presents promising results regarding the use of CGM sensors for diagnosing prediabetes and T2D.

EPV332 / #1054

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

THE IMPACT OF AGE AND SEX ON FASTING PLASMA GLUCOSE AND GLYCATED HAEMOGLOBIN (HBA1C) IN THE NON-DIABETES POPULATION

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Background and Aims: We previously reported sex differences in the distribution of glycated haemoglobin (HbA1c) for men/women aged <50 years vs older individuals, with implications for delayed diabetes diagnosis. Here we explored whether this pattern was also seen in matched fasting-plasma-glucose (FPG) levels.

Methods: We extracted data on same-day, (morning)-paired HbA1c/FPG levels from UK Clinical Biochemistry Laboratory databases from Mersey/West Lancashire Teaching Hospitals NHS Trust (n=10,153) and Cambridge University Hospitals NHS Foundation Trust (n=10,022) between Jan 2019 and Dec 2023. Only cases with a single, general practice HbA1c test were utilised to minimise the risk of including non-diagnostic tests and tests from specialist care (e.g. endocrinology/antenatal services) final dataset: n=17,271). We examined the link between HbA1c and FPG levels with age/sex.

Results: Median HbA1c levels were 1mmol/mol lower in women aged<45 years compared to men aged<45 years, but not in those aged ≥45 years. This pattern was not seen with FPG where median levels in women were 0.1-0.2 mmol/L lower across all ages. HbA1c:FPG ratio was significantly higher in women than men in the 45-54 and ≥55 year age groups (p=0.004, Z-score=2.9 and <0.001, Z-score=8.9, respectively) but not in the <45 year age group (p=0.649, Z-score=0.5). For women <50 years at the critical diabetes diagnosis threshold 48 mmol/mol, the FPG was 2.6% (ratio 1.026) higher than in

men age <50 whereas for age ≥50 years 4.0% (ratio 0.96) blood glucose was lower than in men.

Conclusions: We showed differences in HbA1c and FPG patterns with age between men and women with implications for the diabetes diagnostic threshold.

EPV333 / #752

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

MEASURING THE COMORBIDITY BURDEN OF DIABETES AND ITS DETERMINANTS IN THE EUROPEAN UNION USING A COMPREHENSIVE COMORBIDITY INDEX

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Background and Aims: The presence of multiple chronic conditions can significantly reduce the quality of life and increase health care needs for people with diabetes mellitus (DM). Therefore, an understanding of the complexity of comorbidity patterns is needed to develop strategies to reduce the burden of disability associated with DM. This study aims to describe the prevalence of comorbidities associated with DM in the European Union (EU), at national and sub-national levels by using a comprehensive comorbidity burden index.

Methods: A cross-sectional study was carried out using micro-data from European Health Interview Survey 2019. The study included adults aged 25 or older who reported having DM from 26 EU member states (n=20,042). Comorbidity index was calculated for 9 chronic conditions using self-rated general health of individuals and disability weights obtained from the Global Burden of Disease 2019. Beta regression analysis was conducted to evaluate the association between comorbidity burden and several determinants.

Results: The most prevalent comorbid conditions among patients with DM was coronary heart disease (12.9%) and depression (12.6%). A higher comorbidity index was found in sub-populations characterized by lower level of education, being unemployed or other labour status, lower income, rural residence, and poor health behaviour including obesity, physical inactivity, and poor diet. A higher comorbidity burden was observed in Eastern and Southern European countries and specific subregions within each country.

Conclusions: The comorbidity index has the potential to identify regions and subpopulations with the highest disability burden and to help develop interventions to improve the quality of life of people with DM.

EPV334 / #555

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

CERAMIDES SURPASS LDL-CHOLESTEROL IN PREDICTING CARDIOVASCULAR MORTALITY IN DIABETIC AND NON-DIABETIC PATIENTS

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Background and Aims: The power of cardiovascular risk prediction is biased by comorbidities (including T2DM), medical treatment, and age, which impact cholesterol levels. Consequently, when applying LDL-C, the true cardiovascular risk of such confounded patients is often underestimated. However, it is not clear whether this constraint for risk prediction may likewise apply to other lipid risk markers in particular ceramides.

Methods: In this observational cohort study, we recorded cardiovascular mortality for 16 years in 1195 patients. Their median age was 67 years, all of them had a high preexisting cardiovascular risk, 51% were taking statins, and 30% had T2DM.

Results: We found a U-shaped association between cardiovascular mortality and LDL-C. We thus stratified the population according to the vertex into high (≥150mg/dL) and lower LDL-C (<150mg/dL) and also according to the T2DM status. A Cox regression analysis revealed that LDL-C failed to predict cardiovascular mortality in any subgroup. In contrast, no U-shaped but a linear association was found for ceramide-based markers. They were able to significantly predict cardiovascular mortality after stratification and even after multivariate adjustment.

Conclusions: We thus propose that ceramide-based predictors rather than LDL-C should be applied for a more accurate cardiovascular risk prediction in diabetic and other high-risk patients.

EPV335 / #1310

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

ONSITE SCREENINGS IN THE WORKPLACE FOR EARLY DETECTION OF DIABETES AND PREDIABETES IN RURAL MISSISSIPPI USING DCA VANTAGE A1C MACHINES

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Background and Aims: Mississippi has some of the highest rates of diabetes in the world with about 1 in 6 residents (15%) living with the disease. While rates of diabetes in this state are high, it is estimated 38% of adults are suspected to have prediabetes and 80 percent of those with prediabetes do not know it. These numbers illustrate the importance of early detection to prevent diabetes and complications. The Mississippi Diabetes Network provides free onsite health screenings for blood sugar, HbA1c, and blood pressure. The primary aim is to detect diabetes and prediabetes in high-risk people and populations in rural Mississippi where they are likely unaware and currently undiagnosed. Early detection of such conditions is a key way to prevent

complications in those with diabetes and to prevent the onset of diabetes in those with prediabetes.

Methods: In 2024, our team screened 650 people at various worksites including municipalities, factories, schools, and state-wide organizations.

Results: Of those who were previously unaware they had diabetes or prediabetes (N=403), 6% had an HbA1c >6.5% indicating diabetes and 35% had an HbA1c between 5.7 – 6.4% indicating prediabetes. Detection of high blood pressure was notable as well. Of those who had never been told they had high blood pressure 87% had blood pressures in the hypertension range.

Conclusions: These results portray the value and importance of worksite screenings to help people understand their numbers and risk for conditions like diabetes and hypertension that can have dire consequences if not caught and treated early in the disease process.

EPV336 / #585

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

ASSOCIATION OF TRANSCRIPTION FACTOR 7-LIKE 2 (TCF7L2) GENE POLYMORPHISM RS7895340 AS A RISK FACTOR FOR TYPE 2 DIABETES MELLITUS IN JAVANESE POPULATION

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Background and Aims: Type 2 Diabetes Mellitus (T2DM) is a metabolic disease commonly observed in individuals over 45 years of age, characterized by reduced insulin responsiveness or insulin resistance. The International Diabetes Federation (IDF) reported that 463 million people aged 20-79 years had diabetes in 2019, accounting for 9.3% of the population. Transcription factor 7-like 2 (TCF7L2) is a transcription factor that regulates pancreatic islet cells. There has been limited research on the association between TCF7L2 polymorphism and T2DM, particularly in Indonesia. This study aims to determine the association between TCF7L2 polymorphism rs7895340 and the risk of T2DM in Javanese population.

Methods: This is a case-control study with 30 cases and 30 controls selected through consecutive sampling. The TCF7L2 rs7895340 polymorphism was genotyped using Amplification Refractory Mutation System Polymerase Chain Reaction (ARMS-PCR). Genotyping was interpreted as wild-type (showing band at 431 bp), homozygous mutant (300 bp), and heterozygous (showing both 431 bp and 300 bp bands). Blood glucose levels were measured for all participants. Data analysis included univariate and bivariate analyses.

Results: All subjects in this study exhibited TCF7L2 gene polymorphism with a frequency of 30 (100%) in both case and control groups. This was confirmed by the presence of two bands in gel electrophoresis visualization. Analysis revealed no association between TCF7L2 gene polymorphism and the risk of T2DM (p= NA; OR=NA).

Conclusions: TCF7L2 polymorphism is a common allele in the Javanese population and is not associated with the risk of T2DM.

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E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

COMBINED MUTATIONS OF KCNJ11 AND PPAR γ GENE POLYMORPHISMS IN TYPE 2 DIABETES MELLITUS PATIENTS

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Background and Aims: Type 2 Diabetes Mellitus (T2DM) is a complex metabolic disorder influenced by genetic factors. Polymorphisms in KCNJ11 and PPAR γ genes have been implicated in diabetes susceptibility. Understanding these genetic variations, especially in combination, can provide insights into T2DM mechanisms and potential protective factors. This study investigates the association between combined mutations of KCNJ11 and PPAR γ gene polymorphisms and susceptibility to T2DM.

Methods: A case-control study involving 29 T2DM patients and 29 healthy controls was conducted. Genetic analysis was performed using Polymerase Chain Reaction-Restriction Fragment Length Polymorphism (PCR-RFLP) to identify polymorphisms in the KCNJ11 and PPAR γ genes. Statistical analysis used Chi-square tests and odds ratio (OR) calculations.

Results: In T2DM cases, 17 patients (58.6%) had GG and 12 patients (41.4%) had GA/AA for KCNJ11, while 16 patients (55.2%) had CC and 13 patients (44.8%) had CT/TT for PPAR γ . In controls, 11 subjects (37.9%) had GG and 18 subjects (62.1%) had GA/AA; 4 subjects (13.8%) had CC and 25 subjects (86.2%) had CT/TT. Compound mutations were observed in 5 cases (17.2%) and 24 cases (82.8%) were negative; in controls, 14 subjects (48.3%) were positive and 15 subjects (51.7%) were negative. Statistical analysis revealed a significant association between these polymorphisms and T2DM (p = 0.012), with an OR of 0.2 (95% CI: 0.067-0.747) suggesting a protective effect.

Conclusions: Combined mutations of KCNJ11 and PPAR γ genes, particularly GG and CC wildtypes, may serve as protective factors against T2DM. These findings highlight their potential role in modulating disease risk and offer insights into personalized diabetes prevention strategies.

EPV338 / #897

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

ENZYMATIC DETECTION OF ALPHA-HYDROXYBUTYRATE AS A CLINICAL BIOMARKER FOR EARLY DIAGNOSIS OF INSULIN RESISTANCE

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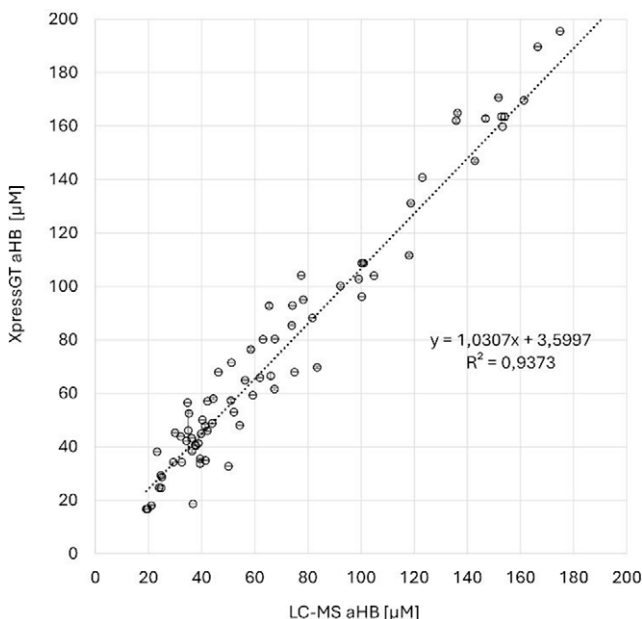
DirectSens GmbH, Vienna, Austria

Background and Aims: Alpha-hydroxybutyrate (α -HB or 2-hydroxybutyrate) is a well-established biomarker for insulin resistance, impaired glucose tolerance, and the risk of Type 2 diabetes (T2D). α -HB levels have been confirmed as biomarkers of hepatic reductive stress, highlighting their role in the early detection of insulin resistance. Traditional quantification via

liquid chromatography-mass spectrometry (LC-MS) is effective but not feasible for routine clinical use. The XpressGT[®] enzymatic test kit was developed to address this, offering a simpler, scalable method for α -HB detection. Available on widely used clinical analyzers such as the ABBOTT Alinity c and ROCHE Cobas, this test supports routine diagnostics and high-throughput screening.

Methods: Serum and plasma samples from at-risk patients were analyzed using both the XpressGT[®] enzymatic test and a published LC-MS method. The enzymatic test uses photometric detection to quantify α -HB and was evaluated under routine conditions in a high-throughput laboratory setting. Critical performance parameters were determined within this infrastructure.

Results: The XpressGT[®] test demonstrated excellent linearity and 93% accuracy compared to LC-MS for a collection of relevant samples. The test performed reliably on clinical analyzers with various sample types, and its analytical performance parameters complied with industry standards, making it suitable for application in clinical settings.



Conclusions: The XpressGT[®] test offers a validated, cost-effective, and scalable solution for routine clinical measurement of α -HB. Its availability on standard clinical analyzers positions it as a valuable tool for the early detection of insulin resistance, allowing timely intervention and broader population screening. We are seeking partnerships for licensing and clinical collaborations to further validate its potential.

EPV339 / #1252

E-Poster Viewing Topic: AS13. Screening for and Prevention of Type 2 Diabetes

DIFFERENT PHENOTYPES OF GESTATIONAL DIABETES INFLUENCE METABOLIC ABNORMALITIES IN NORMOGLYCEMIC WOMEN POSTPARTUM

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Background and Aims: Previous studies suggested various phenotypes of gestational diabetes(PoGD) based on predominant insulin sensitivity(IS) and/or secretion(ISS) defect. However, there is limited evidence regarding PoGD and future metabolic abnormalities. In that context, we aimed to evaluate PoGD in respect to early postpartum metabolic abnormalities.

Methods: Study included 182 normoglycemic women 6 months postpartum, when IS(HOMA-IR and Matsuda index (MI)) and ISS(insulinogenic index (IGI)) were assessed. According to pregnancy 2h-OGTT, study was grouped as follows: A(n=63) normal glucose tolerance and B,C and D had gestational diabetes(GD). Regarding glucose values during pregnancy OGTT, women with GD were further classified in group B: GD-sensitivity(n=17) only fasting glucose(FG) above in OGTT, group C: GD-secretion(n=77) elevated glucose after 60 and 120 min and group D:GD-mixed(n=25) with elevated FG and after 60 or 120min of OGTT.

Results: Groups differed regarding age(groupA:32.6 $\pm$ 5.0, B:33.6 $\pm$ 3.5, C:34.4 $\pm$ 5.6, D:37.2 $\pm$ 6.3ys,p=0.04), body mass index at preconception(groupA:24.4 $\pm$ 0.3, B:27.5 $\pm$ 1.3, C:27.8 $\pm$ 0.6, D:27.3 $\pm$ 0.9kg/m²,p=0.03) and postpartum(groupA:27.7 $\pm$ 0.3, B:30.7 $\pm$ 1.1, C:30.9 $\pm$ 0.5, D:29.6 $\pm$ 0.3 kg/m²,p=0.001). Also, HOMA-IR was higher among all three PoGD compare to group A(p<0.01), while B had higher HOMA-IR(5.9 $\pm$ 0.7) than C(2.4 $\pm$ 0.1,p<0.01) and D(4.4 $\pm$ 0.6,p=0.03), whereas MI was comparable among PoGD. IGI was overall lower among PoGD(groupB:2.9 $\pm$ 0.6, C:2.1 $\pm$ 0.2, D:3.7 $\pm$ 0.4) compare to group A (4.2 $\pm$ 0.1,p=0.05). Simultaneously,PoGD had higher postpartum FG(p<0.01) and HbA1c(p<0.01) than group A. Furthermore, difference was observed regarding postpartum total cholesterol(A:6.6 $\pm$ 0.1, B:5.8 $\pm$ 0.2, C:5.8 $\pm$ 0.9, D:5.7 $\pm$ 0.2mmol/l,p<0.001), HDL-c(A:2.0 $\pm$ 0.5, B:1.0 $\pm$ 0.5, C:1.1 $\pm$ 0.4, D:1.1 $\pm$ 0.1mmol/l, p<0.001) and triglycerides(A:2.0 $\pm$ 0.0, B:2.4 $\pm$ 0.1, C:2.2 $\pm$ 0.6, D:2.3 $\pm$ 0.1mmol/l,p<0.001).

Conclusions: Our study imply that heterogeneity among PoGD might influence the level of insulin resistance, glucose and lipid parameters.However, further research is needed to determine how heterogeneity during pregnancy affects future metabolic risk.

EPV340 / #1018

E-Poster Viewing Topic: AS14. Glucose Monitoring and Advanced Medical Technologies Used in Hospitals

COMPARISON OF CONTINUOUS GLUCOSE MONITORING CGM-BASED COMPOSITE METRICS FOR ASSESSMENT OF GLYCEMIC STATUS IN IN-PATIENT DIABETES CARE

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Background and Aims: Diabetes care faces an increasing number of people living with type 1 (T1) and 2 (T2) diabetes and a shortage of time for clinicians to assess glycemic status. The metrics Comprehensive Glucose Pentagon (CGP), Glycemic Risk Index (GRI) and Quality-Score (Q-Score) summarize overall glycemic quality and are tools for evaluating glycemic control. We investigated the relationships of these metrics applying CGM profiles of people with T1 and T2 diabetes.

Methods: Intermittent CGM-profiles were from a non-interventional, retrospective cross-sectional study of 261 participants (T1: n=146, T2: n=115) during in-patient diabetes management. CGP includes mean sensor glucose (MSG), intensity of hypo- and hyperglycemia, glucose variability (GV) and time out-of-range. GRI has hypo- and hyperglycemia components. Q-Score components include MSG, time above range (T>180), time below range (T<70), variability within days (Range) and between days (MODD). Statistical analyses were performed using PASW Statistics for Windows.

Results: Q-Score had high correlations with GRI ($r = 0.931$) and CGP ($r = 0.863$). CGP had a linear relationship with GRI ($r=0.919$) but curvilinear relationships with Q-Score and GRI. Based on these relations, a Q-Score of 10 corresponds to GRI<40% or CGP <2, while a Q-Score of 12 corresponds to a GRI<60 % or CGP <3.

Conclusions: CGP, GRI and Q-Score consist of closely related parameters for hypo- and hyperglycemia, mean glucose, and variability accounting for their high correlation.

EPV341 / #843

E-Poster Viewing Topic: AS14. Glucose Monitoring and Advanced Medical Technologies Used in Hospitals

EFFICACY AND SAFETY OF THE MINIMED 780G® ADVANCED HYBRID CLOSED-LOOP SYSTEM IN PERIOPERATIVE MANAGEMENT OF PATIENTS WITH TYPE 1 DIABETES

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Background and Aims: To describe the safety and efficacy of the Advanced Hybrid Closed-Loop (AHCL) System in the perioperative management of patients with type 1 diabetes (T1D) undergoing surgery.

Methods: Observational study of a cohort of adult patients with T1D undergoing surgery using the MiniMed 780G. Continuous Glucose Monitoring (CGM) metrics were analyzed prior to surgery; if time below range (TBR<70mg/dl) >4%, the SmartGuard (SG) glucose target (GT) was increased. CGM metrics were analyzed 14 days before, during, and 14 days after surgery.

Results: 18 patients were enrolled (mean age 47.7±14.5 years, mean operative time 73.5±40.3 minutes). Baseline CGM metrics Time in Range (%TIR,70-180 mg/dl) was 76±0.1%, TBR<70mg/dl and <54% were 2±0.0% and 1±0.0%, respectively. The GT for the procedure was 110 mg/dL in four patients and 120 mg/dL in seven patients. The remaining patients continued on optimal GT programming of 100 mg/day and 2-hour continuous insulin. CGM metrics during the surgical

procedure TIR were 87±0.1%, TBR<70 mg/dl 3±0.0% and TBR <54 mg/dl 1±0.0%. A significant increase was found on the day of surgery TIR 0.77 (CI 0.72-0.82, $p<0.001$) with a decrease in TBR less than 70 mg/dl 0.02 (CI 0.72-0.82, $p<0.001$) and less than 54 mg/dl 0.01 (CI 0.00-0.01, $p=0.008$) compared to baseline. This improvement was maintained for 14 days post-operatively. There were no serious adverse events during the procedure.

Conclusions: This study demonstrates that the use of the 780G system, with the SmartGuard feature and glucose target adjustments, effectively maintains TIR without increasing the risk of hypoglycemia before, during, or after surgery.

EPV342 / #851

E-Poster Viewing Topic: AS14. Glucose Monitoring and Advanced Medical Technologies Used in Hospitals

GREATER SAFETY AND EFFICACY OF INSULIN DEGLUDEG/LIRAGLUTIDE COMPARED TO MDI IN THE TRANSITION FROM HOSPITAL TO OUTPATIENT MANAGEMENT IN T2D, EVALUATED BY CONTINUOUS GLUCOSE MONITORING

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Background and Aims: To evaluate the safety of the combination of IDegLira compared to multiple daily insulin injections (MDI) during the hospital discharge transition, defined as the percentage of patients with at least one hypoglycemic event during the first 4 weeks of follow-up.

Methods: This was a randomized, controlled, open-label clinical trial comparing IDegLira with MDI in patients with type 2 diabetes (T2DM) at hospital discharge. The study assessed the percentage of patients with at least one hypoglycemic event, hypoglycemia event density, Time in Range (TIR: 70-180 mg/dL), Time Below Range (TBR: <54 and <70 mg/dL), and other glycemic control metrics, measured by continuous glucose monitoring (CGM).

Results: 64 patients were included in the analysis (32 in the IDegLira group and 32 in the MDI group), baseline HbA1c of 11.6±1.7%, average age of 58±12.4 years. The proportion of patients with at least one hypoglycemic event <54 mg/dL was lower in the IDegLira group (6.2% vs 31.2%; $p<0.010$), as was hypoglycemia event density (incidence rate ratio 15.2; 95% CI 6.2-48.2, $p<0.001$), TBR <70 mg/dL (0.9% vs 2.9%; $p=0.019$), and TBR <54 mg/dL (0.6% vs 1.3%; $p=0.008$). The proportion of patients with CV>36% was higher in the MDI group (34.3% vs 9.3%; $p=0.016$). TIR (70–180 mg/dL) was greater in the IDegLira group (80.6% vs 69.7%; $p=0.008$). These findings were consistent regardless of baseline HbA1c. No severe hypoglycemic events occurred in either group.

Conclusions: The use of IDegLira was superior in terms of safety and efficacy for managing patients with poorly controlled T2DM during the transition from hospital to outpatient care.