ΕΛΕΜΕΔ
Ελληνική Εταιρεία Μελέτης & Εκπαίδευσης για τον Σακχαρώδη Διαβήτη

37ο Πανελλήνιο Ετήσιο Συνέδριο

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Ημέρα Κοινού
16 Νοεμβρίου 2024
Αίθουσα Ολύμπιον
Ολύμπιον Πλ. Αριστοτέλους

Continuous Glucose Monitoring και Διατροφική διαχείριση στον Σακχαρώδη Διαβήτη τύπου 2

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Επιστημονική συνεργάτης ΠΜΣ Νεότερες τεχνολογίες και μέθοδοι στην θεραπευτική αντιμετώπιση του ΣΔ και του Διαβητολογικού κέντρου Α'ΠΡΠ ΠΓΝΘ ΑΧΕΠΑ
Nestle Research Switzerland

Disclosures

- Η ομιλήτρια είναι εργαζόμενη στην Nestle Research, Lausanne, Switzerland

Is CGM the new CBT?

Ας σκεφτούμε το τυπικό άτομο με ΔΜΤ2

- 2 φαινότυποι

Παχυσαρκία
και αντίσταση στην ινσουλίνη

Νορμοβαρής
και αντίσταση στην ινσουλίνη

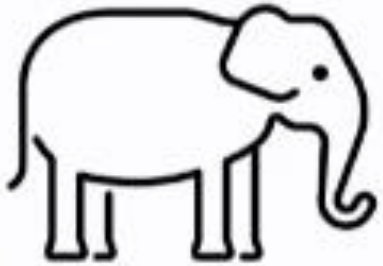
Μεγάλο ψυχολογικό βάρος – πολλές πληροφορίες κατά την διάγνωση – έντονο σοκ
Φορτίο για την συμμόρφωση
Πασχίζει χρόνια με «δίαιτα» και το να συμμορφωθεί στις διατροφικές οδηγίες
Ανάγκη να χάσει κιλά

Ποιοι χρειάζονται το CGM? Και γιατί?

Diabetes Management 2024

T1D: 5-10% of diabetes population

- CGM upfront
- Automated insulin delivery as a destination
- ?Prevention
- ?beta cell replacement
- ?SGLT-2i and GLP-1RA therapy for comorbidities



T2D: 90-95% of diabetes population

T2D Non-insulin (75%)

- ASCVD/CHF/CKD = GLP-1RA or SGLT2i therapy
- Beyond that, therapy based on weight and glycemic goals
- GLP-1RA as first injectable
- Insulin = last resort

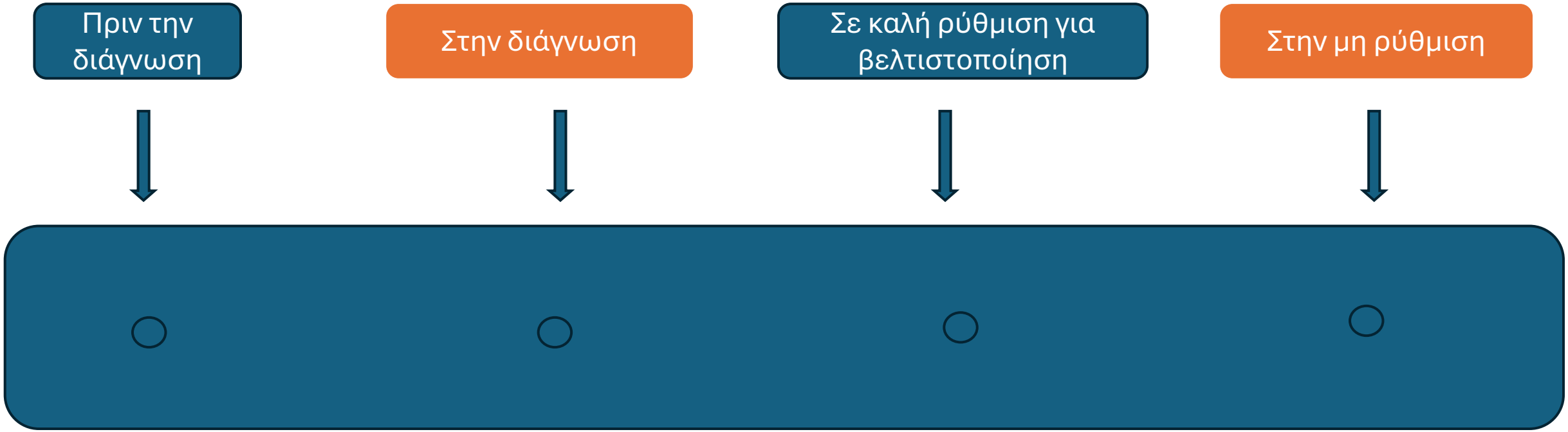
T2D on insulin ± non-insulin therapies (25%)

- More advanced co-morbidities
- Worse outcomes
- 69% unable to get A1C <7% (American data)

Συνήθης οδηγία

- **Μέτρα από το δάχτυλο κάθε πρωί νηστικός και 2 φορές την εβδομάδα 2 ώρες μετά το γεύμα**

Σε ποια στιγμή και γιατί?



In the beginning, There was No Data

Then CGM said “Let There Be Data”

- National Diabetes Prevention Program
- Πολλά ολοκληρωμένα προγράμματα παρέμβασης στον τρόπο ζωής, όπως το Πρόγραμμα Πρόληψης του Διαβήτη (DPP)3 και **στρατηγικές αλλαγής συμπεριφοράς (μόνες τους ή σε συνδυασμό)** έχουν χρησιμοποιηθεί για την προώθηση της απώλειας βάρους σε άτομα που ζουν με παχυσαρκία ή είναι υψηλού κινδύνου με ποικίλα αποτελέσματα.
- Οι στρατηγικές αυτές περιλαμβάνουν τη **συνέντευξη με κίνητρα(motivational interviewing), accountability / αυτοπαρακολούθηση, ημερολόγια διατροφής, βηματόμετρα και εφαρμογές κινητών τηλεφώνων για την απώλεια βάρους.**
- DPP: έδειξε ότι οι αλλαγές στον τρόπο ζωής (διατροφή και σωματική δραστηριότητα με στόχο την **απώλεια βάρους**) ήταν πιο αποτελεσματικές από τις μετρήσεις στην πρόληψη του διαβήτη μεταξύ των ατόμων με προδιαβήτη- ωστόσο, η παρέμβαση στον τρόπο ζωής DPP περιελάμβανε **συχνές επισκέψεις** και καθοδήγηση για αρκετά χρόνια, γεγονός που είναι δαπανηρό και χρήζει ανθρώπινων πόρων.
- A meta-analysis conducted in 2012 reviewing 28 National DPP translational interventions showed an average weight loss of 4%.
- However, the attrition rate or drop-out rate was as high **as 50%** in some programs.
- The weight loss achieved in these interventions was **highly dependent on number of core sessions attended**, highlighting the **challenges of engaging patients in ongoing weekly group sessions** and the need to evaluate alternative, self-directed behavioral change methods to promote weight loss and glycemic management.

Glycemic targets for DMT2

TABLE 1. RECOMMENDED GLYCEMIC TARGETS FOR TYPE 2 DIABETES PATIENTS ON CONTINUOUS GLUCOSE MONITORS

Parameter	*T2D (%)*	*T2D with advanced age or significant comorbidities*
HbA1c	<7.0	<8.0%
TIR (70–180 mg/dL)	>70	>50%
% Under 70 mg/dL	<4	<1%
% Under 54 mg/dL	<1	To be avoided
Glucose variability (CV)	≤36	≤33%

Adapted from Battelino et al.[4]

CV, coefficient of variation; T2D, type 2 diabetes; TIR, time in range.

DIABETES TECHNOLOGY & THERAPEUTICSVolume 23, Supplement 1, 2021Mary Ann Liebert, Inc.DOI: 10.1089/dia.2021.0007

American Diabetes Association®

From: **Comparing Continuous Glucose Monitoring and Blood Glucose Monitoring in Adults With Inadequately Controlled, Insulin-Treated Type 2 Diabetes (Steno2tech Study): A 12-Month, Single-Center, Randomized Controlled Trial**

Diabetes Care. Published online March 15, 2024. doi:10.2337/dc23-2194

CONTINUOUS GLUCOSE MONITORING FOR ADULTS WITH INSULIN-TREATED TYPE 2 DIABETES

AIM

To evaluate the long-term effect of CGM versus BGM in adults with inadequately controlled, insulin-treated type 2 diabetes

METHODS

12-month single-center, open-label, parallel, RCT

76 participants randomized to 12 months of CGM or BGM

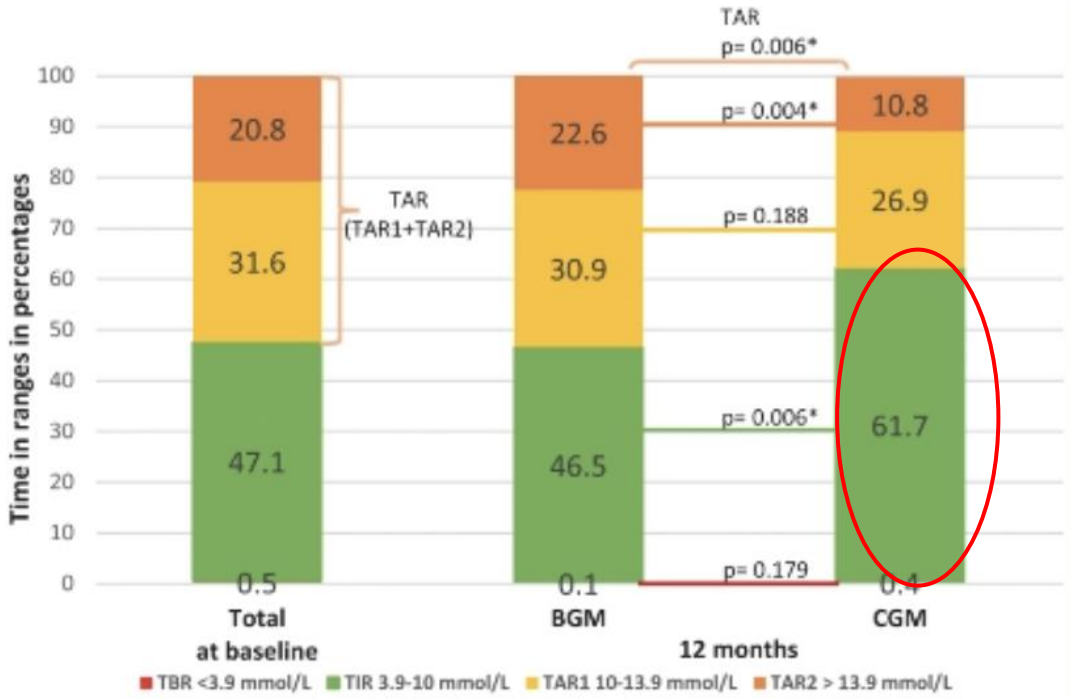


Figure 1: CGM-derived metrics at baseline and 12-month follow-up.

MAIN RESULTS

(BETWEEN-GROUP DIFFERENCE IN CHANGE)

↑ 15.2% TIR (3 h 39 min)
↓ 15.5% TAR
↓ 0.9% (9.4 mmol/mol) in HbA_{1c}
↓ 10.6 units of insulin/day
↓ 3.3 kg in body weight

↑ Self-rated treatment and glucose monitoring satisfaction
↑ Self-rated general and diabetes-related health
↑ Self-rated health behavior

Significant Improvement in Glycemic Outcomes in Type 2 Diabetes Patients: The Impact of 14-D Personalized Coaching and Continuous Glucose Monitoring on Glycemic Variations

Dr Manoj Chawla, Annie Mattilda Raymond, Shivtosh Kumar, Dr Chhavi Mehra
Ragus Healthcare Pvt Ltd

Background:

Continuous Glucose Monitoring (CGM) is a revolution in diabetes management as it helps provide continuous insights into glycemic variability (GV) including hypo- and hyperglycemic episodes. The aim of this study was to observe if CGM-directed personalized nutrition, progressive fitness, and mindfulness coaching, improved glycemic parameters in patients with T2D.

Methodology:

In this retrospective study, we analyzed data obtained from 2860 participants diagnosed with type 2 diabetes (T2D) who enrolled in Sugarfit's Diabetes Reversal and Management Program (SDRMP). These participants completed a 14-day continuous glucose monitoring (CGM) period. The average CGM readings for the initial 3 days (days 2,3,4) and the last 3 days (day-12,13,14) gathered with the help of the Sugarfit app. In this duration coaches effectively implemented personalized changes such as dietary modifications and introduced fitness and mindfulness activities. Importantly, no medication adjustments were made for the duration of 14 days.

Results:

Of the 2,860 participants, 2,078 were males (72.63%) and 782 were females (27.34%). The mean age of participants was 46.5±10.7 years. The CGM captured one reading every 15 minutes, resulting in a total of 96 glucose readings every day for up to 14 days. A significant increase in Time in Range (TIR) of 22.01% ($p<0.001$) was observed from days 2, 3, and 4 to days 12, 13, and 14. Moreover, there was a notable reduction in Time Above Range (TAR) by 28.21% and an improvement in Time Below Range (TBR) by 78.63% ($p<0.001$ for both).

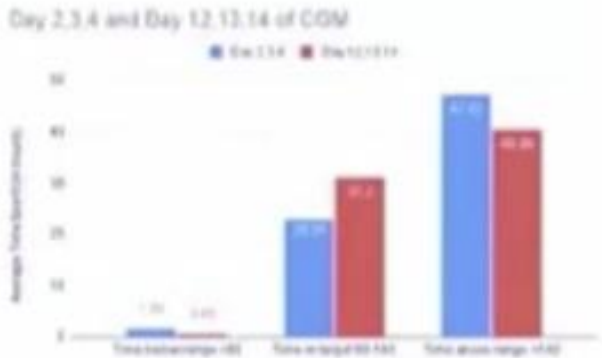


Figure 1 – CGM metrics at day 1 to day 14 of follow-up

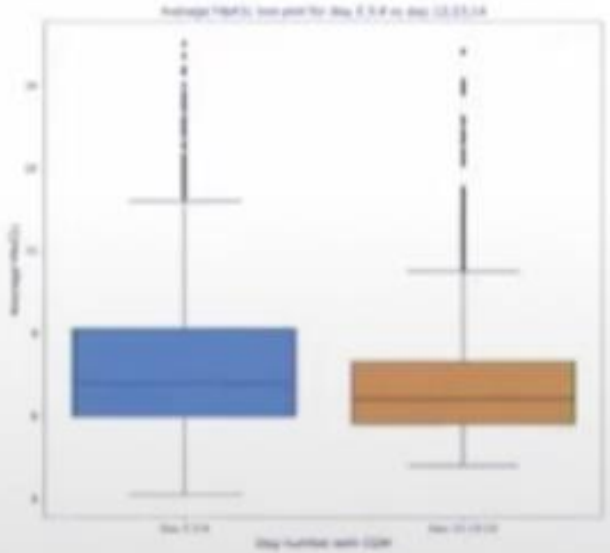


Figure 2 – The average HbA1c in CGM period (day 1 to day 14)

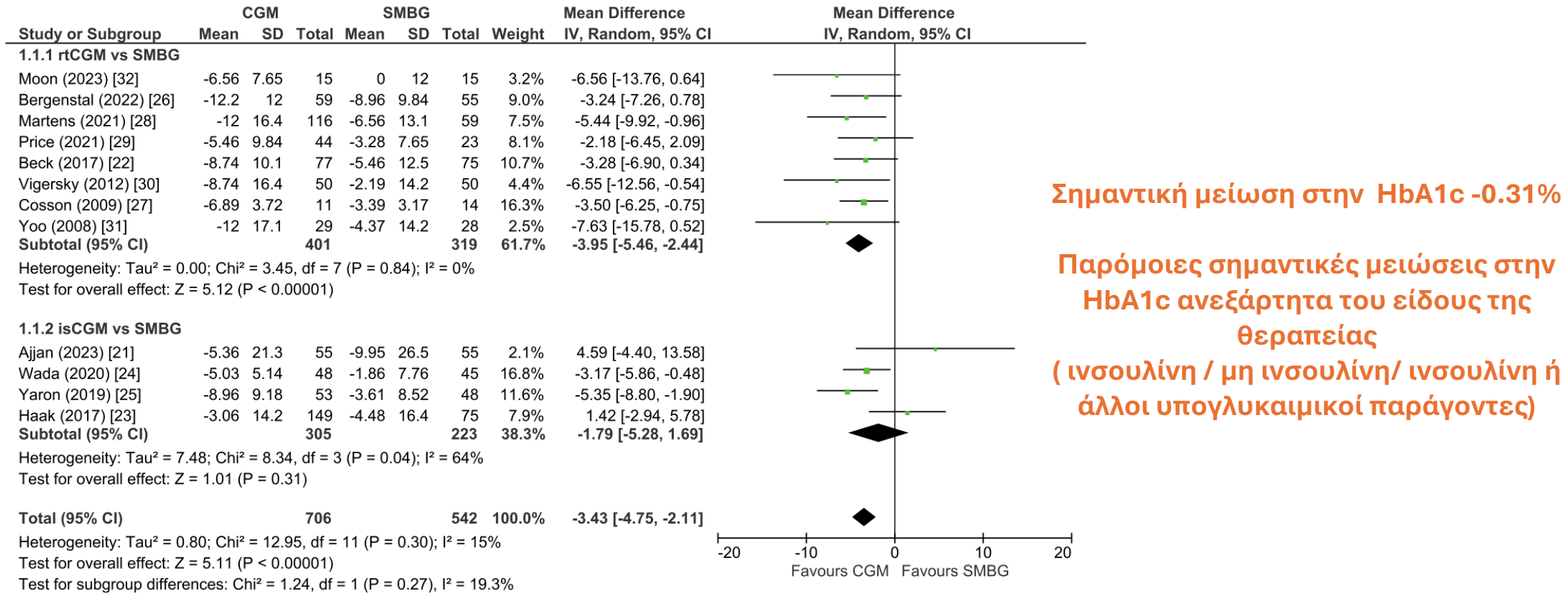
These findings un effectiveness of conti monitoring combined w interventions in optim control.

Conclusion:

Observation of glycem variability using CGM personalized lifestyle in shown improved Time Technological advance CGM, provide valuabl inter and intra-day glyc for participants. Th understanding prom adherence to lifestyle ultimately leading outcomes and reduced in diabetes. The SDRM advancements to deliv interventions that effe glycemic control and outcomes in a short peri

Continuous glucose monitoring in adults with type 2 diabetes: a systematic review and meta-analysis

Milena Jancev[1] · Tessa A. C. M. Vissers[1] · Frank L. J. Visseren[1] · Arianne C. van Bon[2] · Erik H. Serné[3] · J. Hans DeVries[3] · Harold W. de Valk[1] · Thomas T. van Sloten[1]



Σημαντική μείωση στην HbA1c -0.31%

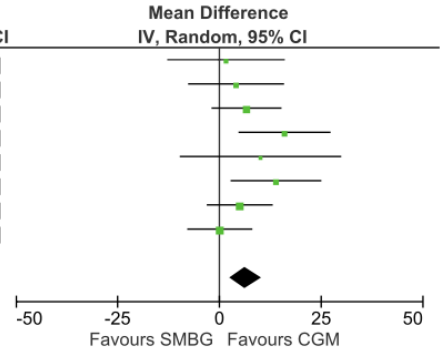
Παρόμοιες σημαντικές μειώσεις στην HbA1c ανεξάρτητα του είδους της θεραπείας (ινσουλίνη / μη ινσουλίνη/ ινσουλίνη ή άλλοι υπογλυκαιμικοί παράγοντες)

Diabetologia (2024) 67:798–810https://doi.org/10.1007/s00125-024-06107-6

a

Study or Subgroup	CGM Mean	CGM SD	CGM Total	SMBG Mean	SMBG SD	SMBG Total	Weight	Mean Difference IV, Random, 95% CI
Ajjan (2023) [21]	8.73	38.57	54	7.1	36.57	50	6.9%	1.63 [-12.81, 16.07]
Moon (2023) [32]	3.1	17.9	15	-1	14.9	15	10.0%	4.10 [-7.69, 15.89]
Bergenstal (2022) [26]	18.21	23.3	59	11.55	23.5	55	17.7%	6.66 [-1.94, 15.26]
Martens (2021) [28]	19	36.07	116	3	36.07	59	10.8%	16.00 [4.70, 27.30]
Price (2021) [29]	-3.2	35.36	42	-13.3	37.15	19	3.7%	10.10 [-9.73, 29.93]
Wada (2020) [24]	18.2	23.89	41	4.3	25.4	35	11.1%	13.90 [2.75, 25.05]
Beck (2017) [22]	4	24.83	78	-1	26.25	75	19.6%	5.00 [-3.10, 13.10]
Haak (2017) [23]	-1.2	26.82	149	-1.3	29.77	75	20.1%	0.10 [-7.90, 8.10]
Total (95% CI)			**554**			**383**	**100.0%**	**6.36 [2.48, 10.24]**

Heterogeneity: Tau² = 2.90; Chi² = 7.70, df = 7 (P = 0.36); I² = 9%
Test for overall effect: Z = 3.21 (P = 0.001)

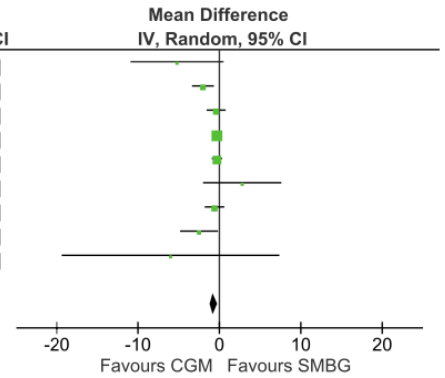


Time in Range

b

Study or Subgroup	CGM Mean	CGM SD	CGM Total	SMBG Mean	SMBG SD	SMBG Total	Weight	Mean Difference IV, Random, 95% CI
Ajjan (2023) [21]	-3.91	11.92	54	1.29	17.15	50	0.9%	-5.20 [-10.92, 0.52]
Bergenstal (2022) [26]	-0.8	4.4	59	1.22	2.8	55	11.2%	-2.02 [-3.36, -0.68]
Moon (2023) [32]	-0.4	2.3	15	0	0.2	15	13.4%	-0.40 [-1.57, 0.77]
Martens (2021) [28]	-0.1	0.64	116	0.2	1	59	32.0%	-0.30 [-0.58, -0.02]
Price (2021) [29]	-0.3	1.62	42	0	0.92	19	23.6%	-0.30 [-0.94, 0.34]
Wada (2020) [24]	1.2	4.9	41	-1.6	13.78	35	1.2%	2.80 [-2.01, 7.61]
Beck (2017) [22]	-0.9	3.9	78	-0.3	3.72	75	12.8%	-0.60 [-1.81, 0.61]
Haak (2017) [23]	-2.9	8.17	149	-0.4	8.5	75	4.7%	-2.50 [-4.83, -0.17]
Cosson (2009) [27]	-4	15.52	7	2	12.04	12	0.2%	-6.00 [-19.36, 7.36]
Total (95% CI)			**561**			**395**	**100.0%**	**-0.66 [-1.21, -0.12]**

Heterogeneity: Tau² = 0.22; Chi² = 14.47, df = 8 (P = 0.07); I² = 45%
Test for overall effect: Z = 2.39 (P = 0.02)

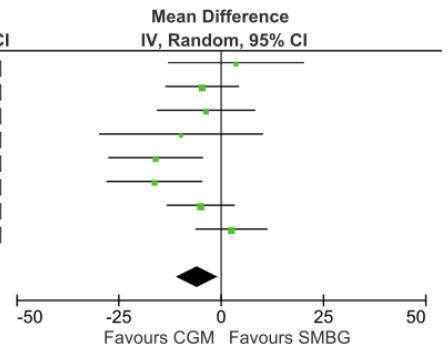


Time Below Range

c

Study or Subgroup	CGM Mean	CGM SD	CGM Total	SMBG Mean	SMBG SD	SMBG Total	Weight	Mean Difference IV, Random, 95% CI
Ajjan (2023) [21]	-5	42.92	54	-8.63	43.5	50	7.2%	3.63 [-13.00, 20.26]
Bergenstal (2022) [26]	-17.41	24.9	59	-12.77	24.2	55	16.5%	-4.64 [-13.66, 4.38]
Moon (2023) [32]	-2.7	18.5	15	1	14.9	15	11.7%	-3.70 [-15.72, 8.32]
Price (2021) [29]	3.4	35.78	42	13.2	37.46	19	5.3%	-9.80 [-29.82, 10.22]
Martens (2021) [28]	-18	36.07	116	-2	37.48	59	12.2%	-16.00 [-27.60, -4.40]
Wada (2020) [24]	-19.1	24.53	41	-2.8	27.12	35	12.1%	-16.30 [-28.01, -4.59]
Beck (2017) [22]	-4	25.46	78	1	26.97	75	17.9%	-5.00 [-13.32, 3.32]
Haak (2017) [23]	4.1	28.88	149	1.6	33.02	75	17.0%	2.50 [-6.29, 11.29]
Total (95% CI)			**554**			**383**	**100.0%**	**-5.86 [-10.88, -0.84]**

Heterogeneity: Tau² = 18.56; Chi² = 11.06, df = 7 (P = 0.14); I² = 37%
Test for overall effect: Z = 2.29 (P = 0.02)



Time Above Range

.3 Forest plot of pooled analysis of change in TIR (**a**) TBR (**b**) and TAR (**c**) in individuals with type 2 diabetes using rtCGM or isCGM
npared with SMBG

Efficacy and Safety of Continuous Glucose Monitoring and Intermittently Scanned Continuous Glucose Monitoring in Patients With Type 2 Diabetes: A Systematic Review and Meta-analysis of Interventional Evidence

Samuel Seidu ; Setor K. Kunutsor; Ramzi A. Ajjan; Pratik Choudhary

We included **26 RCTs (17 CGM and 9 isCGM)** involving **2,783 patients with T2D** (CGM 632 vs. usual care/SMBG 514 and isCGM 871 vs. usual care/SMBG 766). **CGM reduced HbA_{1c} (mean difference −0.19%** [95% CI −0.34, −0.04]) and **glycemic medication effect score (−0.67 [**−1.20 to −0.13]), **reduced user satisfaction** (−0.54 [−0.98, −0.11]), and **increased the risk of adverse events (relative risk [RR] 1.22 [**95% CI 1.01, 1.47]).

isCGM reduced HbA_{1c} by −0.31% (−0.46, −0.17), **increased user satisfaction (0.44** [0.29, 0.59]), improved CGM metrics, and increased the risk of adverse events (RR 1.30 [0.05, 1.62]).

Neither CGM nor isCGM had a significant impact on body composition, blood pressure, or lipid levels.

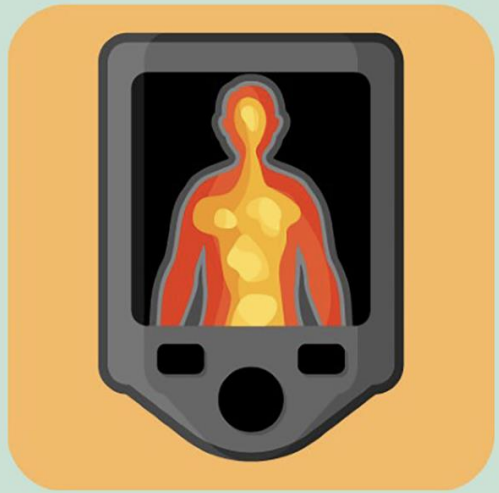
LIMITATIONS

Limitations include small samples, single-study outcomes, population variations, and uncertainty for younger adults. Additionally, inclusion of <10 studies for most end points restricted comprehensive analysis, and technological advancements over time need to be considered.

CONCLUSIONS

Both CGM and isCGM demonstrated a **reduction in HbA_{1c}** levels in individuals with T2D, and **unlike CGM, isCGM use was associated with improved user satisfaction**. The impact of these devices on body composition, blood pressure, and lipid levels remains unclear, while both CGM and isCGM use were associated with increased risk of adverse events.

Both continuous glucose monitoring and intermittently scanned continuous glucose monitoring demonstrated a reduction in HbA_{1c} levels.



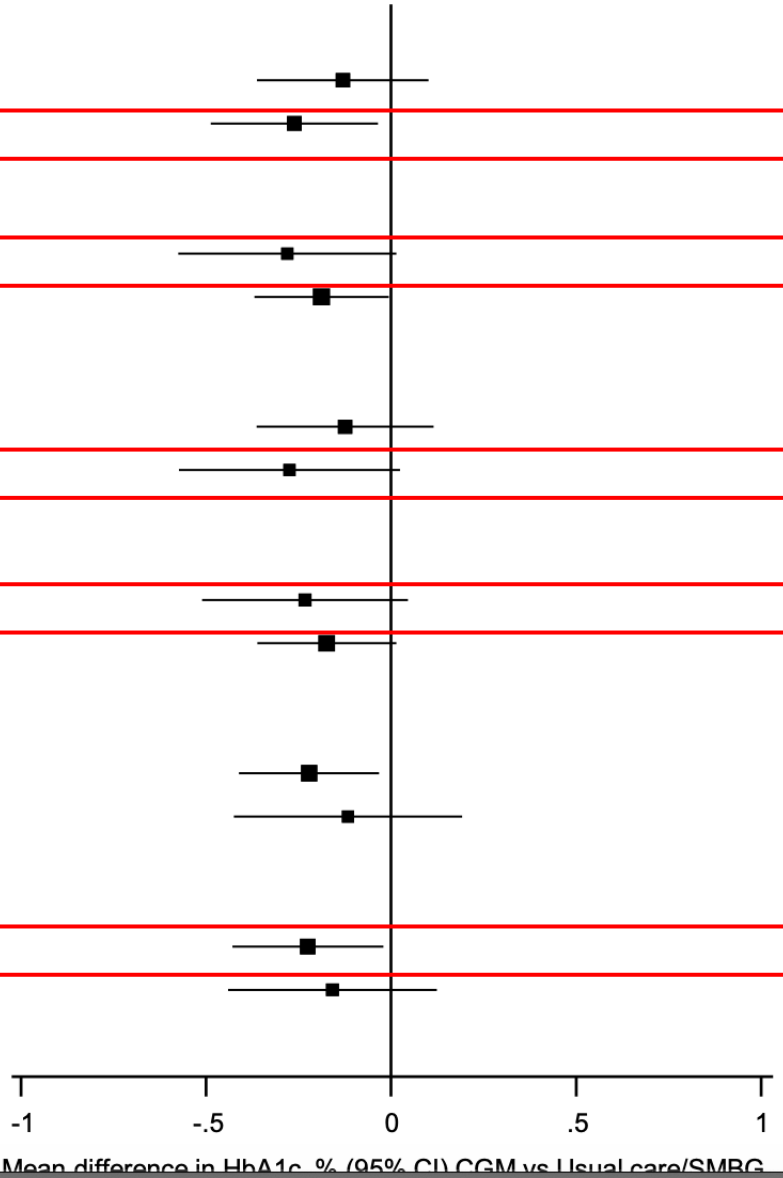
Neither continuous glucose monitoring nor intermittently scanned continuous glucose monitoring had a significant impact on body composition, blood pressure, or lipid levels.

Use of continuous glucose monitoring and intermittently scanned continuous glucose monitoring was associated with increased risk of adverse events, with no impact on hypoglycemia.

Subgroup Analyses

Παροτι οι διαφορες δεν είναι σημαντικες παρατηρουμε οτι υπαρχει **εντονη ταση βελτιωσης της HbA1c** ανεξάρτητα από τα χαρακτηριστικα των ατόμων

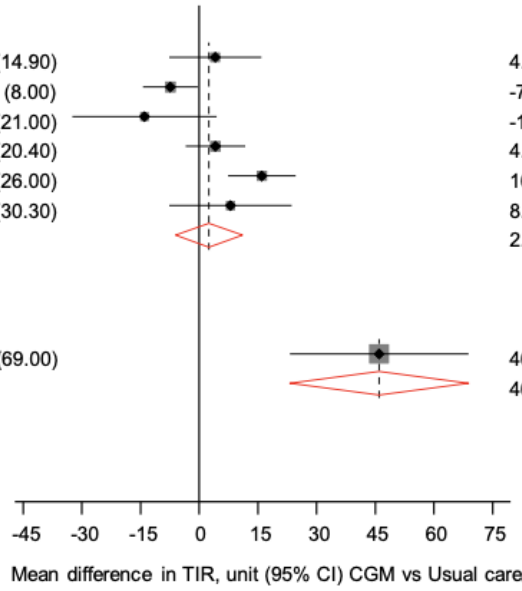
Subgroup	No. of studies	CGM N	Usual care/SMBG N	Mean Difference (95% CI)	*p*-value*
Age at baseline, yrs					
≥60	7	228	211	-0.13 (-0.36, 0.10)	.43
<60	7	299	234	-0.26 (-0.49, -0.04)	
T2D treatment					
No insulin	6	169	138	-0.28 (-0.57, 0.01)	.68
With insulin	8	358	307	-0.19 (-0.37, -0.01)	
T2D duration, yrs					
≥13.0	6	309	236	-0.12 (-0.36, 0.12)	.46
<13.0	6	158	149	-0.27 (-0.57, 0.02)	
Baseline HbA1c, %					
≥8.6	7	253	196	-0.23 (-0.51, 0.05)	.74
<8.6	7	274	249	-0.17 (-0.36, 0.01)	
CGM type					
Real-time	10	426	338	-0.22 (-0.41, -0.03)	.61
Retrospective	4	101	107	-0.12 (-0.42, 0.19)	
CGM use					
Intermittent short-term use	9	259	233	-0.23 (-0.43, -0.02)	.66
Long-term continuous use	5	268	212	-0.16 (-0.44, 0.12)	



Appendix 9: Change in TIR metrics comparing CGM and isCGM with usual care/SMBG

A.

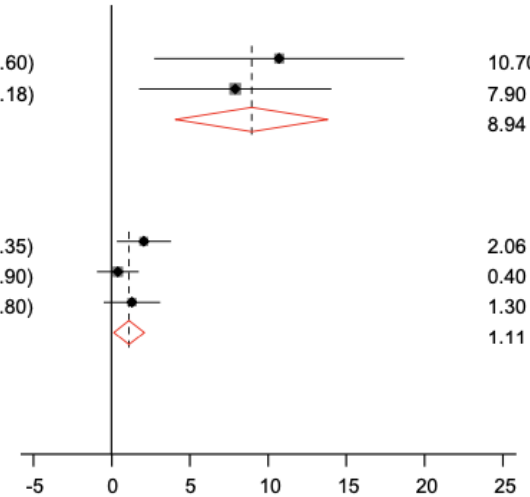
Author, year of publication	CGM N	CGM Mean (SD)	Usual care/SMBG N	Usual care/SMBG Mean (SD)	Mean difference (95% CI)
% Time in range of 70-180 mg/dl					
Moon, 2023	15	3.10 (17.90)	15	-1.00 (14.90)	4.10 (-7.69, 15.89)
Sato, 2016	17	39.13 (12.38)	17	46.50 (8.00)	-7.37 (-14.38, -0.36)
Cosson, 2009	11	39.00 (25.00)	14	53.00 (21.00)	-14.00 (-32.42, 4.42)
Bergenstal, 2022	59	70.65 (21.00)	55	66.51 (20.40)	4.14 (-3.46, 11.74)
Martens, 2021	93	59.00 (25.00)	53	43.00 (26.00)	16.00 (7.35, 24.65)
Price, 2021	42	63.10 (25.50)	19	55.10 (30.30)	8.00 (-7.66, 23.66)
Subgroup, DL	237		173		2.51 (-6.08, 11.09)
(I^2= 75.9%, p = 0.001)					
Time/day in glucose range of 70-180 mg/dl					
Beck, 2017	74	882.00 (71.67)	72	836.00 (69.00)	46.00 (23.18, 68.82)
Subgroup, DL	74		72		46.00 (23.18, 68.82)



Mean difference in TIR, unit (95% CI) CGM vs Usual care/SMBG

B.

Author, year of publication	isCGM N	isCGM Mean (SD)	Usual care/SMBG N	Usual care/SMBG Mean (SD)	Mean difference (95% CI)
% Time in range of 70-180 mg/dl					
Aronson, 2023	51	76.30 (17.40)	48	65.60 (22.60)	10.70 (2.72, 18.68)
Furler, 2020	149	54.80 (27.09)	150	46.90 (27.18)	7.90 (1.75, 14.05)
Subgroup, DL	200		198		8.94 (4.07, 13.82)
(I^2= *0.0*%, p = 0.586)					
Time with glucose range 70-180 mg/dl					
Wada, 2020	41	18.71 (3.15)	35	16.65 (4.35)	2.06 (0.33, 3.79)
Haak, 2017	149	13.60 (4.60)	75	13.20 (4.90)	0.40 (-0.93, 1.73)
Ajjan, 2019	50	13.70 (4.50)	52	12.40 (4.80)	1.30 (-0.50, 3.10)
Subgroup, DL	240		162		1.11 (0.13, 2.09)
(I^2= *12.4*%, p = 0.319)					



Mean difference in TIR, unit (95% CI) isCGM vs Usual care/SMBG

Παρατηρούμε ότι τα άτομα που ήταν στην ομαδα των αισθητηρων περνουν περισσοτερο χρονο της ημερας τους ΕΝΤΟΣ στόχου (70-180) σε σχεση με τα ατομα που μετρουν από το δαχτυλο

Randomized comparison of self-monitored blood glucose (BGM) versus continuous glucose monitoring (CGM) data to optimize glucose control in type 2 diabetes☆

Richard M. Bergenstal[a], Deborah M. Mullen[b,*], Ellie Strock[a], Mary L. Johnson[a], Min X. Xi[a]

Aims: Evaluate whether structured BGM testing (BGM) or real-time CGM (CGM) lead to improved glucose control (A1c). Determine which approach optimized glucose control more effectively.

Methods—multi-arm parallel: trial of three type 2 diabetes (T2D) therapies ± metformin: (1) sulfonylurea (SU), (2) incretin (DPP4 inhibitor or GLP-1 agonist), or (3) insulin. After a baseline CGM, 114 adult subjects were randomized to either BGM (4 times daily) or CGM (24/7) for 16 weeks with therapies adjusted every 4 weeks.

Results: A1c means decreased from 8.19 to 7.07 (1.12% difference) with CGM ($n = 59$) and 7.85 to 7.03 (0.82% difference) with BGM ($n = 55$) ($p < 0.001$). BGM and CGM groups showed significant improvements in time in range and glucose variability—with no significant difference between the two groups. Clinically important hypoglycemia (<50 mg/dL) was significantly reduced for the CGM group compared with BGM ($p < 0.01$), particularly in subjects taking insulin or therapies with higher hypoglycemic risk (SU).

Conclusion: In T2D, structured, consistent use of glucose data regardless of device (structured BGM or CGM) leads to improvements in A1c control. CGM is more effective than BGM in minimizing hypoglycemia particularly for those using higher hypoglycemic risk therapies.

Multicenter Randomized Trial of Intermittently Scanned Continuous Glucose Monitoring Versus Self-Monitoring of Blood Glucose in Individuals With Type 2 Diabetes and Recent-Onset Acute Myocardial Infarction: Results of the LIBERATES Trial

Ramzi A. Ajjan, Simon R. Heller, Colin C. Everett, Armando Vargas-Palacios, Ruchi Higham, Linda Sharples, Diana A. Gorog, Alice Rogers, Catherine Reynolds, Catherine Fernandez, Pedro Rodrigues, Thozhukat Sathyapalan, Robert F. Storey, and Deborah D. Stocken

Of 141 participants randomly assigned (median age 63 years; interquartile range 53, 70), 73% of whom were men**, isCGM was associated with increased TIR by 17 min/day (95% 2105 to +153 min/day).**

Users of isCGM showed **lower hypoglycemic exposure (<3.9 mmol/L) at days 76–90 (**280 min/day; 95% CI 2118, 243), also evident at days 16–30 (228 min/day; 95% CI 292, 2).

Compared with baseline, HbA1c showed similar reductions of 7 mmol/mol at 3 months in both study arms. Combined glycemic emergencies and mortality occurred in four isCGM and seven SMBG study participants.
QOL measures marginally favored isCGM, and the intervention proved to be cost effective

Participants randomly assigned to **isCGM showed less hypoglycemia** (<3.9 mmol/L) in days 16–30 (45.5 min/day a difference that became **more pronounced in days 76–90 (80.5 min**)

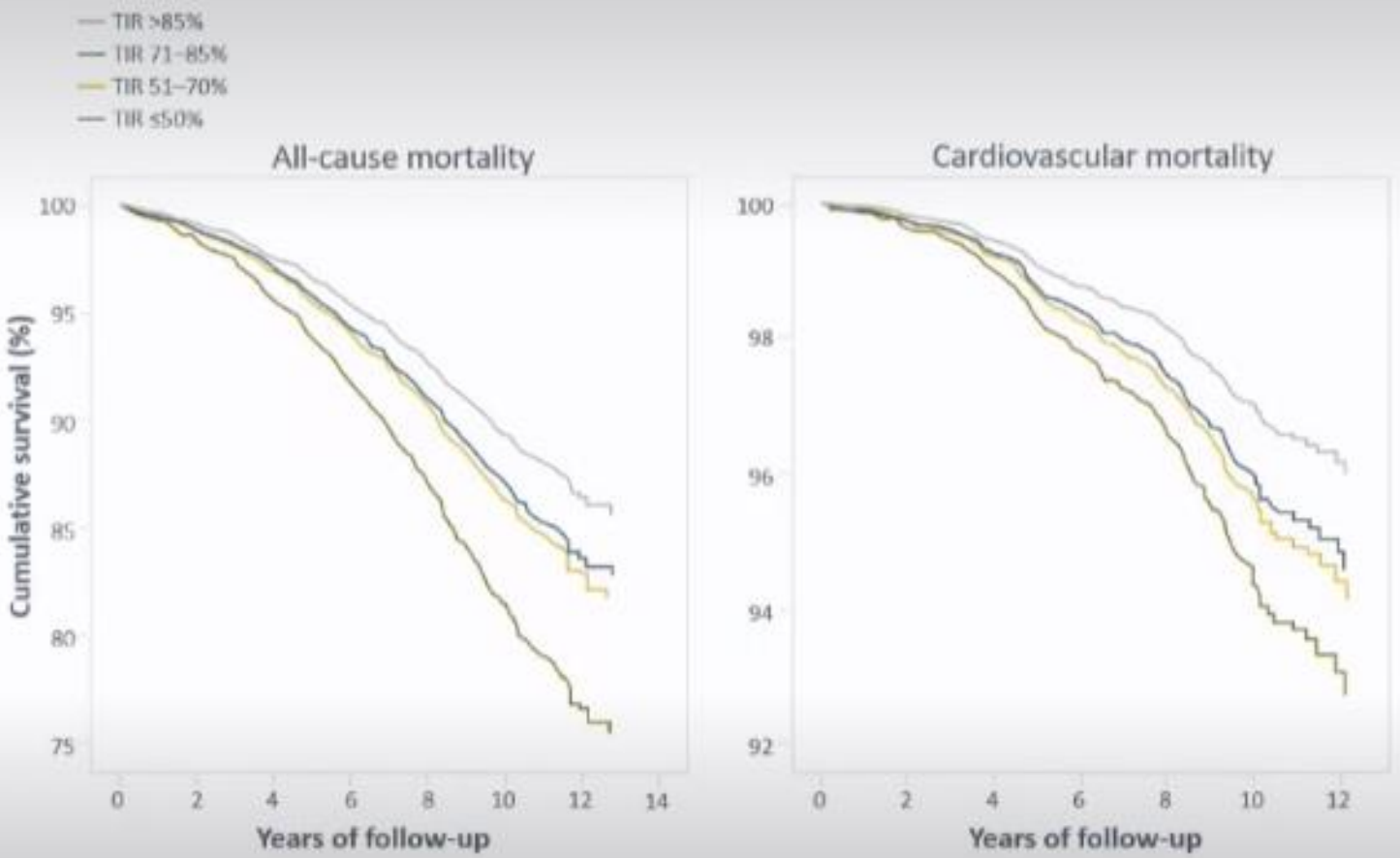
Participants randomly assigned to isCGM spent numerically **less time in hyperglycemia** (>10.0 mmol/L) in days 16–30 (35.9 min/day) with a numerical increase in days 76–90 (79.5 min/day)

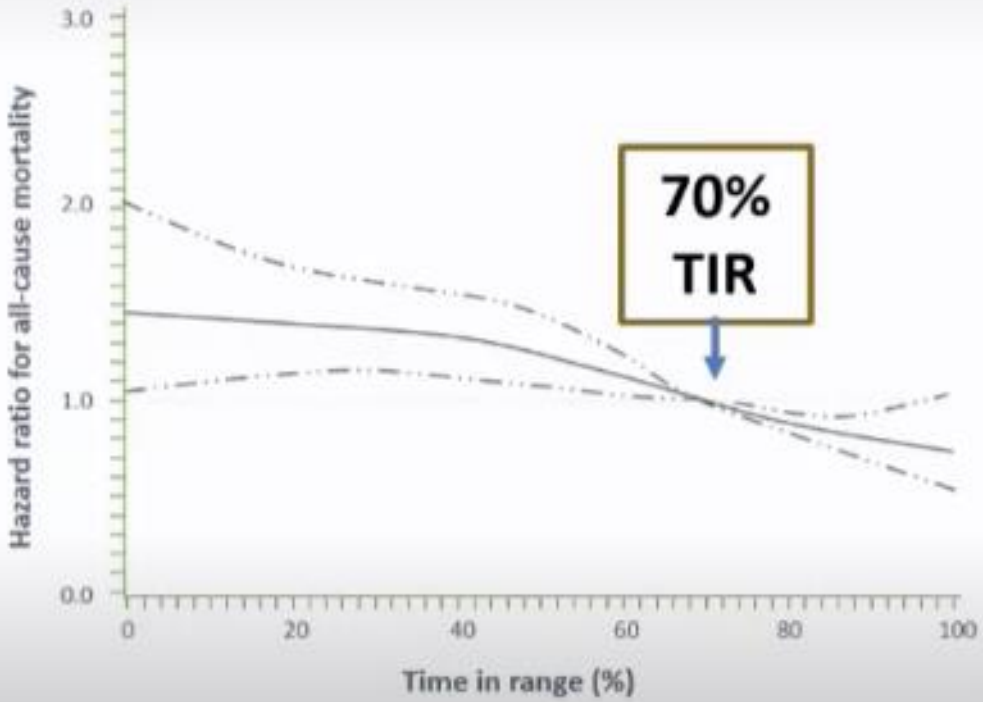
Diabetes Care 2023;46(2):441–449 |https://doi.org/10.2337/dc22-1219

Association between TIR and all-cause and CV mortality

Time in Range in Relation to All-Cause and Cardiovascular Mortality in Patients With Type 2 Diabetes: A Prospective Cohort Study

- 6,225 T2D – CGM (72 hours)
- Followed 10 years (2005–2015)
- Association baseline TIR & mortality
  - All cause & CV mortality



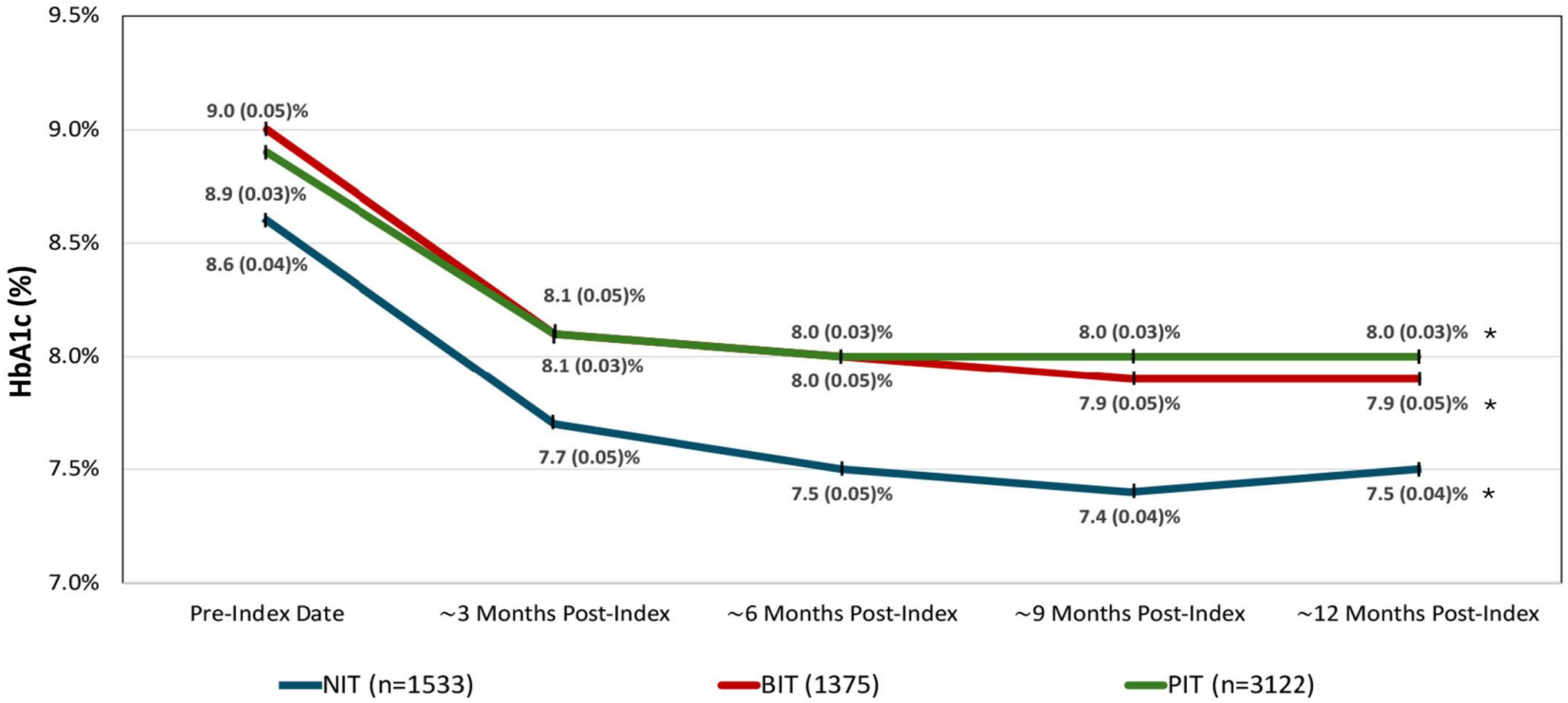


CGM, continuous glucose monitoring; CV, cardiovascular; TIR, time in range.
Lu J, Wang C, Shen Y et al. Diabetes Care. 2021 Feb;44(2):549-555. doi: https://doi.org/10.2337/dc20-1862.

Impact of continuous glucose monitoring on hospitalizations and glucose control in people with type 2 diabetes: real-world analysis

Satish K. Garg MD ✉, Irl B. Hirsch MD, Enrico Repetto MD, Janet Snell-Bergeon PhD, Brian Ulmer MD, Christopher Perkins MS, Richard M. Bergenstal MD

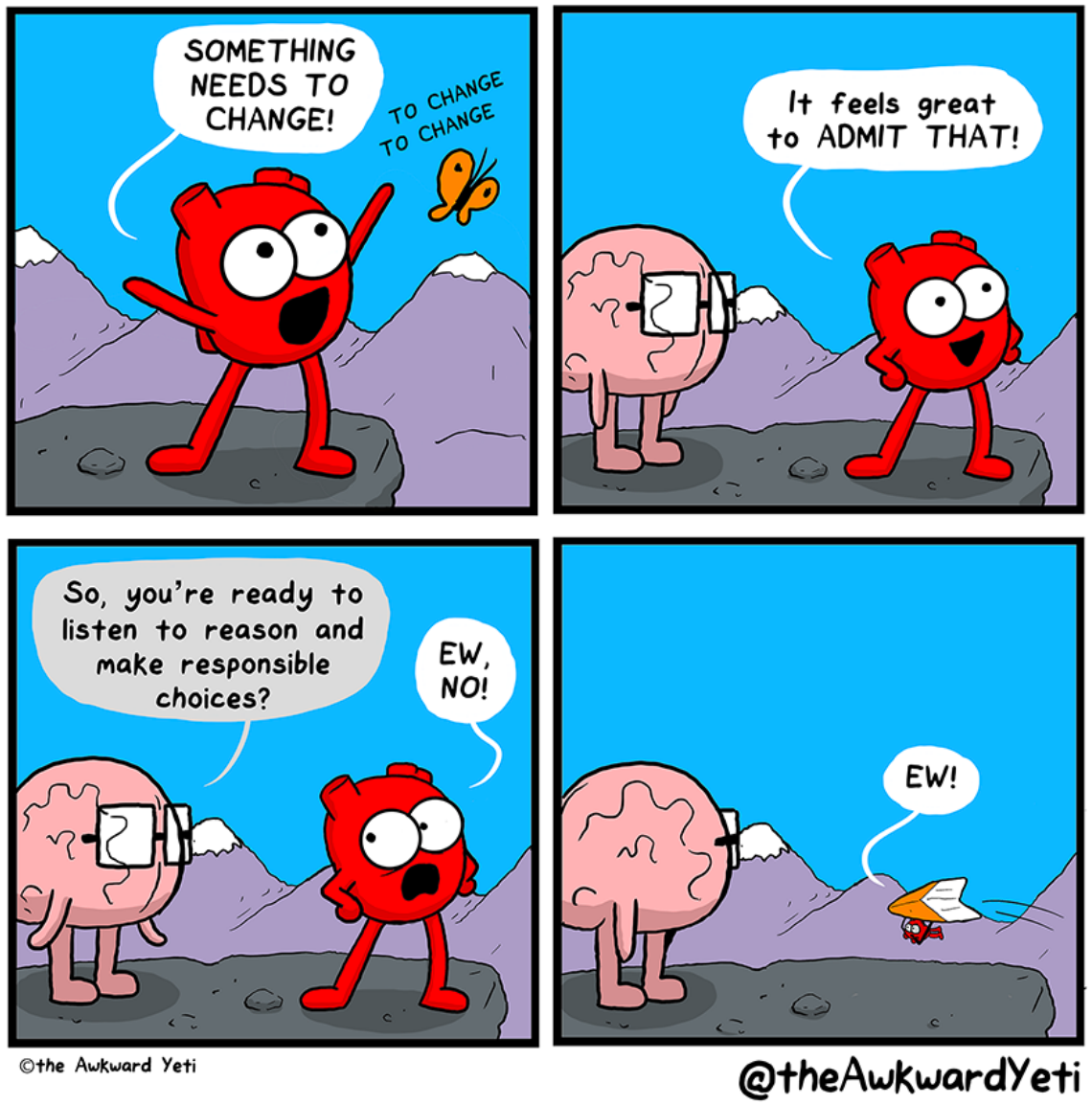
First published: 12 September 2024 | https://doi.org/10.1111/dom.15866



Improved glucose control associated with continuous glucose monitoring use at 3, 6 and 12 months.

Non-insulin therapy (NIT), basal insulin treatment (BIT) and prandial insulin therapy (PIT) are represented in blue, red and green lines, respectively.

A significant improvement was observed in glycated haemoglobin (HbA1c) as early as 3 months and was sustained throughout the study period. HbA1c values are represented as mean ± SEM. *$p < 0.0001$



Το CGM βελτιώνει τον γλυκαιμικό έλεγχο

Πώς?

I think this really shows the value of CGM, regardless what you're using to treat the glucose. While it might be thought that people who are not on insulin don't need CGM, these data clearly show the benefit, regardless whether you're getting insulin before meals, basal insulin, or medications that are not insulin.

The biggest problem with A1c is that it's not actionable because you don't know what the A1c is now, just what it used to be. That's the value of CGM that you have an immediate understanding of what your blood sugar's doing

Ποιο είναι το τρικ των αισθητήρων που οι επαγγελματίες υγείας δεν έχουν καταφέρει τόσα χρόνια?

- CGM can help patients through a "**carrot and stick**" approach to dieting.
- Lean proteins, nonstarchy vegetables, and monounsaturated fats such as nuts and avocado all support weight loss and tend to keep blood glucose levels stable.
- In contrast, foods known to cause weight gain (eg, sugary foods, refined starches, and processed foods) cause sugar spikes in real time.
- Similarly, **large portion sizes are more likely to result in sugar spikes**, and **pairing proteins with carbohydrates** minimizes blood glucose excursions.
- **The constant feedback from a CGM device holds patients accountable for their food choices and helps with behavioral change.**
- And because blood glucose is influenced by myriad factors including stress, genetics and metabolism, CGM can also potentially help create personal guidance for food choices.

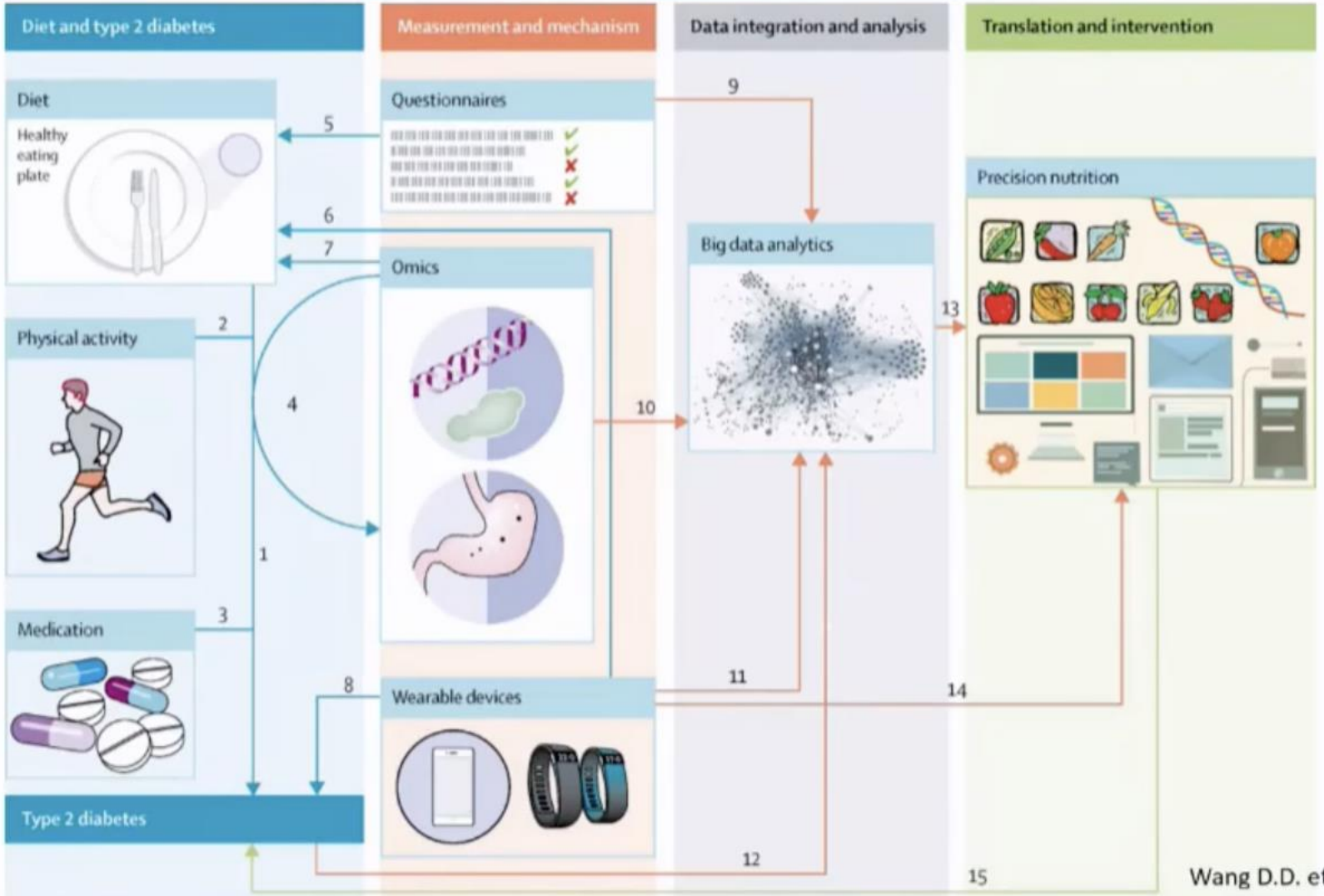
Ποιο είναι το τρικ των αισθητήρων που οι επαγγελματίες υγείας δεν έχουν καταφέρει τόσα χρόνια?

- The data collected also may provide information on how different modalities of **physical activity** affect blood glucose levels.
- A recent study compared the effect of high-intensity interval training (HIIT) and continuous moderate-intensity exercise on postmeal blood glucose in overweight individuals without diabetes. **CGM revealed that HIIT is more advantageous for preventing postmeal spikes**.
- Although **CGM appears to be a sophisticated form of cognitive-behavioral therapy**, the incessant stream of information can lead to **worsening anxiety, obsessive compulsive behaviors, or restrictive eating tendencies**.

Ας μην ξεχνούμε

- Η θεραπευτική ομάδα μπορεί να χρησιμοποιήσει το CGM ως εργαλείο ώστε να επικοινωνήσει την επίδραση των πράξεων του ατόμου.

Precision nutrition for prevention and management of type 2 diabetes



Wang D.D. et al., Lancet 2018.

REVIEW Open Access

Leveraging continuous glucose monitoring as a catalyst for behaviour change: a scoping review

Michelle R. Jospe[1†], Kelli M. Richardson[2†], Ahlam A. Saleh[3], Lauren C. Bohlen[4], Jacob Crawshaw[5], Yue Liao[6], Kristin Konnyu[7] and Susan M. Schembre[1*]

Most studies (n=20/31, 65%) included adults with type 2 diabetes and reported HbA1c as an outcome (n=29/31, 94%). CGM was most commonly used in interventions to target changes in **diet** (n=27/31, 87%) and/or **physical activity** (n=16/31, 52%). 42% (n=13/31) of studies provided prospective **CGM-based guidance on diet or activity**, while 61% (n=19/31) included retrospective CGM-based guidance. CGM data was typically unblinded (n=24/31, 77%) and CGM-based biological feedback was most often provided through the CGM and two-way communication (n=12/31, 39%). Communication typically occurred in-person (n=13/31, 42%) once per CGM wear (n=13/31; 42%).

Libre: 14
Medtronic: 9
Dexcom:3
Menarini: 1
Not specified: 5

Additional: Medication tracking, physical activity tracking, HCP feedback, meal timing algorithm

Taxonomy of Technology-Enabled Self-Management Interventions

Three active components of personalised interventions:

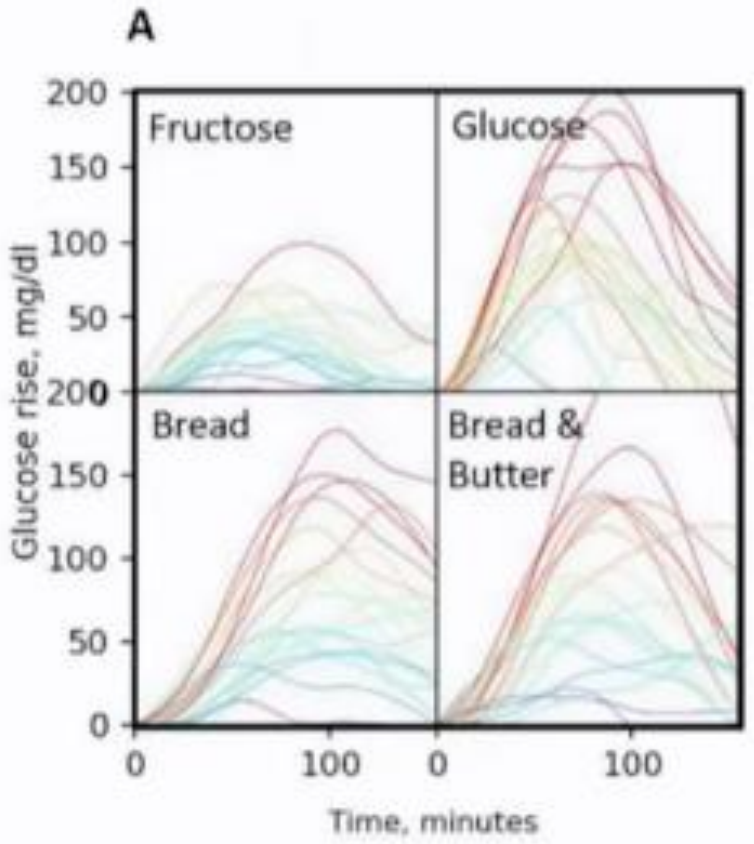
(1) sensing, (2) reasoning, and (3) acting .

Sensing describes the input parameters (ie, glucose) needed for the personalised intervention and how the measurement is performed (ie, CGM) .

Reasoning refers to providing feedback that is based on the input data (ie, biological feedback), including personalised behaviour recommendations or disease management guidance.

Lastly, **acting** refers to how the biological feedback is communicated to the consumer to promote behaviour change (e.g., the mode, channel, frequency, and timing)

Μήπως το CGM είναι η φωνή και η υπενθύμιση μας στο άτομο ?

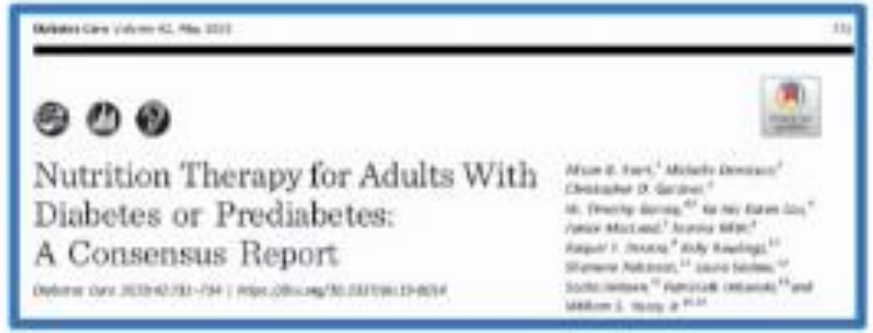


- Rein et al
- Analyzed postprandial glucose responses
  - 4 standardized meals: 50 gm carb
- 23 adults with newly diagnosed T2DM
  - Each colored line represents a unique participant
- Results show high interpersonal variability in postprandial glucose responses among subjects with T2DM

Rein et al. Effects of personalized diets by prediction of glycemic responses on glycemic contro and metabolic health in newly diagnosed T2DM: a reandomized dietary intervention pilot trial. BMC Medicine (2022) 20:56

ADA Nutrition Therapy Consensus Report

- Summarizes latest and greatest nutrition research (600+ publications!)
- Part of the ADA Standards of Care in Diabetes


Nutrition Therapy for Adults With Diabetes or Prediabetes: A Consensus Report

GOAL: provide nutrition recommendations that **promote ideal health outcomes, reduce complications, and improve QOL** for all PWD

Many eating patterns can work! No one-size-fits-all eating pattern. Individualize!

Evart A, et al. Nutrition Therapy for Adults with Diabetes or Prediabetes: A Consensus Report. Diabetes Care 2019;42:731-754

AGP and Nutrition – Analysing postprandial glucose courses with CGM

Jens Kröger[a,*], *Thorsten Siegmund*[b], *Oliver Schubert-Olesen*[c], *Winfried Keuthage*[d], *Melanie Lettmann*[e], *Katja Richert*[f], *Andreas F.H. Pfeiffer*[g]

Table 1 – Recommendations for nutrition therapy and consultation of the practice recommendations of the German Diabetes Society for the treatment of type 2 diabetes [30].

Nutrition therapy and consultation
• Motivation for healthy, balanced diets, under consideration of the previous dietary routine.
• As far as possible, avoid industrially processed food products and limit the intake of sucrose (WHO recommendation < 25 g/day).
• **No general prohibition of sugar, but avoidance of large quantities of household sugar, fruit sugar, sugar alcohols, or beverages containing these substances.**
• **The estimation of type and amount of CH in the respective meals should be used as an essential strategy for metabolic control in people with type 2 diabetes who inject insulin.**
• **People with type 2 diabetes without insulin therapy should be trained to recognize blood glucose increasing foods.**
• For people with type 2 diabetes and renal failure, a daily protein intake of 0.8 g/kg is recommended [35]. In the stage of dialysis therapy, protein intake should be increased to 1.2–1.3 g/kg.
• People with type 2 diabetes should be advised on a differentiated approach to alcohol as part of the individual consultation.
• Practical suggestions for a healthy and balanced diet, best in the sense of a Mediterranean diet.
• Avoid large portions and frequent consumption of fatty foods.
• Prefer vegetable fats.
• Include in your diet high fibre foods.

Behavior Modification in Prediabetes and Diabetes: Potential Use of Real-Time Continuous Glucose Monitoring

Journal of Diabetes Science and Technology
2019, Vol. 13(2) 271–275

DOI: 10.1177/1932296818790994
journals.sagepub.com/home/dst
SAGE

Table 1. Changes in HbA1c, Body Mass Index (BMI), and CGM Intervention for Behavioral Changes.

Study	Duration	Control (n)	Intervention (n)	CGM intervention	Initial HbA1c (%)	HbA1c change (%)	BMI change (Kg/m^2)
Yoo et al[23]	3 months	n = 28 (SMBG)	n = 29	3 days RT-CGM, monthly for 3 months	9.1 ± 1.0%	−1.0 ± 1.2%, P = .004	0.7 ± 0.35, P = .008
Allen et al[24]	2 months	n = 25 (education)	n = 21	3 days retrospective CGM, 1 session	8.7 ± 1.15%	−1.16 ± 1.4%, P < .05	−0.53 ± 0.75, P < .05
Allen et al[28]	3 months	N/A	n = 29[a] Group 1 = 14 Group 2 = 15	3 day retrospective CGM, 1 session	Group 1 = 8.4 ± 1.3% Group 2 = 8.7 ± 1.4%	Group 1 = 0.7 ± 2.2% Group 2 = 0.5 ± 0.9%	Weight (kg)[b] Group 1 = −6.2 ± 7.2 Group 2 = 2.4 ± 4.0
Mohan et al[26]	3 months	N/A	n = 148	3 days retrospective CGM, 2 sessions	8.6 ± 1.14%	−0.6 ± 1.11%	Not reported
Cox et al[25]	3 months	N/A	n = 4	RT-CGM 3 months	7.8 ± 0.5%	−1.1 ± 0.5%	Weight (kg)[b] −7.2 kg
Bailey et al[c27]	3 months	n = 6 (8-week exercise program)	n = 7	RT-CGM	Prediabetes/T2D	Not reported	Not reported

[a]Group 1: CGM + DM education, Group 2: CGM + problem-solving skills and DM education.
[b]BMI change not reported.
[c]Only published study prediabetes/T2DM: outcome was exercise adherence and participation during intervention and 1 month after completion.

CGM driven changes

- Yoo et al did show that intermittent use (3 days of RT- CGM every month for 12 weeks) produced a significant decrease in calorie consumption, increase in physical activity, improvement of weight, and a 1% decrease in HbA1c in poorly controlled patients with T2D.
- Allen et al found that the data from a single three-day session of blinded CGM when combined with subsequent counseling and review of the CGM glucose data with the patient resulted in an increase in physical activity and a decrease in HbA1c by 1.2% and BMI by 0.5 kg/m2.
- A recent small pilot study by Cox et al25 that focused on glycemic index reduction using RT-CGM and newly diagnosed T2D not on insulin showed decrease in HbA1c by 1% over 3 months.
- They reported average weight loss of 7.2 kilograms, decreased intake in high glycemic index food, total carbohydrate intake, and increase in fiber.
- There has been only one community-based study looking at CGM. This study using retrospective CGM with two sessions over 3 months in 181 T2D at 11 health clinics in India showed improvement of HbA1c by 0.6% and noted that in their participants 67.6% made dietary and 48.6% made exercise changes although specifics of these changes were not qualified

CGM driven changes

- The one pilot RT-CGM study on exercise which included both participants with prediabetes and diabetes did not report HbA1c but not only showed positive changes in body composition and increased fitness but also assessed and showed improved ability for goal setting, self-efficacy to self-monitor, higher attendance, and more registration for additional exercise sessions than those in the standard exercise group.
- Interestingly, in the second pilot in T2D which attempted to assess CGM as a tool for theory-based behavioral counseling, both groups received CGM and counseling on CGM.
- However, one group received only diabetes education and the other received additional problem-solving skills. Both groups had improvement in physical activity, HbA1c, and weight but the CGM/problem solving skills group's results were slightly although not statistically better.

Η διατροφική θεραπεία μπορεί να μειώσει την HbA1c κατά 2%

Γιατι να χρησιμοποιήσουμε CGM στα άτομα με ΣΔ?
Γιατι επιθυμουν να γνωρίζουν τι τρώνε!
Συνήθως αυτό που κάνουν τα περισσότερα άτομα στην διάγνωση

Short-term use of CGM in youth onset type 2 diabetes is associated with behavioral modifications

Results: Participants (n=41) had median age of 16.2 y, were 61% female, 81% NH Black, median diabetes duration of 0.8 y, and baseline HbA1c of 10.3%. A majority had household income<$50,000 (81%) and parental education level of HS or less (73%). Average 5-day TIR 49% was similar to 10-day TIR 51% (p=0.62). There was no change in HbA1c after 3-6 months (10.2% v 10.3%, p=0.89). Nineteen participants completed full 10-day CGM use; of those, 84% wanted a CGM long-term. Adolescents reported behavioral changes including increased blood sugar checks, increased insulin administration and overall improved diabetes management.

Manfredo J,Lin T,Gupta R,Abiola K,West M,Busin K,Tracey J,Brown EA,Magge SN andWolf RM (2023) Short-termuse of CGM in youth onset type 2 diabetesis associated with behavioral modifications.Front. Endocrinol.14:1182260.doi: 10.3389/fendo.

Effects of Patient-Driven Lifestyle Modification Using Intermittently Scanned Continuous Glucose Monitoring in Patients With Type 2 Diabetes: Results From the Randomized Open-label PDF Study

Hun Jee Choe,[1,2] Eun-Jung Rhee,[3] Jong Chul Won,[4] Kyong Soo Park,[1,2] Won-Young Lee,[3] and Young Min Cho[1,2]

OBJECTIVE

To investigate the effects of patient-driven lifestyle modification using intermittently scanned continuous glucose monitoring (isCGM) in patients with type 2 diabetes (T2D).

RESEARCH DESIGN AND METHODS

We conducted a 12-week, open-label, randomized controlled trial. A total of 126 participants were 1:1 randomized to either the intervention group (structured education + isCGM) or the control group (standard care with blood glucose monitoring). The Self-Evaluation Of Unhealthy foods by Looking at postprandial glucose (SEOUL) algorithm was developed and applied to aid structured education in guiding patients to follow healthy eating behavior depending on the postprandial glycemic response. The primary end point was the change in HbA_{1c} level from baseline.

Diabetes Care 2022;45:2224–2230 | https://doi.org/10.2337/dc22-0764

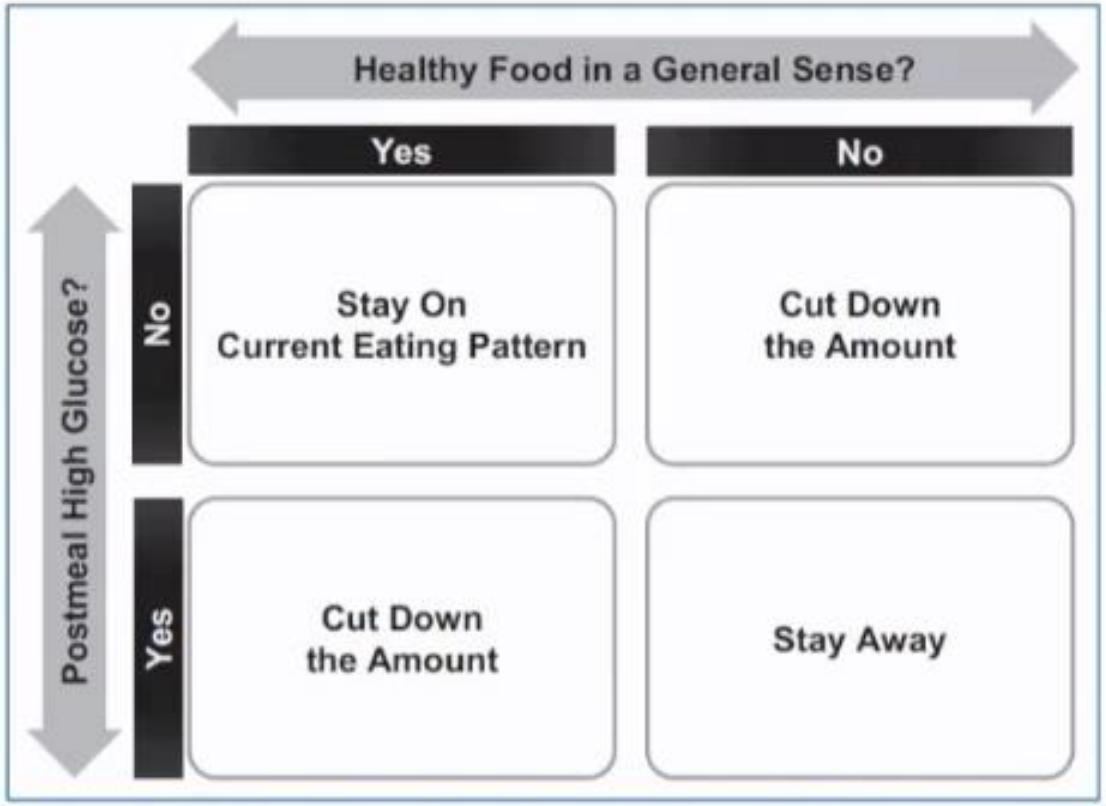


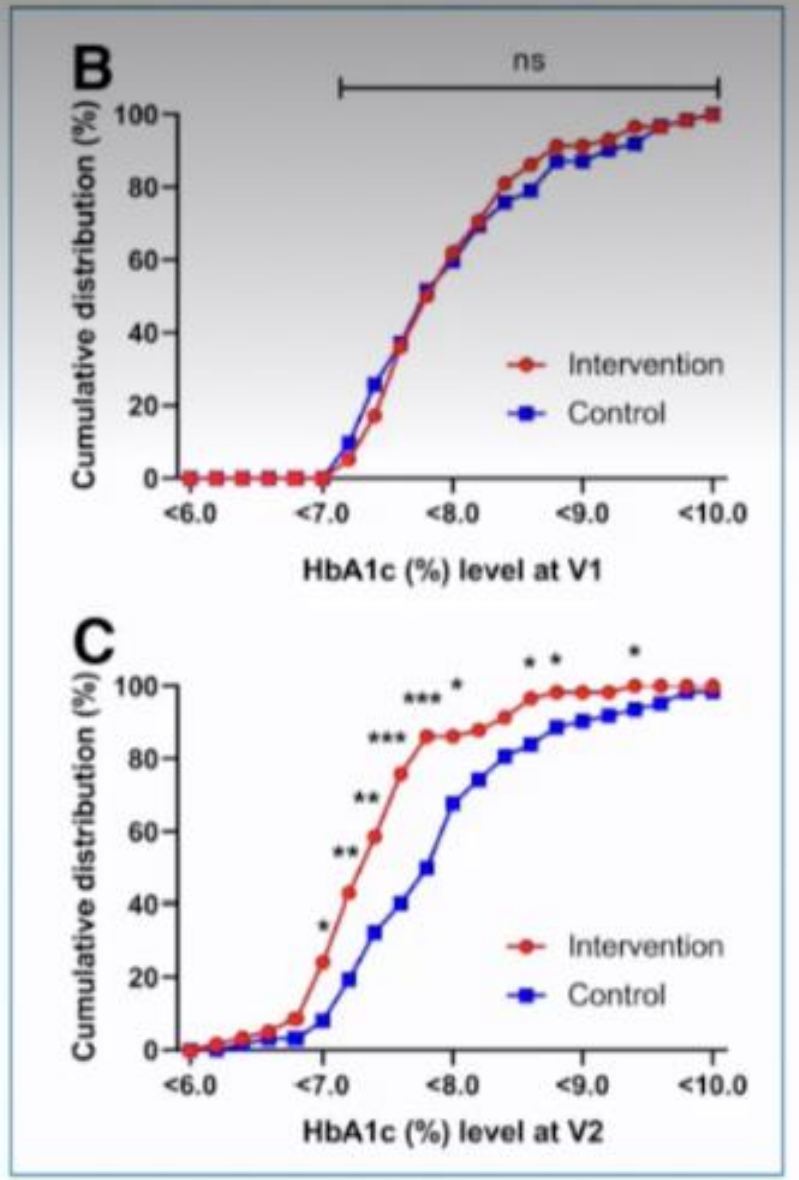
Figure 1—The SEOUL algorithm. Participants are encouraged to continue eating a healthy meal with tolerable glycemic response after consuming the food and should avoid an unhealthy meal that provokes postprandial hyperglycemia. If hyperglycemia is detected after consuming a meal that is generally considered to be healthy, reducing the amount of food is recommended; the amount of unhealthy food should also be reduced even if it does not generate hyperglycemia on ingestion. Decisions on lifestyle modification will be made on an individual basis according to the SEOUL algorithm.

Diabetes Care 2022;45:2224–2230

Effects of Patient-Driven Lifestyle Modification Using Intermittently Scanned Continuous Glucose Monitoring in Patients With Type 2 Diabetes: Results From the Randomized Open-label PDF Study

Hun Jee Choe,[1,2] Eun-Jung Rhee,[3] Jong Chul Won,[4] Kyong Soo Park,[1,2] Won-Young Lee,[3] and Young Min Cho[1,2]

Study demonstrated that the patient-centered approach of isCGM with the SEOUL algorithm, focused mainly on eating behavior, was highly effective in reducing HbA1c and facilitating behavior change to improve general diabetes care in patients with T2D who are not on prandial insulin.



Diabetes Care 2022;45:2224–2230

	V1			V2			Risk-adjusted difference (95% CI)	
	Intervention	Control	*P*	Intervention	Control	*P*		*P**
N	58	62		58	62			
Primary outcome								
HbA_{1c} (%)	7.9 ± 0.6	7.9 ± 0.7	0.808	7.3 ± 0.6	7.8 ± 0.9	<0.001	−0.50 (−0.74 to −0.26)	<0.001
Secondary outcome								
Fasting glucose (mg/dL)	142 ± 27	147 ± 36	0.420	136 ± 35	154 ± 43	0.013	−16.5 (−30.0 to −3.0)	0.017
Body weight (kg)	70.5 ± 11.7	72.7 ± 12.5	0.331	69.1 ± 11.3	72.8 ± 12.8	0.105	−1.5 (−2.7 to −0.3)	0.013
Waist circumference (cm)	87.7 ± 8.1	91.8 ± 10.2	0.018	87.4 ± 8.8	92.1 ± 10.6	0.010	−0.6 (−1.7 to 0.5)	0.262
SBP (mmHg)	133 ± 16	126 ± 16	0.022	134 ± 14	124 ± 21	0.003	7.7 (1.3–14.1)	0.019
DBP (mmHg)	79 ± 10	77 ± 10	0.153	78 ± 9	79 ± 9	0.530	−2.3 (−5.0 to 0.4)	0.100
Total cholesterol (mg/dL)	138 ± 29	140 ± 25	0.707	136 ± 34	140 ± 28	0.565	−1.5 (−9.1 to 6.0)	0.690
Triglyceride (mg/dL)	131 ± 68	153 ± 73	0.094	149 ± 197	141 ± 72	0.761	33.9 (13.6 to 79.4)	0.164
HDL-C (mg/dL)	48 ± 13	48 ± 17	0.965	47 ± 12	48 ± 15	0.627	−1.3 (−4.5 to 1.9)	0.415
LDL-C (mg/dL)	74 ± 22	75 ± 20	0.852	70 ± 25	74 ± 25	0.487	−2.4 (−8.3 to 3.6)	0.432
SDSCA-K total score	26.6 ± 13.6	25.1 ± 12.8	0.533	44.4 ± 9.2	39.2 ± 10.1	0.005	4.8 (1.7 to 8.0)	0.003

Diabetes Care 2022;45:2224–2230

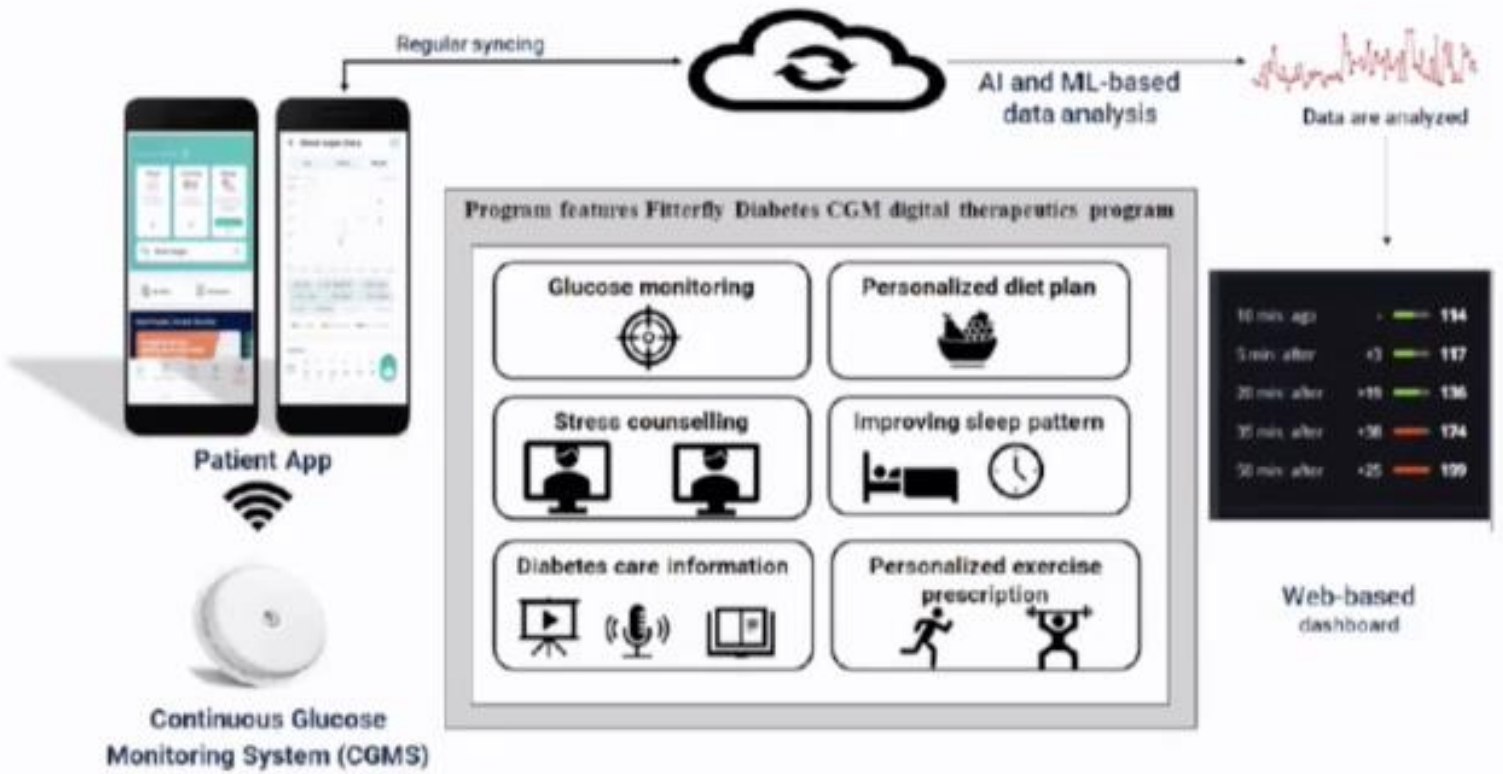
Original Paper

Fitterfly Diabetes CGM Digital Therapeutics Program for Glycemic Control and Weight Management in People With Type 2 Diabetes Mellitus: Real-world Effectiveness Evaluation

Background: Digital therapeutic platforms facilitate health care through patient-centered strategies based on multidisciplinary teams and shared decision-making. Such platforms can be used for developing a dynamic model of diabetes care delivery, which can help in improving glycemic control by promoting long-term behavior changes in people with diabetes.

Objective: This study aims to evaluate the real-world effectiveness of the Fitterfly Diabetes CGM digital therapeutics program for improving glycemic control in people with type 2 diabetes (T2D) after the completion of 90 days in the program.

Figure 1. Process flow of the Fitterfly diabetes CGM digital therapeutics program. AI: artificial intelligence; CGM: continuous glucose monitoring; ML: machine learning.



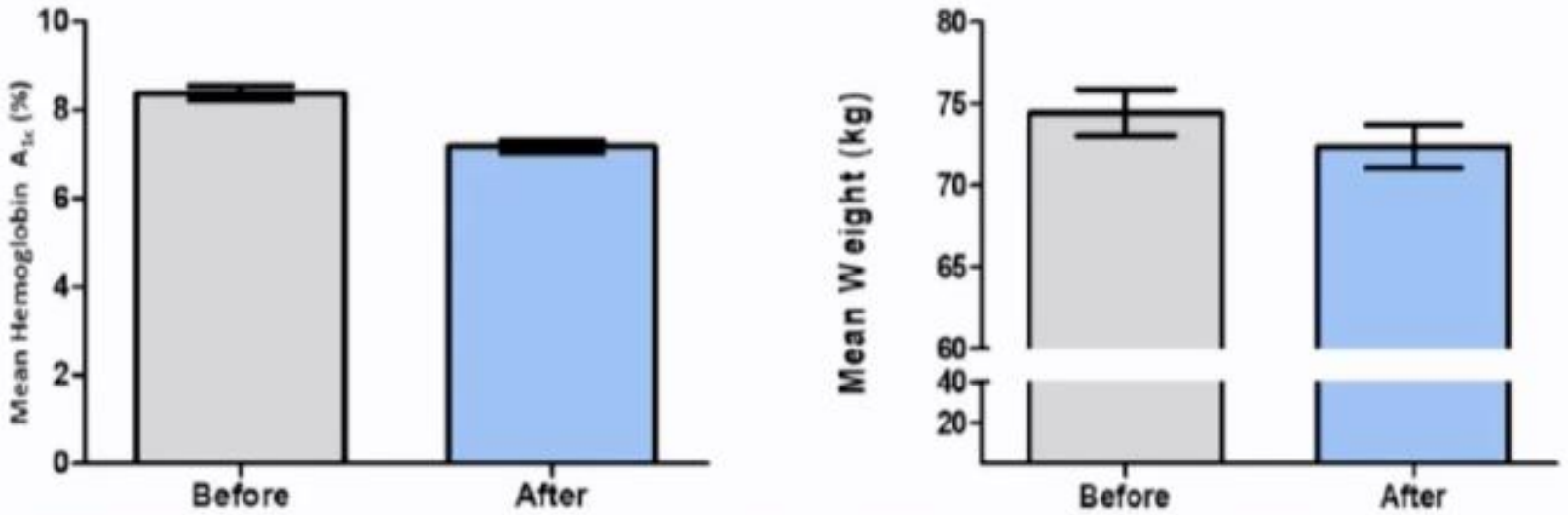
The Fitterfly Diabetes CGM program uses machine learning and artificial intelligence models to integrate and correlate the data collected from the CGM device and the mobile app to create a personalized lifestyle plan based on an individual's glycemic response

JMIR Diabetes 2023;8:e43292

Original Paper

Fitterfly Diabetes CGM Digital Therapeutics Program for Glycemic Control and Weight Management in People With Type 2 Diabetes Mellitus: Real-world Effectiveness Evaluation

Figure 2. Changes in (A) hemoglobin A1c level and (B) weight before and after the program.



Original Paper

Fitterfly Diabetes CGM Digital Therapeutics Program for Glycemic Control and Weight Management in People With Type 2 Diabetes Mellitus: Real-world Effectiveness Evaluation

Table 2. Summary of the parameters in the participants before and after the Fitterfly Diabetes continuous glucose monitoring intervention program.

Parameters	Preintervention, mean (SD), median (IQR)	Postintervention, mean (SD), median (IQR)	Change in parameters, mean (SD), median (IQR)	*P* value[a]
Hemoglobin A_{1c} (%)	8.4 (1.7), 8.1 (7.0 to 9.1)	7.2 (1.4), 7.1 (6.4 to 7.8)	−1.2 (1.6), −0.9 (−1.9 to −0.3)	<.001
Weight (kg)	74.45 (14.96), 73.0 (64.50 to 82.50)	72.40 (13.92), 71.0 (64.0 to 80.0)	−2.05 (2.84), −1.40 (−4.0 to 0)	<.001
BMI (kg/m^2)	27.44 (4.69), 26.50 (23.85 to 30.35)	26.70 (4.41), 25.98 (23.43 to 29.53)	−0.74 (1.02), −0.55 (−1.41 to 0)	<.001
ABG[b] (mg/dL)	152.90 (51.63), 139.00 (120.0 to 171.50)	136.50 (44.26), 125.00 (108.0 to 155.50)	−16.44 (32.05), −10.00 (−22.50 to −1.50)	<.001
TIR[c] (%)	57.5 (25.0), 61.0 (45.1 to 75.0)	64.6 (26.0), 72.0 (48.0 to 83.5)	7.1 (16.7), 6.0 (−0.2 to 16.1)	<.001
TAR[d] (%)	36.7 (28.4), 32.7 (13.8 to 51.7)	28.1 (28.1), 16.9 (6.3 to 41.2)	−8.7 (17.1), −5.2 (−16.8 to 0.0)	<.001
TBR[e] (%)	6.0 (11.8), 1.1 (0.0 to 5.6)	7.5 (13.3), 0.9 (0.0 to 8.7)	1.5 (11.2), 0 (−1.3 to 1.0)	.86

[a]Wilcoxon signed-rank test

Original Paper

An Innovative, Paradigm-Shifting Lifestyle Intervention to Reduce Glucose Excursions With the Use of Continuous Glucose Monitoring to Educate, Motivate, and Activate Adults With Newly Diagnosed Type 2 Diabetes: Pilot Feasibility Study

Glycemic excursion minimization (GEM) is an alternative lifestyle treatment option focused on reducing postnutrient glucose excursions rather than reducing weight.

Nutrition Matters for More than just Glucose


Journal of the Academy of Nutrition and Dietetics

Diet Quality and Glycemic Control in Patients with Type 2 Diabetes

The Best Diet: Quality Counts

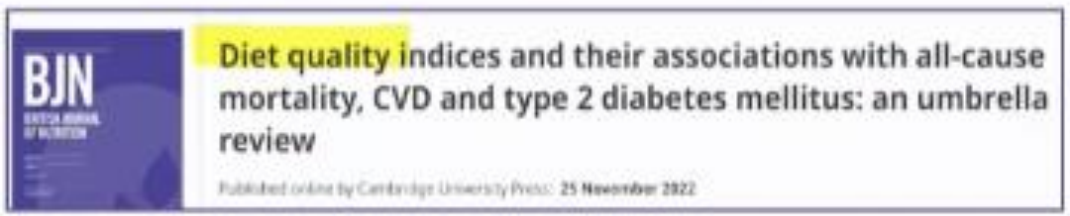
Lowers HbA1c

Improves Heart Health

Weight Loss

Reduces Cancer Risk

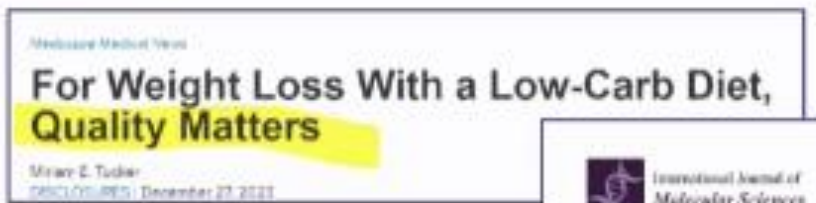
Increases Life Expectancy


BJN

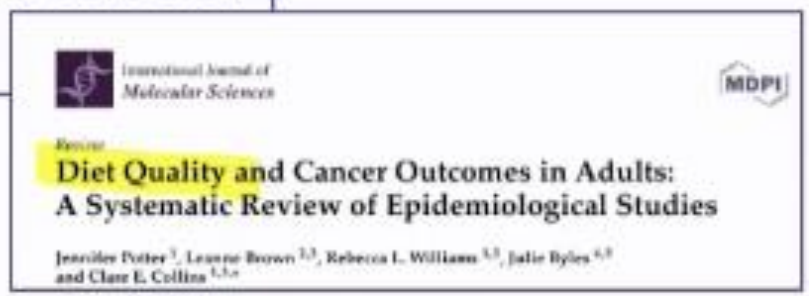
Diet quality indices and their associations with all-cause mortality, CVD and type 2 diabetes mellitus: an umbrella review

Published online by Cambridge University Press: 25 November 2022


Life expectancy can increase by up to 10 years following sustained shifts towards healthier diets in the United Kingdom


For Weight Loss With a Low-Carb Diet, Quality Matters

Miriam E. Tucker


International Journal of Molecular Sciences

MDPI

Review

Diet Quality and Cancer Outcomes in Adults: A Systematic Review of Epidemiological Studies

Jennifer Potter, Leanne Brown, Rebecca L. Williams, Julie Byles and Clare E. Collins

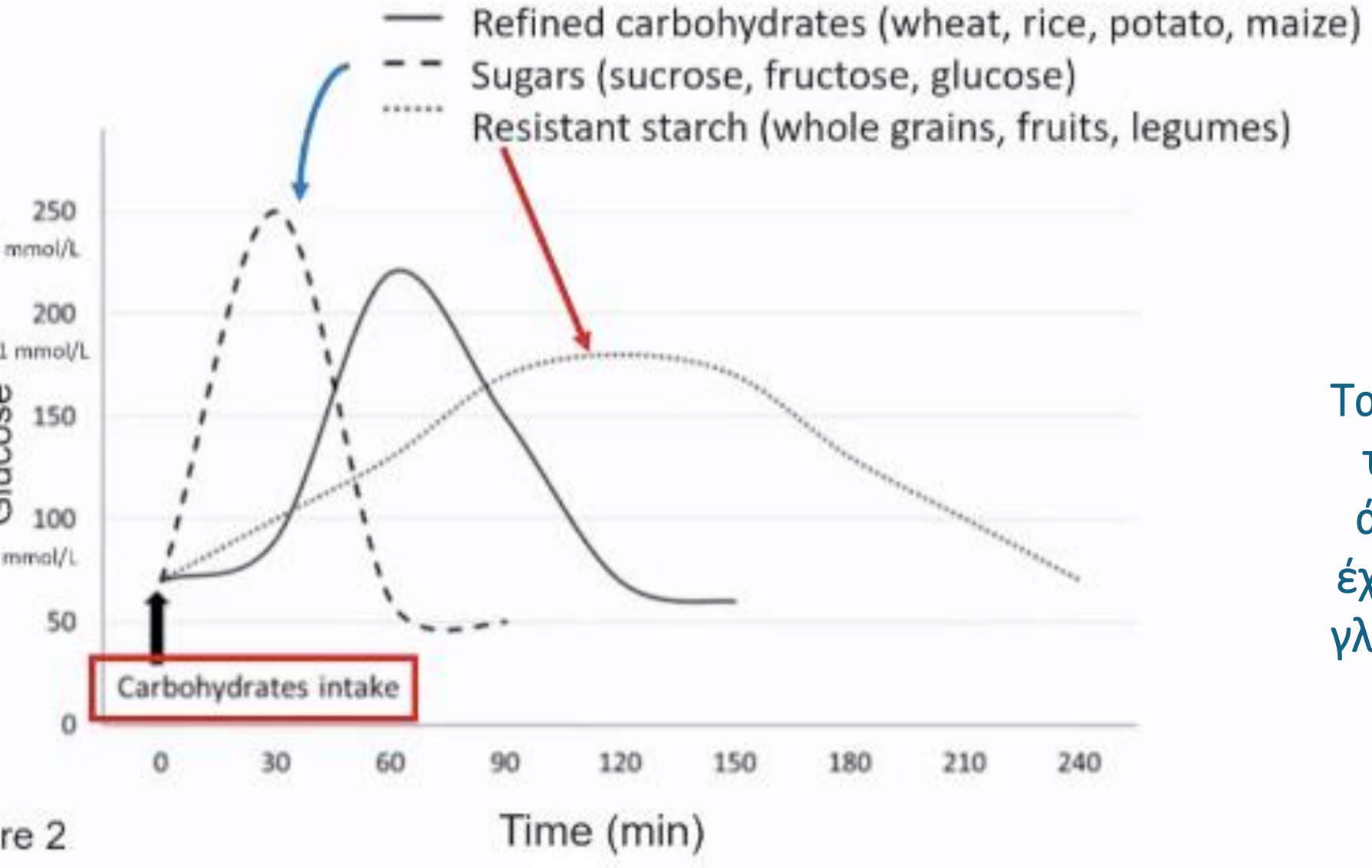
Casas R, et al. Nutrition and Cardiovascular Health. Int J Mol Sci. 2018 Dec 11;19(12):3988.
The Nutrition Source. "The Best Diet: Quality Counts." Harvard T.H. Chan School of Public Health

Η γνώση που δίνεται στα άτομα μέσω της χρήσης των συστημάτων αυτών βοηθά στην αλλαγή της συμπεριφοράς!

	Medication	Design	Results
Cox et al (2020)	Noninsulin	Routine care vs CGM and lifestyle intervention	CGM arm: HbA1c ↓ 1.3%; ↓ DM distress; ↓ **PPG**; **Improved QOL** and DM knowledge
Majitha et al (2019)	Insulin and noninsulin	CGM with telemedicine (single arm) and remote lifestyle coaching	HbA1c ↓ 1.6%; ↓ **Weight; TIR↑ 10.2%; BP and Lipid improvement**
Bergenstal et al (2021)	Insulin and noninsulin	Retrospective analysis evaluated patient satisfaction with CGM use in Onduo participants	HbA1c ↓ 2% (noninsulin with starting HbA1c ≥8%); **Improved understanding of impact of food (97%);** Improved DM management when NOT wearing a sensor (79%)
Porter et al (2022)	Insulin and noninsulin	Lifestyle counseling; blinded CGM at weeks 0 and 14; randomized to rtCGM (x20d), FFQ to measure diet	**84% excluded certain foods as a result of CGM & ↑PA** (at week 24); ↓ Weight; **92% would like to wear CGM regularly**

Jackson M. Diabetes Technol Ther. 2021;23(S1):S27-S34
Alappo G. Diabetes Technol Ther. 2023; Oct; 25(10):741-751

Carbohydrates are Not All Equal



re 2

Τα άτομα με διαβήτη έχουν την δυνατότητα να δουν άμεσα την επίδραση που έχουν τα γεύματα τους στο γλυκαιμικό τους προφίλ και αντίστοιχα να δράσουν

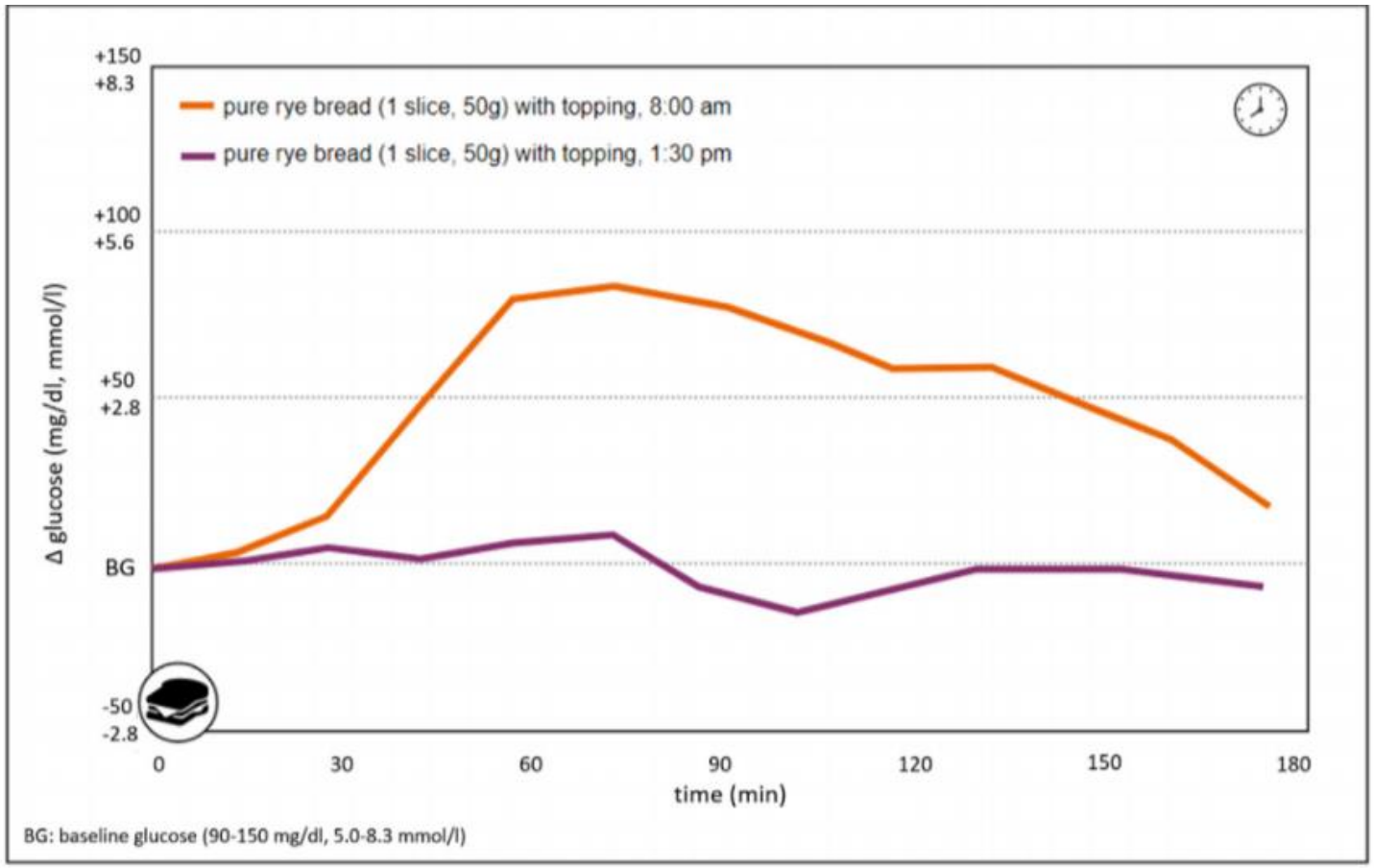
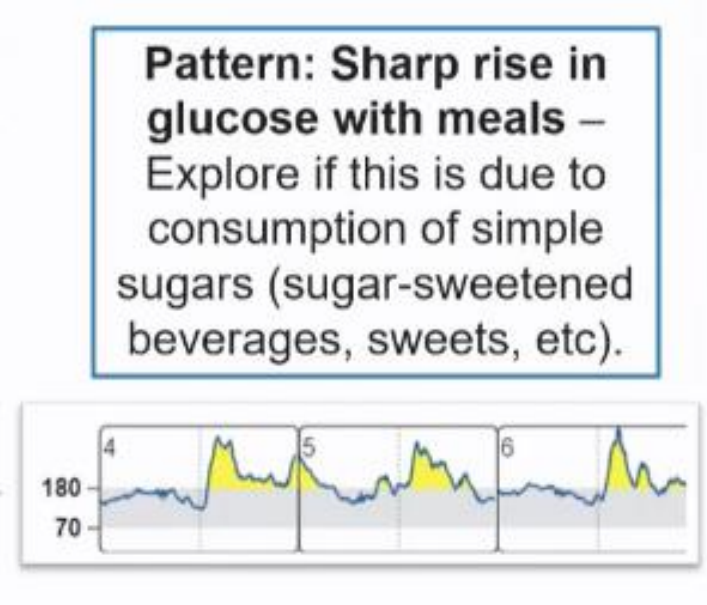


Fig. 3 – Postprandial glucose courses of a person with type 2 diabetes after consumption of rye bread at different times of the day [62]. **The figure shows the different glucose courses of a person with type 2 diabetes treated with metformin and a DPP-4 inhibitor. Consumption of 50 g rye bread with toppings in the morning and at noon (8:00 and 13:30) results in different postprandial glucose courses. In the morning, the increase is much more pronounced than at noon.**

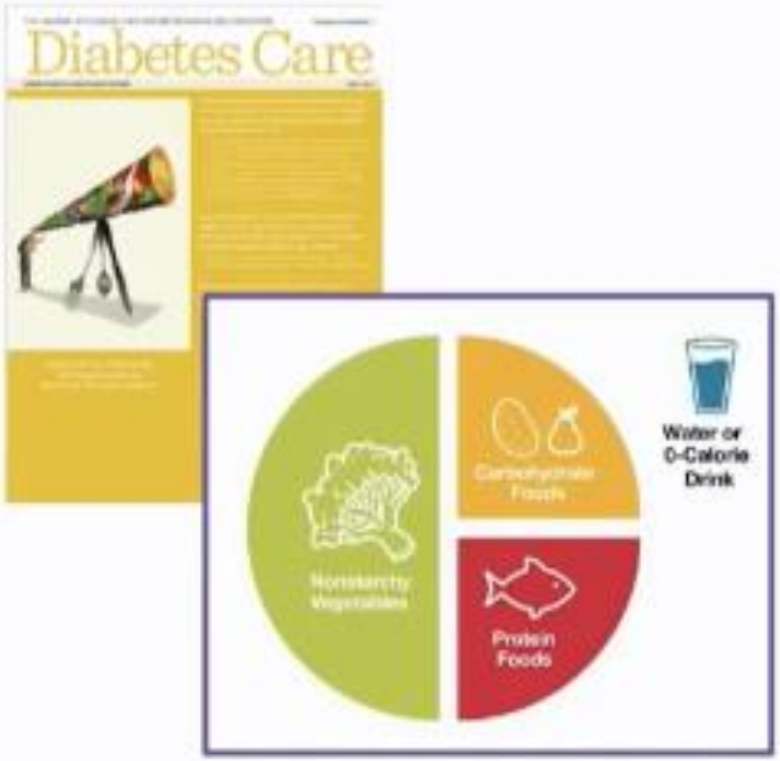
Συνεργασία



Ο ρόλος του διαιτολόγου και της διεπιστημονικής ομάδας είναι

1) **Να εκπαιδεύσουμε το άτομο να "διαβάζει" τα δεδομένα**
2) **Να εξηγήσουμε την επίδραση των τροφίμων**
3) **Να προτείνουμε εναλλακτικές πρακτικές και ΥΛΟΠΟΙΗΣΙΜΕΣ λύσεις για το άτομο**

Χωρίς την ανατροφοδότηση και την επικοινωνία με την θεραπευτική ομάδα το άτομο με διαβήτη δεν μπορεί να μεγιστοποιήσει τα οφέλη από την χρήση του αισθητήρα.



1. Emphasize non-starchy vegetables
2. Minimize added sugars and refined grains
3. More whole foods
4. Replace sugar-sweetened beverages with water as often as possible

Foundation to ANY eating pattern

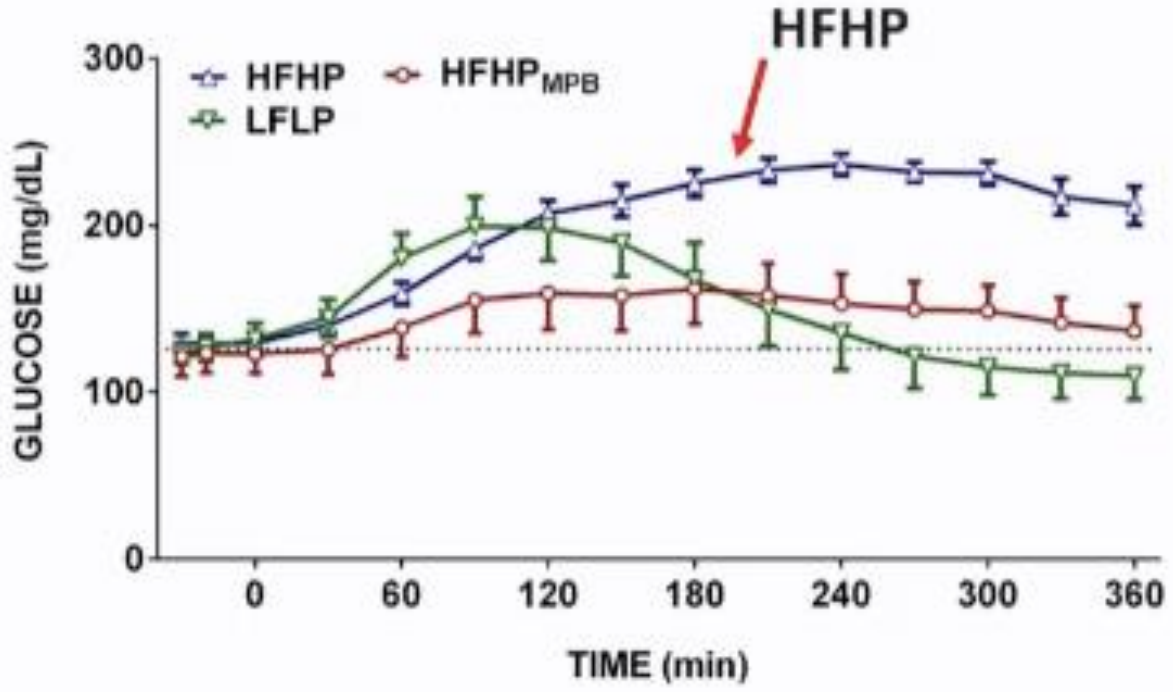
ALL health care professionals play an important role in guiding nutrition changes that are better for glucose and overall health

Evert A, et al. Nutrition Therapy for Adults with Diabetes or Prediabetes: A Consensus Report. Diabetes Care 2019;42:731-754.

Είναι δική μας ευθύνη να εξηγήσουμε την ερμηνεία των επιλογών του ατόμου και να το οδηγήσουμε σε καλύτερες επιλογές!

Meal composition (high fat/high protein vs low fat/low protein) *T1D*

- 2 meals matched for carbohydrate
- Same insulin dose



Diabetes Care 2016;39(9):1631–1634

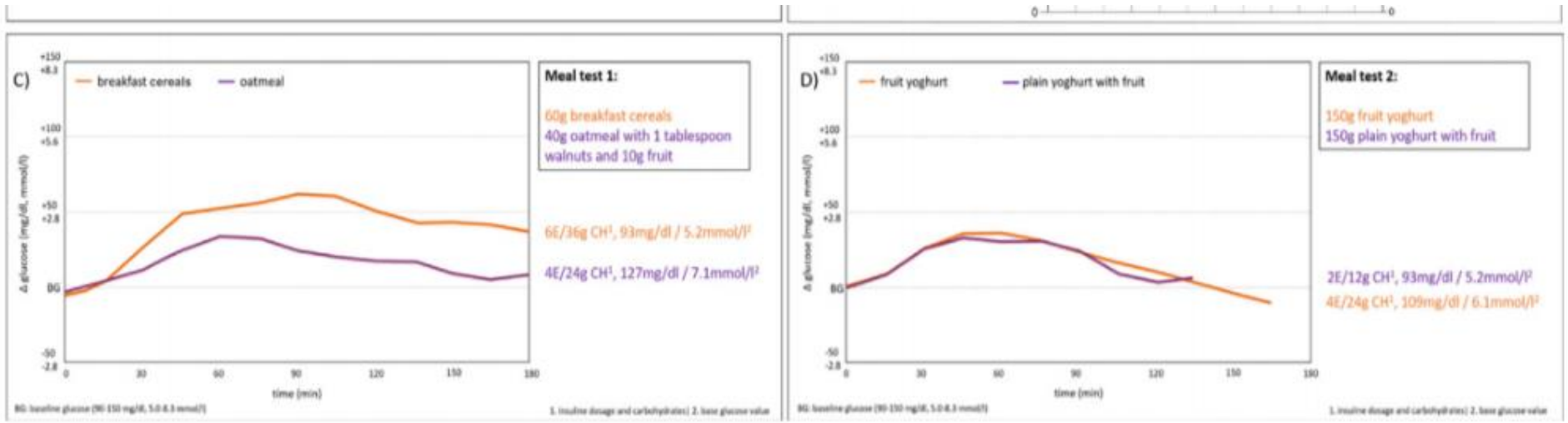
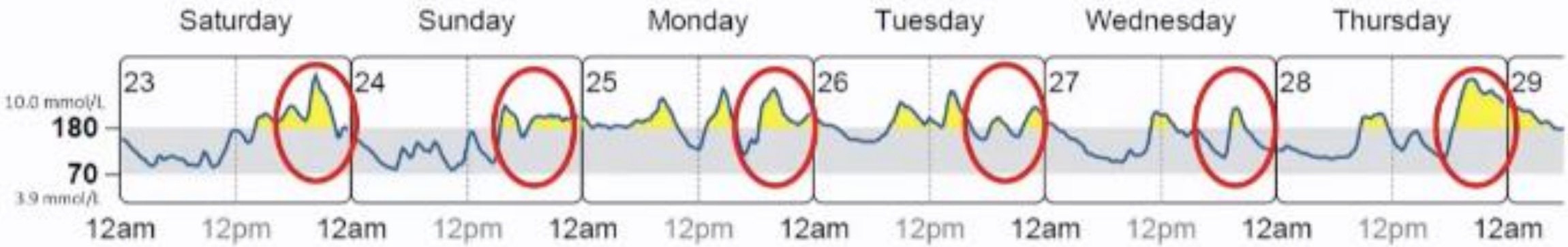


Fig. 4 – Casuistry of a nutritional evaluation using continuously measured glucose values [62]. **(A) The AGP (29 days) shows an estimated HbA1c of 6.5 % [48 mmol/mol]. Glucose values are median in the target range (70–180 mg/dl [3.9–10 mmol/l]). Increased glucose levels can be observed in particular at breakfast and in the evening with an increased variability in the IDR and in the morning also in the IQR. (B) The daily profiles show incomplete documentation of medication and food intake. (C) Consumption of 60 g ready-to-eat cereals (36 g CH) compared to 40 g oatmeal with 10 g fruit and 1 tablespoon of nuts (24 g CH) led to a reduction in insulin dose from 6 IU to 4 IU. Despite the reduction in the insulin dose, PPG progression remained less pronounced after consumption of the oatmeal. (D) The consumption of 150 g fruit yoghurt (24 CH) compared to 150 g natural yoghurt with 10 g fruit (12 CH) led to a reduction in the insulin dose from 2 IU to 1 IU. The PPG curve was comparable.**

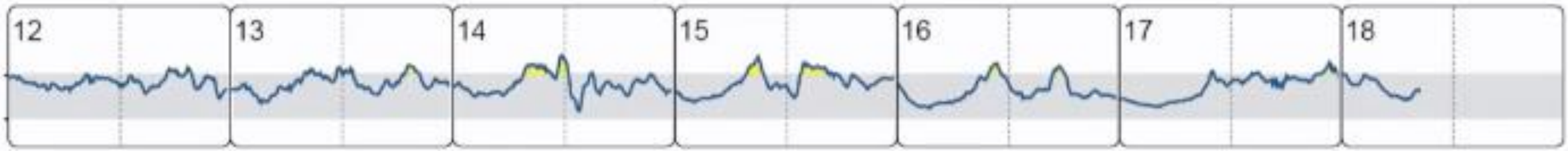
The Need for Personalized Nutrition



Notable eating habits: rice or noodles at dinner with family each night

Agreed upon trying LESS rice and noodles and MORE vegetables at dinner

2 weeks later



Tip: Pick one meal at a time to focus on. Ask what changes they are willing to make.

Impact of Applying the Core Concepts

Blinded CGM Data

57 yo M
T2D
Metformin + Semaglutide

HealthPartners

Impact of Applying the Core Concepts

2 months later

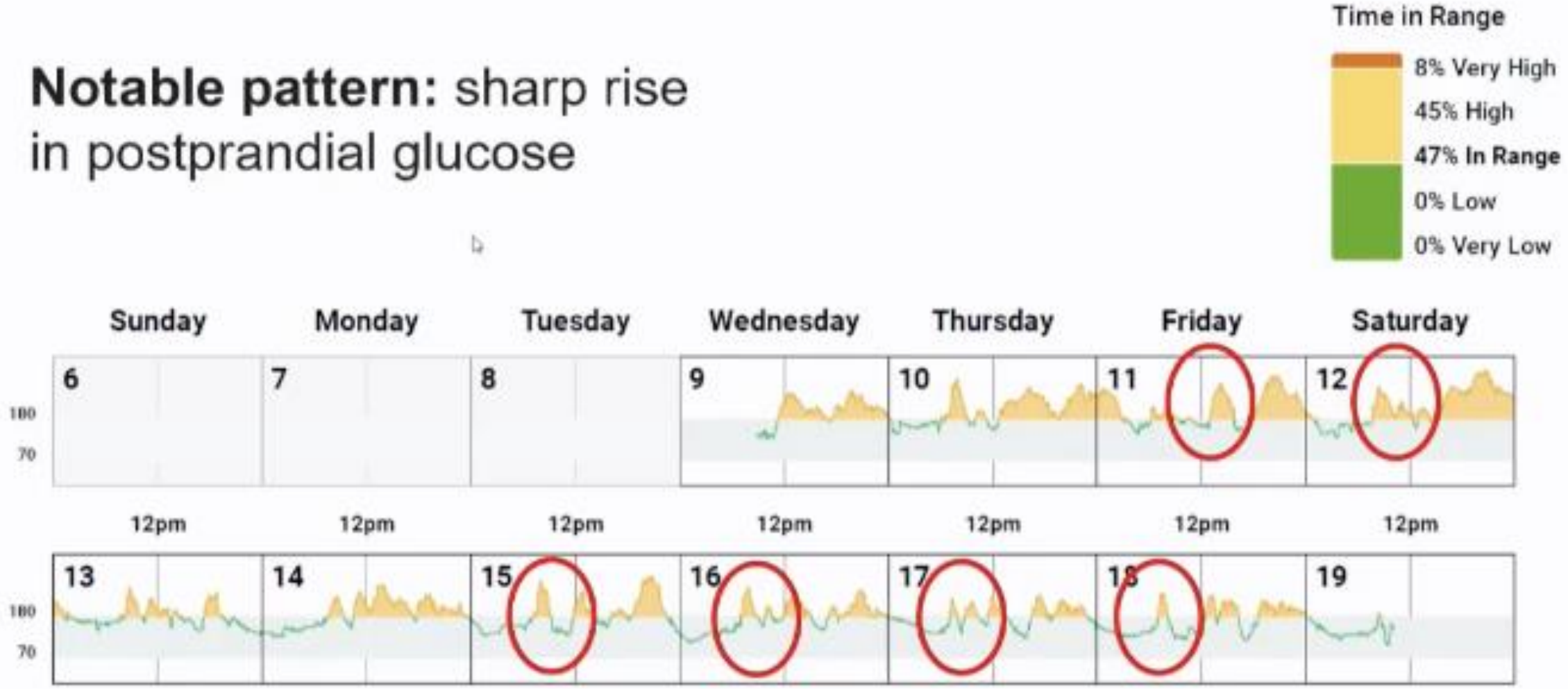
TIR ↑ 47%

Δημητριακα για πρωινο

1. Emphasize non-starchy vegetables
2. Minimize added sugars and refined grains
3. More whole foods

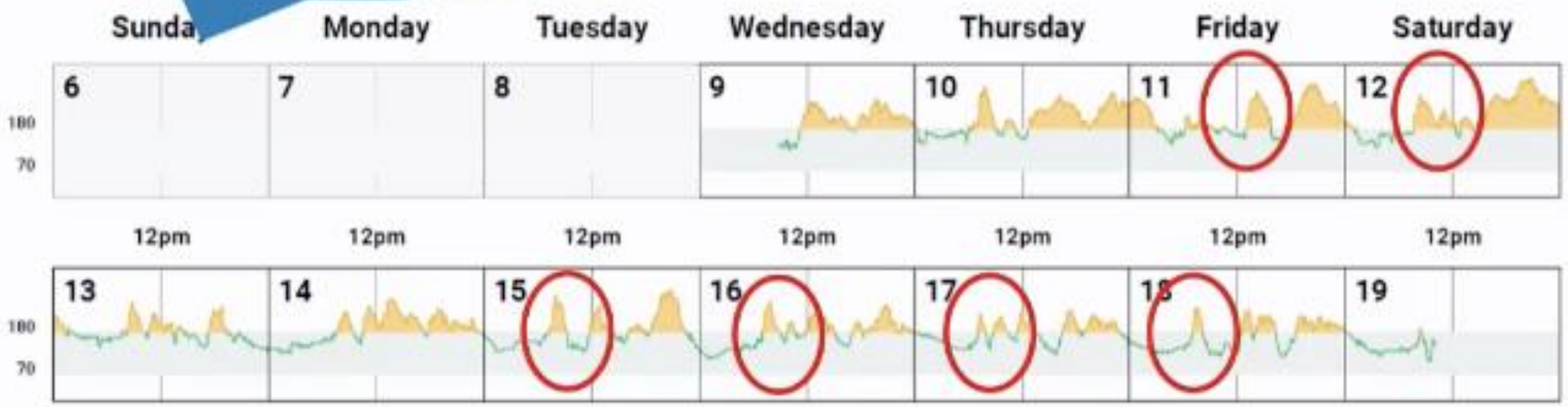
Applying CGM Guided Nutrition in the Clinic

Notable pattern: sharp rise in postprandial glucose



Applying CGM Guided Nutrition in the Clinic

"Can you tell me more about what you eat and drink for your meals?

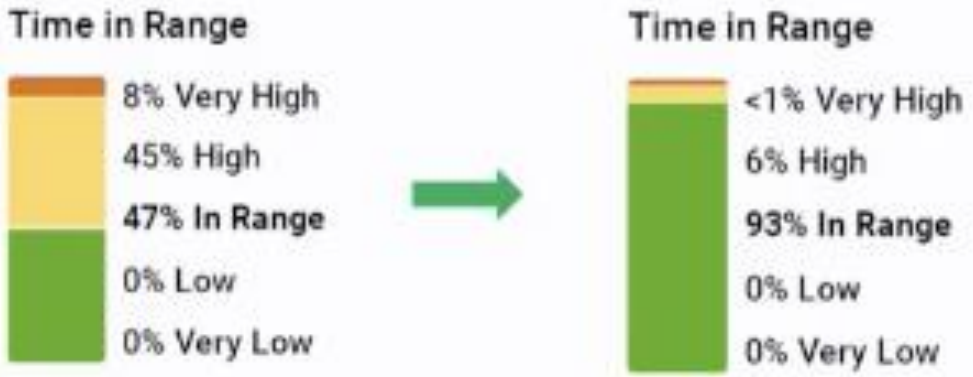


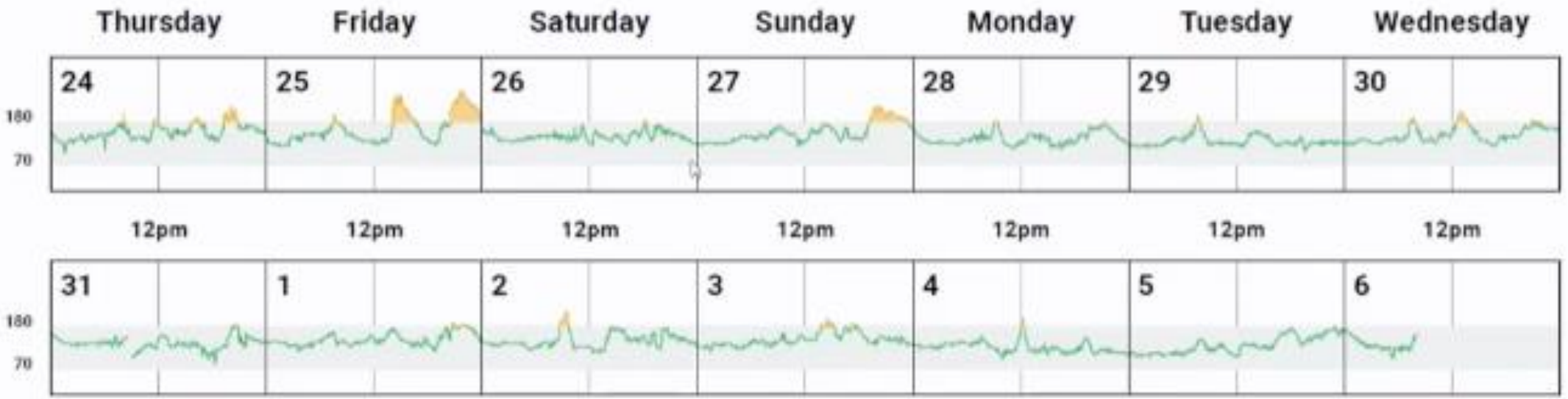
Tip: Suggest keeping a food log or tracking meals in the app

HealthPartners

3 weeks later

4. Replace sugar-sweetened beverages with water as often as possible



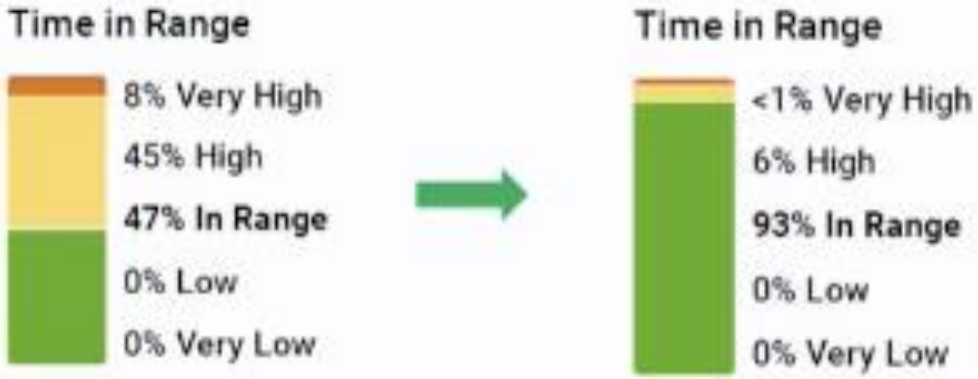


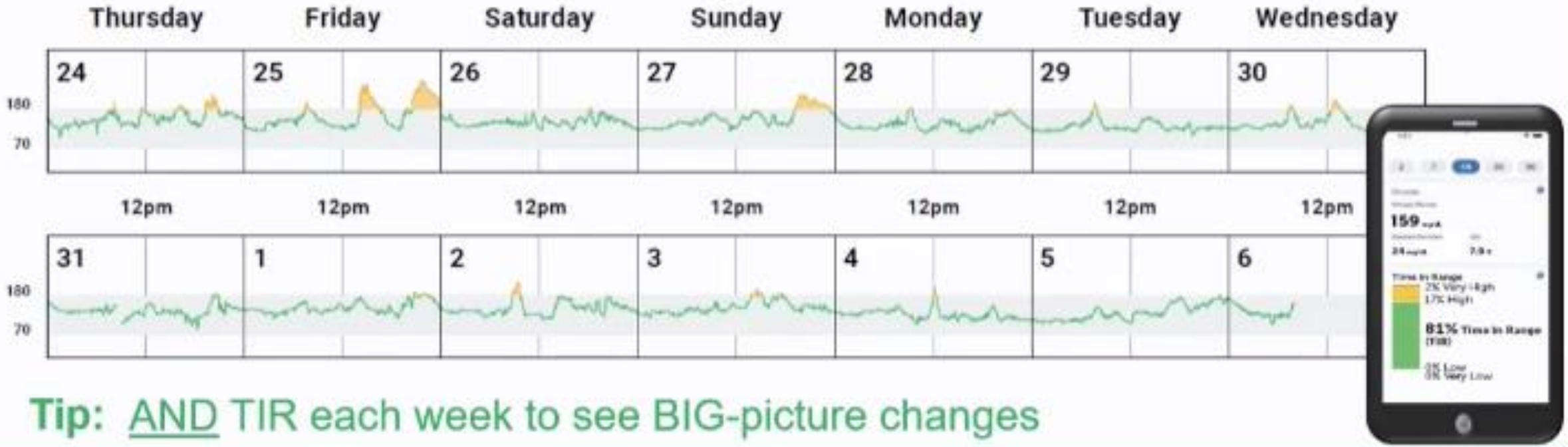
Tip: Encourage checking glucose before and 1-2 hours after meals

HealthPartners

3 weeks later

4. Replace sugar-sweetened beverages with water as often as possible



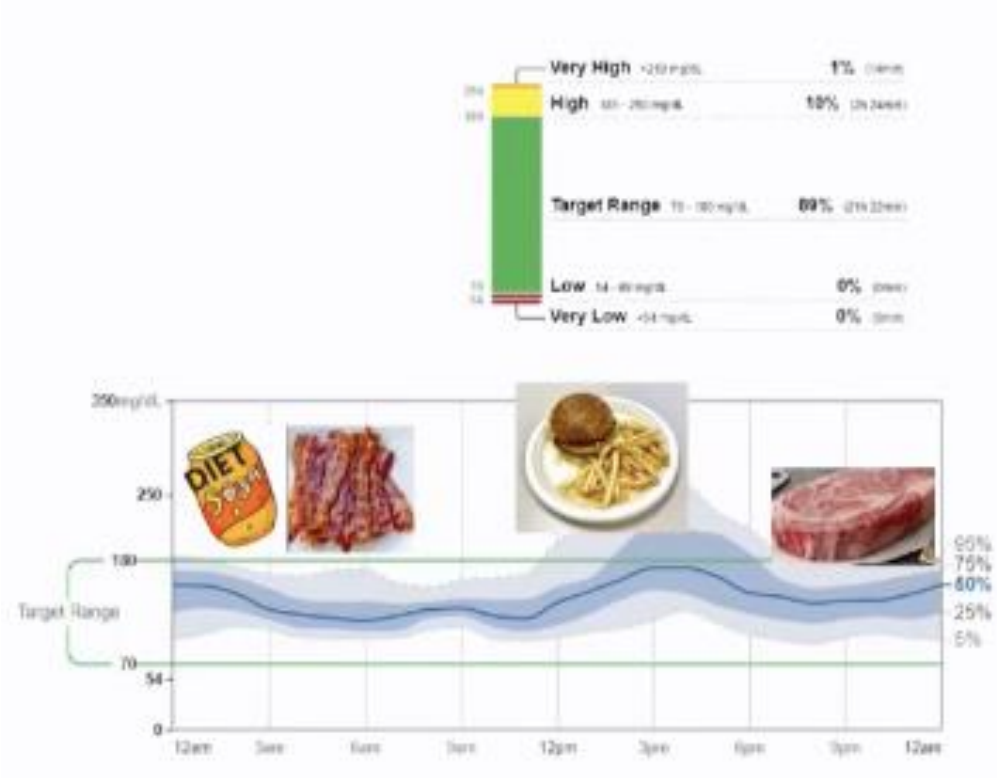


Tip: AND TIR each week to see BIG-picture changes

- Μένουμε στα θετικά μηνύματα
- Δεν δαιμονοποιούμε τρόφιμα και ροφήματα
- Τι μαθαίνεις στο πώς τα τρόφιμα και τα ροφήματα επηρεάζουν το σάκχαρο σου?
- Ελέγχουμε ποιότητα διατροφής όχι μονο γλυκαιμικούς στόχους!

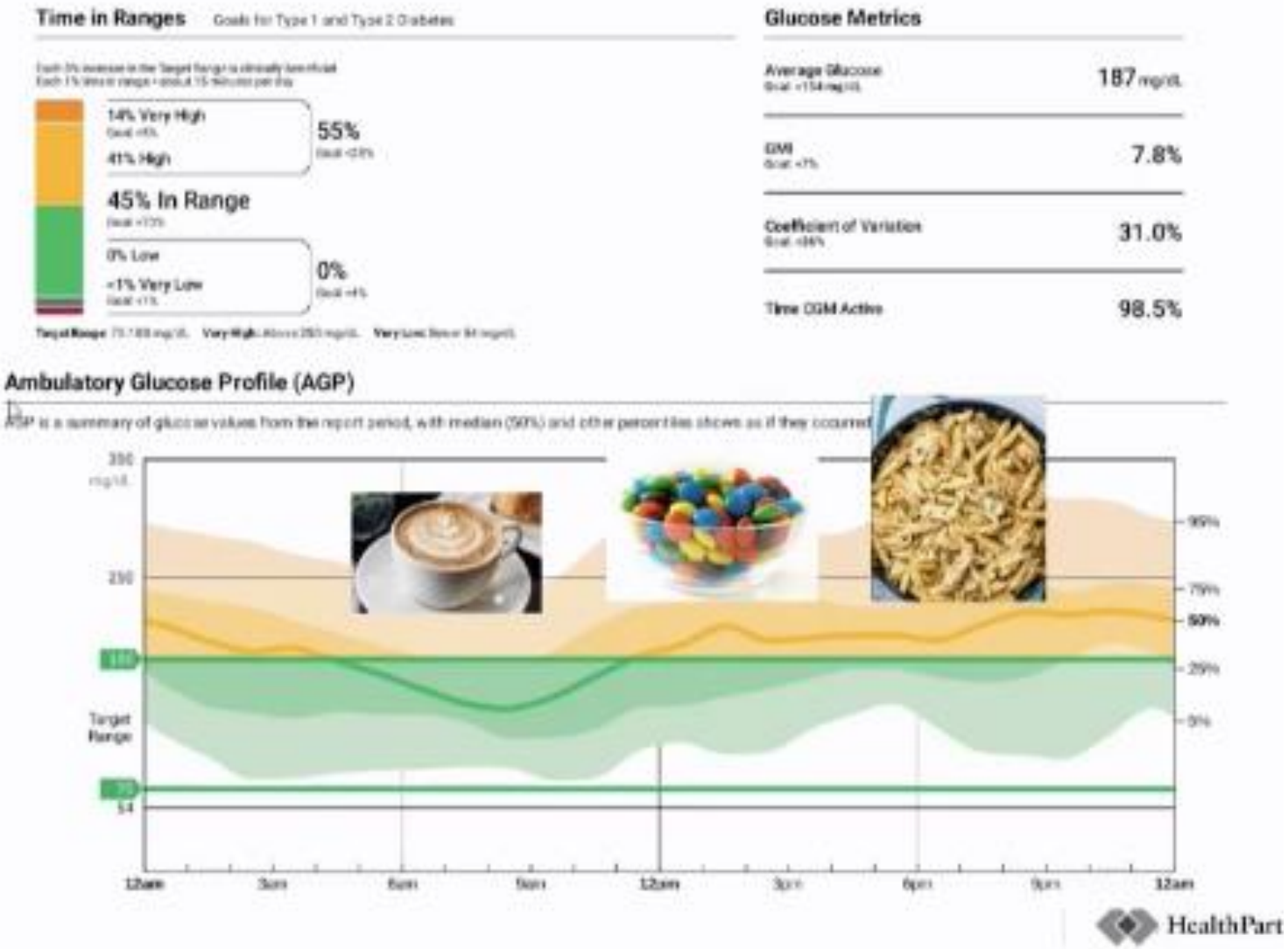
- Ενθαρρύνουμε την περιέργεια

- Προτείνουμε πειράματα!
- (**αλλαγή μερίδων, χρονισμό, σειρά τροφίμων)**

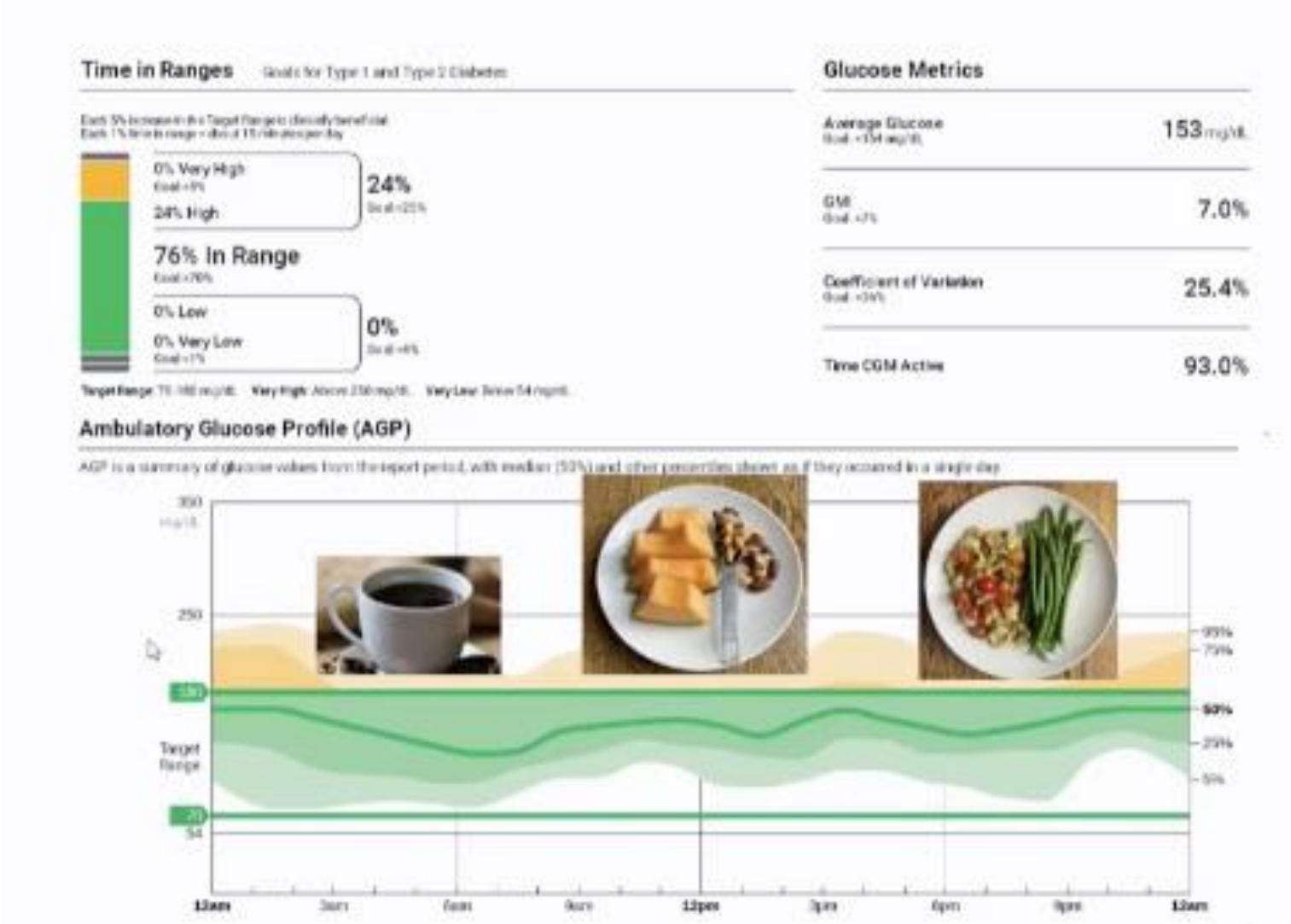


Ερωτήσεις που δεχόμαστε συχνά από τα άτομα με ΣΔ2

- Μέλι
- Ταχίνι
- Μπάρες
- Σοκολατα στεβια
- Γλυκα στεβια
- Φυτικά τρόφιμα
- Όσπρια
- Γιατι όχι χυμο?????



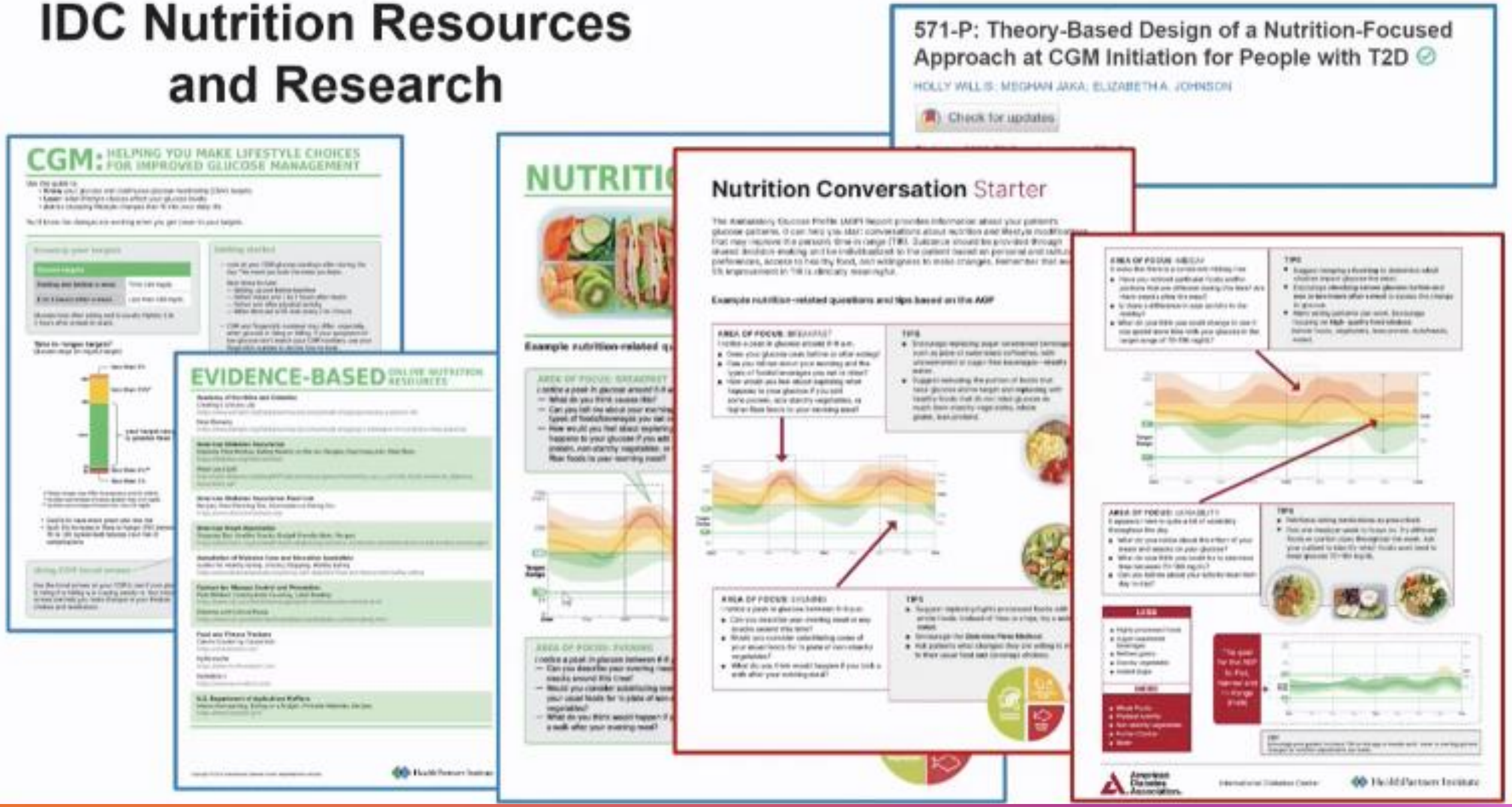
"Would you be open to an unsweetened drink in the morning? What about exploring a different snack option to see what happens?"



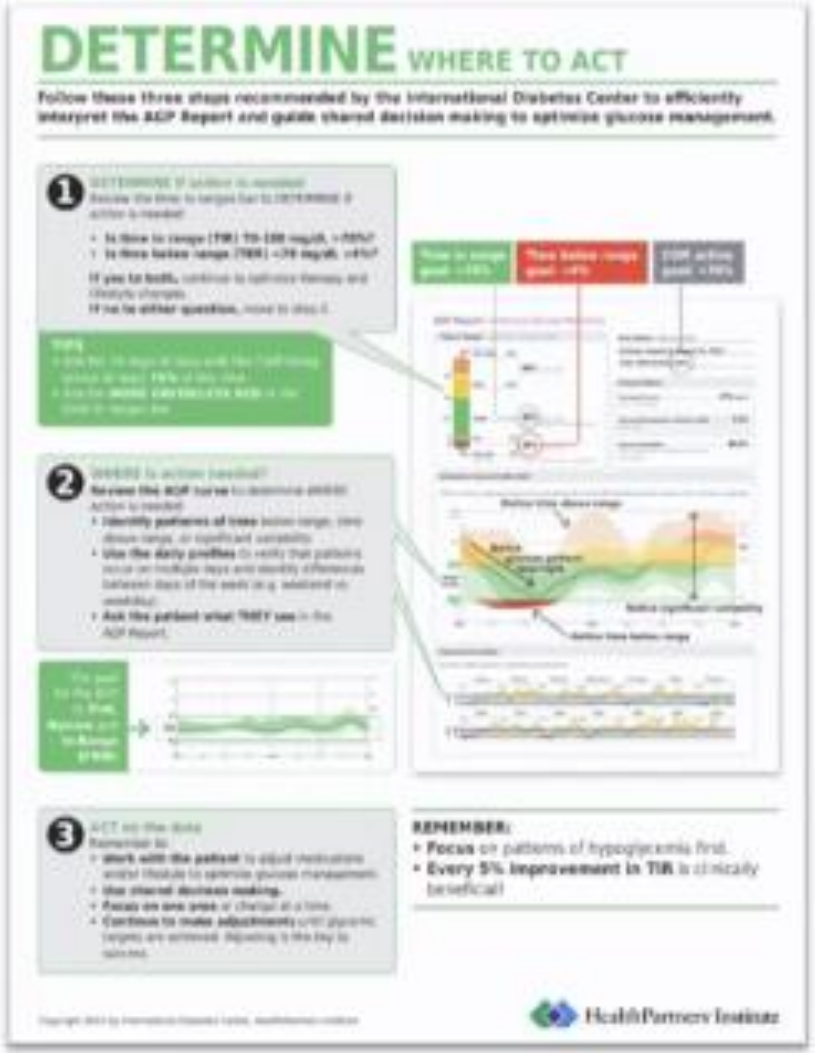
"It was very eye opening to see how high my blood sugar was really getting, especially after eating certain foods. **It [CGM] made me much more conscious about what I was eating as well as how much and when.**"

Quote from real patient

IDC Nutrition Resources and Research



CGM is available and recommended for T2D on insulin: how do we leverage CGM for precision management?



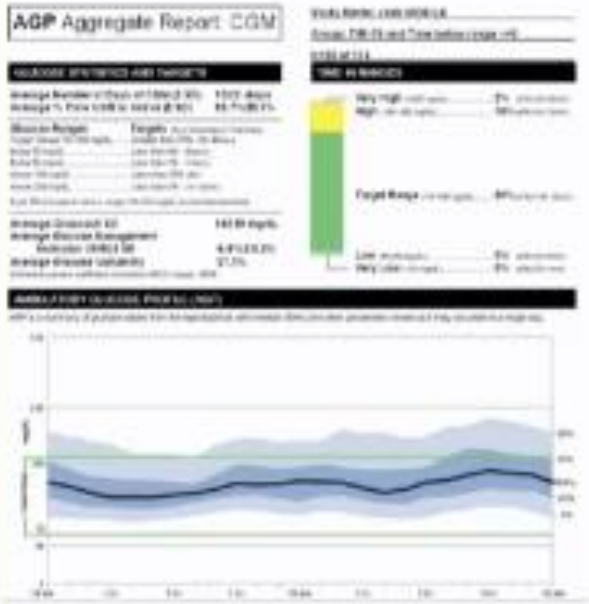
We've worked hard on rapid interpretation for Primary Care . . .

But rapid interpretation really isn't enough . . .

CCGM: Moving from Interpretation to Action

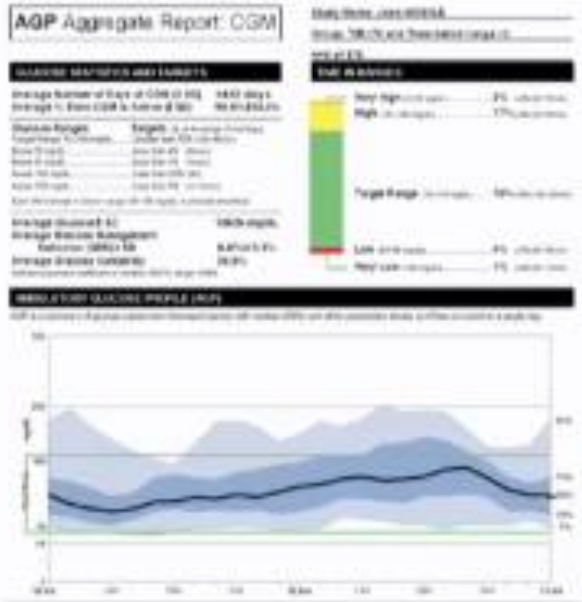
T2D on Basal Insulin: CCGM TIR/TBR categories

TIR >70%
TBR <3%
Category 1



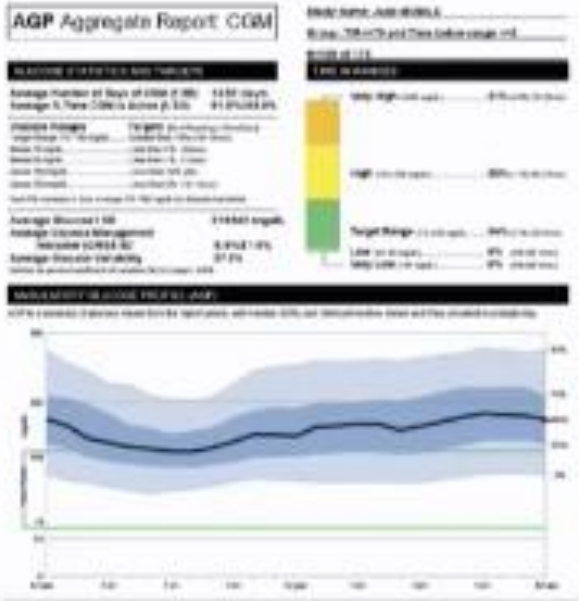
Doing well- keep going!

TIR >70%
TBR ≥ 3%
Category 2



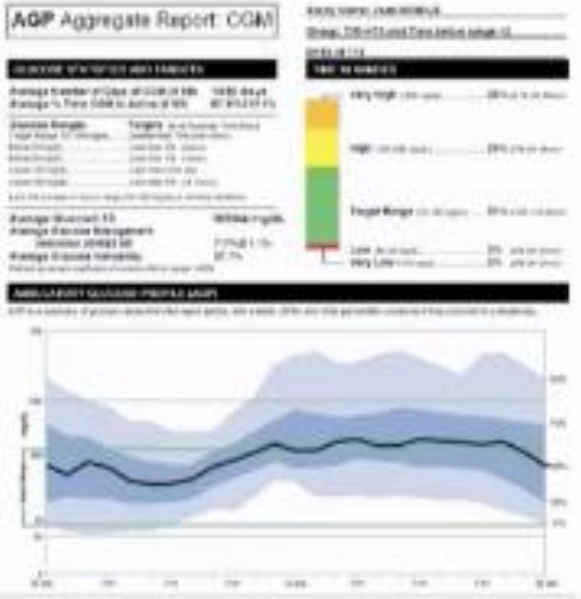
Too much hypoglycemia- decrease therapy

TIR <70%
TBR <3%
Category 3



Too much hyperglycemia- increase therapy

TIR <70%
TBR ≥ 3%
Category 4



Too much hypoglycemia AND too much hyperglycemia- fix or advance therapy

(CCGM) CGM Clinician Guided Management

Be careful with the mental state of the person

Disordered eating

Maladaptive eating behavior

Chronic dieters-Binge eating

Overwhelming information

- Μήπως είναι ένα μεσο για να προωθήσουμε δίαιτες χαμηλών υδατανθράκων???
- Είναι τελικα ένα εργαλειο να βοηθησουμε τα ατομα που ζουν με διαβητη να αλλαξουν και να διατηρησουν τις αλλαγες στον τροπο ζωης τους?
- Τα θεματα προβληματα που θετουν οι μελετες είναι το κοστος και οι ανεπιθυμητες ενεργειες οσον αφορα την χρηση του αισθητηρα
- Είναι σημαντική η επικοινωνία με τα άτομα , να διερευνούμε τις ανάγκες τους, τις συνήθειες τους και να εστιάζουμε σε **ΜΙΚΡΕΣ και ΠΡΑΓΜΑΤΟΠΟΙΗΣΙΜΕΣ ΑΛΛΑΓΕΣ !!!**

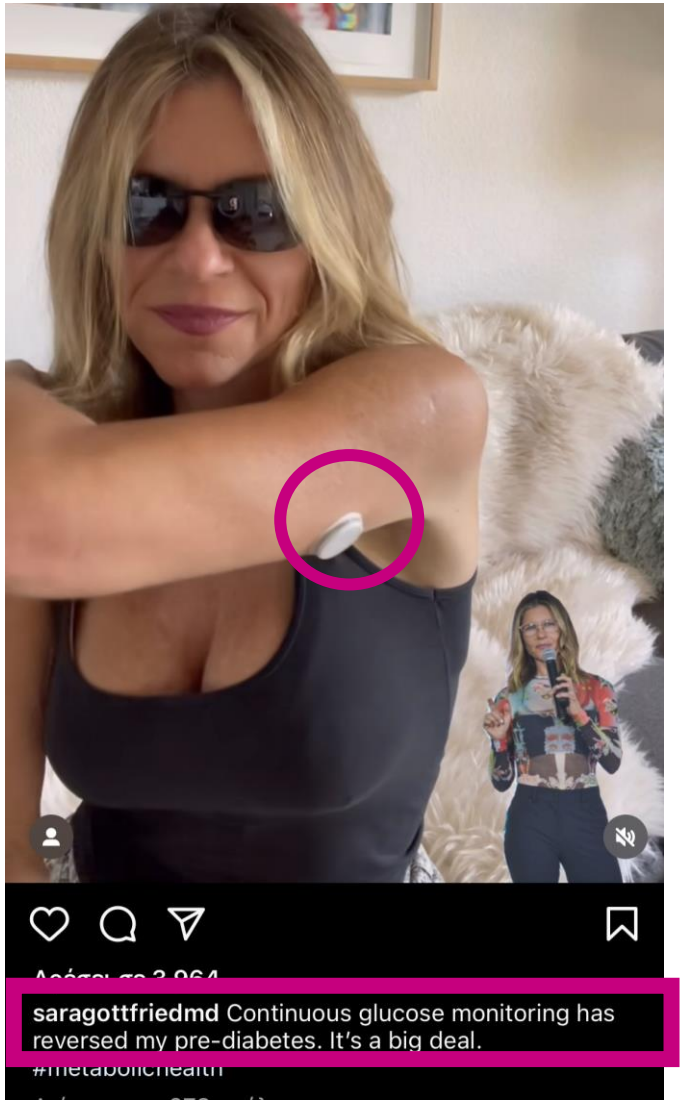
Take home messages

Οι συστασεις για την διατροφικη θεραπεια πρεπει να προσαρμοζονται τακτικα αναλογα τις αλλαγες στις συνθηκες ζωης του ατομου, τις προτιμησεις και την πορεια της νοσου

Η τακτικη παρακολουθηση του ατομου από ένα ατομο της διεπιστημονικης ομαδας είναι σημαντικη για την προσαρμογη όλων των πλευρων του θεραπευτικου πλανου

Πολλα ατομα δεν λαμβανουν διατροφικη θεραπεια η επισημη εκπαιδευση για τον διαβητη

Τα CGM είναι ένα σημαντικο εργαλειο για να βοηθησουμε την συμπεριφορικη αλλαγη στα ατομα με διαβητη οσον αφορα την γλυκαιμια και τον ελεγχο του βαρους



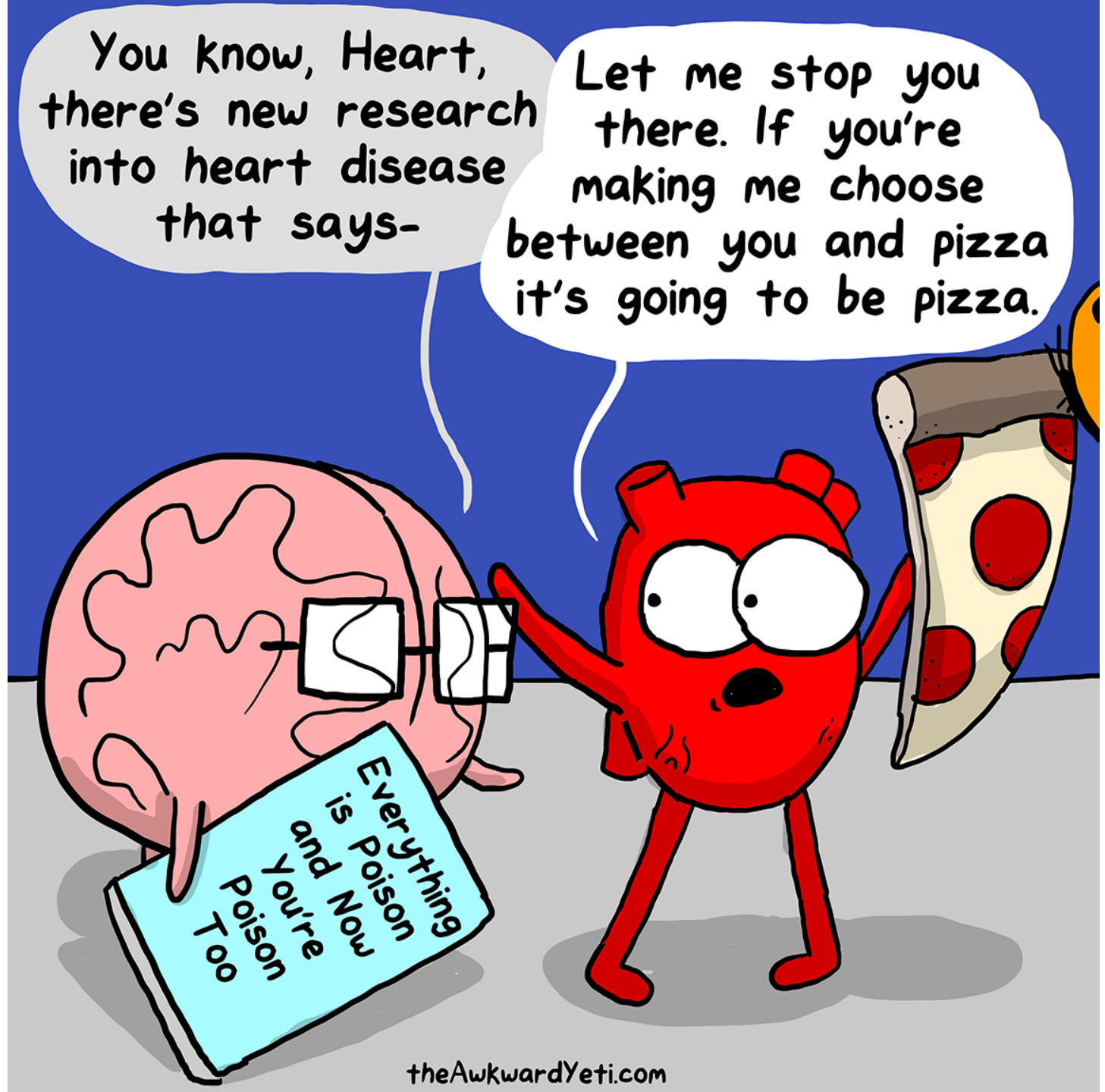
Δεν είναι η τεχνολογία και η καταγραφή γλυκόζης αυτό που βοηθά

ΑΛΛΑ

η αλλαγή συμπεριφοράς στην γνώση την οποία λαμβάνει το άτομο!

An excellent tool for helping motivated patients improve health and achieve T2DM remission. Relatively simple intervention, although food reintroduction presents numerous challenges which a structured and supportive approach can help overcome. Participant 4

ΕΥΧΑΡΙΣΤΩ ΓΙΑ ΤΗΝ ΠΡΟΣΟΧΗ ΣΑΣ !!!


You know, Heart, there's new research into heart disease that says-
Let me stop you there. If you're making me choose between you and pizza it's going to be pizza.
Everything is Poison and Now You're Poison Too
theAwkwardYeti.com