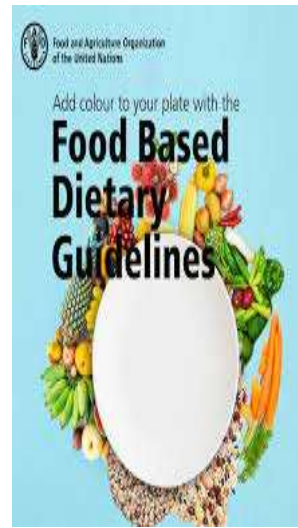


"Διατροφή στον ΣΔτ1"



Δρ Χάρης Δημοσθενόπουλος *MMedSci. PhD*
Κλινικός Διαιτολόγος-Προϊστάμενος Διαιτολογικού Γ.Ν.Α. «Λαϊκό»
Διδάκτωρ Ιατρικής Σχολής ΕΚΠΑ
Αντιπρόεδρος ΕΜΠΑΚΑΝ
Board member of IDF Europe
Communications Officer of Diabetes Nutrition Study Group (DNSG)
8.12.2025

Οι κατευθυντήριες οδηγίες για τη δίαιτα στο ΣΔτ1



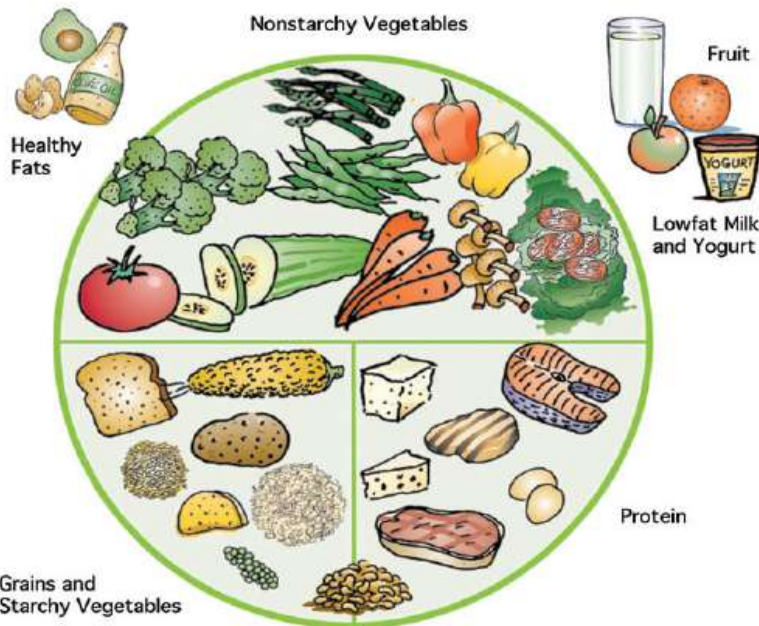
Η διατροφή παίζει καθοριστικό ρόλο στην καλύτερη ρύθμιση του ΣΔτ1 και στην ποιότητα ζωής

ISPAD Clinical Practice Consensus Guidelines 2022: Nutritional management in children and adolescents with diabetes



ISPAD

International Society for Pediatric and Adolescent Diabetes



About 3-4 ounces



About 1 cup



About 1 teaspoon



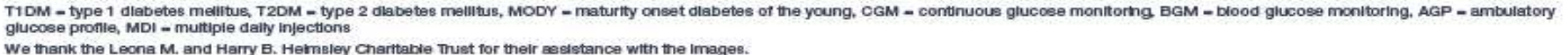
About 1 tablespoon

Content in this brochure regarding diabetes, nutrition and nutrition education was provided by Joslin Diabetes Center (www.joslin.org), a nonprofit teaching and research affiliate of Harvard Medical School. Joslin does not endorse the products or services of any company.

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Evidence suggests that it is possible to improve diabetes outcomes through attention to nutritional management and an individualized approach to education. This requires a clear focus on dietary goals in relation to glycemic control and the reduction in cardiovascular risk.

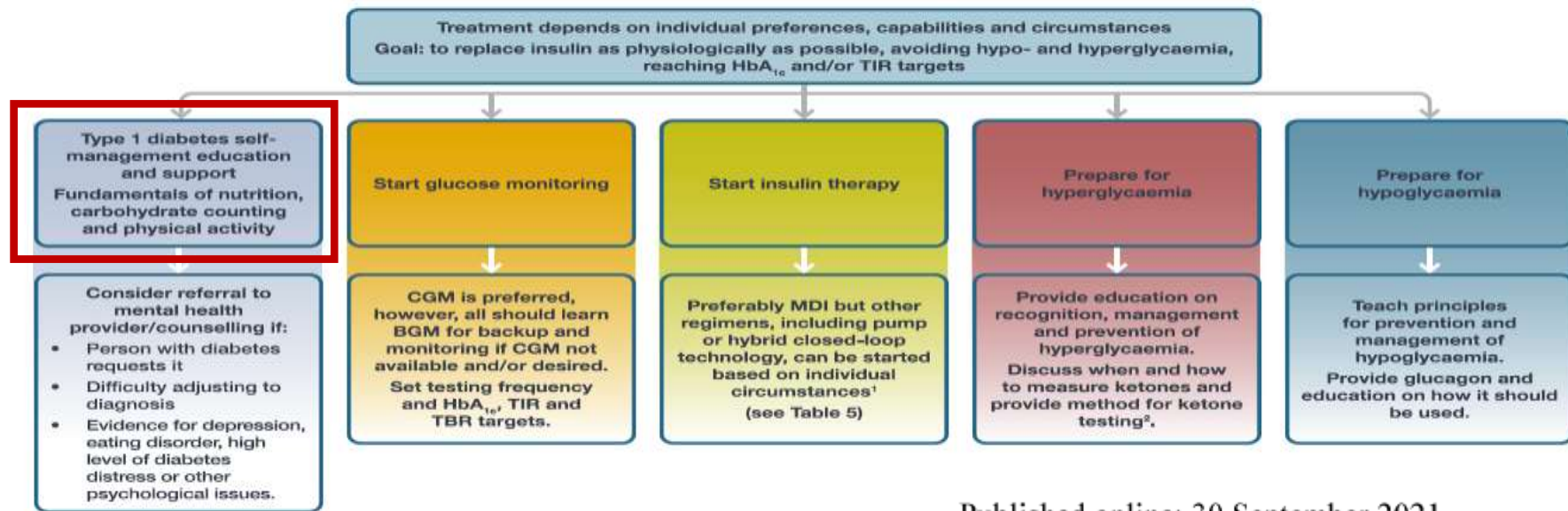


We thank the Leona M. and Harry B. Helmsley Charitable Trust for their assistance with the images.

The management of type 1 diabetes in adults. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

Richard I. G. Holt^{1,2} · J. Hans DeVries^{3,4} · Amy Hess-Fischl⁵ · Irl B. Hirsch⁶ · M. Sue Kirkman⁷ · Tomasz Klupa⁸ · Barbara Ludwig⁹ · Kirsten Norgaard^{10,11} · Jeremy Pettus¹² · Eric Renard^{13,14} · Jay S. Skyler¹⁵ · Frank J. Snoek¹⁶ · Ruth S. Weinstock¹⁷ · Anne L. Peters¹⁸

Schematic for management of new-onset type 1 diabetes in an adult



Published online: 30 September 2021

Fig. 3 A framework for initial assessment and treatment of an individual with newly diagnosed type 1 diabetes. In most people, frequent follow-up until the diabetes is stabilised is needed. ¹People can switch back and forth between MDI and pump or hybrid closed-loop therapy based on preference and circumstances; however, all people must be prepared to use injected insulin therapy if pump or hybrid closed-loop systems fail or are not available. ²The availability of blood and urine ketone measurement varies across healthcare systems

Goals of nutrition therapy for type 1 diabetes

- Promote healthful eating patterns, emphasizing a variety of nutrient-dense foods in appropriate sizes to improve overall health and to:
 - Improve HbA1C, blood pressure, cholesterol and aid in maintaining weight
 - Focus on weight management in overweight and obesity



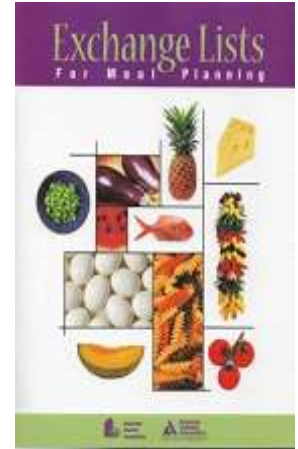
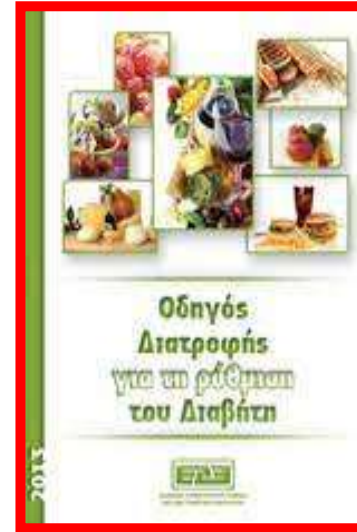
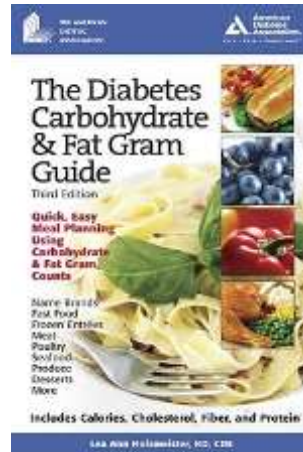
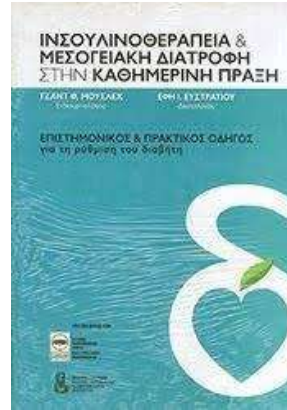
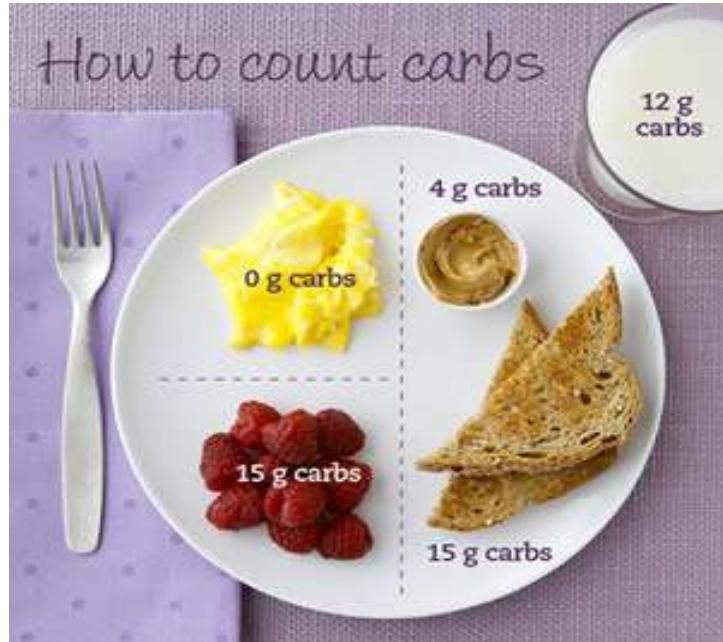
Goals of nutrition therapy for type 1 diabetes

- Individualize nutrition needs based on personal and cultural preferences, health literacy, access to healthful food choices

Goals of nutrition therapy for type 1 diabetes

- Provide practical tools for day-to-day meal planning

Κατάλογοι και apps (ισοδυνάμων) τροφής



Goals of nutrition therapy for type 1 diabetes

- ***Focus on matching insulin doses with meal composition through advanced carbohydrate counting***

14. Children and Adolescents: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S283–S305 | <https://doi.org/10.2337/dc25-S014>

Nutrition Therapy

Recommendations

14.2 Individualized medical nutrition therapy is recommended for youth with type 1 diabetes as an essential component of the overall treatment plan. **A**

14.3 Monitoring carbohydrate intake, whether by carbohydrate counting or experience-based estimation, is a key component to optimizing glycemic management. **B**

14.4 Comprehensive nutrition education at diagnosis, with annual updates, by an experienced registered dietitian nutritionist, is recommended to assess caloric and nutrition intake in relation

to weight status and cardiovascular disease risk factors and to inform macronutrient choices. **E**



Nutrition therapy

- Refer for *individualized medical nutrition therapy (MNT)* provided by a registered dietitian (RD) knowledgeable and skilled in providing diabetes-specific nutritional advice
- MNT delivered by a RD ----
 - associated with a reduction HbA_{1c} of **1.0-1.9% (11-21 mmol/mol)**
 - for sub-optimally managed type 1 diabetes/integrated into an overall management program
- **No one eating pattern recommended** for people with type 1 diabetes
 - The nutrition approach should be individualized based on personal preferences, socioeconomic status, cultural backgrounds and comorbidities.
 - Carbohydrate counting
 - Insulin-to-carbohydrate ratios to adjust mealtime dosing for improved glycaemic outcomes

The management of type 1 diabetes in adults. The updated 2026 consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

3. Nutrition, Education, and Psychosocial Care

Nutrition therapy should be individualized.

- Low-carb or very-low-carb patterns can be safe *if* combined with balanced nutrition and close monitoring.
- The report warns that **ketogenic diets** can blunt glucagon responses and raise DKA risk, especially in insulin deficiency.

Carbohydrate counting remains the standard teaching method, though **carbohydrate consistency** can be an acceptable alternative.

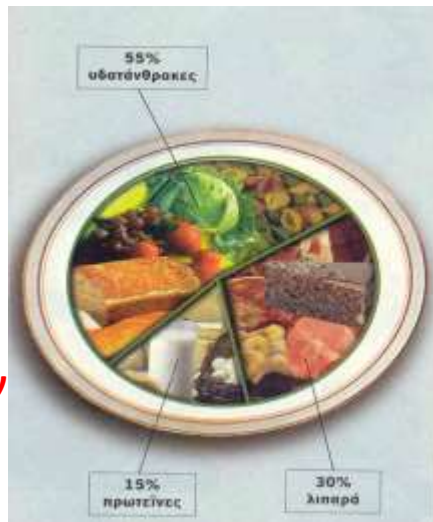
DSMES (Diabetes Self-Management Education and Support) is emphasized as an *ongoing process* — at diagnosis, annually, and whenever life circumstances change.

Clinicians are encouraged to screen routinely for:

- Diabetes distress
- Depression and eating disorders
- Social determinants of health

Διαιτητικές συστάσεις για τα άτομα με ΣΔ μετά το 2014

- Τα στοιχεία πλέον δείχνουν ότι **δεν υπάρχει ιδανικό ποσοστό των θερμίδων** από υδατάνθρακες, πρωτεΐνες και λίπος για όλα τα άτομα με διαβήτη
- Η **κατανομή των μακροθρεπτικών συστατικών** πρέπει να καθορίζεται με βάση την **εξατομικευμένη αξιολόγηση** των διατροφικών συνηθειών, των προτιμήσεων, του είδους της αγωγής και των μεταβολικών στόχων.



A guide to the distribution of macronutrients

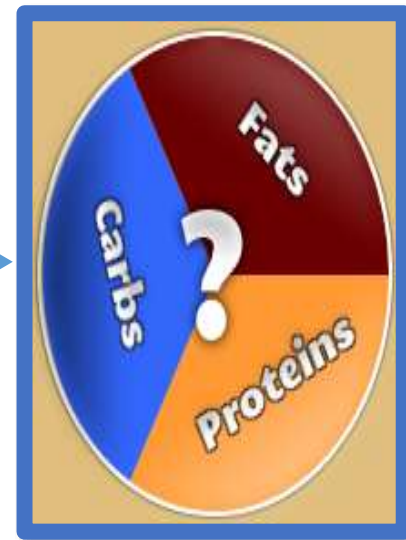
Carbohydrate 45% to 55% energy

Moderate sucrose intake (up to 10% total energy)

Fat 30% to 35% energy

<10% saturated fat + trans fatty acids

Protein 15% to 20% energy



Nutrition therapy

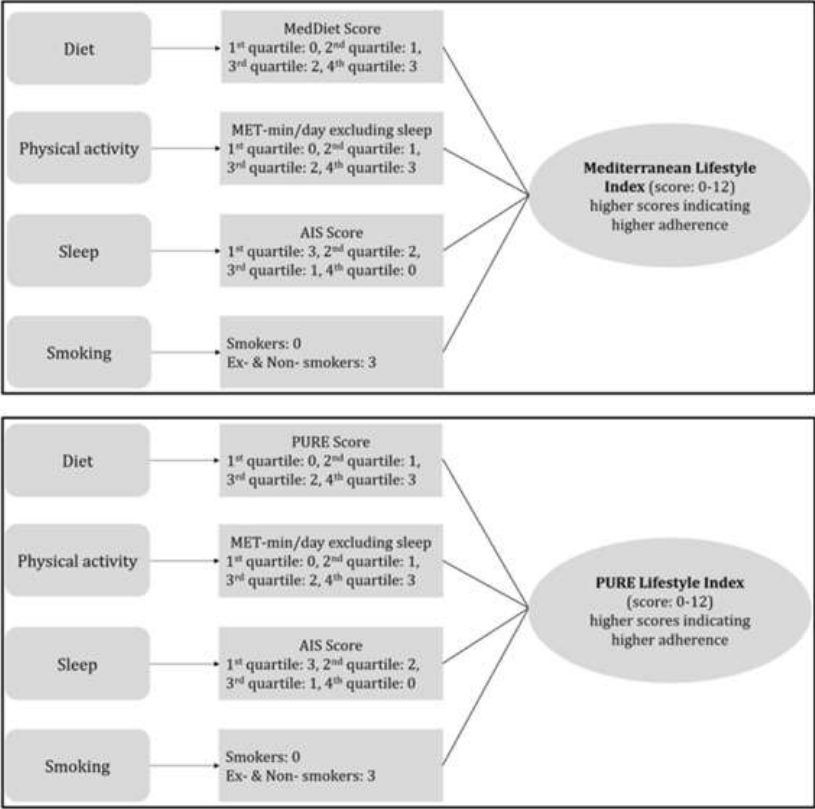
- Low-carbohydrate/very-low carbohydrate eating patterns
 - Have been found to reduce HbA_{1c} levels in the *short-term*
 - IF an individual wishes to utilize, it is important to incorporate **in conjunction with healthy eating guidelines.**

The management of type 1 diabetes in adults. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

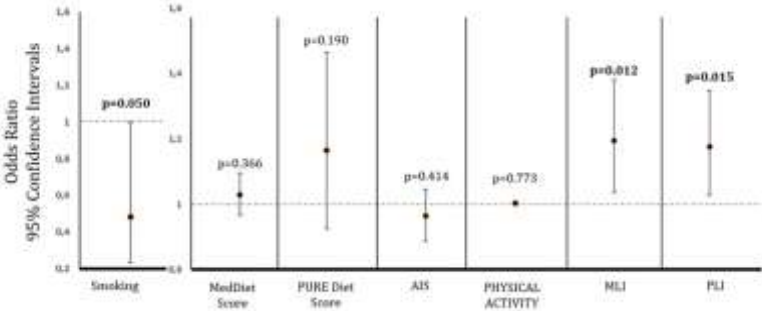
Richard I. G. Holt^{1,2} • J. Hans DeVries^{3,4} • Amy Hess-Fischl⁵ • Irl B. Hirsch⁶ • M. Sue Kirkman⁷ • Tomasz Klupa⁸ • Barbara Ludwig⁹ • Kirsten Nørgaard^{10,11} • Jeremy Pettus¹² • Eric Renard^{13,14} • Jay S. Skyler¹⁵ • Frank J. Snoek¹⁶ • Ruth S. Weinstock¹⁷ • Anne L. Peters¹⁸

Exploring the effect of adhering to a healthy lifestyle pattern on glycemic control in adults with type 1 diabetes mellitus

Melina Karipidou^{a,*}, Stavros Liatis^b, Athanasia Kyrkili^a, Alexandra Skoufi^a, Vaia Lambadiari^c, Stelios Tigas^d, Evangelos Liberopoulos^b, Meropi D. Kontogianni^{a,*}



Dietary, physical activity and sleep habits were evaluated using validated questionnaires. Diet quality was assessed with two scores (MedDietScore and PURE Diet Score) and two healthy lifestyle indices (HLI) were constructed (MLI based on MedDietScore and PLI based on PURE score).



Conclusion: Our results suggest that adherence to a healthy lifestyle, more so than single lifestyle parameters, is associated with better GC in PwT1D.

Fig. 1. Healthy Lifestyle Indices construction.

Ο κανόνας των 500

Ο κανόνας των 500

- Ινσουλίνη:Αναλογία υδατανθράκων = 450 ή $500 \div$ συνολική ημερήσια δόση ινσουλίνης (TDD)

παράδειγμα

- TDD = 36 μονάδες
- τα επίπεδα γλυκόζης είναι μέσα στους επιθυμητούς στόχους
- Ινσουλίνη:Αναλογία υδατανθράκων = $500 \div 36 = 13.8$ (περίπου 14)
➡ αναλογία = **1:14**

Συντελεστής ινσουλينو-ευαισθησίας (ISF)

Μέθοδος με το συντελεστή ινσουλينو-ευαισθησίας (ISF)¹

- $ISF = 1500 \text{ or } 1800 \div TDD$
- Ινσουλίνη:Αναλογία υδατανθράκων = $ISF \times 0.33$

παράδειγμα

- $TDD = 25 \text{ units}$
- $ISF = 1800 \div 25 = 72 \text{ mg/dl}$
- Ινσουλίνη:Αναλογία υδατανθράκων = $72 \times 0.33 = 23.8$ (round up to 24)
Ratio = 1:24

Υπολογισμός Προγευματικής Ινσουλίνης

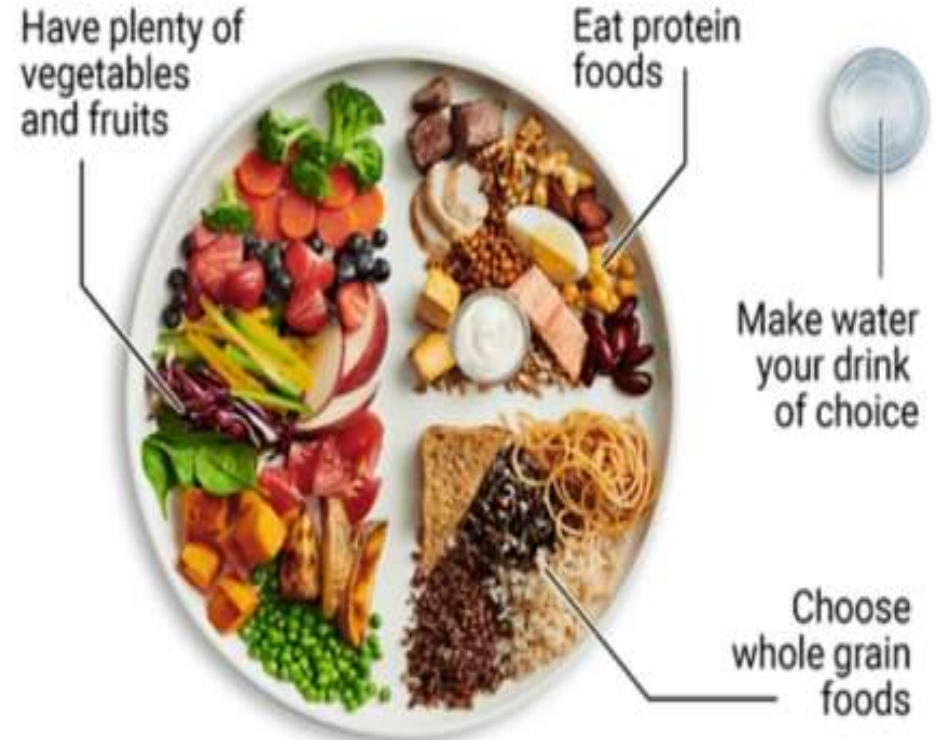
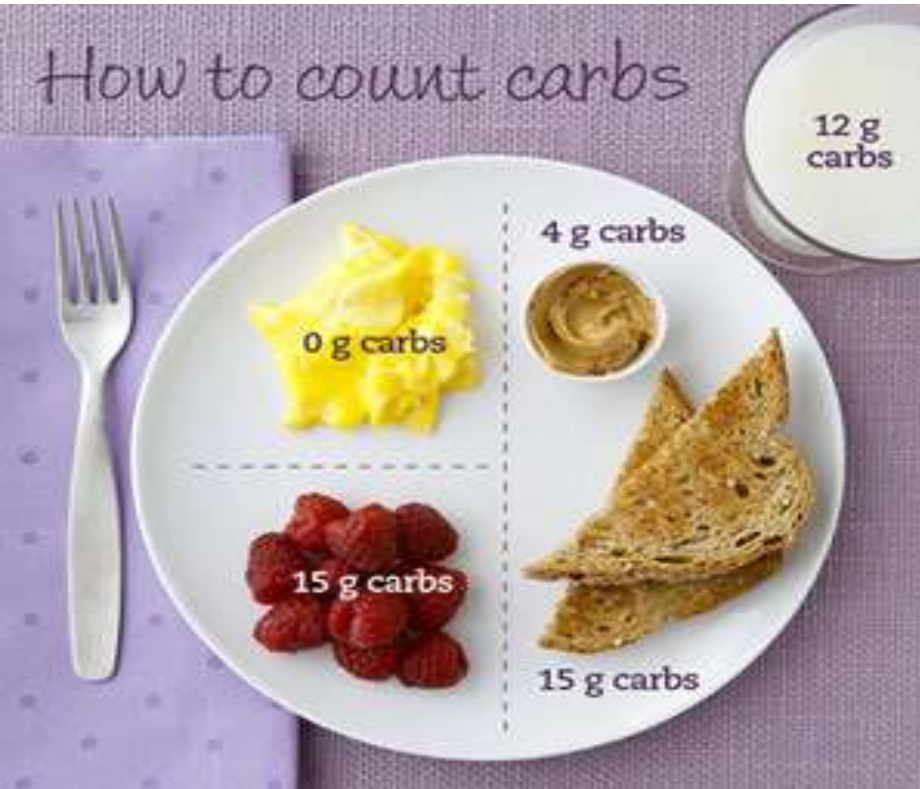
Table 5.1—Medical nutrition therapy recommendations	
Topic	Recommendation
Effectiveness of nutrition therapy	5.9 An individualized medical nutrition therapy program as needed to achieve treatment goals, provided by a registered dietitian nutritionist (RD/RDN), preferably one who has comprehensive knowledge and experience in diabetes care, is recommended for all people with type 1 or type 2 diabetes, prediabetes, and gestational diabetes mellitus. A 5.10 Because diabetes medical nutrition therapy can result in cost savings B and improved outcomes (e.g., A1C reduction, reduced weight, decrease in cholesterol) A, medical nutrition therapy should be adequately reimbursed by insurance and other payers. E
Energy balance	5.11 For all patients with overweight or obesity, behavioral modification to achieve and maintain a minimum weight loss of 5% is recommended. A
Eating patterns and macronutrient distribution	5.12 There is no ideal macronutrient pattern for people with diabetes; meal plans should be individualized while keeping total calorie and metabolic goals in mind. E 5.13 A variety of eating patterns can be considered for the management of type 2 diabetes and to prevent diabetes in individuals with prediabetes. B 5.14 Reducing overall carbohydrate intake for individuals with diabetes has demonstrated the most evidence for improving glycemia and may be applied in a variety of eating patterns that meet individual needs and preferences. B
Carbohydrates	5.15 Carbohydrate intake should emphasize nutrient-dense carbohydrate sources that are high in fiber (at least 14 g fiber per 1,000 kcal) and minimally processed. Eating plans should emphasize nonstarchy vegetables, fruits, and whole grains, as well as dairy products, with minimal added sugars. B 5.16 People with diabetes and those at risk are advised to replace sugar-sweetened beverages (including fruit juices) with water as much as possible in order to control glycemia and weight and reduce their risk for cardiovascular disease and fatty liver B and should minimize the consumption of foods with added sugar that have the capacity to displace healthier, more nutrient-dense food choices. A 5.17 When using a flexible insulin therapy program, education on the glycemic impact of carbohydrate A, fat, and protein B should be tailored to an individual's needs and preferences and used to optimize mealtime insulin dosing. 5.18 When using fixed insulin doses, individuals should be provided education about consistent pattern of carbohydrate intake with respect to time and amount, while considering the insulin action time, as it can result in improved glycemia and reduce the risk for hypoglycemia. B

Στα άτομα με ΣΔ και εντατικοποιημένο σχήμα ινσουλινοθεραπείας αλλά και στη θεραπεία με αντλία είναι απαραίτητη η εκπαίδευση στη μέτρηση των υδατανθράκων

(Α) καθώς και στον υπολογισμό των πρωτεϊνών και λιπιδίων

(Β) αλλά και τον υπολογισμό της προγευματικής δόσης ινσουλίνης.

Χρήση ισοδυνάμων τροφής



Ισοδύναμα τροφίμων

Groups/Lists	CHO	Protein	Fat	Calories
ΑΜΥΛΟΥΧΑ-ΟΜΑΔΑ ΨΩΜΙΟΥ	15	3	≤1	80
ΦΡΟΥΤΑ	15	0	0	60
ΓΑΛΑ ΚΑΙ ΠΡΟΙΟΝΤΑ ΤΟΥ	12	8	0-3	90
ΑΠΑΧΟ	12	8	5	120
ΗΜΙΠΑΧΟ	12	8	8	150
ΠΛΗΡΕΣ				
ΑΛΛΟΙ ΥΔΑΤΑΝΘΡΑΚΕΣ	12	varies	varies	varies
ΛΑΧΑΝΙΚΑ	5	2	0	25
ΚΡΕΑΣ ΚΑΙ ΥΠΟΚΑΤΑΣΤΑΤΑ				
πολύ άπαχο	0	7	0-1	35
άπαχο	0	7	3	55
μετρίου λίπους	0	7	5	75
υψηλού λίπους	0	7	8	100
ΟΜΑΔΑ ΛΙΠΟΥΣ	0	0	5	45

Ανανάς 3/4 φλιτζ 	αχλάδι 1 μικρό 110 γρ 	βερίκοκα 4 ολόκληρα 150 γρ 	γκρέιπ φρούτ ½ μεγάλο 330 γρ 	δαμάσκηνα 2 μέτρια 140 γρ 
καρπούζι 1 φέτα 380 γρ 	κεράσια 12 μεγάλα 85 γρ 	μανταρίνι 2 μικρά 220 γρ 	μήλο 1 μικρό 120 γρ 	μπανάνα ½ μεγάλη ή 1 μικρή 120 γρ 
νεκταρίνι 1 μέτριο 140 γρ 	πεπόνι 3/4 φλιτζ. 280 γρ 	πορτοκάλι 1 μικρό 180 γρ 	ροδάκινο 1 μέτριο 110 γρ 	σταφύλια 17 ρόγες μικρές 85 γρ 
φράουλες 10 μικρές ή 1 φλιτζ 	Χυμός μήλου ½ φλιτζ 	Χυμός πορτοκαλιού ½ φλιτζ. 	Σταφίδες 1κουτ σούπας 	Ξερά βερύκοκα 8 κομμάτια 

½ φλιτζάνι ντομάτα 	1 φλιτζάνι μανιτάρια 	1 φλιτζάνι μαρούλι 	½ φλιτζάνι μπρόκολο 	1 φλιτζάνι καρότα 
½ φλιτζάνι κουνουπίδι 	½ φλιτζάνι κολοκυθάκια 	½ φλιτζάνι πατζάρια 	½ φλιτζάνι μπάμιες 	½ φλιτζάνι μελιτζάνα 
½ φλιτζάνιο ραπανάκια 	½ φλιτζάνι πράσα 	1 φλιτζάνι λάχανο 	½ φλιτζάνι σπαράγγια 	½ φλιτζάνι σπανάκι 

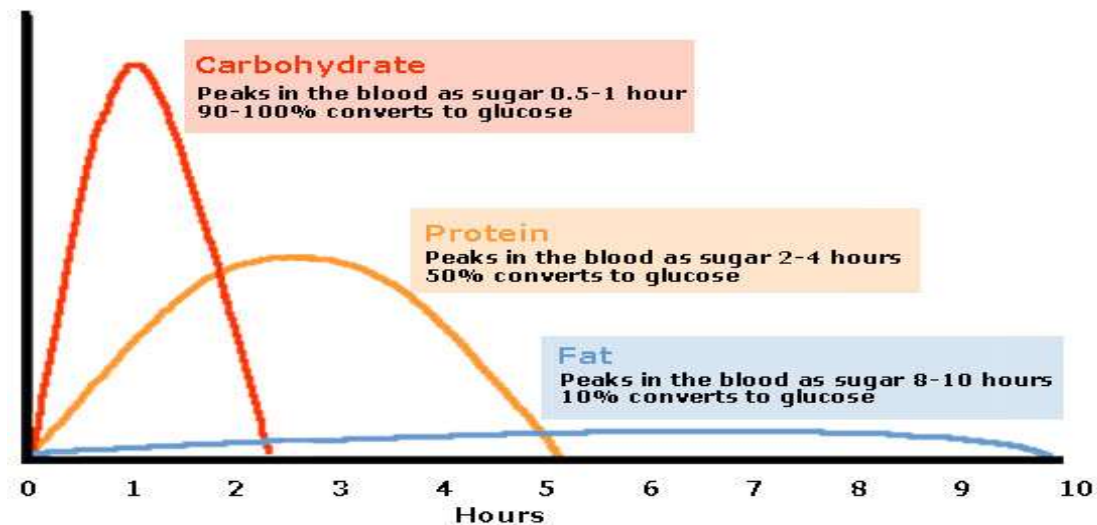
κουλούρι Θεσ/νίκης 1/2 	κριτσίνια 2 	1/2 φλιτζ. Κουκιά 	μπισκότα τύπου cream crackers 2 	φρυγανιές (μικρές) 2 τεμάχια 
ψωμί σίκαλης 1 φέτα (30 γρ) 	ψωμάκια τύπου χάμπουργκερ 1/2 (30 γρ.) 	Αλεύρι 3 κ.σ. 	βρώμη 1/2 φλιτζ., 	Κορν Φλέικς 1/2 φλιτζ 
μακαρόνια- κριθάρaki-χυλοπίττες 1/3 φλιτζ.(μαγειρ.) 	μούσλι 1/4 φλιτζ 	ρύζι (μαγειρεμένο) άσπρο ή καστανό 1/3 φλιτζ. 	Μπάρα Δημητριακών 1 τεμάχιο (απλή) 	ρεβίθια, φασόλια, Φακές 1/2 φλιτζ. 
Αρακάς (μαγειρεμένος) 1/2 φλιτζ 	καλαμπόκι βραστό 1/2 φλιτζ 	κάστανα 4 μεγάλα 	πατάτες ψητές 1 μικρή μεγέθους αβγού (85 γρ) 	Μπισκότα digestive χωρίς ζάχαρη 2 
πατάτες πουρέ 1/2 φλιτζ 	φασολάκια (πράσινα με καρπό μαγειρεμένα) 1/2 φλιτζ. 	Σούπα ντομάτα με ρύζι 1 φλιτζάνι 	Βάφλα 85 γρ 	Αραβική πίτα 1/2 
Πίτα για σουβλάκι 1/2 	Κρέπα 1/2 	Μπισκότα πτιμπερ 2 	Σούπα κοτόπουλο ή φαρόσουπα με ρύζι 1 φλιτζάνι 	Παξιμαδάκια κρίσιπς 2 τεμάχια 

ΙΣΟΔΥΝΑΜΑ ΥΔΑΤΑΝΘΡΑΚΩΝ ΣΕ ΕΝΤΑΤΙΚΟΠΟΙΗΜΕΝΟ ΣΧΗΜΑ ΙΝΣΟΥΛΙΝΗΣ

ΔΕΝ ΠΡΕΠΕΙ ΝΑ ΞΕΧΝΑΜΕ ΠΟΤΕ: 1 ισοδύναμο υδατάνθρακα = 15 γρ υδατανθράκων

	<u>ΠΟΣΟΤΗΤΑ/ΜΕΡΙΔΑ</u>	<u>ΥΔΑΤΑΝΘΡΑΚΕΣ (γρ)</u>
<u>ΟΜΑΔΑ ΔΗΜΗΤΡΙΑΚΩΝ- ΑΜΥΛΟΥΧΩΝ ΛΑΧΑΝΙΚΩΝ</u>		
Ψωμί λευκό	30 γρ	15 (1 ισοδύναμο)
Ψωμί ολικής αλέσεως	30 γρ	15 (1 ισοδύναμο)
Ψωμί του τοστ	1 φέτα	15 (1 ισοδύναμο)
Ψωμί τύπου χάμπουργκερ	½ (30γρ)	15 (1 ισοδύναμο)
Φρυγανιές λευκές	2 τεμ.	15 (1 ισοδύναμο)
Φρυγανιές ολικής αλέσεως	2 τεμ	15 (1 ισοδύναμο)
Κουλούρι Θεσ/νίκης	½ τεμ	15 (1 ισοδύναμο)
Κράκερς (cream crackers)	2 τεμ	15 (1 ισοδύναμο)
Πίτα	½ τεμ	15 (1 ισοδύναμο)
Παξιμάδια	2 μικρά	15 (1 ισοδύναμο)
Αλεύρι	3 κ.σ	15 (1 ισοδύναμο)
Δημητριακά άσπρα	½ φλυτζ.	15 (1 ισοδύναμο)
Ρύζι μαγειρευμένο	50 γρ	15 (1 ισοδύναμο)
Όσπρια μαγειρευμένα (στραγγισμένα)	90 γρ	15 (1 ισοδύναμο)
Ζυμαρικά μαγειρευμένα	50 γρ	15 (1 ισοδύναμο)
Πατάτες	75 γρ	15 (1 ισοδύναμο)
Αρακάς μαγειρευμένος	80 γρ	15 (1 ισοδύναμο)
Καλαμπόκι βραστό	65γρ	15 (1 ισοδύναμο)
Κάστανα	4 μεγάλα, 6 μικρά	15 (1 ισοδύναμο)

- Σημαντικότερη παράμετρος είναι **η συνολική ενεργειακή πρόσληψη** και όχι η πηγή της ενέργειας.
- Οι υδατάνθρακες είναι το κύριο θρεπτικό συστατικό που επηρεάζει την μεταγευματική γλυκόζη του αίματος.
- Ωστόσο, επειδή **και τα τρία θρεπτικά συστατικά** απαιτούν ινσουλίνη για τον μεταβολισμό τους και επηρεάζουν την επιτυχία των στόχων, θα πρέπει να λαμβάνονται υπόψη μέσα στο πλαίσιο της ισορροπημένης διατροφής.



Standards of Medical Care in Diabetes—2017:

Summary of Revisions

Diabetes Care 2017;40(Suppl. 1):S4–S5 | DOI: 10.2337/dc17-S003

Το 2017, για πρώτη φορά, στις επίσημες συστάσεις τις αμερικανικής διαβητολογικής εταιρείας, αναφέρεται πως στα άτομα με ΣΔ, που ακολουθούν εντατικοποιημένο σχήμα ινσουλινοθεραπείας, είναι απαραίτητη η εκπαίδευση στην μέτρηση των υδατανθράκων και σε μερικές περιπτώσεις και ο υπολογισμός των πρωτεϊνών και του λίπους (ADA,2017:40 (Suppl 1)

Για πρώτη φορά αναφέρεται και
ο Υπολογισμός ΚΑΙ λίπους-
πρωτεΐνης

The recommendation for nutrition therapy in people prescribed flexible insulin therapy was updated to include fat and protein counting in addition to carbohydrate counting for some patients to reflect evidence that these dietary factors influence insulin dosing and blood glucose levels.



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

<https://doi.org/10.2337/dci19-0014>

- When consuming a mixed meal that contains carbohydrate and is high in fat and/or protein, insulin dosing should not be based solely on carbohydrate counting. A cautious approach to increasing mealtime insulin doses is suggested; continuous glucose monitoring (CGM) or self-monitoring of blood glucose (SMBG) should guide decision-making for administration of additional insulin.

5. Facilitating Positive Health Behaviors and Well-being to Improve Health Outcomes: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S86–S127 | <https://doi.org/10.2337/dc25-S005>

5.17 When using a flexible insulin therapy program, education on the glycemic impact of carbohydrate A, fat, and protein B should be tailored to an individual's needs and preferences and used to optimize mealtime insulin dosing.

Υπολογισμός Προγευματικής Ινσουλίνης

Received: 27 June 2018 | Accepted: 16 July 2018
DOI: 10.1111/jpedi.12758

ISPAD CLINICAL PRACTICE CONSENSUS GUIDELINES

WILEY

ISPAD Clinical Practice Consensus Guidelines 2018: Nutritional management in children and adolescents with diabetes

Carmel E. Smart^{1,2} | Francesca Annan³ | Laurie A. Higgins⁴ | Elisabeth Jellery⁵ |
Mercedes Lopez⁶ | Carlo L. Acerini⁷



Το διαιτητικό λίπος και η πρωτεΐνη επηρεάζουν την γλυκαιμία. Αλλαγές στη δόση της ινσουλίνης και στον τρόπο χορήγησης είναι **απαραίτητες**.

Αύξηση της αρχικής δόσης ινσουλίνης κατά 15-20% για γεύματα πλούσια σε λίπος & πρωτεΐνη.

Κατευθυντήριες Οδηγίες για τη διαχείριση του ατόμου με ΣΔ ΕΔΕ



Διατροφικές οδηγίες για άτομα με ΣΔ και ινσουλινοθεραπεία:

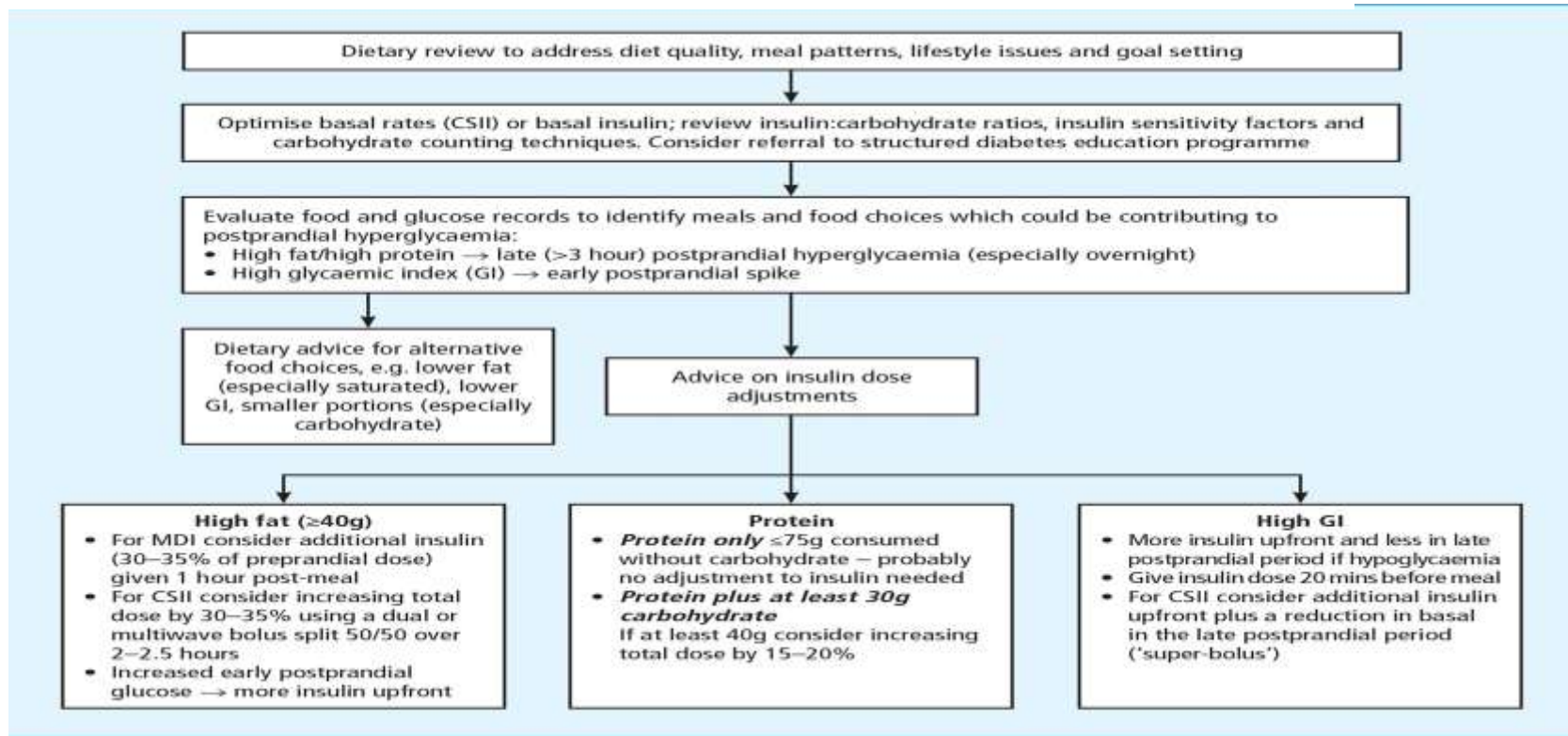
- Στα άτομα με ΣΔ και εντατικοποιημένο σχήμα ινσουλινοθεραπείας ή χρήση αντλίας συστήνεται η εκπαίδευση στη μέτρηση των υδατανθράκων –και σε κάποιες περιπτώσεις **και η μέτρηση των πρωτεϊνών και λιπιδίων της τροφής– για τη βελτίωση του γλυκαιμικού ελέγχου**

**The management of type 1 diabetes in adults. A consensus report
by the American Diabetes Association (ADA) and the European
Association for the Study of Diabetes (EASD)**

Richard I. G. Holt^{1,2} • J. Hans DeVries^{3,4} • Amy Hess-Fischl⁵ • Irl B. Hirsch⁶ • M. Sue Kirkman⁷ • Tomasz Klupa⁸ •
Barbara Ludwig⁹ • Kirsten Nørgaard^{10,11} • Jeremy Pettus¹² • Eric Renard^{13,14} • Jay S. Skyler¹⁵ • Frank J. Snoek¹⁶ •
Ruth S. Weinstock¹⁷ • Anne L. Peters¹⁸

- High fat and/or high protein, may contribute to delayed hyperglycemia and the need for insulin dose adjustments.
 - Highly variable between individuals
 - Postprandial glucose measurements for up to three or more hours may be needed to determine initial dose adjustments

Fat and protein counting in type 1 diabetes



Getting Started Counting Carbs for Diabetes



Read nutrition labels



Measure serving sizes



Keep a food diary



Meet with a registered dietitian

7. Diabetes Technology: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S146–S166 | <https://doi.org/10.2337/dc25-S007>

Table 7.3—Continuous glucose monitoring (CGM) devices

Type of CGM	Description
Real-time CGM (rtCGM)	CGM systems that measure and display glucose levels continuously
Intermittently scanned CGM (isCGM)	CGM systems that measure glucose levels continuously but only display glucose values when swiped by a reader or a smartphone
Professional CGM	CGM devices that are placed on the patient in the provider's office (or with remote instruction) and worn for a discrete period of time (generally 7–14 days). Data may be blinded or visible to the person wearing the device. The data are used to assess glycemic patterns and trends. These devices are not fully owned by the patient—they are a clinic-based device, as opposed to the patient-owned rtCGM/isCGM devices.



Recommendation

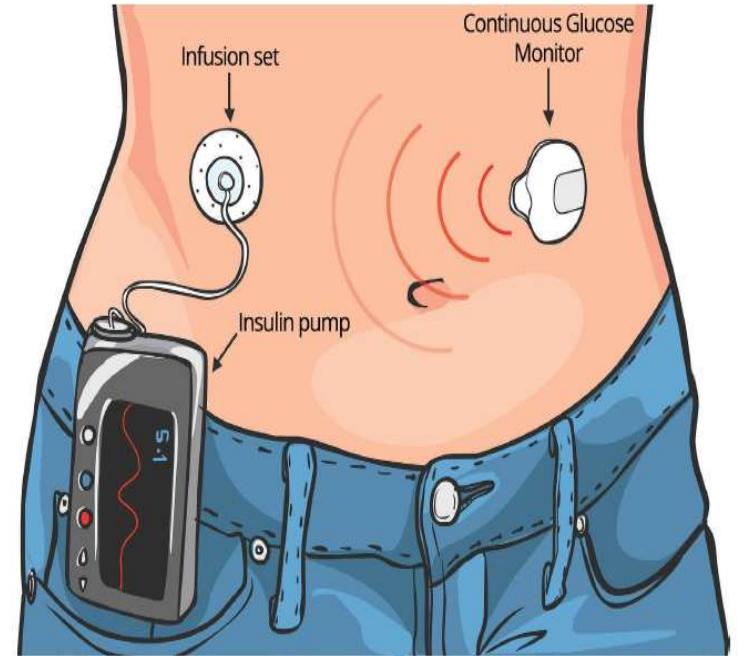
7.1 Use of technology should be individualized based on a patient's needs, desires, skill level, and availability of devices. E

Technology is rapidly changing, but there is no “one-size-fits-all” approach to technology use in people with diabetes. Insurance coverage can lag behind device availability, patient interest in devices and willingness to change can vary, and providers may have trouble keeping up with newly released technology. Not-for-profit websites can help providers and patients make decisions as to the initial choice of devices. Other sources, including health care providers and device manufacturers, can help people troubleshoot when difficulties arise.





Insulin Pumps



Benedict developed a **copper reagent** for urine glucose. 1908



1921

Frederick Banting and Charles H. Best discovered the **hormone insulin** in pancreatic extracts of dogs.

1963



The first insulin pump was developed by Dr. Arnold Kadish. It delivered both **glucagon and insulin** (only available for clinical use).

1976

PUMP



Dean Kamen formed a company called "AutoSyringe" to market the product, which he sold to Baxter Health Care in 1981. The pump known as the **Big Blue Brick** was marketed in 1978.



First commercial closed-loop bedside device in 1974-1976, the Biostator created by Miles Laboratories (about \$55,000 in 1982). The patient was confined to a bed or a chair, the machine checked glucose levels and needed constant supervision to recalibrate the glucose (also delivered insulin). **This was the first closed-loop system!**

C.G.M?



1983



First commercial insulin pump MiniMed 502.

Moore's Law in Diabetes Technology



Past and Present of CSII

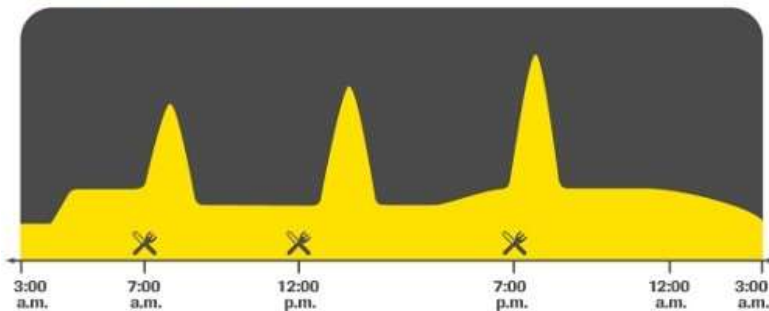


Vs

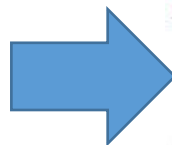


Τρόπος δράσης Ινσουλινών=Εντατικοποιημένο σχήμα

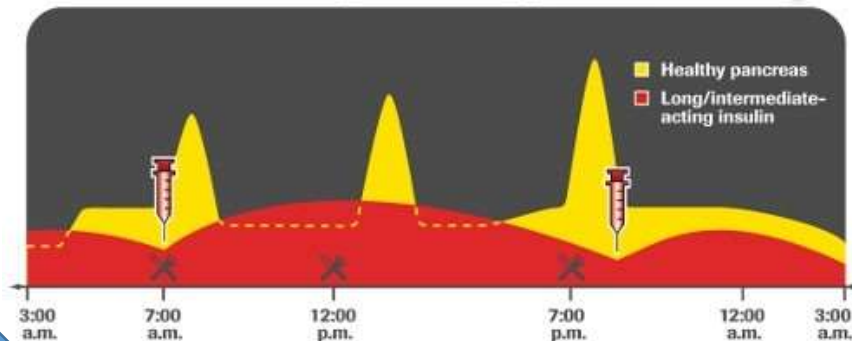
Healthy pancreas



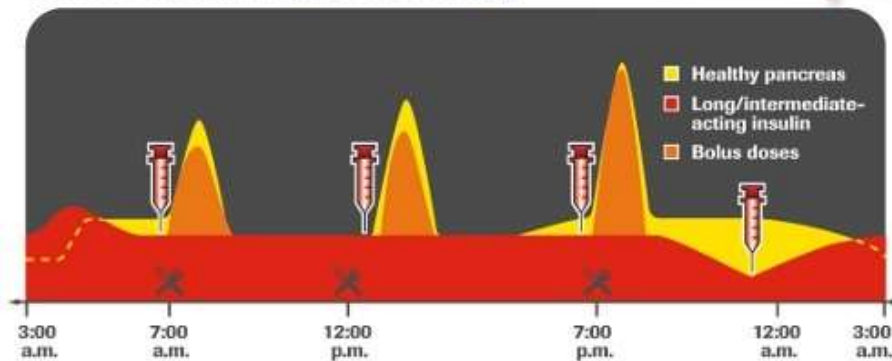
Healthy pancreas delivers small doses of insulin throughout the day and extra insulin for meals and snacks



Conventional insulin injection therapy



Intensive insulin injection therapy



Καθορίζοντας τη βασική δόση

Pre-Pump Dose

Συνολική ημερήσια ποσότητα

(~70-75% of prior insulin regimen TDD)

~50%
Βασική*

~50%
Bolus*

***Range: 40 to 60%**

Usually divided into 3 premeal doses
(depending on number and size of meals)



Η διατροφική εκπαίδευση/αξιολόγηση προσαρμόζεται στον τύπο θεραπείας του ασθενούς

Ασθενής με CSII με CGM/FMG or SAP



Ασθενής με ΑΗCL



ΧΡΗΣΙΜΗ Η ΒΟΗΘΕΙΑ ΑΠΟ ΕΞΕΙΔΙΚΕΥΜΕΝΟ ΔΙΑΙΤΟΛΟΓΟ ΓΙΑ ΤΗΝ ΘΕΡΑΠΕΙΑ ΜΕ ΑΝΤΛΙΑ

- Διατροφική εκπαίδευση
- Εκπαίδευση στην καταμέτρηση υδατανθράκων
- Επιλογή κατάλληλου μοτίβου γλυκαιμίας
- Τροποποίηση διατροφικής συμπεριφοράς
- Εντοπισμός λανθασμένων πρακτικών στη διαχείριση του ΣΔ
- Ανάδειξη αλλαγών στη θεραπεία

Οι αντλίες χορήγησης ινσουλίνης χρησιμοποιούν **ταχείας δράσης ανάλογο ινσουλίνης**.

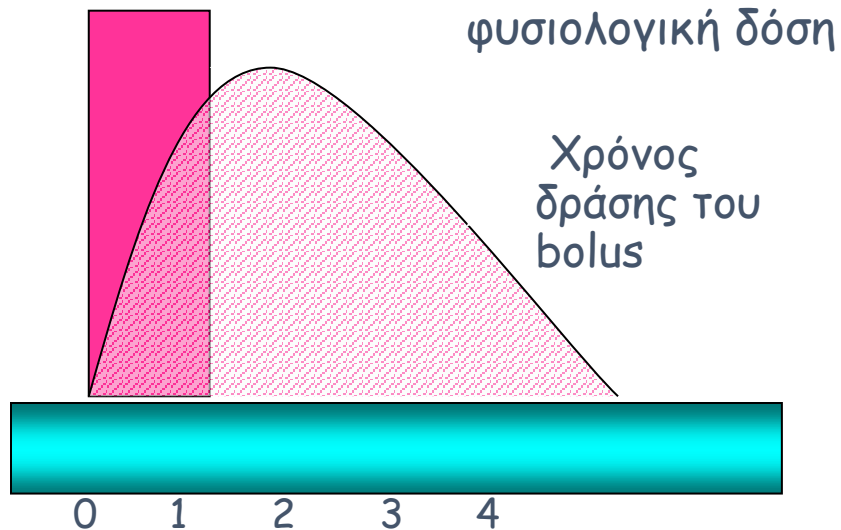
Η αντλία χορηγεί μικρο-δόσεις ταχείας δράσης ινσουλίνης ανά λίγα λεπτά κάθε μισή/1 ώρα.

Food bolus:

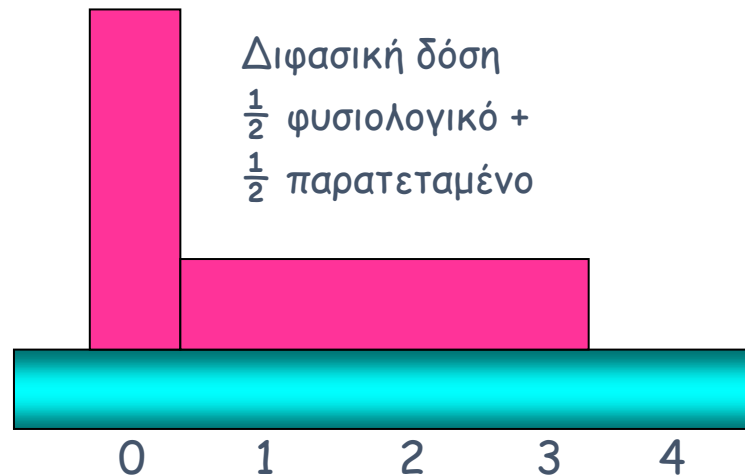
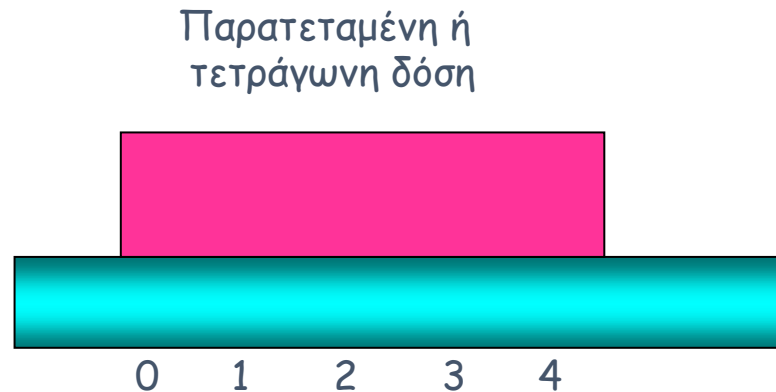
Ινσουλίνη που χορηγείται για να καλύψει την αύξηση των επιπέδων γλυκόζης που εμφανίζεται μετά από την κατανάλωση τροφών που περιέχουν υδατάνθρακες.

Correction bolus:

- Ινσουλίνη που χορηγείται για τη διόρθωση των επιπέδων γλυκόζης BG που είναι εκτός του εύρους στόχου.



Στις περιπτώσεις της αντλίας
υπάρχουν **3** τρόποι δράσεις:



Review

A Nutritional Approach to Optimizing Pump Therapy in Type 1 Diabetes Mellitus

Evdoxia Gitsi ¹, Sarantis Livadas ², Nicholas Angelopoulos ³, Rodis D. Paparodis ⁴, Marina Raftopoulou ¹ and Georgia Argyrakopoulou ^{1,*}

Nutrients 2023, 15, 4897. <https://doi.org/10.3390/nu15234897>

Table 2. Nutritional recommendations for patients with T1DM on pump therapy during fasting.

Study (Year)	Population	Topic	Recommendation
Reiter et al. (2007) [43]	Individuals with T1DM on MDI and CSII	Before fasting	Consider a 25% reduction in the last pre-meal insulin bolus. Tailor modifications to the individual, with a reduction range of 25% to 75%. The latter may be more appropriate for extended fasting periods lasting 25 h.
Karamat et al. (2010) [39]	Individuals with DM (type 1 and 2)		Incorporate sources of complex CHO into the meals.

Table 2. *Cont.*

Study (Year)	Population	Topic	Recommendation
IDF–DaR (2022) [48]	Individuals with T1DM	During fasting	Consider a 20–40% reduction in the basal insulin rate during the final 4–5 h before fasting break.
IDF–DaR (2022) [48]	Individuals with T1DM		Consider a 10–30% increase in the basal insulin rate for the initial hours after the fasting break.
Reiter et al. (2007) [43]	Individuals with T1DM on MDI and CSII	After fasting	Consider a reduction in the ICR for the initial post-fasting meal due to increased insulin sensitivity.
Karamat et al. (2010) [39]	Individuals with DM (type 1 and 2)		Consider options from low to higher GI. Encourage the restriction of sources high in both fat and sugar.

A Nutritional Approach to Optimizing Pump Therapy in Type 1 Diabetes Mellitus

Evdoxia Gitsi ¹, Sarantis Livadas ², Nicholas Angelopoulos ³ , Rodis D. Paparodis ⁴ , Marina Raftopoulou ¹ and Georgia Argyrakopoulou ^{1,*}

Table 1. Nutritional recommendations for patients with T1DM on pump therapy.

Study (Year)	Population	Meals	Recommendation
Gingras et al. (2018) [24] Wolpert et al. (2013) [23] Bell et al. (2016) [22] Smith et al. (2021) [16] Lopez et al. (2017) [20] Al Balwi et al. (2022) [21]	Individuals with T1DM in CLS Individuals with T1DM in CLS Individuals with T1DM in OLS Children and adolescents with T1DM on CSII Children and adolescents with T1DM on CSII Individuals with T1DM	HFHP	Increase T1D by 25–60% for high-fat (>40 g) and/or high-protein (>25 g) meals. Initiate with a 10–20% ICR increase, gradually raise by 10% if hyperglycemia persists. For HFHP meals, favor a combination bolus, delivering 30–70% of T1D before meals and the remainder over 2–3 h based on individual requirements. High-GI foods alongside a HFHP meal might suggest the need for an elevated upfront dose.
ISPAD (2022) [13]	Children and adolescents with T1DM	Mixed meals	Utilize CGMs for achieving personalized management of mixed meals effectively.
O’Connell et al. (2008) [31]	Young individuals (8–18 y.o.) with T1DM on CSII	Low-GI meals	Consider the use of a combination bolus (50:50 over 2 h).
Lopez et al. (2014) [32]	Children and adults with T1DM on CSII	Moderate-GI meals	Consider implementing an extended/wave bolus initiated 20–30 min prior to eating.
Lupoli et al. (2019) [30]	Individuals with T1DM	High-GI meals	Consider administering insulin 15 min prior to eating.
Bell et al. (2015) [17]	Individuals with T1DM		An alternative strategy for high-GI meals includes a Super Bolus (=50% increase in the initial insulin bolus, followed by reduction in basal rate for the subsequent 2 h).
Bozzetto et al. (2019) [35]	Individuals with T1DM		Consider including a source of MUFAs alongside a high-GI meal for lowering the glycemic response.
ADA (2014) [29]	Individuals with T1DM	CHO rich meals	Aim to swap high-glycemic options with lower glycemic alternatives. In particular, promote the consumption of whole, less refined foods (i.e., legumes, whole grains, fruits, vegetables).
Faber et al. (2018) [37]	Young patients (7–17 y.o.) with T1DM		Discourage the intake of processed products (i.e., sugary drinks, fast food, refined grains). Consider intake of protein and/or fat 15 min prior to a CHO-rich meal for lowering the glycemic response.

Dietary determinants of postprandial blood glucose control in adults with type 1 diabetes on a hybrid closed-loop system

Claudia Vetrani¹ • Ilaria Calabrese¹ • Luisa Cavagnuolo¹ • Daniela Pacella² • Elsa Napolano¹ • Silvia Di Rienzo¹ • Gabriele Riccardi¹ • Angela A. Rivellese¹ • Giovanni Annuzzi¹ • Lutgarda Bozzetto¹

Adults with type 1 diabetes treated with a hybrid closed loop system

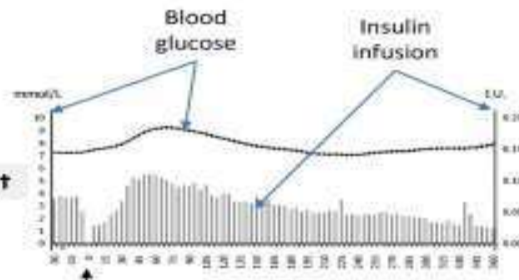


7-day food record

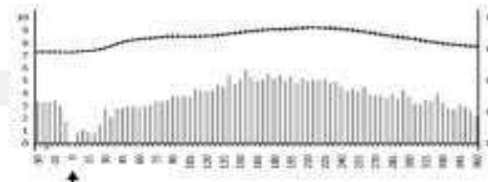


N=1264 meals

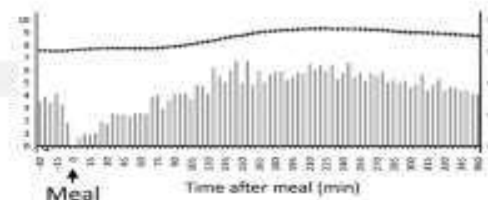
Breakfast



Lunch



Dinner



Meal components associated with postprandial time in range (3.9–10 mmol/L)

Positive predictors
None

Negative predictors
Energy, total protein, MUFA, cholesterol, glycaemic load, carbohydrates, simple sugars

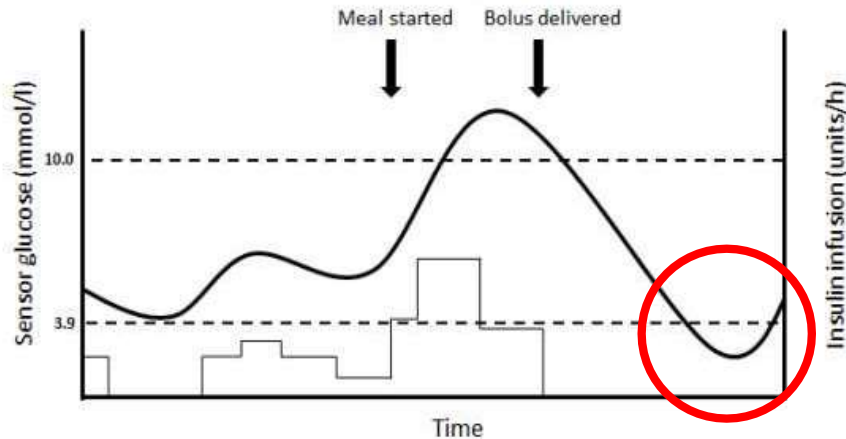
No significant predictors

Positive predictors
Plant proteins

Negative predictors
Glycaemic load, simple sugars, carbohydrates

Insulin Bolus Timing

- Η δήλωση ΥΔΚ πριν το γεύμα είναι ιδιαίτερα σημαντική, καθώς το κλειστό σύστημα θα αυξήσει αυτόματα την παροχή ινσουλίνης μετά από μια αρχική άνοδο των επιπέδων γλυκόζης, οπότε μία δήλωση ΥΔΚ είτε κατά τη διάρκεια είτε μετά την κατανάλωση του γεύματος θα μπορούσε να οδηγήσει σε υπογλυκαιμία.



Δήλωση ΥΔΚ και έναρξη γεύματος

- Τα κλειστά συστήματα απαιτούν τη δήλωση ΥΔΚ 10-20 λεπτά πριν την έναρξη του γεύματος, για τη βελτιστοποίηση της δράσης της ινσουλίνης και της απορρόφησης υδατανθράκων.....

εκτός αν....

- ...προηγήθηκε ή υπάρχει υπογλυκαιμία
- ...το γεύμα είναι υψηλής πρωτεΐνης/λίπους
- ...το άτομο έχει γαστροπάρεση
- ...ακολουθεί επιπρόσθετη θεραπεία

Continuous Glucose Monitoring: The Future of Diabetes Management

[Mark R. Burge](#), MD, [Stephen Mitchell](#), DO, [Alison Sawyer](#), MD and [David S. Schade](#), MD

Continuous glucose monitoring (CGM) technology has the potential to revolutionize diabetes care in the near future because of the *real-time feedback* it provides about therapeutic interventions and variations in lifestyle or dietary intake. *Volume 21, Number 2, 2008*

Continuous glucose monitoring: A review of the evidence in type 1 and 2 diabetes mellitus

Diabetic Medicine. 2021;38:e14528.

Conclusions: Continuous glucose monitoring is revolutionising diabetes management. It is a cost-effective adjunct to diabetes management that has the potential to improve glycaemic outcomes and quality of life in PWD, especially type 1 diabetes.



7. Diabetes Technology: *Standards of Care in Diabetes—2023*

Diabetes Care 2023;46(Suppl. 1):S111–S127 | <https://doi.org/10.2337/dc23-S007>

7.13 Real-time continuous glucose monitoring **B** or intermittently scanned continuous glucose monitoring **E** should be offered for diabetes management in youth with type 1 diabetes on multiple daily injections or continuous subcutaneous insulin infusion who are capable of using the devices safely (either by themselves or with a caregiver). The choice of device should be made based on the individual's circumstances, preferences, and needs.

Type 1

7.14 Real-time continuous glucose monitoring or intermittently scanned continuous glucose monitoring should be offered for diabetes management in youth with type 2 diabetes on multiple daily injections or continuous subcutaneous insulin infusion who are capable of using the devices safely (either by themselves or with a caregiver). The choice of device should be made based on the individual's circumstances, preferences, and needs. **E**

Type 2

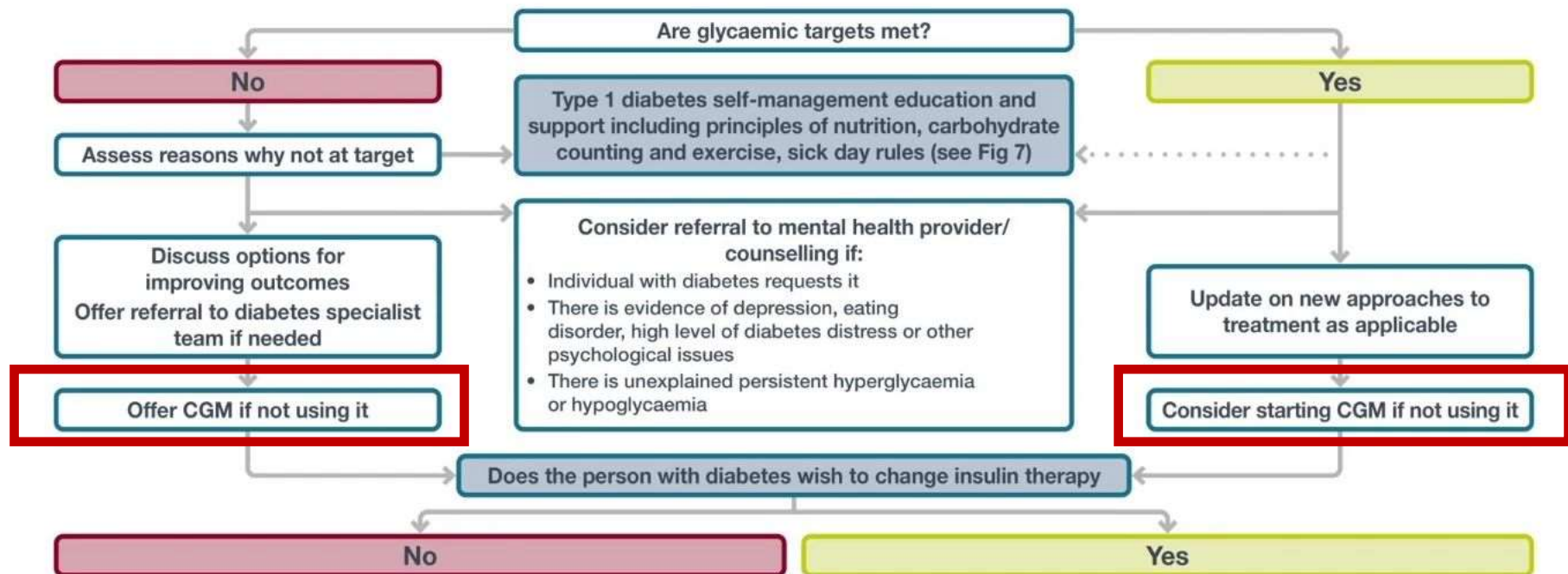


9. Ο έλεγχος της γλυκαιμικής εικόνας από το άτομο με ΣΔ. Αυτοέλεγχος- Συνεχής καταγραφή γλυκόζης

Η χρήση της ΣΚΓ ενδείκνυται σε:

- Εφήβους και παιδιά με ΣΔτ1 που ακολουθούν σχήμα πολλαπλών ενέσεων (εντατικοποιημένο σχήμα ινσουλινοθεραπείας) ή φέρουν αντλία ινσουλίνης ως επιπρόσθετο βοηθητικό εργαλείο στη ρύθμιση του γλυκαιμικού ελέγχου
- Άτομα με ΣΔ με συχνά επεισόδια υπογλυκαιμίας ή ανεπίγνωστη υπογλυκαιμία
- Σε παιδιά και εφήβους με ΣΔτ1, η ΣΚΓ μπορεί να συμβάλλει στην καλύτερη ρύθμιση της γλυκαιμίας είτε χρησιμοποιούν σύστημα πολλαπλών ενέσεων ινσουλίνης είτε χρησιμοποιούν αντλία ινσουλίνης

General principles for management of glycaemia in existing type 1 diabetes in an adult



The management of type 1 diabetes in adults. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

Richard I. G. Holt^{1,2} • J. Hans DeVries^{3,4} • Amy Hess-Fischl⁵ • Irl B. Hirsch⁶ • M. Sue Kirkman⁷ • Tomasz Klupa⁸ • Barbara Ludwig⁹ • Kirsten Nørgaard^{10,11} • Jeremy Pettus¹² • Eric Renard^{13,14} • Jay S. Skyler¹⁵ • Frank J. Snoek¹⁶ • Ruth S. Weinstock¹⁷ • Anne L. Peters¹⁸

- CGM is the standard for glucose monitoring in adults with type 1 diabetes
 - The choice of the device should be based on individual preferences and needs as well as which devices are available or reimbursed.

Transatlantic Comparison of Pediatric Continuous Glucose Monitoring Use in the Diabetes-Patienten-Verlaufsdokumentation Initiative and Type 1 Diabetes Exchange Quality Improvement Collaborative

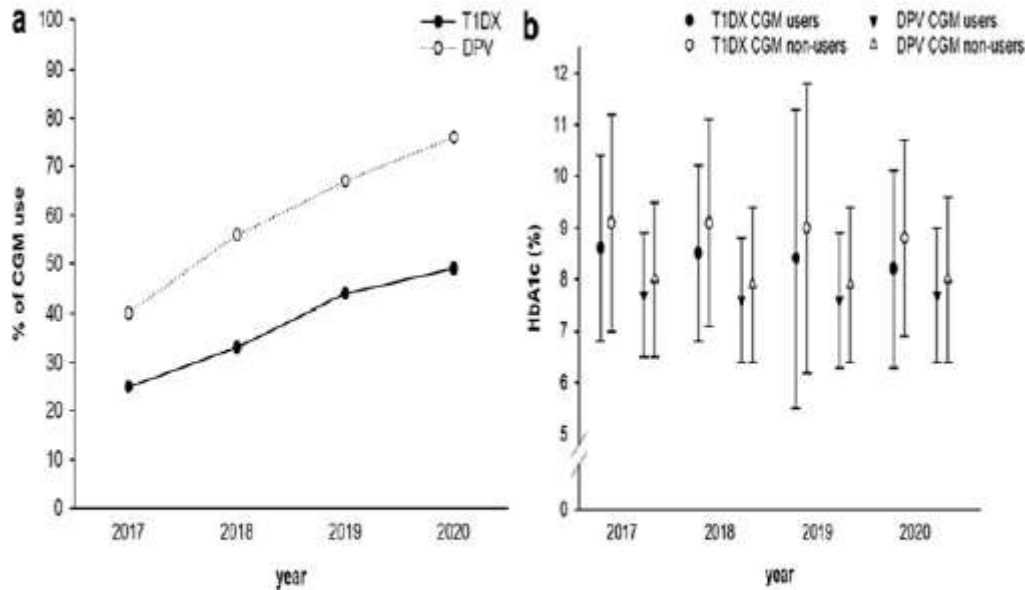


FIG. 1. (a) Proportion of CGM use from 2017 to 2020 among those <25 years of age. (b) HbA1c (%) in CGM users compared with nonusers. CGM, continuous glucose monitoring; HbA1c, hemoglobin A1c.

Use of continuous glucose monitoring (CGM) in children and young adults with type 1 diabetes nearly doubled from 2017 to 2020 in the US from 25% to 49% and was associated with lower glycated hemoglobin (HbA1c), according to recent data.

7. Diabetes Technology: Standards of Care in Diabetes—2025

Diabetes Care 2025;48(Suppl. 1):S146–S166 | <https://doi.org/10.2337/dc25-S007>

- CGM systems have an important role in assessing the efficacy and safety in the treatment of type 1 & type 2 diabetes
- BUT ALSO...
- CGMs improve glycemic management, contribute to the management of hypoglycemia and **better dietary therapy** since they capture the effect of nutrition on postprandial sugar levels



The Management of Type 1 Diabetes in Adults. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD)

- Switching from an isCGM without alarms to an rtCGM improved TIR, HbA1c and reduced Level 3
- Hypoglycaemia : Most people with T1DM can benefit from rtCGM technology with appropriate training, including frequent observation of glucose trends and **formulating a more personalized diet plan that meets their needs while maintaining low glucose levels**



AGP and Nutrition – Analysing postprandial glucose courses with CGM

- Συνιστάται η διατροφή να προσαρμόζεται ατομικά στις προσωπικές συνθήκες, τις προτιμήσεις και τους μεταβολικούς στόχους.
- Στην εποχή της ψηφιοποίησης, οι παρεμβάσεις mHealth όπως τα συστήματα συνεχούς παρακολούθησης γλυκόζης (CGM) βρίσκουν όλο και περισσότερο τον δρόμο τους στη διατροφική θεραπεία.
- Το προφίλ γλυκόζης (AGP), μια δομημένη και γραφική συλλογή των δεδομένων CGM που λαμβάνονται, μπορεί επίσης να χρησιμοποιηθεί για την υποστήριξη της διατροφικής προσαρμογής.

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

Selective blood glucose (BG) measurements have already showed **the influence of food on postprandial glucose (PPG) levels.**

Currently, glucose monitoring systems **are becoming more and more common** providing insights into glucose curves after eating meals.

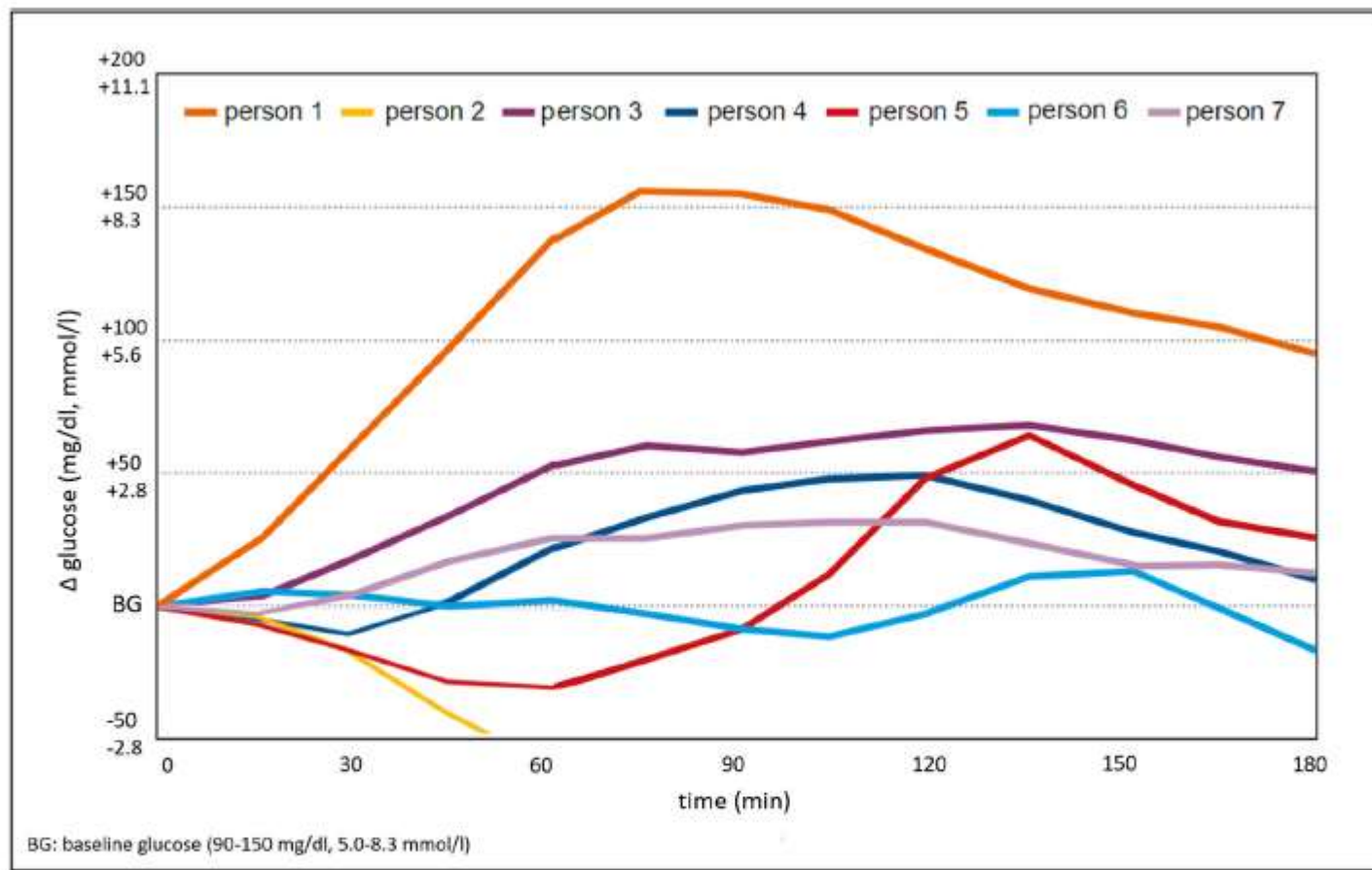


Fig. 2 – Postprandial glucose profiles of people with type 1 diabetes after consumption of a defined amount of wheat toast [6]. After consumption of 50 g wheat toast with topping, 7 people with type 1 diabetes showed high varying glucose courses when meal boluses were considered. The variability reflects the level, the speed and the duration of postprandial glucose

Chapter 10: Nutritional management in children and adolescents with diabetes

Carmel E. Smart, Francesca Annan, Laurie A. Higgins, Elisabeth Jelleryd, Mercedes Lopez, Carlo L. Acerini



What is new in the ISPAD Nutritional Management Chapter?

- The ISPAD Nutritional Management chapter has been updated by authors from Australia, Europe, South America, UK and USA.

What is different in the 2018 chapter?

- The impact of dietary fat and protein -not just carbohydrate- is considered in the calculation of the meal-time insulin dose and how it is delivered.
- The role of **continuous glucose monitoring** as a useful tool for educating both the clinician and young person with diabetes on food related behaviors is discussed.
- Strategies to minimize the postprandial excursions caused by carbohydrate, protein and fat are included. The importance of **family based meal-time routines** with limitations on snacking is emphasized to improve dietary quality.

Continuous Glucose Monitoring (CGM)

- Most people with type 1 diabetes can benefit from this technology with appropriate initial and ongoing education, including frequent observation of the glucose trends.
- However, not suitable for all
 - May not find it valuable
 - May find it stressful because they dislike being 'attached to a device' or constantly reminded of their diabetes or feeling exhausted by alarms.

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

Rather than being used as a “reactionary device” for hypoglycemia prevention and glycemic management, RT-CGM should be assessed for its use **as a prevention tool**.

Its potential role as an **adjunct to lifestyle changes, weight reduction, and potential to decrease overall use of insulin and other medications** in patients with T1D, T2D, and prediabetes calls for further evaluation.

Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range

<https://doi.org/10.2337/dci19-0028>

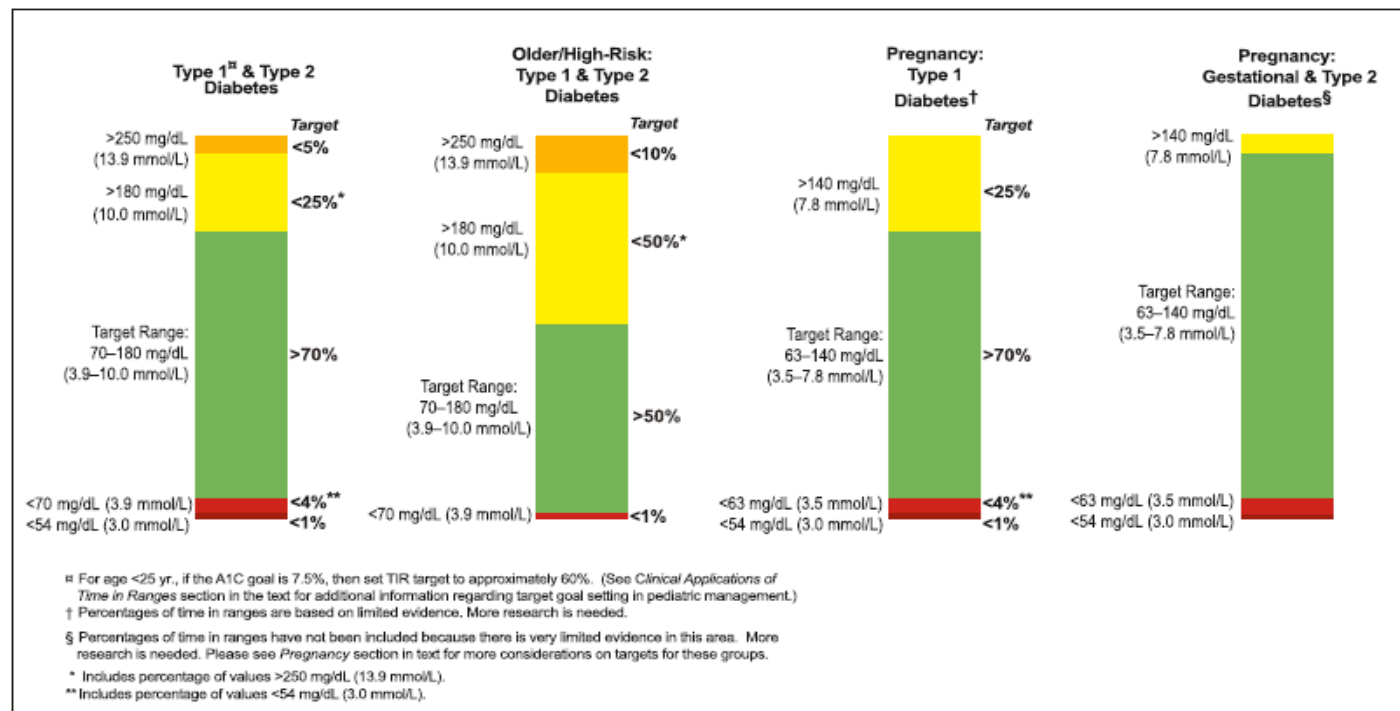
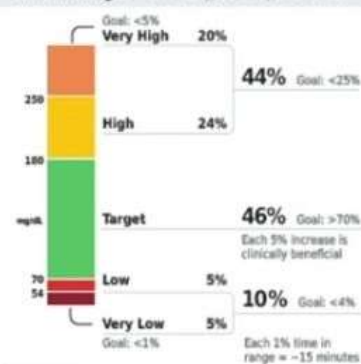


Figure 1—CGM-based targets for different diabetes populations.

AGP Report

AGP Report: Continuous Glucose Monitoring

Time in Ranges Goals for Type 1 and Type 2 Diabetes



Sam Test Patient DOB: Jan 1, 1970

14 Days: Aug 8-Aug 21, 2021

Time CGM Active: 100%

Glucose Metrics

Average Glucose

175 mg/dL Goal: <154 mg/dL

Glucose Management Indicator (GMI)

7.5% Goal: <7%

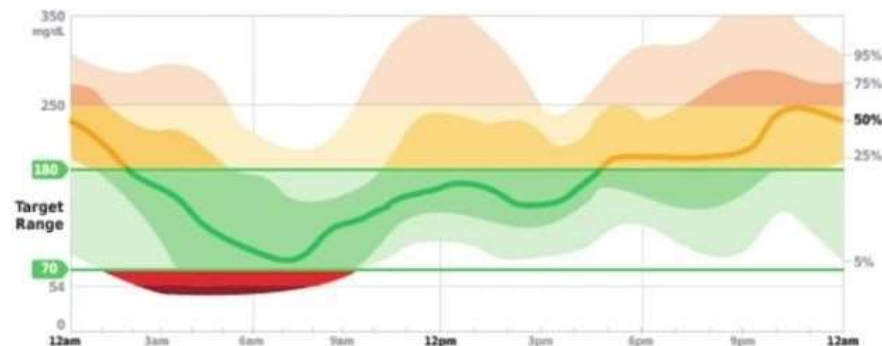
Glucose Variability

Defined as percent coefficient of variation

45.5% Goal: $\leq 36\%$

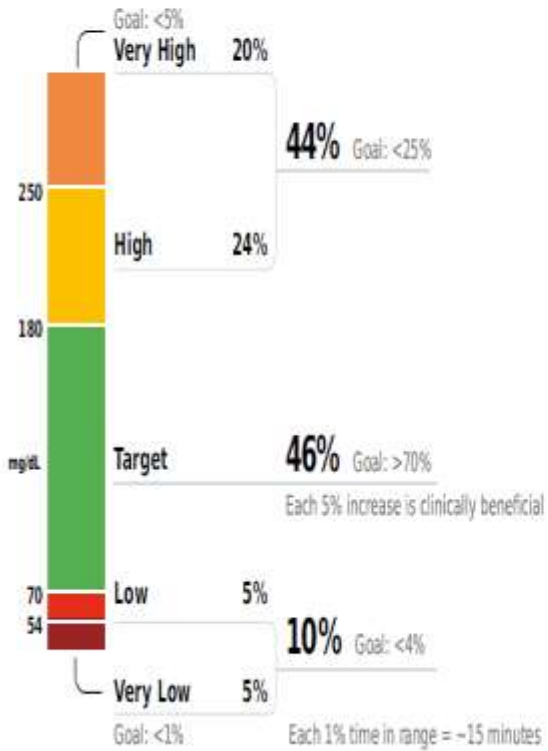
Ambulatory Glucose Profile (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if they occurred in a single day.



AGP Report: Continuous Glucose Monitoring

Time in Ranges Goals for Type 1 and Type 2 Diabetes



Test Patient DOB: Jan 1, 1970

14 Days: August 8-August 21, 2021

Time CGM Active: 100%

Glucose Metrics

Average Glucose.....175 mg/dL
Goal: <154 mg/dL

Glucose Management Indicator (GMI).....7.5%
Goal: <7%

Glucose Variability.....45.5%
Defined as percent coefficient of variation
Goal: ≤36%

Standardised CGM metrics for clinical care

- Number of days CGM device is worn:
 - recommend 14 days
- Percentage of time CGM device is active:
 - recommend 70% of data from 14 days
- Mean glucose
- GMI
- Glycaemic variability (%CV)
- Time above range
 - Per cent of readings and time >13.9 mmol/l (>250 mg/dl); Level 2 hyperglycaemia
 - Per cent of readings and time >10.0 mmol/l (>180 mg/dl); Level 1 and Level 2 hyperglycaemia
- TIR
 - Per cent of readings and TIR 3.9–10.0 mmol/l (70–180 mg/dl)
- TBR
 - Per cent of readings and time <3.9 mmol/l (<70 mg/dl); Level 1 and Level 2 hypoglycaemia
 - Per cent of readings and time <3.0 mmol/l (<54 mg/dl); Level 2 hypoglycaemia

The beneficial short-term effects of a high-protein/low-carbohydrate diet on glycaemic control assessed by continuous glucose monitoring in patients with type 1 diabetes

Charilaos Dimosthenopoulos MMedSci¹ | Stavros Liatis MD² |
Elias Kourpas PhD³ | Elpida Athanasopoulou MD² | Stamatina Driva MD² |
Konstantinos Makrilakis MD² | Alexander Kokkinos MD²

Επιλογή καταλληλότερου
διατροφικού προτύπου με
χρήση CGM

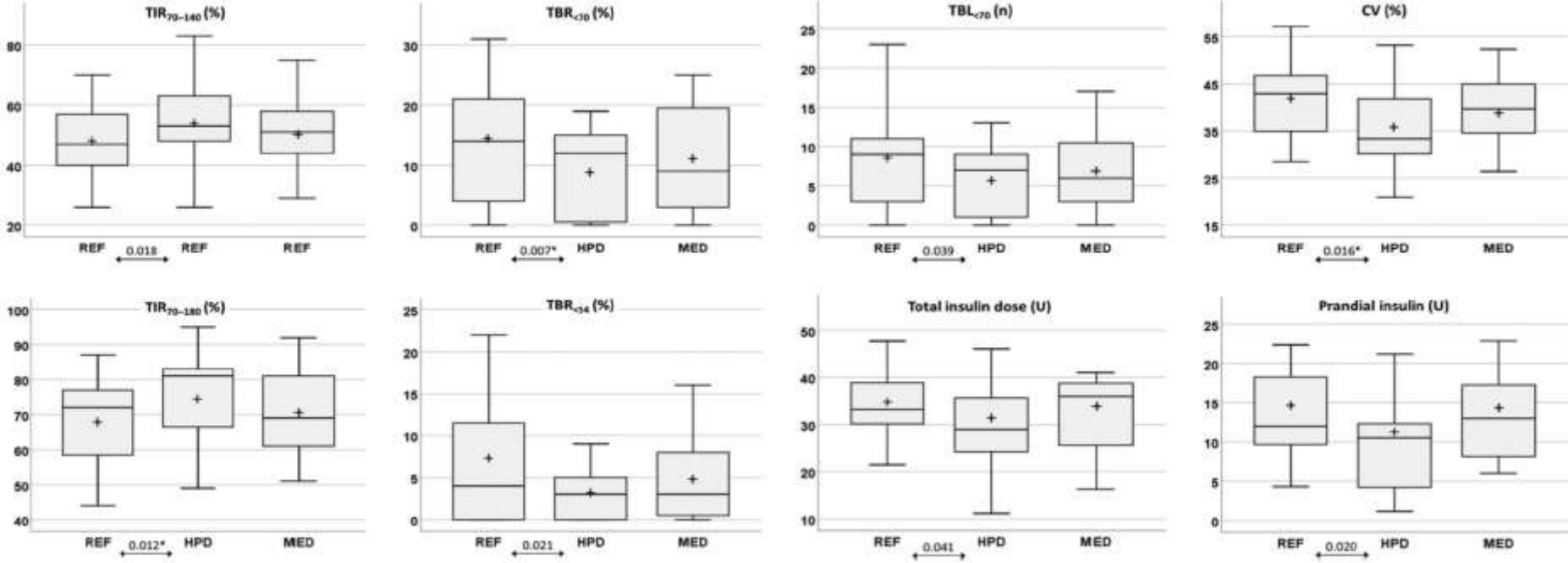
TABLE 1 Composition of the three dietary interventions

Diet	REF	HPD	MED
Carbohydrates (%)	50	20	40
Sugars (%)	10	Very limited	10
Fibre (g/1000 kcal)	20	As high as possible	20
Protein (%)	20	40	25
Fat (%)	30	40	35
SAFA (%)	<10	<10	<7
PUFA (%)	<10	<15	<10
MUFA (%)	>10	>15	>20

Abbreviations: HPD, high-protein/low-carbohydrate diet; MED, Mediterranean diet; MUFA, monounsaturated fatty acids; PUFA, polyunsaturated fatty acids; REF, reference diet; SAFA, saturated fatty acids.

The beneficial short-term effects of a high-protein/low-carbohydrate diet on glycaemic control assessed by continuous glucose monitoring in patients with type 1 diabetes

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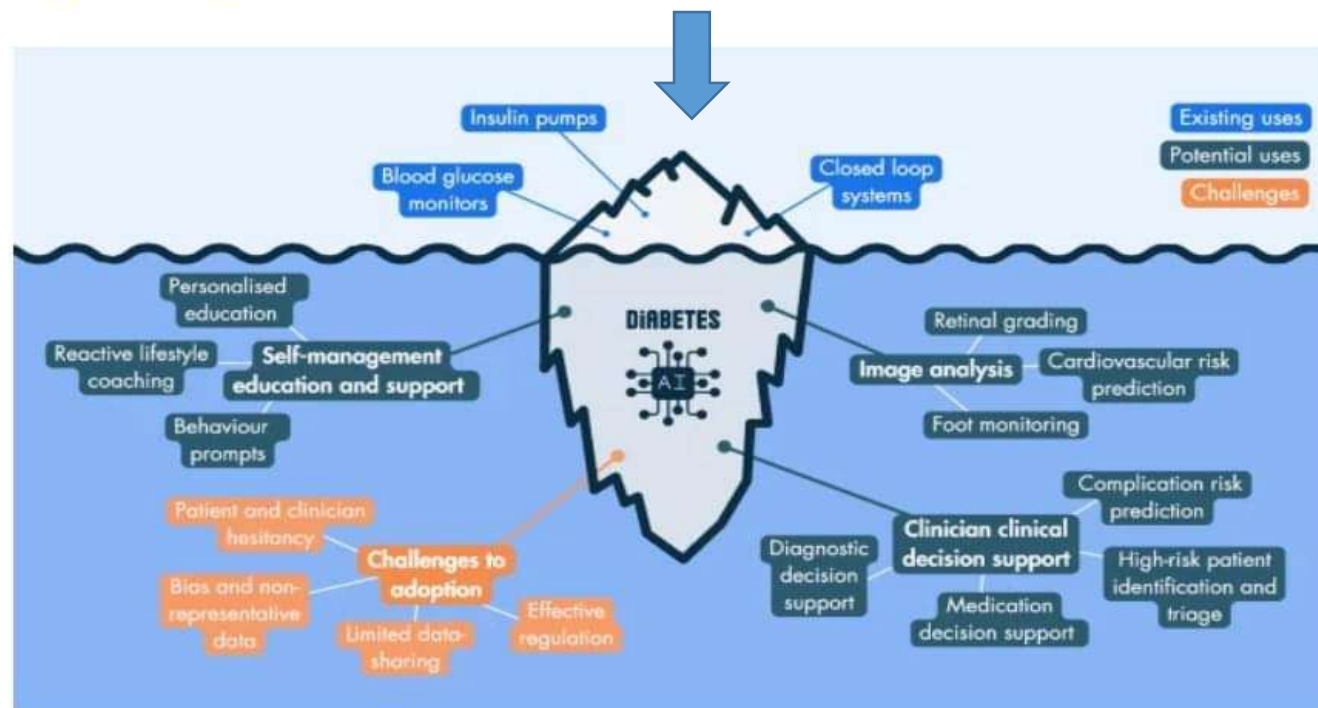
nutritional interventions based on a high-protein/low-carbohydrate dietary plan may have a positive impact on glycaemic control in patients with T1D. Patients with T1D following the HPD regimen spent on average a longer time in TIR₇₀₋₁₈₀, a shorter time in hypoglycaemia, and exhibited lower glycaemic variability than patients following a REF regimen.

Conclusions: Compared with REF and MED, an HPD plan may have a positive impact on glycaemic control in patients with T1D. During the HPD, patients spent a shorter time in hypoglycaemia and exhibited lower glycaemic variability.



Diabetes and artificial intelligence beyond the closed loop: a review of the landscape, promise and challenges

Scott C. Mackenzie¹ · Chris A. R. Sainsbury² · Deborah J. Wake^{1,4}



Είναι
αποτελεσματικές
οι παρεμβάσεις
εκπαίδευσης στη
διατροφή και τον
διαβήτη στη
βελτίωση των
αποτελεσμάτων;

Ισχυρά στοιχεία υποστηρίζουν την
αποτελεσματικότητα και τη σχέση κόστους-
αποτελεσματικότητας της διατροφικής θεραπείας
ως συστατικού της ποιοτικής φροντίδας του
διαβήτη, συμπεριλαμβανομένης της ενσωμάτωσής
της στην ιατρική διαχείριση του διαβήτη.



Επομένως, είναι σημαντικό όλα τα μέλη της ομάδας
υγειονομικής περίθαλψης να γνωρίζουν και να
υπερασπίζονται τα οφέλη της διατροφικής
θεραπείας και τα βασικά διατροφικά μηνύματα.

Τρόποι επίτευξης ιδανικής μεταγευματικής γλυκόζης

Μέτρηση υδατανθράκων και
αντιστοίχιση μονάδων
ινσουλίνης

Χορήγηση κατάλληλης
ινσουλίνης
προγευματικά

Προτίμηση τροφίμων
χαμηλού γλυκαιμικού
δείκτη & φορτίου

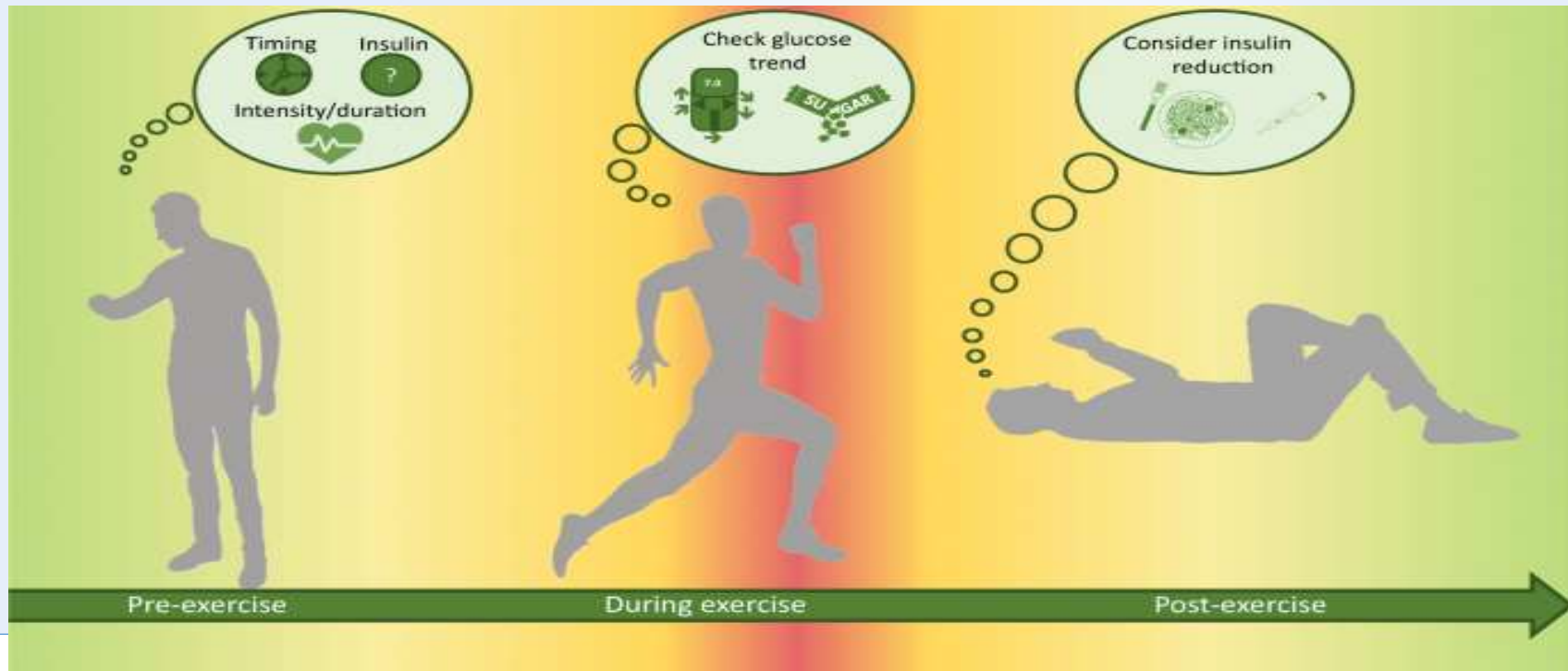


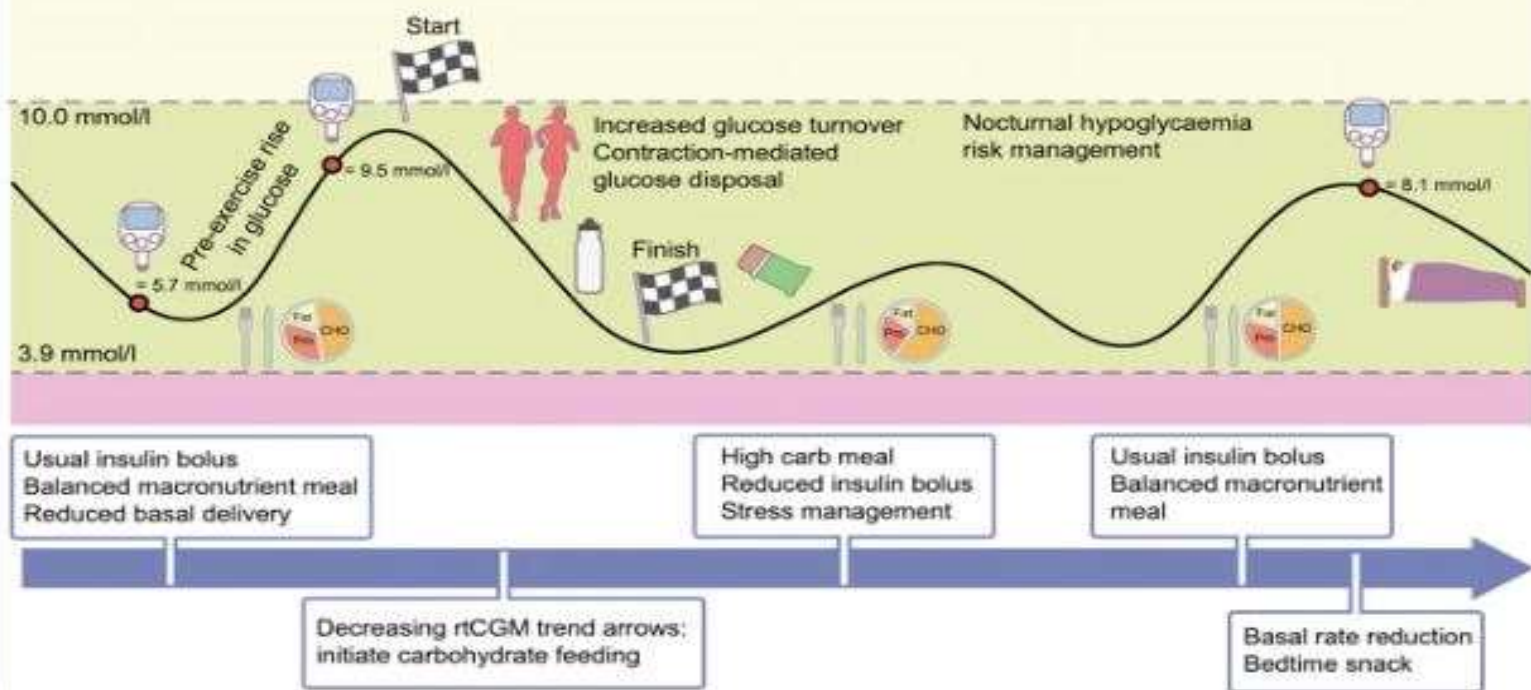
Δομημένα γεύματα:
3 κύρια και σνακ κατά
περίπτωση

Επιπλέον ινσουλίνη για γεύματα
πλούσια σε λίπος & πρωτεΐνη (?)

Περιορισμός τσιμπολογήματος
Χορήγηση ινσουλίνης (?)

Ο ρόλος των CGMs στην άσκηση





Previous Literature

Clinical Care/Education/Nutrition/Psychosocial Research

BRIEF REPORT

Barriers to Physical Activity Among Patients With Type 1 Diabetes

ANNE-SOPHIE BRAZEAU, RD^{1,2}
RÉMI RABASA-LHORET, MD, PhD^{1,2,3,4,5}

IRENE STREYCHAR, EDD, RD^{1,2,3,5}
HORTENSIA MIRCESCU, MD^{1,2,3,4}

The Benefits and Limits of Technological Advances in Glucose Management Around Physical Activity in Patients Type 1 Diabetes

Sémah Tagougui^{1,2†}, Nadine Taleb^{1,2†} and Rémi Rabasa-Lhoret^{1,2,3,4,5*}

OPEN ACCESS Freely available online



Attitudes and Barriers to Exercise in Adults with Type 1 Diabetes (T1DM) and How Best to Address Them: A Qualitative Study

Nadia Lascar^{1,2}, Amy Kennedy^{1,2}, Beverley Hancock³, David Jenkins², Robert C. Andrews³, Sheila Greenfield^{4,5}, Parth Narendran^{1,2,4,5}

Original article

The Barriers to Physical Activity in Type 1 Diabetes (BAPAD-1) scale: Predictive validity and reliability

A.S. Brazeau^{a,b}, H. Mircescu^{a,b,d}, K. Desjardins^{a,b}, M.C. Dubé^e, S.J. Weisnagel^e, C. Lavoie^f, R. Rabasa-Lhoret^{a,b,g,c,d}

Open Access

Research

BMJ Open Attitudes and barriers to exercise in adults with a recent diagnosis of type 1 diabetes: a qualitative study of participants in the Exercise for Type 1 Diabetes (EXTOD) study

Amy Kennedy,¹ Parth Narendran,² Robert C Andrews,³ Amanda Daley,⁴ Sheila M Greenfield,⁴ for the EXTOD Group

PSYCHOLOGICAL ASPECTS OF DIABETES

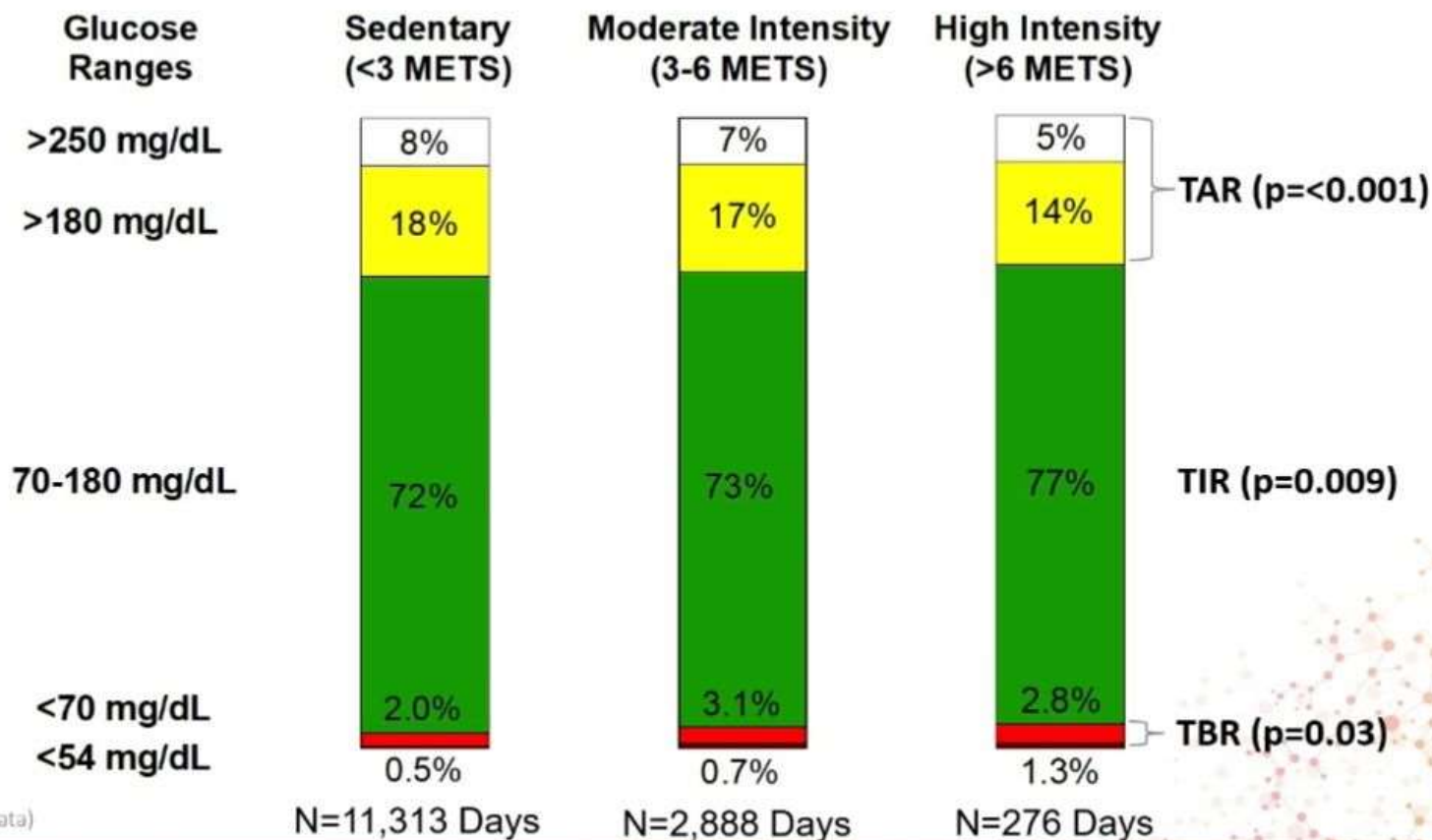


Identifying sources of support and barriers to physical activity in pediatric type 1 diabetes

Ruth Livny¹ | Wasim Said¹ | Smadar Shilo² | Ronen Bar-Yoseph³ | Shoshana Gal^{2,4} | Meirav Oren^{2,4} | Milana Levy² | Ram Weiss^{1,2,5} | Naim Shehadeh^{2,5} | Nehama Zuckerman-Levin^{2,5} | Michal Cohen^{1,2,4,5}

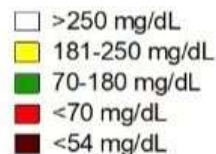
Previous Day Activity & 24h CGM Profile

THE 16TH INTERNATIONAL CONFERENCE ON
ADVANCED TECHNOLOGIES
TREATMENTS FOR DIABETE

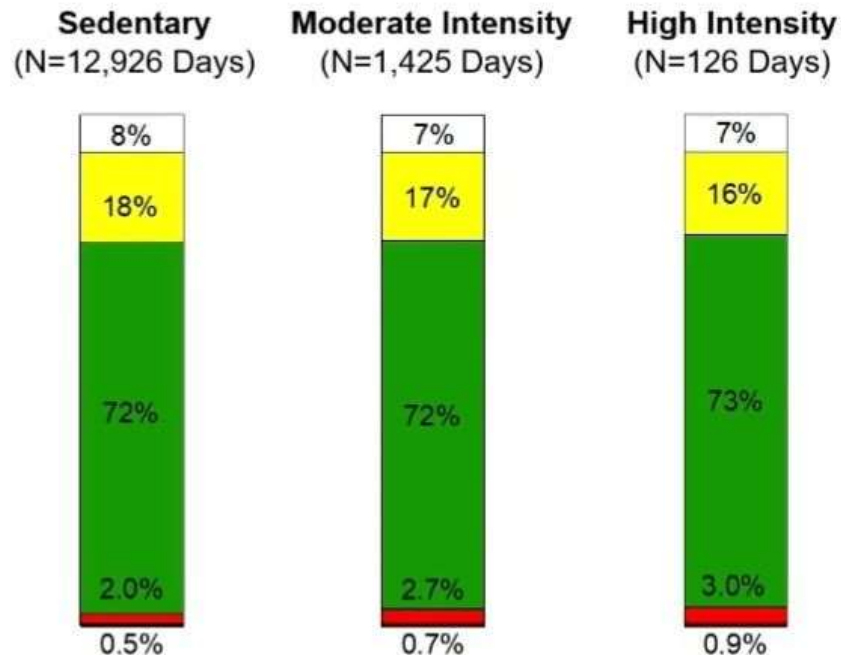


(Zaharieva et al. Unpublished Data)

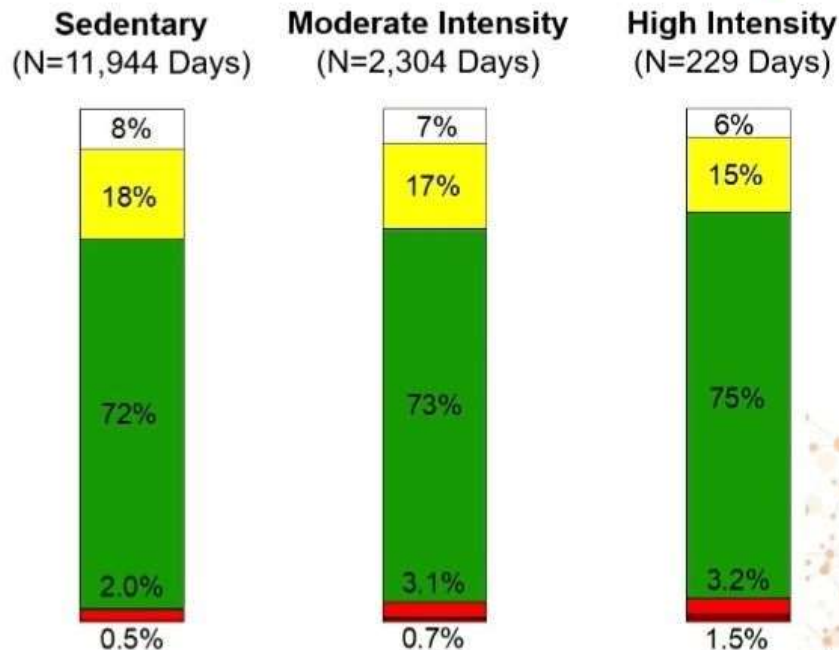
24h CGM Profile Following Morning vs Afternoon Exercise



MORNING



AFTERNOON



(Zaharieva et al. Unpublished Data)

Ερμηνεία βέλους τάσης στη λήψη θεραπευτικής απόφασης σχετικά με τη διατροφή και την άσκηση

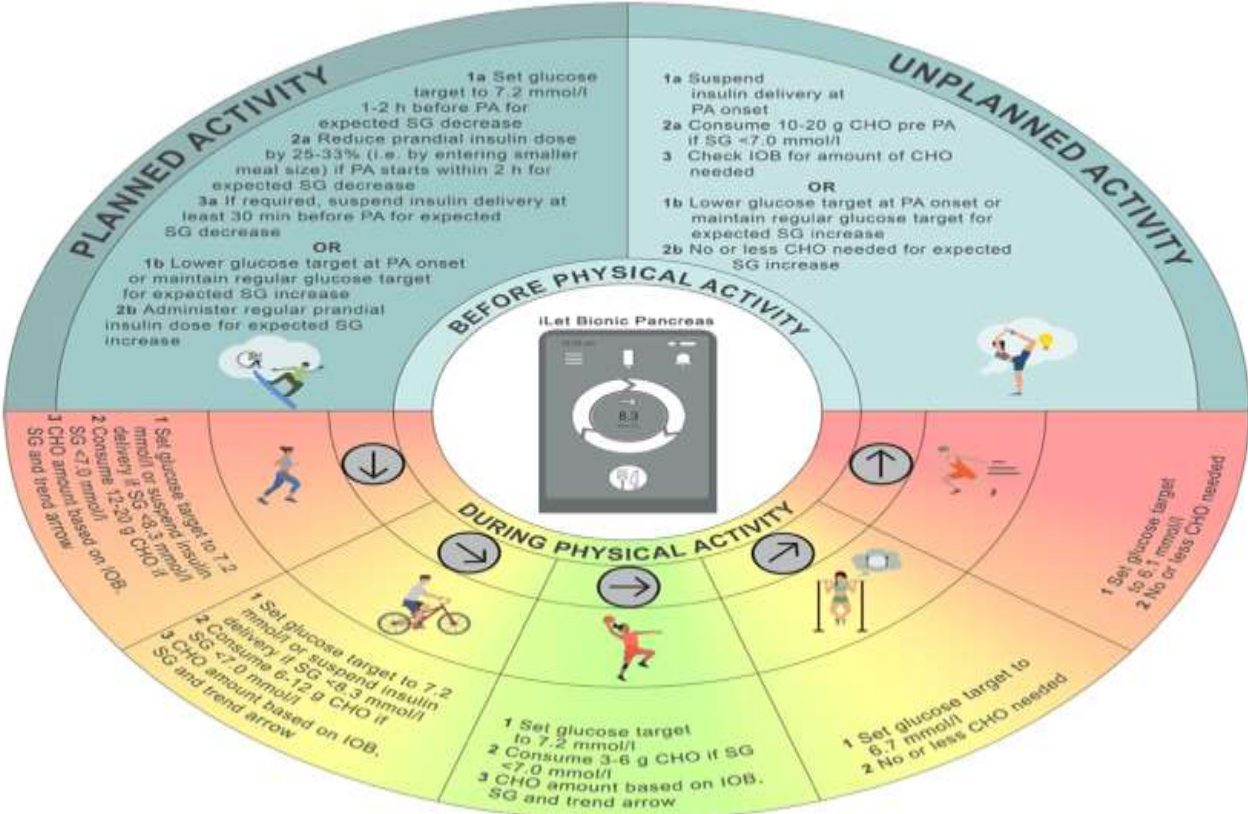
Πριν την άσκηση:

Προ άσκησης Γλυκόζη Αίματος	Συνήθης Δράση	Βέλος Τάσης	Ρυθμός & Κατεύθυνση Μεταβολής	Ιδανική Δράση
125 mg/dL	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση	➡	Σταθερός	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση
125 mg/dL	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση	⬇️ ➡️	Μέτρια Πτώση	Λάβετε 20-30 γρ. Υδατανθράκων πριν την άσκηση
125 mg/dL	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση	⬇️ ⬇️	Ραγδαία Πτώση	Λάβετε 30-40 γρ. Υδατανθράκων πριν την άσκηση & ξαναμετρήστε τη γλυκόζη αίματος πριν την άσκηση
125 mg/dL	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση	⬆️ ⬆️	Μέτρια Άνοδος	ΟΚ για την άσκηση χωρίς απαραίτητο σνακ
125 mg/dL	Λάβετε 10-15 γρ. Υδατανθράκων πριν την άσκηση	⬆️ ⬆️	Ραγδαία Άνοδος	ΟΚ για την άσκηση. Ξαναμετρήστε τη γλυκόζη αίματος σε 15-20 λεπτά. Αν είναι αξιοσημείωτα αυξημένη, χορηγήστε γευματική ινσουλίνη

The use of automated insulin delivery around physical activity and exercise in type 1 diabetes: a position statement of the European Association for the Study of Diabetes (EASD) and the International Society for Pediatric and Adolescent Diabetes (ISPAD)

Exercise intensity and mode					
	Postprandial, continuous, sustained, prolonged aerobic exercise; low stress hormone response	Mixed activity; individual and team sports	Overnight fasted, burst, explosive, competitive anaerobic exercise; high stress hormone response		
Average glucose response to exercise	⬇️	↘️	➡️	↗️	⬆️
Exogenous insulin requirements around exercise	⬇️	↘️	➡️	↗️	⬆️
Carbohydrate intake requirements around exercise	⬆️	↘️	➡️	↗️	⬇️

The use of automated insulin delivery around physical activity and exercise in type 1 diabetes: a position statement of the European Association for the Study of Diabetes (EASD) and the International Society for Pediatric and Adolescent Diabetes (ISPAD)



Η σημασία της διατροφικής εκπαίδευσης στο ΣΔτ1



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



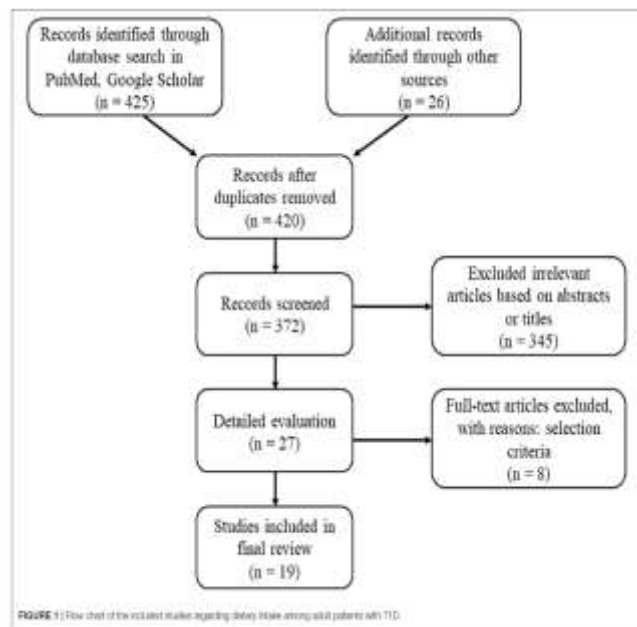
EFFECTIVENESS OF DIABETES NUTRITION THERAPY

Consensus recommendations

- Refer adults living with type 1 or type 2 diabetes to individualized, diabetes-focused MNT at diagnosis and as needed throughout the life span and during times of changing health status to achieve treatment goals. Coordinate and align the MNT plan with the overall management strategy, including use of medications, physical activity, etc., on an ongoing basis.
- Refer adults with diabetes to comprehensive diabetes self-management education and support (DSMES) services according to national standards.

- Diabetes-focused MNT is provided by a registered dietitian nutritionist/registered dietitian (RDN), preferably one who has comprehensive knowledge and experience in diabetes care.
- Refer people with prediabetes and overweight/obesity to an intensive lifestyle intervention program that includes individualized goal-setting components, such as the Diabetes Prevention Program (DPP) and/or to individualized MNT.

Dietary Intake and Adherence to the Recommendations for Healthy Eating in Patients With Type 1 Diabetes: A Narrative Review



Research Strategy and Methods: A literature search for articles, published between January 2006 and July 2021 was conducted, using electronic databases (PubMed and Google Scholar) for all available publications in English and Bulgarian. The process of study selection, identification, screening, eligibility and inclusion followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) recommendations for a flowchart. Based on the keywords search, 425 titles were retrieved, of which 27 were selected based on title and abstract. All papers were crosschecked and reviewed for selection by 3 independent reviewers. As a result, 19 titles were eligible and met inclusion criteria for a full review.

CONCLUSION

Study findings suggested a lack of knowledge or misunderstanding of diabetes dietary management. Patients with T1D, who are being consulted with a dietician as a part of their treatment plan may have better compliance to the recommended diet and as a result, are likely to have better outcomes. Nutritional therapy should focus not only on glycemic control and pure carbohydrate counting but also on healthy eating patterns and complication prevention.

**Healthy
Eating**

**Being
Active**

**Healthy
Coping**



**Medication
Management**

Monitoring

Diabetes Self-Management Education and Support (DSMES)

Dietary Interventions for Adults with Type 1 Diabetes: Clinical Outcomes, Guideline Alignment, and Research Gaps—A Scoping Review

Beata Małgorzata Sperkowska ^{1,*}, Agnieszka Chrutek ², Anna Gryn-Rynko ³ and Anna Proszowska ¹

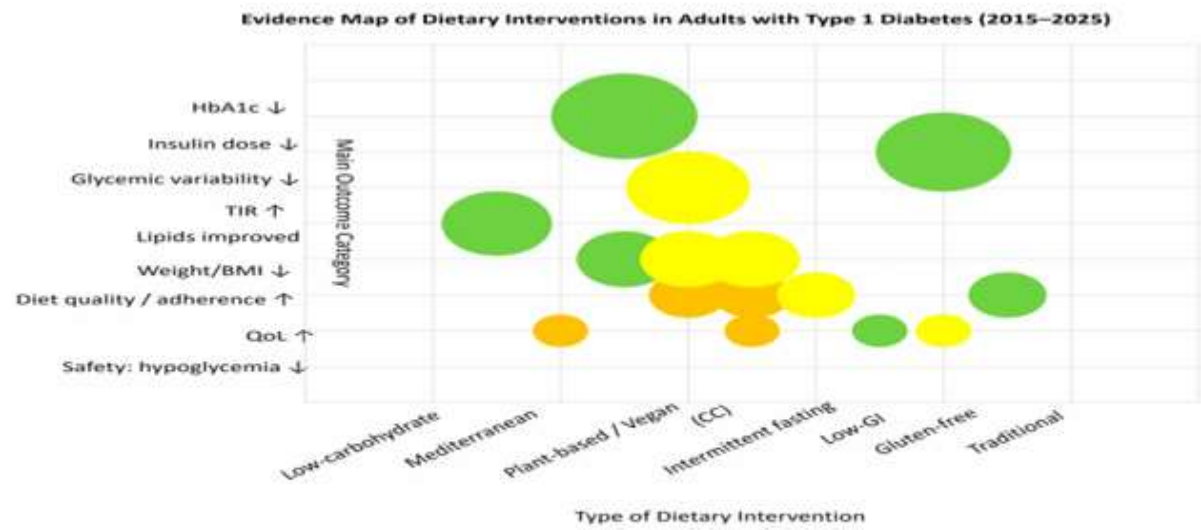


Figure 2. Evidence map of dietary interventions in adults with type 1 diabetes (2015–2025). Each bubble represents an aggregated cell (intervention × outcome); bubble size reflects total sample size, and color indicates study design: green—RCTs, yellow—observational, orange—psychosocial; ↑ increase; ↓ decrease (relative to baseline or control).

Conclusions: Combining an LCD with education, CC, and modern diabetes technology provides the most consistent benefits for adults with type 1 diabetes (T1D adults). The MedDiet and plant-based diet support diet quality and psychosocial well being, although current evidence remains limited, primarily due to small sample sizes and short follow-up periods.

Four critical times for DSMES in type 1 diabetes



Figure Legend:

The four critical times when DSMES is particularly needed for people with diabetes (and their caregivers, when applicable). ICR, insulin:carbohydrate ratio; incl., including; ISF, insulin sensitivity factor.



ΚΑΡΔΙΟΜΕΤΑΒΟΛΙΚΗ ΙΑΤΡΙΚΗ

**YOU can control diabetes
with a healthy lifestyle,
proper nutrition
and support.**



Σας ευχαριστώ