

In quali pazienti è utile un monitoraggio glicemico

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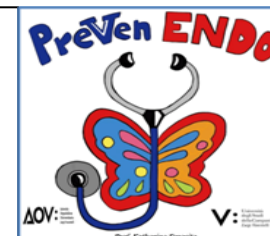
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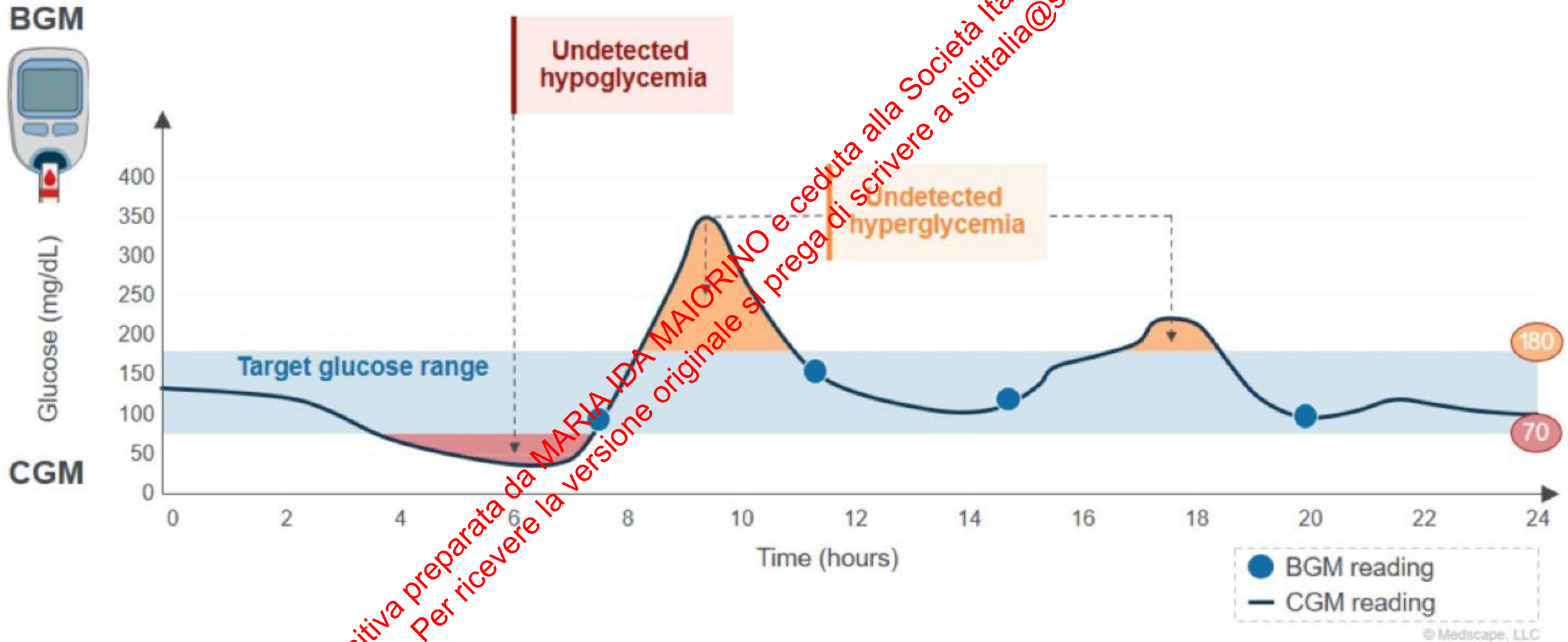
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Glycemic patterns are often missed by blood glucose meters but seen with CGM





6. Glycemic Goals, Hypoglycemia, and Hyperglycemic Crises: Standards of Care in Diabetes—2026

FREE

Table 6.2—CGM metrics for clinical care in nonpregnant individuals with type 1 or type 2 diabetes

Metric	Interpretation	Goals
Metrics for valid CGM wear		
Wear time	Number of days CGM device is worn	≥14-day wear for pattern management
Active percentage time	Percent of time CGM device is active	70% of time active out of 14 days
Glycemic metrics		
Mean glucose	Mean of glucose values	*
Glucose management indicator (GMI)	Calculated value approximating A1C (not always equivalent)	*
Glucose coefficient of variation (CV)	Spread of glucose values	≤36%†
TAR >250 mg/dL (>13.9 mmol/L)	Percent of time in level 2 hyperglycemia	<5% (most adults); <10% (older adults with complex/intermediate health)
TAR >180 mg/dL (>10 mmol/L)	Percent of time in level 1 hyperglycemia	<25% (most adults); <50% (older adults with complex/intermediate health)‡
TIR 70–180 mg/dL (3.9–10.0 mmol/L)	Percent of time in range	>70% (most adults); >50% (older adults with complex/intermediate health)
TBR <70 mg/dL (<3.9 mmol/L)	Percent of time in level 1 hypoglycemia	<4% (most adults); <1% (older adults with complex/intermediate health)§
TBR <54 mg/dL (<3.0 mmol/L)	Percent of time in level 2 hypoglycemia	<1%

CGM, continuous glucose monitoring; TAR, time above range; TBR, time below range; TIR, time in range. *Goals for these values are not standardized. †Some studies suggest that lower coefficient of variation targets (<33%) provide additional protection against hypoglycemia for those receiving insulin or sulfonylureas. ‡Goals are for level 1 and level 2 hyperglycemia combined. §Goals are for level 1 and level 2 hypoglycemia combined. Adapted from Battelino et al. (33).



7. Diabetes Technology: Standards of Care in Diabetes—2026 FREE

American Diabetes Association Professional Practice Committee for Diabetes*

Table 7.3—Continuous glucose monitoring devices

Type of device	Brand*	Availability	Alarms
rtCGM	Libre 2 Plus and Libre 3 Plus	Prescription	Yes
	Dexcom G6 and G7	Prescription	Yes
	Eversense 365	Prescription	Yes
	Guardian 4	Prescription	Yes
	Simplexa	Prescription	Yes
OTC-CGM	Dexcom Stelo	OTC	No
	Abbott Lingo	OTC	No
Professional CGM	Abbott FreeStyle Libre Pro	In office	No
	Dexcom G6 Pro	In office	No

CGM, continuous glucose monitoring; isCGM, intermittently scanned CGM; OTC, over the counter; rtCGM, real-time CGM. *Generic names not available.



Ritenete che il monitoraggio continuo (CGM) debba essere considerato uno standard necessario per tutti i pazienti in terapia insulinica (basale o MDI), al fine di ottimizzare la sicurezza e ridurre le ipoglicemie?

A: SI

B: NO

C: NON SO

Diapositiva preparata da MARIA IDA RIMORINO e ceduta alla Società Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it



Effects of Continuous Glucose Monitoring on Metrics of Glycemic Control in Diabetes: A Systematic Review With Meta-analysis of Randomized Controlled Trials

Diabetes Care 2020;43:1146–1156 | <https://doi.org/10.2337/dc19-1459>

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Giuseppe Bellastella,^{1,2}
Lorenzo Scappaticcio,^{1,2} Miriam Longo,²
Dario Giugliano,^{1,2} and
Katherine Esposito^{2,4}

Table 2—Preplanned subgroup analysis

	Comparisons	Patients	Control subjects	Estimated WMD (95% CI)	P	I ²	P value of Q test
HbA _{1c}							
rtCGM	13	851	769	−0.23 (−0.36 to −0.10)	<0.001	92.2%	<0.001
iCGM	3	350	276	0.00 (−0.01 to 0.02)	0.861	0.0%	0.934
SAP	2	107	108	−0.26 (−0.62 to 0.35)	0.542	85.5%	0.009
Overall	18	1,308	1,153	−0.07 (−0.29 to −0.06)	0.003	96.2%	<0.001
TIR							
rtCGM	13	851	769	83.49 (52.68–114.30)	<0.001	66.5%	<0.001
iCGM	3	350	276	53.91 (28.54–79.27)	<0.001	0.0%	0.617
SAP	2	107	108	37.10 (0.74–73.45)	0.045	0.0%	0.799
Overall	18	1,308	1,153	70.74 (46.73–94.76)	<0.001	66.3%	<0.001
TBR level 1							
rtCGM	13	851	769	−15.82 (−25.70 to −5.95)	0.002	96.6%	<0.001
iCGM	3	350	276	−56.26 (−88.91 to −23.60)	0.001	93.7%	<0.001
SAP	2	107	108	−41.04 (−127.10 to 45.02)	0.350	88.1%	0.004
Overall	18	1,308	1,153	−27.16 (−42.08 to −12.25)	<0.001	98.9%	<0.001
TBR level 2							
rtCGM	8	524	450	−5.65 (−10.83 to −0.46)	0.033	74.3%	<0.001
iCGM	3	350	276	−26.23 (−49.07 to −3.40)	0.024	86.8%	0.001
SAP	1	76	77	−37.40 (−46.05 to −28.75)	<0.001	—	—
Overall	12	950	803	−13.58 (−20.63 to −6.53)	<0.001	91.7%	<0.001
TAR level 1							
rtCGM	12	788	716	−54.34 (−75.03 to −33.64)	<0.001	21.7%	0.230
iCGM	3	231	156	35.52 (−3.00 to 74.03)	0.071	0.0%	0.588
SAP	2	107	108	23.98 (−34.95 to 82.90)	0.425	26.3%	0.244
Overall	16	1,126	980	−30.26 (−58.15 to −2.38)	0.033	67.9%	<0.001
TAR level 2							
rtCGM	8	545	462	−44.79 (−74.97 to −14.61)	0.004	69.6%	0.002
iCGM	3	350	276	−16.16 (−30.57 to −1.74)	0.028	0.0%	0.562
SAP	1	76	77	−1.44 (−28.09 to 25.21)	0.916	—	—
Overall	12	971	815	−27.68 (−45.31 to −9.97)	0.004	63.9%	0.002
CV							
rtCGM	7	509	449	−2.56 (−5.28 to 0.17)	0.066	93.1%	<0.001
iCGM	3	350	276	−3.86 (−5.15 to −2.57)	<0.001	78.1%	0.010
SAP	—	—	—	—	—	—	—
Overall	10	859	725	−3.09 (−4.43 to −1.74)	<0.001	90.7%	<0.001



The therapeutic efficacy of continuous glucose monitoring in diabetes: an updated meta-analysis with meta-regression

Maria Ida Maiorino^{1,2} · Nicole Di Martino² · Silvia Angelino^{1,3} · Antonietta Maio¹ · Paola Caruso² · Michela Petrizzo² · Lorenzo Scappaticcio¹ · Miriam Longo⁴ · Daniela Forestiere^{1,3} · Chiara Porcellini^{1,3} · Giuseppe Bellastella^{1,2} · Dario Giugliano¹ · Katherine Esposito^{1,2,3}

- We included RCTs reporting both HbA1c and mean CGM glucose together with time in range (TIR), time above range (TAR) and time below range (TBR).
- The meta-analysis included 19 studies involving 2936 patients.

Subgroup analysis relative to TIR outcome.

	Comparisons	Intervention	Control	Mean change (95%CI)	P	ANOVA	I ²	Heterogeneity test
	(N)	(n)	(n)			Q-Test P		P
Diabetes type						0.608		
Type 1	16	1189	1124	5.85 (4.35, 7.36)	<0.001		63.74	<0.001
Type 2	4	377	246	7.66 (1.09, 14.11)	0.022		65.59	0.033
Background therapy						0.746		
CSII	2	153	153	4.63 (-0.14, 9.40)	0.057		62.15	0.104
MDI	6	490	371	5.75 (2.83, 8.67)	<0.001		49.63	0.077
Both	12	923	846	6.45 (4.76, 8.15)	<0.001		56.84	0.008
Glucose monitoring modality						0.025		
rtCGM	13	959	839	6.94 (5.23, 8.66)	<0.001		52.14	0.014
isCGM	6	531	454	4.82 (2.98, 6.67)	<0.001		20.50	0.279
SAP	1	77	77	2.70 (0.02, 5.38)	0.048		/	/
Study design type						<0.001		
Cross-over	2	103	102	9.45 (7.95, 10.95)	<0.001		0.00	0.508
Parallel	18	1463	1268	5.48 (4.16, 6.80)	<0.001		40.49	0.039
Consensus 2019						0.025		
Before Consensus 2019	12	991	856	4.95 (2.97, 6.92)	<0.001		71.66	<0.001
After Consensus 2019	8	575	514	7.90 (6.24, 9.56)	<0.001		3.65	0.402



Standards of Care in Diabetes—2026



American
Diabetes
Association
ISSN 0149-5992

7. Diabetes Technology: Standards of Care in Diabetes—2026

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American Diabetes Association Professional Practice Committee for Diabetes*

7.15 Use of CGM is recommended at diabetes onset and anytime thereafter for children, adolescents, and adults with diabetes who are on insulin therapy, **A** on noninsulin therapies that can cause hypoglycemia, **C** and on any diabetes treatment where CGM helps in management. **C** The specific CGM device and method for use should be made based on the individual's circumstances, preferences, and needs. **E**

7.16 In people with diabetes on insulin therapy, CGM devices should be used as close to daily as possible for maximal benefit. **A** People with diabetes should have uninterrupted access to their supplies to minimize gaps in CGM. **A**

7.17 During pregnancy for individuals with type 1 diabetes, CGM can help achieve glycemic goals (e.g., time in range and time above range) **A** and A1C goal **B** and may be beneficial for other types of diabetes in pregnancy. **E** See section 15, "[Management of Diabetes](#) in Pregnancy," for more detail regarding use of technology in pregnancy.

7.18 In circumstances when consistent use of CGM is not feasible, consider periodic use of personal or professional CGM to adjust medication and/or lifestyle. **C**

7.19 Skin reactions, either due to irritation or allergy, should be assessed and addressed to aid in successful use of devices. **E**

7.20 People who wear CGM devices should be educated on potential interfering substances and other factors that may affect accuracy. **C**

Diapositiva preparata da MARIA DA MAIORINO e ceduta alla Società Italiana di Diabetologia per ricevere la versione originale si prega di scrivere a siiditalia@siiditalia.it

An updated algorithm for an effective choice of continuous glucose monitoring for people with insulin-treated diabetes

Maria Ida Maiorino, Raffaella Buzzetti, Concetta Irace, Luigi Laviola, Nicola Napoli, Dario Pitocco, Katherine Esposito
*on behalf of LIVE CGM working group**

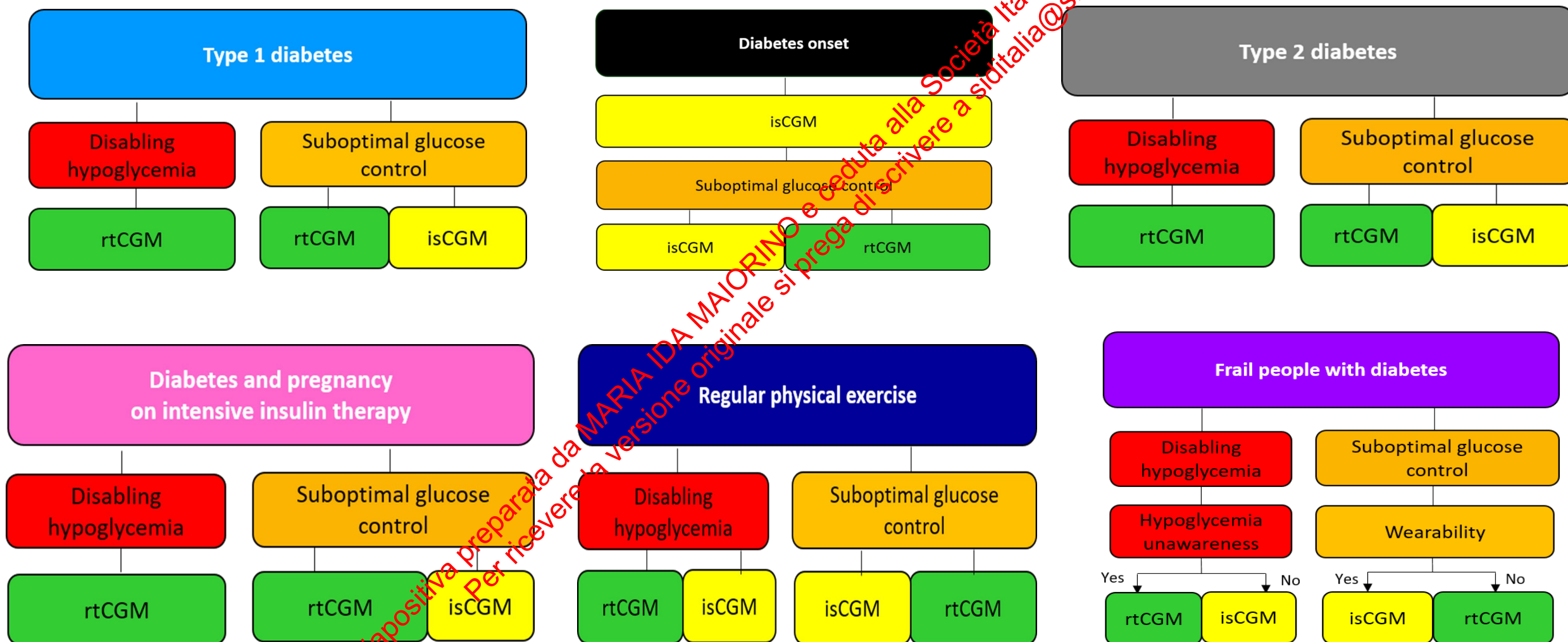


“...an update algorithm on the most suitable choice of CGM for insulin-treated PwD in six different clinical scenarios, including type 1 diabetes, type 2 diabetes, pregnancy on intensive insulin therapy, regular physical exercise, new onset of diabetes, and frailty.”



An updated algorithm for an effective choice of continuous glucose monitoring for people with insulin-treated diabetes

Maria Ida Maiorino ^{ID}1,2 • Raffaella Buzzetti ^{ID}3 • Concetta Irace ^{ID}4 • Luigi Laviola ^{ID}5 • Nicola Napoli ^{ID}6 •
Dario Pitocco ^{ID}7 • Katherine Esposito ^{ID}1,2 • on behalf of LIVE CGM working group



Real-time continuous glucose monitoring in adults with type 1 diabetes and impaired hypoglycaemia awareness or severe hypoglycaemia treated with multiple daily insulin injections (HypoDE): a multicentre, randomised controlled trial *Lancet* 2018; 391: 1367-77



Recovery of Hypoglycemia Awareness in Long-standing Type 1 Diabetes: A Multicenter 2 × 2 Factorial Randomized Controlled Trial Comparing Insulin Pump With Multiple Daily Injections and Continuous With Conventional Glucose Self-monitoring (HypoCOMPaSS)

Diabetes Care 2014;37:2114-2122 | DOI: 10.2337/dc14-0030

Benefit of Continuous Glucose Monitoring in Reducing Hypoglycemia Is Sustained Through 12 Months of Use Among Older Adults with Type 1 Diabetes

DIABETES TECHNOLOGY & THERAPEUTICS
Volume 24, Number 6, 2022
© Mary Ann Liebert, Inc.
DOI: 10.1089/dia.2021.0503

JAMA | Original Investigation

Effect of Continuous Glucose Monitoring on Hypoglycemia in Older Adults With Type 1 Diabetes

JAMA. 2020;323(23):2397-2406. doi:10.1001/jama.2020.6928

A Randomized Clinical Trial

Received: 5 September 2021

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DOI: 10.1111/dom.14644

ORIGINAL ARTICLE

DIABETES, OBESITY AND METABOLISM
A JOURNAL OF PHARMACOLOGY AND THERAPEUTICS

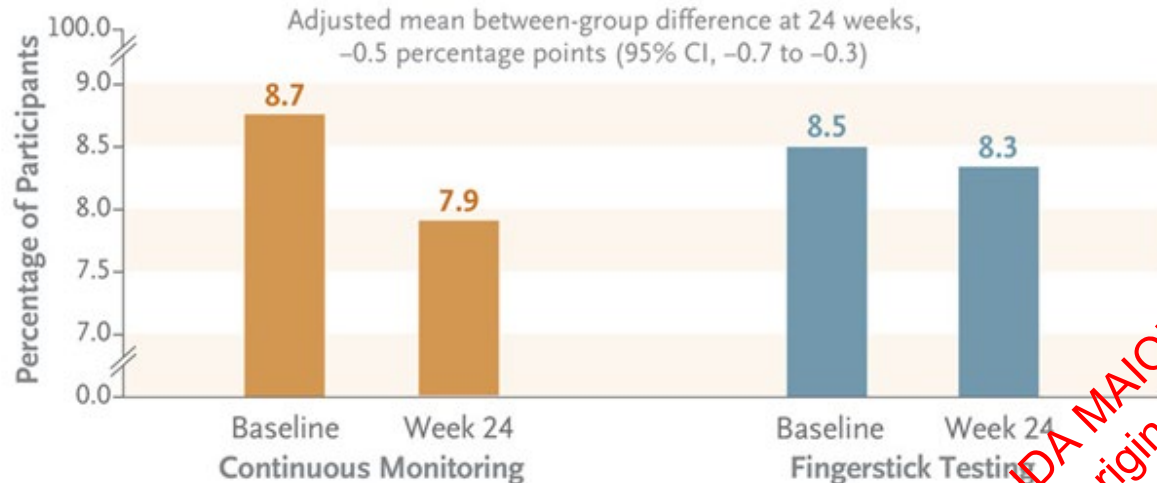
Reduction of clinically important low glucose excursions with a long-term implantable continuous glucose monitoring system in adults with type 1 diabetes prone to hypoglycaemia: the France Adoption Randomized Clinical Trial



Intermittently Scanned Continuous Glucose Monitoring for Type 1 Diabetes

Leelarathna L et al. DOI: 10.1056/NEJMoa2205650

Mean Glycated Hemoglobin Level at 24 Weeks

Adjusted mean between-group difference at 24 weeks,
−0.5 percentage points (95% CI, −0.7 to −0.3)

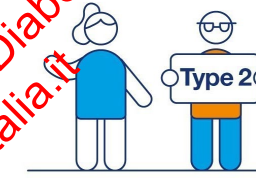
CONCLUSIONS

Among participants with type 1 diabetes and high glycated hemoglobin levels, the use of an intermittently scanned continuous glucose monitor with optional alarms for high and low blood glucose levels resulted in a lower mean glycated hemoglobin level at 24 weeks than levels monitored with fingerstick testing.

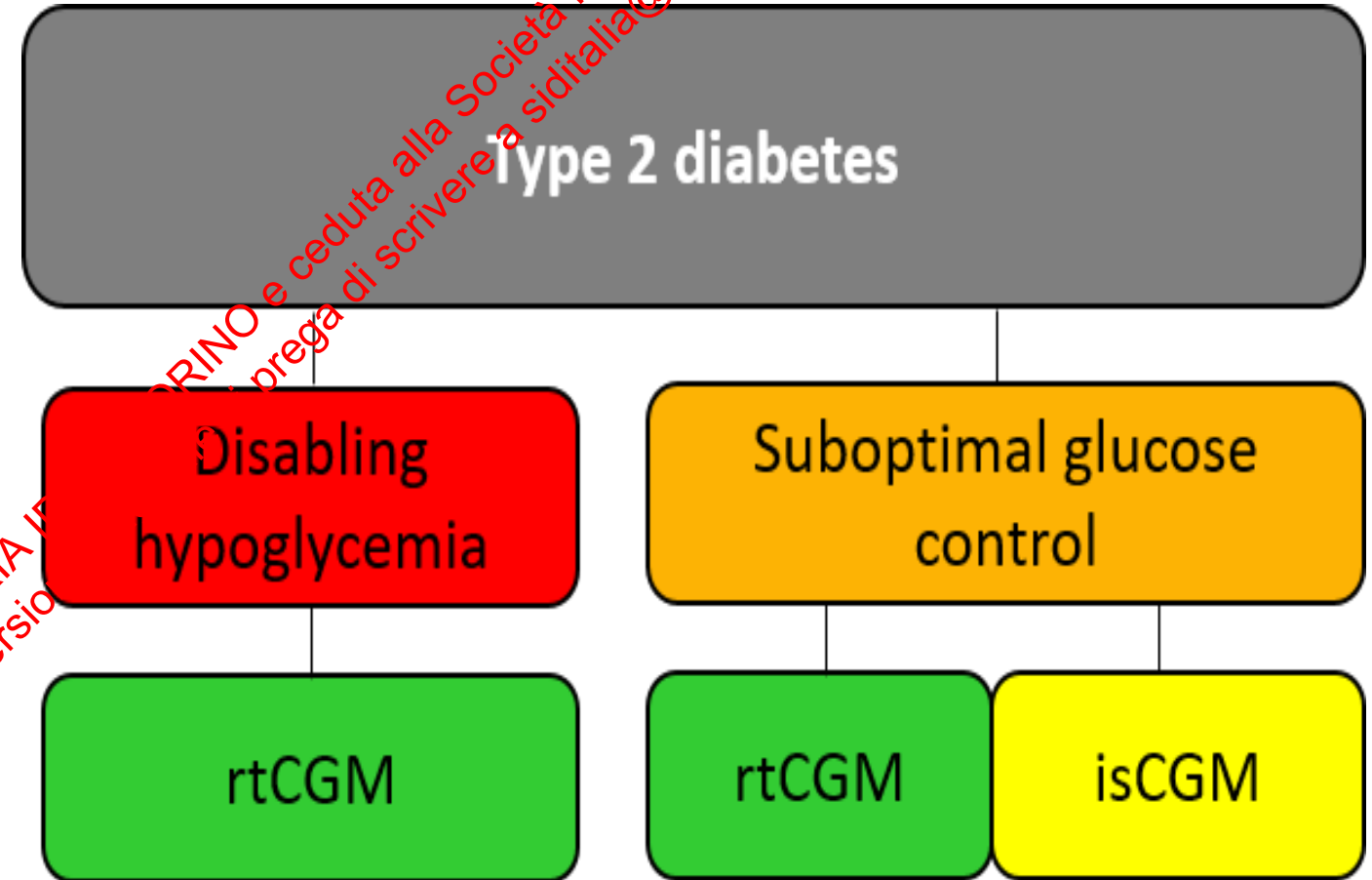
Table 3. Glycemic Outcomes According to Sensor Data.*

Outcome	Baseline		24 Weeks		Adjusted Mean Difference (95% CI) [†]
	Intervention Group (N=78)	Usual-Care Group (N=78)	Intervention Group (N=75)	Usual-Care Group (N=62)	
Percent of time spent in specified glucose range					
In range, 70–180 mg/dl	42.8±13.3	45.5±14.2	52.1±15.9	45.2±16.7	9.0 (4.7 to 13.3)
Below range, <70 mg/dl [‡]	7.0±6.2	6.6±5.4	3.5±3.6	6.5±5.9	−3.0 (−4.5 to −1.4)
Above range, >180 mg/dl	50.2±16.8	48.0±16.5	44.5±17.3	48.3±19.9	−6.0 (−11.0 to −0.9)
Above range, >250 mg/dl [‡]	23.7±14.9	21.8±14.9	15.8±12.3	21.0±15.5	−6.5 (−10.5 to −2.6)
Glucose level — mg/dl	191±38	187±36	178±32	185±40	−11 (−20 to 0)
Glucose SD — mg/dl	81±18	77±16	65±14	74±14	−9 (−14 to −5)
Coefficient of variation of the glucose level — %	42.7±7.5	42.1±6.9	37.0±5.4	40.4±7.0	−3.5 (−5.3 to −1.8)
Percent of time spent with glucose level at specified level [‡]					
<63 mg/dl	5.2±5.1	4.8±4.6	2.1±2.9	4.7±5.0	−2.6 (−3.9 to −1.3)
<54 mg/dl	3.1±3.8	2.8±3.4	0.8±1.8	2.8±3.9	−2.0 (−3.0 to −1.0)
<50 mg/dl	2.4±3.3	2.2±3.0	0.5±1.2	2.2±3.4	−1.8 (−2.6 to −0.9)
>300 mg/dl	11.6±10.8	10.8±10.6	6.2±7.6	9.6±10.3	−4.1 (−6.7 to −1.4)
AUC for glucose level of <54 mg/dl — mg/dl × min per day [‡]	23.9±34.6	21.4±30.3	4.7±11.9	22.4±35.8	−17.7 (−26.6 to −8.8)

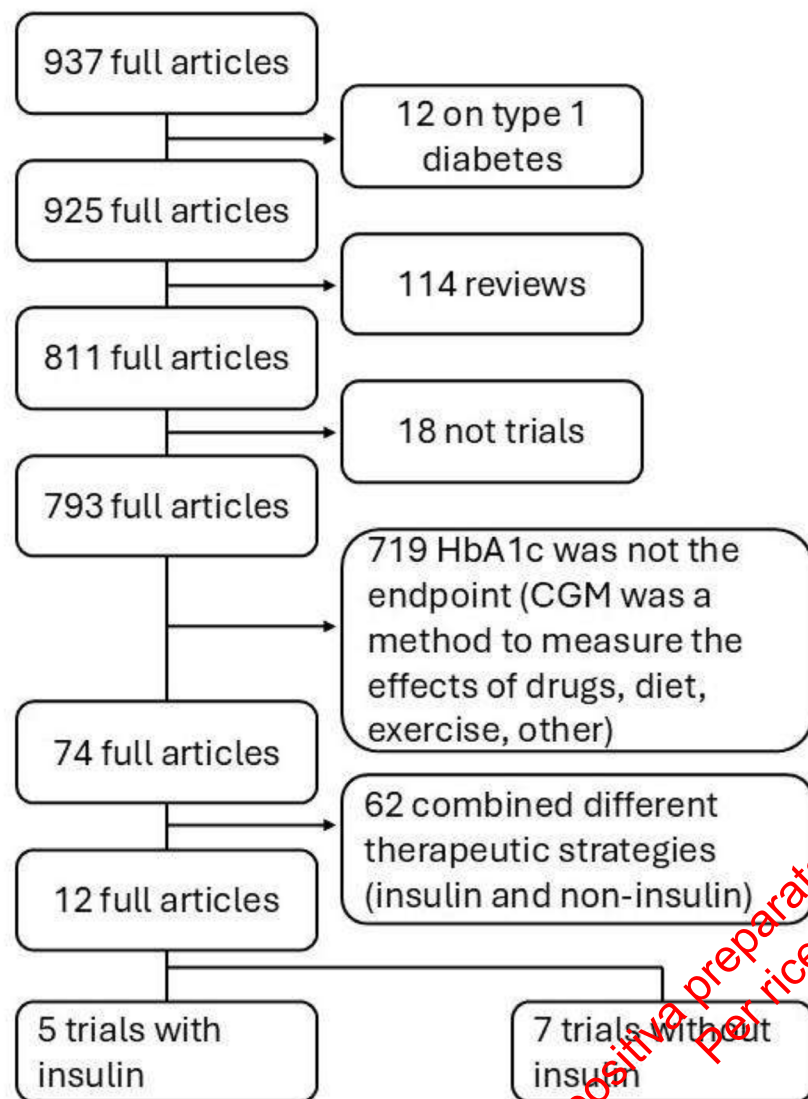
An updated algorithm for an effective choice of continuous glucose monitoring for people with insulin-treated diabetes



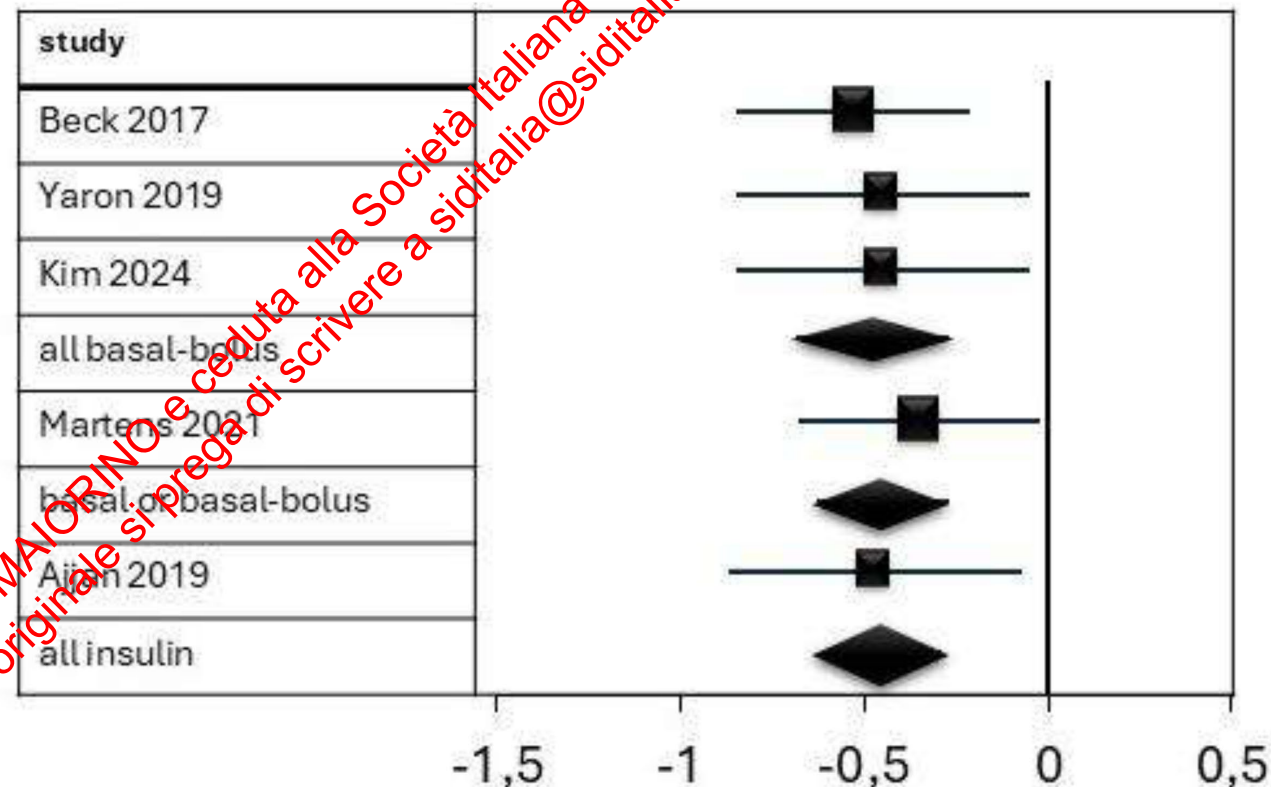
- In patients with type 2 diabetes treated with insulin therapy in whom hypoglycemia predominates, a rtCGM with predictive alerts and alarms should be used.
- In type 2 PwD with suboptimal glucose control and low risk for hypoglycemia who require more data than those offered by SMBG, both isCGM and rtCGM can be suggested, depending on the individual's circumstances, preferences, and needs.



Type 2 diabetes

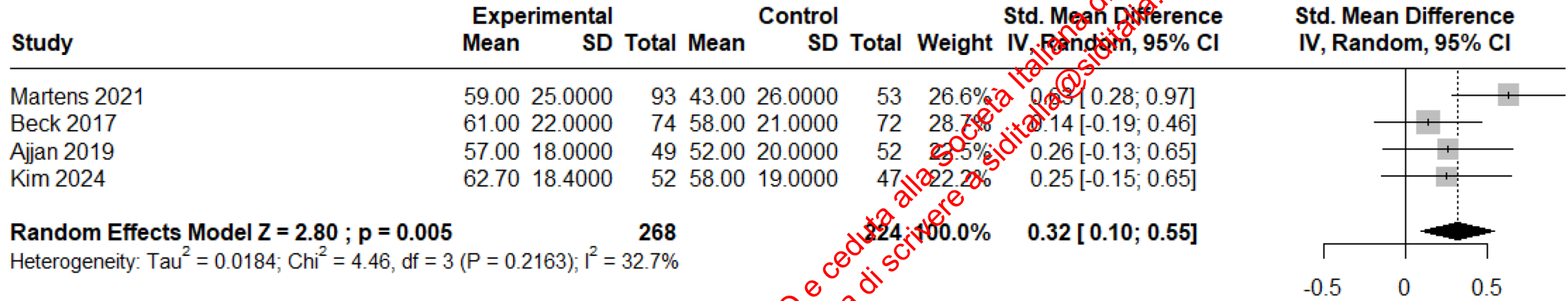


Effetti su **HbA1c** del monitoraggio continuo (CGM) rispetto al monitoraggio glicemico capillare (SMBG) della glicemia in pazienti trattati con insulina.

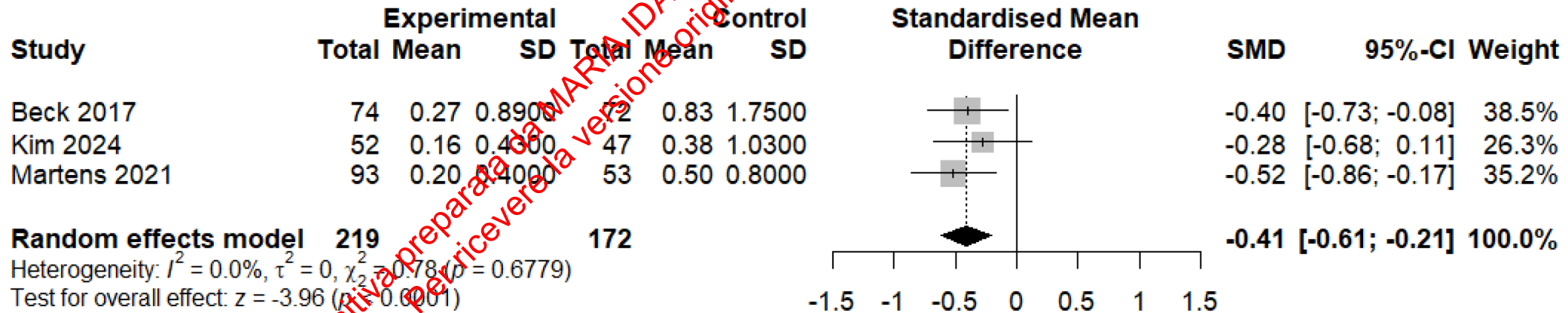


Type 2 diabetes

Effetti su **TIR** del monitoraggio continuo (CGM) rispetto al monitoraggio glicemico capillare (SBMG) della glicemia in pazienti trattati con insulina.



Effetti su **TBR** del monitoraggio continuo (CGM) rispetto al monitoraggio glicemico capillare (SBMG) della glicemia in pazienti trattati con insulina.



***Linea Guida della Società Italiana di Diabetologia (SID) e dell'Associazione dei Medici Diabetologi (AMD)
La terapia del diabete mellito di tipo 2 – rev 2025***

Raccomandazione forte a favore del monitoraggio continuo della glicemia in pazienti trattati con insulina, sia solo basale che basal-bolus. Qualità delle prove moderata.

Si raccomanda al monitoraggio glicemico in continuo rispetto al controllo glicemico capillare per la misurazione della glicemia nei pazienti con diabete mellito di tipo 2 in trattamento insulinico sia solo basale che basal-bolus.

Diapositiva preparata da MARIA IDA MAIORINO e ceduta alla Società Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it



Nel paziente con Diabete Tipo 2 trattato con soli farmaci orali e scarso controllo glicemico, ritenete utile l'impiego del CGM in definiti contesti clinici?

A: SI

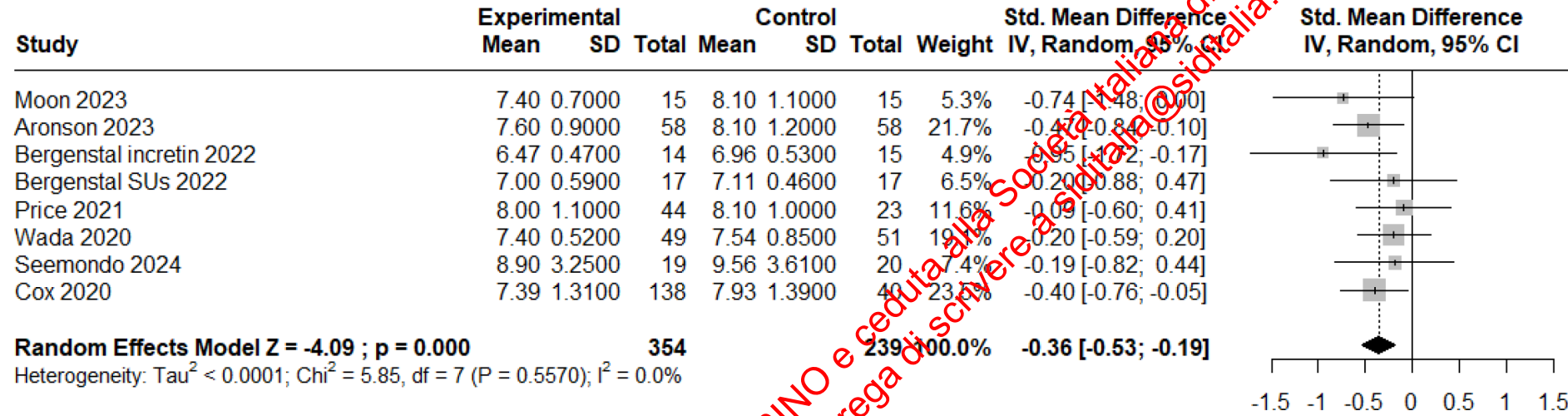
B: NO

C: NON SO

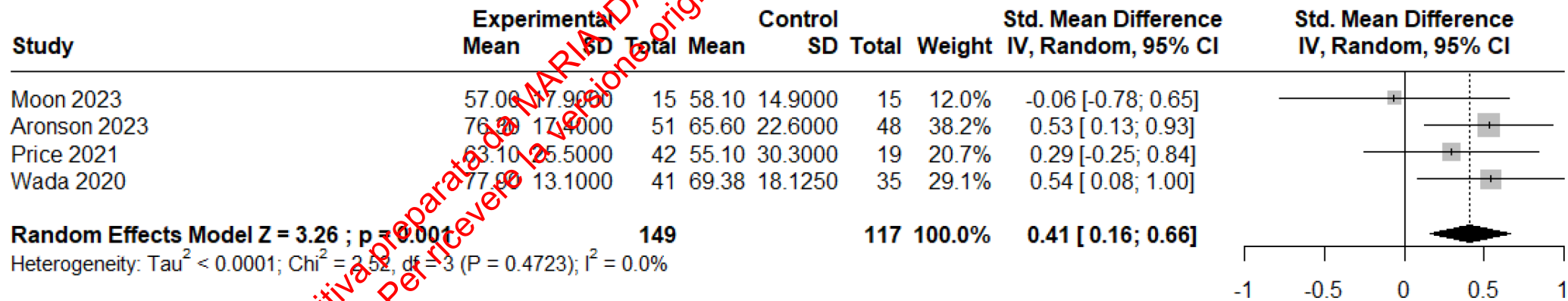
Diapositiva preparata da MARIA IDA MAIORANO e ceduta alla Società Italiana di Diabetologia.
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Type 2 diabetes

Effetti su **HbA1c** del monitoraggio continuo (CGM) rispetto al monitoraggio glicemico capillare (SBMG) della glicemia in pazienti **NON** trattati con insulina.

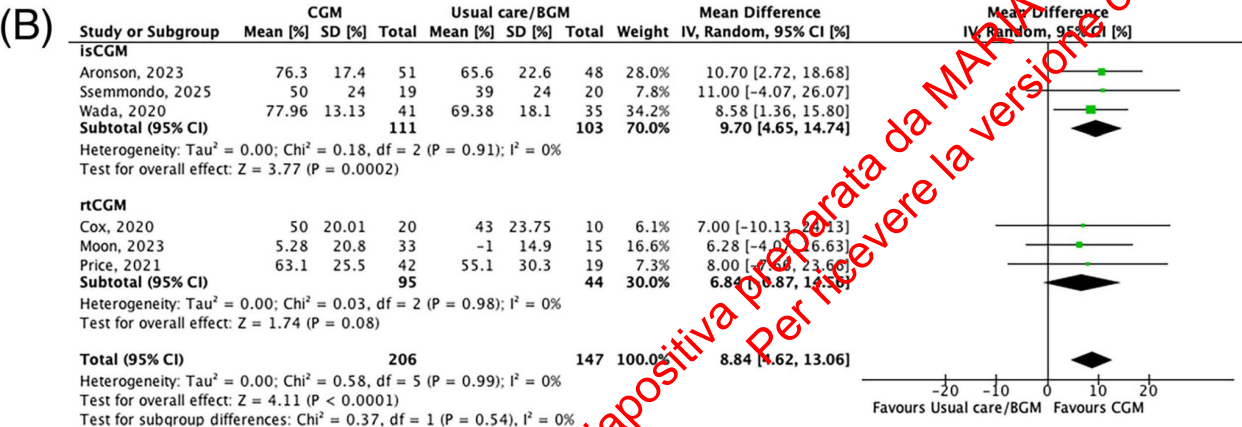
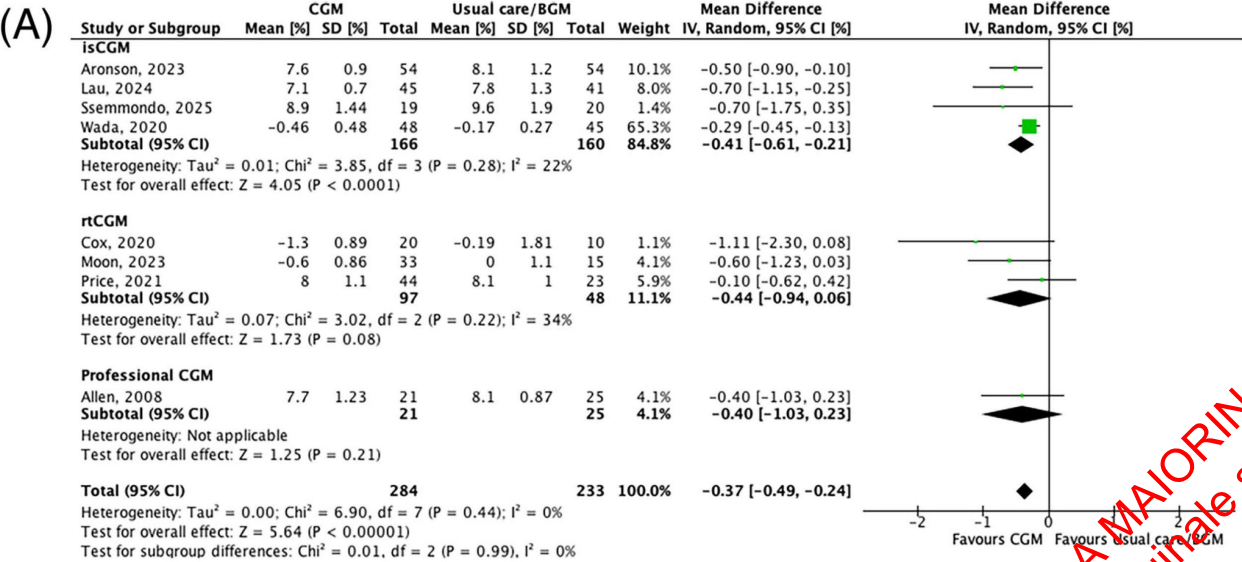


Effetti su **TIR** del monitoraggio continuo (CGM) rispetto al monitoraggio glicemico capillare (SBMG) della glicemia in pazienti **NON** trattati con insulina.



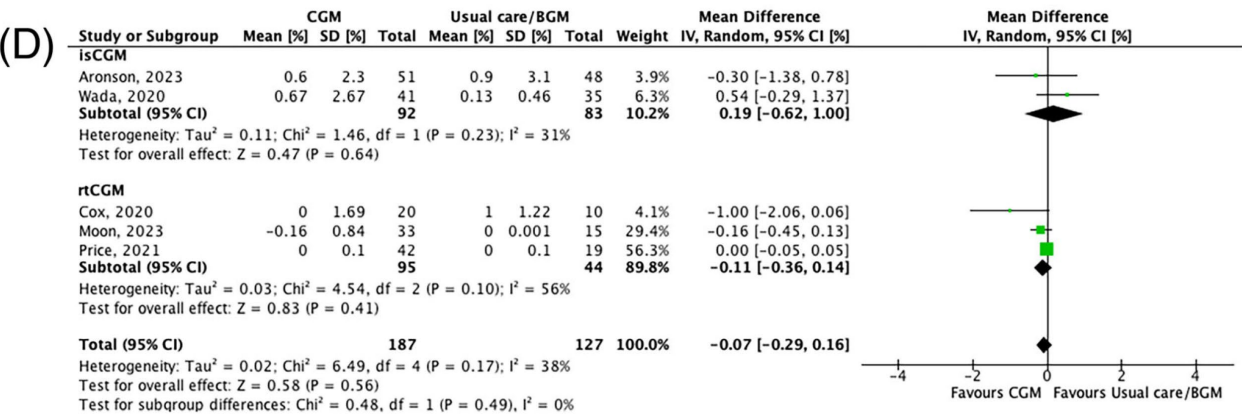
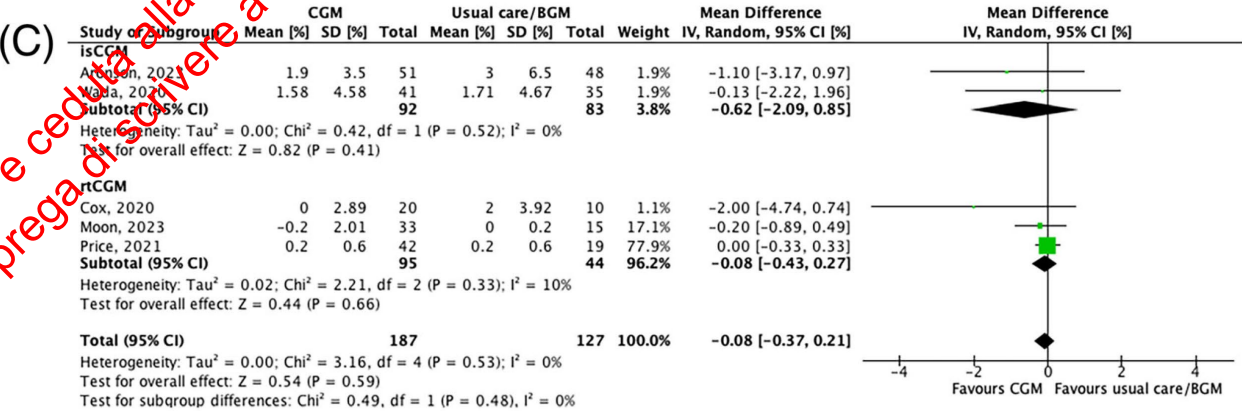
The meta-analysis of RCTs in noninsulin users included 8 studies encompassing 541 participants, among whom 297 (55%) were assigned to the CGM group.

HbA1c



Continuous glucose monitoring in noninsulin-treated type 2 diabetes: A critical review of reported trials with an updated systematic review and meta-analysis of randomised controlled trials Diabetes Obes Metab. 2025;27:6220–6242.

DIABETES
OBESITY AND
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TIR

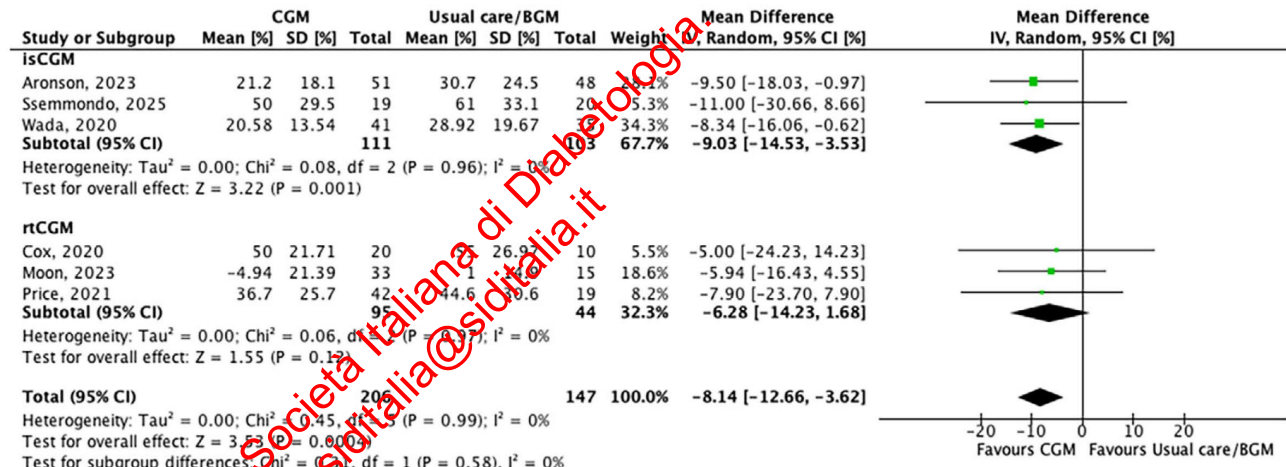
TBR 2

PRAGMATIC RECOMMENDATIONS FOR USING CGM IN NONINSULIN-TREATED ADULTS LIVING WITH TYPE 2 DIABETES

- Continuous Glucose Monitoring (CGM) should be considered to increase individual time in range and lower HbA1c
- CGM should be considered to improve patient glucose monitoring satisfaction and to reduce diabetes-related distress
- CGM may be considered as a component of structured diabetes and lifestyle counselling to optimize behavioural changes in diet management and physical activity.
- CGM can be used a useful tool to support healthcare provider decision-making to guide treatment intensification options
- CGM should be considered to reduce acute diabetes-related events and hospitalisations
- The choice of CGM device may be isCGM or rtCGM based on individual preferences and consideration of cost and coverage

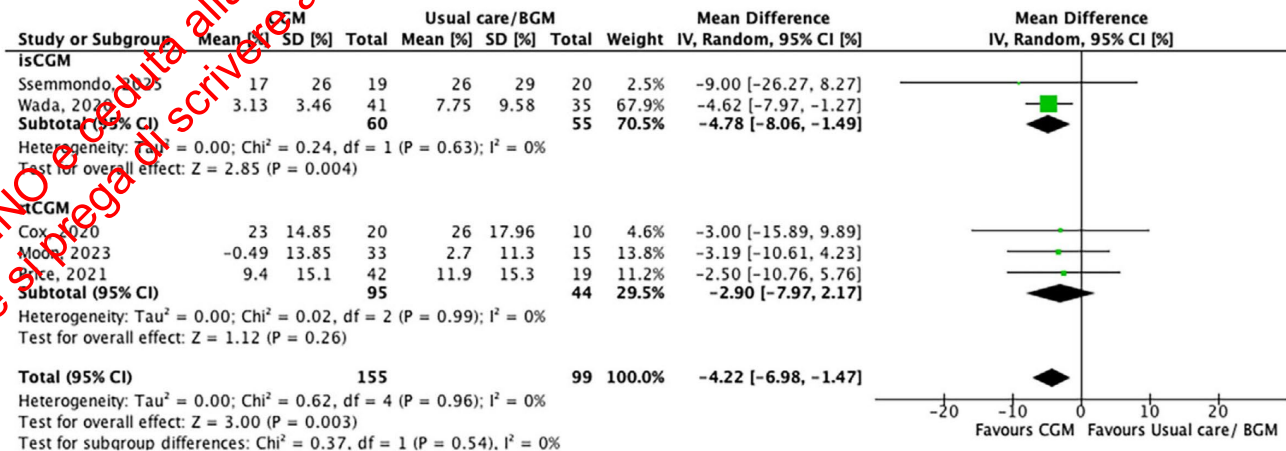
TAR 1

(E)



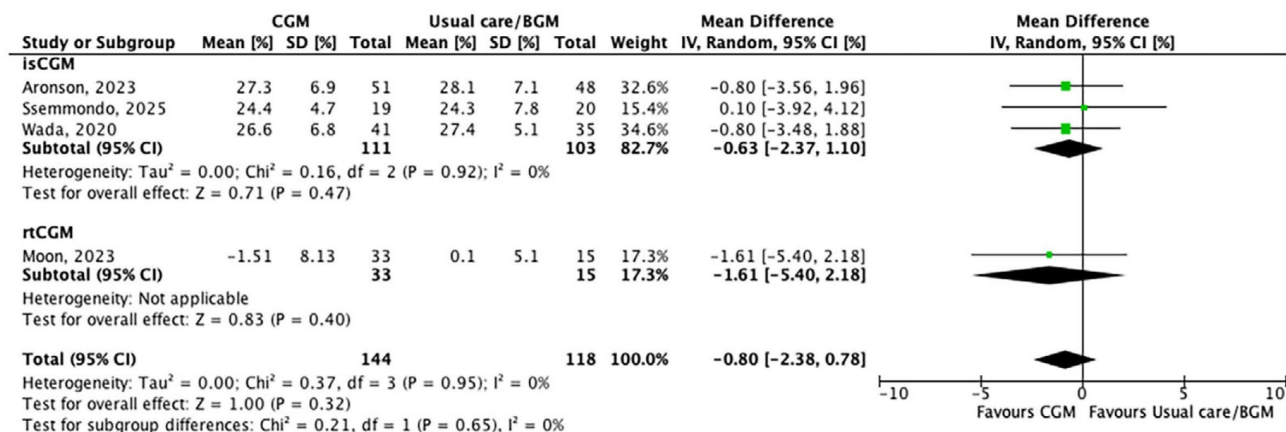
TAR 2

(F)



CV

(G)



DIABETES
OBESITY AND
METABOLISM

Linea Guida della Società Italiana di Diabetologia (SID) e dell'Associazione dei Medici Diabetologi (AMD)
La terapia del diabete mellito di tipo 2 – revisione 2025

Raccomandazione debole a favore del monitoraggio continuo della glicemia in pazienti trattati con terapia non insulinica. Qualità delle prove forte.

Si raccomanda il monitoraggio glicemico in continuo rispetto al controllo glicemico capillare per la misurazione della glicemia nei pazienti con diabete mellito di tipo 2 in trattamento farmacologico non insulinico, soprattutto in pazienti con emoglobina glicata $\geq 7\%$.

Esistono 7 studi effettuati con CGM in pazienti con diabete di tipo 2 non trattati con insulina. La meta-analisi di questi studi dimostra una riduzione significativa dell'endpoint critico emoglobina glicata. In 4 di questi studi è riportato anche il Time in Range (TIR). La meta-analisi di questi quattro studi dimostra un aumento significativo del TIR. Sia per HbA1c che per TIR non è presente una eterogeneità significativa. Nessun effetto sia nei singoli studi che nella loro meta-analisi, sembra essere presente sul Time below Range, nonostante alcuni pazienti siano trattati con sulfoniluree. La costo-efficacia è favorevole all'intervento. Accettabilità ed equità potrebbero variare in contesti diversi (rimborsabilità, età ed autonomia dei pazienti). In considerazione del minore rischio di ipoglicemie, considerati i valori elevati di glicata media degli studi esaminati ed in conformità con la raccomandazione 1.2.1, la raccomandazione per l'uso di CGM in questi pazienti è da considerarsi soprattutto in pazienti con emoglobina glicata $\geq 7\%$.

Table 2 | Proposed use of CGM throughout the natural history of T2DM

Group	At diagnosis and early disease	Management of stable disease	Long duration of disease ^a
All people with T2DM	Utilize CGM for 14 days after T2DM diagnosis Establish a baseline glucometric profile Provide education on the glycaemic response to diet and exercise in T2DM Decide on the initial treatment plan and therapy Evaluate the patient's early (14-day) response to T2DM treatment	Predict risk of microvascular complications Adjust therapy Manage glycaemic goals for time in range, time below range, time above range, glycaemic variability and glucose management indicator (CGM-defined HbA _{1c} correlate)	Facilitate T2DM therapy de-escalation in older and/or frail people with T2DM Prevent hypoglycaemia Reduce risk of cardiorenal complications (for example, chronic kidney disease) Reduce incidence and progression of microvascular disease Allow care workers to more effectively manage the care of people with T2DM
People with T2DM on: Multiple daily injections Basal insulin Premixed insulin Insulinotropic drugs ^b	Continuous access to CGM for daily use		
	Prevent hypoglycaemia Manage hyperglycaemia Support self-management	Prevention of hypoglycaemia Manage hyperglycaemia Facilitate periods of therapy escalation or de-escalation Support self-management	
People with T2DM on non-insulin therapy ^c	Intermittent use of CGM at least every 3 months, with HCP review		
	Reinforce education on glucose profiles, diet, physical activity and the effects of medication	Can be combined with a coincident HbA _{1c} test HCP can make decisions on whether to change therapy or not Predict changes in risk of microvascular complications People with T2DM can re-establish the behaviours of good self-management with support from CGM	

CGM, continuous glucose monitoring; HCP, health care professional; T2DM, type 2 diabetes mellitus. ^aPeople with long-standing T2DM, with risk of consequent comorbid microvascular and macrovascular disease. ^bPeople with T2DM at increased risk of frequent hypoglycaemia confirmed during a CGM-led medical review. ^cCan include people on insulinotropic oral drugs with low risk of hypoglycaemia confirmed during a CGM-led medical review.

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

- GEM was self-administered by 17 adults recently diagnosed with T2D (mean age 52 years, SD 11.6 years; mean T2D duration 3.9 months, SD 2.5 months; mean HbA1c levels 8.0%, SD 1.6%; 40% female; 33.3% non-White), with the aid of a 4-chapter pocket guide and diary, automated motivational text messaging, and feedback from an activity monitor, along with CGM and supplies for the 6-week intervention and the 3-month follow-up.
- Posttreatment mean ratings (0-4) for how helpful each of the different elements were: Libre 2 CGM=3.9, Fitbit=3.4, GEM Pocket Guide=2.9, diaries=2.6, GEM Supplement=2.5, and text messages=2.4.

Table 1. Variables, pretreatment, and 3 months post-glycemic excursion minimization intervention.

Variable	Pretreatment	3 months post-glycemic excursion minimization	P value	Baseline correlation with change in hemoglobin A _{1c} levels	Change in correlation with change in hemoglobin A _{1c} levels
Primary outcome variables, mean (SD)					
Hemoglobin A _{1c} levels (%)	8.0 (1.6)	6.3 (1.1)	<.001 ^a	−0.755 ^b	
Metformin (mg/day)	0 (0)	133 (516)	.33		−0.219
Mechanism variables					
Continuous glucose monitoring data, unblinded weeks 1 and 18, mean (SD)					
Percentage of time when continuous glucose monitoring values were >140 mg/dL	23.9 (28.9)	14.5 (22)	.03	−0.012	−0.086
Glucose variability	22.4 (10.1)	20.2 (8.3)	.08	0.132	−0.208
High-carbohydrate foods	39.6 (21.9)	10.3 (6.8)	<.001 ^a	−0.243	0.238
Low-carbohydrate foods	50.2 (20.8)	48.6 (20.0)	.69	−0.413	0.635 ^c
Secondary benefits, mean (SD)					
Diabetes knowledge	15.5 (3.0)	15.9 (3.0)	.53	0.061	0.555 ^c
Diabetes empowerment	31.0 (5.9)	34.6 (3.8)	.06	−0.253	0.251
Diabetes distress, emotional	2.2 (0.8)	1.8 (1.0)	.10	−0.580 ^c	0.015
Diabetes distress, regimen	2.8 (1.4)	1.8 (0.9)	.03	0.363	−0.052
Depressive symptoms	6.1 (4.5)	2.3 (3.9)	.001 ^a	0.400	0.132
BMI	36.5 (8.1)	34.4 (8.2)	.002 ^a	0.013	0.333

The use of continuous glucose monitoring in people living with obesity, intermediate hyperglycemia or type 2 diabetes

Tadej Battelino ^a · Nebojsa Lalic ^b · Sufyan Hussain ^{c,d,e} · Antonio Ceriello ^f · Sanja Klobucar ^g · Sarah J. Davies ^h · Pinar Topsever ⁱ · Julie Heverly ^j · Francesca Ulivi ^k · Kevin Brady ^l · Tsvetalana Tankova ^m · Júlia Galhardo ⁿ · Kostas Tagkalos ^o · Erik Werson ^p · Chantal Mathieu ^q · Peter Schwarz ^{r,s} [Show less](#)

Diabetes Res Clin Pract. 2025;223:112111



Consensus statements. People living with type 2 diabetes mellitus.

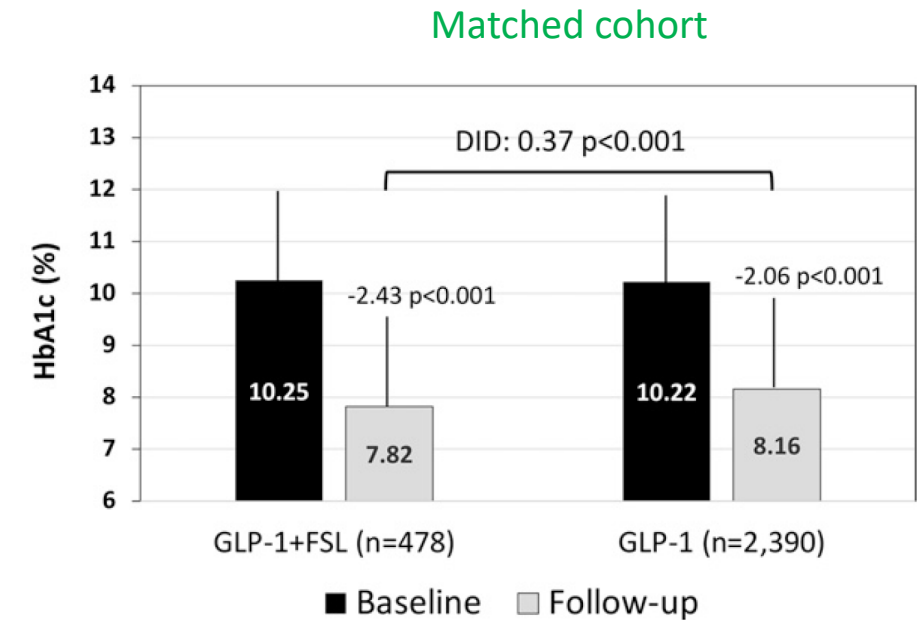
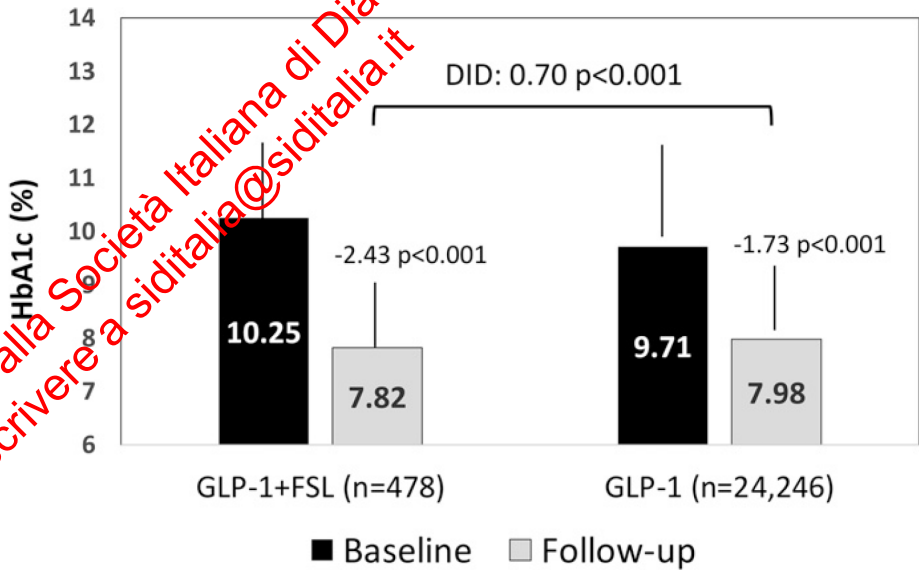
- The goal of reversing dysglycemia in people newly diagnosed with type 2 diabetes mellitus is achievable in many cases.
- Benefits at a global population level will only be realised if access to CGM technology is improved to enable widespread adoption, especially in developing countries where burden and impact from diabetes remains highest.
- For people with newly diagnosed type 2 diabetes mellitus, CGM should be applied to establish their baseline glycemic profile and deciding and monitoring their initial treatment approach. Where restoration of normoglycemia is assessed as achievable, use of CGM should be used as part of this approach.
- For people with type 2 diabetes mellitus on non-insulin therapy, CGM use should be considered as an educational and motivational tool during diabetes self-management education and support (DSMES) interventions targeted at diet, physical activity and exercise.
- CGM should be applied as standard of care in people living with type 2 diabetes mellitus on non-insulin therapies, at any point where treatment intensification or deintensification is required.
- For people with type 2 diabetes mellitus on insulin therapy, we endorse existing international recommendations on the access and use of CGM technology[144]
- Further developments and integration of CGM data is required to simplify interpretation for those with lower digital and health literacy.

Initiating GLP-1 Therapy in Combination with FreeStyle Libre Provides Greater Benefit Compared with GLP-1 Therapy Alone

This real-world study used Optum’s de-identified Market Clarity Data, a linked electronic health records (EHR)-claims database, and included adults with T2D and HbA1c $\geq 8\%$ who acquired their first GLP-1 RA medication between 2018 and 2022. GLP-1+FSL subjects acquired their first FSL within ≤ 30 days of their first GLP-1 acquisition.

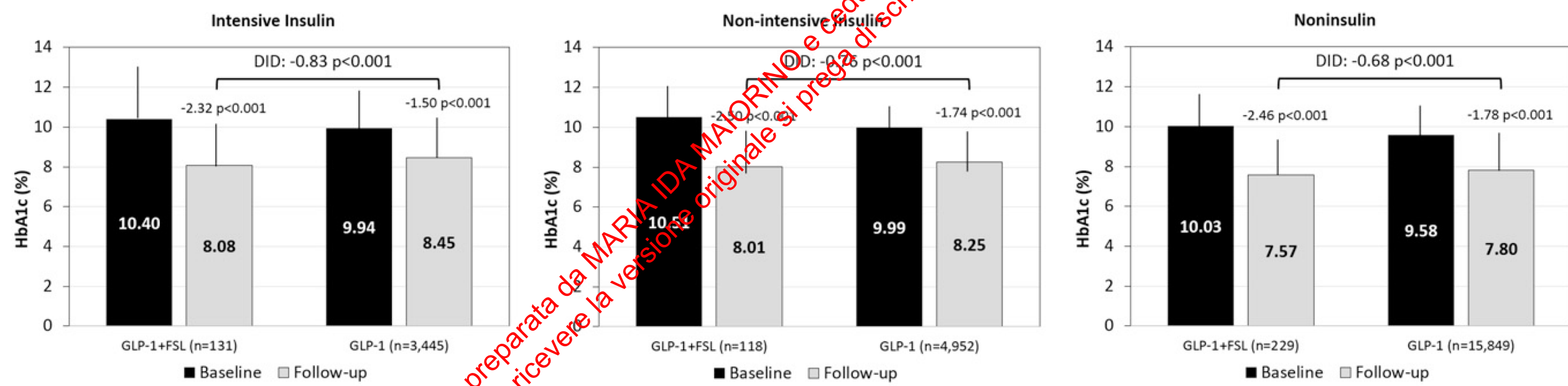
The study included 24,724 adults in the unmatched cohort (GLP-1+FSL, n = 478; GLP-1, n = 24,246).

The matched cohort included 478 GLP-1+FSL users and 2,390 GLP-1 users: mean age 53.5 $\pm$ 11.8 and 53.5 $\pm$ 11.3 years, HbA1c 10.25 $\pm$ 1.68% and 10.22 $\pm$ 1.69%, respectively.



Initiating GLP-1 Therapy in Combination with FreeStyle Libre Provides Greater Benefit Compared with GLP-1 Therapy Alone

This finding was seen in those on intensive insulin therapy, nonintensive insulin therapy, and noninsulin medications. This suggests that concomitant use of CGM with GLP-1 therapy may have an additive effect in helping patients achieve their glycemic targets.



Diapositiva preparata da MARIA IDA MAIORINO e ceduta alla Societa Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it

ORIGINAL RESEARCH

Switching from Multiple Insulin Injections to a Fixed Combination of Degludec and Liraglutide in Patients with Type 2 Diabetes Mellitus: Results from the Simplify Study After 6 Months

A subgroup of 55 patients underwent continuous glucose monitoring with the evaluation of CGM-derived parameters, such as time in range (TIR), time above range (TAR), time below range (TBR), hypoglycemia, and glucose variability.

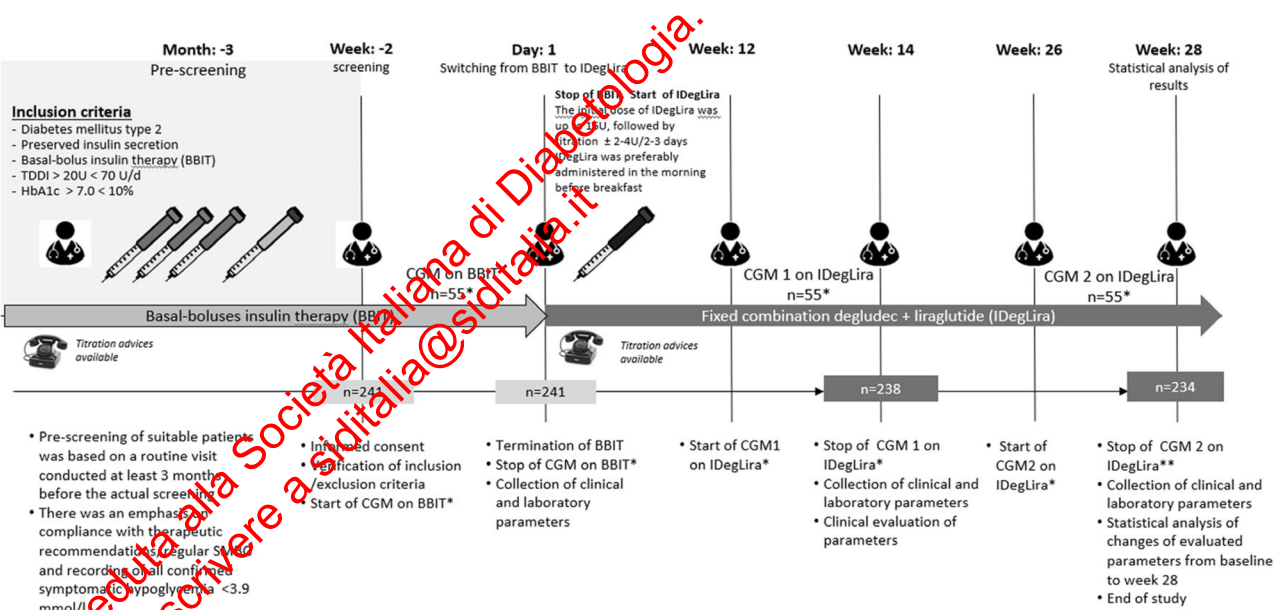
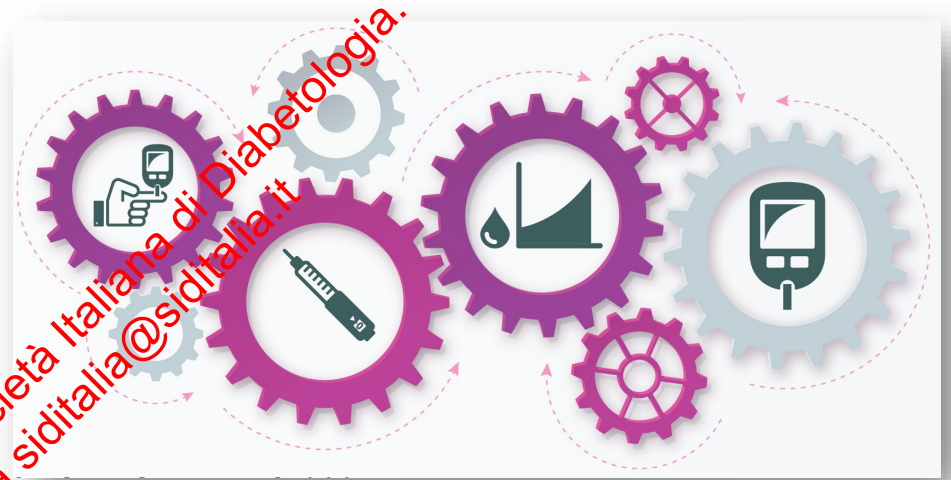


Table 3 Continuous glucose monitoring derived parameters. Change from baseline to week 28

Parameter	Patients (n = 55)			Baseline to week 28 P
	Baseline	Week 14	Week 28	
Time in range (%)	57.9 $\pm$ 25.3	68.9 $\pm$ 23.7	69.0 $\pm$ 17.5	0.01
Time above range (%)	40.1 $\pm$ 26.9	30.1 $\pm$ 24.8	28.8 $\pm$ 18.8	0.01
Time below range (%)	1.84 $\pm$ 4.00	1.00 $\pm$ 1.80	1.53 $\pm$ 2.94	n.s
Hypoglycemia—number of episodes per patient	2.55 $\pm$ 4.85	1.40 $\pm$ 2.51	1.33 $\pm$ 2.61	n.s
Hypoglycemia—proportion of patients (%)	52.7	38.2	38.2	n.s
Glucose variability (%)	28.6 $\pm$ 6.0%	25.9 $\pm$ 6.6%	27.8 $\pm$ 6.4%	n.s



Ritenete che l'uso del CGM per periodi limitati e intermittenti (es. 3 mesi) rappresenti uno strumento efficace per l'empowerment del paziente e per guidare eventuali modifiche della terapia non insulinica?

A: SI

B: NO

C: NON SO

Diapositiva preparata da MARIA IDA MAIORANO e presentata alla Società Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it

Enhancing Type 2 Diabetes Care With CGM Integration: Insights From an Italian Expert Group

Concetta Itrace¹ | Angelo Avogaro² | Federico Bertuzzi³ | Raffaella Buzzetti⁴ | Riccardo Candido⁵ | Stefano Del Prato⁶ | Paolo Di Bartolo⁷ | Paolo Fiorina^{8,9,10} | Carlo Bruno Giorda¹¹ | Francesco Giorgino¹²

Diabetes/Metabolism Research and Reviews, 2025; 41:e70059

Expert suggestion on intermittent CGM use for T2D patients on oral antidiabetic drugs.

Scenario	Reason
 Hypoglycaemia	Reduce fear of hypoglycaemia
 Young people	Better self-management during worktime, physical activity, and other everyday scenarios
 Old people needing care givers	Support care givers management
 Lack of adherence	Favour more medical contacts through telemonitoring and televisits; Favour intensification of treatment
 Need for multidisciplinary management	Favour connectivity
 During treatment escalation, de-intensification or modification	Earlier reach the target
 During lifestyle changes	Adapt the therapeutic regimen Educational role
 Before and after surgery or during acute events	Decrease short-term dysglycaemia-related complications
 During diabetes complications, such as gastroparesis	Adjust habits to one's own postprandial glycaemic profile
 In pregnancy	Adapt the therapeutic regimen Educational role
 In the first period after T2D diagnosis	Improve glycaemic stability, favour patient's education and self-knowledge, face the fear of hypoglycaemia

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Diabetes/Metabolism Research and Reviews, 2025; 41:e70059

Expert suggestion on intermittent CGM use for T2D patients on oral antidiabetic drugs.

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Diabetes/Metabolism Research and Reviews, 2025; 41:e70059

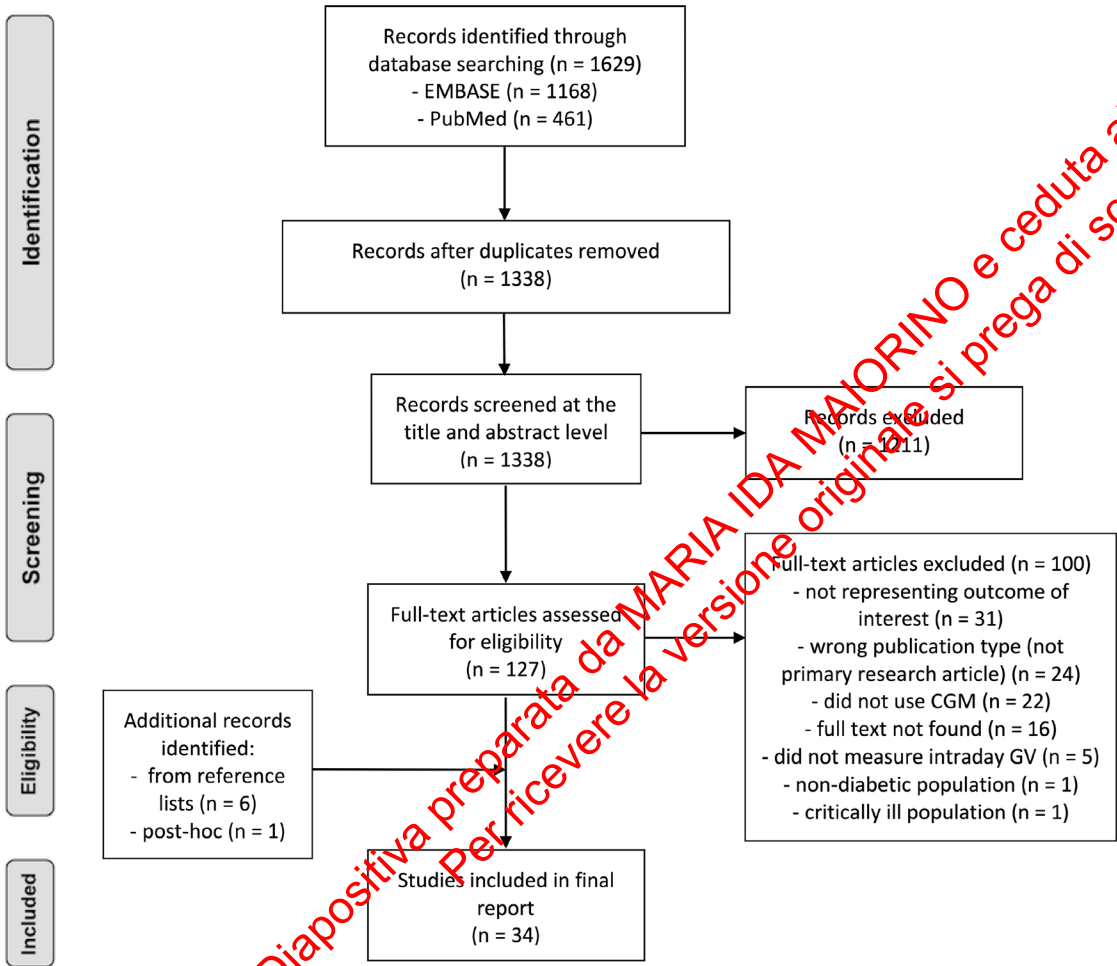
Expert suggestion on intermittent CGM use for T2D patients on oral antidiabetic drugs.

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Complications of Diabetes and Metrics of Glycemic Management Derived From Continuous Glucose Monitoring



Of the 20 852 total participants, 663 had type 1 diabetes (T1D) and 19 909 had type 2 diabetes (T2D).

Glycemic variability and low time in range (TIR) showed associations with all studied microvascular and macrovascular complications of diabetes.

Notably, higher TIR was associated with reduced risk of albuminuria, retinopathy, cardiovascular disease mortality, all-cause mortality, and abnormal carotid intima-media thickness.

Figure 2. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart.

Initiation of CGM Is Linked to Improved Glycemic Control and Fewer Clinical Events in Type 1 and Type 2 Diabetes in the Veterans Health Administration (VA)

	CGM Initiation vs Self-Monitoring Glucose	
	Type 1 Diabetes	Type 2 Diabetes
12-Month Change in HbA1c	n = 4930 vs n = 3263	n = 15,292 vs n = 28,467
CGM use leads to more reduction in 12-month HbA1c		
β (95% CI):	-0.26 (-0.33, -0.19) ↓	-0.35 (-0.42, -0.36) ↓
Clinical Events Over 12 Months	n = 5015 vs n = 3815	n = 15,706 vs n = 29,912
I. Hypoglycemia admissions	CGM use leads to reduced hypoglycemia admissions in T1D	
HR (95% CI):	0.69 (0.48, 0.98) ↓	0.93 (0.74, 1.16)
II. Hyperglycemia admissions	CGM use leads to reduced hyperglycemia admissions in T2D	
HR (95% CI):	0.83 (0.65, 1.06)	0.87 (0.77, 0.99) ↓
III. All hospitalizations	CGM use leads to reduced hospitalizations	
HR (95% CI):	0.75 (0.63, 0.93) ↓	0.89 (0.82, 0.87) ↓

HbA1c, glycated hemoglobin; T1D, type 1 diabetes; T2D, type 2 diabetes.
Reaven PD, et al. Diabetes Care. 2023;46:854-863.

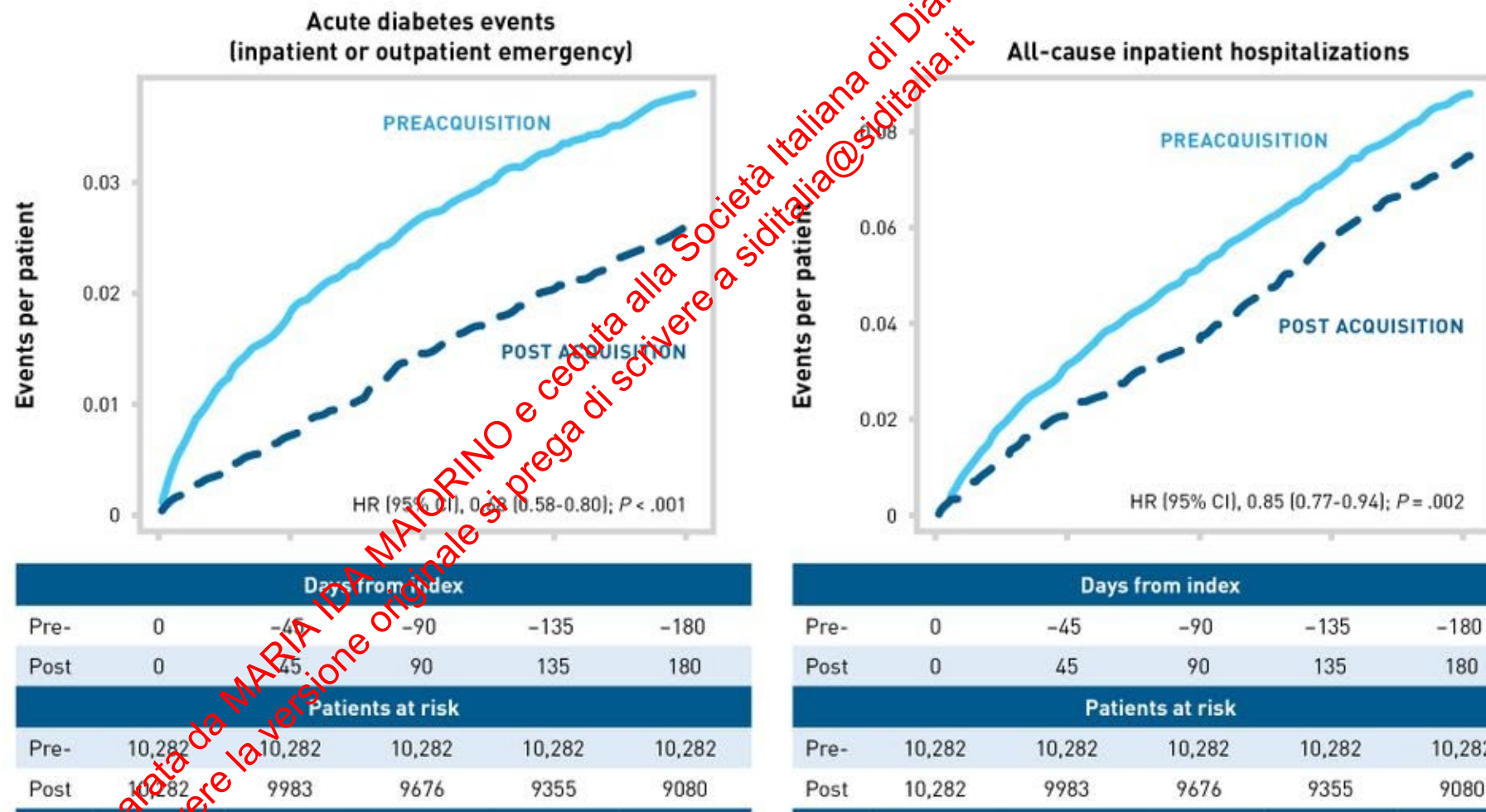
Flash CGM Associated With Event Reduction in Nonintensive Diabetes Therapy

The analysis included patients with a diagnosis of T2D, aged 18 years or older, naïve to CGM, and who acquired their flash CGM system during the period between October 2017 and March 2019.

Acute events included hypoglycemia, hypoglycemic coma, hyperglycemia, diabetic ketoacidosis (DKA), and hyperosmolarity.

A cohort of 10,282 adult patients with T2D was identified for assessment.

FIGURE 1. Changes in (A) ADE and (B) ACH^a



ACH, all-cause inpatient hospitalization; ADE, acute diabetes-related event; CGM, continuous glucose monitoring.

^aFigure shows reduction in ADEs and ACHs from the 6-month period pre-flash CGM acquisition (solid line, light blue) to the 6-month period post flash CGM acquisition (dashed line, dark blue). Cumulative event rate is based on a Nelson-Aalen estimator. Results of weighted Cox regression with Andersen-Gill extension are presented as HRs with 95% CIs and P values.

Effect of Continuous Glucose Monitoring on Hypoglycemia in Older Adults With Type 1 Diabetes

A Randomized Clinical Trial

Question Is continuous glucose monitoring effective in reducing hypoglycemia compared with standard blood glucose monitoring in older adults with type 1 diabetes?

Findings In this randomized clinical trial that included 203 adults aged 60 years or older with type 1 diabetes, treatment for 6 months with continuous glucose monitoring compared with standard blood glucose monitoring resulted in a significantly lower percentage of glucose values less than 70mg/dL (adjusted difference, 1.9%).

Meaning Among older adults with type 1 diabetes, continuous glucose monitoring resulted in a small but statistically significant improvement in hypoglycemia over 6 months.

Table 2. Glycemic Outcomes

Outcomes	Baseline		Follow-up (8, 16, and 26 wk pooled) ^a		Adjusted difference, CGM – standard BGM (95% CI) ^b	P value ^b
	CGM (n = 103)	Standard BGM (n = 100)	CGM (n = 102)	Standard BGM (n = 94)		
Primary outcome						
Time with glucose <70 mg/dL, %	5.1 (3.0-9.7)	4.7 (2.4-9.5)	2.7 (1.6-4.6)	4.9 (2.5-8.5)	-1.9 (-2.8 to -1.1)	<.001
Secondary continuous glucose monitoring outcomes						
Hours of CGM data, median (IQR)	324 (308-388)	324 (309-397)	473 (449-489)	465 (423-483)		
Hypoglycemia, median (IQR)						
Time with glucose <60 mg/dL, %	3.0 (1.5-5.5)	2.4 (1.1-5.9)	0.9 (0.5-1.9)	2.4 (0.8-5.1)	-1.4 (-2.0 to -0.8)	<.001
Time with glucose <54 mg/dL, %	1.9 (0.9-3.6)	1.5 (0.5-4.1)	0.5 (0.2-1.0)	1.6 (0.4-3.4)	-1.0 (-1.4 to -0.5)	<.001
Rate of hypoglycemia events per wk ^c	1.6 (1.5-3.9)	2.1 (0.9-4.1)	0.8 (0.3-2.2)	1.8 (0.7-4.0)	-0.9 (-1.3 to -0.5)	<.001
Time with glucose in range of 70-180 mg/dL, mean (SD), %	56 (13)	56 (14)	63 (13)	54 (14)	8.8 (6.0 to 11.5)	<.001
Glucose level, mean (SD), mg/dL	167 (29)	168 (31)	162 (23)	171 (30)	-7.7 (-13.1 to -2.4)	.005
Coefficient of variation, mean (SD), % ^d	41 (6)	42 (7)	37 (5)	42 (7)	-4.7 (-6.1 to -3.3)	<.001
Hyperglycemia						
Time with glucose >180 mg/dL, mean (SD), %	37 (16)	38 (17)	34 (14)	39 (16)	-5.8 (-8.8 to -2.8)	<.001
Time with glucose >150 mg/dL, mean (SD), %	10 (6-21)	13 (5-20)	9 (3-15)	13 (8-23)	-3.6 (-5.2 to -2.2)	<.001
Time with glucose >300 mg/dL, median (IQR), %	3.8 (1.5-8.5)	4.2 (1.3-9.4)	2.4 (0.6-5.2)	5.2 (2.2-9.4)	-1.7 (-2.5 to -0.9)	<.001
Secondary HbA _{1c} outcome						
HbA _{1c} , mean (SD), % ^e	7.6 (0.9) [n = 100]	7.5 (0.8) [n = 97]	7.2 (0.9) [n = 100]	7.4 (0.9) [n = 95]	-0.3 (-0.4 to -0.1)	<.001

Original Article

Impact of Age ≥ 75 Years on Glycemic Outcomes After Intermittently Scanned Continuous Glucose Monitoring (isCGM) Initiation in Type 2 Diabetes: Evidence Against Ageism in a Universal-Coverage System

Endocr Pract. 2026 Jan 7:S1530-891X(25)01352-7

Objective: To assess whether adults aged ≥ 75 years with type 2 diabetes (T2D) treated with multiple daily insulin injections achieve glycemic improvements comparable to younger adults after initiation of intermittently scanned continuous glucose monitoring (isCGM) within a universal-coverage health system.

Methods: Post hoc subanalysis of a retrospective multicenter cohort from 3 hospitals. Adults with T2D on multiple daily insulin injections who initiated isCGM had glycated hemoglobin A1c (HbA1c) measured ≤ 1 month preinitiation and ≥ 3 months post-initiation.

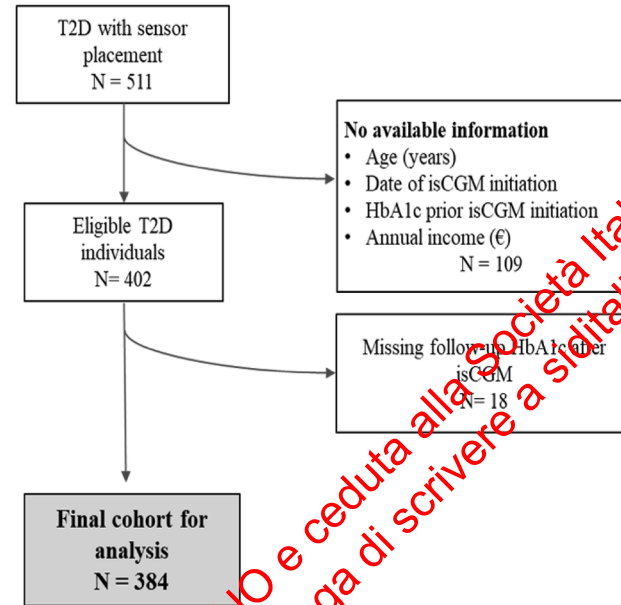


Fig. 1. Flowchart diagram. HbA1c = glycated hemoglobin; isCGM = intermittently scanned continuous glucose monitoring; T2D = type 2 diabetes.

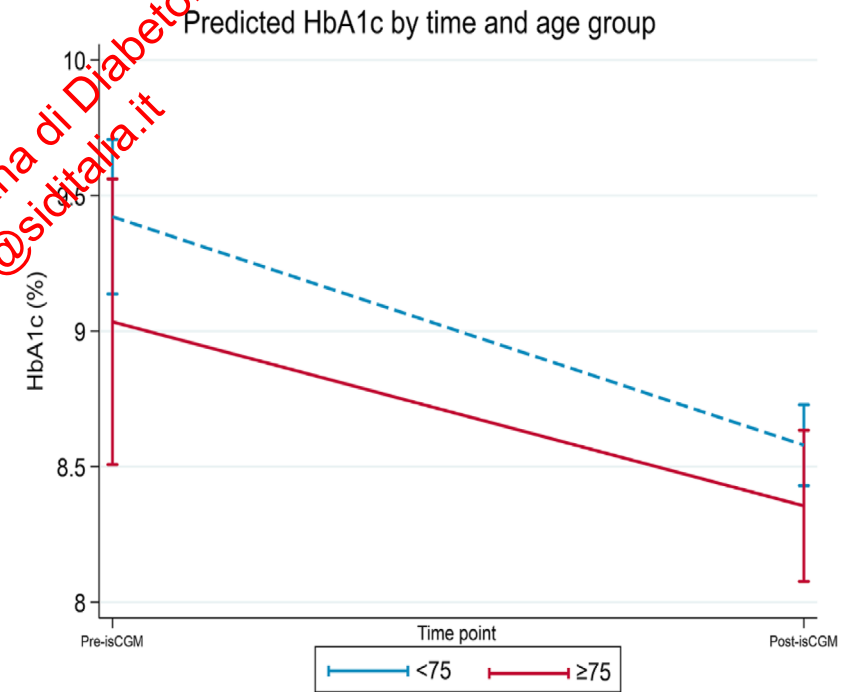
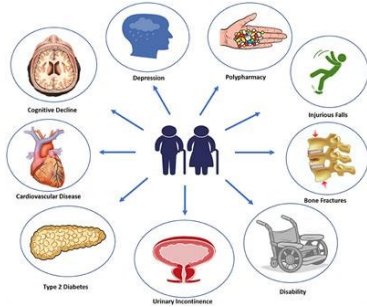


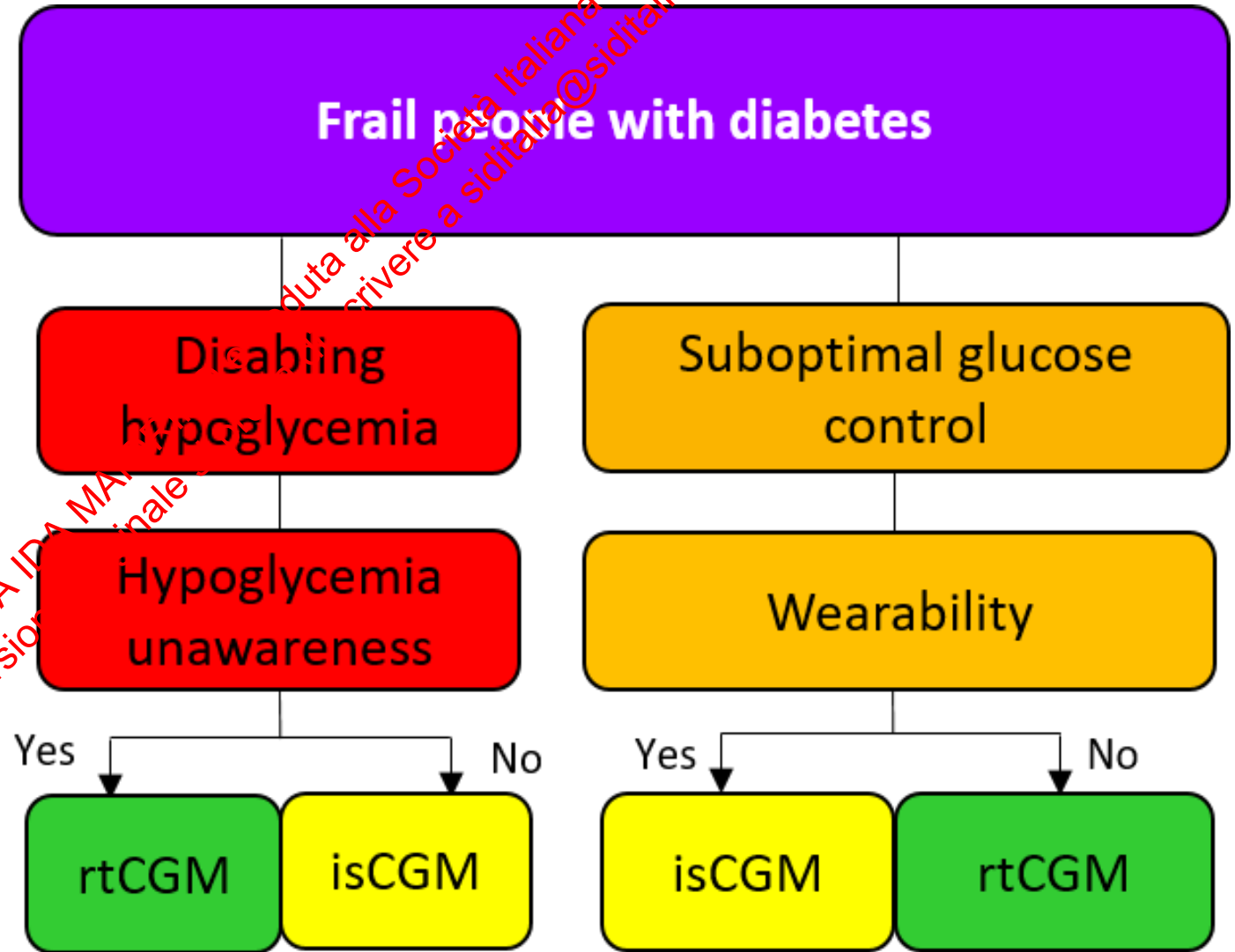
Table 2
Mixed-Effects Linear Regression Model Assessing HbA1c Variation Over Time According to Age ≥ 75 Years

Variable	Coefficient (β)	95% CI	P value
Time (post vs pre)	-0.843	-1.016 to -0.669	<.001
Age ≥ 75 y	-0.388	-0.988 to 0.213	.206
Interaction: Time $\times$ Age ≥ 75 y	0.164	-0.199 to 0.527	.376
Sex (female)	0.213	-0.017 to 0.443	.070
Smoking (current)	0.503	0.201 to 0.805	.001
BMI (kg/m ²)	0.018	-0.007 to 0.043	.149
Other antidiabetic agents	0.033	-0.077 to 0.143	.556
Nephropathy	0.035	-0.187 to 0.256	.760
Net income (per unit)	-0.000017	-0.000039 to 0.000005	.129

An updated algorithm for an effective choice of continuous glucose monitoring for people with insulin-treated diabetes



- In frail people with insulin-treated diabetes able to use the devices (either by themselves or with a caregiver) and recurrent hypoglycemic episodes without hypoglycemia awareness, a rtCGM should be suggested in order to reduce the risk of hypoglycemic events.
- If the awareness of hypoglycemia is preserved, an isCGM may be considered. In the case of suboptimal glycemic control, the choice of a rtCGM or isCGM should be based on the wearability and portability of the devices and individual preferences



**Original Investigation** | Diabetes and Endocrinology

Continuous Glucose Monitoring in Insulin-Treated Older Adults With Diabetes and Alzheimer Disease and Related Dementias

Pareeta Kotecha, PharmD, MS; Steven M. Smith, PharmD, MPH; William T. Donahoo, MD, FTOS; Steven T. DeKosky, MD; Jiang Bian, PhD; Jingchuan Guo, MD, PhD

Abstract

IMPORTANCE Cognitive impairment and glycemic control have a bidirectional association. Understanding the impact of continuous glucose monitoring (CGM) vs self-monitoring of blood glucose (SMBG) is important for treating older adults with Alzheimer disease and related dementias (ADRD) and diabetes that is treated with insulin.

OBJECTIVE To compare the risks of glycemic outcomes and related adverse events between CGM users and prevalent SMBG users in insulin-treated older adults with ADRD and diabetes.

DESIGN, SETTING, AND PARTICIPANTS This retrospective, prevalent-new user cohort study utilized a nationwide, 15% random sample of Medicare claims data (Parts A, B, and D) from January 2016 to December 2020 to ensure balanced cohorts. Insulin-treated older adults (≥ 66 years) with ADRD and diabetes were included. Individuals in hospice care or with a professional CGM use were excluded. Analysis was carried out from August 2023 to December 2024.

EXPOSURE Therapeutic CGM use vs prevalent SMBG use.

MAIN OUTCOMES AND MEASURES Primary outcomes included hypoglycemia hospitalizations, hyperglycemia crisis, and all-cause mortality; falls and all-cause hospitalizations were secondary outcomes. Upper respiratory tract infections served as a negative control outcome. A 1:1 propensity score matching with a 0.25 caliper was carried out for confounding control. Cox proportional hazards models were used for outcome analysis.

Key Points

Question Is the use of continuous glucose monitoring (CGM) associated with improved glycemic outcomes and related adverse events in insulin-treated older adults with Alzheimer disease and related dementias (ADRD) and diabetes?

Findings This cohort study of 1011 CGM users and 1011 prevalent SMBG users who were propensity score-matched found that CGM use was associated with a significantly lower risk of all-cause hospitalization and all-cause mortality, while associations with glycemic outcomes varied.

Meaning This study highlights the potential long-term benefits of CGM in insulin-treated older adults with diabetes and ADRD and the need for clinical trials in this population.

Figure 2. Cumulative Incidence of Primary Outcomes in a 1:1 Matched Cohort of Continuous Glucose Monitoring (CGM) Users vs Prevalent Self-Monitoring of Blood Glucose (SMBG) Users

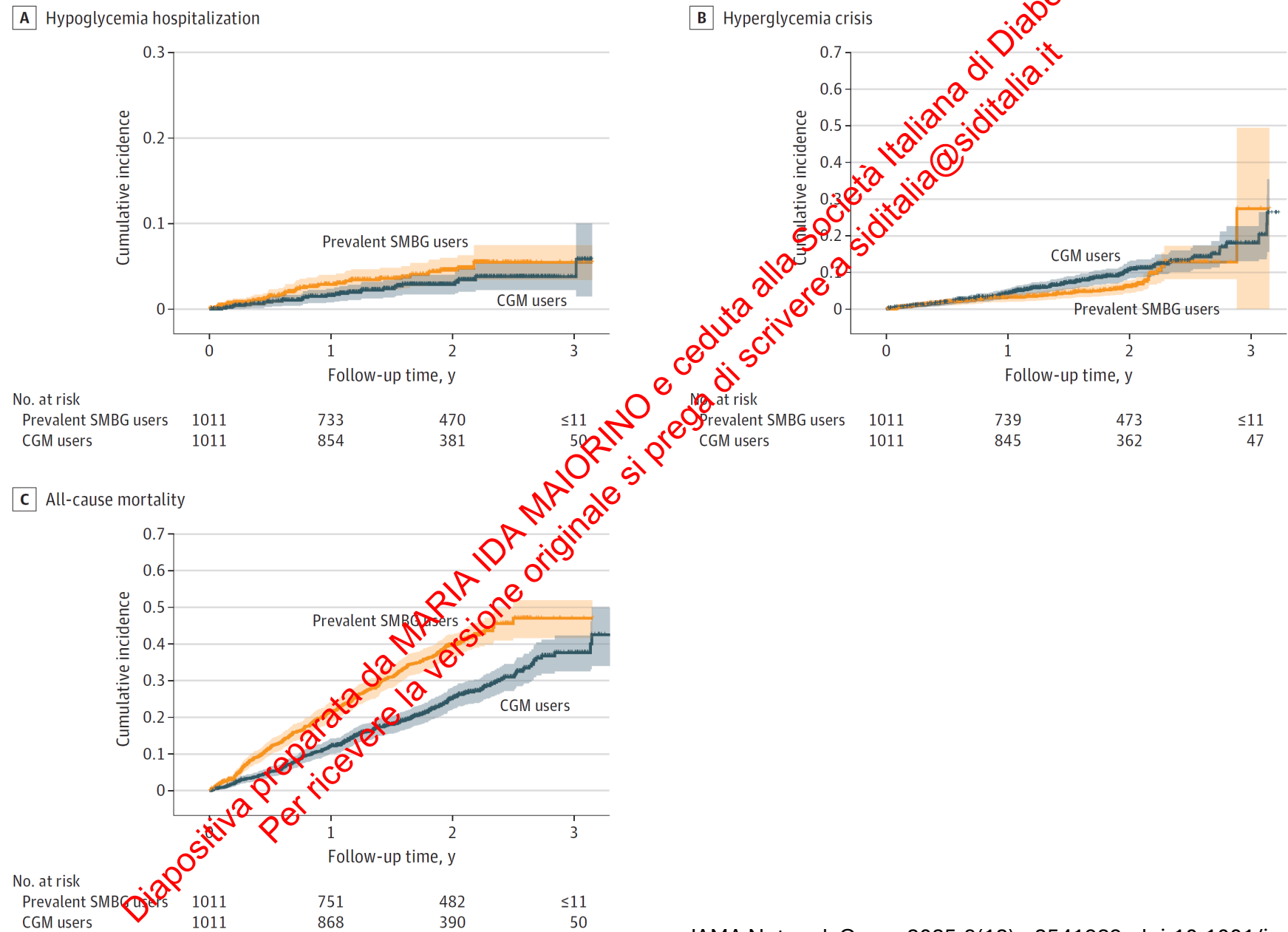
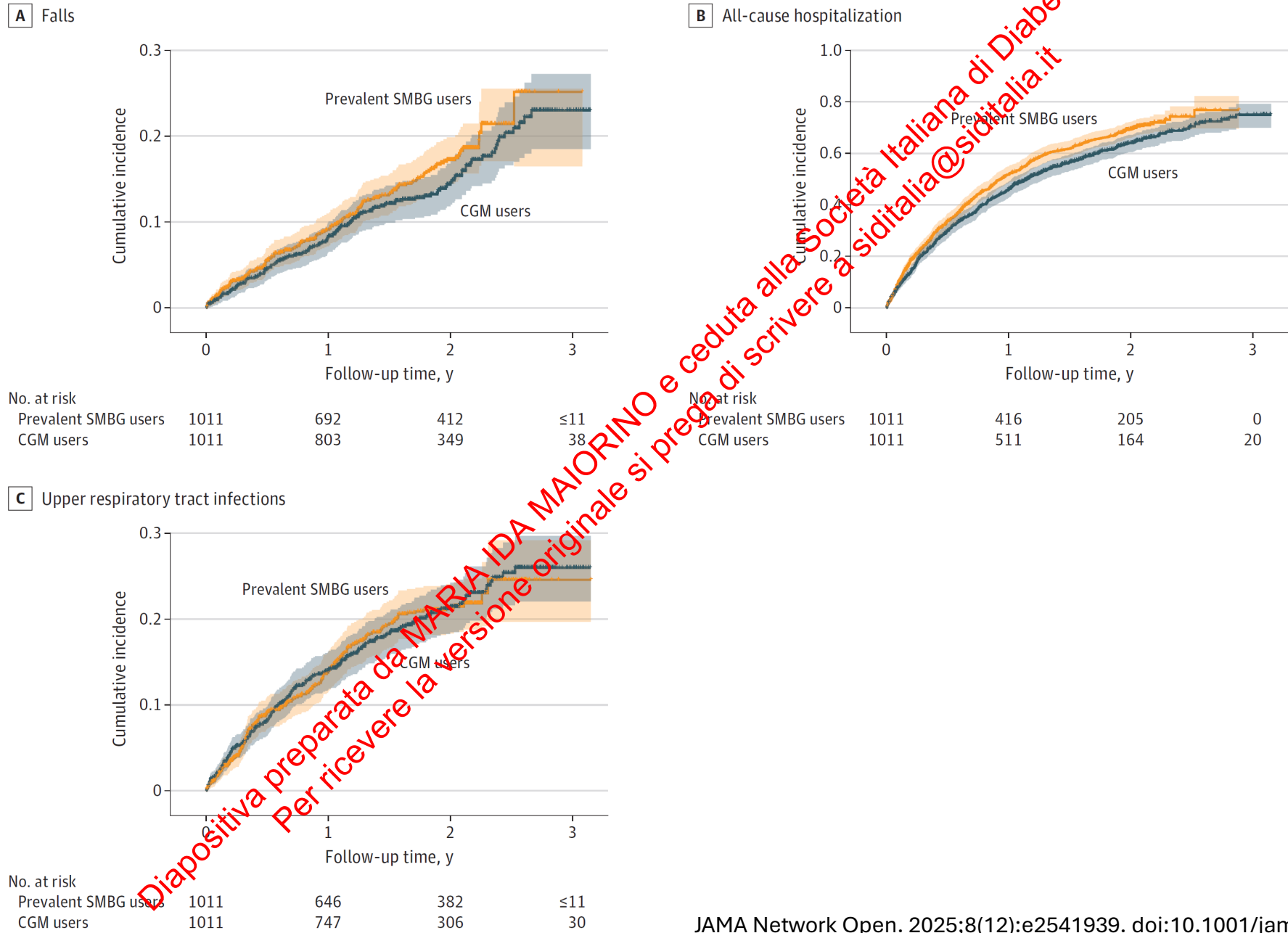


Figure 3. Cumulative Incidence of Secondary and Negative Control Outcomes in a 1:1 Matched Cohort of Continuous Glucose Monitoring (CGM) Users vs Prevalent Self-Monitoring of Blood Glucose (SMBG) Users





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2.4 In conditions associated with an altered relationship between A1C and glycemia, such as some hemoglobin variants, pregnancy, glucose-6-phosphate dehydrogenase deficiency, HIV, and conditions that may alter red blood cell turnover, plasma glucose criteria should be used to diagnose diabetes. **B**

Diabetes Care 2026;49(Supplement_1):S27–S49

<https://doi.org/10.2337/dc26-S002>

“A1C may not be a suitable diagnostic test in people with anemia, people treated with erythropoietin, or people undergoing hemodialysis or HIV treatment”

Glycemic Assessment

Diabetes Care 2026;49(Supplement_1):S132–S149

<https://doi.org/10.2337/dc26-S006>

Recommendations

6.1 Assess glycemic status by A1C **A** and/or continuous glucose monitoring (CGM) metrics such as time in range, time above range, and time below range. **B** Fructosamine or CGM can be used for glycemic monitoring when an alternative to A1C is required. **B**

6.2 Assess glycemic status at least two times a year, and more frequently (e.g., every 3 months) for individuals not meeting glycemic goals or with recent treatment changes, frequent or severe hypoglycemia or hyperglycemia, or changes in health status, or during periods of rapid growth and development in children and adolescents. **E**

Diapositiva preparata da MARIA IDA MAIORINO e ceduta alla Società Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it

Time in Range

Key metric of Glucose control

TIR may be useful when HbA1c is not reliable for glycemic status and goals:

- Hemoglobinopathy
- Iron-deficient anemia
- CKD

Estimates of Percentage of Time in Range relative to A1C and Average Glucose

Beck 2019 (N = 455 participants with T1D)		Vigersky 2019 (N = 1137 participants with T1D or T2D)		Average - Beck and Vigersky	
%TIR 70–180 mg/dL	A1C, %	%TIR 70–180 mg/dL	A1C, %	%TIR 70–180 mg/dL	A1C, %
20%	9.4	20%	10.6	20%	10.0
30%	8.9	30%	9.8	30%	9.4
40%	8.4	40%	9.0	40%	8.7
50%	7.9	50%	8.3	50%	8.1
60%	7.4	60%	7.5	60%	7.5
70%	7.0	70%	6.7	70%	6.9
80%	6.5	80%	5.9	80%	6.2
90%	6.0	90%	5.1	90%	5.6

CKD, chronic kidney disease.

Beck RW, et al. J Diabetes Sci Technol. 2019;13:614-626; Vigersky RA, et al. Diabetes Technol Ther. 2019;2181-2185.



Characterisation of transfusion-dependent prediabetes using continuous glucose monitoring: The Haemoglycare study

Angela Zanfardino^{a,*}, Gulsum Ozen^{a,b,d}, Giorgia Ippolito^a, Domenico Roberti^c,
Silverio Perrotta^c, Dario Iafusco^a, Emanuele Miraglia del Giudice^a, Maddalena Casale^c

- Patients resulted negative to the screening tests for glucose disorders were compared to healthy controls using CGM system for 7 days.
- HbA1c was falsely elevated in patients, despite normal mean glucose and GMI. Standard deviations and coefficients of variation were higher in patients than controls.
- CGM identified 37 % of patients with prediabetes. These cases had not been detected using traditional screening tests, highlighting the high sensitivity of glucose sensors to dysglycaemia when appropriate cutoffs and parameters are applied. Our data define the profile of transfusion-dependent prediabetes using a TAR140 >6 % cutoff.

Table 2

Comparison of glycated hemoglobin (HbA1c) and continuous glucose monitoring (CGM) glucose metrics between patients and controls *p value < 0.05.

	<i>Patient with thalassemia (cases) n = 19</i>	<i>Healthy volunteers (controls) n = 20</i>	<i>p</i>
GMI,% (mean ± SD)	5.34 ± 0.4	5.29 ± 0.1	n s
HbA1c mmol/mol (mean ± SD) % (mean ± SD)	49 ± 9.81 6.7 ± 0.9	33 ± 2.18 5.2 ± 0.2	<0.001
Mean glucose,mg/dl (mean ± SD)	104 ± 11.5	101 ± 6	n s
SD,mg/dl (mean ± SD)	17.93 ± 4.22	14.55 ± 2.2	0.003*
CV, % (mean ± SD)	17.22 ± 3.6	14.42 ± 1.94	0.004*
Number of participants with Glucose values ≥ 200 mg/dl	1/19 (5 %)	0/20 (0 %)	n s
Number of participants with Glucose values ≥ 140 mg/dl	16/19 (84 %)	17/20 (85 %)	n s
TAR ≥ 200,% (median; IQR)	0 (0–0)	0 (0–0)	n s
TAR ≥ 140,% (median; IQR)	3 (1–9)	1.5 (1–2)	n s
TBR < 70,% (median; IQR)	1 (0–3)	1 (0–1)	n s
Number of participants with. TAR ≥ 140 2 %	10/19 (52 %)	4/20 (20 %)	0.034
Number of participants with. TAR ≥ 140 > 6 %	7/19 (37 %)	0/20 (0 %)	0.003

Table 2 Outcomes of interests and findings of the selected studies (*n* = 12)

References	No. of pts	Design	Arms	Type of CGM	Follow-up (Days)	Outcome of interest	Findings
Gai et al. [24]	36	Perspective observational	1	r-CGM	6	Glycemic monitoring in HD	Glycemic fluctuations and hypoglycemia during HD
Jin et al. [31]	46	Perspective observational	2	r-CGM	3	Glycemic monitoring in HD	Glycemic fluctuations during HD
Jung et al. [33]	9	Perspective observational	1	r-CGM	6	Glycemic monitoring in HD	No glycemic fluctuations but increased risk of hypoglycemia during HD
Chantrel et al. [29]	33	Perspective observational	1	rt-CGM	90	Glycemic monitoring in HD	Glycemic fluctuations and hypoglycemia during HD
Mirani et al. [36]	12	Perspective observational	1	r-CGM	2	Glycemic monitoring in HD	Large glycemic fluctuations during HD
Riveline et al. [38]	58	Perspective observational	2	r-CGM	4	Glycemic monitoring in HD	No glycemic fluctuations during HD
Kazempour-Ardebili et al. [34]	17	Perspective observational	1	r-CGM	2	Glycemic monitoring in HD	Glycemic fluctuations and hypoglycemia during HD
Divani et al. [30]	37	Perspective observational	1	r-CGM	2	Validity/accuracy of CGM in HD	CGM is accurate in glycemic monitoring
Képénékian et al. [29]	27	Perspective observational	1	rt-CGM	90	Improving DM therapy in HD	Improved glycemic control with CGM
Joubert et al. [32]	15	Perspective observational	1	r-CGM	90	Improving DM therapy in HD	Large glycemic fluctuations during HD and improved glycemic control with CGM
Mori et al. [37]	1	Case report	1	rt-CGM	2	Glycemic monitoring in HD	Glycemic fluctuations and hypoglycemia during HD
Yajima T et al. [39]	13	Perspective observational	1	r-CGM/ FGM	2	Glycemic monitoring in HD	Accuracy of FGM in HD



Continuous glucose monitoring in patients with type 2 diabetes on hemodialysis

Maurizio Gallieni^{1,2} · Cristina De Salvo² · Maria Elena Lunati³ · Antonio Rossi³ · Francesca D'Addio⁴ · Ida Pastore³ · Granmarco Sabiu² · Roberta Miglio² · Gian Vincenzo Zuccotti⁵ · Paolo Fiorina^{3,4,6}

- All studies reported a higher mean amplitude of glucose variations on the hemodialysis day. Three studies agreed that continue glucose monitoring is better than HbA1c in detecting these abnormalities. Moreover, continue glucose monitoring was more accurate and perceived as easier to use by patients and their caregivers.
- In patients with type 2 diabetes on hemodialysis, glucose levels show different variation patterns than the patients on hemodialysis without diabetes.
- Considering manageability, accuracy, and costeffectiveness, continue glucose monitoring could be the ideal diagnostic tool for the patient with diabetes on hemodialysis

REVIEW

Open Access



Continuous glucose monitoring in kidney transplant recipients: a narrative review

- Studies demonstrate higher glucose variability in kidney only recipients compared to other organ recipients, and in type 2 diabetes patients compared to those with PTDM.
- Poor perioperative glycemic control and glycemic variability detected by CGM have been linked to acute rejection and reduced graft survival. CGM-derived metrics outperform conventional glucose measures in predicting PTDM.
- CGM metric thresholds within the first month posttransplant achieved sensitivities above 85% and specificities up to 83% for PTDM risk.
- CGM-guided adjustment of immunosuppressants and steroid dosing have been shown to reduce hyperglycemia and variability.
- Comparative studies indicate that glycosylated hemoglobin A1c correlates poorly with CGM in the early post-transplant period, often misclassifying patients as normoglycemic.
- CGM appears to offer clinically relevant insights for the early detection, prediction, and management of dysglycemia in kidney transplant recipients.

LINEE DI INDIRIZZO PER LA PRESCRIZIONE DELLE TECNOLOGIE APPLICATE AL TRATTAMENTO E ALL'AUTOCONTROLLO DEL DIABETE MELLITO

AGGIORNAMENTO 2025



CGM BASE	ETÀ ADULTA
Sistemi CGM a minor impatto economico	
	Adulti con diabete in terapia insulinica (basale o multi-iniettiva), con una durata del piano di 12 mesi.
	Adulti con diabete tipo 2 (o altro tipo di diabete non autoimmune) in terapia insulinica basale (durata piano 12 mesi)*.
	Adulti con diabete tipo 2 (o altro tipo di diabete non autoimmune) in terapia ipoglicemizzante non insulinica, solo per un periodo limitato di 3 mesi (consecutivi o non consecutivi a giudizio del curante)** in condizioni particolari: -modifica terapia -scompenso glicemico -variabilità glicemica -necessità di educazione alla gestione della malattia.
	Adulti con diabete per un periodo limitato di 3-6 mesi in una delle seguenti condizioni**: -ricovero ospedaliero -condizioni cliniche richiedenti terapia cortisonica prolungata -diabete secondario.
	Adulti con patologie endocrine associate ad alterazioni del metabolismo glucidico (panipituitarismo, insufficienza corticosurrenalica, iperinsulinismo congenito, altro) per un periodo limitato di 3-6 mesi.

CGM con allarmi soglia (is-CGM e rt-CGM)	ETÀ ADULTA
	La scelta del dispositivo deve essere effettuata in base alle circostanze, alle preferenze e alle esigenze dell'individuo.
	Diabete tipo 1 (DT1) in terapia insulinica multi-iniettiva o con microinfusore di insulina;
	Diabete tipo 2 (DT2) o diabete secondario in terapia insulinica multi-iniettiva (insulina basale + almeno due somministrazioni al giorno di analogo ad azione rapida o ultrarapida dell'insulina);
	Donne con diabete pre-gestazionale e gestazionale (GDM) in terapia insulinica basale ;
	Diabete tipo 2 (DT2) o altri tipi di diabete in terapia insulinica che praticano meno di tre somministrazioni/die ad alto rischio di ipoglicemia, in cui, per condizioni lavorative o stili di vita, un controllo frequente è consigliabile ma non praticabile;
	Persone con sindromi ipoglicemiche in controllo terapeutico inadeguato (Es. glicogenosi, mutazioni ABCC8, insulinoma, altro).

CGM con allarmi predittivi (rt-CGM)	ETÀ ADULTA
	La scelta del dispositivo deve essere effettuata in base alle circostanze, alle preferenze e alle esigenze dell'individuo.
	adulti con diabete mellito in MDI/CSII con ipoglicemia problematica per la vita del paziente: asintomatica, ricorrente, severa;
	donne in gravidanza in terapia multi-iniettiva per migliorare il compenso metabolico e gli outcomes neonatali (solo dispositivi con sensore transcutaneo);
	pazienti con diabete in terapia MDI/CSII e comorbidità rilevanti e/o complicanze microvascolari e macrovascolari (cardiopatia ischemica, IRC di stadio avanzato, neuropatia autonoma vegetativa, gastroparesi, retinopatia diabetica) che presentano ipoglicemie ripetute.

Article

The Glycemia Risk Index (GRI) as a Biomarker for Subclinical Endothelial Dysfunction in Type 1 Diabetes: A Cross-Sectional Study

Nicole Di Martino ¹, Silvia Angelino ^{1,2,3}, Antonietta Maio ¹, Paolo Cirillo ², Alessandro Pontillo ¹, Mariangela Caputo ¹, Lorenzo Scappaticcio ², Paola Caruso ¹, Miriam Longo ^{2,4}, Giuseppe Bellastella ^{1,2}, Maria Ida Maiorino ^{1,2,*} and Katherine Esposito ^{1,2,3}

This cross-sectional study included 132 adults with T1D, on intensive insulin therapy. We calculated GRI from 14 days continuous glucose monitoring-derived metrics and quantified EPCs count by flow cytometry, stratifying results by GRI zones, ranging from A (lowest risk) to E (highest risk).

Adults with T1D and a high GRI level had a lower EPCs count. GRI was significantly associated with certain EPC phenotypes, suggesting its potential role as a biomarker for cardiovascular risk assessment.

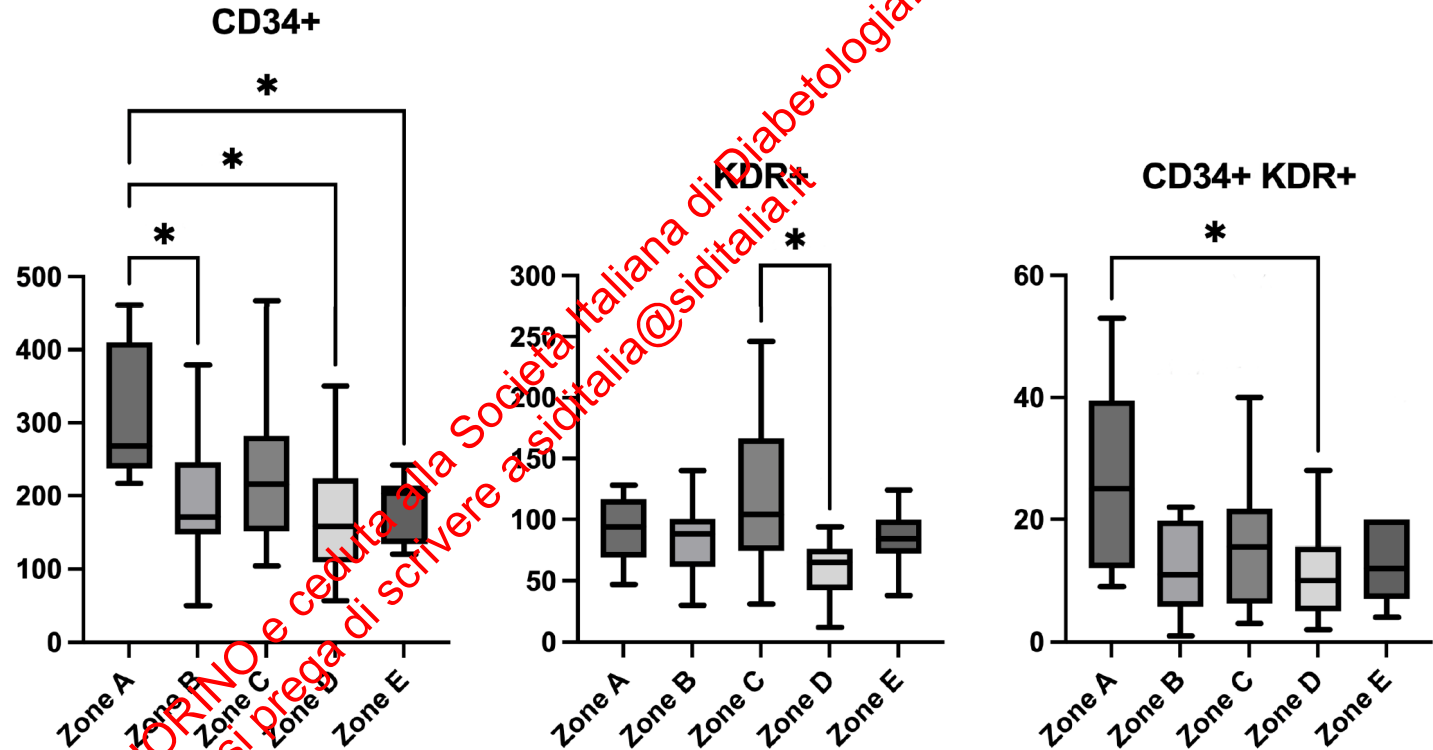


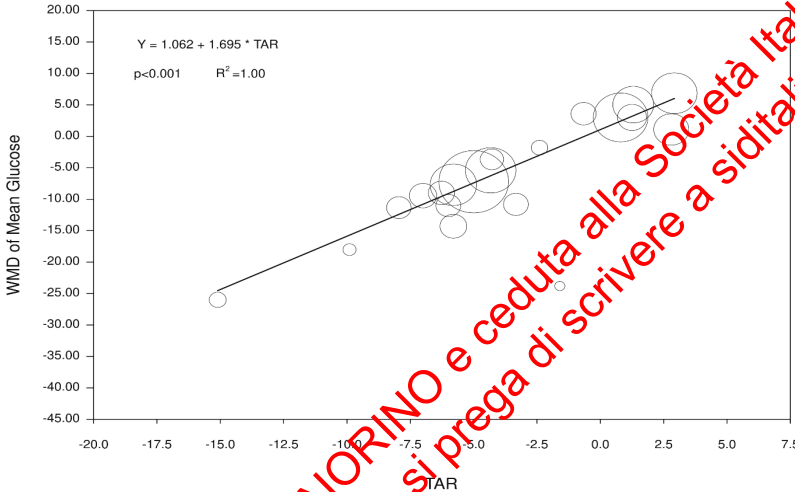
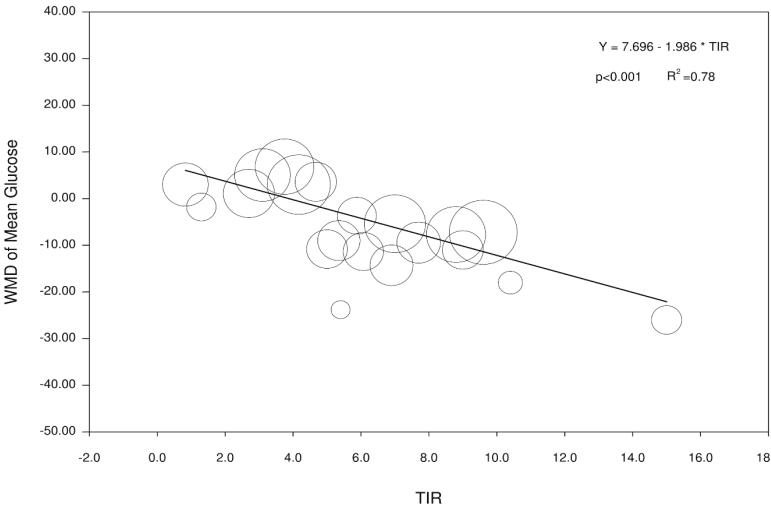
Table 1. Linear regression analysis between different EPC phenotypes levels (dependent variable) and GRI (independent variable).

	β	p	R^2
CD34 ⁺	−1.079	0.006	0.06
CD133 ⁺	−0.426	0.233	0.01
KDR ⁺	−0.481	0.089	0.02
CD34 ⁺ CD133 ⁺	−0.581	0.008	0.06
CD34 ⁺ KDR ⁺	−0.147	0.010	0.05
CD133 ⁺ KDR ⁺	0.020	0.209	0.01
CD34 ⁺ CD133 ⁺ KDR ⁺	0.007	0.437	0.01

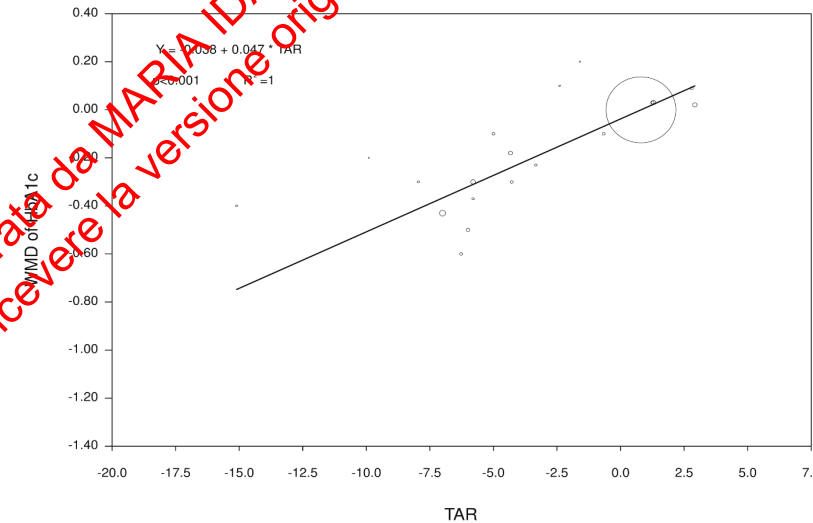
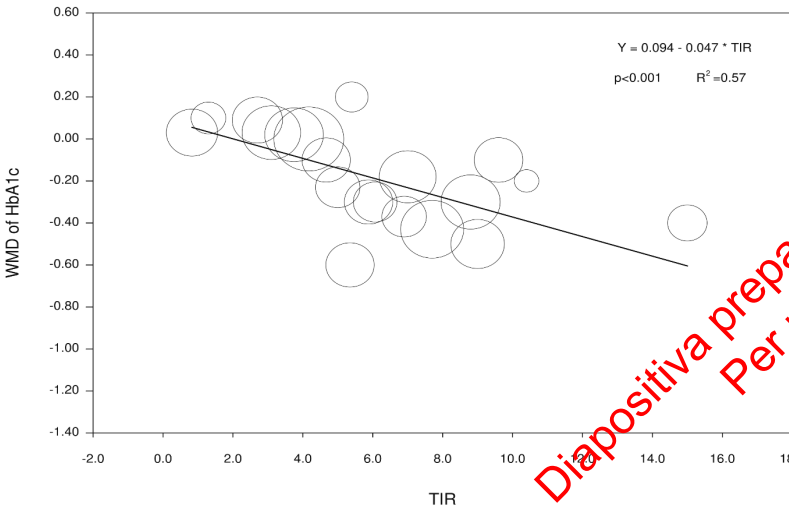
The therapeutic efficacy of CGM in diabetes: a meta-analysis with meta-regression

- P: subjects with both type 1 and type 2 diabetes and pregnant women with diabetes.
- I: CGM as either rtCGM, iCGM or SAP, compared with usual care (mainly self blood glucose monitoring).
- C: age-matched subjects with type 1 or type 2 diabetes.
- O: change in HbA1c, mean glucose and CGM-derived metrics (including TIR, TAR, TBR)

19 RCTs, 20 comparisons and 2949 patients



Variable	β Coefficient	P value	R ² (%)
TIR	-1.98	0.000	78
TBR	-0.90	0.095	21
TAR	1.69	0.000	100



Variable	β Coefficient	P value	R ² (%)
TIR	-0.046	0.000	57
TBR	-0.014	0.371	0
TAR	0.047	0.000	100

Take home messages



Il monitoraggio continuo (CGM/isCGM) rappresenta oggi lo strumento fondamentale per la personalizzazione della terapia insulinica, riducendo significativamente le ipoglicemie e migliorando il tempo in range (TIR) sia nel Diabete di Tipo 1 che di Tipo 2



L'uso strategico del CGM è efficace anche nei pazienti con Diabete di Tipo 2 in terapia non insulinica, permettendo di identificare pattern glicemici invisibili al monitoraggio capillare e guidando l'intensificazione o la de-intensificazione terapeutica.



In presenza di comorbidità quali anemia grave, insufficienza renale avanzata o nei pazienti fragili, l'HbA1c può risultare fuorviante; in questi scenari, i parametri CGM (TIR, GMI, variabilità) offrono una valutazione molto più accurata del compenso metabolico.



L'applicazione temporanea del sensore (3-6 mesi) è un potente strumento educativo di empowerment per il paziente e un supporto decisionale critico in fasi di scompenso o modifiche della terapia orale.

Diapositiva preparata da MARIA IDA MAIORINO e ceduta alla Società Italiana di Diabetologia.
Per ricevere la versione originale si prega di scrivere a siditalia@siditalia.it

Università degli Studi della Campania Luigi Vanvitelli
UOC di Endocrinologia e Malattie del Metabolismo
Direttore: Prof. Katherine Esposito

Diapositiva preparata da MARIA IDA MAIORINO e ceduta alla Società Italiana di Diabetologia.
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Napoli, Policlinico del centro storico, 3.02.2026