FEATURE ARTICLE

CONTINUOUS GLUCOSE MONITORING IN NUTRITION PRACTICE:

REVIEWING THE EVIDENCE FOR MEDICAL AND PREVENTIVE APPLICATION

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CONTINUOUS GLUCOSE MONITORING

OVERVIEW

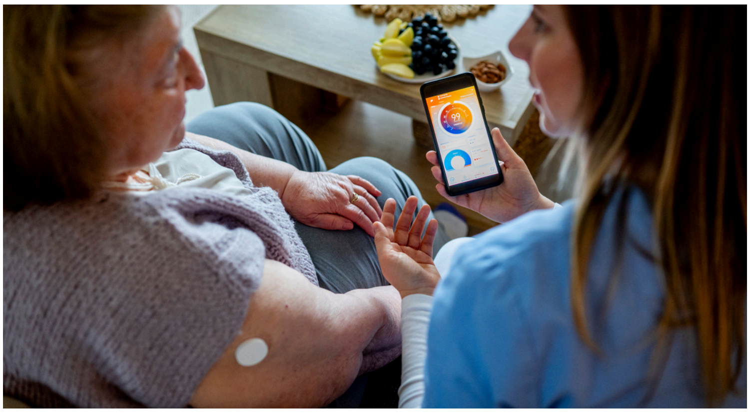
Continuous glucose monitoring (CGM) was developed as a medical tool for people managing insulin-dependent diabetes, replacing the discomfort and data gaps of finger-prick testing with a continuous, real-time picture of interstitial glucose levels. What has shifted considerably over the past decade is the evidence base - and the conversation - around CGM use in people without diabetes. As rates of insulin resistance, pre-diabetes and metabolic syndrome continue to climb across the UK and globally, the question for nutrition practitioners is no longer whether CGM has a role beyond diabetes management, but how to use it preventatively, interpret it accurately and deploy it responsibly where it genuinely adds clinical value. This short article examines that evidence, outlines a framework for data interpretation and considers when CGM use may not be appropriate.

MEDICAL VS. PREVENTATIVE APPLICATION: A MEANINGFUL DISTINCTION

In a medical context, CGM monitors glycaemic control in people with diagnosed type 1 or type 2 diabetes, detects hypoglycaemia and guides insulin dosing. Here, the evidence is well-established and regulatory frameworks are clear. The preventive application is categorically different: CGM is used to help surface patterns in people who have not yet reached diagnostic thresholds.

This matters more urgently than it might appear. Over 55% of UK adults exhibit biomarkers consistent with insulin resistance, an estimated 15 million Britons are predicted to have pre-diabetes, with the majority unaware, and up to 17 million UK adults are projected to be at increased risk of type 2 diabetes by 2030 [1, 2, 3]. Diabetes treatments already account for 15% of NHS prescription spending - £1.92 billion - excluding comorbidity costs [4]. These statistics reflect a system that identifies metabolic dysfunction too late. CGM, in a preventive context, offers an opportunity to detect early dysregulation; not to diagnose disease, but to inform behaviour change before clinical criteria are met. In relation to the preventative health framework, CGMs used in this way are employed for primary, rather than secondary, prevention, thereby encouraging persons at risk to remain in primary prevention and avoid entering secondary prevention.

This principle extends into specific high-risk scenarios. Quah et al. (2024) conducted a pilot RCT in 206 pregnant women in their first trimester, none with prior diabetes, randomised to unblinded CGM for real-time glucose feedback or blinded CGM. Worn across three gestational periods, the intervention demonstrated that access to real-time glucose data can influence subsequent gestational diabetes outcomes, reinforcing the case that early, visible glucose feedback has the potential to alter clinical trajectories rather than merely describe them [5].



THE EVIDENCE

GLUCOSE DYSREGULATION BEYOND DIABETES

Review articles examining CGM use in people without diabetes consistently demonstrate meaningful glucose variability in people without diagnosed metabolic disease [6, 7]. Postprandial excursions above 7.8 mmol/L occur regularly in non-diabetic individuals, particularly after high-glycaemic-index meals [7]. Marco et al. (2022) found that increased time above range (TAR), even without diabetes, is independently associated with elevated future risk of type 2 diabetes, metabolic disease and cardiovascular disease, and that this risk exists on a continuum, beginning well before the point of formal diagnosis [8]. This reinforces the opportunity that exists to utilise CGMs at the primary prevention level, rather than waiting for diagnosis and the move to secondary prevention and treatment.

A 2025 clinical review by Battelino and colleagues found that CGM frequently revealed hidden glucose spikes in people with obesity, even when HbA1c was within normal range, and recommends that for all people living without diabetes, practitioners track the percentage of time spent above 7.8 mmol/L, with a target of less than 5% [9]. Every 5% improvement in time-in-range has the potential to lead to meaningful reductions in long-term metabolic and vascular risk, as elevated 1-hour plasma glycaemia (≥8.6 mmol/L) has been associated with a high risk for both macro- and microvascular complications [10]. HbA1c is a three-month average that can mask considerable daily volatility; CGM makes postprandial excursions visible, measurable and actionable.

CLINICAL UTILITY

NUTRITION PRACTICE: THE CASE FOR CGM INTEGRATION

The most compelling evidence for CGM in lifestyle medicine lies in its role as a behaviour change tool. A 2024 systematic review and meta-analysis by Richardson et al., encompassing 25 RCTs and nearly 3,000 participants, found that CGM-based feedback produced statistically significant reductions in HbA1c (mean difference −0.28%; 95% CI 0.15–0.42, $p<0.001$) and increased time in range by 7.4% compared to controls, across populations with and without diabetes [11]. CGM provides real-time biofeedback connecting food choices, movement, sleep and stress to physiological consequences - including glucose disruption from psychological stress, a variable that is otherwise invisible in standard assessments [12].

The following other domains of impact are particularly relevant in nutrition practice.

APPETITE REGULATION

Wyatt et al. (2021), across more than 1,000 adults and 8,600 standardised meals, found the magnitude of postprandial glucose dip at 2-3 hours, rather than the glucose spike, was the strongest predictor of subsequent hunger and total calorie intake over 24 hours ($r=0.27$; $p<0.001$), independent of age, BMI, and weight [13]. CGM makes this pattern visible for each individual, enabling targeted intervention at the dip rather than blanket caloric restriction.

MOOD AND ENERGY

Breymeyer et al. (2016) showed in a randomised crossover trial that a high-glycaemic-load diet increased depressive symptom scores by 38% ($p=0.002$) and total mood disturbance by 55% ($p=0.05$) versus a matched low-GL diet, with fatigue rising 26%, with effects amplified in those living with overweight or obesity [14]. CGM provides an objective map connecting dietary patterns to symptomatic experience.

COGNITION AND FOCUS

Nilsson et al. (2009) demonstrated that a more stable postprandial glucose profile from a low-GI breakfast significantly enhanced working memory at 90 minutes ($p<0.034$) and selective attention at 170 minutes ($p<0.017$) in healthy middle-aged adults [15]. Impaired brain insulin signalling has been linked to deficits in memory and focus even before the onset of diagnosed metabolic disease [15].

INTERPRETING CGM DATA

A PRACTICAL FRAMEWORK

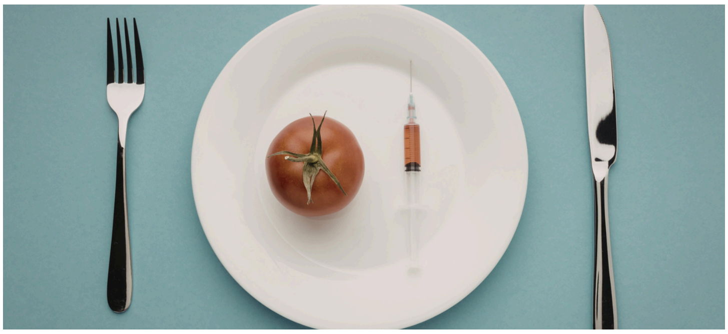
The quality of CGM integration depends almost entirely on the quality of interpretation. Grounded in the Battelino 2025 consensus, the primary clinical question is: what percentage of time is the client spending above 7.8 mmol/L [8]? Under 5% is the target for a wellness population and one that can be employed in primary prevention programmes. Where that threshold is met, focus should shift to within-range fluctuations correlating with symptomatic experience - energy, hunger, mood and sleep. Where it is exceeded, dietary and lifestyle factors should be investigated systematically: meal composition and timing, carbohydrate quality, sleep disruption and stress.

Practitioners should evaluate daily and weekly patterns to identify high-impact spikes and peak glycaemic load times. Meal and lifestyle logs alongside CGM data substantially improve interpretive accuracy [6, 9, 11], and two weeks of annotated data provide an ideal clinical picture. Variability indices, including standard deviation and coefficient of variation, provide a fuller picture than average glucose alone. Crucially, a glucose excursion must always be contextualised within the broader clinical presentation: what was eaten, sleep quality the night before and stress on the day.

CONSIDERATIONS

WHEN CGM USE MAY NOT BE APPROPRIATE IN CLINICAL PRACTICE

In the absence of formal consensus guidelines for CGM use in non-diabetic populations [7], practitioners should apply clinical judgement and appropriate safeguarding. CGM should not be used in individuals with a history of disordered eating, as real-time data can reinforce restrictive or anxious food behaviours, nor in those with problematic hypoglycaemia [7, 17]. In people managing insulin-dependent diabetes, medically supervised devices remain appropriate [16].



Caution is warranted in clients prone to health anxiety or data fixation [17]. Importantly, CGM data should not be used as a diagnostic for HbA1c in non-diabetic populations: Rodriguez et al. (2025) found that across 972 individuals, CGM metrics showed minimal association with HbA1c in those with normoglycaemia - with time in range showing no significant relationship - concluding that standard CGM metrics cannot be interpreted to reflect HbA1c outside of a diabetes diagnosis [18].

CONCLUSION

CGM IN CLINICAL PRACTICE

The evidence for CGM in preventive nutrition practice has matured considerably. Real-world studies, RCTs and consensus reviews consistently support its value as a behaviour-change tool, an appetite-regulation aid and a window into metabolic health that standard blood testing cannot provide. The practitioner's role is not to replace medical management but to use these insights to deliver more precise, personalised and preventive care - before disease develops, at the primary, sub-clinical preventative level.

ACKNOWLEDGEMENTS

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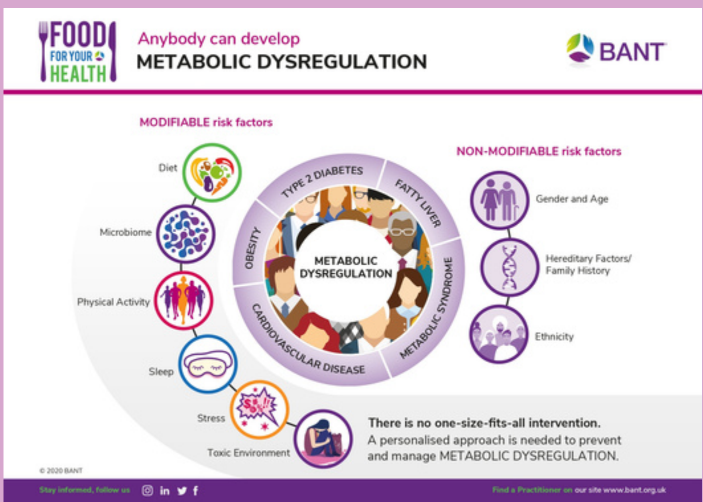

BLOOD GLUCOSE TAKEAWAYS

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INFOBITE

Continuous Glucose Monitors

The effect of continuous glucose monitoring-guided glycemic control on progression of coronary atherosclerosis in type 2 diabetic patients with coronary artery disease: The OPTIMAL randomized clinical trial

YU KATAOKA, SATOSHI KITAHARA, SAYAKA FUNABASHI, ET AL.
JOURNAL: JOURNAL OF DIABETES AND ITS COMPLICATIONS 2023;37(10):108592

Reviewed by OUR EXPERTS NED — With Expert Review from Dr Michelle Barrow

Glycaemic fluctuations and in particular hypoglycaemia promote pro-atherogenic responses in those with type 2 diabetes (T2D) and may contribute to an increased risk for the development of atherosclerosis. Recently, research has indicated that continuous glucose monitors (CGMs) may aid better blood glucose control.

This randomised control trial aimed to compare the effects of CGM use and HbA1c-guided glucose control on coronary atherosclerosis development in individuals with T2D and coronary artery disease (CAD). This study included 94 individuals who were monitored for 48 weeks.

The results showed that CGM use resulted in a greater reduction in glucose variability and more time with glucose in the healthy range. However, the progression of CAD in the CGM group remained similar to those who underwent HbA1c guided glucose control.

It was concluded that despite better glucose control, CGM monitoring did not slow CAD progression in individuals with T2D when compared to standard HbA1c monitoring.

Continuous glucose monitoring in pregnant women with type 1 diabetes (CONCEPTT): a multicentre international randomised controlled trial

DENICE S FEIG, LOIS E DONOVAN, ROSA CORCOY, ET AL. JOURNAL: LANCET (LONDON, ENGLAND) 2018;390(10110):2347-2359

Reviewed by OUR EXPERTS NED — With Expert Review from Ana-Paula Agrela

A randomised controlled trial was conducted in women aged 18–40 years with type 1 diabetes receiving intensive insulin therapy, to evaluate the effectiveness of continuous glucose monitoring (CGM) on maternal glucose control, as well as obstetric and neonatal health outcomes. 325 women (215 pregnant and 110 planning pregnancy) were randomly assigned to either: CGM plus standard finger-prick capillary glucose testing group or a capillary glucose testing only group.

Results found differences in HbA1c reported in pregnant women using CGM compared with those using standard monitoring (mean difference −0·19%; 95% CI −0·34 to −0·03; p=0·02). Pregnant women using CGM spent more time within the target glucose range (68% vs 61%, p=0.003) and less time in hyperglycaemia (27% vs 32%, p=0.028) than the control group and had fewer episodes of severe hypoglycaemia than the control group (18 v 21) but this was not significant. The infants of CGM-using mothers had lower rates of large-for-gestational-age births, fewer neonatal intensive care admissions lasting more than 24 hours and fewer cases of neonatal hypoglycaemia requiring treatment with intravenous dextrose.

Authors concluded that CGM use during pregnancy in women with type 1 diabetes receiving intensive insulin therapy leads to better glucose control and improved neonatal outcomes

PHAIK LING QUAH, LAY KOK TAN, NGEE LEK, ET AL.
JOURNAL: AMERICAN JOURNAL OF PERINATOLOGY 2024;41(S 01):E3374-E3382 With Expert Review from Sarah Cassar

Continuous Glucose Monitoring Feedback in the Subsequent Development of Gestational Diabetes: A Pilot, Randomized, Controlled Trial in Pregnant Women.

This study's aim was to examine the effects of receiving glucose feedback from continuous glucose monitoring (CGM) by intermittent scanning (unblinded group) versus masked feedback (blinded group) in the subsequent development of GDM. This study was a prospective randomised controlled trial which enrolled 206 pregnant women who were in their first trimester of pregnancy.
Results showed no significant differences in GDM outcomes or plasma glucose concentrations between study arms. The unblinded group had higher percentage time-in-range during pregnancy compared to the blinded group. CGM feedback, coupled with better glycaemic control, indicates its potential use for promoting better glucose control during pregnancy. Authors conclude that CGM feedback may enhance glucose management in pregnant women, but further research is needed to validate these findings.

Impact of Continuous Glucose Monitoring Versus Blood Glucose Monitoring to Support a Carbohydrate-Restricted Nutrition Intervention in People with Type 2 Diabetes

CAROLINE G P ROBERTS, BRITTANIE M VOLK, HOLLY J WILLIS, ET AL.
JOURNAL: DIABETES TECHNOLOGY & THERAPEUTICS 2025;27(5):341-356

Reviewed by OUR EXPERTS NED — With Expert Review from Ana-Paula Agrela

The use of continuous glucose monitors (CGMs) has been shown to improve glycaemic control compared to blood glucose monitoring (BGM) in individuals with type 2 diabetes (T2D). CGMs have also been hypothesised to guide dietary and lifestyle changes in those with T2D. However, their use in this cohort for nutrition advice is still poorly understood. This study aimed to determine differences in diabetes-related outcomes based on the type of glucose monitoring during a medically supervised ketogenic diet program. This was a randomised control trial of 163 individuals with T2D given a ketogenic diet. 81 used a CGM, whilst the remainder used a BGM to aid understanding of how meals and food influenced their blood sugar for 6 months.
The results showed that time in range of optimal blood glucose levels, medication use, HbA1c levels, and nutritional ketosis was significantly improved in both groups regardless of the method of blood glucose monitoring. It was concluded that both CGM and BGM when combined with a ketogenic diet and remote care significantly improved glycaemic outcomes, with no superior benefits of either monitoring method.

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What is Blood Glucose Regulation?

Blood sugar regulation is the process of maintaining blood glucose within an optimal range

Blood sugar regulation is the process by which the levels of blood sugar, primarily glucose, are maintained by the body within an optimal biological range. This tight regulation is referred to as glucose homeostasis. The pancreas gland secretes two hormones and they are responsible for regulating glucose levels in blood; Insulin which lowers blood sugar, and glucagon, which raises it.

Blood Sugar Range — **A normal blood sugar level is 4 to 5.9 mmol/L before eating and under 7.8 mmol/l 90 minutes after eating a meal (1, 2)**

The body has several ways to keep blood sugar within the normal range. Insulin and glucagon are two hormones secreted by islet cells within the pancreas. They are both secreted in response to blood sugar levels, but in opposite fashion!

Insulin

Insulin is normally secreted by the beta cells of the pancreas. The stimulus for insulin secretion is HIGH blood glucose, typically after eating a meal. In response to insulin, cells absorb glucose out of the blood, having the net effect of lowering the high blood glucose levels back into normal range.

Glucagon

Glucagon is secreted by the alpha cells of the pancreas. The stimulus for glucagon secretion is LOW blood glucose. When blood glucose goes down (such as between meals, and during exercise) more and more glucagon is secreted. Like insulin, glucagon has an effect on many cells of the body, but most notably the liver.

Diet & Nutrition

Diet plays an important role in blood glucose regulation. Blood sugar levels are directly influenced by the amount of sugars in the foods we eat. Sugars are most prevalent in carbohydrate foods including grains, cereals, fruits and some vegetables. Whereas protein foods and fats typically contain no, or trace amounts, of sugars. Balancing dietary intake of these macronutrients to help balance sugars consumed from food is the first line of support for blood glucose regulation.

FOOD FOR YOUR HEALTH

1. https://www.nhs.uk/conditions/high-blood-sugar-hyperglycaemia/
2. https://www.diabetes.co.uk/diabetes_care/blood-sugar-level-ranges.html

Find a Practitioner at www.bant.org.uk

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