European Journal of Public Health Studies
ISSN: 2668 - 1056
ISSN-L:2668 - 1056
Available on-line at: www.oapub.org/hlt

DOI: 10.46827/ejphs.v9i14.249 Volume 9 | Issue 1 | 2026

POST-MEAL WALKING IN WORKING-AGE ADULTS: EVIDENCE, MECHANISMS, AND LIFESTYLE MEDICINE PERSPECTIVES

Supawongduan Thongchan[i]
D&D Clinic,
Thailand

Abstract:
Background: Sedentary behavior following meals is pervasive among working-age adults globally, with office workers spending up to 80% of working hours seated. The postprandial period — characterized by acute rises in blood glucose and triglycerides — represents a clinically significant window of cardiometabolic vulnerability. Postprandial hyperglycemia has been independently associated with accelerated endothelial dysfunction and elevated cardiovascular risk. Despite this, practical interventions targeting this window within working-age populations remain underutilized in clinical practice. **Objective:** To synthesize current evidence on the physiological mechanisms and clinical benefits of post-meal walking, and to propose an integrated Lifestyle Medicine prescription framework for working-age adults (18–65 years). **Methods:** A narrative review of peer-reviewed literature from PubMed, Scopus, and Google Scholar (up to April 2025). Search terms included: post-meal walking, postprandial exercise, postprandial glycemia, sedentary behavior, GLUT4 translocation, Lifestyle Medicine, and working adults. Primary emphasis was placed on RCTs, systematic reviews, and meta-analyses. **Key Findings:** A 10-minute walk immediately after a meal significantly reduces the 2-hour glucose area under the curve (AUC) and peak glucose, comparable to a 30-minute walk performed later (Sci Rep, 2025). Three 15-minute post-meal bouts outperform a 45-minute sustained walk in reducing post-dinner glycemia (DiPietro et al., Diabetes Care, 2013). The primary mechanism involves AMPK-mediated, insulin-independent GLUT4 translocation — intact in insulin-resistant individuals. Additional benefits include reduced postprandial lipemia, improved endothelial function, mood elevation, and afternoon cognitive performance. **Conclusions:** Post-meal walking is a high-yield, low-cost, behavior-anchored Lifestyle Medicine micro-intervention. A prescription of ten minutes of light-to-moderate walking after each main meal is one of the most actionable and evidence-supported recommendations in contemporary preventive medicine.

[i] Correspondence: email dearrasae@gmail.com

Keywords: post-meal walking; postprandial exercise; postprandial glycemia; sedentary behavior; working-age adults; lifestyle medicine; metabolic health; GLUT4; physical activity

1. Introduction

Non-communicable diseases (NCDs) — including type 2 diabetes mellitus (T2DM), cardiovascular disease (CVD), and metabolic syndrome — collectively represent the leading cause of morbidity and premature mortality worldwide. Physical inactivity and sedentary behavior are among the most important modifiable risk factors for this global burden, yet population-level adherence to physical activity guidelines remains critically low. According to the most recent analysis of global trends, the proportion of adults failing to meet WHO-recommended physical activity levels increased from 23.3% in 2000 to 31.3% in 2022, with the highest rates concentrated among working-age individuals in urbanized settings [1].

Within the working-age population, sedentary occupational behavior is particularly pronounced. Office-based workers spend up to 80% of working hours seated, accumulating more than 7.9 hours of total sedentary time per day [2]. The proliferation of desk-based employment — further accelerated by remote and hybrid work arrangements — has entrenched sedentary patterns, with studies documenting a 16% increase in sedentary behavior among home-based workers compared to office counterparts. This occupational context creates a pattern in which individuals experience uninterrupted sitting not only during working hours, but also immediately following meals — a behavioral pattern with distinct and underappreciated metabolic consequences.

The postprandial period — typically defined as the two to four hours following a meal — is characterized by dynamic metabolic perturbations: blood glucose peaks approximately 30–60 minutes post-meal, while plasma triglycerides peak two to four hours later. When this metabolic window coincides with prolonged sitting, peripheral glucose disposal and triglyceride clearance are markedly impaired. Epidemiological evidence consistently links postprandial hyperglycemia to endothelial dysfunction and subclinical inflammation, independent of fasting glycemia and HbA1c [3]. Researchers have characterized this period as a 'window of metabolic vulnerability' that disproportionately drives cumulative cardiometabolic risk in sedentary working-age individuals.

Despite this established risk, interventions targeting the postprandial window remain underutilized in clinical practice. Walking — the most accessible, universally practiced, and extensively studied form of physical activity — offers a compelling solution. Post-meal walking requires no equipment, no dedicated space, and can be completed within a typical lunch break. Furthermore, meal completion provides a natural, reliable behavioral cue for habit formation — a key principle in contemporary behavior change science.

Lifestyle Medicine, as defined by the American College of Lifestyle Medicine (ACLM) and the International Board of Lifestyle Medicine (IBLM), provides an evidence-based framework through six pillars: physical activity, plant-predominant nutrition, restorative sleep, stress management, avoidance of risky substances, and positive social connection. Post-meal walking uniquely addresses multiple pillars simultaneously, making it one of the most contextually appropriate and clinically practical micro-interventions available within this framework. This narrative review synthesizes current physiological, clinical, and behavioral evidence, and proposes an integrated Lifestyle Medicine prescription framework for occupational and primary care settings.

2. Physiology of the Postprandial State

2.1 Postprandial Glucose Metabolism

Following carbohydrate ingestion, absorbed glucose enters the portal circulation, stimulating pancreatic beta-cell insulin secretion. Skeletal muscle accounts for approximately 70–80% of insulin-mediated whole-body glucose uptake, with GLUT4 translocation from intracellular storage vesicles to the sarcolemma as the rate-limiting step. In healthy adults, blood glucose peaks at 30–60 minutes post-ingestion, returning to near-fasting levels within two hours. In sedentary working-age individuals, however, inactivity following meals reduces peripheral glucose uptake, prolongs glycemic excursion, and increases cumulative glucose AUC.

Repeated postprandial hyperglycemic spikes generate reactive oxygen species (ROS), activate the NF-κB inflammatory pathway, promote advanced glycation end-product (AGE) formation, and impair endothelial nitric oxide synthase (eNOS) activity [4]. The glycemic excursion — not simply elevated fasting or mean glucose — is now recognized as an independent determinant of cardiovascular outcomes across both diabetic and non-diabetic populations [5].

2.2 Postprandial Lipid Metabolism

Dietary fat ingested at each meal is packaged into chylomicrons that enter the lymphatic system before reaching the systemic circulation, with plasma triglycerides peaking two to four hours post-meal. Postprandial lipemia — the sustained elevation of triglyceride-rich lipoproteins (TRLs) — is now recognized as an independent cardiovascular risk factor. TRL remnant particles penetrate the arterial intima, where they promote foam cell formation and atherosclerotic plaque development. Pronounced postprandial lipemia acutely impairs brachial artery flow-mediated dilation (FMD), a validated surrogate of endothelial function, through oxidative stress and reduced nitric oxide bioavailability [6, 7].

2.3 Vascular and Inflammatory Postprandial Responses

Both postprandial hyperglycemia and lipemia independently and synergistically activate NF-κB signaling in endothelial cells, upregulating adhesion molecules including VCAM-

1, ICAM-1, and E-selectin. In individuals who are habitually sedentary during the postprandial period, this acute vascular stress is repeated three or more times daily — representing a substantial cumulative atherogenic burden. This postprandial inflammatory state has been termed the 'meal-driven' pathway of cardiovascular risk, distinct from but synergistic with classical fasting-state risk factors [8].

3. Physiological Mechanisms of Post-meal Walking

3.1 Insulin-Independent Muscle Glucose Uptake via GLUT4

The primary mechanism by which post-meal walking improves glycemic control is insulin-independent GLUT4 translocation in contracting skeletal muscle. Muscle contraction activates 5'-AMP-activated protein kinase (AMPK) through increased AMP:ATP ratio and cytoplasmic calcium. Activated AMPK phosphorylates TBC1D1 and TBC1D4 (AS160), two Rab GTPase-activating proteins that maintain GLUT4 vesicles in a transport-inactive intracellular state. Phosphorylation enables GLUT4 translocation to both the sarcolemma and T-tubular system, substantially increasing muscle glucose uptake capacity [9].

This contraction-mediated pathway is mechanistically distinct from insulin signaling — involving different proximal kinases (AMPK and CaMKII rather than PI3K-Akt) and different intracellular GLUT4 storage pools — and critically, it remains intact in the setting of insulin resistance [10]. This is of particular therapeutic relevance in working-age individuals with prediabetes or early T2DM, in whom insulin-stimulated glucose disposal is blunted but contraction-stimulated uptake is preserved. The two pathways are additive: combined insulin stimulation and muscle contraction results in greater total glucose uptake than either stimulus alone.

3.2 Lipoprotein Lipase Activation and Triglyceride Clearance

Skeletal muscle contractions during walking upregulate lipoprotein lipase (LPL) activity within the capillary endothelium of working muscles. LPL catalyzes the hydrolysis of triglycerides from circulating chylomicrons and VLDL particles, releasing free fatty acids for mitochondrial oxidation within contracting muscle. This mechanism directly reduces postprandial triglyceridemia, attenuating the TRL-mediated endothelial stress described previously. Studies employing moderate-intensity exercise in the postprandial period consistently demonstrate reduced triglyceride AUC compared to sedentary controls [11].

3.3 Effects on Gastric Emptying and Nutrient Absorption

Light-to-moderate walking after meals modestly accelerates gastric emptying and enhances intestinal motility through increased vagal tone, potentially blunting the rate of glucose absorption from the small intestine. This mechanism is intensity-dependent: vigorous exercise (>60% VO2max) performed immediately post-meal paradoxically slows gastric emptying by redirecting splanchnic blood flow to working muscles — a risk not relevant to light post-meal walking, which avoids these adverse gastrointestinal effects.

3.4 Autonomic Nervous System and Cortisol Modulation

Post-meal walking promotes parasympathetic predominance through vagal activation, reflected in improvements in heart rate variability (HRV). In the context of occupational stress — where cortisol levels remain elevated throughout the workday — post-meal walking provides a brief but physiologically meaningful period of sympathetic withdrawal. Elevated cortisol amplifies postprandial hyperglycemia by stimulating hepatic gluconeogenesis and promoting peripheral insulin resistance. Light walking-mediated cortisol attenuation therefore provides an additional pathway through which post-meal ambulation reduces glycemic excursions, particularly in high-stress occupational environments.

4. Clinical Evidence

4.1 Postprandial Glucose Control: Key Randomized Controlled Trials

The landmark study by DiPietro et al. (Diabetes Care, 2013) remains the cornerstone of post-meal exercise research in glycemic control [12]. In a randomized crossover design, ten inactive older adults (≥60 years) with impaired fasting glucose were assigned to three protocols: (a) 45-minute sustained morning walking, (b) 45-minute sustained afternoon walking, and (c) three 15-minute moderate-intensity bouts (3.0 METs) performed 30 minutes after each meal. Continuous glucose monitoring over 48 hours demonstrated that post-meal walking was significantly more effective than either sustained walking condition in reducing the 3-hour post-dinner glucose AUC ($P < 0.01$), underscoring that temporal alignment between exercise and the postprandial window is an independent determinant of glycemic benefit.

A 2025 randomized crossover trial published in Scientific Reports [13] extended this evidence to younger adults, comparing a 10-minute walk immediately after a 75g oral glucose load versus a 30-minute walk beginning 30 minutes post-ingestion versus sedentary sitting, in twelve healthy young adults. Both walking conditions yielded significantly lower 2-hour glucose AUC and mean blood glucose levels compared to control ($P < 0.05$; Cohen's $d = 0.71–0.90$). The 10-minute walk group achieved a significantly lower peak glucose (164.3 ± 8.9 mg/dL) versus control (181.9 ± 8.4 mg/dL; $P = 0.028$, $d = 0.731$), demonstrating that brief, immediately post-meal walking is as effective as longer, delayed-onset exercise — with important practical implications for time-constrained working adults.

Bellini et al. (Nutrients, 2022) conducted two randomized crossover studies in 21 healthy young volunteers, evaluating post-meal walking efficacy across varied meal compositions [14]. In both studies — one manipulating carbohydrate load, one comparing a mixed meal to a carbohydrate drink matched for absolute carbohydrate content — 30 minutes of brisk post-meal walking substantially reduced the glucose peak

(P < 0.009) regardless of meal composition, confirming robustness across diverse dietary contexts including high-carbohydrate Asian dietary patterns.

Engeroff, Groneberg, and Wilke (Sports Medicine, 2023) conducted a pre-registered systematic review and meta-analysis (PROSPERO: CRD42022324070) evaluating eight RCTs (n = 116 participants) comparing post-meal versus pre-meal exercise on postprandial glycemia [15]. Pooled analyses using Hedges' g demonstrated that post-meal exercise was significantly superior to pre-meal exercise in reducing postprandial glucose response, with the greatest benefit observed when exercise was initiated within 30 minutes of meal ingestion.

4.2 Postprandial Lipemia and Cardiovascular Markers

Exercise-mediated reductions in postprandial triglyceride AUC are well-documented. Moderate-intensity exercise in the postprandial period reliably reduces triglyceride-rich lipoprotein exposure and is accompanied by partial recovery of FMD [16]. Endocan levels — a proteoglycan biomarker of endothelial activation — are also attenuated by exercise interventions that reduce postprandial TRL concentrations [17]. Emerging data from continuous glucose monitoring studies further support that post-meal walking reduces glycemic variability metrics including mean amplitude of glycemic excursions (MAGE) and improves time in range (TIR) [18].

4.3 Mental Health, Cognitive Function, and Workplace Productivity

The postprandial period is associated with a well-documented decline in alertness and cognitive processing — the 'afternoon slump' — driven by serotonin-mediated drowsiness following protein ingestion, postprandial hypotension, and adenosine accumulation. Moderate physical activity counteracts these effects through catecholamine and BDNF release, enhanced cerebral perfusion, and improved autonomic tone. Studies in occupational settings consistently show that brief mid-day walks improve self-reported mood, reduce afternoon fatigue, and enhance cognitive performance during remaining working hours — outcomes of direct relevance to workplace productivity and presenteeism.

5. Post-meal Walking Prescription Framework

Translating evidence into clinical practice requires specification of four key parameters: duration, timing, intensity, and context. Table 1 summarizes the evidence-informed prescription framework for Lifestyle Medicine practitioners and occupational health professionals.

Table 1: Evidence-Informed Post-meal Walking Prescription for Working-Age Adults

Parameter	Recommendation	Clinical Notes
Duration	10–15 minutes minimum per meal	Even 2–5 min yields measurable glycemic benefit; 3 × 10–15 min bouts per day superior to 1 × 45 min sustained walk (DiPietro et al., 2013)
Timing	Within 30 min of meal completion; immediately if tolerated	Post-meal > pre-meal for glycemia. Immediate initiation maximizes overlap with absorption peak. GERD: delay 20–30 min.
Intensity	Light-to-moderate: 3.0–4.0 METs (~3–4 km/h; conversational pace)	Vigorous exercise (>60% VO2max) risks GI discomfort via splanchnic blood flow redistribution; light walking avoids this
Frequency	After all three main meals daily	Post-dinner walking provides greatest 24-h glycemic benefit due to lowest evening insulin sensitivity
Location	Any: office corridors, stairs, parking lots, outdoor walkways	Walking meetings, treadmill desks, under-desk pads are validated occupational alternatives
Contraindications	Severe GERD (delay 20–30 min); acute musculoskeletal injury	Complete postprandial rest is not recommended for any group; some movement always preferred over sitting
Special groups	Prediabetes / T2DM: highest benefit; CGM-guided timing optimal	Shift workers: apply prescription to all major meals regardless of clock time

6. Lifestyle Medicine Integration

The Lifestyle Medicine framework identifies six evidence-based behavioral pillars through which chronic disease can be prevented, managed, and reversed. Post-meal walking is uniquely positioned to intersect with and amplify multiple pillars simultaneously.

Physical Activity Pillar
Post-meal walking simultaneously satisfies two WHO 2020 Physical Activity Guideline targets: accumulating 150–300 min/week of moderate-intensity aerobic activity AND reducing prolonged sedentary time through regular activity breaks. Three 10–15 minute post-meal walks per day provide 30–45 minutes of daily moderate physical activity — fully satisfying the minimum threshold — while also interrupting sedentary bouts at the metabolically most vulnerable postprandial moment [19].

Nutrition Pillar
Dietary composition modulates postprandial glycemic and lipemic responses — the same perturbations targeted by post-meal walking. Low-GI meals and dietary fiber reduce the absolute excursion height, while walking accelerates its resolution. Co-prescribing meal composition optimization with post-meal walking creates a synergistic therapeutic package. Bellini et al. (2022) confirmed consistent post-meal walking benefits across varied meal compositions, including high-carbohydrate Asian dietary patterns [14].

Stress Management Pillar
Cortisol excess amplifies postprandial hyperglycemia through hepatic gluconeogenesis and peripheral insulin resistance. Post-meal walking attenuates cortisol secretion, activates parasympathetic dominance, and — when practiced mindfully — reduces rumination. Brief post-meal walks provide a micro-dose of the stress management benefits associated with mindfulness-based interventions, without requiring dedicated instruction in formal meditation practices.
Sleep Pillar
Post-dinner walking facilitates core body temperature reduction — a key trigger for sleep onset — and may advance melatonin secretion timing. The improved glycemic control achieved through post-meal walking also attenuates nocturnal glucose spikes associated with sleep fragmentation. Light-intensity post-dinner walking does not elevate sympathetic tone sufficiently to impair sleep onset and is therefore appropriate for evening prescription.
Social Connection Pillar
Shared post-meal walks with colleagues, family, or friends combine physical activity with social interaction — both independently associated with cardiometabolic and psychological health benefits. Walking meetings are increasingly adopted in progressive organizational cultures, with evidence supporting their effectiveness in maintaining productivity while reducing sedentary time. Group walking leverages social facilitation to enhance adherence.

7. Behavior Change: Why Post-meal Walking Is Optimally Designed for Habit Formation

The clinical effectiveness of any lifestyle intervention depends not only on its physiological potency but on whether patients will perform it consistently. Post-meal walking possesses a constellation of behavioral properties that render it exceptionally amenable to habit formation and sustained adherence.

Fogg's Behavior Model (FBM) posits that behavioral execution requires three simultaneous factors: sufficient motivation, adequate ability, and a reliable prompt. Post-meal walking is exceptional in that meal completion provides an automatic, daily, and highly salient behavioral prompt — eliminating the need for volitional reminders. The physical demands are minimal (ability is high), and the reward — reduced postprandial discomfort, improved alertness, mood elevation — is immediate (motivation). This trifecta makes post-meal walking among the most naturally FBM-compatible health behaviors available to the general population.

The Tiny Habits methodology (Fogg, 2019) formalizes this as an implementation intention: 'After I finish eating my lunch, I will walk for 10 minutes' [20]. This anchor + behavior + duration structure has been shown in multiple behavioral RCTs to significantly increase follow-through compared to generic intentions. Lally et al. (Eur J Soc Psychol, 2010) demonstrated that habit automaticity develops on average over 66 days of consistent repetition, with behaviors having strong contextual cues and immediate rewards reaching automaticity fastest [21]. Post-meal walking, practiced three times daily, provides 21 repetitions per week — among the highest frequency achievable for any health behavior.

8. Special Populations and Clinical Considerations

Table 2: Special Populations: Modified Prescription Considerations

Population	Key Considerations	Modified Recommendation
Prediabetes / IFG / IGT	Postprandial hyperglycemia is the dominant early dysglycemic feature. CGM-guided timing identifies individual peak glucose windows.	10–15 min immediately post-meal, all three meals; CGM encouraged; combine with low-GI meal modification
Type 2 Diabetes	Preserved contraction-stimulated GLUT4 uptake despite insulin resistance. Risk of hypoglycemia with insulin or sulfonylurea.	Caution with SU/insulin users; check glucose before walking; 10–15 min brisk walking; avoid if glucose <5.6 mmol/L
Shift Workers	Circadian misalignment amplifies postprandial glycemia at nocturnal meal times.	Apply prescription to all major meals regardless of clock time; especially beneficial post-night-shift meals
GERD / Dyspepsia	Immediate vigorous exercise worsens reflux; light walking tolerated after 20–30 min.	Initiate 20–30 min after meal completion; light pace (2.0–2.5 METs) only
Musculoskeletal Limitations	Lower limb arthritis may limit ambulation.	Seated knee extensions, under-desk pedaling devices; consult physiotherapy for alternatives
Obesity (BMI ≥30)	Impaired postprandial lipid metabolism amplifies LPL-mediated benefit from walking.	Standard prescription; comfortable self-selected pace; any movement superior to sedentary sitting

9. Research Gaps and Future Directions

9.1 Long-term RCTs in Working-Age Adults

The majority of existing RCTs are short-term and frequently conducted in older adults or individuals with established T2DM. Long-term RCTs (≥6 months) specifically targeting the working-age population within occupational settings are urgently needed to establish chronic metabolic, cardiovascular, and psychosocial benefits of habitual post-meal walking.

9.2 Cultural and Dietary Context Specificity

High-glycemic-index dietary patterns — dominated by white rice, sticky rice, and refined carbohydrates prevalent in East and Southeast Asian populations — generate substantially higher postprandial glucose excursions than equivalent caloric loads from lower-GI Western diets. Research in these dietary contexts, and in tropical climates that create thermal barriers to outdoor post-meal walking, is notably limited and represents a significant evidence gap for rapidly urbanizing Asian working-age populations.

9.3 Personalized Prescription via CGM and Wearable Integration

Individual variability in postprandial glucose responses — reflecting differences in gut microbiome composition, insulin secretory capacity, meal composition, and stress —

suggests that a fixed prescription may be suboptimal for some individuals. Chang et al. (2023) demonstrated the feasibility of CGM-guided exercise timing [18]. Future research should evaluate whether AI-assisted, wearable-integrated prescriptions further optimize glycemic outcomes and whether such approaches are scalable within primary care and occupational health settings.

9.4 Gut Microbiome Interactions

Emerging evidence implicates the gut microbiome as a mediator of postprandial glycemic responses and exercise-induced metabolic adaptations. Post-meal walking may influence microbiome composition through effects on gastric motility and intestinal transit time — a novel and largely unexplored research frontier.

10. Conclusion

Post-meal walking represents a convergence of mechanistic rigor, clinical evidence, behavioral science, and practical feasibility that is rare among lifestyle interventions. The insulin-independent GLUT4 pathway provides a mechanism particularly robust in working-age individuals with insulin resistance — precisely those whose insulin-mediated glucose disposal is already compromised. Clinical evidence from RCTs consistently demonstrates that even brief (10-minute) walks initiated immediately after meals produce significant and clinically meaningful reductions in postprandial glucose AUC, peak glucose, and triglycerides.

Within the Lifestyle Medicine framework, post-meal walking stands out as a micro-intervention with uniquely broad pillar coverage, addressing physical activity, stress management, sleep, and social connection simultaneously. The meal-completion behavioral cue provides an automatic daily trigger aligned with optimal habit formation principles, and the brevity and low intensity of the behavior eliminates the primary barriers — time, effort, and equipment — that limit adherence to conventional exercise programs.

A formal clinical prescription of ten minutes of light-to-moderate walking after each main meal should be considered a first-line Lifestyle Medicine recommendation for working-age individuals with sedentary occupational profiles, metabolic risk factors, or established NCDs. The simplicity, safety, universality, and evidence base of this prescription make it one of the most actionable and cost-effective recommendations in contemporary preventive medicine.

Conflict of Interest Statement

The authors declare no conflicts of interest.

References

1) Strain T, Flaxman S, Guthold R, Fullman N, Ng M, Engell RE, et al. National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: a pooled analysis of 507 population-based surveys with 5.7 million participants. Lancet Glob Health. 2024;12(8):e1232-e1243. doi:10.1016/S2214-109X(24)00150-5. PMID: 38705160
2) Biswas A, Oh PI, Faulkner GE, Bajaj RR, Silver MA, Mitchell MS, et al. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. Ann Intern Med. 2015;162(2):123-132. doi:10.7326/M14-1651. PMID: 25599350
3) Blaak EE, Antoine JM, Benton D, Bjorck I, Bozzetto L, Brouns F, et al. Impact of postprandial glycaemia on health and prevention of disease. Obes Rev. 2012;13(10):923-984. doi:10.1111/j.1467-789X.2012.01011.x. PMID: 22780564
4) Ceriello A, Esposito K, Piconi L, Ihnat MA, Thorpe JE, Testa R, et al. Oscillating glucose is more deleterious to endothelial function and oxidative stress than mean glucose in normal and type 2 diabetic patients. Diabetes. 2008;57(5):1349-1354. doi:10.2337/db08-0063. PMID: 18299315
5) Monnier L, Lapinski H, Colette C. Contributions of fasting and postprandial plasma glucose increments to the overall diurnal hyperglycemia of type 2 diabetic patients: variations with increasing levels of HbA1c. Diabetes Care. 2003;26(3):881-885. doi:10.2337/diacare.26.3.881. PMID: 12610053
6) Nordestgaard BG. Triglyceride-rich lipoproteins and atherosclerotic cardiovascular disease: new insights from epidemiology, genetics, and biology. Circ Res. 2016;118(4):547-563. doi:10.1161/CIRCRESAHA.115.306249. PMID: 26892958
7) Araujo GSM, Silva TOC, Guerra GM, Izaias JE, Rocha HMN, Faria D, et al. Effects of postprandial lipemia combined with disturbed blood flow on the flow-mediated dilation, oxidative stress, and endothelial microvesicles in healthy subjects. Front Physiol. 2022;13:812942. doi:10.3389/fphys.2022.812942
8) Meessen ECE, Warmbrunn MV, Nieuwdorp M, Soeters MR. Human postprandial nutrient metabolism and low-grade inflammation: a narrative review. Nutrients. 2019;11(12):3000. doi:10.3390/nu11123000. PMID: 31817718

9) Richter EA, Hargreaves M. Exercise, GLUT4, and skeletal muscle glucose uptake. Physiol Rev. 2013;93(3):993-1017. doi:10.1152/physrev.00038.2012. PMID: 23899560
10) Richter EA. Is GLUT4 translocation the answer to exercise-stimulated muscle glucose uptake? Am J Physiol Endocrinol Metab. 2021;320(3):E240-E243. doi:10.1152/ajpendo.00503.2020. PMID: 33283635
11) Kruger RL, Teixeira BC, Farinha JB, Macedo RCO, Boeno FP, Rech A, et al. Effect of exercise intensity on postprandial lipemia, markers of oxidative stress, and endothelial function after a high-fat meal. Appl Physiol Nutr Metab. 2017;42(3):271-276. doi:10.1139/apnm-2016-0326. PMID: 28121453
12) DiPietro L, Gribok A, Stevens MS, Hamm LF, Rumpler W. Three 15-min bouts of moderate postmeal walking significantly improves 24-h glycemic control in older people at risk for impaired glucose tolerance. Diabetes Care. 2013;36(10):3262-3268. doi:10.2337/dc13-0084. PMID: 23761134
13) Iida Y, Takeishi N, Fushimi K, Tanaka K, Mori A, Sato Y. Positive impact of a 10-min walk immediately after glucose intake on postprandial glucose levels. Sci Rep. 2025;15:21589. doi:10.1038/s41598-025-07312-y. PMID: 40594496
14) Bellini A, Nicolo A, Bazzucchi I, Sacchetti M. The effects of postprandial walking on the glucose response after meals with different characteristics. Nutrients. 2022;14(5):1080. doi:10.3390/nu14051080. PMID: 35268055
15) Engeroff T, Groneberg DA, Wilke J. After dinner rest a while, after supper walk a mile? A systematic review with meta-analysis on the acute postprandial glycemic response to exercise before and after meal ingestion in healthy subjects and patients with impaired glucose tolerance. Sports Med. 2023;53(4):849-869. doi:10.1007/s40279-022-01808-7. PMID: 36715875
16) Zhang X, Zheng C, Ho RST, Miyashita M, Wong SHS. The effects of accumulated versus continuous exercise on postprandial glycemia, insulin, and triglycerides in adults with or without diabetes: a systematic review and meta-analysis. Sports Med Open. 2022;8(1):14. doi:10.1186/s40798-021-00401-y. PMID: 35113280
17) Yaman SO, Yaman H, Altinkaynak K, Kural BV, Yucesan FB, Orem C, et al. Elevated circulating endocan levels are associated with increased levels of endothelial and inflammation factors in postprandial lipemia. J Clin Med. 2023;12(4):1267. doi:10.3390/jcm12041267. PMID: 36835803
18) Chang CR, Russell BM, Cyriac T, Francois ME. Using continuous glucose monitoring to prescribe a time to exercise for individuals with type 2 diabetes. J Clin Med. 2023;12(9):3237. doi:10.3390/jcm12093237. PMID: 37176677
19) Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. Br J Sports Med. 2020;54(24):1451-1462. doi:10.1136/bjsports-2020-102955. PMID: 33239350
20) Fogg BJ. Tiny habits: the small changes that change everything. Boston: Houghton Mifflin Harcourt; 2019. 320 p. ISBN: 9780358003328

21) Lally P, van Jaarsveld CHM, Potts HWW, Wardle J. How are habits formed: modelling habit formation in the real world. Eur J Soc Psychol. 2010;40(6):998-1009. doi:10.1002/ejsp.674
22) Bellini A, Scotto di Palumbo A, Nicolo A, Sacchetti M. Exercise prescription for postprandial glycemic management. Nutrients. 2024;16(8):1170. doi:10.3390/nu16081170. PMID: 38674863
23) Zhang X, Wongpipit W, Sun F, Sheridan S, Huang WYJ, Sit CHP, et al. Walking initiated 20 minutes before the time of individual postprandial glucose peak reduces the glucose response in young men with overweight or obesity: a randomized crossover study. J Nutr. 2021;151(4):866-875. doi:10.1093/jn/nxaa420. PMID: 33484136
24) Buffey AJ, Herring MP, Langley CK, Donnelly AE, Carson BP. The acute effects of interrupting prolonged sitting time in adults with standing and light-intensity walking on biomarkers of cardiometabolic health in adults: a systematic review and meta-analysis. Sports Med. 2022;52(8):1765-1787. doi:10.1007/s40279-022-01649-4. PMID: 35462617
25) Mechanick JI, Kushner RF, editors. Lifestyle medicine: a manual for clinical practice. 2nd ed. New York: Springer; 2016. 298 p. ISBN: 9783319245058