ISSUE 10
MARCH 2026

NED JOURNAL

Healthy Weight Loss

Exploring weight loss strategies, and GLP-1 medications

The effects of energy distribution, meal timings and exercise on weight loss and body composition

Effects of dietary interventions on metabolic markers and weight loss in subjects with T2DM

Cardiometabolic parameters, trajectory of weight regain, and bone health in subjects using GLP-1 medications

With special feature article Supporting Clients on GLP-1 Therapy: Evidence-Based Nutritional and Lifestyle Strategies for Weight Management

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WELCOME

Clare Grundel
Managing Editor

WELCOME TO THE WEIGHT LOSS ISSUE

Have you got **your tickets** yet to this year's NED Science Forum? Now **on sale** and promising to be a stimulating event. Come along on 12 May 2026 at The Royal Society of Medicine from 1pm, as we hear scientific wisdom and debate on:
"Realising the Vision of Preventative Health - Translating Genetic and Wearable Data".
Through a mix of visionary presentations and practical clinical applications of genetic and wearable data, the event will be of interest to BANT members and primary healthcare workers interested in pushing the envelope on health prevention. All healthcare professionals are welcome! If you are a BANT member, join us for the AGM which precedes the NED Science Forum.

This is our **10th edition of the NED Journal**! We continue to innovate and aim to bring you practical and up-to-date science on an aspect of nutrition and lifestyle medicine. This edition focuses on **healthy weight loss**, with some interesting NED expert reviews on the evidence surrounding weight loss medications. We are also delighted to feature **NED Expert Reviewer Gail Brady**, lead author of the newest NED Article, **Supporting Clients on GLP-1 Therapy**: Evidence-Based Nutritional and Lifestyle Strategies for Weight Management. This has been peer-reviewed by the NED Editorial Board and brings you a fantastic evidence-based review of the role of nutrition for those using GLP-1 therapies for weight loss.

We would like to extend our thanks to our NED Science Forum sponsors:

Pure Encapsulations, our premium sponsor, Lifecode Gx, Doctors Data, Microba, Metabolics and Pharma Nord.

We are looking forward to meeting their representatives at the **NED Science Forum on 12 May** at the RSM London and thank them for their support of our annual event.

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With thanks to the expert reviewers who have written reviews for this edition and to the NED Editorial Board for their peer-review. Each review provides summary overviews of an article and clinical takeaways for you to apply to your own decision making with clients.

The British Association of Nutrition and Lifestyle Medicine (BANT) is a professional membership body for nutrition practitioners, trained in nutrition sciences and the delivery of personalised nutrition services.

BANT members are reading and interpreting nutrition and lifestyle sciences such as that found in this NED Journal on a routine basis to inform their clinical decision making. You can find the BANT member practitioner listing here.

The Nutrition Evidence Database is one of the ways that BANT contributes to the evidence-based practice of precision nutrition. BANT is delighted to make this resource open access for all and encourages all healthcare practitioners interested in personalised healthcare to make use of the resource on a regular basis. You can sign up to an account here and subscribe to receive monthly NED alerts here.

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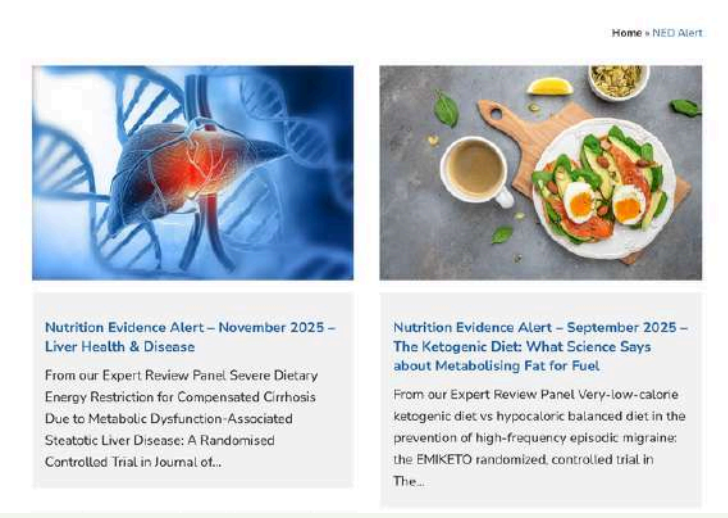

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Dr Justin Roberts, Ph.D, SFHEA, FBANT **EDITOR-IN-CHIEF**

Professor Roberts is a Professor of Nutritional Physiology applied to exercise and functional health within the Cambridge Centre for Sport and Exercise Sciences, Anglia Ruskin University. He has published over 65 peer-reviewed, scientific articles and book chapters, and is a reviewer for numerous academic journals. His research focuses on nutritional strategies to promote metabolic flexibility and adaptive recovery in relation to exercise, including polyphenol and protein-targeted approaches, along with interests in pre-probiotic and food-based strategies to support gastrointestinal function.

Dr Michelle Barrow, DProf, MSc, SFHEA, FBANT, RNutr

Dr. Michelle Barrow is the Academic Team Director and Clinical Director at CNELM. Michelle also supervises PhD students at the University of Central Lancaster, Middlesex University and the University of West London. Michelle completed a Doctorate in Professional Studies (DProf) in 2019, titled "Leading transformation in Personalised Nutrition Practice". She is published in many scientific journals, including Autoimmunity Reviews, Nutrition Reviews and Current Research in Food and Nutrition.

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Founder and director of the Nutritional Medicine Institute, an educational, advocacy and research group. An internationally acclaimed lecturer. Editor of the Nutritional Medicine Journal.

Dr Kate Lawrence, BA(Hons), PhD, FHEA

Dr Lawrence is a Senior Lecturer in psychology at St Mary's University. Kate's research specialises in nutritional psychology and neurodiversity. She is widely published in scientific journals.

Clare Grundel, MANAGING EDITOR MSc, BA (Hons), MBANT

Clare is an experienced nutrition practitioner, and a regular speaker on BBC Radio Cambridge. Clare's area of clinical expertise is digestive health and chronic pain.

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Knowledge sharing is a key strategic pillar for the NED editorial team. Not only do the expert reviews get directly published on the NED database, they are further communicated via a series of monthly resources and across our BANT social media channels reaching in excess of 25,000 practitioners and followers.

EXPERT REVIEWERS IN THIS ISSUE (In order of appearance)

Daniel Quinones, MSc, MBANT

Daniel Quinones is a BANT and CNHC Registered Nutritional Therapist. He obtained his nutritional therapy diploma from the College of Naturopathic Medicine and MSc in Personalised Nutrition from CNELM, Middlesex University. Daniel contributes to Nutrition Evidence through his clinical experience working with weight loss clients and research into the drivers of obesity

Dr Michelle Barrow, DProf, FBANT

Dr. Michelle Barrow is the Academic Team Director and Clinical Director at CNELM. Michelle also supervises PhD students at the University of Central Lancaster, Middlesex University and the University of West London. Michelle completed a Doctorate in Professional Studies (DProf) in 2019, titled "Leading transformation in Personalised Nutrition Practice". Her doctoral research included the construction of clinical tools to enable the development of a new evidence base for personalised nutrition practice in obesity management. She strives to develop the evidence base to support personalised nutrition practice through her academic work, research supervision, post-doctoral research, and publication. She is published in many scientific journals, including Autoimmunity Reviews, Nutrition Reviews and Current Research in Food and Nutrition.

Chloe Steele, MSc, MBANT

Chloe has an MSc in Personalised Nutrition from the University of Middlesex, and specialises in cardiovascular disease, type 2 diabetes, and anxiety. Chloe started her career at BANT as a member of the Nutrition Evidence Database research team and now has over 5 years experience of research and writing. She has worked in several countries, and is currently in Australia, where she worked for Nutrition Australia and is currently the principal nutritionist for Heart Research Australia. She has published two papers in the Nutrition Medicine Journal, on gut microbiota and collagen. Chloe is a member of BANT and the Nutrition Society of Australia and sits on the editorial board for the Nutrition Medicine Institute in the UK.

Gail Brady, MSc, AFMCP, MBANT

Gail is a Registered Nutritional Therapy Practitioner CNHC MBANT. She qualified in 2013 from The Institute for Optimum Nutrition in London and has since furthered her studies and completed a Master's of Science (MSc) degree in Advanced Nutrition (Research and Practice). The topic for her MSc dissertation project was menopause and potential diet and lifestyle interventions that may help to prevent weight gain. In clinical practice, Gail specialises in female health and works 1:1 with clients using a Functional Medicine framework. She also runs an online course providing a tool kit for managing perimenopause and menopause.

Sarah Cassar, MSc

Sarah is a Registered Nutritional Therapist with a Master's degree in Personalised Nutrition. With a strong background in education, she is committed to bridging the gap between nutrition science and practical application, empowering individuals and families to make informed dietary choices. She delivers educational sessions to children, adolescents, parents, and educators while collaborating with other healthcare professionals to promote holistic health strategies. Sarah focuses on their impact on cognitive development, behavioural health, and overall well-being. She actively contributes to the field through research analysis, community engagement, and the indexing of scientific journals.

Priya Kannath, MSc, ANLP, MBANT

Anna is a Registered Nutritional Therapy Practitioner and a member of BANT, holding an MSc in Personalised Nutrition and a PGCert in Higher Education. Her dissertation delved into the intricate relationship between dietary refined carbohydrates and the onset of gout in overweight individuals, highlighting a beneficial role of magnesium in managing hyperuricaemia. Anna supports clients to optimise their health, with a particular focus on cardio-metabolic and immune function disorders. Beyond her clinical work, she teaches and lectures at the Centre for Nutrition Education & Lifestyle Management (CNELM).

Miranda Harris, MSc, SFHEA, MBANT

Miranda is a member of BANT and a CNHC Registered Nutritional Therapy Practitioner with over 10 years clinical experience, specialising in endurance sport. She is a senior lecturer (SFHEA) focusing on research methods, dissertation supervision and sports nutrition on the Nutrition and Lifestyle Medicine MSc course at the University of Worcester. She has recently published in the European Journal of Integrated Medicine and the Journal of Nutrition and Health and is working towards a PhD by publication. She is a keen triathlete training for Ironman.

Dr Michelle Weech, MSc, PhD

Michelle is a Research Fellow at the Hugh Sinclair Unit of Human Nutrition, University of Reading and holds a PhD in human nutrition. With over 15 years' experience in nutrition research, she has authored more than 50 scientific publications and conducted over 10 human studies. Her research investigates the impact of individual nutrients (particularly dietary fats), diet quality, dietary patterns, and sustainable diets on cardiometabolic health. Michelle has expertise in dietary assessment methodologies and has developed research tools, including digital technologies, to assess dietary intake and deliver evidence-based personalised nutrition advice.

Laurentia (Laura) Campbell, MSC, AfN

Laura is a Biomedical Scientist academic, Neuroscientist and Nutritionist and an active member of the Nutrition Society, BANT, Association of Nutrition, and World Health Organisation Fides Committee, an expert panel of health advisers trying to stop scientific misinformation online. She has worked in gut microbiota labs, as a science writer for high profile papers and magazines and as a freelance scientist, helping review and develop new food and supplement products to improve health quality based on new emerging scientific evidence. Her focus has been on food for the brain, with published research on the effects of plant polyphenols on anxiety and depression. When working as Head of Education at Nutritank, she educated doctors on nutrition and worked to improve nutrition communication. Laura has also worked with the NHS and Public Health England as a innovation advisor and Health Champion, focusing on eating disorders, obesity and diabetes. Her book, Planetable, releases in 2026.

Karin Elgar, PhD, MBANT

Following the completion of a PhD in Physiology and a career in the pharmaceutical industry, Karin graduated as a nutritional therapist from the Institute of Optimum Nutrition in 2004. She has since been practising in the Greater Manchester area, specialising in women's health and autoimmunity. Karin has written a number of literature reviews and carried out a variety of research and editing projects. She has also delivered CPD seminars and webinars on various topics.

Kirsty Baxter, MSc, AFMCP, MBANT

Kirsty is a member of BANT and a CNHC Registered Nutritional Therapy Practitioner with over 7 years of clinical practice, with a Masters in Advanced Nutrition. She has completed training in Applying Functional Medicine in Clinical Practice (IFM) and is a published researcher (2021). Her specialisms include metabolic conditions: including diabetes, insulin resistance, metabolic syndrome, PCOS and weight loss and she works extensively with Irritable Bowel Syndrome and Food Sensitivities.

Creative Editor

Claire Sambolino, MSc, ANLP, MBANT

Claire Sambolino is a PSA-accredited Registered Nutritional Therapy Practitioner with a passion for food provenance and sustainability. She completed an MSc in Personalised Nutrition in 2017, and runs online clinics in the UK and Italy specialising in metabolic health and integrative cancer nutrition. She is a certified MTIH Terrain Advocate ®, Metabolic Balance ® Consultant, NLP Coach, and Systems Approach to Cancer ® Programme enhanced cancer nutrition practitioner. Since 2007, Claire has been based in Italy with over 18 years lived-experience of the Mediterranean diet and Blue Zones.
As Creative Editor, Claire designs the layout for each NED Journal, overseeing the creative direction and realisation of the digital and printed formats, and diffusion across multi-media and social channels.

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GENERAL WEIGHT LOSS

5 REVIEWS

Distribution of energy intake across the day and weight loss: A systematic review and meta-analysis

CISABEL E YOUNG, AMUDHA POOBALAN, KATHARINE STEINBECK, HELEN T O'CONNOR, HELEN M PARKER
JOURNAL: OBESITY REVIEWS : AN OFFICIAL JOURNAL OF THE INTERNATIONAL ASSOCIATION FOR THE STUDY OF OBESITY 2023;24(3):E13537

BACKGROUND

Chrononutrition refers to the timing and distribution of total daily energy intake across the day. It has been proposed that consuming a greater proportion of total daily energy intake earlier in the day as opposed to the evening may be beneficial for weight loss and metabolic health.

Aims: This systematic review and meta-analysis aimed to assess the impact of earlier versus later distribution of total daily energy intake on weight loss.

RESULTS

A total of 9 randomised controlled trials involving 485 participants were included in this analysis. The study durations ranged from 5-16 weeks. All of the studies included in this analysis applied energy-restricted diets to both intervention arms.
The mean percentages of energy intake in 8 of the 9 studies per meal were:

- Earlier distributed intakes: breakfast: 34% ± 16%, lunch: 38% ± 7%, dinner: 20% ± 6%.
- Later distributed intakes: breakfast: 19% ± 6%, lunch: 30% ± 10%, dinner; 40% ± 11%.

One of the studies advised percentage of energy intakes as either:

- Earlier: 70% for breakfast, morning tea and lunch and 30% for afternoon tea and dinner
- Late: 55% for breakfast, morning tea and lunch and 45% for afternoon tea and dinner.

The earlier distributed energy intake groups demonstrated significantly greater weight loss when compared with later distributed energy intake groups (Mean Difference (MD) −1.23 kg; 95% CI −2.40, −0.06, p = 0.04; I2 = 98%).

The earlier energy intake groups also displayed lower fasting and bedtime glucose levels (fasting: −0.83 vs. −0.27 mmol/L, p = 0.001; before sleep: −1.70 vs. −0.28 mmol/L, p = 0.009).

A random-effects model demonstrated that the earlier intake groups displayed greater reductions in LDL (MD: −0.11 mmol/L; 95% CI −0.14, −0.07, p < 0.01), fasting glucose (MD: 0.15 mmol/L, 95% CI −0.23, −0.06, p < 0.001) and HOMA-IR (MD: −0.38; 95% CI −0.64, −0.11, p = 0.005).

One study reported that earlier distribution energy intake also led to a greater reduction in medications following the intervention for type 2 diabetics (31% vs. 0%, P=0.002).

Two of the studies assessed both appetite and hunger and identified that earlier distribution of energy led to improvements in their urge to eat, preoccupation with food and cravings for sweets and fats.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

Implementing a dietary strategy where a higher proportion of energy is consumed earlier in the day may offer additional benefits to an energy restricted diet for weight loss, blood glucose, improve markers of insulin resistance, increase satiety and improve hunger management. Based on the findings, earlier distribution of energy intake may serve as an effective component of a weight loss protocol. Read the article here

CLINICAL PRACTICE APPLICATIONS

Earlier distribution of energy intake may be beneficial for:

- Weight loss
- Improve fasting insulin, HOMA-IR, fasting glucose and HbA1c
- Reducing LDL
- Improving satiety and hunger management
- Supporting the reduction of medications for individuals with type 2 diabetes
- Improving regularity of sleep and waking times

CONSIDERATIONS FOR FUTURE RESEARCH

As the included studies only ranged from 5-16 weeks, longer duration studies would be useful to identify the effect of earlier distribution of energy intake on body weight, metabolic health and appetite over a longer period of time. There was a high degree of heterogeneity between the studies and a lack of uniformity in the distributions of energy intake across the day. Further studies with more uniformity of energy distribution would be needed to identify the optimal distribution of energy across the day to improve body weight and metabolic health.

PLAIN LANGUAGE SUMMARY

Obesity increases an individual's risk of metabolic disease, such as diabetes and cardiovascular disease, musculoskeletal disorders such as osteoarthritis, and some cancers. “Chrononutrition” relates to the timing of meals and distribution of total energy intake across the day. Evidence is building chrononutrition as a potential target in both weight loss and metabolic disease interventions. The aim of this study was to examine the impact of earlier versus later distribution of total daily energy intake on weight loss, and to evaluate the potential for utilizing altered energy distribution as a tool in weight loss interventions. This study is a systematic review and meta-analysis of nine clinical studies. Total number of participants was 485 (earlier distributed total energy intakes: n = 244, later distributed total energy intakes; n = 241). Results show that energy intakes with a focus on earlier distribution resulted in significantly greater weight loss when compared with similarly energy-restricted diets with individuals consuming a larger proportion of their total energy intake later in the day and into the evening. Authors conclude that earlier energy intakes may be a promising tool to be used in conjunction with other weight loss strategies such as energy restriction to enhance weight loss. However, further research is required to elucidate the additional positive impacts that earlier distributed total energy intakes may have on weight and metabolic health.

EXPERT REVIEWER Daniel Quinones

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Dose-response relationship between weight loss and improvements in obstructive sleep apnea severity after a diet/lifestyle interventions: secondary analyses of the "MIMOSA" randomized clinical trial

MICHAEL GEORGOULIS, NIKOS YIANNAKOURIS, IOANNA KECHRIBARI, ET AL.
JOURNAL: JOURNAL OF CLINICAL SLEEP MEDICINE : JCSM : OFFICIAL PUBLICATION OF THE AMERICAN ACADEMY OF SLEEP MEDICINE 2022;18(5):1251-1261

INTRODUCTION

OSA represents one of the most common and serious sleep-related breathing disorders, with a high worldwide prevalence of almost 1 billion people. OSA has numerous well-established cardiometabolic consequences.
The authors highlight that weight loss is essential for obstructive sleep apnea (OSA) management. However, the optimal degree of weight loss for improving OSA severity or eliminating sleep-disordered breathing has not been extensively studied. The aim of this study was to explore the dose-response relationship between the degree of weight loss and improvements in OSA severity.

METHOD

This is a secondary analysis of the Mediterranean diet/lifestyle Intervention for the Management of Obstructive Sleep Apnea (MIMOSA) study. This study was designed as a single-center, single-blind, parallel, randomised, controlled clinical trial to evaluate the effectiveness of a weight-loss Mediterranean dietary/lifestyle intervention on managing OSA. This 6-month long clinical trial included 180 adult, overweight/obese moderate-to-severe OSA patients (45 patients per study group plus a 29% dropout rate). All patients were prescribed the standard of care continuous positive airway pressure (CPAP) therapy and were randomised to 3 arms: standard care; Mediterranean diet; Mediterranean lifestyle
Based on percent change in weight at 6 months, participants were categorised into a weight-stable/gain (WS/GG) group or one of 3 weight-loss groups (WLG): < 5%WLG; 5%–10%WLG; ≥ 10%WLG. Polysomnographic data and OSA symptoms were also evaluated preintervention and postintervention.

TAKE HOME MESSAGE

Important from a public health perspective:

- This study has confirmed that even a small degree of weight loss can have a beneficial effect on respiratory events and oxygen desaturation in moderate-to-severe OSA, but clinicians should preferably aim at a ≥ 5% weight loss, and ideally a ≥ 10% weight loss, to achieve clinically meaningful reductions in OSA severity.

Read the article here

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

RESULTS

- Results confirm a dose-response relationship between the degree of weight loss achieved through a dietary/lifestyle intervention and improvements in OSA severity.
- Respiratory events and oximetry indices improved only in patients who lost weight. Improvements were proportional to the degree of weight loss.
- Median percent change in apnea-hypopnea index (AHI) was −11.7%, − 37.9%, and − 49.3% in the < 5%WLG, 5%–10%WLG, and ≥ 10%WLG, respectively (P < .001).
- Compared to the WS/GG, the age-, sex-, baseline-, and CPAP use–adjusted relative risk (95% confidence interval) of severe OSA (AHI ≥ 30 events/h) was 0.45 (0.23–0.87) in the 5%–10%WLG and 0.32 (0.17–0.64) in the ≥ 10%WLG; the risk was also lower in the ≥ 10%WLG vs the < 5%WLG (0.42 [0.22–0.82]).
- Insomnia and daytime sleepiness also improved more in participants exhibiting ≥ 5% weight loss.
- The dose-response relationship between weight loss and improvement in OSA severity was evident regardless of self-reported CPAP use.

CLINICAL PRACTICE APPLICATIONS

- These findings might be useful for Nutritional Therapists and Clinical Practitioners:
- Clinicians should aim for a ≥ 5% weight loss, and ideally a ≥ 10% weight loss, to achieve clinically meaningful reductions in OSA severity.
- Improvements after weight loss were significant even though a healthy body weight was not achieved.

CONSIDERATIONS FOR FUTURE RESEARCH

- The study sample consisted of predominantly male, overweight, otherwise healthy patients with moderate-to-severe OSA. Therefore, findings cannot be generalised to the whole OSA population and further research is required with broader, diverse, study samples.
- 6 months is a short duration period, therefore longer trials are required.
- Self-reported CPAP use by participants is a limitation of this study. Further robust analysis methods should be considered for future trials.
- Participants were advised to abstain from CPAP therapy for 2 days prior to the follow-up PSG but this was not evaluated or confirmed in this study and should be in future research.

CONCLUSION

- The authors conclude that even a < 5% weight loss was sufficient for improvements in respiratory events and oximetry indices, but the prevalence of severe OSA reduced only after a ≥ 5% weight loss, and patients achieving a ≥ 10% weight loss exhibited the greatest benefits compared to weight-stable/gain patients.

EXPERT REVIEWER Dr. Michelle Barrow

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

An Energy-Reduced Mediterranean Diet, Physical Activity, and Body Composition:

An Interim Subgroup Analysis of the PREDIMED-Plus Randomized Clinical Trial

JESÚS F GARCÍA-GAVILÁN, JORDI SALAS-SALVADÓ, DORA ROMAGUERA, ET AL.
JOURNAL: JAMA NETWORK OPEN 2023;6(10):E2337994

TAKE HOME MESSAGE

- The addition of exercise to an energy-reduced diet, which focuses on whole grains, healthy fats, lean protein, and fruits and vegetables can emphasise positive effects on body composition in older adults.
- However, there is a loss of lean mass associated with this type of diet (contrary to author conclusions) and measures should be taken to monitor and increase protein intake to prevent or limit this loss.

Read the article here

INTRODUCTION

This study aimed to determine the long-term effects of an energy reduced MedDiet in combination with physical activity on body composition.

METHOD

- This is a predetermined 3-year interim analysis of a 6-year single-blind, randomised control trial of 1556 individuals aged 55-75 who are overweight or obese with metabolic syndrome.
- 760 individuals on 30% energy reduced MedDiet with limited processed foods, plus 45 minutes walking 6 days per week and behavioural and motivational support. [Intervention group]
- 761 on standard MedDiet without physical activity. [Control]

RESULTS

Within group comparisons showed that individuals in the intervention group lost (P value represents baseline vs year 3):

- Total fat mass percentage (1-year vs baseline, −1.14%; 95% CI, −1.32% to −0.96%; 3-year vs baseline, −0.52%; 95% CI, −0.71% to −0.33% P=<0.001)
- Absolute visceral fat (1-year vs baseline, −154 g; 95% CI, −191 to −116 g; 3-year vs baseline, −75.1 g, 95% CI, −115 to −35.3 g P=<0.001)
- Absolute total fat after 1 year (mean change at 1 year vs baseline, −1677 g; 95% CI, −1930 to −1424 g) but regained some at year 3 (mean change at 3 years vs baseline, −1018 g; 95% CI, −1280 to −756 g P=<0.001)
- Absolute lean mass (mean change at 1 year vs baseline −300 g; 95% CI, −439 to −162 g) with further losses at year 3 (−626 g; 95% CI, −770 to −483 g P=0.001).

Within group comparisons also showed significantly increased:

- Total lean mass percentage, which was greater at year 1 than year 3 (1-year vs baseline, 1.07%; 95%CI, 0.90%-1.25%; 3-year vs baseline, 0.47%; 95% CI, 0.29%-0.65% P=<0.001).

As a result of total fat loss and some lean mass in the intervention group, the lean:fat mass ratio improved and was unchanged in the control group (between group differences (P=<0.001).

Compared to women, men may find the MedDiet + exercise more beneficial as it was shown that body composition changes were slightly more pronounced in men.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

CLINICAL PRACTICE APPLICATIONS

- The recommendation of a reduced energy MedDiet in combination with physical activity to older people who are overweight or obese may improve body composition.
- Although lean mass loss slowed between years 1 and 3, other practices should be employed to attenuate the loss of lean mass associated with an energy-reduced MedDiet and ageing.

CONSIDERATIONS FOR FUTURE RESEARCH

- The research has not yet concluded but when it does, it will address the incidence of cardiovascular disease along with body composition changes.
- It will also look at long-term effects of the diet to determine longevity.
- Future research could focus on how to limit lean mass loss through the possibility of changing the type of exercise that accompanies the MedDiet.

CONCLUSION

- An energy-reduced MedDiet plus exercise emphasised positive changes to body composition compared to standard MedDiet in older adults who are overweight or have obesity.

EXPERT REVIEWER Chloe Steele

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Intentional Weight Loss, Waist Circumference Reduction, and Mortality Risk Among Postmenopausal Women

MARISA A BITTONI, WENDY E BARRINGTON, MICHAEL HENDRYX, JUHUA LUO, ET AL.
JOURNAL: JAMA NETWORK OPEN 2025;8(3):E250609

INTRODUCTION

Studies on the impact of intentional weight loss among older adults and risk of mortality are inconsistent, with both increased and decreased risks being reported. Waist circumference (WC), which may be a stronger indicator of risk of mortality than body mass index (BMI), is often not taken into consideration. The aim of this study was to investigate whether an intentional reduction in weight and/or WC were associated with a lower risk of mortality in postmenopausal women.

METHOD

- N=58961 US-based women, aged 50-79 years from the Women's Health Initiative were included in this cohort study. Mean baseline BMI = 27 and WC 84.1cm.
- Women with intentional or unintentional weight loss changes of 5 pounds or more, and a reduction in WC between baseline and year 3 weight, were followed up annually for an average of 18.6 years.
- Measurement outcomes included mortality from cardiovascular disease (CVD), cancer and all other causes, as reported on death certificates, medical (and other, such as autopsy) records and the National Death Index.

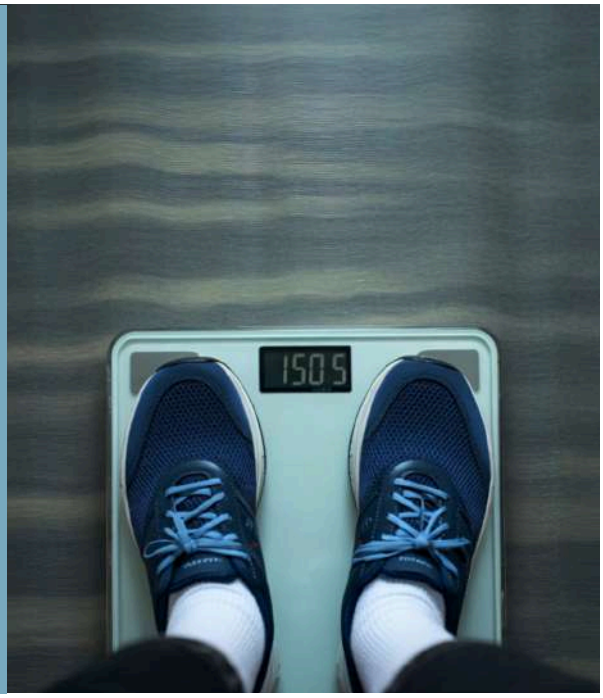
RESULTS

- Lower risk of all-cause mortality was found in women who intentionally lost 5 pounds or more (95% CI) and had a reduction in WC
- Intentional weight loss alone was associated with a lower risk of mortality from CVD only.
- Unintentional weight loss and/or a reduction in WC were associated with a higher risk of mortality from all causes (CI 95%).

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

- Intentional weight loss that occurs with WC reductions is associated with reduced mortality risk in postmenopausal women across all causes, cancer and cardiovascular disease.
- Intentional weight loss without WC reductions is associated with lower mortality from cardiovascular disease only.
- Clinicians can use this research to support monitoring of reductions in WC during intentional weight loss programmes with postmenopausal women, whilst ensuring adequate protein in diets and the addition of strength training for maintenance of muscle mass.

Read the article here



CLINICAL PRACTICE APPLICATIONS

- Monitoring of both weight loss and reductions in WC should be considered in overweight and obese postmenopausal women seeking to lose weight. The focus on weight loss together with WC reduction mitigates the risk of weight loss from muscle loss alone.
- Dietary changes should include adequate protein intake and physical activity to include strength training in order to support the maintenance of muscle mass and reduce risk of sarcopenia.
- Unintentional weight loss could be linked to underlying chronic disease or as an adverse side effect of treatment.

CONSIDERATIONS FOR FUTURE RESEARCH

- Further research into weight loss combined with WC reduction in other demographic groups in relation to mortality would add value i.e. in younger women or in men.
- Research into WC reductions, irrespective of weight loss, as a means to lower mortality rates would be of interest.

CONCLUSION

Intentional weight loss, together with a reduction in WC were associated with a decreased risk of mortality from CVD, cancer and all other causes. These findings suggest that adherence to diet and exercise strategies that support a reduction in abdominal adiposity should be encouraged in overweight or obese postmenopausal women.

EXPERT REVIEWER Gail Brady

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: C: Non-randomized trials, observational studies, narrative reviews

Effect of an mHealth weight loss intervention on Healthy Eating Index diet quality: the SMARTER randomised controlled trial.

JESSICA CHENG, TINA COSTACOU, SUSAN M SEREIKA, MOLLY B CONROY, BAMBANG PARMANTO, ET AL.
JOURNAL: THE BRITISH JOURNAL OF NUTRITION 2024;130(11):2013-2021

INTRODUCTION

This study aimed to assess the association between diet quality and a mHealth intervention of self-monitoring (via Fitbit food diary) and personalised, automated feedback compared with self-monitoring alone.

METHOD

This was a secondary analysis of data (n=356) from the SMARTER randomised controlled trial, a parallel-group weight loss intervention conducted among adults with overweight or obesity. Participants were originally randomised to either self-monitoring with personalised app-based feedback (SM+FB) or self-monitoring alone (SM). Diet quality was assessed using Healthy Eating Index (HEI-2015) scores calculated from multiple 24-hour dietary recalls collected at baseline, 6 and 12 months.

RESULTS

- Participants in the complete-case analysis were predominantly female (78.9%), white (85.4%), middle-aged (median 51.0 years), and had obesity (median BMI 33.1 kg/m²).
- The proportion of participants with complete dietary data did not differ by treatment groups (SM 67.7% vs. SM+FB 74.1%; chi-square P = 0·12).
- Baseline HEI-2015 total scores were similar between SM+FB (63.11; 95% CI [60.41, 65.24]) and SM (61.02; 95% CI [58.72, 62.81]), with minimal change at 6 months (65.42 vs. 63.19) and 12 months (63.94 vs. 63.56).
- At 6 months, participants achieving ≥5% weight loss had higher HEI-2015 scores than those with <5% loss (67.46 [65.27, 70.12] vs. 62.41 [60.26, 63.94]), despite similar baseline scores. However, by 12 months, HEI-2015 scores were comparable by 6-month weight-loss status (65.38 [62.87, 67.97] vs. 62.72 [60.28, 64.43]).
- Among SM+FB participants, those viewing ≥50.5% of feedback messages showed slightly higher HEI-2015 scores at 6 months (68.02 [63.98, 71.15] vs. 63.04 [61.40, 64.61]), with smaller differences at 12 months.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

- Diet quality change may not occur without explicit focus on specific dietary components.
- Personalised feedback alone did not significantly change diet quality compared with self-monitoring alone.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- Personalised nutrition can be used in adults with overweight or obesity to support improvements in overall diet quality.
- Nutritional strategies may prioritise reducing refined grains, added sugars, and saturated fats, as targeting these energy-dense components may positively influence multiple diet quality indices.
- Incorporating structured, feedback-based digital or remote interventions may enhance patient engagement and facilitate dietary behaviour change.

CONSIDERATIONS FOR FUTURE RESEARCH

- Future studies should test more targeted feedback addressing sodium, whole/refined grains, and saturated fat to determine whether focused messaging leads to greater improvements in diet quality.
- Research should examine additional personalisation strategies (e.g., timing, delivery mode, cultural tailoring, self-efficacy support) to enhance engagement and effectiveness of digital interventions.
- Improved dietary assessment designs including weekday/weekend and non-consecutive recalls are needed, and strategies to minimise missing data should be prioritised.
- Interventions that address both individual behaviours and broader socio-ecological influences concurrently may be more effective in improving dietary behaviours and health outcomes.

CONCLUSION

Minimal diet quality improvement was observed in this mHealth intervention among participants with overweight and obesity.

EXPERT REVIEWER Sarah Cassar

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

HEALTHY WEIGHT LOSS SCIENCE TAKEAWAYS

NED INFOBITES

Not yet discovered our one page science summaries? Our NED InfoBites are designed to provide quick overviews of some of the latest research available on particular health issues and nutrition topics. Designed as a one-page clinical handout, the NED InfoBites unite our editorial team's pick of the research and provide a plain-language summary suitable for sharing with nutrition clients. Download the latest InfoBites on Healthy Weight Loss **here**.

Additionally, BANT has developed a dedicated range of resources to support practitioners and educate on common symptoms, biological processes, and dietary and lifestyle approaches to health and well-being. These are suitable to share with clients in clinical consultations and group programmes.

NED INFOBITE

Healthy Weight Loss

Effects of Mediterranean diet, exercise, and their combination on body composition and liver outcomes in metabolic dysfunction-associated steatotic liver disease: a systematic review and meta-analysis of randomized controlled trials

Reviewed by OMR EXPERTS NED With Expert Review from Sarah Caesar

Metabolic dysfunction–associated steatotic liver disease (MASLD) is highly prevalent among individuals living with obesity and represents a growing global health challenge. While diet and lifestyle modification are universally recognised as central to management, there remains considerable uncertainty among clinicians regarding the most effective dietary and exercise strategies.

This systematic review and meta-analysis of 37 randomised controlled trials critically evaluated the effects of the Mediterranean diet (MD), exercise, and their combination on anthropometric measures and liver-related outcomes in individuals with MASLD. The results demonstrated that both MD and exercise, when implemented independently, produced modest yet consistent improvements in body composition and liver function, as reflected by reductions in alanine aminotransferase (ALT), reinforcing their clinical relevance for weight management and hepatic health in MASLD.

Although fewer trials examined combined diet-and-exercise interventions, the available evidence suggested additive benefits, with participants achieving approximately 1.5–2 kg of weight loss, reductions in waist circumference, and further improvements in liver function

Replacing dietary carbohydrate with protein and fat improves lipoprotein subclass profile and liver fat in type 2 diabetes independent of body weight: evidence from 2 randomized controlled trials

With Expert Review from Karin Elgar

This study aimed to determine the effects of a short-term carbohydrate-reduced, high-protein (CRHP) diet (30% carbohydrate, 30% protein, 40% fat) on lipid metabolism, particularly lipoprotein density subclasses, compared with a conventional diabetes (CD) diet. A secondary analysis was conducted using data from two open-label RCTs in adults with T2DM...with all meals provided to maximise dietary adherence. Despite no differences in weight maintenance or loss between dietary groups in either study, the CRHP diet produced significantly greater improvements in atherogenic lipoprotein profiles. Notably, reductions were observed in triacylglycerol-rich lipoproteins, small dense low density lipoprotein (LDL) particles, and unfavourable high density lipoprotein (HDL) subclasses, alongside favourable shifts in the HDL2/HDL3 ratio. Importantly, intrahepatic triglyceride content was reduced to a significantly greater extent in the CRHP group in both trials, with changes closely correlated to improvements in lipoprotein subclasses. Collectively, these findings indicate that a CRHP diet can improve dyslipidaemia and liver fat accumulation in individuals with T2DM independently of weight loss, highlighting its potential as a targeted dietary strategy to reduce atherogenic risk and metabolic liver disease

Early Time-Restricted Eating Improves Weight Loss While Preserving Muscle: An 8-Week Trial in Young Women

Time-restricted eating (TRE) works on the principle of confining the daily eating window to a relatively short duration. During the extended fasting period, beneficial metabolic processes, such as improved insulin resistance, weight loss, and fatty acid oxidation may be enhanced.

This 8-week study aimed to determine whether an early TRE (eTRE), eating within an 8:00am-2:00pm, or delayed TRE (dTRE), eating between 12:00pm-6:00pm, best enhances resistance training adaptations. The results showed that eTRE resulted in greater weight loss than both dTRE and control without any detrimental effects on muscle thickness and push-up performance. The authors concluded that eTRE appears to be more beneficial than dTRE for weight management, without hindering muscle adaptations when combined with resistance exercise

Cardiometabolic Parameter Change by Weight Regain on Tirzepatide Withdrawal in Adults With Obesity: A Post Hoc Analysis of the SURMOUNT-4 Trial

With Expert Review from Chloe Steele

Tirzepatide, a dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist, has demonstrated substantial efficacy for weight reduction and improvements in anthropometric and metabolic parameters in the SURMOUNT-4 RCT. However, treatment withdrawal was associated with weight regain and a reversal of metabolic benefits, despite the continuation of lifestyle interventions.

This analysis aimed to quantify the extent of weight regain following cessation of therapy. A total of 308 participants who achieved ≥10% weight loss after 36 weeks of tirzepatide treatment were included in the analysis. The findings revealed that, among individuals with obesity, treatment discontinuation led to ≥25% weight regain in a substantial proportion of participants within one year, accompanied by a pronounced deterioration in cardiometabolic outcomes

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Nutrition Evidence Alert – February 2026

Healthy Weight Loss

We shift our focus to healthy weight loss. In clinical practice this requires more than calorie restriction, it demands a structured, evidence-based approach that preserves lean mass, supports metabolic health, and addresses the behavioural drivers of long-term weight regulation. Read our expert reviews, resources library and check out the latest NED Article and NED Infobites. **bant.org.uk/category/ned-alert/**

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4 REVIEWS

MEAL TIMING & HEALTHY WEIGHT LOSS

Delayed dinnertime impairs glucose tolerance in healthy young adults

FUZUKI NAKAMURA, YUKI SHIMBA, SAKI TOYONAGA, ET AL.
JOURNAL: JOURNAL OF DIABETES INVESTIGATION 2024;15(2):172-176

INTRODUCTION

This study aimed to investigate the relationship between dinnertime delay, hourly up to 3 h, on the subsequent glucose fluctuations in healthy adults.

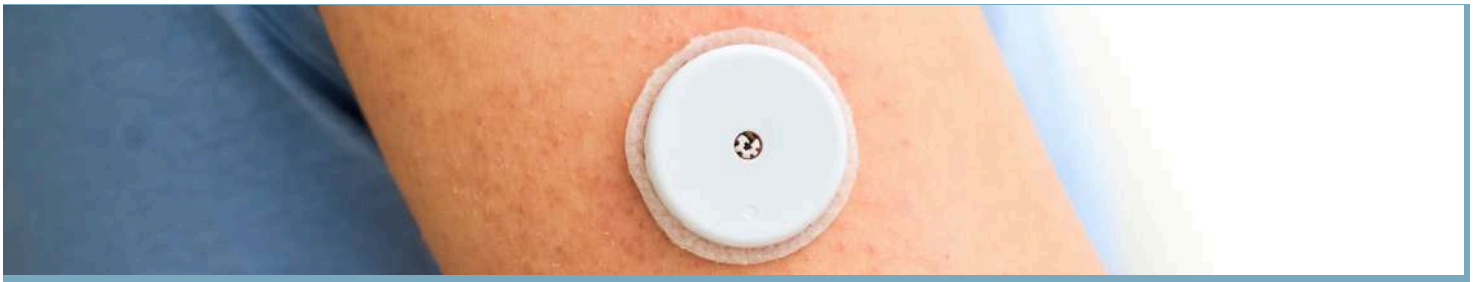
METHOD

This was a 14-day open-label, randomised, cross-over trial with fixed mealtimes at 7:00 (breakfast), 13:00 (lunch), and 19:00 (dinner; 19D). On intervention days, dinner was consumed at 20:00 (20D), 21:00 (21D), or 22:00 (22D), in random order, with only water, tea, or non-sweetened coffee permitted outside mealtimes. Interstitial glucose was measured every 15 minutes using intermittently scanned continuous glucose monitoring. Data from specified intervention days were used for comparative glucose analyses.

RESULTS

- Compared with the 19:00 dinner condition (19D), dinners consumed at 20:00, 21:00, and 22:00 were associated with impaired postprandial glucose tolerance, characterised by higher glucose peaks and a delayed return to baseline.
- Postprandial glucose concentrations and incremental area under the curve from 0–180 min ($iAUC_{0-180}$) were significantly higher for 20D, 21D, and 22D than for 19D.
- The postprandial glucose peak was significantly higher in the 21D condition compared with 19D.
- No significant differences in postprandial glucose parameters were observed among 20D, 21D, and 22D, indicating similar glycaemic responses across these later dinner times.
- Mean 24-h glucose, glucose standard deviation, coefficient of variation, and mean amplitude of glycaemic excursions did not differ significantly between conditions, except for a higher 24-h average glucose in the 20D condition.
- Analysis of glucose levels between 19:00 and 25:00 and corresponding $iAUC_{19-25}$h supported poorer glucose tolerance with dinners later than 20:00.
- Findings suggest that factors beyond circadian regulation alone may contribute to glucose intolerance after 20:00, as no further deterioration was observed between 20:00 and 22:00.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE



- Eating dinner later than 19:00 may impact the body's ability to manage blood sugar after a meal.
- Delaying dinner by just 1 hour may lead to higher blood glucose levels.
- Meal timing may play an important role in short-term glucose regulation, even in healthy young adults.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- Encouraging earlier evening meals (around 19:00) may help support optimal postprandial glucose control.
- Meal timing should be considered alongside diet quality in glycaemic management strategies.

CONSIDERATIONS FOR FUTURE RESEARCH

- Longer-term intervention studies are needed to determine whether the observed acute effects persist over time.
- Future research could include populations with metabolic disorders to improve generalisability.
- Larger, adequately powered trials are required to explore potential sex-based differences.
- Future studies could standardise meal energy content and more tightly control physical activity.
- Mechanistic studies examining alternative meal timings, macronutrient composition, and related metabolic markers (e.g., free fatty acids, GLP-1) are warranted to better understand the pathways influencing postprandial glucose responses.

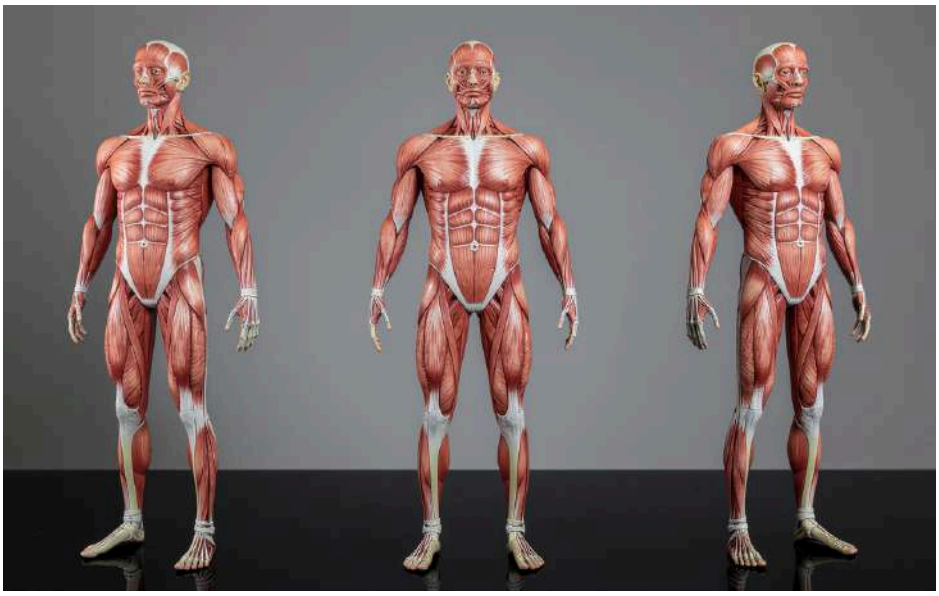
CONCLUSION

A delay of as little as 1 hour in dinnertime may impair postprandial glucose tolerance in healthy young adults.

EXPERT REVIEWER Sarah Cassar

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

The Effect of Time-Restricted Eating Combined with Exercise on Body Composition and Metabolic Health: A Systematic Review and Meta-Analysis



ZIHAN DAI, KEWEN WAN, MASASHI MIYASHITA, ROBIN SZE-TAK HO, ET AL.
JOURNAL: ADVANCES IN NUTRITION (BETHESDA, MD.) 2024;15(8):100262

TAKE HOME MESSAGE

- Combining time restricted eating with exercise may be beneficial for managing body weight, fat mass and metabolic health. Further research is needed to confirm these results in specific populations, exercise types and time frames. Read the article here

INTRODUCTION

The aim of this study was to investigate the efficacy of a combination of time restricted eating (TRE) and exercise for improving body composition and metabolic health in adults.

METHOD

- 19 randomised controlled trials (RCT) with a total population of N=568 adults aged 18-62 years were included in this review.
- 11 RCTs were in males, 6 in females and 2 were mixed sex. The number of participants ranged from 12 to 131 and intervention durations from 4 weeks to 12 months.
- 8 RCTs had unrestricted energy intake (ad libitum) while in 11 RCTs, energy intake was restricted (non-ad libitum). All RCTs used control groups following a normal dietary pattern. All groups included exercise.
- Outcome measures included: body mass, fat mass, free fat mass, total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density cholesterol (HDL-C), triglycerides (TG), fasting glucose, inflammatory markers, cytokines and adipokines (insulin-like growth factor 1 (IGF-1), IL-6, TNF-A, leptin and adiponectin).
- Subgroups included: Ad-libitum and non-ad-libitum energy intake within a TRE window, and intervention durations of >4 (moderate-term) or < 4 weeks (short-term).

RESULTS

- A reduction in body mass ($p<0.01$) and fat mass ($p<0.01$) was found in TRE plus exercise groups. Analysis of subgroups found this may only apply for non-ad libitum diet groups ($p<0.01$) with moderate-term study durations ($p<0.01$). There was no difference in fat-free mass with intervention duration ($p=0.23$).

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

RESULTS CONTINUED...

- There was no difference between TRE with exercise and control on fasting glucose and insulin (p=0.35), though reductions in fasting glucose were reported in subgroups for non-ad libitum TRE with exercise intervention groups (p0.01) with durations of >4 weeks (p=0.04) only.
- There was no difference in lipid profile between groups (p>0.05), though subgroup analysis found reductions in TG in non-ad libitum diet groups (p<0.01) with study durations >4 weeks (p<0.01) only, a reduction in LDL-C for non-ad libitum diet groups (p<0.01) with moderate durations (p<0.01).
- The study also revealed reductions in leptin (p<0.01) but no difference in adiponectin (P=0.11) with the combined strategy of TRE plus exercise.
- Reductions in IGF-1 (p<0.01), IL-6 (p=0.01), TNF-A (p<0.01) were also observed.

CLINICAL PRACTICE APPLICATIONS

- TRE and exercise may be an effective strategy for reducing body and fat mass and improving metabolic health in adults but likely only with an energy restricted diet for more than 4 weeks
- Fat mass loss may be due to increased fat oxidation stimulated by exercise and the use of fat as a fuel source, however, further research into mechanisms is needed.
- Participant characteristics and metabolic health varied between studies; 11 studies were in physically active males, 5 studies were in overweight or obese females, 1 study in normal weight, active females and 2 studies were mixed sex, 1 of which was in obese individuals, 88% of which were females.
- Exercise types and duration of fasting varied between studies.

CONSIDERATIONS FOR FUTURE RESEARCH

- Heterogeneity in participant characteristics, metabolic profiles, exercise types, duration of fasting and timing of meals and control diet types may have influenced the results.
- Further research is needed to confirm these results in specific populations, exercise types and time periods.

CONCLUSION

This study found that combining TRE with exercise was effective for reducing fat mass and body weight as well as improving lipid profiles and specific metabolic markers in adults. However, further research is needed to confirm these results in specific populations, exercise types and durations.

EXPERT REVIEWER Gail Brady

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Early Time-Restricted Eating Improves Weight Loss While Preserving Muscle: An 8-Week Trial in Young Women

TAKESHI UEDA, ZIFU YU
JOURNAL: NUTRIENTS 2025;17(6):

INTRODUCTION

Early time-restricted eating (eTRE) combined with resistance training (RT) may promote better weight loss than a delayed time-restricted eating (dTRE) schedule.
• This randomised controlled trial aimed to determine the effects of eTRE in combination with RT, compared to dTRE or the control group with no time restriction.

METHOD

24 healthy young women with limited previous experience in RT, were randomly assigned to:
• early time-restricted eating (eTRE) group restricted eating between 8:00 AM – 2:00 PM – (n=8)
• delayed time-restricted eating group (dTRE) restricted eating between 12:00 PM – 6:00 PM – (n=8)
• control group with no time restriction in eating between 8:00 AM – 8:00 PM – (n=8)
All participants performed standardised RT form push-ups for 8 weeks, involving knee-supported push-ups to reduce loading.
Protein intake was required to be at least 1.2 g/kg/day across all groups, and no group had imposed caloric restriction.

RESULTS

- At week 8, participants in the eTRE group achieved significant weight loss ($p = 0.004$) and muscle thickness ($p = 0.043$) compared to the control group only.
- At week 8, participants in the dTRE group did not achieve a significant weight reduction ($p = 0.499$) or muscle thickness compared to the control group ($p = 0.228$).
- Overall eTRE showed a larger pre–post weight reduction than control ($p < 0.001$), whereas dTRE showed a smaller but still statistically significant weight reduction ($p = 0.047$).
- All groups increased triceps brachii thickness by 1.36–1.55 mm, with no statistically significant interactions, indicating gains were similar in eTRE and dTRE.
- Both eTRE ($p = 0.896$) and dTRE ($p = 0.339$) groups failed to demonstrate a statistically significant change in push-up repetition count following the intervention.

The authors discussed the following potential mechanisms for eTRE were proposed:

- Aligning food intake earlier in the day may better match circadian clocks, favouring metabolic efficiency and fat loss compared with delayed eating.
- Early feeding is linked to higher daytime insulin sensitivity and a larger thermic effect of food after breakfast than after dinner, increasing total energy expenditure and supporting weight loss.
- Longer fasting overnight with eTRE may improve fatty acid oxidation, insulin sensitivity, inflammatory and oxidative stress pathways, promoting adiposity reductions.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

RESULTS CONTINUED

Mechanisms for preserved/improved muscle thickness with TRE + RT:

- Resistance training is the primary driver of hypertrophy; with sufficient protein intake (≥1.2 g/kg/day), TRE did not seem to reduce myofibrillar protein synthesis or muscle adaptations.
- TRE may enhance insulin sensitivity and mTOR signalling but lower testosterone and IGF-1; this explains why muscle gains were similar across eTRE, dTRE, and control despite weight-loss differences.

- Time-restricted eating is an effective strategy for weight loss.
- eTRE may help achieve significant weight loss compared with dTRE and control.
- eTRE combined with resistance training may offer additional benefits such as improving muscle thickness, because earlier, circadian-aligned eating enhances metabolic efficiency and fat loss, while the resistance training stimulus and adequate nutrition still allow muscle protein synthesis and hypertrophy to occur.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- TRE appears to be a simple pattern to adopt to achieve weight loss.
- eTRE (8:00 AM–2:00 PM) may promote greater weight loss than a delayed eating window or dTRE (12:00 PM–6:00 PM).
- • eTRE combined with resistance training may significantly improve muscle thickness alongside significant weight loss.
- In clinical practice, scheduling an early time-restricted eating window alongside resistance training may help patients lose primarily fat mass while preserving or improving muscle thickness in the trained region.

CONSIDERATIONS FOR FUTURE RESEARCH

Further robust research with greater numbers of participants is required to determine how the weight loss and muscle thickness-promoting effects apply across the broader population with obesity or chronic diseases.

• Future studies should examine how combining time-restricted eating patterns with resistance training influences associated hormones, sleep responses, muscle hypertrophy and endurance.

CONCLUSION

TRE with a scheduled eating window earlier in the day, combined with resistance training, could aid better weight loss and improve muscle thickness in young healthy females with no prior experience of resistance training.

EXPERT REVIEWER Priya Kannath

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Efficacy of time restricted eating and resistance training on body composition and mood profiles among young adults with overweight/obesity: a randomized controlled trial

TINGTING CUI, WEIBING YE, YUBO LIU, ET AL.
JOURNAL OF THE INTERNATIONAL SOCIETY OF SPORTS NUTRITION
2025;22(1):2481127

INTRODUCTION

This study aimed to compare independent and combined effects of Time-restricted eating (TRE) and resistance training (RT) on body weight (BW), fat mass/fat free mass (FM/FFM), blood pressure (BP), heart rate (HR), mood profiles (DASS-21) and sleep quality (PSQI).

TAKE HOME MESSAGE

- TRE independently and combined with RT is effective for body weight, BMI, waist and hip circumference, diastolic BP and sleep.
- RT is effective for fat mass loss with enhanced lean body mass. Combined with TRE, fat mass loss is enhanced while preserving lean body mass.
- TRE and RT strategies do not affect mood profile adversely and have been shown to improve sleep quality.

Read the article here

METHOD

- 54 healthy, physically active students completed an 8-week RCT (mean age 20, BMI 26kg/m_2). Randomised into control (n=13), TRE (n=16), RT (n=15), TRE and RT (n=14).
- TRE and TRE+RT followed a 10-hour eating period between 8am-8pm.
- RT and TRE+RT performed RT 3 times per week.

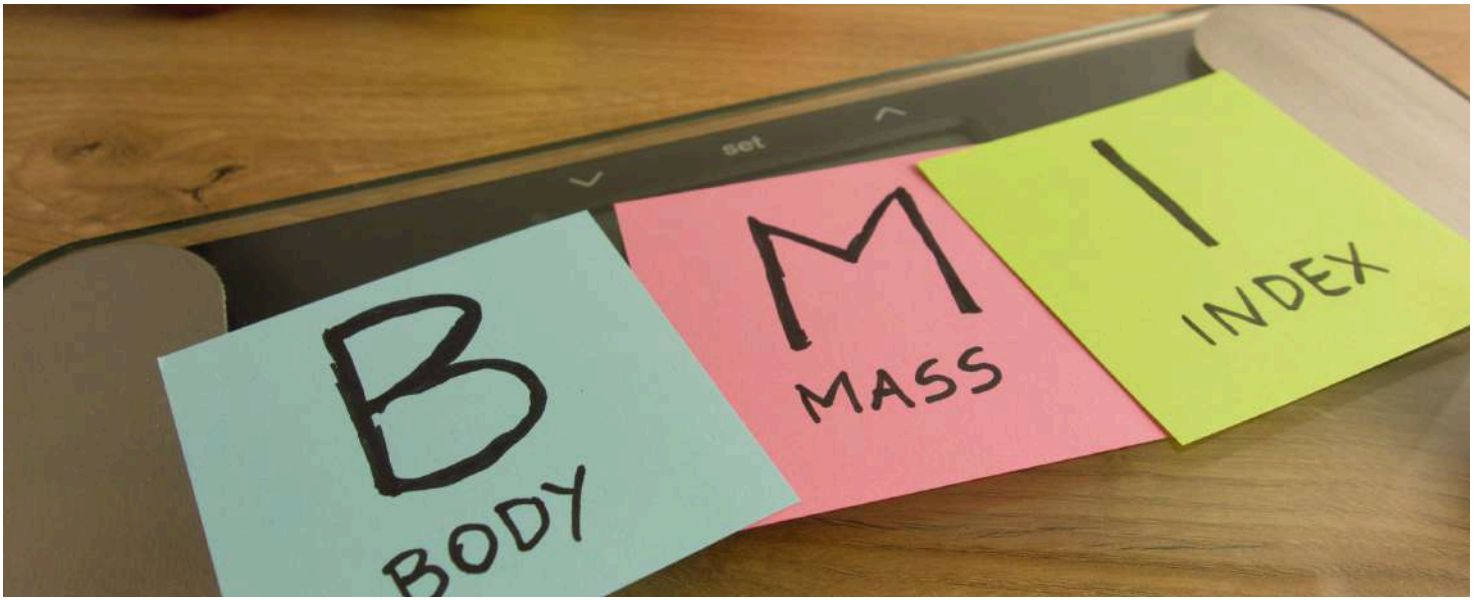
RESULTS

There was

- A significant ($p < 0.01$) decrease in BW (−2.6 ± 0.4 kg) and BMI (−1 ± 0.1 kg/m2) in TRE and similarly in TRE+ RT but not in RT.
- A significant ($p < 0.01$) decrease in waist (−4.6 ± 0.7 cm; −4 ± 1 cm) and hip (−4.7 ± 0.6 cm, −4.6 ± 0.8 cm) circumference in TRE and TRE+RT respectively but no difference in waist-hip ratio.
- RT independently and combined with TRE substantially decreased FM by 1.1 ± 0.5 and 3.2 ± 0.4 kg respectively but not in TRE. Fat-free mass was significantly ($p < 0.01$) decreased with TRE (−2.3 ± 0.6 kg), increased with RT (1.6 ± 0.3 kg), but unaffected in TRE+RT.
- A significant ($p < 0.05$) decrease in diastolic BP in RT and TRE+RT but no difference in systolic BP or HR in any group.

No difference in mood in time or group interaction. PSQI improved significantly in RT (4.8 ± 2.9; $p < 0.05$) and tended to improve in TRE+RT (4.5 ± 1.9).

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE



CLINICAL PRACTICE APPLICATIONS

- TRE and RT have reported beneficial effects on addressing overweight and obesity.
- TRE and RT have reported beneficial effects on sleep quality with no adverse effects on mood.
- TRE can be considered as an independent strategy for weight loss BMI, waist and hip circumference reductions.
- RT can be considered as an independent strategy for fat loss and increased lean body mass but when used with TRE or when TRE is used independently these effects are not seen.
- Choosing the most effective strategy depends on individual needs and practical preferences, so either TRE or RT independently or combined could be considered.

CONSIDERATIONS FOR FUTURE RESEARCH

- Evaluating different eating windows and duration of TRE to evaluate compliance outcomes.
- Evaluating different types of exercise such as endurance exercise to compare their effectiveness.
- Considering other metrics for evaluation for example inflammatory, and a range of cardiometabolic markers.
- Evaluating the effects of dietary composition, calorie content and other factors such as hydration.

CONCLUSION

TRE+RT and TRE/RT independently reduced BW, BMI, FM, waist/hip circumference, diastolic BP and improved sleep. Combining TRE with RT prevented TRE-induced FFM loss. There appeared no negative mood effects in any group.

EXPERT REVIEWER Miranda Harris

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

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WEIGHT LOSS DRUGS

GLP-1 MEDICATIONS

3 REVIEWS

Cardiometabolic Parameter Change by Weight Regain on Tirzepatide Withdrawal in Adults With Obesity: A Post Hoc Analysis of the SURMOUNT-4 Trial.

DEBORAH B HORN, BRUNO LINETZKY, MELANIE J DAVIES, ET AL.
JOURNAL: JAMA INTERNAL MEDICINE 2025

INTRODUCTION

- Obesity increases the risk of cardiometabolic diseases.
- Tirzepatide, a dual GIP/GLP-1 receptor agonist, is currently being used to treat obesity.
- In the SURMOUNT-4 trial, participants used tirzepatide for 36-weeks, achieving weight loss and cardiometabolic improvements, before being randomised to continue treatment or stop treatment (placebo) for a year.
- This post-hoc analysis examined whether greater weight regain after tirzepatide withdrawal influenced the cardiometabolic benefits achieved during weight loss.

TAKE HOME MESSAGE

- Tirzepatide treatment was associated with weight loss and improved cardiometabolic risk profile in the SURMOUNT-4 trial.
- Most participants (82.5%) regained at least 25% of their lost weight within a year of stopping tirzepatide treatment.
- Those with greater weight regain had greater increases in cardiometabolic risk markers, including blood pressure, fasting glucose and triglycerides, highlighting the importance of maintaining treatment for weight management.

Read the article here

METHOD

- SURMOUNT-4 participants in the treatment withdrawal group who achieved ≥10% weight reduction (n=308) were grouped by % of weight regained over a year (week 36 to 88) relative to their prior weight loss (week 0 to 36): <25%, ≥25% to <50%, ≥50% to <75%, and ≥75%.
- Cardiometabolic outcomes included weight, body mass index (BMI), waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), triglycerides, high-density lipoprotein cholesterol (HDL-C), non- HDL-C, HbA1C, fasting glucose and insulin, and indexes of insulin resistance (HOMA2-IR) and β-cell function (HOMA2-B).
- Changes in cardiometabolic factors between weight regain groups were analysed using a mixed model for repeated measures.

RESULTS

Participants were 47.1 (±12.2) years old, 71% were female, and demographics were similar across groups.

- By week 88, 82.5% had regained ≥25% of weight lost.
- Comparing week 88 to 36, greater weight regain was associated with larger increases in weight, BMI, WC, SBP, DBP, triglycerides, non-HDL-C, HbA1C, glucose and insulin ($p \leq 0.002$), while WC, triglycerides, non-HDL-C, insulin, and HOMA2-IR did not significantly differ when weight regain was <25% ($p > 0.05$).
- When weight regain was <50%, BMI, WC, SBP, DBP, triglycerides, non-HDL-C, HbA1C, glucose and insulin remained significantly lower than pre-treatment (week 0) levels, ($p \leq 0.05$).

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

CLINICAL PRACTICE APPLICATIONS

- This article highlighted the importance of maintaining weight reductions in the long-term to sustain cardiometabolic benefits and improve health-related quality of life.
- These findings can support discussions between patients and healthcare professionals about long-term weight management, including counselling on the wider clinical implications of stopping treatment beyond weight regain alone.

CONSIDERATIONS FOR FUTURE RESEARCH

- Future research should focus on evaluating and optimising strategies to maintain weight loss after discontinuing tirzepatide or other weight-loss medications.
- These studies should actively involve key stakeholders—such as people using weight-loss medications and professionals across the healthcare pathway—to better understand barriers to weight-loss maintenance and to inform the development of more effective long-term strategies.

CONCLUSION

- Most participants regained ≥25% of the weight lost within a year of discontinuing tirzepatide.
- Higher weight regain was associated with greater reversal of the cardiometabolic improvements achieved during treatment.
- Findings highlight the need for longer-term treatment of obesity.

EXPERT REVIEWER Michelle Weech

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Trajectory of the body weight after drug discontinuation in the treatment of anti-obesity medications

JOURNAL: BMC MEDICINE 2025;23(1):398

INTRODUCTION

This study aimed to evaluate the long-term effects of anti-obesity medications (AOMs) on body weight trajectories following treatment discontinuation, with a focus on patterns of weight change over time.

METHOD

This was a systematic review and meta-analysis of eleven randomised controlled trials evaluating anti-obesity medications. Eight trials used placebo comparators and three used active drug controls, comprising 1,573 participants in intervention groups and 893 in control groups. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

RESULTS

- Compared with controls, AOM discontinuation was associated with greater weight regain overall, with the magnitude varying by follow-up time.
- At week 4, AOMs were still associated with a non-significant 0.32kg weight loss (95% CI −3.60 to 2.97; P = 0.85; I^2 = 83%), whereas significant weight regain was observed at week 8 (WMD = 1.50kg; 95% CI 1.32–1.68; P < 0.0001; I^2 = 0%), week 12 (1.76kg; 95% CI 1.29–2.24; P < 0.0001; I^2 = 72%), week 20 (2.50kg; 95% CI 2.27–2.73; P < 0.0001; I^2 = 0%), week 26 (2.30kg; 95% CI 0.53–4.07; P = 0.01; I^2 = 0%), and week 52 (2.47kg; 95% CI 0.24–4.70; P = 0.03; I^2 = 92%).
- increased through weeks 12–20, then stabilised. Body weight at 52 weeks remained lower than baseline.
- Significant weight regain was observed in both placebo-controlled (WMD = 1.72kg; 95% CI 1.20–2.23; P < 0.001; I^2 = 83%) and active-controlled studies (WMD = 2.37kg; 95% CI 0.30–4.44; P = 0.02; I^2 = 0%), with no between-subgroup difference (P = 0.55).
- GLP-1–based agents showed significant weight regain versus controls (WMD = 1.78kg; 95% CI 0.76–2.80; P = 0.006; I^2 = 85%), whereas non–GLP-1 strategies did not (P = 0.18).

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

- AOMs produce clinically meaningful weight loss during active treatment, but partial weight regain may occur after discontinuation.
- Weight regain following cessation of therapy reflects weight cycling and may be influenced by metabolic adaptation, including reductions in resting energy expenditure after weight loss.
- Regular physical activity may help shift energy balance toward expenditure rather than storage, potentially attenuating post-treatment weight regain.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- Long-term or sustained weight management strategies should be considered when prescribing AOMs, as weight regain after discontinuation is common. The results from this study suggest that support is particularly important in the first 6 months following discontinuation of AOMs, when weight regain tends to taper off.
- Ongoing lifestyle interventions, particularly structured exercise, should accompany pharmacotherapy to help minimise weight regain.
- Individualised nutritional follow-ups and monitoring may support early identification and management of post-treatment weight changes.

CONSIDERATIONS FOR FUTURE RESEARCH

- Longer-term follow-up studies are needed to better characterise weight trajectories and determinants of weight change after AOM discontinuation.
- Future analyses should incorporate additional efficacy outcomes beyond weight and body mass index, such as body composition and metabolic markers.
- Larger numbers of trials with more standardised intervention protocols would help reduce heterogeneity and strengthen evidence.
- Further investigation is required to clarify the impact of adverse events and treatment discontinuation on post-treatment weight regain.

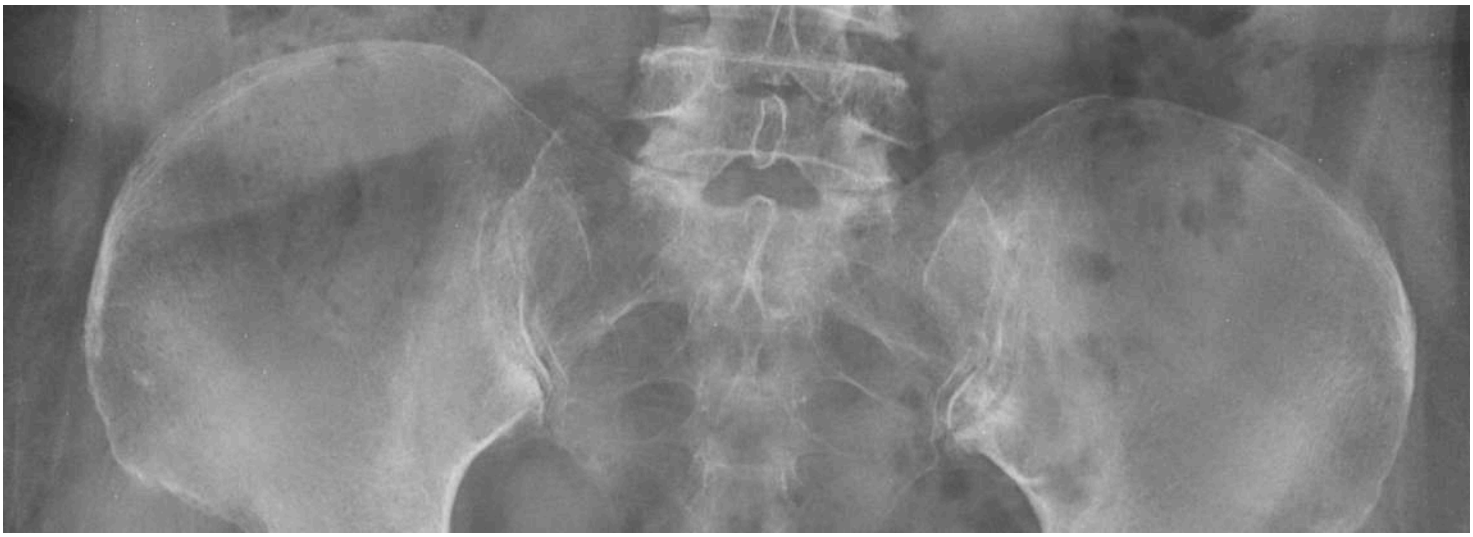
CONCLUSION

- Significant weight regain occurred 8 weeks after discontinuation of AOMs and was sustained through 20 weeks. Weight regain patterns varied across drug classes and study designs.

EXPERT REVIEWER Sarah Cassar

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Bone Health After Exercise Alone, GLP-1 Receptor Agonist Treatment, or Combination Treatment: A Secondary Analysis of a Randomized Clinical Trial



JOURNAL: JAMA NETWORK OPEN 2024;7(6):E2416775
PMID: 38916894

INTRODUCTION

- Exercise and glucagon-like peptide-1 receptor agonists (GLP-1RAs) represent weight loss strategies that may protect bone mass despite weight loss.
- The aim of this study was to investigate bone health at clinically relevant sites (hip, spine, and forearm) after diet-induced weight loss followed by a 1-year intervention with exercise, liraglutide, or both combined.

METHOD

- Predefined secondary analysis of a blinded randomised clinical trial conducted between August 2016 and November 2019 in Denmark.
- Participants included adults aged 18 to 65 years with obesity (BMI of 32-43) and without diabetes.
- After an 8-week low-calorie diet (800 kcal/day), participants were randomised to 1 of 4 groups for 52 weeks: a moderate- to vigorous-intensity exercise program (exercise alone), 3.0 mg daily of the GLP-1 RA liraglutide (liraglutide alone), the combination, or placebo.
- The primary outcome measured was change in site-specific bone mineral density (BMD) at the hip, lumbar spine, and distal forearm from before the low-calorie diet to the end of treatment, measured by dual-energy x-ray absorptiometry in the intention-to-treat population.
- Participants, personnel, and investigators were blinded regarding study medication until the primary outcomes were analysed.

RESULTS

- In total, 195 participants (mean [SD] age, 42.84 [11.87] years; 124 female [64%] and 71 male [36%]; mean [SD] BMI, 37.00 [2.92]) were randomised, with 48 participants in the exercise group, 49 participants in the liraglutide group, 49 participants in the combination group, and 49 participants in the placebo group.

- The total estimated mean change in weight losses during the study was 7.03 kg (95% CI, 4.25-9.80 kg) in the placebo group, 11.19 kg (95% CI, 8.40-13.99 kg) in the exercise group, 13.74 kg (95% CI, 11.04-16.44 kg) in the liraglutide group, and 16.88 kg (95% CI, 14.23-19.54 kg) in the combination group.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

RESULTS CONTINUED

- In the combination group, BMD was unchanged compared with the placebo group at the hip (mean change, -0.006 g/cm2; 95% CI, -0.017 to 0.004 g/cm2; P = .24) and lumbar spine (-0.010 g/cm2; 95% CI, -0.025 to 0.005 g/cm2; P = .20). Compared with the exercise group, BMD decreased for the liraglutide group at the hip (mean change, -0.013 g/cm2; 95% CI, -0.024 to -0.001 g/cm2; P = .03) and spine (mean change, -0.016 g/cm2; 95% CI, -0.032 to -0.001 g/cm2; P = .04).

- Exercise with GLP-1 (liraglutide) treatment may help reduce the risk of associated bone mineral density loss in obese patients under 65.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- More awareness of the affects of GLP-1 treatments such as liraglutide on bone-mineral-density and the need for lifestyle changes such as increased exercise in parallel, is needed to reduce bone loss risk in patients.
- The substantial weight loss of 16.9kg for the combination group vs 7.0kg for the placebo group in this RCT and the combination treatment of exercise with GLP-1 preserving site - specific BMD compared with placebo, suggests recommendation of combination of GLP-1 (liraglutide) treatment with exercise may benefit maintenance of bone density of patients during this specific weight loss treatment.
- This study has limitations as cohort limited to adults aged 18 to 65 years without other chronic diseases, therefore the results may not be generalisable to patients with diabetes or older individuals.

CONSIDERATIONS FOR FUTURE RESEARCH

- A strength of the reviewed secondary RCT was that the primary RCT sample had a large sample size (195 participants) and was heterogeneous, including males and premenopausal and post-menopausal females. However, this study has limitations as the cohort was limited to adults in Denmark aged 18 to 65 years without other chronic diseases, therefore the results may not be generalisable to patients with diabetes or older individuals or in other (non Danish) populations. More studies are needed in wider populations.

CONCLUSION

- Combination of exercise and GLP-1RA (liraglutide) was the most effective weight loss strategy while preserving bone health. Liraglutide treatment alone reduced BMD at clinically relevant sites more than exercise alone despite similar weight loss.

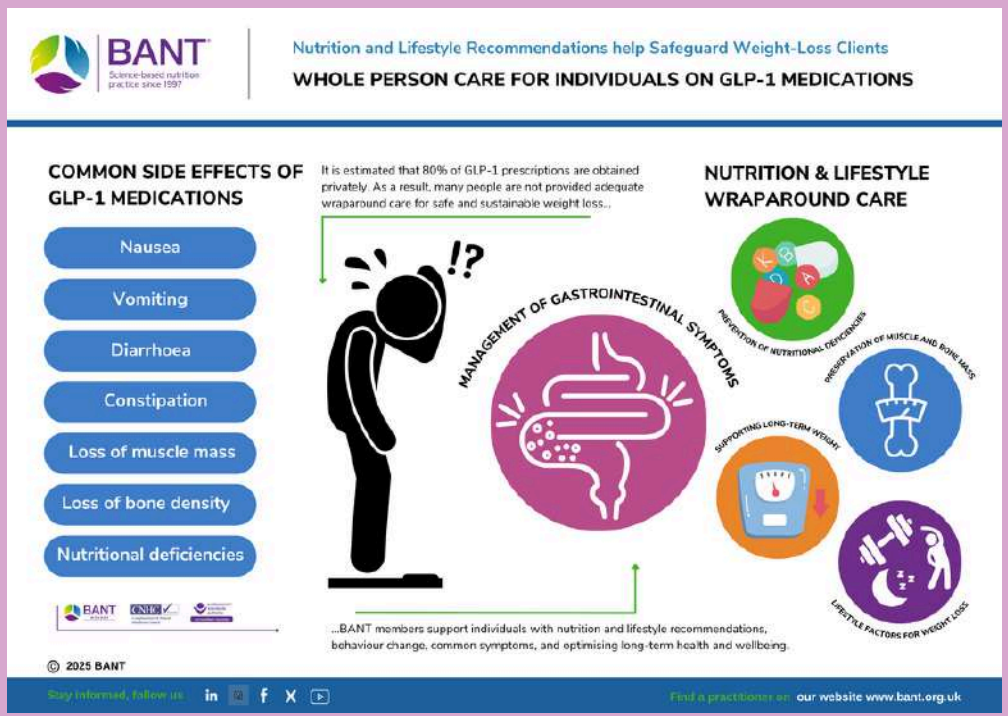
EXPERT REVIEWER Laura Campbell

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

GLP-1 INFOGRAPHICS

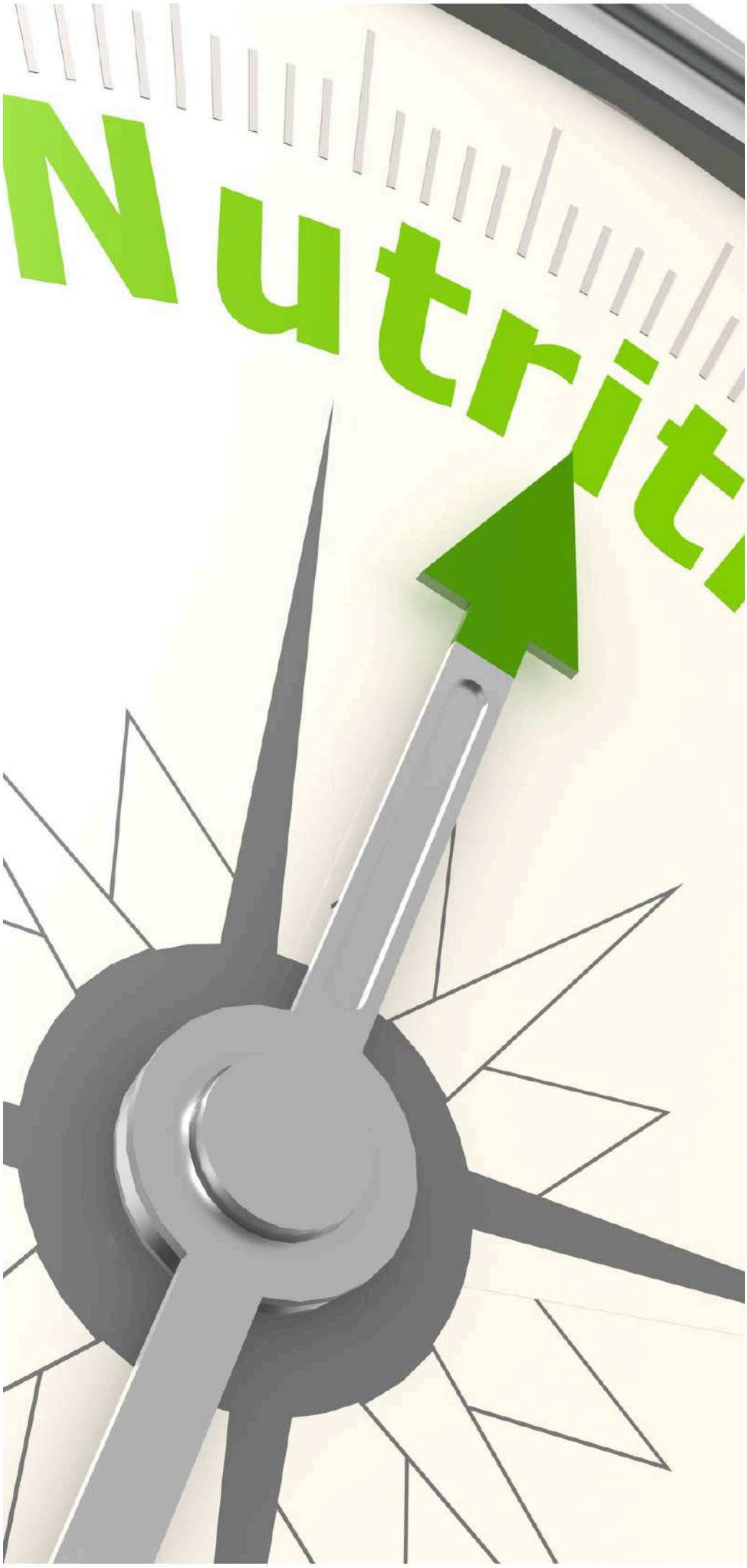
INFOGRAPHICS FOR PRACTITIONERS

BANT has developed a dedicated range of resources to complement the personalised nutrition and lifestyle advice given by practitioners in a clinical setting. These resources are open access on our website bant.org.uk and aid further comprehension of nutrition science and clinical interventions.



METABOLIC

HEALTHY WEIGHT LOSS



3 REVIEWS

Replacing dietary carbohydrate with protein and fat improves lipoprotein subclass profile and liver fat in type 2 diabetes independent of body weight:

evidence from 2 randomized controlled trials

JOURNAL: THE AMERICAN JOURNAL OF CLINICAL NUTRITION 2025;121(2):224-231

INTRODUCTION

- The aim was to evaluate the effect of a 6-week carbohydrate-reduced high-protein diet (CRHP, 30% carbohydrates, 30% protein, 40% fat) on lipid profiles, with an emphasis of lipoprotein density subclasses, in patients with type 2 diabetes mellitus (T2DM) compared to a conventional diabetes diet (CD, 50%, 17% and 33%, respectively).

METHOD

- Secondary analysis of two open-label, randomised controlled trials (RCT) in adults with T2DM:
  - isoenergetic diet crossover RCT in 30 participants who had a CRHP diet and a CD diet.
  - hypocaloric diet parallel RCT of 72 participants split into two groups, where one group followed the CRHP diet the other followed the CD diet. The weight loss goal was 6%.
- In both studies, all meals were provided to participants.
- Outcome measures included: triacylglycerol (TAC), total cholesterol, HDL and LDL cholesterol and density profiles of lipoproteins.

RESULTS

- There was no difference between groups in weight maintenance or weight loss in either study.
- In the isocaloric study, patients on CRHP improved significantly more than the CD group in various subclasses of lipoproteins : TAG-rich lipoproteins (TRL, mean -33%, 95% CI (-48%, -14%), LDL5 (-16%; (-26%, -4%)), HDL3 particles (-8%; (-14%, -0.7%)), HDL2/HDL3 ratio (10%; (0%, 22%)), and LDL1 (-20%; (-35%, -2%)).
- In the hypocaloric study, patients on the CRHP improved significantly more in LDL5 (-13%; (-22%, -3%) and HDL2/HDL3 ratio (11%; (0.7%, 22%)), with a trend to reduced TRL (-16%; (-30%, 1%).
- Intrahepatic TAG (IHTG) content reduced significantly more in the CRHP group than the CD group in both studies (-55%; (-74%, -22%) in the isocaloric study; -26% (-45%, 0%) in the hypocaloric study). Changes in IHTG correlated with changes in lipoprotein subclasses.
- In both studies, glycaemic and lipid markers improved significantly more in the CRHP compared to the CD group.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

TAKE HOME MESSAGE

A reduced carbohydrate/high protein diet (30% CHO, 30% protein) may benefit patients with T2DM with improved lipid profiles and liver health

Read the article here

CLINICAL PRACTICE APPLICATIONS

- A reduced carbohydrate/high protein diet (30% CHO, 30% protein) could be considered for patients with T2DM to improve lipid profiles and liver health.

CONSIDERATIONS FOR FUTURE RESEARCH

- Longer-term studies in a real-life situation (meals not provided) are needed to confirm the long-term safety and efficacy of as well as compliance with a reduced carbohydrate diet.

CONCLUSION

- A CRHP diet may improve metabolic dysfunction–associated steatotic liver disease and dyslipidaemia in patients with T2DM independent of weight loss, resulting in reduced atherogenicity.

EXPERT REVIEWER Karin Elgar PhD

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Diets for weight management in adults with type 2 diabetes: an umbrella review of published meta-analyses and systematic review of trials of diets for diabetes remission

CHAITONG CHURUANGSUK, JULIEN HALL, ANDREW REYNOLDS, ET AL.
JOURNAL: DIABETOLOGIA 2022;65(1):14-36

INTRODUCTION

- This systematic review of meta-analyses aimed to evaluate dietary approaches for weight loss in those with a diagnosis of Type 2 Diabetes, including disease remission.

METHOD

- 19 meta-analyses (MA) on weight-loss diets, involving 23 primary trials, were assessed using A Measurement Tool to Assess Systematic Reviews (AMSTAR) 2. Findings were synthesised by diet type and study quality (Cochrane Risk of Bias tool 2.0 and Risk Of Bias In Non-randomised Studies – of Interventions [ROBINS-I]) with GRADE applied.
-
- Time period of diets / length of observation / intervention: 1) Formula meal replacements (>12–52 wk), 2) LCDs ranged between (>8 wk to 4 years), 3) Very low energy diets (>8–12 wk), 4) High- protein (>4->8 wks), Mediterranean (>4->8 wk), high-monounsaturated-fatty-acid (>2wk), vegetarian (≥3wk) and low-glycaemic-index diets (≥6mo).

RESULTS

Weight loss diets in the review included:

- Formula meal replacements (high quality, GRADE moderate) achieved 2.4 kg (95% CI −3.3, −1.4) greater weight loss over 12–52 weeks.
- Low-carbohydrate diets were no better for weight loss than higher-carbohydrate/low-fat diets (high quality, GRADE high).
- High-protein, Mediterranean, high-monounsaturated-fatty-acid, vegetarian and low-glycaemic-index diets all achieved minimal (0.3– 2 kg) or no difference from control diets (low to critically low quality, GRADE very low/moderate).
- Greatest weight loss was reported with very low energy diets (VLED), (400–500 kcal). However, this study found that low-carbohydrate diets (LCD) (21–70g of carbohydrate daily from 1000–1500 kcal) were no better for weight loss than higher-carbohydrate/low-fat diets.

SUMMARY

This MA found that VLED and formula meal replacement appear the most effective approaches for weight management in T2D by providing less energy than self-administered food-based diets. Potential pathophysiological mechanisms highlighted by authors are HbA1c reduction and remission which appear to be from weight loss, with only small differences between diet types assessed over 3–12 months, irrespective of diet type. Authors highlight weight reduction is fundamental for T2D management and remission.

Study limitations: Many meta-analyses were of ‘low’ and ‘critically low’ AMSTAR 2 quality, predominantly through ‘no protocol reported’ (despite clear and sound methods) and no assessment of publication bias.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

TAKE HOME MESSAGE

- Authors highlight current evidence on diets for T2D remission is limited but believe remission can be achieved if sufficient weight loss is maintained. The main contributor to HbA1c reduction and remission appears to be weight loss, irrespective of diet type.
- NICE Guidelines highlight the remission of diabetes occurs when a patient no longer satisfies the diagnostic criteria, without receiving glucose-lowering medication. By 2019 in one UK GP practice 27% of the practice population with T2D who followed a LCD for 23 months, lost weight and lowered their HbA1c to 48 mmol/mol (NICE target range) in conjunction with prescribed medication.
- This review highlights an opportunity for Nutritional Therapy Practitioners to successfully work with LCD approaches to support weight loss and improved HbA1c.

Read the article here

CLINICAL PRACTICE APPLICATIONS

- While this study found a variety of dietary compositions can be used effectively for weight management with T2D, VLED was successfully used to achieve remission for T2D.
- Programmes with a 'total diet replacement' induction phase were the most effective dietary approach for T2D remission (up to 61% of participants at 1 year).

CONSIDERATIONS FOR FUTURE RESEARCH

- Authors state future research should provide implementation with optimal support in real-life settings for weight loss, prevention of weight regain and remissions, rather than seek subtle differences from macronutrient compositions.
- Future studies should report sufficient detail about macronutrient or micronutrient contents, or prescribed and reported energy intakes, including energy intake of nutrient-restricted diets.
- Most studies included European participants, such that findings may not be equally applicable to other ethnic and/or deprived communities. Durations of interventions varied, where weight regain is frequent over a longer period. Authors highlight evidence from clinical practice is needed to identify safe and effective approaches to achieve and maintain weight loss
- Authors highlight primary studies should use an RCT design, with data analyses conducted 'blind'. They should define the intervention clearly (e.g., diets, physical activity, and behavioural and psychological support), and address separately the induction (usually 3–6 months) and maintenance (≥12 months) phases.

EXPERT REVIEWER Kirsty Baxter

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

Effect of weight-maintaining ketogenic diet on glycemic control and insulin sensitivity in obese T2D subjects

AURORA MEROVCI, ANDREA HANSIS-DIARTE, EUGENIO CERSOSIMO, ET AL.
JOURNAL: BMJ OPEN DIABETES RESEARCH & CARE 2024;12(5):

TAKE HOME MESSAGE

- In the absence of weight loss, a ketogenic diet did not improve glucose metabolism in individuals with obesity and T2D in the absence of weight loss.
- However, it is unclear whether other diet types may have similar outcomes.

Read the article here

INTRODUCTION

Obesity and type 2 diabetes (T2D) are related comorbidities. Recently hypocaloric, low carbohydrate, ketogenic diets have been shown to promote weight loss and improve glycaemic control in individuals with T2D. However, it is unclear as to whether improved glucose control seen with the ketogenic diet is independent of weight loss. This study aimed to determine the effect of the ketogenic diet on glucose metabolism in individuals with T2D in the absence of weight loss.

METHOD

- 29 overweight/obese subjects with T2D were given either 1) standard diet (SD), 2) low carbohydrate, ketogenic diet (KD) or 3) low carbohydrate, ketogenic diet with keto ester supplementation (KD+) for 10 days. All diets were designed to be weight-maintaining.
- All meals were made by a certified dietitian and participants were only allowed to eat the prepared food and drink water.

RESULTS

- Body weight, fat content and body fat percentage did not change significantly in any of the groups.
- The KD and KD+ diets were shown to induce metabolic changes, with carbohydrate oxidation decreasing (KD p=0.019; KD+ p=0.003) and fat oxidation increasing (KD p=0.020; KD+ p=0.002) whereas the standard diet did not.
- Fasting plasma glucose modestly declined in all three groups but failed to reach significance (SD p=0.465; KD p=0.525; KD+ p=0.137).
- HbA1c, insulin resistance, muscle insulin sensitivity, insulin clearance rate, diastolic blood pressure, heart rate, total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides were unchanged in all groups.

HOW TO BRING THIS INTO YOUR CLINICAL PRACTICE

CLINICAL PRACTICE APPLICATIONS

- Weight loss is important for improving blood sugar levels in individuals with obesity and T2D.
- In the absence of weight loss, a ketogenic diet may have very little benefit for individuals who are trying to improve blood glucose control.

CONSIDERATIONS FOR FUTURE RESEARCH

- Future research could analyse other diets in the absence of weight loss on blood glucose levels. This would aid understanding of the level of importance of weight loss compared to diet type on blood glucose control.

CONCLUSION

- A weight maintaining 10-day ketogenic diet with or without ketone supplementation did not improve glucose control, insulin sensitivity, blood lipids, or blood pressure in individuals with obesity and T2D.

EXPERT REVIEWER Chloe Steele

CONFLICTS OF INTEREST: None
EVIDENCE CATEGORY: A: Meta-analyses, position-stands, randomized-controlled trials (RCTs)

METABOLIC SCIENCE TAKEAWAYS

NED INFOBITES & CLINICAL RESOURCES

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GAIL BRADY ET AL.

FEATURE ARTICLE

SUPPORTING CLIENTS ON GLP-1 THERAPY:

EVIDENCE-BASED NUTRITIONAL AND LIFESTYLE STRATEGIES FOR WEIGHT MANAGEMENT

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HEALTHY WEIGHT LOSS

ABSTRACT

GLP-1s are an effective weight loss intervention for individuals with obesity and overweight. Low energy intake may however result in nutritional deficiencies and loss of lean body mass. Use of GLP-1s, and rapid weight loss, could also increase risk of adverse effects. Additionally, weight regain is common. Comprehensive, nutritional and lifestyle strategies to support safe and sustainable results and are currently missing from the existing model of care. The aim of this narrative review was to summarise current evidence to guide evidence-based clinical practice on the role nutrition and lifestyle support could play in effective weight management outcomes, and long-term success during, and after, GLP-1 treatment.

INTRODUCTION

Glucagon-like peptide-1 receptors agonists (GLP-1RAs) and their newer combination dual and triple mechanism medications, are commonly referred to as GLP-1s (Mozaffarian et al., 2025). Originally developed for glycaemic control and restoring glucose homeostasis in type 2 diabetes mellitus (T2DM) (Patel & Niazi, 2025), GLP-1s are also effective pharmacotherapies for weight loss (WL) in obesity and overweight, achieving results similar to those only previously attained with bariatric surgery (Abdrabou Abouelmagd et al., 2025).

Clinical trials have shown WL reductions of between 5-18% with use of GLP-1s (Mozaffarian et al., 2025). More recently, WL of >20% has been reported with use of tirzepatide, a GLP-1RA, paired with a glucose dependant insulinotropic peptide (GIP) (Hamza et al., 2025). Available data suggests that this is due to energy intake being reduced by 16-39% (Spreckley et al., 2026). There are however concerns that low food consumption may increase the risk of both macronutrient and micronutrient deficiencies. Additionally, nutrient deficiencies and rapid WL could increase the risk of loss of lean body mass (Neeland et al., 2024). Substantial weight regain after treatment is also frequently reported (Abu-Nejim & Becker, 2025).

Gastrointestinal (GI) side effects such as nausea, vomiting, diarrhoea and constipation are common (Wharton et al., 2022). Rarer adverse effects are also reported, including gallbladder issues, acute pancreatitis and gastroparesis (Wharton et al., 2022). There is currently limited data on the long-term safety of GLP-1s (Abu-Nejim & Becker, 2025) and misuse is a concern (Jackson et al., 2026). It is unknown how many people are presently using GLP-1s off-label, and outside of approved licenses, and without appropriate clinical supervision (Jackson et al., 2026).

Despite these challenges, public interest is rapidly increasing and GLP-1s are widely prescribed (Jackson et al., 2026). Based on a 2026 study of "nationally representative" households in the UK, it was estimated that around 910,000 adults (CI 95%) were using GLP-1s solely for WL in the 12-months preceding January-March 2025 (Jackson et al., 2026). A further estimated 3.3 million adults (CI 95%), have expressed an interest in using them. The key demographics for current use, and interest, were female, individuals in midlife and people facing socioeconomic disadvantage.

Currently there is limited research or guidelines around adequate nutritional and lifestyle support during, and after GLP-1 treatment (Spreckley et al., 2026). Research has primarily focused on restricting calorie intake for WL and not on diet quality or minimising risks of nutrient deficiencies and lean body mass (Spreckley et al., 2026). The aim of this narrative review was to highlight the current evidence for GLP-1 use and WL outcomes, as well as provide an overview for nutrition practitioners on how nutrition and lifestyle support could be effective for managing health, adverse effects and supporting long-term WL success.

MECHANISM OF ACTION

GLP-1 MECHANISMS OF ACTION FOR WEIGHT LOSS

In humans, GLP-1 medications mimic endogenous peptide GLP-1 incretin hormones (Wang et al., 2023). They are predominantly released in the gut by intestinal enteroendocrine L-cells around 10-15 minutes after a meal, peaking at around 60 minutes post prandial (Pandey et al., 2023). However, their glucose lowering effect is short-lived, lasting only for around 1-2 minutes before being deactivated by the enzyme dipeptidyl peptidase IV (Lu et al., 2025). Smaller amounts of GLP-1s can also originate from the central nervous system (CNS) and other organs (Chen et al., 2024).

GLP-1s have a wide-ranging systemic effect (Fredrick et al., 2025). For WL they work on maintaining blood glucose stability by increasing the release of insulin (Chen et al., 2024) and

suppressing the secretion of glucagon from the pancreas (Nauck & Müller, 2023). In addition, the GI tract sends signals via the vagus nerve to the nucleus tractus solitarii (NTS) found in the brainstem, and the hypothalamus, after food intake (Fredrick et al., 2025). GLP-1s bind to the receptors in these regions of the brain, promoting feelings of fullness and satiety by enhancing activity of serotonergic, dopaminergic and glutamate systems (Moiz, Kristian B. Filion, et al., 2025). Reductions in cravings, emotional eating and

'food noise' are also reported (Mozaffarian et al., 2025). Energy intake is further reduced through delayed gastric emptying (Patel & Niazi, 2025). Leptin signalling is also enhanced, increasing its ability to suppress appetite and reduce leptin resistance which becomes altered with obesity (Fredrick et al., 2025).
Early GLP-1 medications needed to be administered daily, making adherence a challenge. Longer-term treatments that have a half-life of approximately 1-week including semaglutide have subsequently been developed (Salvador et al., 2025).

Additionally, the dual agonist tirzepaptide, a GLP-1RA paired with GIP, targets additional complementary incretin receptors for increased effectiveness (Cai et al., 2024). Brands currently licensed for WL use in the UK include "Wegovy" (semaglutide), "Mounjaro" (tirzepatide) and "Saxenda" (liraglutide) (Jackson et al., 2026). The emerging triple agonist, Retatrutide combines a GLP-1RA and GIP with glucagon and has been developed for even greater WL results (Salvador et al., 2025). Small molecule oral GLP-1s have also been formulated to increase adherence and patient compliance (Luna Ceron et al., 2025) and overcome objections to injections (Kokkorakis et al., 2025).

SPECIALIST POPULATIONS

OVERWEIGHT & OBESITY

Outside of their use for T2DM, and WL, GLP-1s have licensed for the improvement of cardiovascular outcomes in individuals with obesity or overweight (Abu-Nejim & Becker, 2025). Additionally, due to their mechanistic versatility, research is ongoing into a wide range of other disorders including, Metabolic dysfunction-associated steatohepatitis (MASH) and steatotic liver disease (MASLD), obstructive sleep apnoea (OSA), polycystic ovary syndrome (PCOS), neurodegenerative diseases such as Parkinson's disease (PD) and Alzheimer's disease (AD), substance use disorders (SUD) and autoimmune diseases (Patel & Niazi, 2025).

WEIGHT LOSS OUTCOMES

GLP-1 THERAPIES & WEIGHT LOSS

Globally, rates of obesity are believed to have doubled between 1990 and 2020, bringing significant costs to healthcare (Fredrick et al., 2025). Obesity is associated with over 200 complications and comorbidities that affect quality of life (Almandoz et al., 2024). Diet and lifestyle interventions are the first line of treatment, both in the UK and internationally (Salvador et al., 2025). However, currently clinician and public knowledge are believed to be low (Mozaffarian et al., 2025). The National Institute of Health and Care Excellence (NICE) clinical guidelines in the UK recommend GLP-1s be prescribed for obesity (BMI >35kg/m2) or overweight (BMI 30kg/m2) with at least one weight-related comorbidity (A Practical Guide to Using Medicines to Manage Overweight and Obesity Implementation Support-and-Conditions#notice-of-Rights), 2025).

WL of >5% is considered clinically relevant (Squire et al., 2025). However, significant WL >15% is needed to address obesity and its associated complications (Wadden et al., 2023). It is estimated that <20% of patients achieve WL >15% from baseline following diet and lifestyle interventions (Wadden et al., 2023). Historically, bariatric surgery has been the most successful intervention for obesity with WL outcomes of between 25-30% and long-term sustainability (Melson et al., 2025). Bariatric surgery is however costly and comes with risks (Hamza et al., 2025). It is therefore not scalable to large numbers of people.

Studies have found that the GLP-1s semaglutide and tirzepatide have superior WL reductions compared to diet and lifestyle interventions (Ceasovschih et al., 2025). A systematic review and meta-analysis including seven randomised controlled trials (RCT) and n=4795 participants, concluded that compared to a placebo, tirzepatide results in superior WL changes in a dose dependant manner (Qin et al., 2024). Results showed average WL reductions following 5mg, 10mg and 15mg doses of -8.07%, -10.79% and -11.83% respectively (P=<0.00001) over 12–72-week time frames.

The Surmount-1 trial monitored the effects of a once weekly dose of tirzepatide over 72 weeks versus a placebo in n=2539 adults with obesity or overweight (Jastreboff et al., 2022). Participants were prescribed an energy deficit of 500kcal/day and moderate intensity physical activity for 150 minutes/week. The results found average WL reductions at doses of 5mg, 10mg, 15mg of -15%, -19.5% and -20.9% respectively in 89-91% of the participants, versus an average 3.1% WL in the placebo group (CI 95%). A further large trial of n=1961 in people with obesity (>30kg/m2) or overweight (>27kg/m2) with >1 comorbidity assigned semaglutide (n=1306) at a dose of 2.4mg or a placebo (n=655) for 68 weeks (Wilding et al., 2021). Both groups received diet counselling every 4 weeks and increased physical activity was encouraged. Compared to baseline, the intervention group achieved an average WL of 14.9% (p= 0.001) compared to 2.5% (p= 0.001) in the placebo group. Additionally, the Surmount-3 trial found that inclusion of supervised diet and lifestyle interventions prior to the use of tirzepatide, resulted in increased WL in adults with obesity or overweight (Wadden et al., 2023).

Despite these results and similar interventions, heterogeneity between individual responses and WL outcomes is reported (Melson et al., 2025). Efficacy may also differ in older adults (Chen et al., 2025). In a study of n=483 participants followed for 520 days, female gender was associated with a hyper-response (Squire et al., 2025). This may be due to lower average body weight resulting in higher drug concentrations at fixed doses. Conversely, in the recent, STEP trials, up to 30% of people using a GLP-1 were non-responders, achieving WL of <5% (Squire et al., 2025). However, data on associated clinical and demographic factors is limited. It has been hypothesised that gender, diabetes status, age, baseline BMI, a sedentary lifestyle and anxiety and depression may affect treatment response rates.

Identification of non-responders has highlighted the limited understanding of the obesity mechanisms and weight regulation (Reiss et al., 2025), as well as the need for personalised treatment plans (Salvador et al., 2025). The efficacy of GLP-1s for WL may also differ in real life without the controlled conditions of an RCT (Thomsen et al., 2025).

WEIGHT REGAIN

SUSTAINABLE WEIGHT LOSS LONGER TERM AND RISKS OF REBOUND

Sustaining weight loss over time is challenging (Wilding et al., 2021). Significant weight regain has been observed in individuals coming of GLP-1s, as early as 8 weeks post treatment (Wu et al., 2025). This could be due to metabolic adaptation where lower energy expenditure and increased appetite make long-term outcomes challenging (Hamza et al., 2025). Calorie restriction itself also leads to WL rebound (Reiss et al., 2025). Additionally, a loss of lean body mass may contribute to a further reduction in energy expenditure and increased risk of weight regain (Ceasovschih et al., 2025). It has been suggested that medications may be needed long-term to sustain results (Oczypok & Anderson, 2026).

Weight regain is common within the first 12 months after GLP-1 treatments and increases over time (Melson et al., 2025). It is estimated that 80% of WL will be regained over 5 years. In part, this is attributed to metabolic adaptation, where energy expenditure decreases, hunger hormones increase, and satiety hormones decline (Wadden et al., 2023). A post-treatment one-year extension in n=327 participants from the Step 1 trial, showed net losses at week 120 of only -5.6% in the semaglutide group and -0.1% for the placebo group (Wilding et al., 2022). The Step 10 and Surmount 4 trials also reported weight regain of 40% after 28 weeks and 50% after 52 weeks of treatment respectively (Tzang et al., 2025). In a systematic review and meta-analysis of 37 studies including n=9341 participants, weight regain was found to be greater following GLP-1 treatment than after behavioural weight management interventions by 0.3kg monthly (West et al., 2026). This was independent of the amount of weight lost.

These outcomes highlight the need for long-term strategies to sustain results (Moiz, Kristian B Filion, et al., 2025; Patel & Niazi, 2025). The NICE guidelines for GLP-1 use in the UK, advise that provision be made for support after treatment ends, however, further research is needed into exactly what that should be (West et al., 2026). It has been suggested that an adaptive and personalised response over time is needed (Melson et al., 2025).

ADVERSE EFFECTS

Adverse effects are commonly reported, particularly GI issues (Reiss et al., 2025). Additionally, gallbladder issues and biliary disease have been reported, as well as rarer but more serious outcomes, such as gastroparesis and acute pancreatitis. Other concerns in media reports include mental health changes including suicide ideation, ocular issues, hair loss and increased risk of certain cancers (Reiss et al., 2025). Discontinuation rates within the first 12 months of treatment are reported to be high at around 50% (Fredrick et al., 2025). This may be due in part to adverse effects (Wadden et al., 2023).

GASTROINTESTINAL SIDE EFFECTS

It is estimated that around 80-90% of users will experience adverse GI effects (Reiss et al., 2025). They are often observed with higher doses and are reported to decrease over time (Kokkorakis et al., 2025). Nausea is the most common symptom (Mozaffarian et al., 2025) affecting approximately 25% of users (Squire et al., 2025). Constipation, eructation, bloating, vomiting, diarrhoea (Wharton et al., 2022) and worsening of GERD are also regularly reported ((Mozaffarian et al., 2025). A gradual dose escalation is recommended to minimise risk (Mozaffarian et al., 2025). Gastroparesis and acute pancreatitis have less commonly been reported (Reiss et al., 2025). There may also be an increased risk of gastrointestinal bleeding when GLP-1s are combined with aspirin, especially in older adults with obesity (Abu-Nejim & Becker, 2025).

DIETARY FACTORS

LOSS OF LEAN BODY MASS

Skeletal muscle is responsible for up to 70% of post prandial glucose uptake and is therefore a key metabolic and energy regulator (Ceasovschih et al., 2025). It has been estimated that between 20-50% of WL comes from skeletal muscle with the use of GLP-1s (Grosicki et al., 2024). This is comparable to the loss associated with 10 years of ageing (Grosicki et al., 2024). It is of cause for concern especially in frail or sarcopenic patients (Ceasovschih et al., 2025). However, loss of muscle mass is often seen with all forms weight loss (Fredrick et al., 2025). Bone loss also happens with long-term energy restriction, including with bariatric surgery. Preserving both skeletal muscle and bone mass are essential for long-term health outcomes (Jensen et al., 2024).

HAIR LOSS

There have been conflicting reports around hair loss. Some studies report incidence of alopecia and hair loss, whilst others have seen hair regrowth (Alsuwailem et al., 2025). Rapid weight loss and micronutrients deficiencies could contribute to hair loss. Semaglutide medications may also influence hormone dysregulation leading to a androgenic hair loss. Under-reporting may contribute to limited evidence being available and further research is needed in this area.

GALLBLADDER AND BILIARY ISSUES

Gallbladder disorders, mainly cholelithiasis, were more common with use of semaglutide compared to placebo in the Step 1 trial (Wilding et al., 2021). A systematic review and meta-analysis of 76 RCTs and over 100,000 participants also found that compared to control groups or placebo, the use of GLP-1s was associated with an increased risk of gallbladder and biliary diseases (He et al., 2022). Risk was increased at higher doses and with use over longer durations. However, an increased risk is not limited to use of GLP-1s, but to rapid weight loss itself, including after bariatric surgery (Thomsen et al., 2025).

MEDICATIONS

It is important to consider the potential impact on the effectiveness of other medications due to delayed gastric emptying and GI side effects, including oral contraceptives (GLP-1 Agonists and Contraception Patient Information Leaflet, 2025) and oral hormone replacement therapies.

RARE ADVERSE EFFECT CONSIDERATIONS

Individuals with a family history of medullary thyroid carcinoma or multiple endocrine neoplasia syndrome type 2 should not use GLP-1 medications (Reiss et al., 2025). There has been concern over a potential elevated risk of thyroid cancers in general, however, findings are rare and there is currently no conclusive evidence (Espinosa De Ycaza et al., 2024). In pregnancy decreased foetal growth has been seen in animal studies, but not periconceptually in humans, however, there are a lack of studies (Salvador et al., 2025). It is recommended that GLP-1s should be discontinued at least 4 weeks prior to conceiving. There is also uncertain evidence around an increased risk obowel obstructions and risk of gastrointestinal cancers (Figlioli et al., 2024).

NUTRITION

SUPPORT FOR GLP-1 USERS

Research into evidence-based nutrition interventions to support the effective and safe use GLP-1s is currently limited (Spreckley et al., 2026). Few studies include guidance from nutrition professionals or structured nutrition and lifestyle interventions. In a recent systematic scoping review, only three out of twelve studies involved support from nutrition professionals (Spreckley et al., 2026). The authors concluded that individuals using GLP-1s should receive regular nutritional monitoring for essential nutrients and protein intake as a priority (Spreckley et al., 2026). The recently published World Health Organisation (WHO) guidelines have also highlighted the need for GLP-1 treatment to be combined with diet and lifestyle support (WHO Guideline on the Use of Glucagon-like Peptide-1 (GLP-1) Therapies for the Treatment of Obesity in Adults, 2025).

Successful WL is dependent, in part, to an energy deficit (Kokkorakis et al., 2025). Reducing energy intake to around 1200-1500 kilocalories (kcal) a day for females and 1500-1800 calories kcal/day for males is recommended (Kokkorakis et al., 2025). Regular monitoring of food intake is often required to support the achievement of energy deficits. However, energy intakes of <1200 kcal/d females and <1800kcal/d males may result in nutrient deficiencies and loss of lean body mass (Mozaffarian et al., 2025). Research has suggested energy intakes may be reduced by up to 39% with use of GLP-1 (Christensen et al., 2024). GI side effects could further increase the risk of nutrient deficiencies (Mozaffarian et al., 2025).

A small cross-sectional study of n=69 adults using GLP-1s, found that the daily recommended intake (DRI) for a range of micronutrients was not being met (Johnson et al., 2025). Insufficient amounts of fibre, calcium, iron, magnesium, potassium, choline and vitamins A, C, D and E (p=0.00156) were reported. Conversely, a decreased preference for high sugar and fat, energy dense foods whilst using GLP-1s has been observed in clinical trials (Gibbons et al., 2021). Symptoms of essential nutrient deficiencies can include fatigue, muscle weakness, hair loss, skin itching or flakiness, unusual bruising and poor wound healing (Mozaffarian et al., 2025).

Adequate protein, fibre, micronutrients and hydration should be prioritised to support metabolic health and protect against muscle and bone loss alongside GLP-1s (Spreckley et al., 2026). Sufficient protein intake and physical activity are required to support the preservation of muscle mass (Ceasovschih et al., 2025). This equates to 0.8kg per kg of body weight (kg BW) or aim for 80-120g protein a day (Mozaffarian et al., 2025). Protein Intake of should not fall below 0.4-0.05g/kg/day. Further nutrition strategies should also include small, regular meals of nutrient dense whole foods such as lean proteins, fruits and vegetables (Mozaffarian et al., 2025). Reminders to eat may need to be set. Specific foods have also been identified as increasing endogenous levels of GLP-1s including avocado, eggs, nuts, seeds, legumes and high fibre foods (Mozaffarian et al., 2025). To maximise WL and health outcomes, red and processed meats, ultra processed foods (UPF) and sugar and starchy foods should be limited. Additionally, supplementation of protein and micronutrients may be beneficial to meet adequate requirements (Christensen et al., 2024). Consumption of alcohol, and use of tobacco and recreational drugs should be minimised.

Nutrition and lifestyle support could help to manage GI side effects (Spreckley et al., 2026). Ginger and peppermint teas, and acupressure bands may help to manage nausea (Mozaffarian et al., 2025). Foods with lower viscosity, and higher moisture content such as vegetables and fruits could help with gastric emptying and to manage constipation (Mozaffarian et al., 2025). Vomiting may occur with large meals and care should be taken to avoid waiting until overly hungry (Wharton et al., 2022).

LIFESTYLE

MODIFIABLE LIFESTYLE FACTORS

A systematic review and meta-analysis of 33 studies concluded that exercise guidance and increased physical activity alongside an energy restricted diet and GLP-1 medications and could improve WL results in adults with obesity or overweight ($p = <0.001$) (Chu et al., 2025). Regular, structured resistance training is known to be beneficial for supporting lean body tissue (Mozaffarian et al., 2025). This should consist of moderate intensity exercise of around 3 x weekly strength training sessions in addition to 150 minutes of moderate intensity aerobic exercise such as brisk walking. To help prevent weight regain after treatment, this should be increased to 200-300 minutes a week. (Kokkorakis et al., 2025). Regular measuring of weight using Bioelectrical impedance analysis (BIA) scales to monitor muscle mass is also recommended (Mozaffarian et al., 2025). The mechanical strain placed on bone during exercise could also help to preserve bone mass during weight loss (Jensen et al., 2024).

Other lifestyle considerations include supporting sleep habits and sleep quality due to the potential impact poor sleep can have on blood sugar, risk of insulin resistance and weight gain (Mozaffarian et al., 2025). In addition, psychological stress activates the hypothalamic-pituitary-adrenal (HPA) axis, elevating levels of cortisol, and promoting insulin resistance, fat storage and increasing food cravings for UPF's and stalling WL (Mozaffarian et al., 2025). Individuals reporting high levels of perceived stress may benefit from interventions such as mindfulness-based interventions, and cognitive behavioural therapy.

SUMMARY

THE ROLE OF NUTRITION PRACTITIONERS IN SUPPORTING GLP-1 USE

GLP-1s are an effective and often rapid WL intervention for individuals with obesity and overweight. However, nutrient deficiencies, risk of lean muscle loss and

adverse effects are challenges to health outcomes. Weight regain is also common. Research has highlighted the need for a personalised and multi-faceted approach to care, including nutrition and lifestyle support to help prevent and manage these issues. Nutrition practitioners are well placed to provide this support through regular nutritional monitoring alongside GLP-1 medications. Lifestyle interventions including resistance training and increased physical activity could also help to achieve sustainable results.

AUTHOR CONTRIBUTIONS

GB conceived of the review, wrote the initial draft and is responsible for content. MB peer-reviewed and provided editing of content. CS and CG provided final editing. All authors reviewed and accepted the final manuscript.

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