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FEATURE ARTICLE

SUPPORTING CLIENTS ON GLP-1 THERAPY:

EVIDENCE-BASED NUTRITIONAL AND LIFESTYLE STRATEGIES FOR WEIGHT MANAGEMENT

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.

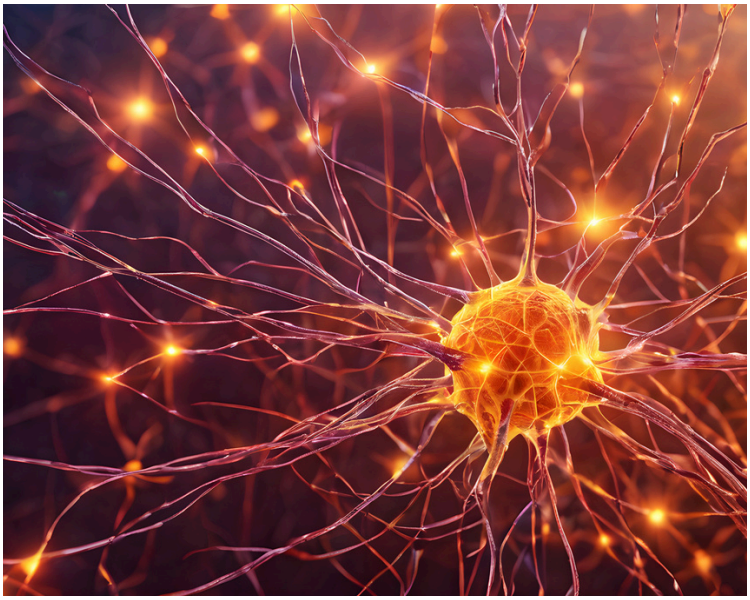
MECHANISM OF ACTION

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

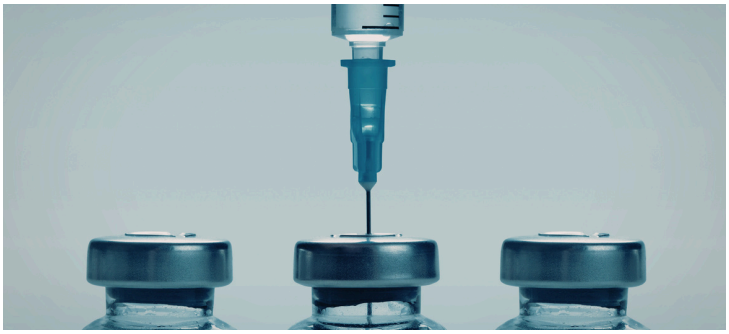
GLP-1 THERAPIES & WEIGHT LOSS

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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References

- A practical guide to using medicines to manage overweight and obesity Implementation support-and-conditions#notice-of-rights). (2025). www.nice.org.uk
- Abdrabou Abouelmagd, A., Abdelrehim, A. M., Bashir, M. N., Abdelsalam, F., Marey, A., Tanas, Y., Abuklish, D. M., & Belal, M. M. (2025). Efficacy and safety of retatrutide, a novel GLP-1, GIP, and glucagon receptor agonist for obesity treatment: a systematic review and meta-analysis of randomized controlled trials. Baylor University Medical Center Proceedings, 38(3), 291–303. https://doi.org/10.1080/08998280.2025.2456441
- Abu-Nejim, H., & Becker, R. C. (2025). Current Perspectives on GLP-1 Agonists in Contemporary Clinical Practice from Science and Mechanistic Foundations To Optimal Translation. In Current Atherosclerosis Reports (Vol. 27, Number 1). Springer. https://doi.org/10.1007/s11883-025-01350-7
- Almandoz, J. P., Wadden, T. A., Tewksbury, C., Apovian, C. M., Fitch, A., Ard, J. D., Li, Z., Richards, J., Butsch, W. S., Jouravskaya, I., Vanderman, K. S., & Neff, L. M. (2024). Nutritional considerations with antiobesity medications. In Obesity (Vol. 32, Number 9, pp. 1613–1631). John Wiley and Sons Inc. https://doi.org/10.1002/oby.24067
- Alsuwailem, O. A., Alanazi, R., Almutairi, H. M., Asiree, R. H., Almutairi, W., Almutairi, T. M., Zamandar, A., & Alkhames, S. (2025). Hair Loss Associated With Glucagon-Like Peptide-1 (GLP-1) Receptor Agonist Use: A Systematic Review. Cureus. https://doi.org/10.7759/CUREUS.92454
- Cai, W., Zhang, R., Yao, Y., Wu, Q., & Zhang, J. (2024). Tirzepatide as a novel effective and safe strategy for treating obesity: a systematic review and meta-analysis of randomized controlled trials. Frontiers in Public Health, 12. https://doi.org/10.3389/FPUBH.2024.1277113
- Ceasovschih, A., Asaftei, A., Lupo, M. G., Kotlyarov, S., Bartušková, H., Balta, A., Sorodoc, V., Sorodoc, L., & Banach, M. (2025). Glucagon-like peptide-1 receptor agonists and muscle mass effects. Pharmacological Research, 220. https://doi.org/10.1016/j.phrs.2025.107927
- Chen, A. S., Hajduk, A. M., Grimshaw, A. A., Fried, T. R., Jastreboff, A. M., & Lipska, K. J. (2025). Efficacy of antiobesity medications for weight reduction in older adults: a systematic review. Obesity, 33(S1), 11–21. https://doi.org/10.1002/OBY.24160

References cont.

- Chen, X., Zhao, P., Wang, W., Guo, L., & Pan, Q. (2024). The Antidepressant Effects of GLP-1 Receptor Agonists: A Systematic Review and Meta-Analysis. American Journal of Geriatric Psychiatry, 32(1), 117–127. https://doi.org/10.1016/J.JAGP.2023.08.010
- Christensen, S., Robinson, K., Thomas, S., & Williams, D. R. (2024). Dietary intake by patients taking GLP-1 and dual GIP/GLP-1 receptor agonists: A narrative review and discussion of research needs. In Obesity Pillars (Vol. 11). Elsevier B.V. https://doi.org/10.1016/j.obpill.2024.100121
- Chu, J., Zhang, H., Wu, Y., Huang, Y., Zhu, T., Zhou, Z., & Wang, H. (2025). Efficacy of lifestyle modification combined with GLP-1 receptor agonists on body weight and cardiometabolic biomarkers in individuals with overweight or obesity: a systematic review and meta-analysis. EClinicalMedicine, 88. https://doi.org/10.1016/J.ECLINM.2025.103464
- Espinosa De Ycaza, A. E., Brito, J. P., McCoy, R. G., Shao, H., & Singh Ospina, N. (2024). Glucagon-Like Peptide-1 Receptor Agonists and Thyroid Cancer: A Narrative Review. Thyroid, 34(4), 403–418. https://doi.org/10.1089/THY.2023.0530
- Figlioli, G., Piovani, D., Peppas, S., Pugliese, N., Hassan, C., Repici, A., Lleo, A., Aghemo, A., & Bonovas, S. (2024). Glucagon-like peptide-1 receptor agonists and risk of gastrointestinal cancers: A systematic review and meta-analysis of randomized controlled trials. Pharmacological Research, 208. https://doi.org/10.1016/J.PHRS.2024.107401
- Fredrick, T. W., Camilleri, M., & Acosta, A. (2025). Pharmacotherapy for Obesity: Recent Updates. Clinical Pharmacology : Advances and Applications, 17, 305–327. https://doi.org/10.2147/CPAA.S497904
- Gibbons, C., Blundell, J., Tetens Hoff, S., Dahl, K., Bauer, R., & Bækdal, T. (2021). Effects of oral semaglutide on energy intake, food preference, appetite, control of eating and body weight in subjects with type 2 diabetes. Diabetes, Obesity and Metabolism, 23(2), 581–588. https://doi.org/10.1111/dom.14255
- GLP-1 agonists and contraception Patient information leaflet. (2025). www.fsrh.org
- Grosicki, G. J., Dhurandhar, N. V., Unick, J. L., Arent, S. M., Thomas, J. G., Lofton, H., Shepherd, M. C., Kiel, J., Coleman, C., & Jonnalagadda, S. S. (2024). Sculpting Success: The Importance of Diet and Physical Activity to Support Skeletal Muscle Health during Weight Loss with New Generation Anti-Obesity Medications. In Current Developments in Nutrition (Vol. 8, Number 11). Elsevier B.V. https://doi.org/10.1016/j.cdnut.2024.104486
- Hamza, M., Papamargaritis, D., & Davies, M. J. (2025). Tirzepatide for overweight and obesity management. Expert Opinion on Pharmacotherapy, 26(1), 31–49. https://doi.org/10.1080/14656566.2024.2436595
- He, L., Wang, J., Ping, F., Yang, N., Huang, J., Li, Y., Xu, L., Li, W., & Zhang, H. (2022). Association of Glucagon-Like Peptide-1 Receptor Agonist Use with Risk of Gallbladder and Biliary Diseases: A Systematic Review and Meta-analysis of Randomized Clinical Trials. JAMA Internal Medicine, 182(5), 513–519. https://doi.org/10.1001/JAMAINTERNMED.2022.0338
- Jackson, S. E., Brown, J., Llewellyn, C., Mytton, O., & Shahab, L. (2026). Prevalence of use and interest in using glucagon-like peptide-1 receptor agonists for weight loss: a population study in Great Britain. BMC Medicine, 24(1). https://doi.org/10.1186/s12916-025-04528-7
- Jastreboff, A. M., Aronne, L. J., Ahmad, N. N., Wharton, S., Connery, L., Alves, B., Kiyosue, A., Zhang, S., Liu, B., Bunck, M. C., & Stefanski, A. (2022). Tirzepatide Once Weekly for the Treatment of Obesity. New England Journal of Medicine, 387(3), 205–216. https://doi.org/10.1056/nejmoa2206038
- Jensen, S. B. K., Sørensen, V., Sandsdal, R. M., Lehmann, E. W., Lundgren, J. R., Juhl, C. R., Janus, C., Ternhamar, T., Stallknecht, B. M., Holst, J. J., Jørgensen, N. R., Jensen, J. E. B., Madsbad, S., & Torekov, S. S. (2024). Bone Health after Exercise Alone, GLP-1 Receptor Agonist Treatment, or Combination Treatment: A Secondary Analysis of a Randomized Clinical Trial. JAMA Network Open, 7(6). https://doi.org/10.1001/jamanetworkopen.2024.16775
- Johnson, B., Milstead, M., Thomas, O., McGlasson, T., Green, L., Kreider, R., & Jones, R. (2025). Investigating nutrient intake during use of glucagon-like peptide-1 receptor agonist: a cross-sectional study. Frontiers in Nutrition, 12. https://doi.org/10.3389/fnut.2025.1566498
- Kokkorakis, M., Chakhtoura, M., Rhayem, C., Al Rifai, J., Ghezzawi, M., Valenzuela-Vallejo, L., & Mantzoros, C. S. (2025). Emerging pharmacotherapies for obesity: A systematic review. Pharmacological Reviews, 77(1). https://doi.org/10.1124/PHARMREV.123.001045
- Lu, C., Xu, C., & Yang, J. (2025). The Beneficial Effects of GLP-1 Receptor Agonists Other than Their Anti-Diabetic and Anti-Obesity Properties. Medicina (Lithuania), 61(1). https://doi.org/10.3390/medicina61010017
- Luna Ceron, E., Reddy, S. D., Kattamuri, L., Muvva, D. M., Chozet, L., & Bright, T. (2025). Current Insights, Advantages and Challenges of Small Molecule Glucagon-like Peptide 1 Receptor Agonists: A Scoping Review. Journal of Brown Hospital Medicine, 4(2). https://doi.org/10.56305/001C.132255

References cont.

- Melson, E., Ashraf, U., Papamargaritis, D., & Davies, M. J. (2025). What is the pipeline for future medications for obesity?: Clinical Research. International Journal of Obesity, 49(3), 433–451. https://doi.org/10.1038/s41366-024-01473-y
- Moiz, A., Filion, Kristian B., Tsoukas, M. A., Yu, O. H., Peters, T. M., & Eisenberg, M. J. (2025). Mechanisms of GLP-1 Receptor Agonist-Induced Weight Loss: A Review of Central and Peripheral Pathways in Appetite and Energy Regulation. American Journal of Medicine, 138(6), 934–940. https://doi.org/10.1016/j.amjmed.2025.01.021
- Moiz, A., Filion, Kristian B, Tsoukas, M. A., Yu, O. H. Y., Peters, T. M., & Eisenberg, M. J. (2025). The expanding role of GLP-1 receptor agonists: a narrative review of current evidence and future directions-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/). www.thelancet.com
- Mozaffarian, D., Agarwal, M., Aggarwal, M., Alexander, L., Apovian, C. M., Bindlish, S., Bonnet, J., Butsch, W. S., Christensen, S., Gianos, E., Gulati, M., Gupta, A., Horn, D., Kane, R. M., Saluja, J., Sannidhi, D., Stanford, F. C., & Callahan, E. A. (2025). Nutritional priorities to support GLP-1 therapy for obesity: A joint advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association, and the Obesity Society. In Obesity Pillars (Vol. 15). Elsevier B.V. https://doi.org/10.1016/j.obpill.2025.100181
- Nauck, M. A., & Müller, T. D. (2023). Incretin hormones and type 2 diabetes. Diabetologia, 66(10), 1780–1795. https://doi.org/10.1007/s00125-023-05956-x
- Neeland, I. J., Linge, J., & Birkenfeld, A. L. (2024). Changes in lean body mass with glucagon-like peptide-1-based therapies and mitigation strategies. Diabetes, Obesity and Metabolism, 26(S4), 16–27. https://doi.org/10.1111/dom.15728
- Oczypok, E., & Anderson, T. S. (2026). Lessons Learned From Antiobesity Medication Withdrawal Trials. In JAMA Internal Medicine. American Medical Association. https://doi.org/10.1001/jamainternmed.2025.6058
- Pandey, S., Mangmool, S., & Parichatikanond, W. (2023). Multifaceted Roles of GLP-1 and Its Analogs: A Review on Molecular Mechanisms with a Cardiotherapeutic Perspective. In Pharmaceuticals (Vol. 16, Number 6). Multidisciplinary Digital Publishing Institute (MDPI). https://doi.org/10.3390/ph16060836
- Patel, S., & Niazi, S. K. (2025). Emerging Frontiers in GLP-1 Therapeutics: A Comprehensive Evidence Base (2025). In Pharmaceutics (Vol. 17, Number 8). Multidisciplinary Digital Publishing Institute (MDPI). https://doi.org/10.3390/pharmaceutics17081036
- Qin, W., Yang, J., Ni, Y., Deng, C., Ruan, Q., Ruan, J., Zhou, P., & Duan, K. (2024). Efficacy and safety of once-weekly tirzepatide for weight management compared to placebo: An updated systematic review and meta-analysis including the latest SURMOUNT-2 trial. Endocrine, 86(1), 70–84. https://doi.org/10.1007/S12020-024-03896-Z
- Reiss, A. B., Gulkarov, S., Lau, R., Klek, S. P., Srivastava, A., Renna, H. A., & De Leon, J. (2025). Weight Reduction with GLP-1 Agonists and Paths for Discontinuation While Maintaining Weight Loss. Biomolecules, 15(3). https://doi.org/10.3390/biom15030408
- Salvador, R., Moutinho, C. G., Sousa, C., Vinha, A. F., Carvalho, M., & Matos, C. (2025). Semaglutide as a GLP-1 Agonist: A Breakthrough in Obesity Treatment. Pharmaceuticals, 18(3). https://doi.org/10.3390/PH18030399
- Spreckley, M., Ruggiero, C. F., & Brown, A. (2026). Nutrition Strategies for Next-Generation Incretin Therapies: A Systematic Scoping Review of the Current Evidence. In Obesity Reviews. John Wiley and Sons Inc. https://doi.org/10.1111/obr.70079
- Squire, P., Naude, J., Zentner, A., Bittman, J., & Khan, N. (2025). Factors associated with weight loss response to GLP-1 analogues for obesity treatment: a retrospective cohort analysis. BMJ Open, 15(1). https://doi.org/10.1136/bmjopen-2024-089477
- Thomsen, R. W., Mailhac, A., Løhde, J. B., & Pottegård, A. (2025). Real-world evidence on the utilization, clinical and comparative effectiveness, and adverse effects of newer GLP-1RA-based weight-loss therapies. Diabetes, Obesity and Metabolism, 27(S2), 66–88. https://doi.org/10.1111/dom.16364
- Tzang, C.-C., Wu, P.-H., Luo, C.-A., Chen, Z.-T., Lee, Y.-T., Huang, E. S., Kang, Y.-F., Lin, W.-C., Tzang, B.-S., & Hsu, T.-C. (2025). Metabolic rebound after GLP-1 receptor agonist discontinuation: a systematic review and meta-analysis. EClinicalMedicine, 90, 103680. https://doi.org/10.1016/J.ECLINM.2025.103680
- Wadden, T. A., Chao, A. M., Machineni, S., Kushner, R., Ard, J., Srivastava, G., Halpern, B., Zhang, S., Chen, J., Bunck, M. C., Ahmad, N. N., & Forrester, T. (2023). Tirzepatide after intensive lifestyle intervention in adults with overweight or obesity: the SURMOUNT-3 phase 3 trial. Nature Medicine, 29(11), 2909–2918. https://doi.org/10.1038/s41591-023-02597-w
- Wang, J.-Y., Wang, Q.-W., Yang, X.-Y., Yang, W., Li, D.-R., Jin, J.-Y., Zhang, H.-C., & Zhang, X.-F. (2023). GLP-1 receptor agonists for the treatment of obesity: Role as a promising approach. Frontiers in Endocrinology, 14, 1085799. https://doi.org/10.3389/fendo.2023.1085799

References cont.

- West, S., Scragg, J., Aveyard, P., Oke, J. L., Willis, L., Haffner, S. J. P., Knight, H., Wang, D., Morrow, S., Heath, L., Jebb, S. A., & Koutoukidis, D. A. (2026). Weight regain after cessation of medication for weight management: systematic review and meta-analysis. BMJ (Clinical Research Ed.), 392, e085304. https://doi.org/10.1136/bmj-2025-085304
- Wharton, S., Davies, M., Dicker, D., Lingvay, I., Mosenzon, O., Rubino, D. M., & Pedersen, S. D. (2022). Managing the gastrointestinal side effects of GLP-1 receptor agonists in obesity: recommendations for clinical practice. In Postgraduate Medicine (Vol. 134, Number 1, pp. 14–19). Taylor and Francis Ltd. https://doi.org/10.1080/00325481.2021.2002616
- WHO guideline on the use of glucagon-like peptide-1 (GLP-1) therapies for the treatment of obesity in adults. (2025). https://iris.who.int/.
- Wilding, J. P. H., Batterham, R. L., Calanna, S., Davies, M., Van Gaal, L. F., Lingvay, I., McGowan, B. M., Rosenstock, J., Tran, M. T. D., Wadden, T. A., Wharton, S., Yokote, K., Zeuthen, N., & Kushner, R. F. (2021). Once-Weekly Semaglutide in Adults with Overweight or Obesity. New England Journal of Medicine, 384(11), 989–1002. https://doi.org/10.1056/nejmoa2032183
- Wilding, J. P. H., Batterham, R. L., Davies, M., Van Gaal, L. F., Kandler, K., Konakli, K., Lingvay, I., McGowan, B. M., Oral, T. K., Rosenstock, J., Wadden, T. A., Wharton, S., Yokote, K., & Kushner, R. F. (2022). Weight regain and cardiometabolic effects after withdrawal of semaglutide: The STEP 1 trial extension. Diabetes, Obesity and Metabolism, 24(8), 1553–1564. https://doi.org/10.1111/dom.14725
- Wu, H., Yang, W., Guo, T., Cai, X., & Ji, L. (2025). Trajectory of the body weight after drug discontinuation in the treatment of anti-obesity medications. BMC Medicine, 23(1). https://doi.org/10.1186/S12916-025-04200-0