# Obesity and It's Management

Professor Kamlesh Khunti

14:00 – 14:30



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# Nutritional and lifestyle supportive care recommendations for the management of obesity with GLP-1-based therapies: an expert consensus statement using a modified Delphi approach

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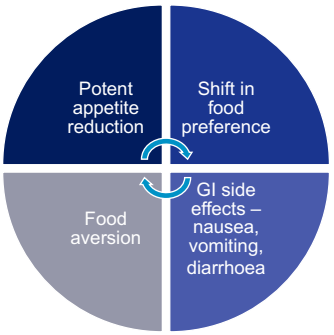
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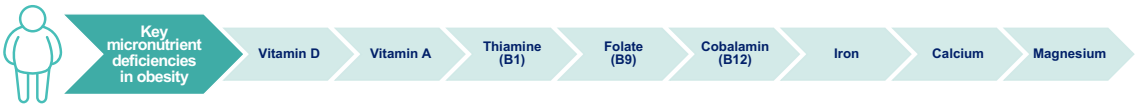
## People with obesity commonly have nutritional deficiencies

**Underlying reasons can include:**[1–4]

- Habitual consumption of energy-rich, nutrient-poor foods
- Changes in the absorption, distribution or excretion of nutrients
- Altered micronutrient metabolism due to systemic obesity-mediated inflammation
- The impact of medications for treating obesity and/or its comorbidities

**Treatment with GBTs may raise the risk of nutritional deficiencies**[1,5,6]




GBT, GLP-1 based therapies; GI, gastrointestinal.

3 1. Bradley M, et al. *Obes Pillars* 2023;8:100087. 2. Brown JC, et al. Canadian Adult Obesity Clinical Practice Guideline 2022. Available from: https://obesitycanada.ca/guidelines/nutrition. Accessed November 2025. 3. Kobylinska M, et al. *Obes Facts* 2022;15(1):19-25. 4. Mwala NN, et al. *Nutr Res Rev* 2025:38(1):219-228. 5. Christensen S, et al. *Obes Pillars* 2024;11:100121. 6. Bettadapura S, et al. *Int J Obes (Lond)* 2025;49(3):418-426.

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## GLP-1 / nutrition connection

Use of GLP-1s results in deficiencies in key nutrients – patient survey

**Adequate intake**

- B vitamins
- Minerals (Cu, P, Se, Zn)

**Inadequate intake**

- Fibre
- Fruit/vegetables
- Minerals (Ca, Fe, Mg, K)
- Choline
- Vitamins A, C, D, and E
- Grains
- Dairy
- Protein

**Participants on GLP-1 therapies are not meeting the daily recommended levels of several vital nutrients and protein intake during weight loss**

GLP-1, glucagon-like peptide-1.

4 Johnson B, et al. *Font Nutr.* 2025;12:1566498.

4

# Rapid weight loss is associated with substantial loss of fat and muscle

- Percentage weight lost as lean mass ranges from 20–40% in patients using GBT[1] with most trials reporting **lean mass loss >25%**[1,2]
- Participants in GBT clinical trials for obesity lost muscle mass that might represent **~20 years** of age-related muscle loss[3]
- Two key factors influence the ability to maintain muscle mass during GBT therapy: **nutrition** and **physical activity**[3]

**Risk factors for muscle loss on GBT[3]**




5 GBT, GLP-1 based therapies; GI, gastrointestinal; T2D, type 2 diabetes.
1. Dubin RL, et at. *Diabetes Obes Metab* 2024;26(12): 5503-5518. 2. Bikou A, et al. *Expert Opin Pharmacother* 2024;25(5):611-619. 3. Mechanick JI, et al. *Obes Rev* 2025:26(1):e13841.

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# Development of international recommendations on nutrition & lifestyle to support GLP-1 based therapies for overweight/obesity

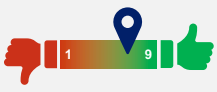
- International panel of 15 expert clinicians and nutritionists
- Meetings between May - September 2024

→ Each of the 15 experts' voices accounted for 7%

- In-depth literature review (Jan 2021 – Jun 2025) and panel discussion
- Modified Delphi process with 2 rating rounds to formulate expert recommendations and achieve consensus

→ Literature review focused on direct evidence from clinical practice, systematic reviews, meta-analyses, RCTs, NRCTs, and prospective cohort studies

- Statements achieving a consensus threshold of ≥67% agreement (agreement rating score ≥7 by 10/15 experts) were accepted



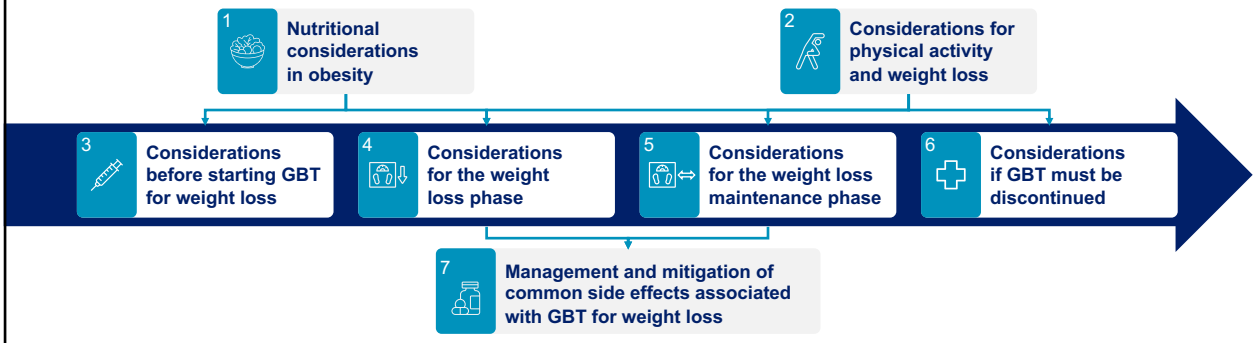

→ Agreement rating score based on a 9-point scale ranging from 1 (absolutely disagree) to 9 (absolutely agree)

6 NRCTs, non-randomised controlled trials; RCTs, randomised controlled trials.
Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.

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## Results

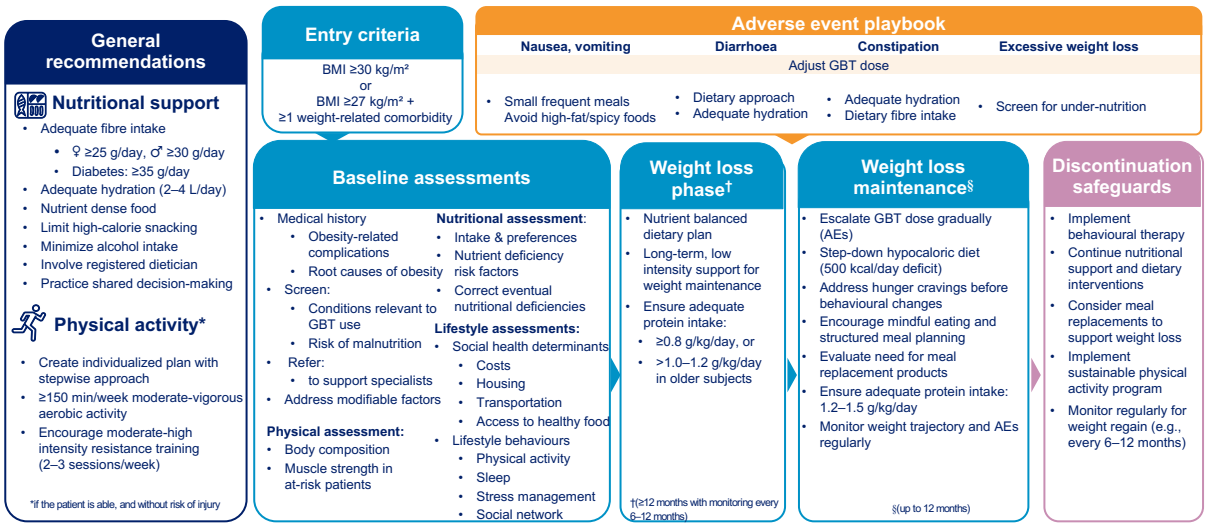
- Consensus reached for 52 statements.
- Focus on nutrition, physical activity, behaviour and the management of common GI adverse effects.
- Consensus statements grouped into 7 modules reflecting different stages of the weight management journey.




7 GBT, glucagon-like peptide-1 based therapies; GI, gastrointestinal.
Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.

7

## Key considerations for weight management before, during, and after GBT for weight loss




8 AE, adverse event; GBT, GLP-1 based therapies; GI, gastrointestinal; MDT, multidisciplinary team.
Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.

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## 1. Nutritional considerations in obesity*




Figure adapted from Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. https://doi.org/10.1016/j.obpill.2025.100228.

### Universal Food & Lifestyle Rules

- **Diet:** low-fat meals, boiled/oven/grilled cooking, water-rich foods
- **Avoid:** fatty, spicy, canned foods, sweets/dressings
- **Hydration:** frequent small sips of water or sugar-free fluids
- **Lifestyle:** fresh air, light exercise, keep food diary to track triggers

Figure adapted from Gorgorjo-Martinez JJ, et al. *J Clin Med.* 2023;12:145.

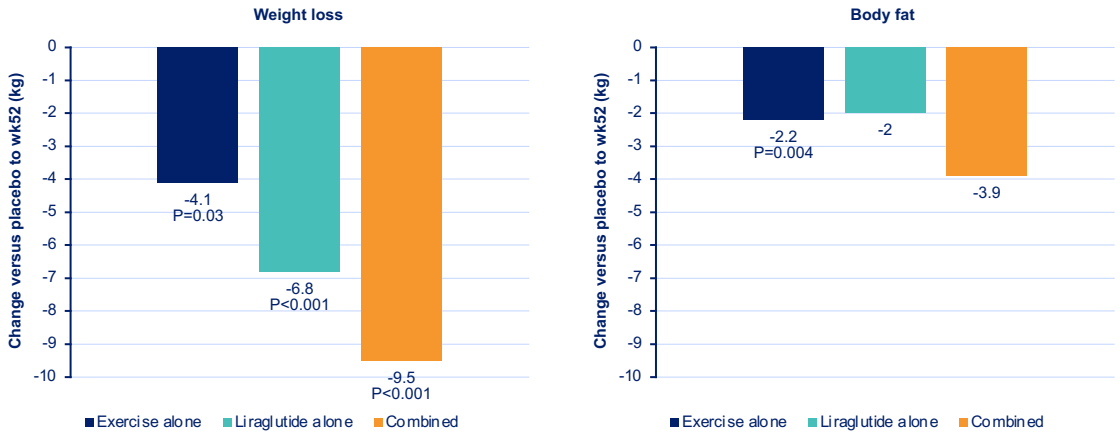
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*The recommendations shown for this category are not exhaustive; additional recommendations were agreed but are not included due to space restrictions. Recommendations were agreed by the authors and those shown had a consensus threshold ≥87% and a median agreement rating score ≥7.

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## GLP-1 / nutrition – what do we not know?

Lifestyle with GLP-1: diet, physical exercise, or both?



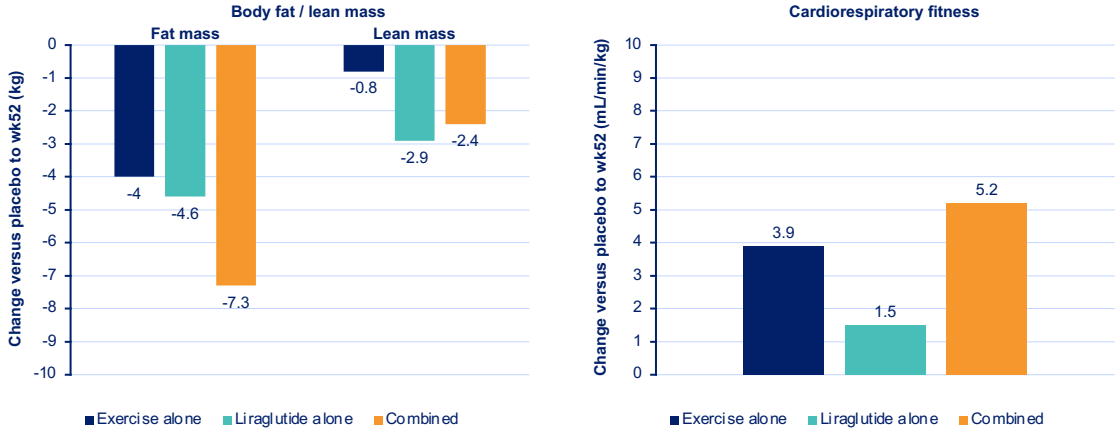

GLP-1, glucagon-like peptide 1; Wk, week.
Lundgren JR, et al. *N Engl J Med.* 2021;384(18):1719-1730.

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## GLP-1 / nutrition – what do we not know?

Lifestyle with GLP-1: diet, physical exercise, or both?

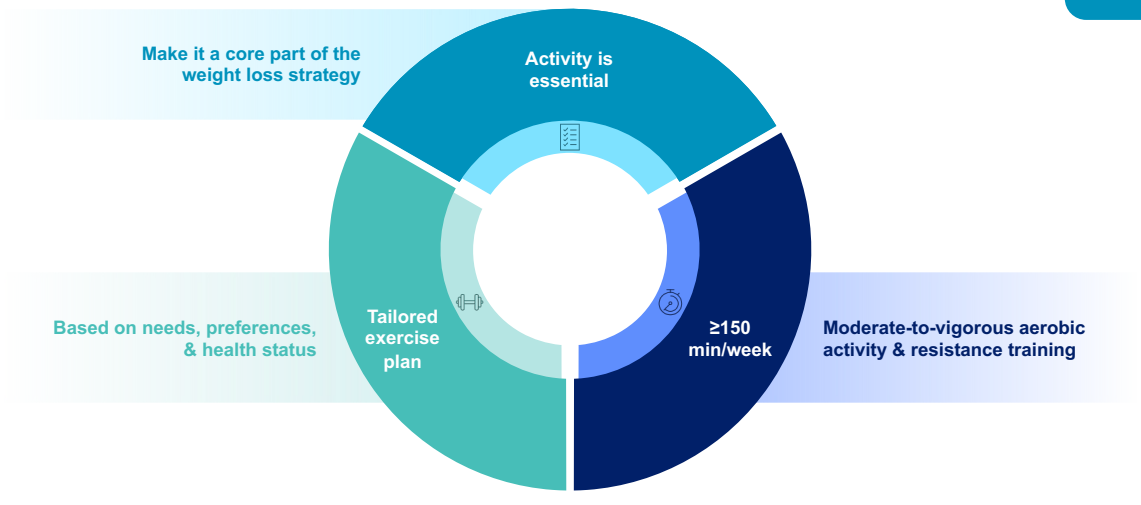



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GLP-1, glucagon-like peptide 1; Wk, week.
Lundgren JR, et al. *N Engl J Med.* 2021;384(18):1719-1730.

11

## 2. Considerations for physical activity and weight loss*




Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
*The recommendations shown for this category are not exhaustive; additional recommendations were agreed but are not included due to space restrictions. Recommendations were agreed by the authors and those shown had a consensus threshold ≥87% and a median agreement rating score ≥7.

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## 3. Considerations before starting GBT for weight loss*




GBT, glucagon-like peptide-1 based therapy.
Sievenpiper JL, et al. *Obesity Pillars*. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
*The recommendations shown for this category are not exhaustive; additional recommendations were agreed but are not included due to space restrictions. Recommendations were agreed by the authors and those shown had a consensus threshold ≥87% and a median agreement rating score ≥7.

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## GLP-1 / nutrition connection

### What do we know about LBM?

**A systematic review of the effect of semaglutide on lean mass: insights from clinical trials**

Alexia Bikou, Foteini Dermiki-Gkana, Michail Penteris, Theodoros K Constantinides & Christos Kontogiorgis

Pages 611-619 | Received 25 Jan 2024, Accepted 10 Apr 2024, Published online: 18 Apr 2024

**Results:** Six studies with 1,541 overweight or obese adults were included, and significant weight reductions were observed primarily due to fat mass loss. While the lean mass remained stable in some cases, notable reductions ranging from almost 0% to 40% of total weight reduction were observed in others. Noteworthy decreases in lean mass were particularly evident in larger trials, yet the proportion of lean mass relative to total body mass increased, suggesting a positive overall outcome.

**Conclusion:** Semaglutide displays potential for weight loss primarily through fat mass reduction. However, concerns arise from notable reductions in lean mass, especially in trials with a larger number of patients.

GLP-1, glucagon-like peptide 1; LBM, lean body mass.
Bikou A, et al. *Expert Opin Pharmacother*. 2024;25(5):611-619.

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## GLP-1 / nutrition connection

What do we know about the effects of protein intake on LBM?

- Consuming 1.2–2.0 g protein/kg is a reasonable target for most adults undergoing weight loss
- Each meal should contain 25–30 g of high value protein
- Protein intake should be distributed evenly across the day
- Leucine is the most robust protein synthesis 'trigger' event
- Muscle amino acid uptake increases significantly post exercise
- Whole-food animal sources are most likely to contain all EAAs
- Plant-powders may increase digestibility and availability of EAAs
- One whey serving should comprise 50% EAAs and 11% leucine by weight
- Full-fat dairy may preferentially augment protein synthesis beyond fat-free products

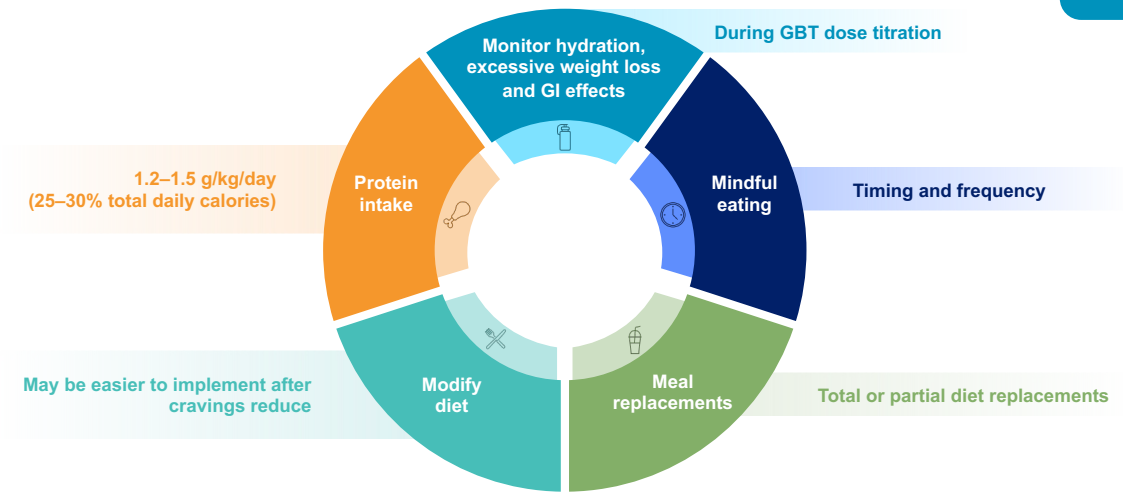
**However, effect of protein intake on LBM during weight loss is not clear**

15

EAA, essential amino acid; GLP-1, glucagon-like peptide 1; LBM, lean body mass.
Volek JS, et al. *Curr Nutr Rep.* 2024;13(3):422-443; Ranjbar M, et al Obesity (Silver Spring) 2025;33:1027-1036; Clina JG, et al. *Obesity (Silver Spring).* 2023;31(8):2021-2030; Ogilvie AR, et al. *Obesity (Silver Spring).* 2022;30:1411-1419.

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## 4. Considerations for the weight loss phase*

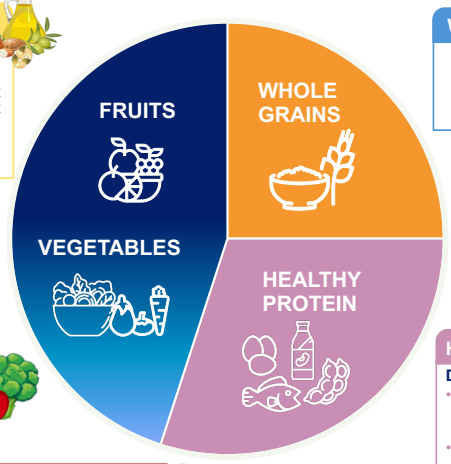



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GBT, glucagon-like peptide-1 based therapy.
Sievenpiper JL, et al. *Obesity Pillars.* 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
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## Healthy diet plate for weight management on GLP-1 based therapy




**HEALTHY FAT**

- With moderation
- Recommended:
  - 25–60 g/day for a 1200–1500 kcal/day diet
  - 35–70 g/day for a 1500–1800 kcal/day diet
- Aid in the absorption of fat-soluble vitamins and stimulate gallbladder emptying
- Examples: olive oil, nuts, seeds, fatty fish

**FRUITS AND VEGETABLES**

- Five servings per day (e.g., two fruit portions and three non-fried vegetable portions)
- Consuming a wide variety of fruits and vegetables optimises intake of vitamins, minerals, and other beneficial nutrients
- Dietary fibre intake targets for
  - Women: ≥25 g/day
  - Men: ≥30 g/day
  - People with diabetes: ≥35 g/day

**PHYSICAL ACTIVITY**

**Physical activity is necessary**

- Follow an individualised exercise training programme based on ≥150 minutes/week of moderate–vigorous intensity aerobic activity and resistance training
- A stepwise approach with shared and measurable goals agreed between the HCP and patient is recommended

**WATER**

**Hydration is important**

- Fluid intake: >2 L/day of water or non-sugary drinks
- Avoid alcohol

**WHOLE GRAINS**

- Consuming a variety of whole grains is recommended (e.g., wholewheat bread, whole grain pasta) to ensure adequate dietary fibre intake
- Choose versions with less added fat, salt, and sugar

**HEALTHY PROTEIN**

**During weight loss phase:**

- Protein intake: 1.2–1.5 g/kg/day or 25–30% of daily energy intake (e.g., 100–120 g/day for a 1600 kcal/day diet)
- Favour lean meat, fish, eggs, low-fat dairy products, legumes

**During weight loss maintenance phase:**

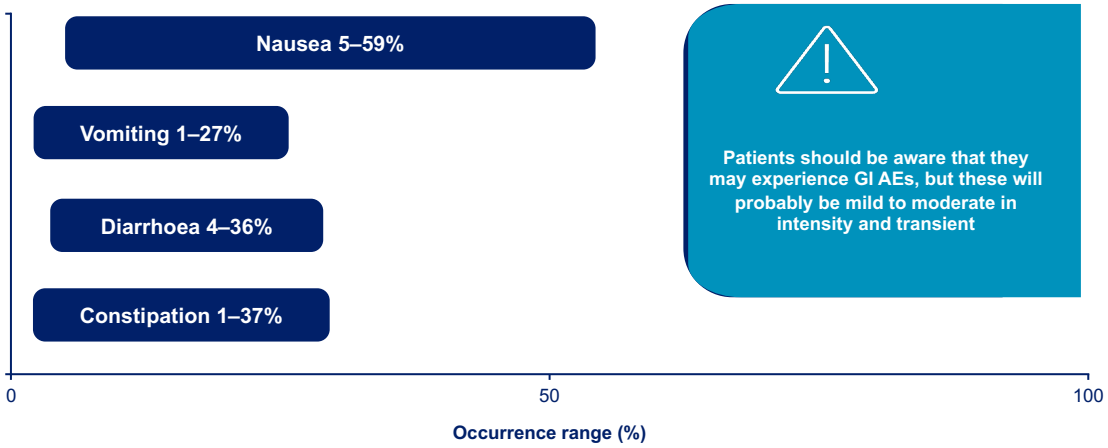
- Protein intake: >0.8 g/kg/day
- For subjects with higher requirements, e.g., >60 years of age, at risk of sarcopenia, high level of physical activity: >1.0–1.2 g protein/kg/day

HCP, healthcare professional.
Sievenpiper JL, et al. *Obesity Pillars*. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228

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## GLP-1 / nutrition connection

GI adverse events in clinical trials with GLP-1 RAs in patients with obesity or T2D



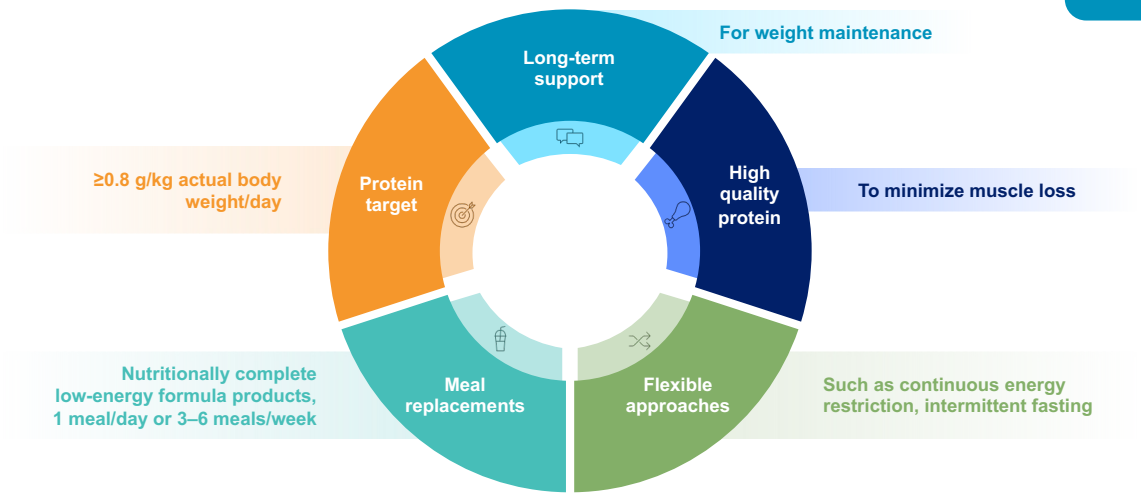

**Patients should be aware that they may experience GI AEs, but these will probably be mild to moderate in intensity and transient**

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AE, adverse event; GI, gastrointestinal; GLP-1, glucagon-like peptide 1.
Gorgojo-Martinez JJ, et al. *J Clin Med*. 2023;12:145.

18

## 5. Considerations for the weight loss maintenance phase*




Sievenpiper JL, et al. *Obesity Pillars*. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228
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## 6. Management and mitigation of common side effects associated with GBT for weight loss*

**Nausea/vomiting**

**Monitor, adjust GBT dose, hydrate**

- Crackers, apples, mint, ginger drinks (30 min post-dose)
- Eat slowly, small portions, stop when full
- Avoid strong smells, lying down after meals, late meals
- Increase meal frequency, no straws, no distractions
- Maintain hydration (water, lemon, bicarbonate)
- Small, frequent meals
- If severe/persistent → urgent care

**Constipation**

**Fibre and fluids, consider supplements**

- More fibre + fluids
- Balanced diet + physical activity
- Stool softeners if needed

**Diarrhoea**

**Tailored medication, diet, hydration**

- Hydration (no sports drinks)
- Avoid high-fiber foods initially → reintroduce slowly
- Eat: chicken broth, rice, carrots, ripe peeled fruit
- Avoid: dairy, coffee, alcohol, sodas, very cold foods, artificial sweeteners

**Monitor weight loss**

**Watch appetite and side effects**

**Hydration awareness**

**>2 L/day, especially during exercise, fasting or fluid loss**

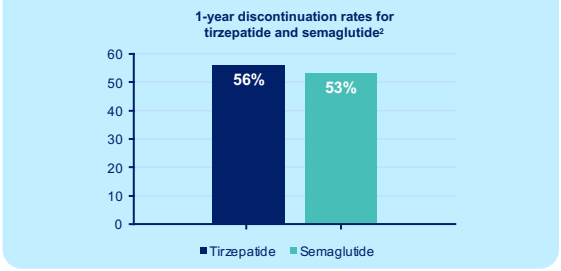
GBT, glucagon-like peptide-1 based therapy.
Figure adapted from Sievenpiper JL, et al. *Obesity Pillars*. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228 and Gorgorjo-Martinez JJ, et al. *J Clin Med*. 2023;12:145.
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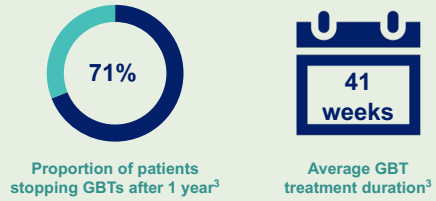
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# Over half of GBT users discontinue their treatment within the first year

**US cohort study of >18,000 patients with overweight/obesity**




**Real-world analyses and surveys in commercially insured GBT users in the US**




Proportion of patients stopping GBTs after 1 year[3]

Average GBT treatment duration[3]

- Most common reasons for discontinuation are loss of access (e.g., cost, drug shortage), side effects, variable individual efficacy, or patient preferences[1-4]
- Patients were **more likely to discontinue GBTs if they did not achieve sufficient weight loss[2]**

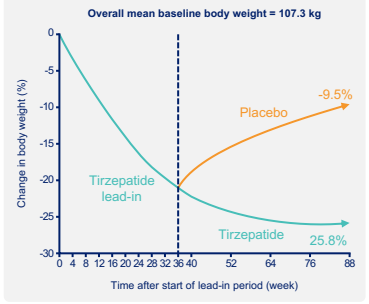
21 GBT, GLP-1 based therapies; US, United States.

1. Gasoyan H, et at. *JAMA Netw Open* 2024;7(9):e2433326. 2. Rodriguez PJ, et al. *JAMA Intern Med* 2024;184(9):1056-1064. 3. Gleason PP, et al. *J Manag Care Spec Pharm*. 2024;30(8):860-867.
4, GLP-1 discontinuation: real-world perspectives on a complex journey. Available at: https://resourcecenter.omadahealth.com/white-papers/glp-1-discontinuation-real-world-perspectives-on-a-complex-journey. Accessed November 2025.

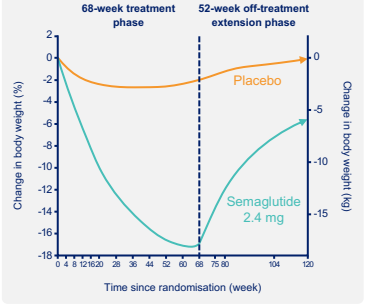
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# After GBT discontinuation, patients regain around two-thirds of their weight within 12 months

**SURMOUNT-4[1]**




**STEP-1 extension[2]**




**Nutrition and lifestyle-focused strategies may help to minimise the impact of weight rebound after GBT treatment is stopped[3]**

22

GBT, GLP-1 based therapies.

1. Aronne LJ, et al. *JAMA*. 2024;331(1):38-48; 2. Wilding JPH, et al. *Diabetes Obes Metab*. 2022;24(8):1553-1564. 3. Wadden TA, et al. *Curr Obes Rep*. 2023;12(4):453-473.

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## 7. Considerations if GBT must be discontinued*




GBT, glucagon-like peptide-1 based therapy; MDT, multidisciplinary team.
Sievenpiper JL, et al. Obesity Pillars. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
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## Our international expert recommendations are in line with recently published US guidance

The advisory outlines eight nutritional priorities

- Baseline nutritional assessment/ screening
- GI AE management
- Navigation of dietary preferences and intakes
- Prevention/ mitigation of nutrient deficiencies
- Preservation of muscle and bone mass
- Maximization of weight reduction efficacy
- Promotion of supportive lifestyle measures
- Patient-centred approach to initiation of GLP-1 therapy

AE, adverse event; GI, gastrointestinal; GLP-1; glucagon-like peptide 1.
Mozaffarian D, et al. *Obesity (Silver Spring)*. 2025;33(8):1475-1503.

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## Limitations

There are several limitations affecting this consensus statement that warrant consideration



- Expert panel mainly from Western countries, potentially introduces bias and limitations on global generalisability
- Lack of clinical data from non-Western regions and underrepresented ethnic populations
- Limited / poorly reported evidence for nutritional and physical activity interventions in the context of GBT; most randomised trials provided insufficient information regarding lifestyle interventions
- Restricted date range of the literature search
- Exclusion of next-generation GBTs still in clinical development

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Sievenpiper JL, et al. Obesity Pillars. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
GBT, glucagon-like peptide-1 based therapies; GI, gastrointestinal.

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## Conclusions

These international consensus recommendations provide HCPs with comprehensive guidance to support people with overweight or obesity along their weight loss journey with a GBT



- GBT can empower individuals to manage hunger and cravings, but long-term nutrition and lifestyle strategies are essential
- Combine GBT with personalised plans that reflect individual values, preferences, and treatment goals
- Successful weight management requires addressing nutritional gaps, promoting physical activity, and managing GI symptoms for sustained adherence
- Provide comprehensive support, including monitoring diet, hydration, and activity, plus guidance from preparation through maintenance and therapy discontinuation

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Sievenpiper JL, et al. Obesity Pillars. 2026;17:10228. . https://doi.org/10.1016/j.obpill.2025.100228.
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