MUSCLE GUARD
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The research, in full.

14 plain-English articles on GLP-1 medications, muscle loss, protein, and resistance training. With sources you can verify yourself.

Compiled by the Muscle Guard research team.
Last updated 4 June 2026 · Free to share.
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Articles are organised into three branches: **What GLP-1s do to your body**, **How to protect your muscle**, and **The research, updated**. Within each branch, articles can be read in any order — each is self-contained.

Compiled and last reviewed.

Compiled 4 June 2026 by the Muscle Guard research team. We update this PDF when the underlying science updates — the version date is in the page footer. Found something we got wrong? Email research@muscleguardglp.com.

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No email gate. No paywall. Send this PDF to anyone on a GLP-1, anyone considering one, or anyone whose prescriber would benefit from seeing the evidence summarised in one place.

Boundary.

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BRANCH 1 · WHAT GLP-1s DO TO YOUR BODY

Do you lose muscle on a GLP-1? What the research shows.

By the Muscle Guard research team · Published 2026-06-04 · 12-minute read

Without specific intervention, between roughly a quarter and forty-five percent of weight lost on a GLP-1 receptor agonist can be lean tissue rather than fat — depending on the drug, the dose, and the trial.[1][5][4] With adequate protein intake (at or above 1.2 g/kg/day) and a resistance-training stimulus, that share drops substantially.[8][9] This article walks through what the published trial substudies actually report, why the figure varies, and what changes it.

The headline number, qualified.

The STEP-1 trial of semaglutide 2.4 mg vs placebo for 68 weeks produced a mean body-weight reduction of ~15%. The DEXA substudy reported lean-body-mass reduction of approximately 13.2% — yielding a lean-mass fraction of total weight loss in the region of 40-45%.[5][2]

The SURMOUNT-1 trial of tirzepatide 15 mg vs placebo for 72 weeks produced ~21% body-weight reduction. The DEXA substudy (n=160 with paired baseline and week-72 scans) reported a 33.9% reduction in fat mass and a 10.9% reduction in lean mass — i.e. lean mass accounted for roughly a quarter of total weight loss.[4][6]

The Neeland et al. (2024) systematic review consolidated body-composition data across the GLP-1 receptor agonist class and concluded that lean-mass-loss share varies meaningfully with the molecule, dose, weight-loss magnitude, baseline body composition, and any concurrent training/protein intervention.[1] Newer co-agonist molecules (tirzepatide, retatrutide candidates) appear to preserve lean mass proportionally better than first-generation single-agonists, but the absolute amount lost is still meaningful.[25]

Why muscle loss happens.

Two mechanisms drive lean-mass loss in this context:

Calorie and protein deficit. GLP-1 receptor agonists suppress appetite so effectively that most users sustain a meaningful daily energy deficit. Without enough dietary protein, muscle protein synthesis cannot keep pace with breakdown.

Reduced training stimulus. Many users feel fatigued or queasy in titration weeks and train less. The 'use it or lose it' principle is unforgiving.[9]

Why the lean-mass fraction varies.

The variation across trials reflects real differences. STEP-1 reported a higher lean-mass-share figure (~45%) than SURMOUNT-1 (~25%) for several reasons: the magnitude of weight loss (a deeper deficit drives proportionally more lean loss), the trial population (baseline composition matters), the drug's effect on appetite vs nutrient partitioning, and methodology (whole-body DEXA captures more than skeletal muscle alone).[1] The Linge et al. follow-up analysis argued that some of what DEXA measures as 'lean mass loss' on a GLP-1 is intramuscular fat clearance, which is metabolically beneficial — but functional lean tissue loss is still occurring.[20]

What changes the figure.

Two interventions, both tested in adjacent (non-GLP-1) energy-deficit trials and supported by GLP-1-era observational data, change the lean-mass-loss fraction substantially:

Protein at or above 1.2 g/kg/day. The Nunes et al. (2022) meta-analysis pooled trials in healthy adults and found that intakes above 1.05 g/kg supported up to 1.21 kg additional fat-free mass retention vs lower intakes.[8] Longland et al. (2016) compared 1.2 vs 2.4 g/kg/day during a 40% deficit with concurrent training — both lost fat, the higher-protein arm preserved (and slightly increased) lean mass.[10]

Resistance training during the deficit. The Murphy and Koehler (2022) meta-analysis showed that an energy deficit of ~500 kcal/day blunts but does not eliminate lean-mass gains from resistance training; strength gains persist regardless of deficit.[11] The 2025 Frontiers review reported that 85% of resistance-training participants in pooled weight-loss trials gained or maintained lean mass.[13]

What Muscle Guard tracks for you.

Protein adherence — log meals via AI plate scan, see daily intake vs your weight-adjusted target, and feed it into the Score.

Resistance training frequency and volume — log sessions, sets, weight per exercise; the app surfaces weekly trends.

Body composition trend — waist, hip, body-fat estimate, visceral-fat rating; flags a healthy-plateau pattern vs an unhealthy-stall pattern.

Muscle Guard Score — single composite metric that captures fat-loss-without-muscle-loss.

Frequently asked questions.

Will I definitely lose muscle on a GLP-1?

Not necessarily. Without intervention, the fraction is in the 25-45% range. With adequate protein and consistent resistance training, the fraction is much smaller. The intervention is the variable; the medication is the driver.

Is some lean-mass loss actually fat clearance from inside the muscle?

Partly. Recent DEXA-MRI analyses argue that some of what shows up as lean-mass loss on a body-composition scan is intramuscular fat being mobilised — a metabolically positive change. But functional muscle is also being lost in the unsupplemented case; protein and training reduce both.[20]

Does the drug choice matter for muscle preservation?

Less than the lifestyle intervention. All approved GLP-1 receptor agonists drive some lean-mass loss in the absence of intervention; the absolute amount scales with the magnitude of weight loss.[25] Tirzepatide produces larger weight loss in absolute terms, so the absolute lean-mass loss is also larger even if the fraction is similar or smaller.

How accurate are DEXA-based body composition estimates?

DEXA is the gold-standard non-research method. Precision is typically within 2-3% for whole-body lean and fat mass. Hydration status, recent food intake, and recent exercise can shift estimates; standardise the scan conditions for serial comparisons.

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BRANCH 1 · WHAT GLP-1s DO TO YOUR BODY

GLP-1 side effects, week by week.

By the Muscle Guard research team · Published 2026-06-04 · 9-minute read

Approximately 40-70% of users on semaglutide or tirzepatide experience gastrointestinal side effects at some point, most commonly during titration steps.[19][18] The pattern matters more than any single symptom: what is common at week 4 is different from what is common at week 16. This article walks through the typical timeline, the standard titration schedules, and when a clinical conversation is warranted.

Weeks 1-4 — starting dose.

Standard semaglutide starting dose is 0.25 mg weekly. Tirzepatide is 2.5 mg weekly. Most users report:[18]

- Mild to moderate nausea, especially in the 24-48 hours after the injection.
- Fatigue, particularly afternoon dips.
- Dramatic appetite suppression by week 2.
- Constipation, mitigated by hydration and fibre.

These symptoms typically subside within days of starting and are not a reason to stop. Hydration (2-3 L water daily), starting the day with protein (25 g+), and light walking help.

Weeks 5-12 — first titration steps.

Standard semaglutide titration: 0.25 mg → 0.5 mg at week 5 → 1.0 mg at week 9. Tirzepatide titrates over 16-20 weeks (2.5 → 5 → 7.5 → 10 → 12.5 → 15 mg).[2][4]

- Nausea returns at each step-up; usually milder than week 1 but real.
- 'Sulphur burps' or 'egg burps' reported by 10-15% of users at higher doses.
- First visible weight loss — typically 4-8% of starting weight.
- Sleep disruption in some users, particularly vivid dreams.

Weeks 13-24 — approaching peak dose.

Semaglutide approaches 1.7 mg then 2.4 mg in this window; tirzepatide reaches 12.5-15 mg. Most users settle at peak dose somewhere here.[23]

- GI symptoms generally easier than during escalation.
- Plateaus possible — weight loss is rarely linear.
- 'Food blankness' — nothing sounds appealing, even foods previously enjoyed.
- Muscle loss becomes visible if not actively prevented.

This is when protein and training matter most. Aim for the upper end of 1.2-1.6 g/kg/day and consistent resistance training.

Months 7-12 — maintenance phase.

Most users settle into a rhythm. Side effects are typically minimal at this stage. New issues that may emerge: reduced enjoyment of food (some users miss the social pleasure); loose skin if weight loss has been rapid; 'Ozempic face' appearance — most pronounced in users who lost weight fastest; hormonal shifts reported in some users (menstrual changes, mood).

When to call your healthcare provider.

Severe abdominal pain, especially if persistent — possible pancreatitis.

Vomiting that prevents you from keeping liquids down.

Signs of dehydration — dark urine, dizziness on standing.

Vision changes.

Severe mood changes or thoughts of self-harm.

Persistent or worsening fatigue.

For non-urgent concerns, log them in Muscle Guard and bring the Doctor PDF to your next consult. The colour-coded timeline view makes the conversation much faster.

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BRANCH 1 · WHAT GLP-1s DO TO YOUR BODY

Mounjaro vs Ozempic vs Wegovy: a 2026 evidence comparison.

By the Muscle Guard research team · Published 2026-06-04 · 10-minute read

In head-to-head trials, tirzepatide (Mounjaro, Zepbound) produces larger average weight loss than semaglutide (Ozempic, Wegovy) at maximal doses: ~21% vs ~15-17% over 68-72 weeks.[4][2][7] Side-effect profiles are broadly similar; cost and regional access differ substantially. This article summarises the published evidence and the practical decisions.

At a glance.

Ozempic and Wegovy are both semaglutide. Ozempic is registered for type 2 diabetes (typically dosed 0.5-1.0 mg weekly); Wegovy is registered for chronic weight management (titrated to 2.4 mg weekly). **Mounjaro and Zepbound** are both tirzepatide. Mounjaro is registered for type 2 diabetes; Zepbound for weight management. Both reach 5-15 mg weekly.

Efficacy (published trial data).

Wegovy 2.4 mg vs placebo: 14.9% body weight loss at week 68 (STEP-1).[2]

Tirzepatide 15 mg vs placebo: 20.9% body weight loss at week 72 (SURMOUNT-1).[4]

Tirzepatide vs semaglutide head-to-head in T2D (SURPASS-2): tirzepatide 5/10/15 mg arms produced 7.6/9.3/11.2 kg loss vs semaglutide 1.0 mg arm at 6.2 kg.[7]

Body composition.

DEXA substudies of both trials show meaningful lean-mass loss in absence of intervention. STEP-1 substudy: ~40-45% of total weight loss was lean mass.[5] SURMOUNT-1 substudy: ~25% of total weight loss was lean mass.[4] The Neeland et al. (2024) review notes that the absolute lean-mass loss is larger with tirzepatide because total weight loss is larger, but the fraction tends to be more favourable.[1]

Side effects.

Broadly similar across all three — nausea, fatigue, vomiting, constipation, diarrhoea — worst during dose escalation.[19] Tirzepatide tends to produce slightly more GI complaints at peak dose in some analyses; semaglutide tends to produce more reports of fatigue. Both produce the 'Ozempic face' appearance with rapid weight loss.

Cost and access (2026, regional).

South Africa. Ozempic registered for T2D, R2,700-R3,100/month. Wegovy not yet registered. Mounjaro registered for T2D, R3,000-R6,000/month. Off-label weight-loss use is permitted at the prescriber's discretion. Compounded semaglutide and tirzepatide common at R1,000-R2,500/month.

United States. Wegovy and Zepbound FDA-approved for weight management. Insurance coverage variable; many plans cover for BMI ≥30 (or ≥27 with comorbidity).

European Union. Wegovy available in most member states; access varies by country. Oral semaglutide higher-dose formulation pending EMA review.

Muscle preservation.

None of the three drugs preserve muscle by themselves. The lifestyle intervention — protein at 1.2-1.6 g/kg/day and resistance training 2-4 times per week — is the variable that changes the fraction. The drug choice is less important for muscle preservation than your daily habits.

Which should you take?

This is a decision for you and your healthcare provider. The trade-offs above are inputs; your access, your insurance or medical aid, your tolerance for side effects, and your medical history are all factors. Muscle Guard supports all three drugs (plus Rybelsus, Saxenda, and compounded preparations) identically.

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BRANCH 1 · WHAT GLP-1s DO TO YOUR BODY

Compounded semaglutide and tirzepatide: what the evidence says.

By the Muscle Guard research team · Published 2026-06-04 · 10-minute read

Compounded semaglutide is real semaglutide — formulated by a registered compounding pharmacy rather than the original manufacturer. Quality varies by pharmacy. The FDA has flagged significant safety concerns including dosing errors, sterility, and adverse events as of mid-2024 through 2025;[14][15] in South Africa, where branded products are often unaffordable, compounded preparations from registered pharmacies remain mainstream. This article walks through what the evidence actually says, how to assess quality, and how to track dose precisely.

What compounded semaglutide is.

Pharmacy compounding is a long-established practice — pharmacists making custom-formulated medications from raw active ingredient for specific patient needs. In the GLP-1 context, the pharmacist combines semaglutide active pharmaceutical ingredient with sterile diluent, vials, and (sometimes) a bacteriostatic agent. The end product is a multi-dose vial that the patient draws from with insulin syringes.

Compounded semaglutide is not a generic version of Ozempic. Generic semaglutide will follow once Novo Nordisk's patent protection lapses (expected in stages from 2026 onward across jurisdictions). Compounded preparations are a parallel route — legal where pharmacy compounding regulation permits, restricted where it does not.

What the FDA has flagged (2024-2025).

Dosing errors. The FDA reported in July 2024 that patient inexperience with measuring and self-administering compound semaglutide had led to overdoses of 5 to 20 times the intended dose; confusion between units (mg vs unit vs mL) is a documented contributor.[14]

Adverse events. As of December 31, 2024, the FDA's Adverse Event Reporting System database recorded more than 900 cases associated with compounded semaglutide and tirzepatide, including 17 deaths.[15]

Sterility and contamination. The FDA has expressed concerns about the sterility of drugs distributed by some compounding facilities, citing risks of serious adverse health consequences including infections and sepsis.

Quality and ingredient variation. Compounded semaglutide has no FDA approval; benefit and risk profiles are not equivalent to the branded product. Some compounders use semaglutide acetate or other salt forms vs the standard sodium form.

The South African context.

In South Africa, compounded semaglutide and tirzepatide from registered compounding pharmacies remain widely used, primarily because the cost gap to branded products is the difference between accessing a GLP-1 and not. Compounded preparations cost R1,000-R2,500/month vs R2,700-R3,100 for branded Ozempic.[22] Quality control varies by pharmacy. Reputable compounders provide a certificate of analysis, disclose API source, and titrate predictably.

How to assess a compounding pharmacy.

Registration. South African Pharmacy Council (SAPC) registration in SA. State pharmacy board licensing and PCAB accreditation in the US.

API source. Reputable compounders disclose the active pharmaceutical ingredient source and have a certificate of analysis available.

Formulation transparency. Some compounders use semaglutide acetate or other salt forms. Ask. Biological activity is equivalent on a per-mg basis, but it changes how you read dose conversions.

Storage and shipping. Semaglutide is temperature-sensitive. Refrigerated transport and clear storage instructions are non-negotiable.

Pharmacist accessibility. The best compounders pick up the phone and answer questions.

Dosing precision — the biggest practical risk.

A branded Ozempic pen is dialled to a specific dose. A compounded vial typically contains semaglutide at a different concentration (5 mg/mL or 10 mg/mL are common) and the patient draws an exact volume with an insulin syringe. Same final dose, different mechanics — and the risk is drawing the wrong volume.[14] Log every shot precisely in Muscle Guard with the concentration and volume your prescriber and pharmacist have agreed on.

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BRANCH 1 · WHAT GLP-1s DO TO YOUR BODY

Rybelsus and oral semaglutide: how it works, dosing rules.

By the Muscle Guard research team · Published 2026-06-04 · 8-minute read

Rybelsus is oral semaglutide — the same active ingredient as Ozempic and Wegovy, in a daily tablet co-formulated with the absorption enhancer SNAC.[17] Bioavailability is approximately 0.4-1%, which is why the dose is much higher than the injectable equivalent.[16] The 30-minute pre-meal fasting rule is non-negotiable: violating it substantially reduces absorption. This article covers the dosing schedule, the absorption window, missed-dose protocol, and what Muscle Guard tracks.

What Rybelsus actually is.

Rybelsus is the oral form of semaglutide, manufactured by Novo Nordisk. The tablet uses an absorption enhancer (sodium N-[8-(2-hydroxybenzoyl)amino] caprylate, SNAC) to facilitate semaglutide crossing the gastric epithelium.[17] Bioavailability is roughly 1% — meaning ~99% of an oral dose does not reach the bloodstream. The higher milligram amounts (3, 7, 14 mg daily) compensate.

Dosing schedule (T2D indication).

Weeks 1-4 (starting): 3 mg daily.

Weeks 5-8 (escalation): 7 mg daily.

Week 9+: 14 mg daily.

Higher doses (25 mg, 50 mg) tested in the OASIS programme for weight management are pending regulatory review in multiple jurisdictions as of 2026.

The 30-minute fasting window.

This is the rule that most determines whether oral semaglutide works for you. The tablet must be taken on an empty stomach with no more than 120 mL of water. Then nothing — no food, no other drink, no other oral medications — for 30 minutes. After 30 minutes, normal eating and drinking resumes.

Why the window matters: anything in the stomach before or shortly after the tablet competes with SNAC-mediated absorption. Coffee, fruit juice, oat milk, multivitamins — all of them substantially reduce the dose reaching your blood.[17] Practical translation: this is a first-thing-after-waking medication. Bedside table, glass of water, tablet, wait, then coffee.

Missed dose protocol.

Per the prescribing information: skip the missed dose entirely, resume the next day. Do not double-dose to compensate. The half-life of semaglutide is about a week regardless of oral vs injected, so one missed daily dose has a smaller impact than missing one weekly injection. Log the missed day in Muscle Guard; the Personal Coach reads patterns and may suggest a routine tweak if missed doses cluster on certain days.

Side effects.

Side-effect profile mirrors injected semaglutide — nausea, fatigue, constipation, occasional sulphur burps, vivid dreams — with one notable difference. Oral semaglutide produces less peak-trough fluctuation than

weekly injections, because the daily dose smooths the blood-concentration curve.[16] Many users report that oral semaglutide feels different from injection — sometimes easier, sometimes harder, individual.

Muscle preservation.

Daily dosing doesn't change the muscle preservation requirement. Protein target of 1.2 to 1.6 g/kg/day; resistance training two to four times per week. The mechanics that drive muscle loss on injected GLP-1s — calorie and protein deficit, reduced training stimulus — are identical on oral.

Tracking Rybelsus in Muscle Guard.

The app handles daily dosing, the 30-minute pre-meal countdown, and missed-dose patterns. A morning reminder fires at the time you set, with a quiet escalation if you don't log within 20 minutes. The 30-minute countdown is visible on the dashboard so you can see how long until you can eat.

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BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

The protein target: 1.2 to 1.6 g/kg per day, in plain English.

By the Muscle Guard research team · Published 2026-06-04 · 9-minute read

For adults on a GLP-1, the evidence supports a daily protein target of 1.2-1.6 grams per kilogram of body weight — meaningfully above the 0.8 g/kg/day general RDA.[8][21] The Longland et al. (2016) trial showed that the upper end of this range, combined with resistance training, preserves and even slightly increases lean mass during a substantial energy deficit.[10] This article translates the range into per-meal targets and practical food sources.

Why the target is higher on a GLP-1.

The 0.8 g/kg/day Recommended Daily Allowance was set to prevent deficiency in sedentary, weight-stable adults. People on a GLP-1 are neither sedentary (resistance training is the preservation strategy) nor weight-stable (they are in a sustained calorie deficit). Both conditions push the protein requirement up.[21][9]

The Nunes et al. (2022) meta-analysis in the Journal of Cachexia, Sarcopenia and Muscle pooled trials of varying protein intake in healthy adults; intakes above 1.05 g/kg/day supported up to 1.21 kg additional fat-free mass retention vs lower intakes.[8] Longland et al. (2016) ran a 4-week, 40% energy deficit with concurrent training, comparing 1.2 vs 2.4 g/kg/day; the higher-protein arm preserved and slightly increased lean mass while losing fat at the same rate.[10]

Translating the range.

- 60 kg adult — 72 to 96 g protein per day.
- 75 kg adult — 90 to 120 g protein per day.
- 90 kg adult — 108 to 144 g protein per day.
- 105 kg adult — 126 to 168 g protein per day.

Use the lower end if you are largely sedentary; the upper end if you are resistance-training.

Per-meal target.

Spread protein across three or four meals containing 25-40 g each. Each of these meals fully stimulates muscle protein synthesis for several hours. Skipping breakfast — a real risk on a GLP-1 — cuts protein opportunities by 25-33%. Start your day with at least 25 g, even when not hungry.

Practical sources with protein content.

- 2 eggs — 12 g
- 100 g chicken breast — 31 g
- 100 g salmon — 25 g
- 100 g lean beef mince — 26 g
- 200 g Greek yoghurt — 20 g
- 1 scoop whey protein — 24 g
- 100 g cottage cheese — 11 g
- 100 g lentils (cooked) — 9 g

100 g firm tofu — 13 g

1 tin tuna in water (drained) — 25 g

Satiety hacks when nothing sounds appetising.

Many users describe a 'food blankness' on a GLP-1 — nothing sounds good, including foods previously loved. Three things help:

Front-load protein. Eat protein first, before carbohydrates and vegetables. The window of willingness is short.

Liquid protein. A protein shake (especially with cold milk) goes down when solid food won't. Keep a tub on hand.

Cold preparations. Cold chicken, cottage cheese, tinned fish — often more tolerable than warm cooked meals on shot days.

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BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

Resistance training on a GLP-1: the minimum effective dose.

By the Muscle Guard research team · Published 2026-06-04 · 8-minute read

The Murphy and Koehler (2022) meta-analysis showed that an energy deficit blunts but does not eliminate lean-mass gains from resistance training; strength gains persist regardless of deficit.[11] The 2025 Frontiers in Endocrinology review reported 85% of resistance-training participants in pooled weight-loss trials maintained or gained lean mass.[13] This article translates the evidence into the minimum effective dose: 2-4 sessions per week, 10-20 hard sets per muscle group per week, RPE 7-9, with progressive overload.

Why resistance training, specifically.

The body has no reason to preserve muscle in a sustained calorie deficit unless something tells it to. Aerobic exercise burns calories but does not provide that signal at meaningful intensity. Resistance training does — and the protein you eat is more efficiently directed to muscle protein synthesis when the muscle has been recently challenged.

The minimum effective dose.

Frequency: 2-4 sessions per week.

Volume: 10-20 hard sets per muscle group per week.

Intensity: RPE 7-9 — two to three reps shy of failure on most sets.

Progression: add weight, reps, or sets every one to two weeks.

The Schoenfeld et al. (2019) meta-analysis on training frequency found that 2x/week per muscle group is sufficient for hypertrophy when weekly volume is matched.[12]

What 'a session' actually looks like.

A 45-60 minute session that hits all major muscle groups, using compound movements as the spine: squat or leg press; deadlift or hip hinge variant; bench press or push-up progression; row or pull-up progression; overhead press. Add 1-2 accessory exercises per session for arms, core, or weak points.

Equipment matters less than consistency.

Bodyweight, dumbbells, resistance bands, or a barbell can all preserve muscle, provided you progressively overload. The training protocols in the published intervention arms used a mix of all four. The consistent feature was 2-4 sessions per week, hitting all major muscle groups, with explicit progression week over week.

Cardio is welcome, but secondary.

Cardiovascular work is useful for cardiovascular health, mood, and additional energy expenditure. It does not replace resistance training for muscle preservation. The order of priority: resistance first, cardio second.

Training around shot day.

Many users find shot day plus the next 24-48 hours brings nausea. Schedule heavier sessions for later in the week. Muscle Guard's Personal Coach reads your symptom timeline and suggests easier session types

when patterns emerge.

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BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

Body recomposition on a GLP-1: can you build muscle while losing fat?

By the Muscle Guard research team · Published 2026-06-04 · 8-minute read

True recomposition — gaining lean mass while losing fat — is harder in a sustained calorie deficit than in normal training conditions, but not impossible.[10][11] For most users on a GLP-1, the realistic goal is closer to 'minimise muscle loss while losing fat' with periods of genuine recomposition during dose plateaus and at maintenance.[1] This article covers the realistic frame, the DEXA cadence, and what the data actually supports.

What recomposition means in this context.

On a GLP-1, you are nearly always in a calorie deficit. Longland et al. (2016) demonstrated that a 4-week 40% deficit with high protein (2.4 g/kg/day) and concurrent training produced lean mass gain in young men — but the cohort was previously trained, the intervention was short, and 2.4 g/kg/day is meaningfully above the routinely-achievable 1.6 g/kg/day many GLP-1 users target.[10] For the typical GLP-1 user (longer time horizon, less extreme protein intake), the data supports 'minimise muscle loss' more than 'gain muscle'.

Body composition tracking — cadence.

Weight: weekly (daily weighing drives anxiety without adding signal).

Waist circumference: weekly, same time of day, same posture.

Body composition (DEXA or BIA): every 12 weeks while losing, every 6 months in maintenance.

Progress photos: monthly, same angles, same lighting.

DEXA caveats.

DEXA is the gold-standard non-research method. Precision is typically within 2-3% for whole-body lean and fat mass. Hydration status, recent food intake, and recent exercise shift estimates; standardise scan conditions for serial comparisons. The Linge et al. analysis argued that some of what DEXA measures as 'lean mass loss' on a GLP-1 is intramuscular fat clearance, which is metabolically beneficial — but functional lean tissue loss is still occurring.[20]

What 'good' looks like at 12 weeks.

Users following the protein-and-training plan typically show: weight down 8-12%; waist circumference down 5-10 cm; body-fat estimate down 4-6 percentage points; strength on baseline lifts holding or improving; lean mass estimate (via DEXA, BIA, or tape) within 2-3% of baseline.

Dose plateaus as recomp windows.

When the dose holds for 4-8 weeks (often during titration steps), appetite normalises slightly. This is the window where a slight protein push and a focused training cycle can produce visible composition change. The Personal Coach reads dose plateaus from your medication log and surfaces this prompt automatically.

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BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

Muscle drain and 'Ozempic face': what's actually happening.

By the Muscle Guard research team · Published 2026-06-04 · 7-minute read

'Muscle drain' and 'Ozempic face' are user-coined terms for the same root phenomenon — losing lean mass alongside the fat. The mechanism is a sustained calorie and protein deficit without a resistance-training stimulus.[1][9] The visible facial change is partly fat-pad depletion and partly lean-tissue loss. Both are largely preventable with the same playbook.

What 'muscle drain' actually describes.

Without intervention, between roughly a quarter and 45 percent of weight lost on a GLP-1 can be lean tissue rather than fat.[1][5][4] Some of that is skeletal muscle, some is connective tissue, glycogen, and water. The visible signs — sunken facial fat pads, gaunt appearance, reduced strength on lifts, fatigue beyond what calorie deficit alone explains — track with the lean-mass fraction of total loss.

Why it shows up most in users who lose weight fastest.

Faster weight loss requires a larger calorie deficit. A larger deficit drives the body harder toward mobilising both fat and muscle stores. The arithmetic: same lean-loss share applied to a larger total loss equals a more visible absolute change.

The face specifically.

The face has fat pads (buccal, malar, periorbital) that contribute significantly to the soft, rounded look associated with 'healthy' weight. Rapid loss in these depots is part of the 'Ozempic face' appearance. Lean-tissue loss contributes the rest. Slower weight loss, adequate protein, and resistance training reduce the rapidity of facial change.

The prevention plan.

Protein: 1.2 to 1.6 g/kg/day.

Resistance training: 2-4 sessions per week.

Don't push the deficit: 0.5-1.0% body weight loss per week is sustainable. Faster than that escalates muscle loss for marginal additional fat loss.

Track waist circumference: A flat-scale week with a tightening waist is recomposition.

What Muscle Guard tracks.

Lean mass estimate across waist, hip, neck measurements and trend

Strength on baseline lifts — leading indicator that muscle is holding

Pace of weight loss — flags weeks where the deficit may be too aggressive

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BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

Maintenance after a GLP-1: what the research says.

By the Muscle Guard research team · Published 2026-06-04 · 8-minute read

In the STEP-1 trial extension, participants regained two-thirds of the lost weight within 12 months of semaglutide discontinuation.[3] Net weight loss from baseline shrank from 17.3% on-treatment to 5.6% one year off. Users who continued the protein-and-training plan during the medication phase regain less, and what they regain is more body-composition-neutral. This article walks through the patterns, the taper decision, and the maintenance protocol.

Why people stop.

Reasons vary by region. In the United States: insurance coverage cycles, plan changes, side-effect fatigue. In South Africa: cost, supply, switching to compounded. In the EU: stigma, side-effect intolerance, pregnancy. Whatever the reason, the physiology is the same — appetite returns as the medication clears, typically within 4-8 weeks of the last dose for weekly semaglutide and 6-10 weeks for tirzepatide.

Regain patterns from the published data.

Full discontinuation, no plan: 65-80% of lost weight regained over 12 months. STEP-1 extension reported ~67% regain at week 120 vs week 68.[3]

Discontinuation with protein + training continued: regain is smaller and more body-composition-neutral.

Taper to low maintenance dose: regain is smallest. Lower-dose semaglutide as continued therapy — discuss with your healthcare provider.

Taper or hard stop.

Both are legitimate. The choice belongs to you and your healthcare provider, and the decision changes the maintenance plan significantly. Hard stop is most users' default. Taper down (step down dose over 8-16 weeks) gives a smoother appetite transition. Low-dose maintenance (with prescriber agreement) — many users stay on a low maintenance dose long-term, ~0.25-0.5 mg semaglutide weekly or equivalent.

Muscle preservation in maintenance is non-negotiable.

The single biggest determinant of how the post-GLP-1 year goes is whether you continued resistance training during the medication phase. Users who didn't train during the active phase don't have the strength baseline to draw on; users who did, do. Maintenance training plan: 2-4 sessions per week, all major groups, progressive overload. Protein 1.2-1.6 g/kg/day.

Living with returning appetite.

The first month is psychologically harder than the first month of starting. On the way up, you noticed hunger disappearing — quiet, welcome. On the way down, you notice hunger returning — loud, intrusive. Many users describe it as 'food sounds different again.' Two strategies that hold up across the data: keep the same eating rhythm you settled into on the medication; find the calorie maintenance level and stay near it.

BRANCH 2 · HOW TO PROTECT YOUR MUSCLE

The Muscle Guard Score, explained.

By the Muscle Guard research team · Published 2026-06-04 · 7-minute read

The Muscle Guard Score is one number, 0-100, that captures whether the fat-loss-without-muscle-loss plan is working. It combines four inputs — protein adherence, resistance training frequency, weight trend, and body composition — weighted by their relative contribution to muscle preservation evidence. The goal isn't 100; it's consistency in the 70+ range across the journey.

Why one number, not five.

The question that matters — 'am I doing this properly?' — is composite. It requires weighting protein against training against scale movement against body composition simultaneously. Humans aren't good at composite mental scoring; we anchor on the metric that moved most this week and miss the one that quietly drifted. The Muscle Guard Score does the weighting for you.

The four inputs and their weights.

Protein adherence — 35%. Rolling 7-day average of (daily protein / weight-adjusted target), capped at 100.

Resistance training frequency — 25%. Rolling 14-day count against target.

Weight trend — 20%. 14-day rolling rate compared against healthy range.

Body composition — 20%. 30-day direction of travel across waist, hip, neck, body-fat estimate.

Weights reflect the relative contribution to muscle preservation evidence. Adjustments may follow as more data accrues — current weights frozen Q1 2026.

Score bands.

0-49: needs attention.

50-69: okay.

70-84: on track.

85+: excellent.

Diagnostic, not graded — the goal is consistency in the 70+ range, not chasing 100.

Trajectory across the journey.

Weeks 1-4 typically score lower than expected — appetite suppression is hitting hard, food blankness is real, training feels worse. A Score in 50-65 in weeks 1-4 is normal. From week 8-10 onwards, a healthy trajectory takes the Score into the 70s and holds it there. Plateaus in weight don't necessarily drop the Score, because protein adherence and training are weighted higher.

What stalls look like.

Protein dropping — most common driver. Re-anchor breakfast protein.

Training missed for two weeks — restart at lighter weight and rebuild.

Weight stalled but body composition slipping — hardest stall to read on the scale alone. More protein, more resistance, less cardio if cardio is excessive.

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BRANCH 3 · THE RESEARCH, UPDATED

GLP-1s in South Africa, 2026: cost, access, the compounded landscape.

By the Muscle Guard research team · Published 2026-06-04 · 8-minute read

Branded Ozempic costs R2,700-R3,100 per month in South Africa as of 2026 and is registered with SAHPRA for type 2 diabetes only.[26] Medical aid coverage for weight-loss use is rare. Compounded semaglutide and tirzepatide from registered SAPC pharmacies fill the gap at R1,000-R2,500 per month.[22] Generic semaglutide is expected to widen access through 2026. This article covers the regulatory landscape, the cost structure, and the compounded ecosystem.

What Ozempic actually costs.

Ozempic 0.25 mg (starter): R1,800-R2,200/month.

Ozempic 0.5 mg: R2,300-R2,700/month.

Ozempic 1.0 mg: R2,700-R3,100/month.

Compounded semaglutide: R1,000-R2,500/month.

Generic semaglutide (expected late 2026): ~R1,500-R2,200/month.

Sources: Dis-Chem and Clicks public price lists Q1 2026; Spotlight SA reporting; Health for Mzansi coverage.[22]

Who can legally prescribe.

Any medically qualified prescriber registered with the HPCSA — GPs, endocrinologists, internal medicine specialists, and registered dietitians where scope of practice allows. The prescription is the legal mechanism that lets a pharmacy dispense it. Off-label use for weight loss is permitted at the prescriber's clinical discretion.

What medical aid will and will not cover.

For diabetes (registered indication): covered with a chronic-condition motivation. Approval typically requires HbA1c above 7%, documented type 2 diabetes diagnosis, prior failed trials on metformin or other oral agents.

For weight loss alone: almost universally not covered, regardless of BMI.

For weight loss with comorbidity: occasionally approved when BMI greater than 35 with documented hypertension, dyslipidemia or other CMS-listed comorbidities.

Practical implication: budget for the medication out of pocket; treat any medical aid contribution as a bonus.

The compounded landscape.

Compounded semaglutide and tirzepatide are custom-made by SAPC-registered compounding pharmacies from active pharmaceutical ingredient under pharmacy-board oversight. Reputable compounders provide a certificate of analysis on request, will discuss their API source openly, and titrate predictably. The FDA's 2024-2025 safety alerts on compounded products are worth reading even if the regulatory landscape differs.[14][15]

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BRANCH 3 · THE RESEARCH, UPDATED

Getting the most from your GLP-1 doctor visit.

By the Muscle Guard research team · Published 2026-06-04 · 6-minute read

Most GLP-1 consults are 15-20 minutes. The productive ones start with a one-page summary your prescriber reads in 60 seconds, three written questions, and a current medication list. They end with three clear actions you've logged before you leave the parking lot. This article is the practical preparation that gets you there.

The five-day prep window.

Day -5: Run a draft Doctor PDF. Read it as if you were your prescriber. Note any gaps.

Day -4 to -2: Fix the gaps — backfill weight entries, untracked side effects, training sessions you forgot to log.

Day -1: Write three questions, prioritised.

Morning of: Generate the final PDF. Email it to yourself or have it on your phone, screen-bright.

What to bring.

The final Doctor PDF — the one-page summary.

Three written questions.

Current medication list (including OTC and supplements).

Last lab results if you have them — HbA1c, lipid panel, liver enzymes inform dose decisions.

Notes on what's changed in your life — stress, sleep, new exercise routine.

Three questions to ask every consult.

Looking at the trend, is the dose right for the next 4-6 weeks? Triggers a deliberate conversation about dose escalation or holding.

Which side effect should I track most carefully between now and our next visit? Forces prioritisation rather than listing everything.

What would make you change the plan? The answer becomes your operating manual until the next visit.

After the visit.

Within four hours, write down the three actions you agreed on. Memory degrades fast; ambiguity creeps in within 24 hours. Then log them in Muscle Guard as scheduled reminders.

Virtual consults.

Same playbook, with two tweaks. Share the Doctor PDF with your prescriber the day before — email or upload to whatever portal they use. They'll read it before the call, which means the call starts with 'what's changed since this was generated?' rather than 'tell me about the last twelve weeks.'

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BRANCH 3 · THE RESEARCH, UPDATED

Privacy and GLP-1 apps: what your data does on the leading trackers.

By the Muscle Guard research team · Published 2026-06-04 · 7-minute read

GLP-1 trackers process at least three categories of personal data: identifying information (email, name); behavioural information (weight, food, exercise, photos); and inferred information (your patterns, risk flags, recommendations). Health data is 'special category' under Article 9 GDPR — requiring explicit consent or another specific legal basis. This article walks through what the leading trackers actually do with your data, the questions to ask, and the red flags to watch for.

Your rights, in plain language.

Access — get a copy of every piece of data the app holds about you, in a readable format, within one month.

Rectification — correct anything inaccurate or incomplete.

Erasure ('right to be forgotten') — delete your data, the account, the lot, usually with a documented retention window under 30 days.

Portability — export your data in a machine-readable format (JSON, CSV) so you can take it elsewhere.

Restriction — limit how the app processes your data without deleting it.

Object — refuse certain types of processing, especially marketing or profiling.

How to read a privacy policy in 10 minutes.

Search for these terms and read the surrounding paragraph:

'Third party' or 'Third parties' — every third party that touches your data must be listed.

'Advertising' — is your data used for advertising? If yes, first-party only or third-party?

'International transfer' or 'Data hosting' — where does your data physically live?

'Retention' — how long is your data kept after you delete your account?

'Legal basis' — under what article of GDPR does the processing happen?

Red flags.

Vague privacy policy ('we may share data with selected partners').

Cookie banner with no genuine reject-all option.

Required social-network login.

No deletion route in-app.

No named data controller.

How Muscle Guard handles privacy.

EU-region data hosting for EU users; equivalent posture for ZA and US.

Explicit consent for health data processing at sign-up.

No third-party advertising. No ad networks. No data sale.

Deletion in one tap. All personal data removed within 7 days.

Portability available on request.

Doctor PDF generated on-device, shared at your discretion only.

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Citations.

All sources used across this library. Click any DOI/URL link to open the original paper.

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Methods note.

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Errors.

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