

GLP-1 MEDICATION: AN EVIDENCE-BASED REVIEW FOR THE FITNESS PROFESSIONAL AND WELLNESS COACH



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Disclaimer

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Abstract

The growing prevalence of obesity among individuals is concerning due to its association with chronic diseases. While the promotion of physical activity and dietary intervention remains the initial step in the treatment of obesity, the use of pharmacologic agents to assist patients in achieving their goals can be a highly effective tool. The most recent option, which has gained great popularity, has been the use of the prescribed glucagon-like peptide-1 (GLP-1) agonist class of medications. Initially researched and used for treating Type 2 Diabetes Mellitus, their popularity in the weight loss sector came from evidence obtained through trials that identified a notable decrease in overall body weight.

This evidence-based review will explore important issues related to GLP-1 medications, focusing on semaglutide. The discussion will cover semaglutide drug actions, adverse effects, contraindications, warnings, precautions, and the potential loss of body mass. The role of the fitness professional and wellness coach will be discussed along with suggested management strategies for individuals taking semaglutide medications.



Introduction

According to the World Health Organization, it is estimated that 1.9 billion adults 18 years and over are overweight (BMI ≥ 25 kg/m²) or obese (BMI ≥ 30 kg/m²). Over 340 million youths aged 5 to 19 years and 41 million under age 5 were overweight or obese in 2016 (World Health Organization, 2021). In the United States (U.S.), data collected from 2017 to 2020 revealed that 41.9% of adults and 19.7% of youths were obese (Trust for America’s Health, 2022). The estimated annual medical costs related to obesity in the U.S. were nearly \$173 billion in 2019 (Centers for Disease Control and Prevention, 2022).



HELPFUL HINT

Body Mass Index is a rough assessment based on the concept that a person’s weight should be proportional to their height. An elevated BMI is linked to an increased risk of disease, especially if associated with a large waist circumference (Aune et al., 2016). There are two formulas to calculate BMI:

- Metric formula: $BMI = \text{weight (kg)} \div [\text{height (m)}]^2$
- Imperial formula: $BMI = 703 \times \text{weight (lb.)} \div [\text{height (in.)}]^2$

BMI is a useful tool to screen the general population, but one weakness is that it fails to differentiate fat mass from lean body mass. Consequently, fitness and wellness professionals should be aware of the following:

- Women tend to have higher body fat percentages than men with an equivalent BMI.
- Older adults tend to have higher body fat percentages than younger adults with equivalent BMI.
- Athletes or bodybuilders with a large amount of muscle mass can mistakenly fall within the moderate- to high-risk categories.

BMI	Disease Risk	Classification
<18.5	Increased	Underweight
18.5–24.9	Low	Healthy weight
25.0–29.9	Increased	Overweight
30.0–34.9	High	Obese
35.0–39.9	Very high	Obesity II
≥ 40.0	Extremely high	Obesity III

There are different factors related to obesity that can make it a challenge to manage (Anekwe et al., 2020; Chatterjee et al., 2020; National Institute of Health, 2022) (**Figure 1**). The growing prevalence is concerning due to its association with chronic diseases (Keramat et al., 2021). The Centers for Disease Control and Prevention (2023) reports that the top 10 causes of mortality in the U.S. indicate that heart disease, cancer, stroke, and diabetes account for 47% of all deaths in 2020. This is significant because evidence supports dietary intervention, exercise, and lifestyle as a means of primary prevention.

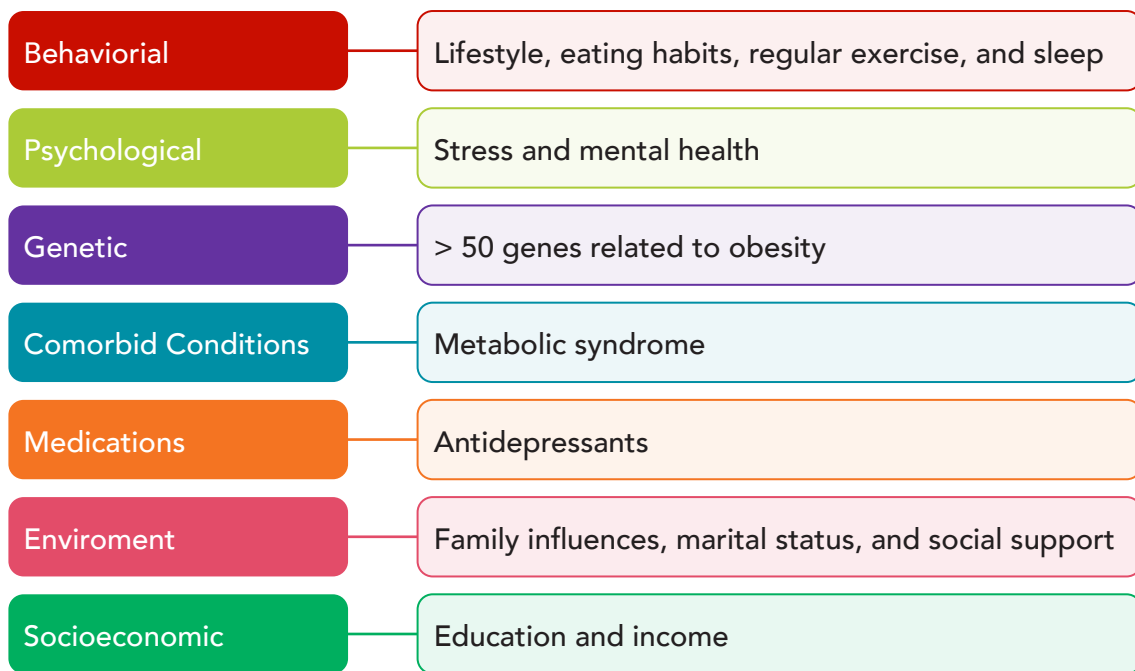


Figure 1. Factors Related to Obesity

Given the scope of the issue and the importance of finding viable prevention and treatment options, healthcare professionals and researchers are constantly working to find ways to slow or reverse this trend. While promoting physical activity and dietary intervention remain the initial step in treating obesity, using medication when warranted to assist patients in achieving their goals can be a highly effective tool. The most recent option, has been the Food and Drug Administration (FDA) (2023) approved use of the Incretin agonist class of medications. Incretins, such as glucagon-like peptide-1 (GLP-1), are peptides (chains of amino acids that act as hormones) that modulate glucose metabolism by facilitating the pancreas to release insulin to reduce blood glucose levels (**Figure 2**). These medications were originally researched and used for the treatment of Type 2 Diabetes Mellitus (T2DM) but now have become a popular option among individuals seeking weight loss for improved health and even for cosmetic weight loss (Wilding et al., 2021a; Bergmann et al., 2023).

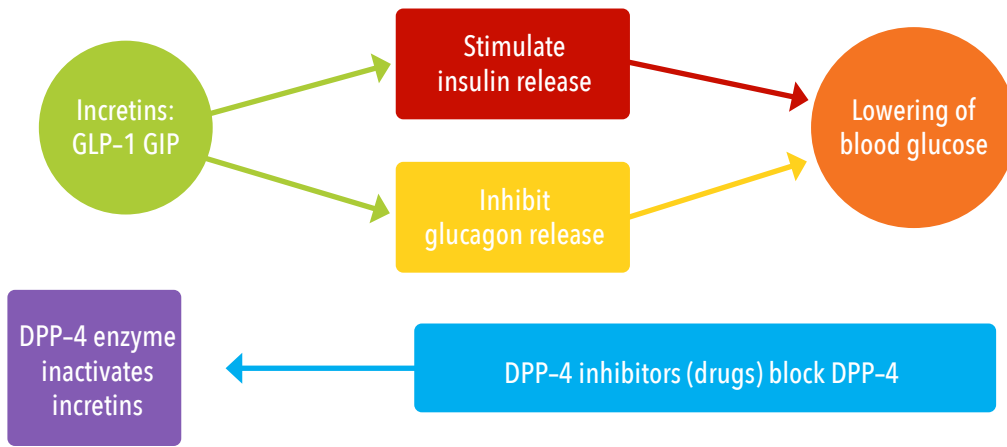


Figure 2. Actions of the Incretins on the Body

In 2005, GLP-1 medications were created to help individuals with T2DM or people who are overweight with related health problems to lower their blood sugars (Amaro et al., 2022; Latif et al., 2023). To date, there are several GLP-1 medications approved by the FDA, with a few medications approved for weight loss (Latif et al., 2023) (**Table 1**).

Purpose	Medication Name	Brand Name
Type 2 Diabetes Mellitus	Dulaglutide	Trulicity®
	Tirzepatide	Mounjaro®
	Exenatide	Byetta®
	Exenatide (extended-release)	Bydureon BCise®
	Lixisenatide	Adlyxin®
Weight loss	Semaglutide	Ozempic®, Wegovy®, and Rybelsus®
	Liraglutide	Saxenda® and Victoza®
	Tirzepatide	Zepbound™

Table 1. GLP-1 Medications for T2DM and Weight Loss



Semaglutide

For weight loss, currently, the most frequently prescribed GLP-1 medication is semaglutide (brand: Ozempic®, Wegovy®, or Rybelsus®) because it is approved for non-diabetic individuals who have a BMI of 27 or greater and at least one weight-related condition (e.g., hypertension or high cholesterol) or have a BMI greater than 30 (Food and Drug Administration, 2021; Wilding et al., 2021a) (**Table 2**). Recently, semaglutide has been prescribed to individuals of all health levels seeking cosmetic weight loss (Han et al., 2023).

Qualifying Individuals	Eligibility Factors
Group 1	BMI \geq 27
	At least one weight-related comorbidity (e.g., high blood pressure, high cholesterol, or diabetes)
Group 2	BMI > 30

Table 2. Semaglutide Eligibility Factors

Semaglutide was originally created to treat individuals with T2DM. In 2018, researchers representing the manufacturer began a planned series of 15 clinical trials called the Semaglutide Treatment Effects in People with Obesity or *STEP* studies, which explore the utility of the once-weekly 2.4 mg semaglutide injection among individuals with overweight and obesity with or without T2DM (Alabduljabbar et al., 2022). In 2019, researchers also began studying the effects of semaglutide among adolescents 12 to 17 years of age as part of the STEP TEENS clinical trial (Weghuber et al., 2022).

IMPORTANT INFORMATION!

The fitness professional and wellness coach should consider that the GLP-1 medications were created to treat specific medical conditions (e.g., T2DM) and not for cosmetic weight loss (Alabduljabbar et al., 2022). The STEP studies included both the GLP-1 medication and lifestyle changes, which are important for long-term weight loss. The study results showed that participants who lost the least amount of weight had a greater chance of regaining (Wilding et al., 2022). Without lifestyle changes, cosmetic weight loss is only temporary. These studies will be discussed more in the upcoming sections.

The fitness professional and wellness coach can coach their clients through different healthy lifestyle strategies. However, they must consider their scope of practice and not recommend medication to their clients. Only qualified healthcare providers can recommend and prescribe medication.

The widespread use of semaglutide has created some concerns among healthcare professionals. The medication may help individuals temporarily lose weight but may not be ideal as a standalone treatment for long-term weight loss due to the potential of regaining weight after stopping the medication (Wilding et al., 2022). There is also a concern regarding the potentially large amount of body mass lost from semaglutide, which may include lean muscle and bone mineral density, which are important for long-term health (Ida et al., 2021; Papageorgiou et al., 2020). These negative effects appear to be analogous to those often seen in extreme or crash diets, where individuals severely reduce their energy intake (calories) and fail to maintain adequate protein intake and other key macro- and micronutrients (Joshi & Mohan, 2018; Tahreem et al., 2022). The results from extreme dieting include rapid weight loss, potential loss of lean muscle, and risk for frailty (physiological decline) as the person ages. Researchers have documented that a weight loss of $\geq 5\%$ among individuals 60 years and older was a significant risk factor for frailty, and weight loss over a lifespan was strongly associated with frailty (Crow et al., 2020). Frailty has been linked to falls, fractures, and mortality among adults 75 years and older (Middleton et al., 2022). These data clearly show the potential health and safety risks related to semaglutide and extreme dieting in the absence of a supervised lifestyle program.

GETTING TECHNICAL

While the research data suggests that GLP-1 medications can cause rapid and substantial weight loss, their use may result in large portions of loss from lean body mass (Ida et al., 2021). This may increase the risk of frailty among some populations (Crow et al., 2020). Adequate protein intake may offset this loss. The recommended daily allowance (RDA) for protein intake is as follows: 0.8 g/kg/body weight (0.36 g/lb.) to maintain nitrogen balance, while the optimal protein intake for exercising individuals is 1.4–2.0 g/kg (0.64–0.91 g/lb.) of body weight (Kerksick et al., 2018).

- Example: A 200-lb male needs a minimum protein intake of 0.36g/lb. (0.8 g/kg) of body weight to maintain nitrogen balance, which would be 2.6 oz (73.7 g) per pound. Protein sources could be 3 oz lean meat or 1.59 oz (45 grams) of whey protein and eight egg whites (1.01 oz) (28.8 grams).

The addition of resistance training may also prove to be an effective tool for lowering the risk of lean body mass loss due to the substantial weight loss from GLP-1 utilization (Papageorgiou et al., 2020).

Combining semaglutide with a healthy lifestyle approach that includes physical activity, healthy eating and weight management, and wellness is the best strategy for long-term weight reduction and overall health (Amaro et al., 2022; Fiorilli et al., 2022). Fitness professionals and wellness coaches are uniquely qualified to provide healthy lifestyle coaching to individuals on semaglutide. However, these professionals must have a working knowledge of the medication to safely design physical activity and healthy lifestyle programs for their clients. Furthermore, healthcare professionals should be aware of healthy lifestyle strategies to safely guide their patients on the medication (Kyrillos et al., 2022).

RESEARCH ROUNDUP

The semaglutide STEP 1 study may provide valuable information for fitness professionals and wellness coaches regarding the efficacy of the medication and the positive impact of a healthy lifestyle.

STEP 1 Study

The STEP 1 study investigated the efficacy of semaglutide + healthy lifestyle versus a matching placebo among 1961 participants. Study participants underwent a 68-week intervention of semaglutide (or placebo) and a lifestyle intervention that included counseling sessions (every 4 weeks) to help them adhere to a reduced-calorie diet (500-kcal deficit per day) and increased physical activity (150 minutes per week of physical activity) (Wilding et al., 2021a). Both diet and activity were recorded daily in a diary or by use of a smartphone application or other tools and were reviewed during counseling sessions.

Results: Participants in the experimental group (semaglutide + healthy lifestyle) lost a mean of 14.9% of baseline body weight versus participants in the placebo group, who lost a mean of 2.4% body weight (Wilding et al., 2021a).

STEP 1 Study (1-Year Follow-Up)

Researchers from the STEP 1 study conducted a secondary analysis of 327 participants (experimental group) 1 year after the original study (Wilding et al., 2022).

Results: The researchers found that participants who stopped semaglutide (2.4 mg once weekly injection) and their healthy lifestyle gained back two-thirds of their prior weight loss, with regressive changes in cardiometabolic variables (e.g., blood sugar levels or blood pressure). Participants regained an average of 11.6% body weight (Wilding et al., 2022).

Professional Application

Fitness and wellness professionals should consider that semaglutide may help with initial weight loss but may not be effective as a standalone intervention. The combined effect of semaglutide with a healthy lifestyle may produce more positive long-term results (Wilding et al., 2022). The lifestyle intervention often includes a multimodal approach, including counseling, a reduced-calorie diet, physical activity, and tracking progress.



Semaglutide: Adverse Effects, Contraindications, Warnings, and Precautions

Semaglutide has several adverse effects reported by the manufacturer (Novo Nordisk, 2023). Common adverse effects include but are not limited to stomach issues (nausea, vomiting, abdominal pain, or distention), gastrointestinal (G.I.) problems (diarrhea, constipation, or flatulence), fatigue, dizziness, runny nose, sore throat, and headache (Novo Nordisk, 2023; Stottlemeyer et al., 2023) (**Figure 3**). Other reported adverse effects include vision changes, allergic reactions, increased heart rate, depression, and suicidal thoughts (Novo Nordisk, 2023).

Fitness professionals and wellness coaches need to consider that common adverse effects may have multifactorial causes in addition to using semaglutide medication, including individual dietary patterns and consuming multiple medications that may magnify the negative effects. For example, an individual consuming a reduced-calorie diet may experience fatigue, constipation, nausea, and diarrhea (National Institute of Diabetes and Digestive and Kidney Diseases, 2023).

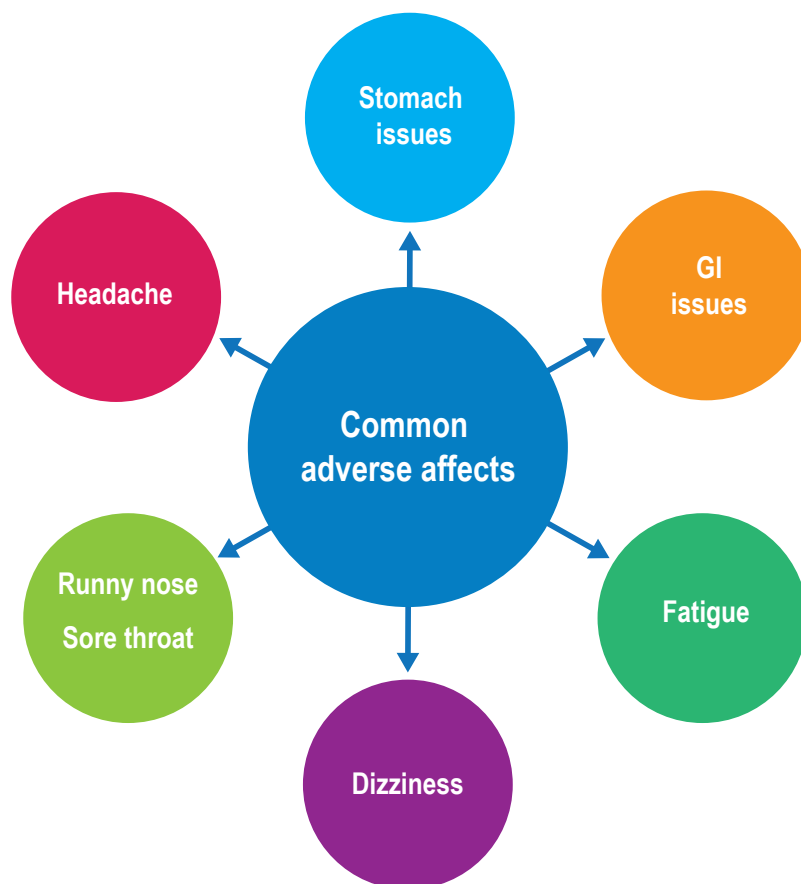


Figure 3. Semaglutide Common Adverse Effects

The semaglutide manufacturer recommends that individuals with a personal or family history of medullary thyroid cancer, multiple endocrine neoplasia syndrome type 2 (MEN2), or individuals with a hypersensitive reaction to semaglutide avoid taking the medication (Novo Nordisk, 2023). They are considered contraindications. Other warnings and precautions when taking semaglutide include but are not limited to pancreatitis, gallbladder disease, kidney injury, diabetic retinopathy complications, and possibly thyroid c-cell tumors (Novo Nordisk, 2023; Smits & Van Raalte, 2021).

The fitness professional and wellness coach should have a basic understanding of common adverse reactions, contraindications, warnings, and precautions. These noted issues are not all-inclusive; individuals may respond differently to the medication. Fitness professionals and wellness coaches may need to carefully monitor their clients taking semaglutide while participating in an exercise and healthy lifestyle program to ensure their safety. Potential issues to monitor for may include but are not limited to a slow recovery between exercises, headache, lightheadedness, fatigue that prevents completion of the exercise program, and excessive soreness after a workout. These potential issues can also be related to low-calorie intake or low-protein intake.

The individual's prescribing healthcare professional (e.g., MD) should be consulted if there are any questions regarding client safety, or the individual should be referred to their healthcare provider if any complications from the medication are suspected. Fitness professionals and wellness coaches can also consult a registered dietitian (RD) if more nutritional counseling is needed.

CRITICAL INFORMATION

Fitness professionals and wellness coaches should also be aware of individuals taking compounded or counterfeit GLP-1 medications or GLP-1-like medications, as they may be unsafe (Novo Nordisk, 2023).

Compound Medication

As of May 2023, Ozempic® and Wegovy® are in shortage in the U.S., allowing them to be compounded (Food and Drug Administration, 2023). Compounding medications (mixing or assembling medication from a pharmacist) can cost considerably less than the brand-name product. However, the FDA recently reported adverse events from individuals taking compounded semaglutide. The compounded form of semaglutide may have non-FDA-approved ingredients or an inaccurate dosage that may be unsafe for individuals (Food and Drug Administration, 2023).

Counterfeit Medication

The semaglutide manufacturer and the FDA reported on June 16th, 2023, a discovery of counterfeit Ozempic® (semaglutide injection) in the U.S. The counterfeit product contained another diabetic medication called insulin glargine injection, which works differently than semaglutide, which can lead to an adverse event (Novo Nordisk, 2023). Medication purchased online or in-person by foreign or unlicensed sources may be misbranded, adulterated, counterfeit, contaminated, improperly stored and transported, ineffective, and/or unsafe (Novo Nordisk, 2023). Fitness professionals and wellness coaches should refer individuals to their healthcare provider if their client purchased or received the medication from an unregulated, unlicensed source or if they suspect it is counterfeit. Counterfeit medications could be a serious health risk for individuals.

Semaglutide and Body Composition

For individuals on semaglutide, there is an emerging concern among healthcare professionals regarding weight reduction and possible loss of lean muscle mass and bone density (Ida et al., 2021; Papageorgiou et al., 2020). Researchers from the STEP 1 trial conducted an exploratory body composition analysis via dual-energy X-ray absorptiometry (DEXA) on 140 non-diabetic overweight or obese participants who completed the 68-week intervention of semaglutide and lifestyle changes. Participants lost a total of 15% body weight (baseline: 98.4 kg, 68 weeks: 83.76 kg), with 40% of the lost weight coming from lean muscle mass (~5.5 kg) (Wilding et al., 2021b). Other researchers have documented modest weight loss (~12 pounds) among study participants after a 52-week intervention with semaglutide. However, ~40% of total weight loss came from lean muscle mass (McCrimmon et al., 2020).

In some cases, semaglutide may not directly cause a loss of lean muscle but may mimic the longer-term effects of a very low-calorie diet (VLCD), which can result in a loss of lean muscle mass (Ardavani et al., 2021). Potential minor negative effects of a VLCD may include but are not limited to dizziness, fatigue, headache, constipation, flatulence, and feeling cold (Christensen et al., 2011; Leeds, 2014). Greater negative effects may include but are not limited to nutrient deficiencies, depression, anxiety, hair loss, gout, and gallstones (Ein et al., 2019; Johansson et al., 2011; Leeds, 2014; Snel et al., 2012) (**Table 3**).

Intervention	Potential Side Effects
Semaglutide	<ul style="list-style-type: none"> • Stomach issues: nausea, vomiting, abdominal pain, and distention • Gastrointestinal problems: diarrhea, constipation, and flatulence • Fatigue, dizziness, runny nose, sore throat, and headache • Vision changes, allergic reactions, increased heart rate, depression, and suicidal thoughts • Loss of lean body mass • Bone mineral loss
Very Low-Calorie Diet	<ul style="list-style-type: none"> • Loss of lean body mass • Loss of bone mass • Dizziness, fatigue, and headache • Constipation, flatulence, or feeling cold • Nutrient deficiencies • Depression or anxiety • Hair loss, gout, and gallstones

Table 3. Potential Side Effects of Semaglutide and VLCD

Researchers have primarily studied the efficacy of the GLP-1 medications for bone density among individuals with T2DM. The researchers found no significant association between semaglutide and loss of bone density in this population (Daniilopoulou et al., 2022; Ozeki et al., 2022).

Perhaps the basis of the growing concern is the widespread use of semaglutide by individuals of all health and body fat levels seeking cosmetic weight loss. Individuals with BMIs outside of well-studied groups and with different health statuses (e.g., no metabolic disorders) may respond differently than participants from the controlled studies that underwent a supervised and structured intervention program (medication and lifestyle changes). These individuals may experience side effects without any real benefit, or they may experience rapid weight loss but may be unable to maintain the long-term benefits due to the absence of a supervised and structured lifestyle program (Wilding et al., 2022). Here are some potential examples fitness and wellness professionals should consider.

- ➔ Example 1: Some individuals who are obese or overweight may take the medication for weight loss without the addition of a healthy lifestyle intervention. They may be at risk of regaining weight due to the lack of healthy lifestyle coaching.
- ➔ Example 2: Individuals may take semaglutide to lose weight for non-health-related reasons, such as cosmetic appearance. The rapid weight loss could put them at risk of losing lean muscle and possibly bone density if not properly supervised by a healthcare provider.
- ➔ Example 3: Semaglutide has the potential to be used by physique athletes seeking changes in body composition in preparation for competition.

The fitness professional and wellness coach should consider these potential client examples and the benefits and challenges of coaching and recommending healthy lifestyle strategies.

Semaglutide and Lifestyle Modification

Overall, it appears that the combined intervention of semaglutide and lifestyle modification may produce positive results among individuals seeking weight loss. To date, seven STEP studies have been published, which all have included semaglutide with a lifestyle intervention that included one or more of the following: dietary counseling, low-calorie diet, unsupervised weekly light- to moderate-intensity physical activity (100 to 200 min. per week), and intensive behavior therapy with registered dietitians (Alabduljabbar et al., 2022). Among the published studies, participants lost an average of 13.2% body mass over an approximate 68-week intervention period (Alabduljabbar et al., 2022). However, this type of intervention may have temporary effects if the intervention is halted, as noted in the STEP 1 study where participants who stopped semaglutide and their lifestyle intervention gained back two-thirds of their prior weight loss and lost any positive cardiometabolic benefits. Moreover, participants who lost the least amount of weight also regained their weight (Wilding et al., 2022) (see Research Roundup in the prior section).

The potential for regaining weight and losing cardiometabolic benefits can be challenging for individuals who need to stop semaglutide. Perhaps the continuation of a healthy lifestyle and proper coaching from the fitness professional or wellness coach could be enough to maintain the positive long-term effects achieved by the individual (Paixão et al., 2020).

The Fitness Professional and Wellness Coach

Fitness professionals and wellness coaches are uniquely qualified to work with individuals taking semaglutide medications. Clients can be coached using a healthy lifestyle approach, including physical activity, healthy eating and weight management, and specific wellness practices (Rippe, 2018).

Physical Activity

Physical activity is one of the key factors of a healthy lifestyle program (Rippe, 2018). The U.S. Physical Activity Guidelines (PAG) recommend the following for adults (Piercy et al., 2018):

- Adults should participate in 150 to 300 minutes a week of moderate-intensity or 75 to 150 minutes a week of vigorous-intensity aerobic physical activity or an equivalent combination of moderate- and vigorous-intensity aerobic activity.
- Adults should also participate in muscle-strengthening activities 2 or more days a week.
- Older adults should do a combined training program of balance, muscle strengthening, and aerobic exercise.

The PAG for children and adolescents aged 6 through 17 recommends the following (Piercy et al., 2018):

- Children and adolescents should participate in 60 minutes or more of moderate to vigorous daily physical activity.
- The 60 minutes of physical activity should include aerobic, muscle-strengthening, and bone-strengthening exercises. Each type of exercise should be done at least 3 days per week or more.

For individuals on semaglutide, a structured exercise program that focuses on both resistance training and cardiovascular exercise may be the best strategy

for long-term weight loss results (Bond et al., 2023; Zouhal et al., 2020). Resistance training may be one of the most important physical activity components to reduce the possible medication-related loss of lean muscle and bone density (Alabduljabbar et al., 2022; Papageorgiou et al., 2020). Researchers have documented that resistance training may prevent or reduce the loss of lean muscle and bone density among individuals consuming reduced calorie weight loss diets (Mesinovic et al., 2021; Sardeli et al., 2018). It is well-documented by researchers that adequate muscle mass and strength are associated with long-term health and decreased mortality (Li et al., 2018; Wang et al., 2023). To date, no published studies have examined the efficacy of a structured exercise program on lean muscle mass and bone density among individuals on semaglutide.

The fitness professional and wellness coach can use the PAG as an overall guide to ensure that clients taking semaglutide medications meet the minimum dose of weekly exercise. Fitness and wellness professionals should also consider using evidence-based guidelines when programming specific aerobic and muscle-strengthening activities for these individuals (Oppert et al., 2021). Several systematic reviews and meta-analyses have

published exercise recommendations for weight loss and fat loss, weight maintenance after weight loss, preservation of lean muscle mass during weight loss, and combined exercise programs (**Table 4**) (Bellicha et al., 2021; O’Donoghue et al., 2021; Oppert et al., 2021).

For *combined exercise programs*, most researchers agree that a combined exercise program of aerobic, resistance training, and caloric restriction will have the greatest impact on weight loss (Bellicha et al., 2021; O’Donoghue et al., 2021; Oppert et al., 2021). More specifically, interventions that combine high-intensity aerobic and high-load resistance training may have the most beneficial effects of decreasing body fat, increasing lean muscle mass, and reducing cardiometabolic risk factors (O’Donoghue et al., 2021). Aerobic or resistance training alone does provide benefits, but neither strategy is as effective as a combined program (O’Donoghue et al., 2021; Swift et al., 2018). The fitness professional or wellness coach must perform a comprehensive assessment before the client participates in their exercise program to determine which strategy will be the best for them.

Exercise Recommendations	Exercise Programming
Weight loss and fat loss	150 to 200 minutes of moderate-intensity (45–65% VO_{2max} , 50–65% HRR, >65–75% HR_{max}) or higher (> 65% VO_{2max} , >65% HRR, >75% HR_{max}) of aerobic activity weekly High-Intensity Interval Training (HIIT) is also recommended for individuals who can safely participate.
Weight maintenance after weight loss	200 to 300 minutes a week of moderate-intensity aerobic exercises
Preservation of lean muscle mass during weight loss	Moderate- (50–75% 1RM) to high- (75% 1RM or higher) intensity resistance training program
Combined exercise programs	A combined aerobic exercise, resistance training, and caloric restriction program will have the greatest impact on weight loss.

Table 4. Exercise Recommendations

The fitness professional and wellness coach should also consider using an integrated training approach focusing on resistance training for these individuals. This may help reduce possible losses in lean muscle mass and bone density experienced while on the medication. The NASM Optimum Performance Training® (OPT™) model provides an effective framework because it provides a linear periodization pathway and time for the individual to safely adapt to their exercise program (Sutton, 2022). The professional can also use the FITTE-VP model (Frequency, Intensity, Time, Type, Enjoyment, Volume, and Progression) for programming the individual’s aerobic exercises. These two strategies will complement the aforementioned guidelines by providing the framework for safe exercise progression. As noted earlier, fitness and wellness professionals may want to consult their client’s healthcare provider prior to their participation to obtain safe exercise recommendations.

THINGS TO KNOW!

Fitness and wellness professionals should consider that it may be unrealistic for some individuals to begin exercising at the levels suggested in **Table 4**. These individuals may lack exercise experience and need time to adapt and change behavior. This may initially require light exercise (e.g., 10–15 min. of walking per day) with a slow exercise progression. Other factors, such as the individual’s health status, fitness level, time availability, and self-efficacy, should be considered when providing exercise recommendations.

Healthy Eating and Weight Management

Healthy eating and weight management are other lifestyle factors that should be considered by the fitness professional and wellness coach. As documented in the semaglutide STEP 1 study, halting the combined use of semaglutide and lifestyle coaching led to participants regressing 1 year after study participation (Wilding et al., 2022). Semaglutide is a major factor in weight loss, but healthy eating also impacts an individual’s success. This is supported by the published manufacturer STEP studies that all included a healthy lifestyle intervention that provided supervision and counseling by registered dietitians (Alabduljabbar et al., 2022; Amaro et al., 2022). STEP study participants clearly had better outcomes when participating in a supervised, structured lifestyle intervention program. A healthy lifestyle may consist of different dimensions of wellness (**Figure 5**).



Figure 5. Healthy Lifestyle and Related Dimensions of Wellness

The challenge for individuals taking semaglutide as a standalone treatment may be a risk for nutrition deficiencies, loss of lean muscle mass, and loss of bone density due to the changes in appetite and food cravings (Alabduljabbar et al., 2022). A supervised, structured lifestyle program promoting healthy eating and weight management may benefit individuals during or after semaglutide treatment (Paixão et al., 2020). An optimal strategy for healthy eating and weight management may include the following components: amount of food intake, meal replacements, types of food eaten (e.g., culturally accepted), dietary strategies (e.g., Mediterranean diet), timing of meal consumption, meal cost, and setting realistic weight loss goals (Kim, 2021; Koliaki et al., 2018).

Fitness professionals and wellness coaches should refer individuals to a registered dietitian or healthcare provider if they identify eating patterns that may contribute to macronutrient or micronutrient deficiencies. In the U.S. population, there are documented micronutrient deficiencies. **Table 5** displays data from the 2005 to 2016 U.S. National Health and Nutrition Examination Surveys documenting such deficiencies (Reider et al., 2020; Bird et al., 2017). Commonly reported micronutrient deficiencies worldwide include iron, folate, zinc, iodine, and vitamin A (Kiani et al., 2022).

Vitamin	U.S Population Deficiency (%)
Vitamin A	45%
Vitamin C	46%
Vitamin D	95%
Vitamin E	84%
Zinc	15%
Vitamin B 12	Up to 5%

Table 5. Micronutrient Deficiencies Among U.S. Population from 2005 to 2016

Among individuals with inadequate nutritional intake, participation in extreme dieting or very low-calorie diets may increase existing nutrient deficiencies (Malik et al., 2020). When combining lifestyle interventions with medications, there are several dietary/nutritional aspects that the fitness professional and wellness coach should consider.



Weight Loss

The first is the level of calorie deficit that an individual should aim to hit. In an ideal scenario, individuals should seek to lose ~1 to 2 pounds of body weight per week to minimize lean mass lost during periods of weight loss. This is usually achieved by targeting a ~300- to 700-calorie-per-day deficit combined with increased physical activity (Koliaki et al., 2018). These targets are slightly lower than many of the GLP-1 studies demonstrating where reductions in daily calorie intake can exceed 1,000 kcals (Alabduljabbar et al., 2022). Large calorie deficits can resemble a VLCD with possible negative effects, as noted in the prior section. Modest reductions in calorie intake can lead to weight loss but also allow for the retention of lean body mass. Modest reductions also enable people to develop sustainable dietary plans and habits that can be continued on cessation of the medication, such as regular structural exercise (resistance training) and healthy nutritional habits.

Protein Consumption

The second consideration is consuming adequate protein to help ensure lean mass preservation and promote satiety independent of GLP-1 medications (Ogilvie et al., 2022). The optimal protein intake for exercising adults is roughly 1.4–2.0 g/kg (0.64–0.91 g/lb.) of body weight (Kerksick et al., 2018). However, among individuals with higher BMIs, body weight may not be the most effective metric, and ideal body weight or lean body mass may be better. This is because protein recommendations are generally determined from studies based on lean individuals, wherein protein recommendations scale with lean body mass (Weijs & Wolf, 2016; Dekker et al., 2022). Additionally, protein recommendations start to become nonsensical at higher body weights (300 grams of protein for a 320-pound individual is probably excessive) and become very hard to adhere to. As such, protein recommendations for individuals looking to lose substantial body mass (10+ kg) should aim for protein recommendations closer to 1.4 g/kg (0.64 g/lb.) of body weight based on lean mass or ideal body weight. This will allow individuals to be more adherent to targets during and after weight loss (Kerksick et al., 2018).

Eating Behavior and Alcohol Consumption

The third consideration is utilizing the lower food drive period that individuals have while on GLP-1 medication to establish habits around food choices, portion sizes, and eating frequency that support their goals. The diminished appetite arising from these drugs presents a unique window for individuals to better monitor their habits, learn to determine hunger cues, and develop systems and routines around their nutrition that they can rely on when the medication is stopped.

Another concern related to healthy eating and weight management is the consumption of alcohol. Alcohol consumption can stimulate appetite and may be a risk factor for obesity due to the high-calorie content of some types of alcohol (Golzarand et al., 2022; Yeomans, 2010). Common alcohol types, serving sizes, and average calories are listed in **Table 6** (U.S. Department of Health and Human Services, 2023).

Alcohol Types	Serving (fl. oz)	Calories (average)
Red wine	5.0 fl. oz	125
White wine	5.0 fl. oz	121
Regular beer	12.0 fl. oz	153
Pina colada cocktail	9.0 fl. oz	490
Martini (traditional)	2.25 fl. oz	124
Margarita	4.0 fl. oz	168

Table 6. Common Alcohol Types, Services, and Average Calories

The *2020–2025 Dietary Guidelines for Americans* suggest that adults of legal drinking age should drink in moderation by limiting intake to two drinks or less daily for biological males and one drink or less daily for biological females (Snetselaar et al., 2021). Individuals taking GLP-1 (semaglutide) medication may develop some resistance to alcohol intake and cravings. Researchers have documented that semaglutide reduced alcohol intake and alcohol-seeking behavior in different rat studies (Aranäs et al., 2023; Chuong et al., 2023). From these results, researchers theorize the GLP-1 medication may help reduce alcohol drinking behaviors in overweight patients and individuals with alcohol use disorders (Aranäs et al., 2023). Human clinical trials are still needed to validate these hypotheses fully. To date, there are no reported negative interactions between GLP-1 medications and alcohol consumption (Aranäs et al., 2023). A potential precaution of combining the GLP-1 medication with alcohol is the possible hypoglycemic effects of the alcohol and the medication (Oba-Yamamoto et al., 2021). Both alcohol and the GLP-1 medication are associated with lowering blood sugars (Oba-Yamamoto et al., 2021; Ozeki et al., 2022). Thus, individuals taking the medication (especially those with T2DM) may need to consult their healthcare provider prior to drinking alcohol as hypoglycemia can be a safety concern for these individuals (Amaro et al., 2022; Chuong et al., 2023).

CRITICAL INFORMATION

Fitness professionals and wellness coaches should advise their clients on the potential precaution of combining the GLP-1 medication with alcohol due to the possible low blood sugar effects of the alcohol and the medication (Oba-Yamamoto et al., 2021). These individuals may need to consult their healthcare provider prior to drinking alcohol because hypoglycemia can be a safety concern for these individuals (Amaro et al., 2022; Chuong et al., 2023).

The fitness professional and wellness coach can reinforce healthy eating and weight management through different nutritional coaching practices. With some individuals, the fitness and wellness professionals may need to refer clients back to their healthcare provider or a registered dietitian for more prescriptive consultation. For example, if a fitness professional or wellness coach identifies that their client needs more prescriptive behavior counseling and meal planning, they should refer them to a registered dietitian. Or, if the client reports adverse reactions to the medication, they may be directed to their healthcare provider for further consultation and management.

Wellness

The fitness professional and wellness coach can also promote specific wellness practices to individuals as part of a healthy lifestyle strategy. Specific strategies that impact obesity and long-term health may include but are not limited to sleep, stress, and social support (Cooper et al., 2018; Lee et al., 2000; Tomiyama, 2019).

Sleep

Sleep deprivation is related to overweight and obesity levels and may counteract the effects of semaglutide (Tiwari et al., 2021). Researchers have documented that individuals who slept less than 7 hours per night were more likely to have a higher BMI and develop obesity. Also, sleep restriction was related to higher levels of ghrelin (a hormone that increases appetite), inflammatory markers, salt retention, and decreased levels of leptin (a hormone that decreases appetite) and insulin sensitivity (Cooper et al., 2018). Researchers have also documented that disturbed sleep patterns can lead to increased energy intake (e.g., excessive snacking) through consuming foods high in fat and carbohydrates (Papatriantafyllou et al., 2022).



The fitness professional and wellness coach can encourage these individuals to try and get 7 or more hours of sleep per day, which can increase the likelihood of successful weight loss by 33% when combined with a healthy lifestyle program (Papatriantafyllou et al., 2022). Researchers have documented that proper amounts of sleep were associated with improved adherence to a behavior weight loss program (Landsbaugh Kaar et al., 2019).

Stress

Stress is also related to weight gain. Researchers associating stress with obesity suggest four key issues (Tomiyama, 2019).

- Stress interferes with cognitive processes (e.g., executive function and self-regulation).
- Stress can alter behavior by triggering overeating and consuming food high in calories, sugar, and fat.
- Stress can cause physiological changes in the hypothalamic-pituitary-adrenal axis (the body's link between perceived stress and physiological reactions to stress), reward processing in the brain, and possibly the gut microbiome.
- Stress can stimulate the production of biochemical hormones and peptides (e.g., leptin and ghrelin).

Obesity stigma can also cause stress and sleep deprivation (Lee et al., 2000; Tomiyama, 2019). The fitness professional and wellness coach can be a positive influence by helping individuals manage stress through exercise, a healthy lifestyle approach, and offering social support (Schultchen et al., 2019).

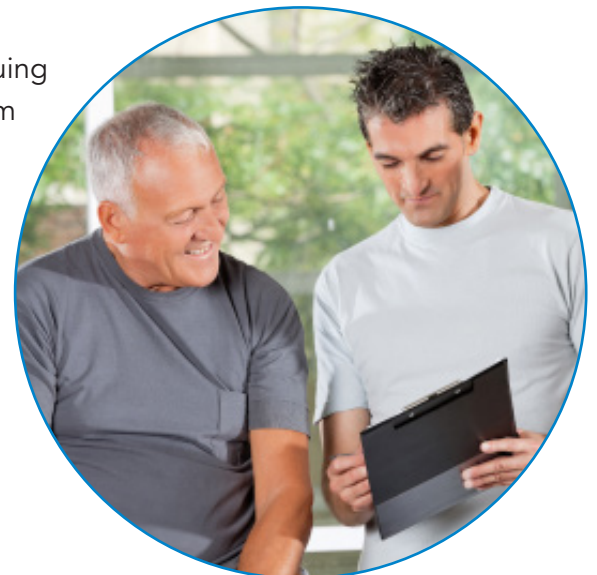
Social Support

Social support is another factor that should be considered by individuals seeking weight loss. Social support groups via an app, social media, or in-person have proven beneficial and may be an effective adjunct to a healthy lifestyle program focusing on weight loss (Loh et al., 2023; Simpson et al., 2020). The main benefit to social support groups may be accountability among individuals with the same goals, which can improve adherence (Shiyab et al., 2023). However, some individuals may not have access to an app or social media groups or receive support from their friends and family. The lack of social support can negatively affect the individual's adherence to a healthy lifestyle and weight loss programs (Kiernan et al., 2012). The fitness professional and wellness coach can help these individuals by having their own social media or in-person support groups or recommend groups that the individual can join. Social support can improve an individual's wellness, especially if they feel challenged by their healthy lifestyle program. The fitness professional and wellness coach can be great resources for these individuals.

Conclusion

The research has suggested that semaglutide combined with healthy lifestyle changes can positively impact an individual's weight loss efforts. Important lifestyle changes may include a reduced-calorie diet, regular exercise, and behavior modification (Alabduljabbar et al., 2022). Fitness and wellness professionals should consider that semaglutide does have known adverse effects (e.g., stomach and gastrointestinal issues) that can affect individuals taking the medication (Novo Nordisk, 2023; Stottlemeyer et al., 2023). There are also concerns regarding the widespread use of the medication, the amount of time individuals can be on the medication, and any long-term complications.

For individuals taking semaglutide for a short period, continuing a healthy lifestyle past cessation of medication may help them maintain their weight loss (Paixão et al., 2020). The fitness professional and wellness coach are uniquely qualified to guide individuals through a healthy lifestyle program that includes physical activity programming, healthy eating and weight management strategies, and suggestions for specific wellness practices.



Key Takeaways



- 1. Understanding Obesity:** Obesity is a global concern affecting both youth and adults. It is essential to recognize that obesity is multifactorial, influenced by genetic, environmental, psychological, and behavioral factors. Its association with chronic diseases and potential mortality underscores the importance of timely intervention.
- 2. Emerging Medication for Weight Loss:** In the battle against obesity, the Incretin agonist class of medications, especially the glucagon-like peptide-1 (GLP-1) class, has recently gained significant popularity.
- 3. Application of GLP-1 Agonists:** Designed primarily for T2DM patients or those overweight with related health complications, such as cardiometabolic issues, GLP-1 agonists offer a new avenue for weight loss.
- 4. Available Medications:** Currently, semaglutide and liraglutide are the two approved weight-loss medications in this category, with other types being prescribed with off-label use.
- 5. Medication Popularity:** Among these, semaglutide (up to 2.4 mg once weekly) has emerged as a top choice for weight loss, followed by liraglutide.
- 6. Potential Side Effects:** Fitness and wellness professionals should be informed of the possible side effects of semaglutide, which can range from gastrointestinal issues to dizziness, runny nose, sore throat, and headaches. There are other contraindications, warnings, and precautions they should be aware of when working with individuals on the GLP-1 medications.
- 7. Consequences of Under-Eating or Poor Diet:** Inadequate nutrient intake can lead to several concerning side effects, whether from undereating or consuming a nutritionally deficient diet. Common manifestations include fatigue, hair loss, and constipation. Individuals must ensure that they consume a balanced and adequate diet to avoid these and other related health issues.
- 8. Safety First:** Fitness and wellness professionals must be watchful about individuals consuming counterfeit or compound GLP-1 or GLP-1-like medications as they might pose severe health risks.
- 9. Emerging Concerns:** The health community has expressed concerns about semaglutide leading to potential losses in lean muscle mass and bone density during weight reduction. This may be an effect related to low-calorie consumption and/or low protein intake. The inclusion of resistance training can help mitigate the loss of lean muscle mass over a person's lifespan. Loss of bone mass has not been demonstrated in research studies to date when used for T2DM.
- 10. Combined Intervention:** An integrated approach of semaglutide and lifestyle modification seems promising for weight loss seekers. Implementing a holistic

lifestyle program supervised by fitness or wellness professionals may be pivotal in ensuring the long-term benefits of such medications.

11. **Optimizing Long-Term Lifestyle Changes:** Aim for a moderate calorie deficit, targeting a weight loss of 1 to 2 pounds per week while ensuring protein intake is around 1.4 g/kg based on lean mass or ideal body weight to maintain muscle mass. Additionally, the decreased appetite from GLP-1 medication should be seen as an opportunity to establish healthy eating habits and understand hunger cues.
12. **Role of Fitness and Wellness Professionals:** With their expertise, fitness professionals and wellness coaches are well-positioned to guide individual lifestyle programs to support GLP-1 medications. A well-rounded approach encompassing physical activity, a balanced diet, weight management strategies, and wellness practices can ensure optimal results for these individuals.



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