



## Do GLP-1s cause muscle loss?

Valerie Williams | January 2, 2025



Glucagon-like peptide-1 receptor agonists (GLP-1s) are drugs that act like the GLP-1 hormone that the human body should release naturally in the gastrointestinal tract after eating. GLP-1 performs many functions in the body, including triggering the release of insulin from the pancreas, improving insulin resistance, slowing down the emptying of the stomach, and increasing the feeling of satiety. Hence, your body knows it's not hungry anymore. GLP-1 drugs are FDA approved for the management of Type 2 diabetes (Ozempic and Mounjaro), obesity (Wegovy and Zepbound). However, sometimes Ozempic or Mounjaro are prescribed off-label for weight loss.

People using GLP-1 inhibitors may experience significant muscle loss. Still, it is thought to be attributed to the very rapid weight loss GLP-1 drugs can cause rather than a direct result of the drugs themselves.

### What happens to muscles when you lose weight?

“During traditional weight loss, the body tends to break down both fat and muscle tissue as an energy conservation mechanism,” explains Michael Baumholtz, MD, a plastic surgeon at San Antonio Gynecomastia Center who frequently treats patients for weight loss with GLP-1s before their surgical procedures. “Rapid weight loss (which is more characteristic of GLP-1s) can accelerate this process if not properly managed.”

A systematic review and meta-analysis published in *The American Journal of Clinical Nutrition* of 41 trials involving 15,135 participants showed that individuals taking GLP-1s showed a significant



reduction in metrics, including body weight, body mass index (BMI), and waist circumference. However, the weight loss experienced with GLP-1s has been shown to be significant, and in some cases, may occur at a rate higher than the one to two pounds a week recommended by the Centers for Disease Control and Prevention (CDC).

“Rapid weight loss often results in a higher percentage of muscle mass loss compared to slower, more gradual weight loss,” cautions [Eric Smith, MD](#), bariatric surgeon and medical director at [POP Recovery System](#). “This loss is especially concerning as muscle plays a key role in maintaining basal metabolic rate (BMR)—the calories your body burns at rest. A lower BMR due to muscle loss makes it harder to maintain weight loss and increases the likelihood of regaining weight.”

Rapid weight loss can be a result of using GLP-1s or from other weight loss interventions, such as bariatric surgery, calorie restriction, or excess energy expenditure. If you are experiencing rapid weight loss as a result of GLP-1s or a surgical procedure, work closely with your healthcare provider to learn how to retain lean body mass and avoid sarcopenic obesity—excess fat tissue accompanied by muscle loss—on your weight loss journey.

### **Do GLP-1s cause muscle loss?**

While GLP-1 agonist drugs themselves have not been shown to cause muscle loss, as experts note, rapid weight loss characteristic of taking GLP-1s can cause muscle loss and affect body composition. “Studies suggest that up to 40% of weight lost while using GLP-1 receptor agonists, such as Ozempic or Wegovy, can come from muscle mass,” says Dr. Smith. “This is a significant concern because muscle mass is essential for maintaining a healthy metabolic rate and long-term weight management. Losing muscle during weight loss can predispose individuals to weight regain.”

A study in *The Lancet* finds that muscle loss when taking GLP-1s can account for as much as 25% to 39% of the total weight lost over 36–72 weeks.

A review of clinical trials published in *Diabetes, Obesity, and Metabolism* showed a range of findings. One trial reported semaglutide (the active ingredient in Ozempic and Wegovy) was associated with a loss of fat-free mass (FFM) of up to 45.2% and liraglutide (the active ingredient in Victoza and Saxenda) with a loss of up to 60%, while tirzepatide (the active ingredient in Mounjaro and Zepbound) showed only 25.7%. However, other studies show a similar loss of lean muscle mass across both drugs and a placebo (inactive medicine) group.

“Preliminary data suggest that different GLP-1 agonist medications may vary slightly in their impact on muscle loss,” Dr. Smith explains. “For example, some evidence indicates that Ozempic (manufactured by Novo Nordisk) may lead to slightly more muscle loss compared to Zepbound (manufactured by Eli Lilly). However, research is still limited, and further studies are needed to confirm these differences and understand the long-term effects of these medications.”

Dr. Baumholtz has not noted any difference in muscle loss between the different GLP-1 agonist drugs. “From my experience, I have not seen material differences between GLP-1s in terms of muscle loss potential, certainly not enough difference to recommend one versus the other. What matters most is the individual patient’s overall weight loss approach, including how they’re combining the medications with lifestyle changes, nutrition, and exercise.”



A recent animal study concluded that combining GLP-1 treatment with myostatin inhibitors, a potential treatment for muscle wasting disorders may help preserve lean muscle mass during weight loss. However, these drugs aren't available yet, and further research in humans is needed.

## **How to prevent muscle loss while taking GLP-1s**

When taking GLP-1s or embarking on any kind of weight loss journey, it's crucial to take steps to prevent muscle loss resulting from losing weight. Sustainable weight loss and maintaining muscle mass means incorporating healthy dietary choices and physical activity.

### **Prioritize protein intake**

Getting enough protein in your diet is one of the most effective ways to minimize muscle loss and gain muscle mass back while maintaining fat loss. "Aim for at least 0.8–1 gram of protein per kilogram of body weight daily. For those aiming to build muscle, protein intake may need to be higher. Consistently meeting protein goals helps prevent the body from breaking down muscle for energy," says Dr. Smith.

"Protein intake is critical," agrees Dr. Baumholtz. "The amount should be guided by your healthcare practitioner, especially for patients with kidney issues."

Consult with your healthcare provider about any dietary changes while taking weight loss drugs.

### **Strength training**

"Resistance training is the most effective form of exercise for maintaining or building muscle mass," says Dr. Smith. "Regular strength training, combined with proper protein intake, ensures that muscle is both nourished and utilized, reducing the risk of muscle loss."

Incorporating resistance training is healthy for building and retaining skeletal muscle mass and having strong bones. This does not have to mean lifting weights—effective bodyweight movements, including push-ups, sit-ups, squats, and planks, can be performed without any equipment. Adults should aim for at least two days a week of strength training, but consult with your healthcare provider before beginning any new workout routines to make sure they are safe for you.

Aside from losing muscle mass due to rapid weight loss, muscle mass is lost naturally during adulthood, so it is important to work on retaining it. "Because muscle mass naturally declines with age, these strategies are vital not only during weight loss but throughout life," notes Dr. Smith. "Being intentional about preserving muscle helps counteract the natural loss that begins after age 30 and accelerates after 60." Loss of muscle mass and strength in older adults is a condition known as sarcopenia.

Cardiovascular activity is also helpful in overall physical health and maintaining a healthy weight. With the advice of your healthcare provider, you can add an appropriate amount of cardio to your routine.



### **Get adequate sleep**

There is an association between poor sleep and loss of muscle mass as well as retention of body fat. As the body is in recovery mode while sleeping, that means the body is working to build and retain muscle in this state. Maintaining a healthy sleep schedule and prioritizing a full night of sleep whenever possible can help prevent loss of muscle mass.

### **Stay hydrated**

Water makes up about 76% of a person's muscle mass, so staying hydrated is critical for maintaining muscle mass and preventing muscle loss.

### **Potential benefits of GLP-1s for muscle health**

"It remains to be seen what additional benefits GLP-1s might have," says Dr. Baumholtz. "There are a wide variety of studies being conducted to see what other applications might be viable. There is some emerging evidence that GLP-1s could potentially improve insulin sensitivity in muscle tissue, but research is ongoing, and any direct benefits are purely speculative at this point."

### **The bottom line**

GLP-1 drugs do not cause muscle mass loss on their own, but rapid weight loss can lead to the loss of lean muscle. Therefore, GLP-1 drugs can cause a person to lose weight rapidly and lose muscle mass, but you can minimize these effects by taking steps such as increasing protein intake and adding strength training to your weekly routine.

When taking GLP-1 drugs, such as Ozempic, Zepbound, Wegovy, or Mounjaro, stay in close contact with your healthcare provider to discuss how the drug is working for you and any side effects of GLP-1s. You can also address concerns you have about losing muscle mass while losing weight.

<https://www.singlecare.com/blog/glp-1-muscle-loss/>