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New Study Gives More Insight on How Ozempic Use Affects Muscle Health

Analysis by Dr. Joseph Mercola | May 29, 2026

STORY AT-A-GLANCE

- Ozempic, originally developed for Type 2 diabetes, is now widely used for weight loss, but new research shows serious effects on muscle and organ health
- A study in Cell Metabolism found Ozempic reduces lean mass by around 10% in mice, with the liver shrinking nearly 50%, raising concerns about long-term organ function
- Researchers observed a mismatch between muscle size and strength, with some muscles staying the same size but losing power, suggesting potential frailty risk and reduced physical performance in animal models — effects requiring confirmation in human clinical trials
- Older adults may face a higher risk, as age-related weakness combined with potential drug-related declines in strength may undermine independence, mobility, and overall longevity
- Long-term use of Ozempic and similar GLP-1 drugs is also associated with adverse side effects like dental issues, eye damage, mental health risks, and possible weight regain following discontinuation

Ozempic, known generically as semaglutide, is a drug originally developed to treat Type 2 diabetes, and it works by mimicking a natural hormone called GLP-1. Its commonly advertised effects include regulating blood sugar, slowing digestion, and reducing appetite — and these are the reasons why many are now relying on it to further their weight loss goals.

But as the number of people worldwide using these drugs continues to grow, so does the list of damaging health effects that are being associated with it. One study, for example, linked Ozempic to effects on muscle strength, even though muscle size remains stable. In animal models, this was associated with increased frailty risk and reduced physical performance — findings researchers note urgently need confirmation in human clinical trials.

Study Finds Unexpected Patterns in Muscle Health During Ozempic Use

A recent animal study published in Cell Metabolism investigated how Ozempic changes body tissues beyond just fat loss.[1] Conducted by researchers from the University of Utah Health, the study found that although changes in muscle mass appear trivial, the same cannot be said for muscle strength. According to a press release from the University, this points out "an urgent need for clinical studies to pin down the full effects of the popular medications."[2]

- **The research used mice as the study population and produced surprising results —** They found that the lean mass of the test subjects dropped by about 10% overall. However, most of that decrease came not from skeletal muscle but from organs like the liver, which shrank nearly in half.
- **This means that your organs are also reshaping during weight changes —** The researchers said that some organ shrinkage is considered normal during healthy weight loss. However, the exact effects on humans are still unclear.
- **Skeletal muscles also shrank slightly —** The researchers noted a 6% reduction in these muscles, although this wasn't enough to explain the total lean mass loss. Some muscles even stayed the same size. The researchers explained that this could reflect a "return to baseline," because when you gain fat, your body also tends to build more muscle just to move the extra weight around. As fat goes away, that supportive muscle drops as well.

- **A significant finding was the mismatch between muscle size and muscle strength —** When the scientists tested how much force the mice's muscles could produce, they found some muscles got weaker even though their size looked unchanged. In others, strength remained unchanged.

- **These effects raise particular concerns for older adults —** People over 60 years old are already at a higher risk for muscle weakness and mobility issues, so if the drug-related strength declines observed in mice translate to humans, it could increase falls and reduce independence. As senior author Katsu Funai, Ph.D., emphasized, "the loss of physical function is a strong predictor of not just quality of life but longevity."[3]

The researchers cautioned against drawing one-to-one comparisons with people, stressing the urgency of conducting human clinical trials to confirm these findings. They explained that while the mice in the study became obese from eating a high-fat diet, human weight gain comes from many causes, including poor sleep, stress, and genetics.

Still, there are similar studies highlighting these effects of Ozempic and similar GLP-1 receptor agonist medications on your musculoskeletal health, adding to the growing body of evidence suggesting that rapid weight loss has damaging consequences for your well-being.

Ozempic Alters More Than Just Your Weight

Earlier this year, I published an article on **how Ozempic leads to alarming side effects**, affecting users not just physically but also psychologically, and even influencing their long-term health trajectory. One of the primary points I raised was that these drugs are leading to severe loss of muscle and bone.

- **GLP-1 drugs reduce lean mass, according to studies —** To better understand, it's important to know what "lean mass" is. Simply put, this refers to the weight of everything in your body except fat — muscle mass, bone mass, organ size, fluids, and water in fat tissues.[4]

According to one review, up to 40% of total weight lost on semaglutide may come from lean mass, while liraglutide, the active ingredient in Victoza, a GLP-1 drug similar to Ozempic, has been linked to a reduction of up to 60% of total weight lost.[5] A 2023 study published in Diabetes Care also compared semaglutide and tirzepatide with a placebo and found lean mass reduction accounted for 15% or less in total weight loss across all groups.[6]

- **GLP-1s help you shed fat, but cause you to lose valuable tissue, too —** One clinical trial involving 140 participants with a mean age of 52 looked at the effects of semaglutide and found that during a 68-week period, they were able to lose 23 pounds of fat — but at the same time, lost about 15 pounds of lean muscle mass as well. That's nearly 40% of their total weight loss coming from tissue the body actually needs to survive and thrive.[7]

- **Rapid weight loss also causes you to lose important bone tissue —** A 2024 study involving 195 participants found that liraglutide led to lower bone density — particularly in the spine and hip. Published in the JAMA Network Open, the study said:

  "Liraglutide alone led to weight and fat loss compared with placebo; however, this was associated with decreased hip and spine BMD compared with placebo and exercise alone."[8]

- **This combination of reduced muscle mass and low bone mineral density poses a mortality risk, especially to older people —** Having low muscle mass and fragile bones leads to a higher risk of injury from falls, particularly in older populations who struggle with mobility. It may also compromise your immune system,[9] potentially reducing your body's ability to handle infections, which is also a common health concern among the elderly.

Muscle and Bone Damage Make Up Just a Fraction of Ozempic's Overall Impact on Health

Ozempic has become a "global sensation," with an estimated 20 million people using it annually to help them reach their weight loss goals faster.[10] But as more and more people become hooked on this trend, the more its ugly side starts to surface. That's the thing about taking shortcuts, especially when it comes to your health — there can be serious consequences.

I've been sounding the alarm about GLP-1 agonists for a few years now, and if you do an in-depth search on this site, you'll see the many articles I've written exposing the pitfalls of these so-called "miracle drugs." Below, I've highlighted some examples of side effects associated with Ozempic and other similar medications:

- **Noticeable physical changes —** These include what's called "Ozempic face,"[11] which is when a person loses too much facial fat, leading to a hollowed-out, gaunt appearance, and "Ozempic breast"[12] in women, wherein their breasts become "saggy" or "deflated" due to too much fat loss.

- **Dental health problems —** There are now increasing cases of tooth- and gum-related health issues among those who use GLP-1 medications — a phenomenon dubbed as "**Ozempic teeth**." These include symptoms like tooth decay, oral infections, bad breath, and dental collapse. Even those with no prior history of dental disease are experiencing these side effects.

- **Blindness —** A 2024 study published by JAMA Ophthalmology found a link between semaglutide and non-arteritic anterior ischemic optic neuropathy (NAION) among Type 2 diabetics and overweight or obese participants.

  This condition is marked by a loss of blood flow to the optic nerve, the neural pathway connecting your eyes to your brain.

  According to the study findings, semaglutide was associated with a 4.28 times higher likelihood of developing NAION among diabetic participants, and a 7.64 times higher likelihood among those who were overweight or obese.[13]

- **Suicide ideation** — One JAMA Network Open analysis of World Health Organization (WHO) adverse-event reports found a 45% greater rate of suicidal ideation reports among patients taking semaglutide compared to other medications.[14] This may be related to how the drug's main component targets GLP-1 receptors, which are present not just in the digestive tract but also in brain areas involved in managing emotions.

- **Kidney damage** — There are reports of semaglutide users experiencing kidney issues like acute interstitial nephritis (AIN), a serious kidney inflammation, and focal segmental glomerulosclerosis (FSGS). FSGS is associated with an increased risk of kidney failure.[15]

- **Gastrointestinal problems** — A 2023 study published in JAMA linked GLP-1 agonists to an increased risk of serious health conditions like pancreatitis, stomach paralysis, and bowel obstruction.[16] There are also studies warning about the possible risk of these drugs causing fatal intestinal obstructions.[17]

- **Thyroid tumors and other cancers** — There are animal studies showing semaglutide causes thyroid C-cell tumors "at clinically relevant exposures," a reason why this medication carries a black box warning.[18] There's also an incident in a trial wherein a patient developed metastatic pancreatic carcinoma about 65 days post-treatment.[19]

There's Also the Problem with 'Ozempic Rebound'

Another issue with taking shortcuts to lose weight is that the effects are not long-term — eventually, many patients end up gaining back the weight they lost, meaning all their efforts go down the drain. This is what's called "Ozempic rebound."

For example, a clinical trial conducted in 2022 found that among 327 long-term semaglutide users, many of those who stopped using the drug regained about two-thirds of their lost weight within a year.[20]

- **Stopping Ozempic may bring back all your hunger cues and cravings —** Basically, when you take Ozempic and then go cold turkey, the hunger cues it had suppressed come raging back. This leads you to revert to unhealthy eating, which causes the weight to return.

- **Even the other purported "health benefits" disappear —** Ozempic is said to help reduce blood pressure, but this could bounce back when you discontinue using the drug.

- **Patients are advised to stop the drug after a period of use —** During this time, they need to assess their cravings for carbohydrates. Benjamin Bikman, Ph.D., a metabolic scientist at Brigham Young University in Utah, said in a Daily Mail article, "Ideally, a person has learned how to eat better and control carb cravings and their weight loss can be sustained in the long run."[21]

There Are Better Strategies to Help Manage Your Weight

Going back to the featured study, the researchers noted that their findings on muscle stress can provide insights to help in the production of other weight loss drugs. "There are many additional weight loss drugs that are in clinical trials and coming out in the next three to five years," Funai says. "But with all those clinical trials, if they're interested in measuring lean mass loss, they need to consider physical function," Funai said.

But that is exactly what's wrong with this picture — many have become so engrossed by these quick remedies to shed pounds and fail to realize that these are not long-term solutions.

I believe that the key to eliminating excess fat and maintaining a healthy weight lies in optimizing your cellular energy production. And while it involves a multifaceted approach that takes time and effort to implement, the payback is so much better, as it leads to safer, healthier results — something GLP-1 receptor agonists don't offer. Here are key strategies that I recommend for healthy weight management.

1. **Eliminate vegetable oils and ultraprocessed foods from your diet —** These contain high amounts of linoleic acid (LA), which disrupt your metabolic pathways and alter how your body stores fat. Instead, cook your meals using tallow, grass fed butter, or ghee. Ideally, keep your LA intake around 5 grams per day; if you can get it down to 2 grams, that would be better.

2. **Shift your carbohydrate sources gradually —** Choose fruits, whole grains, and well-cooked vegetables as your carb sources. If your gut is compromised, start by introducing easily digestible carbohydrates like whole fruit or white rice before incorporating more complex carbs. For those with severe gut issues, sipping dextrose water will provide the cells with a steady source of easy-to-digest, healthy carbohydrates for energy.

3. **Consider your protein intake —** Aim for 0.8 grams of protein per pound of your ideal body weight from a mix of high-quality animal sources. This may help support muscle maintenance, tissue repair, and hormone balance. If you exercise frequently, you might need to slightly increase your intake. My suggestion is to take it slow and listen to how your body responds.

4. **Support your mitochondrial health with other healthy habits —** Getting daily sun exposure is one example; however, if you're still consuming vegetable oils, make sure to avoid intense midday sun for at least six months. Research suggests vegetable oils may accumulate in skin tissue and contribute to oxidative stress under UV exposure.[22] Learn more about this by reading "**The Fast-Track Path to Clearing Vegetable Oils from Your Skin**."

5. **Boost your GLP-1 levels naturally with Akkermansia muciniphila —** This bacterium is a keystone strain in your microbiome. Having higher levels of Akkermansia is associated with lower weight, better blood sugar control, lower inflammation, and less body fat. Meanwhile, having lower levels is linked to obesity.

Frequently Asked Questions (FAQs) About Ozempic and Muscle Health

Q: What is Ozempic and why are so many people using it?

A: Ozempic, or semaglutide, was originally designed to manage Type 2 diabetes by mimicking a natural hormone called GLP-1. It helps regulate blood sugar, slows digestion, and curbs appetite. Because of these effects, millions worldwide now use it as a quick solution for weight loss, making it one of the most talked-about drugs in recent years.

Q: How does Ozempic affect muscle health?

A: Animal studies show that Ozempic use may reduce muscle strength even when muscle size remains mostly stable. This could create a hidden problem — your muscles may look the same but perform worse. This decline in strength may increase the risk of frailty, falls, injuries, and loss of independence, particularly as you age.

Q: Does Ozempic impact organs and bones too?

A: Yes, it does. Research has shown that Ozempic may not only reduce fat but also shrink organ size, especially in the liver, which shrank nearly in half in animal studies. It may also lead to possible decreased bone density in the spine and hips, raising the risk of fractures, frailty, and health complications, especially in older adults.

Q: What other side effects are linked to Ozempic?

A: Beyond weight loss, Ozempic has been tied to a wide range of non-favorable side effects. These include sagging skin and facial fat loss ("Ozempic face"), dental collapse known as "Ozempic teeth," vision damage, kidney issues, gastrointestinal paralysis, pancreatic tumors, and even higher rates of suicidal thoughts.

Q: Is weight loss from Ozempic permanent?

A: No, the results often do not last. Many users experience "Ozempic rebound," where they regain most of the weight they have lost within a year after stopping the drug. Hunger and cravings return quickly, and even the temporary health benefits, like lower blood pressure, diminish.

These findings include results from animal models and clinical research. Results may not apply to all individuals.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

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