

A BETTER NUTRITION GUIDE TO **GLP-1 HORMONE** & MEDICATIONS LIKE OZEMPIC®

WHO IS THIS GUIDE FOR?

This guide is designed to help you, personally. Whether you are looking to lose weight, improve body composition, blood sugar levels, digestion, or heart health, optimizing your GLP-1 hormone production and efforts is essential. You can do that naturally and with medications. In this guide, you will learn the benefits of doing both as we answer frequently asked questions like these:

- What are GLP-1 and GIP agonist medications?
- Which side effects may be of concern for you?
- What are GLP-1 and GIP (incretin) hormones?
- How can and why should you naturally improve your incretin hormones?
- Which tests help determine if your GLP-1/GIP hormone production may be impaired?
- What to consider for specific health issues and populations

We provide 3 plans and resources for you to choose from to optimize your health!

If you're reading this, you're probably aware of the tremendous buzz surrounding drugs like Ozempic®, Mounjaro®, Wegovy®, Trulicity®, Victoza® and Saxenda® and their use for weight loss and diabetes. These drugs are either GLP-1 receptor agonists (semaglutide, dulaglutide, liraglutide) or they are a combined GIP and GLP-1 receptor agonist (tirzepatide). At the time of this writing, some of these medications are approved for treating diabetes and others also for weight loss in people diagnosed as clinically obese. However, people without these medical diagnoses are using them in "off label" cases to lose weight, resolve prediabetes and to address insulin resistance. More recently, some of these medications are showing promise with other metabolic health concerns such as heart disease and cognitive function.



WHAT ARE THESE MEDICATIONS & HOW DO THEY WORK?

Ozempic®, Mounjaro®, Wegovy®, Trulicity®, Victoza® and Saxenda® and the others are a combined GIP and GLP-1 receptor agonist (tirzepatide). They are designed to mimic the effects of GLP-1 and GIP hormones (more on these hormones below) in the body.

An agonist combines with a receptor on a cell to produce a physiologic reaction typical of a naturally occurring substance. So, in this case, when the drugs are injected into fat, they bind to and activate the GLP-1 receptor or GLP-1 and GIP receptors on cells in the pancreas and other organs to improve their effectiveness in triggering the release of insulin. This leads to reduced appetite and slower gastric emptying, all of which can help with weight loss.

Importantly, these agonists don't break down as quickly as the natural substance. This gives them a better chance of connecting with receptor sites in different organs like the pancreas.





DO I NEED TO TAKE THESE MEDICATIONS FOREVER?

Currently, yes. Research shows that results are unlikely to be sustained when these medications are discontinued. When a person stops taking the medication they see changes relatively quickly in appetite (increase) and satiety (less able to feel full), resulting in increased consumption and weight regain or inability to continue to lose weight. Blood sugar levels are likely to increase as well.

However, research participants to date have not been following a plan to optimize their health while on the medication - to improve factors that could lead to more sustained results. As we will discuss below, this is the promise of a truly personalized approach.



WHAT DO WE KNOW ABOUT THE SIDE EFFECTS OF THESE MEDICATIONS?

Side effects can occur immediately with taking medication, over time as the body experiences more exposure to the medication, and its impact on different functions. It's worth noting, at the time of writing, that these are newer medications and newer uses of the medications. So we don't know much about longer term side effects. We also know very little about side effects in "off label" use.

Reported side effects and considerations** (based on usage):

- Allergic reactions—skin rash, itching, hives, swelling of the face, lips, tongue, or throat
- Change(s) in vision
- Dehydration—increased thirst, dry mouth, feeling faint or lightheaded, headache, dark yellow or brown urine
- Gallbladder problems—severe stomach pain, nausea, vomiting, fever
- Heart palpitations—rapid, pounding, or irregular heartbeat
- Kidney injury—decrease in the amount of urine, swelling of the ankles, hands, or feet
- Pancreatitis—severe stomach pain that spreads to your back or gets worse after eating or when touched, fever, nausea, vomiting
- Thyroid cancer—new mass or lump in the neck, pain or trouble swallowing, trouble breathing, hoarseness
- Diarrhea
- Loss of appetite
- Nausea
- Stomach pain
- Vomiting
- Injection site irritation/infection
- Loss of lean body mass**
- Changes in gut motility**
- Sagging skin ("Ozempic® butt" "Ozempic® neck" "Ozempic® face")**
- Severe reactions to alcohol consumption**
- Disordered eating**
- Nutrient insufficiencies/deficiencies**
- Low stomach acid (and side effects)**
- Decline in sexual interest/performance**

WHAT ARE GLP-1 AND GIP HORMONES AND WHAT DO THEY HAVE TO DO WITH BODY WEIGHT?

GLP-1 (glucagon-like peptide-1) and GIP (glucose-dependent insulintropic peptide) are hormones and part of the body's incretin system which regulates blood sugar levels and appetite, increasing satiety (feeling full) and reducing cravings.

GLP-1 is produced by special cells in the intestines in response to food intake, especially when we eat carbohydrates and fats. When GLP-1 is released, it stimulates the pancreas to secrete insulin, which helps lower blood sugar levels. Additionally, GLP-1 slows down the rate at which food leaves the stomach, leading to increased feelings of fullness and reduced appetite. And it promotes beta cell production, which is crucial for healthy insulin response.

GIP is another hormone of the incretin system, produced by the small intestine. It works by increasing glucagon hormone secretion, which is the opposite of GLP-1.

Today, we know that beyond the pancreas, there are additional receptor sites for these hormones in organs like the heart, liver, kidney, lungs, nervous system, pituitary & adrenal cortex, adipose tissue (fat) and likely the thyroid. This means that these hormones will activate response and be a part of health in these organs as well.

Key Takeaway: GLP-1 and GIP hormones are super important for optimal metabolic health!



CAN YOU SUPPORT GLP-1 & GIP HORMONE PRODUCTION NATURALLY? YES, AND IT'S IMPORTANT.

Understanding where these hormones are formed is our biggest hint to optimizing their production. GLP-1 and GIP are produced in your gut. Specifically, it's the L- and K-cells in the lining (mucosal layer) of the intestines in your digestive tract. This mucosal layer plays several roles including to protect the body against fluids, pathogens and particles that could injure it, to secrete enzymes and hormones, and to absorb nutrients. Thus, it is critical that this layer gets the nutrients it needs, avoids insult and injury and gets repaired when those occur.

To protect your L- and K-cells, and their production of GLP-1 and GIP, proper nutrient support includes addressing any "leakiness," and avoiding irritants.

- Supportive nutrients include glutamine, a variety of fibers including prebiotics, essential fatty acids, and polyphenols. Also important is getting the right strains of probiotics, including *akkermansia muciniphila*, a novel probiotic which uniquely consumes mucin in the mucosal layer of the intestines to produce small chain fatty acids that feed other bacteria who produce butyrate that promotes GLP-1 secretion.
- Irritants include environmental toxins, prescribed medications, over-the-counter medications, stress, treatments (radiation, chemotherapy etc.).
- Additional adverse impacts include surgeries (resection, repair), disease (Ulcerative colitis, Crohn's, diverticulosis) and conditions that damage the mucosal layer.

Avoiding injury, may not be possible. Likewise, we may not be aware if we are giving our body enough nutrient support for optimal health of the mucosal layer. That is why routine assessment of digestive symptoms, (like we offer with BNP's Digestive Tune Up™ and Blood Sugar Optimizer™ programs) is essential. There are tests that can help determine if your GLP-1/ GIP hormone production may be impaired (see resources).

SPECIFIC HEALTH CONSIDERATIONS FOR THOSE TAKING THESE MEDICATIONS:

- 1. Digestive health:** As we learned, these hormones are naturally produced in the intestinal lining of the digestive tract. This means that if you experience digestive issues already or if you've had them historically, you likely have less effective production of these hormones. You are also more likely to experience symptoms when you start or while taking these medications. Because digestive health is foundational to overall health, it needs to be addressed. One result is that you can improve your production of incretin hormones and enjoy those benefits as well.
 - a. A lot of the reported side effects of the medications are digestion related. Because optimal digestion is essential for better health, taking steps to prevent and address any digestive side effects is important.
 - b. These medications suppress gastric acid production. If you are taking a proton pump inhibitor (which also does this) or using over the counter treatments to reduce stomach acid you will want to address this ahead of time, as sufficient stomach acid is essential for nutrient breakdown. Aging, medications, and other factors contribute to low stomach acid (often undiagnosed or misdiagnosed). So it would benefit you to assess yours before starting the medication.
 - c. Taking these medications does not improve digestive health, whereas a protocol to naturally improve these hormones does. No matter your health goal, we suggest tuning up digestion before, during, and as part of any plan to discontinue the medication (and maintain your results).
- 2. Thyroid health:** Because many people with thyroid health concerns cite inability to lose body fat or experiencing weight gain regardless of healthy eating and activity, individuals are exploring the use of these medications as part of their thyroid healing efforts. And yet, one study showed concerns about risk of thyroid cancer with this class of medication. We don't know enough to say one way or the other BUT we do know the following:
 - a. Optimizing thyroid health — like we do in BNP's Thyroid Tune Up™ — is valuable for foundational health. We recommend this approach which focuses on digestion, detoxification, nutrient optimization, and lifestyle choices that support healthy thyroid function for anyone considering or on a semaglutide with thyroid health concerns.
 - b. Many thyroid health diagnoses are made without a complete thyroid panel. We strongly recommend evaluating thyroid function in-depth. This will provide insights about why weight loss and other issues may be challenged and how to effectively remedy them — whether that includes a semaglutide or not.
 - c. Medications can interact with each other and that is likely the case with several thyroid medications and semaglutide. This means it is critical that you have someone evaluating this in totality for you.
 - d. Autoimmune disease impacting the thyroid (Graves, Hashimoto's, etc.) requires a more complex systemic approach. While incretin hormones appear to have anti-inflammatory capabilities, we do not know enough about how this translates across the spectrum of autoimmune disease. This does not mean you can't use this class of medication but rather it should be part of a personalized plan.



3. **Heart health:** There is some evidence that because these hormone-like substances can connect at receptor sites outside of the pancreas — including in the heart — that it can play a role in reduction of heart disease by improving blood pressure and vascular health. This is exciting and makes sense. This would likely require ongoing use of one of these medications and evaluation of its impact when combined with other therapies. Who is this right for? Well, as with everything, that's personal but here's what we would consider:
 - a. Low cholesterol numbers are not our goal. Many people with "normal" cholesterol results have heart attacks and strokes. Instead, for optimal heart health, the recommended approach is not to just work towards lower cholesterol levels, rather to improve overall vascular health by reducing the formation of plaque and chronic inflammation. This requires a multi-pronged, personalized approach that targets your body's areas of concern. While medication can be helpful, optimizing nutrition and lifestyle choices for your body may reduce the amount or duration of medication needed as an intervention.
 - b. An expanded lipoprotein profile (LipoMap with Lp(a)) — beyond HDL, LDL and VLDL — tells us a more specific story about your heart health risks and how to develop a more targeted plan for you.
 - c. Genetics are a significant factor in heart health, but not in the way we often use them. Yes, if you have a family history of heart disease, we want to use that data to look into your health earlier. However, your body's specific design (which genetics can show us) will help us identify nutrition, nutrient support, lifestyle and medication recommendations that are better for you. Your roadmap to better health can be very different from another family member — even a twin!
4. **Risk of chronic diseases like cancer:** Simply put there is no data here. So at this time we limit our comments to the following two things:
 - a. Type 2 Diabetes is a metabolic health disease that shows sub-optimal insulin production and/or ability to clear sugar from the blood effectively. It has its roots in chronic inflammation and metabolic dysfunction. These factors increase risk for other diseases. Optimizing insulin response, reducing excess fat mass and addressing underlying inflammation, as well as other aspects of metabolic dysfunction (like we do in BNP's Blood Sugar Optimizer™ program) is a smart disease prevention approach. Semaglutide medications to date appear to be effective by helping improve insulin deployment and reducing fat mass if a person responds favorably to the medication.
 - b. Excess visceral fat mass is the real disease risk concern in people diagnosed with obesity. There is an issue here as the current obesity diagnoses are based on BMI. The problem with BMI is that it does not distinguish between fat and lean body mass, nor does it take different body types into account. Reducing excess fat mass with a plan that ensures the body can detoxify and eliminate the toxins stored in fat mass (and with a plan to ensure lasting results) is an excellent way to reduce risk of many diseases. This cannot be ensured for anyone on a semaglutide medication unless they combine that tool with optimization of digestion, detoxification, hydration, nutrient optimization, and physical activity to prevent the loss of lean muscle mass.
5. **Children:** The physical and emotional impact of disease in children is profound and can persist throughout life. If tools such as these medications can resolve these diseases — and in doing so also reduce the likelihood of carrying them forward to future generations — we should consider them in our toolkit. Here are some considerations:
 - a. Nutrient optimization in a growing body is essential for children's immediate and future health. Anything that reduces appetite and especially that may interfere with the development of healthy cues needs to be consistently evaluated. Likewise, if there is a reduction in intake, it is all the more important that what is consumed meets their nutrient needs.
 - b. Psychosocial development needs to be supported during this time, with a focus on reducing the risk of developing unhealthy behaviors and shifting coping mechanisms if food has previously been that tool for them.
 - c. Optimizing digestion is essential for the health of a growing body. Supporting natural formation of incretin hormones GLP-1 & GIP for long-term health will be valuable concurrent with any medications to address disease.



WHAT'S BETTER FOR YOU TODAY AND RESOURCE

Explore the resources that The Better Nutrition Program can offer to help you easily and effectively implement your better next steps.

Considering Medication	Taking Medication	Not Taking Medication
<p>Ensure there are no contraindications.</p> <ul style="list-style-type: none"> • Have someone review your existing lab data • Consider additional data collection (see testing list below) 	<p>Monitor your progress for the earliest indications of side effects.</p>	<p>Map out your goals - get very specific - for nutrition and lifestyle.</p>
<p>Assess and, as indicated, tune up digestion (can do while you start the medication if you don't have digestive complaints).</p>	<p>Implement a digestive support plan to reduce risk of side effects and to support optimal production of natural hormones.</p>	<p>Identify where your body has needs not currently being met by your nutrition and lifestyle choices:</p> <ol style="list-style-type: none"> 1. Have someone review your existing lab data 2. Consider additional data collection (see testing list below)
<p>Complete experiments and evaluations to determine any areas to optimize before or as you start the medication to help prevent side effects and produce optimal results.</p>	<p>Evaluate existing data and pursue additional testing to identify any insufficiencies, excesses, deficiencies to optimize results.</p>	<p>Complete experiments and evaluations to determine any areas to optimize for their overall health and GLP-1 production benefits.</p>
<p>Monitor your progress for the earliest indications of side effects</p>	<p>Complete experiments and evaluations to determine any areas to optimize to help prevent side effects and produce optimal results.</p>	<p>Assess and, as indicated, tune up digestion to foundationally target production of GLP-1 and GIP hormones.</p>
<p>Create and implement your maintenance plan to sustain your results when you choose to stop the medication and/or when you achieve your goals.</p>	<p>Create and implement your maintenance plan to sustain your results when you choose to stop the medication and/or when you achieve your goals.</p>	<p>Monitor your progress in real-time to see how your body responds to your choices.</p>



THE BETTER NUTRITION PROGRAM RESOURCES

BNP Evaluations & Experiments	Better Laboratory Testing
Hydration Assessment	C reactive protein (CRP)
Sweet Cravings Experiment	Fasting insulin
Caffeine Evaluation	Hemoglobin A1C (HbA1C)
Stress Experiment	Leptin
Digestive Evaluation	Nutrigenomics
Eating Habits Evaluation	Micronutrients
Appetite Experiment	Adiponectin
Blood Sugar Experiment	GI stool test
Sleep Experiment	Complete thyroid panel

Truly Personalized Solutions		
BNP Comprehensive Health Plans™	BNP Programs™	BNP Coaching™
Our comprehensive assessment covers all aspects of your health and choices, including tailored experiments designed to reveal how your body works today. Your plan includes 30 days of plan development and an additional 30 days to get started implementing with your coach, the clinical team and robust library of resources to help you implement the top priorities outlined in your plan.	Know what you want to work on as your better next step? Our foundation and deep-dive programs help you identify and make your better choices. All programs include an additional 30 days of coaching, clinical team support & access to robust resources library to turn recommendations into action.	If you already know what your body needs, but need accountability and support to turn recommendations into a reality, your BNP coach along with clinical team support will help you. All coaching packages include an additional 30 days of coaching, clinical team support & access to robust resources library to turn recommendations into action.

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