Genetics for Wellness Weight-loss Program

What is Considered Obese?

Obesity is objectively assessed by calculating your Body Mass Index or BMI. There is an on-line tool for calculating your BMI from the Center for Disease Control (search "CDC- Adult BMI calculator". Unless you are an athlete or have an unusual amount of muscle mass, the BMI is a good tool for estimating obesity. A BMI between 25-29.9 is considered over weight, a BMI of > 30 is considered obese. Most clinical studies have used BMI as a way of categorizing a person's risk for developing disease(s) associated with excess weight.

What are the health consequences of obesity for adults?

People who have obesity are at increased risk for many diseases and health conditions, including the following: [10, 17, 18]

- All-causes of death (mortality)
- High blood pressure (hypertension)
- High LDL cholesterol, low HDL cholesterol, or high levels of triglycerides (dyslipidemia)
- Type 2 diabetes
- Coronary heart disease
- Stroke
- Gallbladder disease
- Osteoarthritis (a breakdown of cartilage and bone within a joint)
- Sleep apnea and breathing problems
- Chronic inflammation and increased oxidative stress[19,20]
- Some cancers (endometrial, breast, colon, kidney, gallbladder, and liver)
- Low quality of life
- Mental illness such as clinical depression, anxiety, and other mental disorders[21,22]
- Body pain and difficulty with physical functioning[23]

Introduction to Weight-Gain Factors

Obesity is often studied in mice because their food intake (diets) can be closely regulated, their physical activity can be modified either up or down, and genetic engineering can be done to produce mutant mice with specific gene variants or complete gene "Knock-outs". As of 2022, studies of normal and genetically altered mice have identified about 244 genes that play a role in the development of obesity. We share about 97% of our protein-coding genes with mice and

have about a 98% similarity with chimpanzees however, the genes of similar function are often only partially identical in their DNA sequence. Unfortunately, genetic studies in mice do not always correlate well with human studies however, recent advances in whole genome sequencing for humans have provided useful tools for assessing the DNA-coding similarities "of mice and men". When there is high similarity between the two genetic-codes, a mouse gene study is more likely to be relevant to how the same human gene functions. Because controlling for environmental factors that influence obesity is much more difficult in humans, only 74 genes (as of 2022) have been identified that are believed to affect the risk for developing obesity. Studies have shown that 40-70% of BMI differences between people can be attributed to genetic factors however, there has also been observational studies that reported that groups of people with similar genetics, but who have different levels of physical activity and different access to calories in their diets, can have very different rates of obesity. There is little doubt that more physically active lifestyles can lead to lower BMIs and that sedentary behavior is a consequence of higher BMIs

On average, most overweight individuals gained about 2 pounds per year and this slow, often un-noticed, process typically occurred without creating any real wellness concerns. At some point, most individuals choose to embark on weight loss because of its negative impact on their quality of life or because of displeasure with the physical changes they have developed. Others are coerced into weight loss to improve a medical problem that has developed due to excessive weight gain, such as: Type-2 Diabetes, Sleep apnea or arthritis. No matter what motivated you to choose a weight-loss program, Physician administered programs have a better success rate than self-directed plans and access to medications proven to manage obesity (GLP-1RAs) are not available without a prescription.

Why Should I Get an Evaluation for Genetic Obesity Risk Factors Before Starting a Weight-loss Program?

Identifying your specific genetic risk-factors for developing obesity can be used to help design a weight loss plan that is directed specifically at curbing over-eating behaviors, addressing satiety (fullness) problems, and selecting appropriate behavior modifications. For specific gene variants, a dietary supplement may be beneficial for ameliorating or managing a weight-gain factors. A recent study found that there is a wide range of genetic variants in 5 genes frequently associated with obesity (ADIPOQ, FTO, GLP-1R, GHRL and INS). Some thin people are unhealthy and some over-weight people are healthy. We believe that optimizing your health before beginning a weight-loss program can improve the program's effectiveness.

What other testing should be done before Starting a Weight-loss program?

Routine laboratory testing should include: a CBC, a Complete Metabolic Panel (with kidney and liver functions), a urinalysis, Thyroid function testing (TSH), Vitamin D-3 assessment, Testosterone levels (Both men and women), and an a.m. Cortisol level. These tests are typically

covered by Medical Insurance but if they are not, our clinic can provide you with access to substantially discounted lab fees for out-of-pocket charges through Quest Diagnostic Labs.

Is the Weight-loss Plan from GFW the Same for Everyone?

No. The Weight-loss program is designed for you alone, and your weight-loss plan will be influenced by the genetic variations we find in your genome that may be contributing to your weight-gain. There are gene-variants that influence: hunger perception, over-eating behavior, how dietary fats are used for fuel, and the propensity for storing energy as fat. In addition, DNA analysis apps can help us select the best type of exercise for your body. Bad dietary habits have often developed among both thin and obese people and regardless of your weight, will likely need modification; inexpensive, tasty, and energy dense foods are consumed by most of us several times per week. When the energy available to us in the foods we are eating far exceeds our caloric needs, genes have evolved to efficiently store this excess energy as fat; when these genes originally developed, they provided a survival advantage by anticipating emergency caloric needs during "lean times". For most people living in the 22 First-World Countries, "lean times" are never experienced. In addition, to excessive caloric intake, reduced caloric needs results from a normal decrease in energy expenditure that accompanies aging. Our Weight-loss plans are also specifically designed to avoid the protective metabolic slowing that occurs with severe calorie-restricted dietary plans.

What is a LEAP/MRT Test and Why Should I Consider Food Allergy Testing as Well as Genetics?

Many physicians and Dietary counselors describe some foods we eat as "inflammatory". Many Medical people also believe that on-going inflammation can negatively influence a person's Quality of life and contribute to insulin-resistance, leading to obesity. We believe that there are no foods that are intrinsically inflammatory for everyone, but based on years of clinical experience with the LEAP/MRT food test, we believe that it can be useful for directing diets that avoid "inflammatory" foods specific for each individual. Medical Insurance companies have designated the LEAP/MRT test an "Outside-of-the-box" or "Experimental" food "Sensitivity" test, and consequently, they are legally permitted to deny insurance coverage for this test. Like whole genome DNA sequencing, if you choose to do a LEAP/MRT test, you will need to pay the testing company directly (Oxford Biomedical Technologies), we do not benefit financially from recommending this test (or your DNA sequencing). As our patient, we will help you collect your DNA cheek swab correctly and will draw your blood if you choose to do a LEAP/MRT. As of 10/2023, the cost of the LEAP/MRT test was $335.00.

What is GLP-1 and How Does it Affect Obesity?

Glucagon-like peptide-1 (GLP-1) is a protein hormone released by the intestines in response to food. Its effects are to reduce appetite and feelings of hunger. In addition, it slows the release of

food from the stomach and increases the feeling of fullness (Satiety) after eating. Medications that stimulate the receptor (agonists) for GLP-1 mimic the actions of GLP-1 and have found usefulness in Type-2 diabetes not only for reducing blood glucose levels (and Hemoglobin A1C), but have also significantly affected weight-loss among the medication recipients. If requested, a GLP-1RA medication will be prescribed as a weekly injection during the Weight-loss program. The most common side-effects are nausea, vomiting and diarrhea, typically being mild and lasting only a few weeks. *For more information, click on the "GLP-1RAs" tab on top of the home page under "More"