



Wellness
GARAGE

Lifestyle Medicine Clinic

Take Control of Your Health

7 Numbers You Should Know

1 Blood Pressure - optimal <115/75 (systolic/diastolic pressures measured in mmHB)

High blood pressure or hypertension is quantitatively the most important modifiable risk factor for cardiovascular disease (the largest contributor to premature death in our society).

For every 20 mmHg increase in diastolic blood pressure above 75, the risk of death from heart disease or stroke doubles.

2 Fasting Blood Glucose and or HbA1c: optimal FBS <5.2mmol/L (normal <5.6 mmol/L); optimal HbA1c <5.0%

Maintaining normal blood sugars is one of the most important and tightly regulated functions in your body. Diabetes mellitus (DM) is the condition when your body cannot maintain normal blood glucose levels. Type I DM is an autoimmune disease where the pancreas stops producing insulin. Type II DM, is characterized by insulin resistance, where the body no longer responds normally to insulin. In order to maintain blood sugars, the pancreas increases production of insulin - leading to elevated insulin levels which in turn trigger inflammatory changes, which in a vicious cycle further worsens insulin resistance. Insulin resistance precedes Type II Diabetes and can remain undetected for years, as glucose levels are maintain as normal until the pancreas begins to fail, which is relatively late in the process.

Type II DM is currently at epidemic levels, both globally and in Canada, have tripled since 2000.



1 in 10 Canadians have Diabetes,



1 in 3 have pre-diabetes.

Diabetes is diagnosed when FBS >7.0 or HbA1c >6.5%
Pre-Diabetes is diagnosed when FBS > 5.6 and HbA1C > 5.6%

3 TG/HDL - Triglyceride/HDL ratio - optimal <1.0

This ratio can be determined from a standard lipid panel and gives us the best early information about a person's ability to respond to insulin, before blood sugars become abnormal. Insulin resistance, the driving force behind metabolic syndrome and a pre-cursor to Type II Diabetes, takes years to develop and can be prevented with lifestyle changes. Elevation of TG/HDL above 1.0 is a sign that your body is no longer optimally sensitive to insulin - above 1.5 generally represents insulin resistance.

It is estimated that close to 70% of the population may have some degree of insulin resistance. The earlier that this is recognized the easier it is to reverse - thus preventing Type II Diabetes and all the complications that can follow. When the TG/HDL ratio is elevated, LDL cholesterol may be concentrated into small, dense, atherogenic (disease causing) LDL particles that are most highly associated as a causative factor for heart disease. For this reason, some studies have shown that TG/HDL is the most powerful independent predictor of developing heart disease.

4 Android:Gynecoid Ratio - optimal <1.0

For obese people, cardiovascular disease is the leading cause of death and disability, followed by diabetes, kidney failure and cancer. Obesity, through adipocyte dysfunction leads to a chronic inflammatory state that predisposes an individual for many diseases. Abdominal or visceral fat contributes disproportionately to this inflammatory response as compared to peripheral fat. The best way to measure visceral fat is with a DXA body scan, which provides you with android:gynecoid fat ratio. The ratio correlates with insulin resistance, showing the clear link between visceral fat and the pathogenesis of diabetes. The added benefit of getting a DXA scan is getting understanding your lean muscle mass and bone density. As you age maintaining lean body mass and bone density are both essential for vital longevity avoiding age-related sarcopenia and osteoporosis. A good alternative (without the extra bone and lean body information) is a waist:hip ratio. The optimal ratio for men in <0.85 and women <0.75.

The major cause of the global diabetes epidemic is the associated obesity epidemic.



Over 30% of Canadians are obese and another 40% are overweight.

5 Apo B-100- optimal < 0.80 g/L

Apo B100 is not normally done as part of a lipid panel, but is key for understanding risk for atherosclerosis - the disease process underlying heart disease and stroke - the number one cause of death and life years lost in our society. ApoB100 is the lipoprotein carrier of cholesterol in an LDL particle - there is one ApoB100 per LDL particle. Most of the attention with cholesterol has been on the role of LDL-Cholesterol (LDL-C), the amount of cholesterol carried by the LDL particle. When it comes to risk for heart disease it is the number of LDL particles that matters, not the amount of cholesterol carried by the particles. The problem with the standard lipid profile is that it only reports the LDL-Cholesterol and not the particle number. In many circumstances, and especially with insulin resistance where the LDL particles become small and dense, the LDL-Cholesterol may be normal while there are many particles and hence a higher risk. The best way to understand risk is to know your ApoB-100.

6 hsCRP - high sensitivity CRP - optimal < 1.0

Chronic inflammation is at the root of 7 of the top 10 causes of death accounting for 80% of all deaths in our society. The most insidious aspect of this type of inflammation is its silent nature that allows for damage to occur without diagnosis. hsCRP is the gold standard for assessing chronic inflammation - optimizing this number through behavioural change - diet, exercise, stress reduction - decreases the risk for many diseases.

7 Gamma Glutamyl Transferase (GGT) - optimal < 30 U/L

GGT measures a liver enzyme and is commonly described as liver function test most closely associated with the adverse effect of alcohol. GGT is however much more important as it is an indirect measure of the body's glutathione supply. Glutathione protects cells against the oxidative stress resulting from metabolism. Without this protection the free radicals generated by mitochondria through normal metabolism with oxygen would accumulate, overwhelm and damage the mitochondria and the cell. In normal ageing it has been shown that it is this accumulation of oxidative stress that leads to many of the age-related diseases. In many ways, glutathione is considered the master antioxidant: working with as part of the enzyme glutathione peroxidase to protect membranes from oxidation, enabling Vitamin E and C in their anti-oxidant capacities as well as working directly. Glutathione is also a key component of the Phase II metabolism (detoxification) of drugs, hormones and xenobiotics where it works as a component of an enzyme Glutathione s-transferase (GST) that conjugates heavy metals, toxins and other compounds so that they become water soluble and can be excreted in the bile or urine. Exposure to high levels of toxins that overwhelm glutathione in its Phase II metabolic role will lead to oxidative stress.

Bonus Number to Know

Vitamin D - optimal level 100 - 150 nmol/L (40-60 ng/ml)

Vitamin D is a vital hormone necessary for healthy bones, as well as being linked to cellular function in nearly all human tissues. Low levels of Vitamin D are associated with over 100 conditions as well as increased all-cause mortality. Vitamin D is synthesized in the skin from exposure to sunlight. It is available in some foods but in general, food is not considered an adequate source of Vitamin D. In Canada, supplementation is necessary, at a minimum, between October and March. Many factors cause significant variation of Vitamin D levels, so the best way to know whether you have adequate levels of Vitamin D is to be tested. (this is not an insured service in Canada). A new alternative to supplementation is to use the Solius light therapy booth, where a few minutes of specially targeted UVB light stimulates your body to produce Vitamin D for up to a week.