Blood Chemistry Lab Tests

There are several lab tests we find helpful for everyone to get as a baseline.

Everyone would benefit from the following tests performed a s a baseline, then followed up if abnormal. Complete descriptions follow the list:

- Complete Blood Count (CBC) with differential
- Comprehensive Metabolic Panel
- Vitamin D3
- Complete Thyroid Panel(see below)
- Hemoglobin A1C
- Fasting Insulin
- Serum Ferritin
- Homocysteine
- Inflammation Markers

Detailed Descriptions of Tests

- **Complete Blood Count (CBC) with differential**
    - ***WBC***—White blood cells are the body's primary defense against disease. White blood cells help fight infection.
    - ***RBC***—Red blood cells are responsible for carrying oxygen to and carbon dioxide away from all cells. Iron deficiency will lower RBC.
    - ***Hemoglobin***—A chemical compound inside red cells that transports oxygen through the blood stream to all cells of the body. Oxygen is needed for healthy organs. Hemoglobin gives the red color to blood.
    - ***Hematocrit***—Hematocrit measures the amount of space red blood cells take up in the blood. It is reported as a percentage.
    - ***Lymphocytes***—The results of this and basophils, eosinophils, monocytes and neutrophils deal with white blood cell function. Important to the body's defense against infection. Also important in the assessment of nutritional status.
    - ***Monocytes***—The results of this and basophils, eosinophils, lymphocytes, and neutrophils deal with white blood cell function. Important to the body's defense against infection. Also important in the assessment of nutritional status.
    - ***MCV - Mean Corpuscular Volume*** - measures red blood cell volume.

- ***MCH - Mean Corpuscular Hemoglobin*** - a way to measure the average hemoglobin concentration within red blood cells, which varies from normal with different diseases.
- ***MCHC*** - Mean Corpuscular Hemoglobin Concentration.
- ***White Blood Cell Differential –*** White Blood Cells are the body's defense against infection. Each type has a range of functions, and organisms it is most suited to protect against. By looking at the % of each type, it's possible to predict the type of infection your body may be fighting against
  - ***Neutrophil***s — bacteria
  - Lymphocytes - virus
  - Basophils – parasites
  - Eosinophils – allergies and parasites
  - Monocytes – elevated in recovery stage and in low grade chronic infection and sometimes autoimmune conditions
- ***Platelets***—Blood cell particles involved with the forming of blood clots.
- ***RDW***—Red cell distribution width (RDW) is a calculation of the variation in the size of your RBC's. In some anemias, such as pernicious anemia, the amount of variation in RBC size, along with variation in shape, causes an increase in the RDW.

- **Comprehensive Metabolic Panel**
  - **Lipids**
    - ***Cholesterol, Total***—A sterol in the blood. Knowing your cholesterol may be as important as knowing your blood pressure. Elevated cholesterol is associated with an increasing risk of coronary heart disease.
    - ***HDL Cholesterol* -** High-density lipoproteins are believed to take cholesterol away from cells and transport it back to the liver for processing or removal. They have become known as the "good" cholesterol as persons with high levels of HDL may have less heart disease. Low HDL could be the result of smoking and lack of exercise.
    - ***LDL Cholesterol* -** Low-density lipoproteins contain the greatest percentage of cholesterol and may be responsible for depositing cholesterol on the artery walls. For that reason, they are known as the "bad" cholesterol.
    - ***Triglyceride*s**—Triglycerides are fat in the blood responsible for providing energy to the cells of the body. Triglycerides should be less than 400 mg/dl even in a non-fasting state.
  - **Liver**
    - ***Alanine Aminotransferase (ALT or SGPT)—***An enzyme found primarily in the liver. Abnormalities may represent liver disease.

- ***Albumin Serum***—One of the major proteins in the blood and a reflection of the general state of nutrition.
- ***Alkaline Phosphatase***—A body protein important in diagnosing proper bone and liver functions.
- ***Aspartate Aminotransferase (AST or SGOT)—***An enzyme found in skeletal and heart muscle, liver and other organs. Abnormalities may represent liver disease.
- ***Bilirubin, Total***—A chemical involved with liver functions. High concentrations may result in jaundice.
- ***Globulin, Total***—A major group of proteins in the blood comprising the infection fighting antibodies.
- ***Lactate Dehydrogenase (LDH)—***An enzyme found mostly in the heart, muscles, liver, kidney, brain, and red blood cells. When an organ of the body is damaged, LDH is released in greater quantity into the blood stream.
- ***Protein, Total***—Together with albumin, it is a measure of the state of nutrition in the body.
- ***Gamma-glutamyl transpeptidase (GGT),*** also known as GGTP - helps to detect liver and bile duct injury. Some doctors use it in all people they suspect of having liver disease, others use it only to help explain the cause of other changes or if they suspect alcohol abuse.

- **Kidney**
  - ***Urea Nitrogen (BUN)—***Another by-product of protein metabolism eliminated through the kidneys. BUN is an indicator of kidney function.
  - ***Creatinine, Serum***—An indicator of kidney function.
  - ***Uric Acid***—Another by-product of protein metabolism eliminated through the kidneys. Uric acid is an indicator of kidney function.
  - ***Glomerular Filtration (eGFR)—***Provides an assessment of the filtering capacity of the kidney.
- **Minerals and Bone**
  - ***Iron, Total***—An abnormally low test result may indicate iron deficiency anemia.
  - ***Calcium***—A mineral essential for development and maintenance of healthy bones and teeth. It is important also for the normal function of muscles, nerves and blood clotting.
  - ***Phosphorus***—Together with calcium, it is essential for healthy development of bones and teeth. Associated with hormone imbalance, bone disease and kidney disease. It is found mainly in bones and teeth.
- **Fluids & Electrolytes**

        - ***Chloride, Serum***—Similar to sodium, it helps to maintain the body's electrolyte balance. High or low finding can be indicative of adrenal dysfunction.
        - ***Potassium***—Helps to control the nerves and muscles.
        - ***Sodium, Serum***—One of the major salts in the body fluid, sodium is important in the body's water balance and the electrical activity of nerves and muscles. High or low finding can be indicative of adrenal dysfunction.
        - ***Carbon Dioxide*** – Detects the level of carbon dioxide in the blood and can be indicative of acid-base balance.
    - ***Glucose***— Fasting blood sugar level. It's a crude measure of tendency towards diabetes and insulin resistance. Elevation of fasting glucose is generally a late stage indicator of blood sugar dysregulation. Better indicators are insulin and hemoglobin A1C, which are not usually run on a routine screening test.

- **Vitamin D (D3):** Vitamin D is a very important nutrient for digestion, hormone balance, brain function, and much more. Due to being indoors so much, many people are very deficient. Test to get a baseline. If the level is low, repeat within 2 - 3 months of beginning supplementation and continue to retest and adjust supplement dose until it is in the ideal range. We can help you get the right dose and reach optimal levels in your blood.

- **Thyroid Panel**
    - **Thyroid Stimulating Hormone (TSH)**-TSH, produced by the anterior pituitary gland, causes the release and distribution of stored thyroid hormones.

    - **Thyroid Antibodies** Autoimmune thyroid problems are very commonly overlooked. Many people go years allowing their thyroid to be attacked because most doctors don't test for antibodies. And even if they do, most don't know what to do that's different from their approach to hypothyroidism. There is a lot that can be done to restore balance for people with autoimmune thyroiditis. Order this test if you have a history of thyroid problems or have symptoms that would be consistent with thyroid problems.
        - **Thyroid Peroxidase Antibodies(**TPO) attack an enzyme, thyroid peroxidase, that assists the chemical reaction that adds iodine to a protein called thyroglobulin, a critical step in generating thyroid hormones.
        - **Antithyroglobulin aka Thyroglobulin Antibodies(TAA)** attack thyroglobulin proteins and can destroy the thyroid gland itself.

- ***Total T4 –*** this is a measure of the total amount of T4, the storage form of thyroid hormone. It's an important measure of your thyroid glands' capacity.

- ***Free T3 –*** this is a measure of the active thyroid hormone circulating in your blood stream. Order if you have a history of thyroid issues or symptoms of thyroid dysfunction (see results of your hormone and gland assessment or symptoms listed below).

- ***Total T3 (optional) –*** a measure of the protein bound plus free T3. While a good number to have, it's not as critical to measure as are Total T4 (thyroid capacity) and free T3 (active hormone)

- ***Free T4*** – a measure of the free form of the T4 hormone

- ***Reverse T3 (optional)*** – a measure of a form of T3 considered "the brakes". It interferes with free T3 binding to the cells, and the conversion of T4 to T3. Reverse T3 is elevated under extreme stress, injury and illness.

The thyroid panel is recommended when any of the following symptoms are present:

- Tired; physical sluggishness
- Mental sluggishness
- Cold – hands and feet
- Cold all over
- Require excessive amounts of sleep to function properly
- Gain weight easily, even with low-calorie diet
- Difficult, infrequent bowel movements
- Depression
- Lack of motivation
- Morning headaches that wear off as the day progresses
- Outer third of eyebrow thins
- Thinning of hair on scalp, face, or genitals -- or excessive hair falling out
- Dryness of skin and/or scalp

The following tests and panels are also recommended for anyone who is looking to improve energy and balance hormones.

- **Hemoglobin A1C** – indicates the degree of glycation (sugar coating) of red blood cells. It can be used to predict the average blood glucose level over the last few months. This test is indicated if you have a family history of diabetes, weight accumulation around the middle, cravings for sweets after meals, and/or have had fasting glucose readings above 95 on more than one occasion. This test should be repeated every 3 months if it is out of range.

- **Fasting Insulin** - Insulin is the hormone that enables cells to take in glucose. Without insulin, glucose can't get into the cells and it stays in the bloodstream. With too little insulin, blood sugar remains higher than normal, and cells can't get the energy they need. With too much insulin, blood sugar may decrease (unless there is insulin resistance), causing symptoms such as sweating, trembling, light-headedness', and in extreme cases, shock. Too much insulin also damages blood vessel linings and can lead to hypertension and cardiovascular disease. If you have a history of pre-diabetes, insulin resistance or metabolic syndrome, a family history of diabetes or insulin resistance, or a history of elevated triglycerides or glucose (either fasting serum glucose through your doctor or using a home glucose monitor), order fasting insulin.

- **Serum Ferritin** - Composed of iron and protein, ferritin is a storage form of iron in the body. Measurement provides an accurate picture of how much iron you have available in reserve. It is used to evaluate anemia and for diagnosing iron deficiency. Low Ferritin is a sign of iron deficiency. Ferritin is high with inflammation, infection, liver disease, iron overload, certain amends and certain cancers (leukemia and lymphoma). This test should always be ordered along with serum iron if you're fatigued, or you have had more than one low iron reading or a history of anemia. If it's been abnormal in the past, retest every 3 months until normal.

- **Blood Markers of Inflammation**
  - ***Homocysteine:*** Order if you have a family history of heart disease or diabetes, symptoms of vitamin B12 deficiency on your Vitamin Assessment, history or family history of heart disease, elevated MCV on your CBC, or have been told that you have a genetic variance of the MTHFR or other methylation genes.

  - ***C-reactive Protein (hs-CRP):*** A marker for inflammation (especially in the cardiovascular system). Get this tested if you have a family or personal history of heart disease or neurologic disorder, or a personal history of inflammatory conditions. If it was elevated in past, repeat at 3-month intervals until normal.

  - ***Sedimentation Rate:*** Another marker for inflammation, get this if you have a history of inflammatory conditions or autoimmune disorder.

Additional Tests

- **Methylmalonic Acid (MMA):** A reliable indicator of Vitamin B12 status, especially when combined with the Complete Blood Count marker MCV and with homocysteine. MMA can be tested in blood or in urine. A lab called Norman Clinical Laboratory does the urine test. It should be repeated within 3 months of beginning Vitamin B12 supplementation if found to be elevated.

- **Gluten Sensitivity Stool Test:** Order through Entero Lab if you have a history of autoimmune or inflammatory conditions, have unexplained health issues, or suspect you have a gluten intolerance. If you need the test to prompt you to be serious about being gluten-free, run the test. We will explore this in more detail in the gluten section of the program.

- **Iodine Loading Test:** Iodine is important for breast and thyroid health, but it's important not to take too much. To determine if you need iodine before supplementing, do the iodine loading test at Hakala Labs. I have heard feedback that their support is great, and they will tell you what the test results mean.

- **Cyrex Labs Specialty Immune panels** – gluten antibodies, leaky gut, gluten cross reactivity, autoimmune panel

- **DUTCH test for adrenals and hormones**

- **Adrenal Salivary Hormone Test**

- **Stool testing for digestive imbalances**

- **Organic Acids testing for metabolic imbalances**

- **Nutrient testing**

- **23 and Me Genetic Test:** Take a peek into your genes. You can control your gene expression by diet and lifestyle choices. Knowing some of your potential weaknesses can increase your commitment to avoiding stressing your system. We'll have an entire module devoted to helping you understand what's in your genes, so if you'd like to

participate, you'll need to order the test. Go to the ***23 and Me*** website and order your genetic test. Generally, it takes 4-8 weeks to get results once you submit.

You can order some of the advanced functional tests on a special page of your membership website set up exclusively for participants in our coaching programs: https://www.unstoppablehealthcommunity.com/labtesting/

How to Get Testing Done

Your Labwork Online offers direct access to blood tests at lower cost than all the other direct access sites I've investigated.

State law in **New York, New Jersey, and Rhode Island** does not allow direct access testing. If you live in **Canada** (close to the border), you can cross the border to get tested. In certain states, you may need to "cross the border" (to neighboring states) as well.

Unfortunately, we are not familiar with any direct access blood testing **outside the United States.** You'll need to work with a lab or doctor's office in your own country. Some of the specialty labs we use for functional assessments do offer services overseas.

Dr. Ritamarie's Special Panels

Go to www.RunMyLabs.com to access panels we have put together for blood testing.