



METABOLIC CODE®

PERSONALIZED
HEALTH AND VITALITY
ASSESSMENT REPORT





INTRODUCTION TO YOUR HEALTH AND VITALITY

By taking the **Metabolic Code** evaluation, you have taken the first proactive step to a truly personalized health assessment. Feeling well and aging gracefully takes active participation from you. The **Metabolic Code** program develops a lifestyle guidance plan based on target weakness in your metabolism, and then guides you to corrective lifestyle and diet actions. You will be given actions that result in measureable outcomes on the way you look and feel, as well as your biochemistry and metabolism.

For many of us there comes a moment in life when we feel as though we've turned some "invisible corner" in our health. As the feeling of vitality and being healthy erodes, subtle changes in your metabolism begin to signal the sense that something has shifted in your well being. This shift can go on for years before changes are picked up through traditional lab test interpretations. The diagnosis of a health condition that seemingly came out of nowhere is now given to you. Remember, no one will be a better guardian for your health than you.

The **Metabolic Code** looks at your health in different layers in order to build a comprehensive view of who you are. It targets early shifts in the way you feel and how well your metabolism is performing. If left unchecked, these shifts can lead to chronic conditions and accelerated aging. All of us want to live longer, but more importantly, we want vitality at every stage of our lives.

This evaluation looks at relationships between important systems of the body and whether there is a solid metabolic network established between these systems. **No one area of your body works alone.** If you are under a lot of pressure and releasing excessive stress hormones like cortisol, this can affect fat storage, blood sugar balance, memory and focus. The **Metabolic Code** Program helps your practitioner to uncover the hidden metabolic blocks that may be keeping you from achieving your health goals.

Symptom survey

First and most importantly the **Metabolic Code** evaluation will determine how you feel. This is essential because how you feel each day shapes your sense of health and vitality. How you feel today is the sum total of all the biochemical reactions that occur due to the decisions you have made about your health and the exposures you have encountered during your lifetime. The **Metabolic Code** evaluation not only determines how your body is performing now, but more importantly, it also predicts where your health will be in the future. Again, your lab values may not shift for years from the time you first felt a change in your state of health. The **Metabolic Code** evaluation makes specific and personalized suggestions to change the way you feel today so you can create a healthier tomorrow.





Metabolic Biomarkers

Knowing your blood pressure, heart rate, salivary pH and body mass index are key values to derive knowledge about how well your body is performing. For example, if your pH is too acidic (low), this can lead to bone loss, mineral loss, body aches and changes in energy production.

Lab Analysis

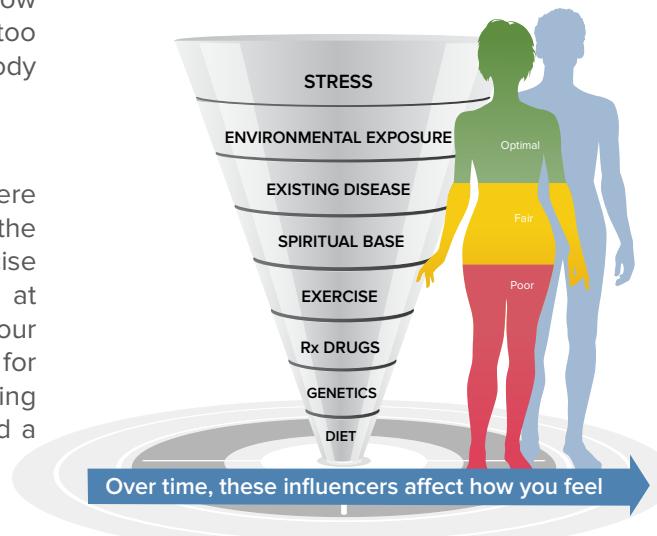
Your questionnaire provides an invaluable input into where your health is today, and how your health will play out in the future. By adding lab tests, it can even create a more precise picture of your total metabolic code evaluation. Looking at trends in your lab tests help to pick up early shifts in your biochemistry and loss of your metabolic reserve - allowing for a more robust early warning system, with the goal of keeping your numbers at optimal levels instead of trending toward a health condition or a disease.

Personalized Results

The **Metabolic Code** evaluation is a proprietary method for creating a TRUE vitality and wellness risk index - just how far you are away from being in a state of true metabolic health. Each index has a broad range of labs and symptoms from your survey that add a raw value of where your health is today and how far you are away from your personal metabolic state of optimal well-being. These values are not only a "snapshot" of your wellness now, but represent you and your health moving through time showing if you are moving to a place of being well or moving toward chronic health conditions.

A personalized diet and exercise plan, along with nutritional supplements are also incorporated into the program to surround you with the tools and information needed to shift your metabolism closer to optimal performance and allow you to have a transformational experience with your health.

LIFESTYLE AND METABOLIC INFLUENCERS



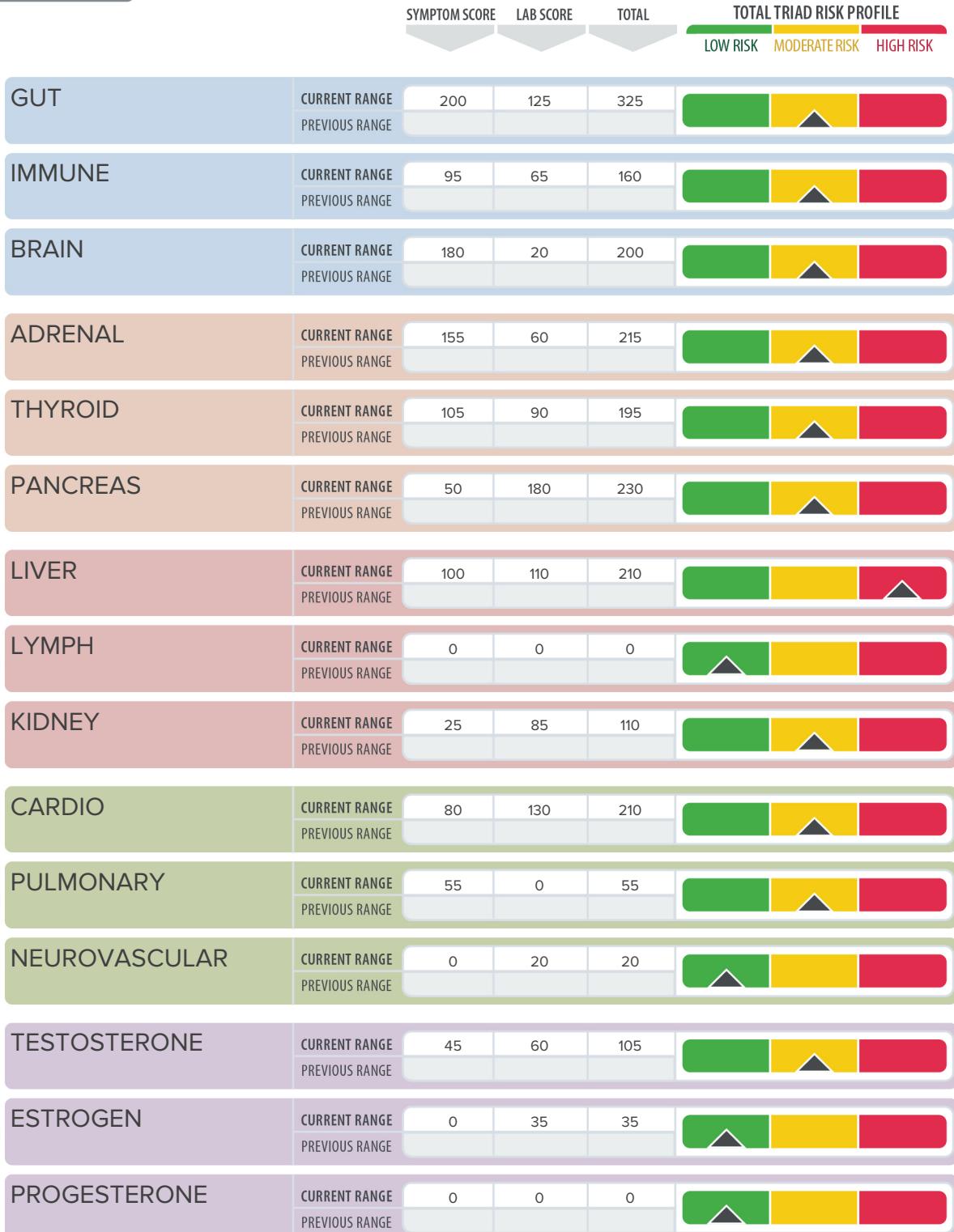
Whether you are training for your next race or you are struggling with significant health issues, the **Metabolic Code** evaluation creates a logical and step wise approach to unwinding complex layers of metabolic patterns that are keeping you from reaching your full health potential.

Learn more by visiting
www.metaboliccode.com



TOTAL PREDICTIVE RISK

RANKING ORDER





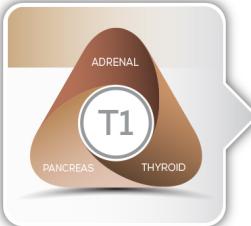
PREDICTIVE VITALITY WELLNESS INDICATORS



Your **Metabolic Code Vitality Index** is the total value of how optimized your body chemistry is performing. Your metabolism is more than just how many calories you burn – it's the sum total of all the biochemical reactions in all your organ systems that drive your mental and physical vigor.



LAB RESULTS



ADRENAL

T1 LAB VALUES

Cortisol urine 1-1st Morn	50 - 150	109.9				
Cortisol urine 2-Mid-Morn	90 - 250	251.6				
Cortisol urine 3-Mid-Day	60 - 180	299.3				
Cortisol urine 4-Eve	35 - 110	152.4				
Cortisol urine 5-PM	15 - 60	115.9				
DHEA-S urine	40 - 600	199.5				
pH (salivary)	5.0 - 8.0					
pH (urinary)	6 - 7.2					
Sodium	135 - 146	142				

THYROID

T1 LAB VALUES

Reverse T3	8 - 25					
T3 Free	2.3 - 4.2	2.8				
T3 Total	76 - 181					
T4 Free	0.8 - 1.8	0.9				
T4 Total	4.8 - 10.4					
Thyroid Peroxidase	< 9					
TSH	0.4 - 4.5	1.45				

PANCREAS

T1 LAB VALUES

Ferritin	20 - 380					
Glucose (fasting)	65 - 99	97				
HDL	> 39.9	43				
Hemoglobin A1c	< 5.7	5.6				
Insulin	2 - 19.6	7.2				
LDH	110 - 250					



LAB RESULTS





LAB RESULTS



GUT

T2 LAB VALUES

CRP-hs	< 3	42.9					
Eosinophils %	0 - 5	2.7					
Monocytes %	3 - 12	7.2					
Vitamin D	30 - 100	30					

IMMUNE

T2 LAB VALUES

Albumin/Globulin Ratio	1.0 - 2.5	1.5					
Basophils %	0 - 1	0.3					
Globulin	1.9 - 3.7	3.1					

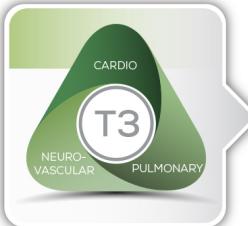
BRAIN

T2 LAB VALUES

Folate	> 5.4						
Homocysteine	< 11.4						
IGF1	55 - 358						
IGFBP3	5 - 34						
Vitamin B12	200 - 1100						



LAB RESULTS



CARDIOVASCULAR

T3 LAB VALUES

Calcium	8.6 - 10.3	10.0				
Cholesterol (total)	125 - 200	179				
LDL	< 130	108				
LDL-P	< 1260					

PULMONARY

T3 LAB VALUES

CO2	20 - 31	26				
-----	---------	----	--	--	--	--

NEURO-VASCULAR

T3 LAB VALUES

BP (diastolic)	60 - 100					
BP (systolic)	100 - 140					
Pulse	40 - 76					



LAB RESULTS



LIVER

T4 LAB VALUES

Albumin	3.6 - 5.1	4.6					
ALP	33 - 130	75					
ALT	9 - 46	19					
AST	10 - 35	16					
Hematocrit	38.5 - 50	49.9					
Hemoglobin	13.2 - 17.1	16.3					
MCH	27 - 33	29.6					
MCHC	32 - 36	32.6					
MCV	80 - 100	90.9					
MPV	7.5 - 11.5	8.1					
Platelets	140 - 400	161					
RBC	4.20 - 5.10	5.48					
RDW	11 - 15	14.1					
Triglycerides	< 150	140					

LYMPH

T4 LAB VALUES

WBC	3.8 - 10.8	8.4					
-----	------------	-----	--	--	--	--	--



LAB RESULTS



KIDNEY

T4 LAB VALUES

Bilirubin	0.2 - 1.2	0.6					
BUN	7 - 25	18					
Chloride	98 - 110	107					
Creatinine	0.6 - 1.35	1.08					
GFR	>= 60	72					
Protein	6.1 - 8.1	7.7					



LAB RESULTS



TESTOSTERONE

T5 LAB VALUES

	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH	T5 LAB VALUES
DHT urine	0 - 12	10.1							
Prolactin	2 - 18	5.0							
PSA (total)	< 4	0.6							
SHBG	10 - 50	69							
Testosterone (free) 24hr	35 - 100	51.444							
Testosterone (free) serum	35 - 155	12.9							
Testosterone (total) serum	250 - 1100	196							
Testosterone bioavailable	110 - 575	25.9							

ESTROGEN

T5 LAB VALUES

	NORMAL RANGE	MY LAB VALUES	MY PREVIOUS LAB VALUES	ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH	T5 LAB VALUES
16 alpha-hydroxyestrone	0.2 - 5	2.3							
2 hydroxyestrone	4.2 - 15.6	1.8							
2 methoxyestrone	0.5 - 6.1	0.2							
2:16 ratio	> 4	0.8							
4 hydroxyestrone	0 - 3.5	0.1							
E Quotient	>1	2.1							
Estradiol serum	< 39	8							
Estradiol urine	0.25 - 2.5	0.3							
Estriol urine	0 - 20	4.2							
Estrone urine	0.5 - 4	1.7							
LH serum	1.5 - 9.3	6.8							
Methylation ratio	> 10	10.0							
Total Estrogen Load	10 - 55	39.0							

PROGESTERONE

T5 LAB VALUES

Pregnane diol urine	30 - 400	156.2							
---------------------	----------	-------	--	--	--	--	--	--	--

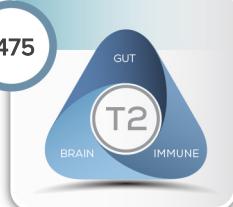


SURVEY ANALYSIS

RANKING ORDER

SYMPTOM SCORE ALERT RELATIONSHIP RISK - SYMPTOMS
 LOW RISK MODERATE RISK HIGH RISK

475



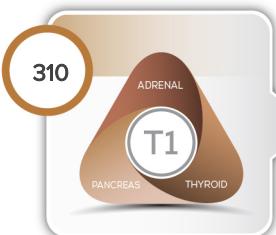
GUT

CURRENT SCORE 200

PREVIOUS SCORE



310



IMMUNE

CURRENT SCORE 95

PREVIOUS SCORE



BRAIN

CURRENT SCORE 180

PREVIOUS SCORE



ADRENAL

CURRENT SCORE 155

PREVIOUS SCORE



THYROID

CURRENT SCORE 105

PREVIOUS SCORE



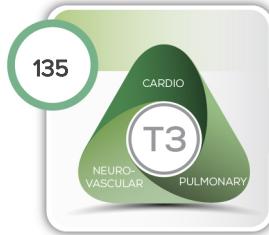
PANCREAS

CURRENT SCORE 50

PREVIOUS SCORE



135



CARDIOVASCULAR

CURRENT SCORE 80

PREVIOUS SCORE



PULMONARY

CURRENT SCORE 55

PREVIOUS SCORE



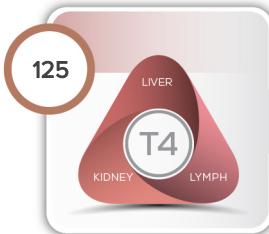
NEURO-VASCULAR

CURRENT SCORE 0

PREVIOUS SCORE



125



LIVER

CURRENT SCORE 100

PREVIOUS SCORE



LYMPH

CURRENT SCORE 0

PREVIOUS SCORE



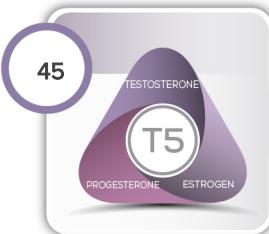
KIDNEY

CURRENT SCORE 25

PREVIOUS SCORE



45



TESTOSTERONE

CURRENT SCORE 45

PREVIOUS SCORE



ESTROGEN

CURRENT SCORE 0

PREVIOUS SCORE



PROGESTERONE

CURRENT SCORE 0

PREVIOUS SCORE





LAB ANALYSIS

RANKING ORDER

ALERT RELATIONSHIP RISK - LABS

LOW RISK MODERATE RISK HIGH RISK



TRIAD 1: ADRENAL • THYROID • PANCREAS

CRP-hs ↑↑	Glucose (fasting) ↑↑	T4 Free ↓↓	T3 Free ↓↓
Cortisol urine 2-Mid-Morn ↑↑	Testosterone (total) serum ↓↓	Testosterone (free) serum ↓↓	SHBG ↑↑
Triglycerides ↑	LDL ↑	GFR ↓	Potassium ↓
Vitamin D ↓	Insulin ↑	Testosterone (free) 24hr ↓	

Triad 1 encompasses the relationship between 3 important hormones - cortisol, insulin and thyroid hormones. These hormones reflect the state of stress, sugar metabolism and total efficiency of your metabolism. In their most basic function, each is responsible for the production of energy in the body. More generally, when these hormones are in balance, the individual feels vital and healthy.

TRIAD 2: GUT • IMMUNE • BRAIN

CRP-hs ↑↑↑	Vitamin D ↓↓	Eosinophils % ↑↑	Cortisol urine 2-Mid-Morn ↑↑
Globulin ↑	Albumin/Globulin Ratio ↓	T4 Free ↓	T3 Free ↓
MPV ↓	Prolactin ↓		

Triad 2 is comprised of three important body systems - digestive tract, immune system and central nervous system. Together, these intelligent body functions make moment to moment decisions with regard to absorption and assimilation, self/non-self, and setting key boundaries physically, immunologically and emotionally. When working well, the individual is safe and secure in themselves and the world around them.



LAB ANALYSIS

RANKING ORDER

ALERT RELATIONSHIP RISK - LABS

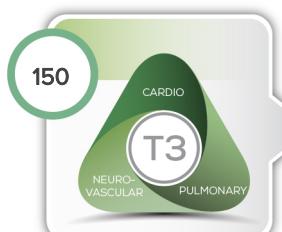
LOW RISK MODERATE RISK HIGH RISK



TRIAD 4: LIVER • LYMPH • KIDNEY

CRP-hs ↑↑	GFR ↓↓	Cortisol urine 2-Mid-Morn ↑↑	Triglycerides ↑
LDL ↑	Chloride ↑	Protein ↑	Globulin ↑
Hemoglobin ↑	MCHC ↓	Platelets ↓	

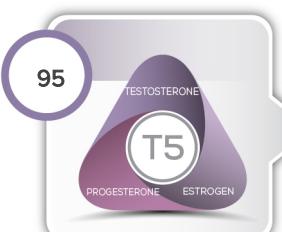
Triad 4 contains the detoxification systems of the liver, lymph and kidney. These form a functional unit to ensure adequate metabolism, shuttling and removal of both internally derived and external toxins. Detoxification is an ongoing process that requires efficiency in order to maintain health.



TRIAD 3: CARDIOVASCULAR • PULMONARY • NEURO-VASCULAR

CRP-hs ↑↑↑	Testosterone (total) serum ↓↓↓	Vitamin D ↓↓	Testosterone (free) 24hr ↓↓
Cortisol urine 2-Mid-Morn ↑↑	Testosterone (free) serum ↓↓	LDL ↑	T4 Free ↓
T3 Free ↓			

Triad 3 includes the cardiopulmonary unit, autonomic and central nervous systems and vascular tree. This triad reflects the relationship of cardiovascular health, cognition and mood, and stress. When in balance, the individual has plenty of metabolic resiliency and strength to meet life's challenges.



TRIAD 5: TESTOSTERONE • ESTROGEN • PROGESTERONE

Testosterone (total) serum ↓↓↓	Testosterone (free) serum ↓↓↓	2:16 ratio ↓↓	SHBG ↑↑
Prolactin ↓	Testosterone (free) 24hr ↓	DHT urine ↑	



LAB ANALYSIS

RANKING ORDER

ALERT RELATIONSHIP RISK - LABS

A horizontal color bar consisting of three segments: a green segment labeled "LOW RISK", a yellow segment labeled "MODERATE RISK", and a red segment labeled "HIGH RISK".

Triad 5 includes the sex hormones estrogen, progesterone and testosterone that play a central role in the human life cycle. These hormones play an important role in either metabolic or global health. More fundamentally, they confer a sense of potency and power to the individual when in balance for both women and men.



ALERT LAB SUMMARY

ALERT LAB SUMMARY – TRENDING RESULTS



T3 Free

Your T3 Free level is Trending Low

The thyroid gland is located in the neck. The thyroid gland works together with the hypothalamus of the brain to release hormones that are the driving force for your metabolism. Thyroid hormones affect all aspects of energy regulation, being involved in both glucose and fat burning. Thyroid hormones dictate how many of the receptors for hormones and neurotransmitters. Thyroid hormone also helps to regulate heart rate, manage cellular health and is involved in digestion and absorption of nutrients.

Thyroid hormones include:

- Thyroid stimulating hormone (TSH)
- T4, thyroxine (most abundant thyroid hormone)
- T3, triiodothyronine (most active thyroid hormone)

Nutrients that are important in thyroid hormone health include the amino acid L-tyrosine, selenium, iron, chromium and iodine. Stress and sleep problems, environmental toxins like pesticides and chemical additives can imbalance your thyroid hormones. Subtle changes in any of the thyroid hormones can have a profound impact upon your metabolism. When testing, the following parameters are checked so a complete picture of your thyroid gland function can be seen, and if any numbers are imbalanced, then appropriate measures can be taken to get you back into metabolic balance.

- Total T3, free T3, reverse T3; where free is the amount of circulating hormone in the blood and total is the free hormone plus the bound hormone (bound to protein for transport in the body); reverse T3 produced in greater amounts when there is chronic stress present
- Total T4, free T4; where free is the amount of circulating hormone in the blood and total is the free hormone plus the bound hormone (bound to protein for transport in the body)
- TSH hormone produced by the pituitary gland and stimulates T3 and T4 production
- Thyroglobulin antibody part of your immune system
- Thyroid peroxidase antibody (TPO) part of your immune system
- Thyroid Binding globulin (TBG) Protein that regulates free thyroid hormone

Your free T3 is trending low or low and this means that you are not making an optimal amount of this thyroid hormone. When free T3 is trending low this could be the cause of a variety of symptoms that you may be feeling. T3 is the most potent thyroid hormone and only the free fraction is actually available. If your free T4 is normal and free T3 is low then that is typically caused by high cortisol (stress), low selenium, chromium and 7 keto DHEA. Your Doctor may decide to have a compound of both T4 and T3 made for you by a compounding pharmacist if our interventions do not bring T3 levels back to normal ranges.

One or more of your thyroid hormones are out of balance and trending low. Hypothyroidism is disorder that occurs when the thyroid does not produce sufficient thyroid hormone that is required by the body. However, numbers that consistently trend low can also be a condition called SUBCLINICAL hypothyroidism, where the low numbers can produce symptoms such as fatigue/tiredness, sleep problems, weight gain/cravings, insulin resistance/insulin signaling imbalances, hair and nail problems, sex hormone imbalances, gastrointestinal problems, increased inflammation/joint aches, heart and blood vessel conditions, memory and mood changes.

ALERT LAB SUMMARY – TRENDING RESULTS



T4 Free

Your T4 Free level is Trending Low

The thyroid gland is located in the neck. The thyroid gland works together with the hypothalamus of the brain to release hormones that are the driving force for your metabolism. Thyroid hormones affect all aspects of energy regulation, being involved in both glucose and fat burning. Thyroid hormones dictate how many of the receptors for hormones and neurotransmitters. Thyroid hormone also helps to regulate heart rate, manage cellular health and is involved in digestion and absorption of nutrients.



ALERT LAB SUMMARY

involved in digestion and absorption of nutrients.

Thyroid hormones include:

- Thyroid stimulating hormone (TSH)
- T4, thyroxine (most abundant thyroid hormone)
- T3, triiodothyronine (most active thyroid hormone)

Nutrients that are important in thyroid hormone health include the amino acid L-tyrosine, selenium, iron, chromium and iodine. Stress and sleep problems, environmental toxins like pesticides and chemical additives can imbalance your thyroid hormones. Subtle changes in any of the thyroid hormones can have a profound impact upon your metabolism. When testing, the following parameters are checked so a complete picture of your thyroid gland function can be seen, and if any numbers are imbalanced, then appropriate measures can be taken to get you back into metabolic balance.

- Total T3, free T3, reverse T3; where free is the amount of circulating hormone in the blood and total is the free hormone plus the bound hormone (bound to protein for transport in the body); reverse T3 produced in greater amounts when there is chronic stress present
- Total T4, free T4; where free is the amount of circulating hormone in the blood and total is the free hormone plus the bound hormone (bound to protein for transport in the body)
- TSH hormone produced by the pituitary gland and stimulates T3 and T4 production
- Thyroglobulin antibody part of your immune system
- Thyroid peroxidase antibody (TPO) part of your immune system
- Thyroid Binding globulin (TBG) Protein that regulates free thyroid hormone

Your free T4 is trending low or low. Free T4 is the thyroid hormone that is active and available to be converted to the more active thyroid hormone triiodothyronine or T3. Increases in thyroid binding globulin can bind to active thyroid hormone and inactivate it. Sleep disturbances can cause these issues in many cases.

ALERT LAB SUMMARY – TRENDING RESULTS



Your Glucose (fasting) level is **Trending High**

Blood glucose, or blood sugar is used as fuel to produce energy for cells in the form of adenosine triphosphate (ATP), the "energy molecule" that runs virtually all of body functions. During digestion, foods rich in carbohydrates (starches and sugars) are broken down into three simple sugars - fructose, galactose and glucose. Once in the bloodstream, glucose is transported into the cells. Insulin is released by the pancreas, and signals cells to take up glucose from the bloodstream. First, it stimulates the conversion of glucose to be stored as glycogen in the liver and muscle tissue for future energy demands. Insulin facilitates the transport of glucose across the cell membranes of cells. These cells, including skeletal and cardiac muscle, the brain as well as cells in adipose (fat) tissue, have insulin receptors. Glucose uptake by these cells results in a decrease in the blood glucose concentration. Excessive carbohydrate and sugar intake in the diet along with nutrient deficiencies, hormone imbalances and environmental toxins can all lead to blood glucose imbalances. People who release too much insulin because cells begin to become "resistant" to its signal develop a condition known as insulin resistance. Insulin resistance is known to lead to the development of Type 2 diabetes.

Your Fasting Glucose level is trending high or high. This indicates an increased risk insulin resistance (IR) and future diabetes. One study of 47,000 people tracked over 10 years reported that for every point above 84, you have a 6% risk of becoming diabetic over the next ten years. Once your glucose level is above 90, your organs and blood vessels begin to become damaged. People with increased glucose levels are more prone for heart disease, kidney disease, fatty liver and cancer. Poor sleep, stress, low thyroid function and mineral imbalances, certain drugs and environmental toxins all can contribute to blood sugar disturbances. The single most important event for plaque buildup in arteries is postprandial hyperglycemia. If you have insulin resistance or elevated blood glucose it can lead to:

- Chronic inflammation
- Kidney damage
- Cardiovascular damage
- Erectile dysfunction

ALERT LAB SUMMARY

- Hypertension
- Weight gain and obesity
- Sleep disturbances; sleep apnea
- Neurochemical imbalances
- Hormonal imbalances
- Dementia/Alzheimer's disease
- Arterial damage
- Premature aging
- Macular degeneration/diabetic retinopathy
- Non alcoholic fatty liver (NASH)

ALERT LAB SUMMARY – TRENDING RESULTS

Insulin



Your Insulin level is Trending High

Insulin is a hormone released by the pancreas in response to increased blood sugar levels. Insulin attaches to our cell membranes signals glucose to be taken out of the blood and transported into the cell where it is used for energy. A diet high in refined carbohydrates (breads, rice, pasta) and sugar (fruit juices, sweetened beverages and foods), your cells begin to become "resistant" to insulin's signal. This is called insulin resistance. Insulin resistance is a condition in which the hormone insulin is not binding to the cell and activating the insulin receptor to open the proper channels for allowing glucose to be carried in. The result is being ineffective at lowering blood sugar levels efficiently. Low magnesium, zinc and chromium are two nutrient deficiencies are associated with the development of hyperinsulinemia. Typically, insulin resistance can exist for over a decade before type 2 diabetes develops.

Trending high or high insulin levels are indicative of looming insulin resistance (IR, also called Pre-Diabetes) and in the future, type 2 diabetes. If both insulin and blood sugar are high, then you are at the peak of insulin resistance. When insulin is high you can be more prone for developing hypertension. You will also gain more weight around the "belly".

Insulin resistance (Pre-Diabetes) can lead to:

- Type 2 diabetes
- Memory/cognitive decline
- Neurological problems/Mood disorders
- Alzheimer's disease
- High blood pressure
- Sleep problems
- Immune problems
- Eye disorders
- Kidney/Liver disorders
- Weight gain
- Cravings
- Fatigue/energy loss
- High blood pressure
- Heart disease
- Cancer



ALERT LAB SUMMARY

ALERT LAB SUMMARY – TRENDING RESULTS

Potassium

Your Potassium level is **Trending Low**

Potassium is an essential mineral and electrolyte that cells need for pH balance, nerve impulse transmission and muscle contraction, among other vital functions. It is the primary mineral inside the cells, which along with the other electrolytes controls fluid balance in the body. It helps to maintain the pH of tissues, so it plays a role in buffering the acid-base balance of body fluids. Lastly it helps to build and preserve muscle tissue.

Your potassium level is trending low or low. This can indicate future risk of insulin resistance (pre-diabetes) and type 2 diabetes since people with excessive insulin release causes the excretion of magnesium and potassium from the kidneys. Low potassium could also be due to medication or low potassium in the diet. If your potassium is trending low you could feel the following:

- Leg cramps and weakness
- Palpitations
- Irregular heartbeat
- Constipation
- Fatigue

ALERT LAB SUMMARY – TRENDING RESULTS

CRP-hs

Your CRP-hs level is **High**

C-Reactive Protein, or CRP, is measured to determine your state of "inflammation". CRP-hs (with the "hs" meaning high-sensitivity) is a more accurate measurement of this inflammation. Cells that make C-reactive protein include the liver, vascular tissue, respiratory tract, kidneys, fat cells, and components of the immune system. Increased inflammation can be a result of insulin resistance and insulin signaling problems, chronic stress, sleep disturbances, nutrient deficiencies in part due to drug therapies, imbalances in thyroid or sex hormones, environmental toxins or an inflammatory diet. Studies report that CRP-hs levels correlate with the incidence of inflammation and cardiovascular problems, including stroke and peripheral artery disease.

Your CRP-hs level is trending High or High. This indicates an increased level of inflammation in the body. Chronic inflammation can lead to:

- Joint stiffness/pain
- Sleep problems
- Weight gain
- Insulin resistance/Type 2 diabetes
- Heart and blood vessel problems
- Memory/cognitive decline
- Nutrient deficiencies
- Gut inflammation and imbalances
- Mood swings/
- Nervousness/anxiety
- Immune changes



ALERT LAB SUMMARY

- Cravings
- Thyroid and sex hormone imbalances

ALERT LAB SUMMARY – TRENDING RESULTS

ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
-----------	------------	----------------	-------------	------------

Eosinophils %



Your Eosinophils % level is Trending High

Eosinophils are a type of immune cell made in the bone marrow that is pro-inflammatory. In most situations this value may be trending up due to allergic response especially if it is a chronic reaction or it can be that you have some sort of infection, in which case your health care provider will determine further tests to consider.

If your eosinophils are trending high or high, you may notice:

- Eczema or skin rashes
- Allergies and asthma problems
- Potential for future autoimmune disorders
- Inflammatory conditions such as colitis

ALERT LAB SUMMARY – TRENDING RESULTS

ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
-----------	------------	----------------	-------------	------------

Vitamin D



Your Vitamin D level is Trending Low

Vitamin D is a fat-soluble vitamin produced mainly in the skin with sunlight contact. Vitamin D3 (25-hydroxy vitamin D) levels are measured to determine if you have an adequate amount of the most potent form of vitamin D. Vitamin D helps regulate cholesterol and fatty acid metabolism, plays an important role in bone, gut health and your immune system and helps regulate other nutrients including magnesium, calcium and phosphorus. It is estimated that approximately 1 billion people worldwide have an insufficient amount of vitamin D.

Your vitamin D value is low or low. It is important to optimize Vitamin D levels because it plays a role in over 4000 different enzyme and gene reactions. Most importantly Vitamin D helps support the nervous system, heart and blood vessels, prostate tissue health in men, immune function, bone density, kidney health and blood sugar regulation. If you are taking Vitamin D supplements and not seeing an improvement in your blood values, you may need to take additional Vitamin A to help the absorption of vitamin D.

ALERT LAB SUMMARY – TRENDING RESULTS

ALERT LOW	LOW NORMAL	OPTIMAL NORMAL	HIGH NORMAL	ALERT HIGH
-----------	------------	----------------	-------------	------------

Globulin



Your Globulin level is Trending High

Globulin is a protein found in the blood. The level of globulin affects the amount of protein available in the blood for use by the body. Globulins play an important role in the function of your immune system.



ALERT LAB SUMMARY

Your globulin level is trending high or high. This can indicate an underlying infection or inflammatory process going on such as an autoimmune condition.

Chronic inflammation can lead to:

- Joint stiffness/pain
- Sleep problems
- Weight gain
- Insulin resistance/Type 2 diabetes
- Heart and blood vessel problems
- Memory/cognitive decline
- Nutrient deficiencies
- Gut inflammation and imbalances
- Mood swings/
Nervousness/anxiety
- Immune changes
- Cravings
- Thyroid and sex hormone imbalances

ALERT LAB SUMMARY – TRENDING RESULTS



LDL

Your LDL level is Trending High

LDL (low density lipoprotein) is a type of cholesterol commonly called the “bad” cholesterol. LDL carries the majority of cholesterol in your body (about 70 percent) through the bloodstream and distributes it to the cells and tissues. There are two main points regarding LDL cholesterol. First, if it oxidized (in other words rusting), this makes the LDL molecule damaged and increases its ability to form plaque that can block arteries and lead to heart and blood vessel problems like high blood pressure, blood clots, stroke and heart attack. The other is the size of the LDL particle. The bigger the LDL particle the less likely it is to slip into the endothelium and begin the plaque forming process.

Your total LDL level is trending high or high. The issue with elevated LDL is that it gives more opportunity for LDL to become oxidized. Oxidation is what triggers the laying down of plaque. Looking at the LDL particle number will also help determine whether this number is at an alert risk. LDL particle number tells you if you are making very small LDL (damaging) or bigger and fluffy LDL (protective and less damaging). Causes of high LDL cholesterol include:

Being overweight (BMI of 25 or more)

- Binge drinking or alcoholism
- Chronic stress/elevated cortisol
- Poor diet, high in refined carbohydrate like sugar, breads and pastas
- High blood pressure
- Low thyroid hormone levels
- Lack of exercise
- Kidney or liver problems
- Insulin resistance (pre-diabetes) or poorly controlled diabetes
- Pregnancy
- Genetics/family history



ALERT LAB SUMMARY

ALERT LAB SUMMARY – TRENDING RESULTS



MCHC

Your MCHC level is Trending Low

MCHC or mean corpuscular hemoglobin concentration is a measurement of the amount of hemoglobin found in a group of red blood cells rather than only one.

Your MCHC is low. Low MCHC occurs when iron is low. This can be due to iron and/or vitamin B6 (pyridoxine) insufficiency, or lead contamination. Athletes can also have a low MCHC. Symptoms can include:

- Fatigue/tiredness
- Decreased endurance
- Shortness of breath
- Poor memory and cognitive function
- Heart palpitations or irregular beats
- Dizziness
- Pale skin
- Loss of sex drive

ALERT LAB SUMMARY – TRENDING RESULTS



MPV

Your MPV level is Trending Low

Your MPV or mean platelet volume is a lab test that measures the average size of platelets found in the blood and is typically included in the CBC blood test. Since the average platelet size is larger when the body is producing more platelets, the MPV is generally used to make reference concerning platelet production in bone marrow or platelet destruction problems. Platelets, in general, are small in size; older platelets are even smaller.

Your MPV is low or trending low. A low MPV can occur due to an impaired production of platelets, such as in the blood condition termed thrombocytopenia. Other causes of low MPV can include:

- Autoimmune conditions
- Viruses
- Lyme Disease
- Platelet autoantibodies
- Drugs including acetaminophen, quinidine, sulfa drugs)
- Chemo or radiation
- Liver conditions including cirrhosis



ALERT LAB SUMMARY

ALERT LAB SUMMARY – TRENDING RESULTS



Platelets

Your Platelets level is Trending Low

Platelets are tiny cell fragments essential for clotting. Too few platelets can cause abnormal bleeding, while excess contributes to unnecessary clot formation, increasing the risk of heart attack, stroke, and pulmonary embolism.

Your platelet numbers are low or trending low. Nutrient deficiencies including vitamin B12 or folic acid or heavy metal contamination can lead to low platelets. Causes or situations that lead to low platelets can include:

- Anemia
- Autoimmune conditions, like LUPUS and rheumatoid arthritis
- Infections
- Chemotherapy
- Vitamin B12 or folic acid deficiency
- Enlarged spleen
- Leukemia
- Pregnancy – generally returns to normal after delivery
- Medications, including:
 - Anticoagulants
 - Anticonvulsants
 - Aspirin
 - NSAIDs, non-steroidal anti-inflammatory drugs like ibuprofen (Advil) or naproxen (Alleva)
 - Gold salts
 - Quinidine
 - Sulfa antibiotics

Low levels of platelets can lead to abnormal clotting, so report any bleeding that is not usual. Symptoms of low platelets include Abnormal bleeding, such as:

- Easily bruising
- Prolonged bleeding of cuts and wounds
- Nosebleeds
- Bleeding of the gums
- Bleeding under the skin
- Heavy menstruation
- Blood in urine and/or stools

ALERT LAB SUMMARY – TRENDING RESULTS



RDW

Your RDW level is Trending High

RDW or red cell distribution width is a calculation based on the MCV and represents the variation in size of red blood cells.

Your RDW is above optimal and could indicate a vitamin B12 deficiency or compromised function. A high RDW value can indicate:



ALERT LAB SUMMARY

- Iron deficiency anemia – usually presented with high RDW and low MCV (mean corpuscular volume)
- Folate and B12 deficiency anemia – usually presented with a high RDW and a high MCV
- Mixed deficiency anemia – usually presents with high RDW and low or normal MCV
- Recent hemorrhage or bleeding

Symptoms can include:

- Fatigue/tiredness
- Decreased endurance
- Shortness of breath
- Poor memory and cognitive function
- Heart palpitations or irregular beats
- Dizziness
- Pale skin
- Loss of sex drive

ALERT LAB SUMMARY – TRENDING RESULTS



Triglycerides

Your Triglycerides level is Trending High

Triglycerides are the main lipids, or fatty substances, found in the blood stream. They are made in the liver and if you take in too many carbohydrates /sugars or alcohol or are insulin resistant you may make too many triglycerides. You can also be more genetically prone to make more triglycerides. Triglycerides are a major source of energy, but when there is too much available, they are stored in fat cells. Triglycerides are carried around in the bloodstream by proteins called lipoproteins, and in particular very-low-density lipoprotein (VLDL). Triglycerides are an important indicator for future cardiovascular disease risk.

Your Triglycerides are trending high or high. If you consume too many calories, especially alcohol, sugar, fruit juices and carbohydrates, your triglycerides can become high. Elevated triglycerides are included in the risk factor for heart disease and blood vessel problems, like atherosclerosis or hardening of the arteries. Elevated triglycerides are also associated with insulin resistance/insulin signaling problems, high blood sugar levels, type 2 diabetes, liver problems and metabolic syndrome. Factors associated with high triglyceride levels include:

ALERT LAB SUMMARY – TRENDING RESULTS



Chloride

Your Chloride level is Trending High

The normal way we obtain chloride is through food and table salt, which is made up of sodium and chloride. The gastrointestinal tract absorbs most of the chloride, and the excess is excreted in urine. Your kidneys carefully control the amount of chloride in your blood, chloride levels are elevated, it could be because of a metabolic shift that is stressing the kidneys. Your salt consumption will also affect chloride levels, as too much salt intake will increase chloride. Fluid intake also affects chloride levels.

Your chloride level is trending high or high. A chloride level that is high can be due to too much salt (sodium/chloride) consumption, high sodium water (like certain mineral waters), diarrhea, and excess cortisol release (high stress levels). If your body is in an acidic state (called metabolic acidosis), then you may have an elevated chloride level. If you are acidic one of the most important things you can do is change your diet (much higher in vegetables) and take additional magnesium to work on buffering the acidity.



ALERT LAB SUMMARY

ALERT LAB SUMMARY – TRENDING RESULTS



Protein

Your Protein level is Trending High

A total protein level determines the level of proteins (albumin and globulin) that are in your blood. A total protein level helps determine nutritional status, if you have liver or kidney problems and is important for immunity.

Protein levels can also help determine the cause of edema, or excess fluid buildup. Proteins consist of amino acids, which are the building blocks of many important functions of our bodies from making our brain neurotransmitters and thyroid hormones, to repairing of our tissues from everything like muscles, bones and connective tissue. Proteins are vital to every cell for formation of enzyme systems for energy and metabolism, antibody production for our immune response, to name a few.

Your Total Protein is high or trending high. A high Total Protein level may mean the kidneys or liver are functioning at less than optimal levels. . Also, you could have an infection and/or be dehydrated or be under high stress levels. . Chronic use of drugs including NSAIDs (non-steroidal anti-inflammatory drugs), aspirin and ACE inhibitors can also lead to high total protein levels. Symptoms of high protein levels include:

- Confusion
- Dehydration
- Edema (swelling)
- Fatigue
- Joint aches/pains
- Frothy urine

ALERT LAB SUMMARY – TRENDING RESULTS



2 hydroxyestrone

Your 2 hydroxyestrone level is Low

Estrogen, which include estradiol (E2), estriol (E3) and estrone (E1), and its metabolites have a large impact on a healthy metabolism. Estrogens are involved in health conditions including:

- Hormonal imbalances in women and men
- Breast cancer
- Prostate cancer
- Osteoporosis
- Cardiovascular disease
- Autoimmune disorders
- Liver conditions
- Gastrointestinal conditions
- Nutrient deficiencies (including B vitamins, folate)

Metabolites of estrogen include:

- 2 hydroxyestrone (the "good metabolite")



ALERT LAB SUMMARY

- 4 hydroxyestrone (a "bad" metabolite)
- 16 alpha-hydroxyestrone (a "bad" metabolite)

The level of 2 hydroxyestrone in your body is low or trending low. Decreased levels of 2 hydroxyestrone along with a higher level of the estrogen metabolite 16 alpha-hydroxyestrone indicates improper estrogen metabolism. An increased level of 16-alpha-hydroxyestrone in relation to 2 hydroxyestrone is associated with an increased risk of breast cancer. Levels of 2 hydroxyestrone can decrease due to:

- Obesity
- Blood sugar imbalances
- Chronic inflammation
- Gastrointestinal imbalances
- Chronic alcohol consumption
- Liver and kidney imbalances
- Immune problems
- Thyroid hormone problems
- Sex hormone imbalances

2:16 ratio



Your 2:16 ratio level is **Low**

Estrogen, which include estradiol (E2), estriol (E3) and estrone (E1), and its metabolites have a large impact on a healthy metabolism. Estrogens are involved in health conditions including:

- Hormonal imbalances in women and men
- Breast cancer
- Prostate cancer
- Osteoporosis
- Cardiovascular disease
- Autoimmune disorders
- Liver conditions
- Gastrointestinal conditions
- Nutrient deficiencies (including B vitamins, folate)

Metabolites of estrogen include:

- 2 hydroxyestrone (the "good" metabolite)
- 4 hydroxyestrone (a "bad" metabolite)
- 16 alpha-hydroxyestrone (a "bad"

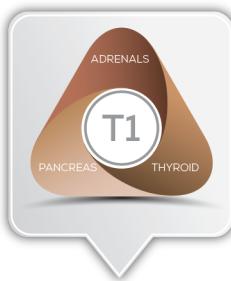


ALERT LAB SUMMARY

metabolite)

The level of 2 hydroxyestrone in relation to 16 alpha-hydroxyestrone in your body is low or trending low. Decreased levels of this ratio indicates improper estrogen metabolism. An increased level of 16-alpha-hydroxyestrone in relation to 2 hydroxyesetrone is associated with an increased risk of breast cancer. Levels of 2:16 ratio can altered due to:

- obesity
- blood sugar imbalances
- chronic inflammation
- gastrointestinal imbalances
- chronic alcohol consumption
- liver and kidney imbalances
- immune problems
- thyroid hormone problems
- sex hormone imbalances



ADRENAL

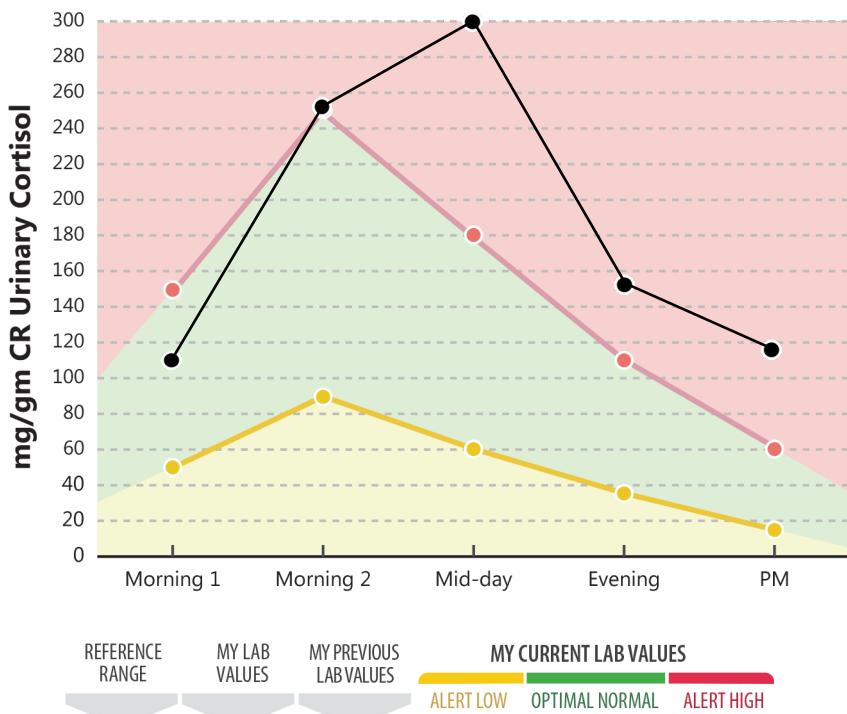
T1 LAB VALUES

Cortisol: Urinary

- HIGH RANGE
- LOW RANGE
- MY CURRENT VALUES

Your Stress Hormone Performance Profile is a urinary hormone test that analyzes the level of cortisol - the "stress" hormone. The "stress test" serves as an important tool for uncovering metabolic imbalances that can lead to symptoms, such as:

- short term memory loss
- anxiety
- depression and mood disorders
- sleep problems
- digestive/ gastrointestinal problems
- insulin resistance (pre-diabetes) and type 2 diabetes
- heart and blood vessel problems
- immune imbalances,
- chronic inflammation
- weight gain
- hormonal imbalances including thyroid and sex hormones (testosterone, estrogen and progesterone)



This hormone test examines 5 urine samples over a 24-hour period for levels of cortisol. When any of your urinary cortisol levels are out of the normal ranges, adrenal stress may be present. The loss of the natural circadian diurnal cortisol pattern results in a loss of vitality and an increase in illness. If you have out-of-range urinary cortisol patterns, you can take dietary supplements that help support adrenal stress, improve dietary habits, increase exercise and try stress-relieving lifestyle changes such as tai chi, yoga or meditation.

Morning 1	50-150	109.9	█ █ █
Morning 2	90-250	251.6	█ █ █
Mid-day	60-180	299.3	█ █ █
Evening	35-110	152.4	█ █ █
PM	15-60	115.9	█ █ █

COMMENTS



DRUG INDUCED NUTRIENT DEPLETION

Drug-Induced Nutrient Depletion (DIND) is a term referring to the reduction in levels of various bioactive compounds in the body, including vitamins and minerals, by commonly used medications (both prescription and non-prescription). Over a period of time, the depletion of these vital nutrients may lead to a worsening of symptoms and eventually to chronic health conditions if not replenished.

POTENTIAL NUTRIENT DEPLETION

Anticonvulsant Drugs

Biotin, Calcium, Carnitine (Zonisamide), Folic acid, Vitamin B1, Vitamin B2 (Zonisamide), Vitamin B3 (inositol/niacin) (Zonisamide), Vitamin B6, Vitamin B12, Vitamin D, Vitamin K

Anti-depressants and/or antipsychotics

Coenzyme Q10 (CoQ10), Melatonin, Vitamin B2 (riboflavin), Tryptophan

Beta Blockers

Coenzyme Q10 (CoQ10), Melatonin

Non-steroidal Anti-inflammatory Drugs (NSAIDs) (including OTC ibuprofen and naproxen)

Folic acid, Melatonin, Zinc, DHEA

NUTRITIONAL SUPPLEMENT SCHEDULE

Focus supplement recommendations on the top 2 triads with the highest point totals to help improve individual metabolic balance. Any additional recommendations can be made if needed.

NUTRITIONAL SUPPLEMENT	MORNING (AM)	NOON	AFTERNOON	DINNER (PM)	BEDTIME
 GI SpecPro (GI Support)	2 capsule(s)			2 capsule(s)	
 Magnesium chelate 200 mg	1 tablet(s)	1 tablet(s)			2 tablet(s)
 Melatonin SRT 6 mg (Restful Sleep Support)					1-2 tablet(s)
 Ortho Biotic (Probiotic Support)	1 capsule(s)			1 capsule(s)	
 Vitamin D3 5,000 IU	1 capsule(s)				
 AdreneVive (Adrenal Support Balance)			2 capsule(s)	1 capsule(s)	1 capsule(s)
 Fiber Factors (Fiber Supplement)	2.5 tablespoonsful				
 Reacted Chromium 200 mcg (Blood Sugar Support)	2 tablet(s)			2 tablet(s)	
 ThyoStasis (Thyroid Support Balance)	2 capsule(s)		1 capsule(s)		
 RenoPat-D (Detoxification Support)	1-2 capsule(s)	1-2 capsule(s)		1-2 capsule(s)	
 Aged Garlic (Cardiovascular/Inflammation Support)	1 capsule(s)			1 capsule(s)	



NUTRITIONAL SUPPLEMENT SCHEDULE

 CoQ10 100 mg (Coenzyme Q10)

1 softGel

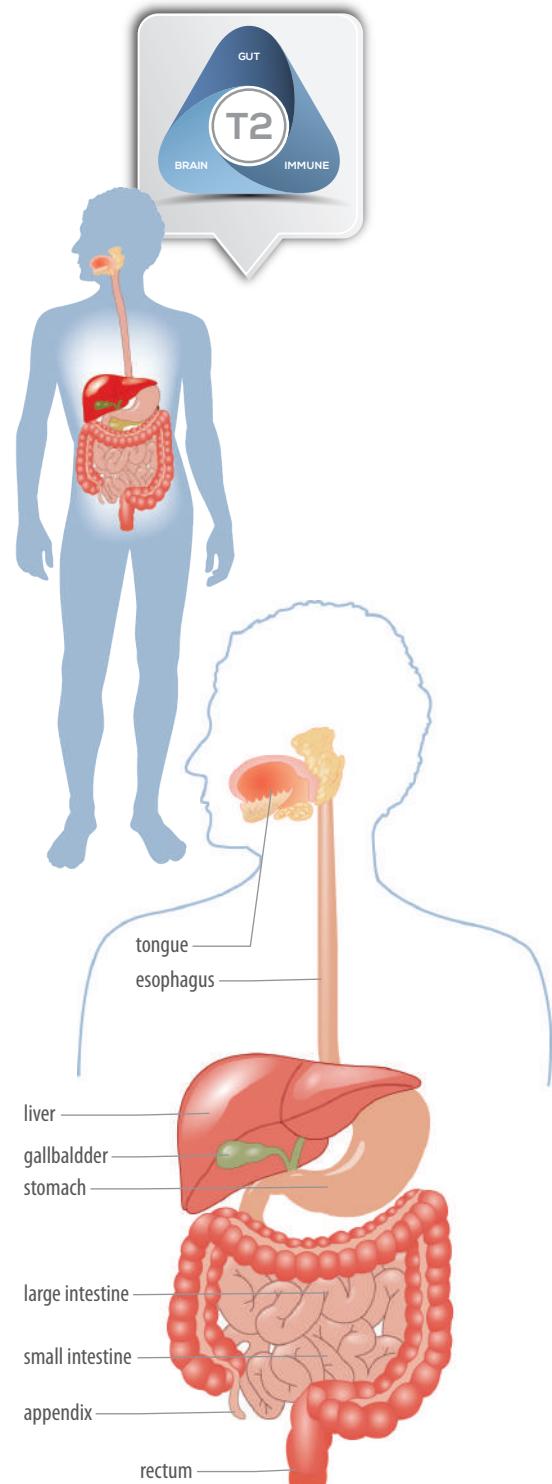
 ResTor-T (Testosterone Support)

1 capsule(s)

1 capsule(s)

PRACTITIONER NOTES

- Metabolic Code Diet
- **Bio-Identical Hormone Therapy Review**
- Check environmental toxins, including heavy metals and Persistent Organic Pollutants (POPs)
- Consider a multiple vitamin/mineral supplement for Drug Induced Nutrient Depletion (DIND)
- Consider C-Bioflav 1000, 1-2 caps daily for antioxidant support
- **Further cardiovascular evaluation recommended**
 - If a more restful sleep is needed, consider adding melatonin, 6-12mg 1/2 hour before bedtime
 - If cognitive impairment is a problem, consider CereVive, 4 capsules 1-2 times daily
 - If initial program does not improve joint pain, consider CurCuCalm
 - If lipids not improved in 60 days with diet/lifestyle changes, consider further management.
 - If sinus or seasonal allergy symptoms present, consider using Seasonal Shield, 2 caps 2 times daily
 - If triglycerides not improved in 60 days with diet/lifestyle changes, consider further management.



GUT

gastrointestinal tract

LOCATION

The gastrointestinal tract (digestive tract or GUT) consists of a hollow muscular tube starting from the oral cavity, where food enters the mouth, continuing through the pharynx, esophagus, stomach and intestines to the rectum and anus, where food is expelled.

There are various accessory organs that assist the tract by secreting enzymes to help break down food into its component nutrients. Thus the salivary glands, liver, pancreas and gall bladder have important functions in the digestive system. Food is propelled along the length of the gastrointestinal tract by peristaltic movements of the muscular walls.

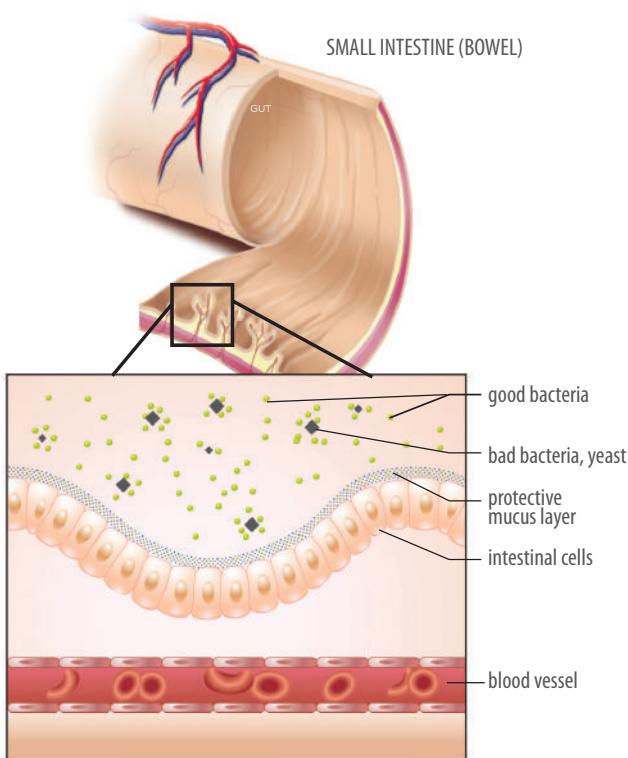
We focus on the intestines and the stomach with the effects of imbalances in these organs.

FUNCTION

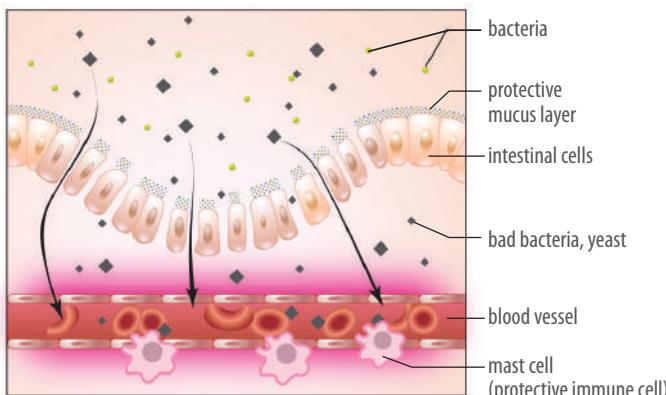
The gut is involved in the breakdown and resorption of food nutrients. The gut is also the largest organ of the immune system. The GUT contains intestinal bacteria (called microflora or probiotic flora), which serve to preserve gut integrity, help metabolize foods and drugs, and prevent the overgrowth of potentially harmful bacteria and fungus (yeast) in the gut. More than 400 separate bacterial species have been identified as part of the normal gut flora, including *Lactobacillus acidophilus*, *Bifidobacterium sp.*, and others. Potentially harmful microorganisms are also kept at bay by an extensive immune system comprising the gut associated lymphoid tissue (GALT). GALT plays a role in a healthy immune system. In addition to the lymphoid tissues that make up the GALT, a number of other cell populations contribute to normal gut defenses.

Cells that line the intestines, called epithelial cells, provide a physical barrier to bacterial entry, through their tight junctions, toll proteins and production of mucus, and produce an array of cytokines that can modulate immune responsiveness.

LEAKY GUT



Normal intestinal wall with normal level of beneficial bacteria and healthy mucus barrier.



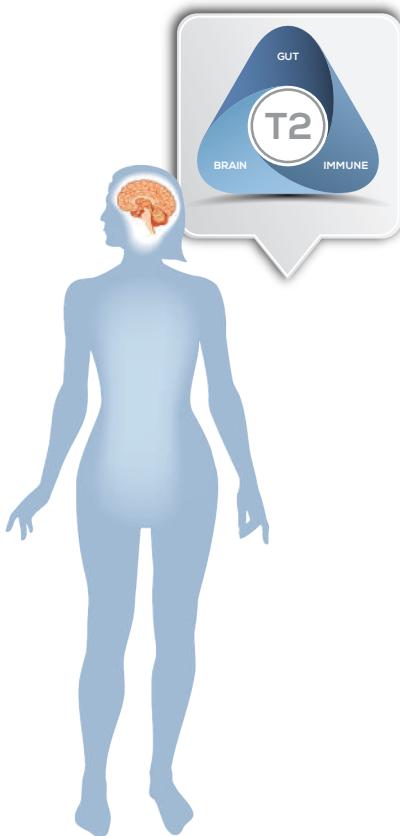
Weakened intestinal wall, break down of mucus layer with low levels of beneficial bacteria causes bad bacterial, yeast and other proteins to enter blood vessels. Mast cells respond to rid the body of these unwanted substances creating inflammation as a response to this activity.

RELATIONSHIP

Damage to the gut lining can lead to a host of health problems. There is a complex balance that exists between the probiotic flora and the immune system, the gut and liver. Any disruption in your normal gut function, through environmental stressors (such as heavy metals and chemical preservatives), poor dietary habits (such as diets high in carbohydrates, refined sugars, and high fructose corn syrup), food allergies, drug therapies (including NSAIDs, steroids, antibiotics), and chronic stress result in the loss of the counter-inflammatory flora balance and can easily lead to uncontrolled inflammation.

Food and bacterial proteins can act together to damage the gut and allow toxic protein complexes and other substances to get through the tight junction glycoprotein and toll receptor network that is normally supposed to be resistant to such a breach. These factors in the development of gut dysbiosis, by promoting the proliferation of *Candida albicans* (yeast). Dysbiosis leads to leaky gut syndrome, which can manifest as:

- food allergies
- thyroid imbalances
- neurochemical imbalances
- autoimmune diseases
- gastrointestinal problems like ulcerative colitis or Crohn's disease
- addictions
- chemical sensitivities
- depression
- sleep problems
- mineral deficiencies
- skin problems
- fatigue
- insulin resistance
- diabetes
- cancer



BRAIN

LOCATION

The brain is located in the cranium, or head. The brain consists of:

Cerebellum

located at the back of the brain; fine tunes movement, balance; rapid and repetitive actions, i.e. video gaming

Cerebrum

major part of brain; divided into right and left hemispheres and wrinkled in appearance; speech, memory, learning/intellect, cognition, movement, personality

Brainstem

lower extension of the brain; connected to the spinal cord; consists of medulla oblongata, pons and the midbrain; serves as a relay station by handling messages between different body parts and the brain; primitive and survival functions (fight/flight, breathing, blood pressure, heart beat) are located here; sleep patterns, taste, sight, hearing and balance coordination

Hypothalamus

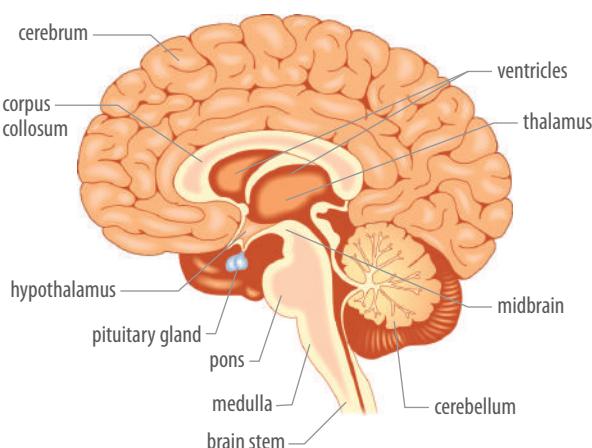
small structure inside the brain that delivers messages to the pituitary gland, which releases hormones; plays role in eating, sexual behavior, sleep, body temperature, emotions, and movement.

The brain is the most complex organ in the body, with the cerebral cortex containing about 15-33 billion neurons, or nerve cells, each connected to other nerve cells.

FUNCTION

The brain is the “command and control” center of the nervous system in the body. The brain contains the primary sensory organs of vision, hearing, balance, taste and smell. The brain controls cognition and memory, mood and emotions and is the central control center for all body processes.

The brain consists of 2 types of cells - neurons and glial cells. Both these cells require a supply of blood that delivers glucose and oxygen to produce ATP or energy.



Glial (meaning “glue”) cells provide protection and support for neurons, helping hold them in place, provide oxygen and nutrients to the neurons, insulate the neurons from one another and helping remove potential pathogens (substances that can produce disease) and dead neurons.

Glial cells are divided into 3 types: astrocytes, oligodendrocytes and microglial cells. Astrocytes help maintain an environment appropriate for the neuronal signaling via neurochemicals. Oligodendrocytes help create myelin, a lipid-rich sheath that surrounds the neuron and allows better conductivity – an insulation of sorts. Microglial cells are part of the immune system and help remove cellular debris and other results of processes of damage in the brain.

Microglia can release chemicals that lead to inflammation in the brain, which can be damaging to the brain if the inflammation is chronic.

The neurons are cells that are excited and activated by electricity. Neurons send signals to various parts of the body, sometimes over long distances, by fibers called axons. These signals are in the form of electrical impulses called action potentials, which lasts less than a thousandth of a second and travels at speeds along the axons of 1-1000 meters per second (over 6/10 of a mile). An action potential is initiated when a chemical messenger attaches itself to a receptor, setting up an electrical charge to be generated through the neuron.

Neurochemicals

Acetylcholine	an excitatory and inhibitory neurotransmitter; governs muscle contraction and hormonal secretion by glands; important in memory (especially short-term) and cognitive function
Serotonin	an inhibitory or calming neurotransmitter; helps with sleep, anxiety/mood, carbohydrate cravings
Dopamine	an excitatory or inhibitory neurotransmitter; helps with focus, attention, memory, motivation; involved in reward cascade (deals with addictive behaviors); increased levels lead to agitation, weight loss, anxiousness, mania, insomnia; decreased levels lead to addictive and compulsive behavior, fatigue/tiredness, weight gain
Norepinephrine	an excitatory neurotransmitter; involved in energy/drive, fight or flight responses, can create anxiety and/or insomnia if high; low levels can lead to fatigue/tiredness, weight gain, depression, inability to focus
Epinephrine	an excitatory neurotransmitter; high levels can lead to agitation, anxiousness, loss of sleep, weight loss; low levels can lead to fatigue/tiredness, weight gain
GABA	an inhibitory neurotransmitter; reduces brain stimulation; low levels can lead to anxiety, depression, mood imbalances, sleep loss
Histamine	an excitatory neurotransmitter; released in response to allergens; low levels lead to fatigue/tiredness; increased levels lead to immune imbalances and increased allergies (food and chemical sensitivity), increased inflammation, poor focus
Glutamate	an excitatory neurotransmitter released by glial cells; most abundant neurotransmitter; increased by excitotoxins - certain foods like MSG and food dyes/preservatives, artificial sweeteners; can lead to agitation, mood disorders, headaches, symptoms of ADHD, loss of sleep and/or focus; depression if low; imbalances of glutamate associated with Parkinson's disease, Alzheimer's disease, vascular dementia

Once the signal reaches the end of an axon, which is at the end of a neuron, tiny sacs are stimulated to release a chemical called a neurotransmitter. Neurotransmitters are chemicals released in the synapse, or space between neurons, by an action potential. Then the neurotransmitters find their way to the other side of the synapse, and attach to a space called a receptor. Each neurochemical has its own special receptors in the brain.

The process repeats over and over, leading to a change in your body's behavior.

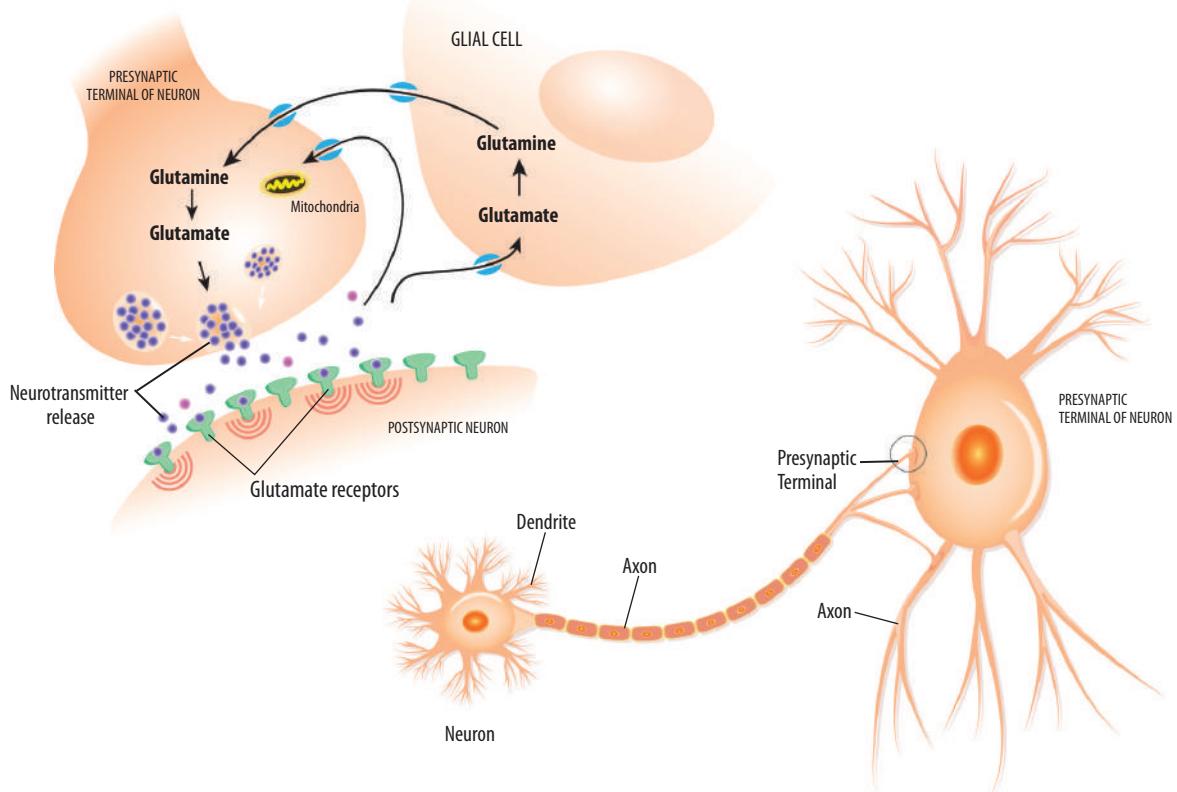
RELATIONSHIP

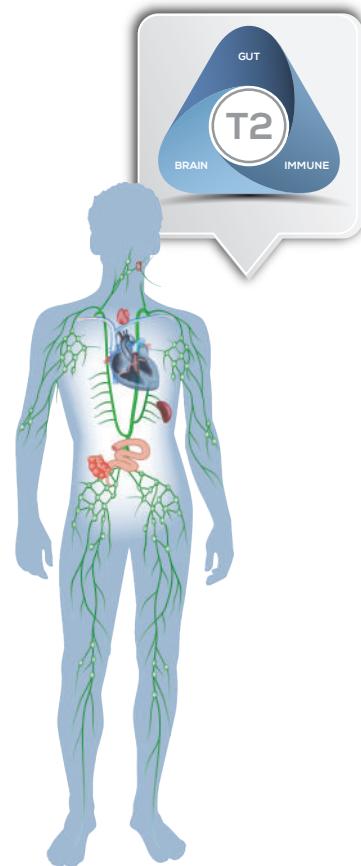
The brain's function is intimately tied to the immune system and your gastrointestinal tract. Imbalances in

metabolism can lead to imbalances in neurochemistry and brain problems. Imbalances can be caused by:

- Chronic inflammation; Elevated C-reactive protein
- Elevated homocysteine; poor methylation
- Insulin resistance/diabetes
- Gastrointestinal imbalances
- Hormonal imbalances (thyroid, cortisol and sex hormones)
- Chronic stress; Cortisol imbalances
- Oxidative Stress
 - Inflammation
 - Smoking
 - Medications
 - Environmental toxins
- Nutrient deficiencies

Nerve impulse triggers release of neurotransmitter





IMMUNE

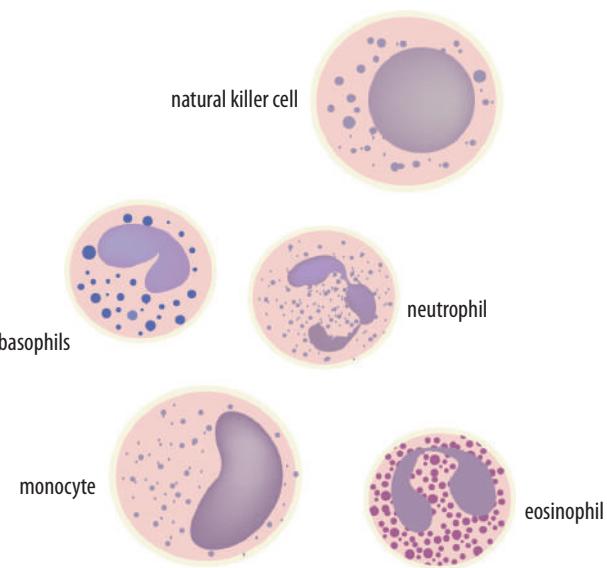
LOCATION

The immune system contains specialized organs and cells that are designed to defend the body against foreign invaders, including microorganisms like bacteria, viruses, fungi, parasites, cancerous cells and even transplanted tissues. The immune system consists of the innate immunity and adaptive immunity. These components are manufactured in various places in the body, including the lymph nodes, bone, spleen, thymus, tonsils, appendix and Peyer's patches in the small intestine.

FUNCTION

The immune system reaction to invaders and attackers is a regimented process, consisting of recognition, activation and mobilization, response and resolution. The immune system is able to determine, in most instances, what is "self" and what is foreign. However, in autoimmune conditions like rheumatoid arthritis and lupus, the immune system begins to attack its host – YOU.

The innate immune system, the dominant part of our immunity, attacks foreign invaders immediately without having encountered them before but does not give long-lasting immunity against the attacker. Innate immunity performs several functions: it leads to inflammation and allergic reactions, helps form a barrier against attack, such as in the gastrointestinal tract, uses white blood cells that ingest invaders, and T and B cells and natural killer cells (NK cells), which help destroy cells and tissues in the body that have gone "awry". The B cells (B lymphocytes) can recognize invaders directly, while the T cells (T lymphocytes) need help from other cells of the immune system called antigen-presenting cells. White blood cells consists of:



- Monocytes
- Neutrophils
- Eosinophils
- Basophils
- Natural Killer Cells

The white blood cells are made in primary lymphoid organs, including:

- **Bone marrow** – produces all the different types of white blood cells, including neutrophils, eosinophils, basophils, monocytes, B cells, and the cells that develop into T cells (T cell precursors).
- **Thymus** – produces T cells; T cells multiply and are trained to recognize foreign attackers (antigens) and ignore the body's own antigens.

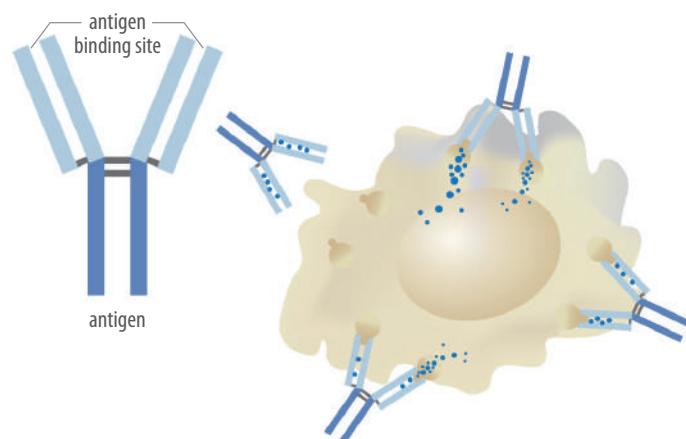
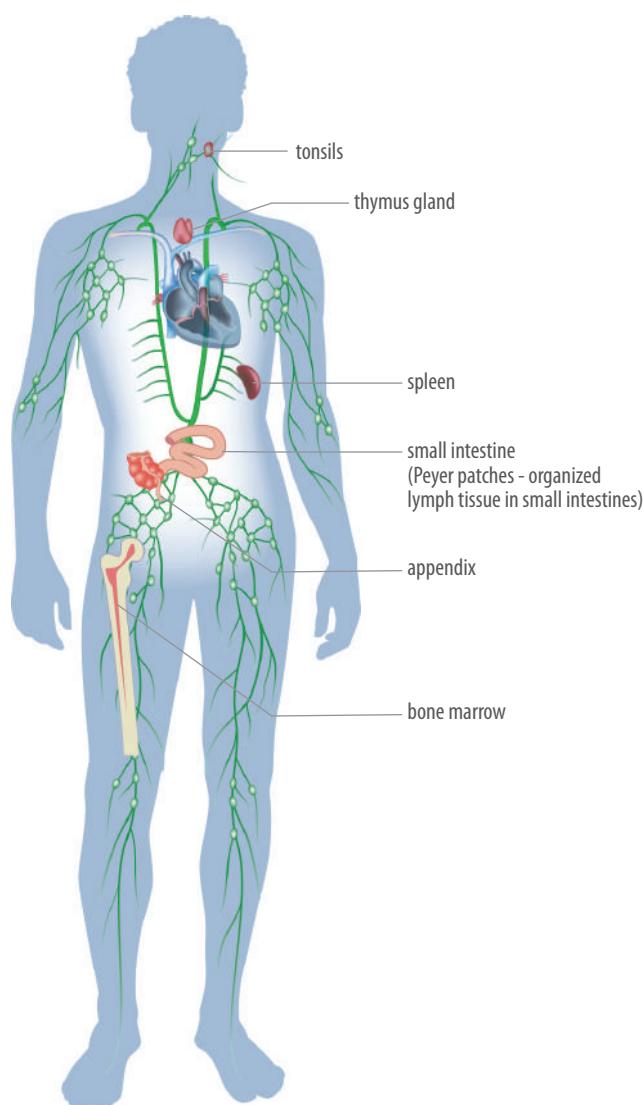
Other cells in the innate immunity include dendritic cells that reside in the skin, lymph nodes, and other tissues in

the body. They help break the attacker apart so T cells can recognize it. Also, the complement system is part of innate immunity. This system uses more than 30 proteins that act in sequence to destroy the invader in your body.

The adaptive or acquired immune system uses antibodies that remember the attackers and is ready to defeat the invader at any time. This is not present at birth and must be learned as you are exposed to various invaders in your body. Cells important in the adaptive immune system are the lymphocytes – the B and T cells. T cells are made in the thymus and B cells in bone marrow.

Antibodies (or immunoglobulins) are also part of the adaptive immune system. Antibodies are large glycoprotein molecules that are released by specific B cells when they encounter a foreign invader (antigen). Antibodies help our immunity by:

- Helping white blood cells ingest the foreign invader
- Inactivating toxic substances produced by bacteria
- Attacking bacteria and viruses directly
- Activating the complement system
- Helping certain cells, such as natural killer cells, kill infected cells or cancer cells



antigen binds to foreign invading cell and destroys cell

Antibodies found in humans include:

- **IgG**

majority of antibody immunity; crosses placenta and provides immune support to fetus

- **IgM**

Attacks foreign invader early before there is enough IgG

- **IgA**

found in gut, eyes, nose, lungs, mouth, urinary tract, breast milk;

- **IgE**

involved in allergies binds to allergens and triggers histamine release

- **IgD**

activate B cells to take part in the defense of the body in the immune system

The immune response must be regulated to prevent extensive damage to the body like that which occurs in an autoimmune condition. Suppressor T cells help control the immune response by secreting cytokines (chemical messengers of the immune system) that lead to inflammation and inhibition of the immune responses.

RELATIONSHIP

The immune system is intimately connected to the gastrointestinal tract and to the brain. Approximately 60-70% of the immune system is located in the gut, in tissue called GALT or gut associated lymphatic tissue.

Stress levels can affect your immune system greatly. Excess cortisol release may lower your immunity, and studies report those with high stress levels are reported to have a much higher incidence of upper respiratory infections as compared to those with low stress levels.

Your sleep quality and amounts can also affect your immune system. Less than 7 hours of sleep a night is reported to almost triple the number of colds you can

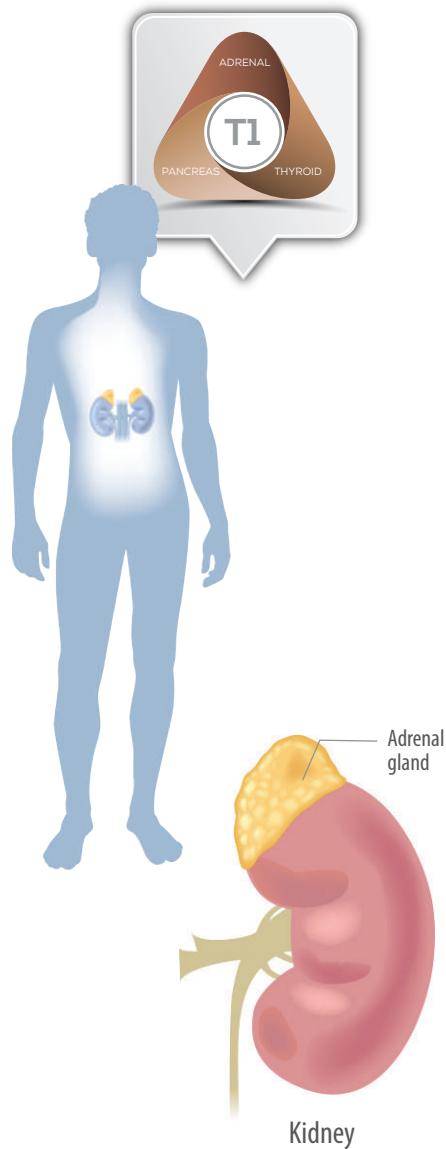
get when compared to sleeping 8 hours a night. 67% of Americans experience frequent problems sleeping.

What you eat and are exposed to in the environment can also affect your immunity. Foods high in refined carbohydrates (sugars, “white” breads/rice, high fructose corn syrup), chemical additives like sweeteners, preservatives, flavoring (MSG, smoking) and coloring (dyes) can lead to imbalances in the immune system. Exposure to heavy metals – lead, cadmium, mercury, arsenic – can also lead to immune imbalances. Other environmental contaminants linked to immune imbalances include cigarette smoking, pesticides, phthalates (found in cosmetics, self-care products) and bisphenol A (BPA, found in the lining of cans and plastics).

Conditions that are tied to chronic inflammation can also imbalance your immune system. These include:

- Sleep problems like sleep apnea
- Obesity
- Insulin resistance/diabetes
- High levels of oxidative stress like smoking
- Gastrointestinal imbalances including inflammatory bowel diseases like Crohn’s disease
- Food allergies

Exercise in moderation can help improve immune function. However, over-training can lead to immune imbalances, which are common in strenuous athletics like triathlons and competitions.



ADRENAL

LOCATION

The adrenals are pyramid-shaped glands that sit on top of each kidney. The adrenal glands contain an inner medulla and an outer cortex, the interior or central portions of the adrenal glands house the adrenal medulla, while the exterior or outer portion of the adrenal glands contain the adrenal cortex.

FUNCTION

The adrenal medulla secretes epinephrine (adrenaline) and norepinephrine (noradrenaline), two chemicals found in high levels in the brain called catecholamines. Catecholamines are released in high amounts in response to acute stress and control body functions that are beyond conscious control like pupil dilation, heartbeat, digestion, and secretions of glands. Under chronic stress too much of these chemicals are produced resulting in hyperarousal of your nervous system.

The adrenal cortex secretes more than thirty different steroids and hormones (known as corticosteroids). The most important corticosteroids are cortisol, aldosterone, and the adrenal androgens (sex hormones, like estrone and the prohormone DHEA). Cortisol is the main hormone secreted in reaction to stress.

RELATIONSHIP

Chronic stress can increase the production of adrenal hormones, especially cortisol, norepinephrine and epinephrine. Chronic stress responses can be triggered by emotional stress, too much exercise, inadequate sleep, nutritional deficiencies, environmental toxins and physical illnesses. Chronic stress can cause your body to enter into three stages – initial stress hormone production, overactive adrenals, and adrenal exhaustion. High levels of stress hormones have a dramatic impact on your future health, leading to the breakdown of lean muscle tissue, poor blood sugar regulation, reduced immune balance, increased belly fat accumulation and slowing down of your metabolic rate all resulting in increased inflammation response. Inflammation is thought to be the principle



STAGE 1 ALARM REACTION

Stress hormone production begins

SYMPTOMS

- sweaty palms
- perspiration
- butterflies in the stomach
- anxiety
- rapid heart
- decrease in digestion
- peristalsis (movement of food through intestines)



STAGE 2 ADRENAL RESISTANCE

- Initial symptoms of stress may disappear
- Resistance rises above normal and person assumes they have adapted to chronic stress
- Negative effects of stress still impacting health

SYMPTOMS

- | | |
|-------------------------|-------------------------|
| • memory problems | • ↑ blood sugar |
| • anxious | • ↑ blood pressure |
| • sleep difficulty | • ↑ cholesterol |
| • weight gain | • digestive disturbance |
| • weakend immune system | |



STAGE 3 ADRENAL EXHAUSTION

- Alarm reaction may return irreversibly with signs of exhaustion, extreme tiredness
- Symptoms will not disappear. In extreme cases death is possible
- Must wait to heal, a breakdown may ensue

SYMPTOMS

- | | |
|-------------------------|-------------------------|
| • memory problems | • ↑ blood sugar |
| • anxious | • ↑ blood pressure |
| • sleep difficulty | • ↑ cholesterol |
| • weight gain | • digestive disturbance |
| • weakend immune system | |

process that accelerates aging and leads to chronic illnesses like heart disease, diabetes, cancer and Alzheimer's disease.

You can get all sorts of variations in stress patterns when under chronic stress. But, as you age and are under more duress, your body slowly but surely changes from a metabolism leading to health to a metabolism leading you to a path of chronic illness.

IF CORTISOL LEVELS ARE HIGH,

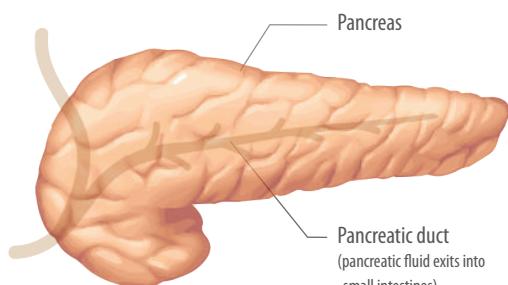
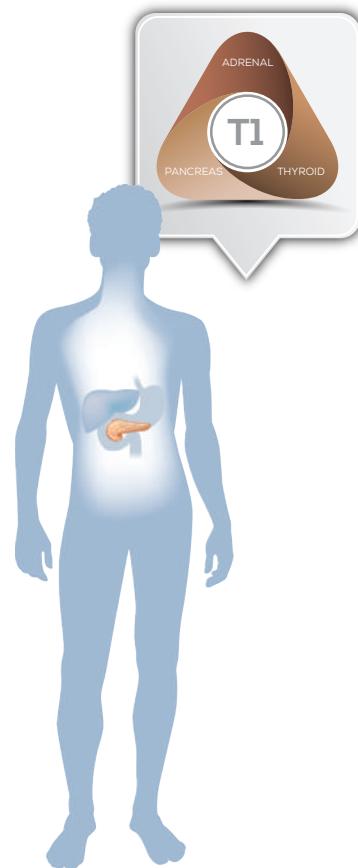
the following symptoms may occur:

- Anxiousness, nervousness
- Increases cravings for carbohydrates and sugar
- Increases cholesterol and triglycerides
- Mid-day fatigue
- Short-term memory loss
- Sleep disturbances
- Mood disorders
- Alterations in immune system balance, less ability to fight off infections
- Increases in inflammatory cytokines, such as TNF alpha, IL-6 leading to allergies
- Estrogen dominance
- Thyroid hormone levels can be lowered slowing metabolism
- Increased insulin release and blood sugar regulation
- Weight gain
- Aches and pains
- Hair loss

IF CORTISOL LEVELS ARE LOW,

the following symptoms may occur:

- General weakness and becoming easily tired.
- Alterations in thyroid hormone levels
- Low blood pressure and dizziness upon standing.
- Abdominal pains, cramps
- Cravings for salty foods
- Alterations in blood sugar regulation
- Menstrual irregularities
- Lowered testosterone in men



PANCREAS

LOCATION

The pancreas is located behind the stomach and is attached to the small intestine.

FUNCTION

The pancreas has two functions. As an excretory gland, it secretes digestive juices into the small intestine by way of the pancreatic duct. As an endocrine gland, the pancreas secretes hormones from a group of specialized cells known as the islets of Langerhans.

The islets of Langerhans contain three types of hormone-secreting cells—the alpha cells, which secrete glucagon (hormone that increase blood sugar levels); the beta cells, which secrete insulin (which lowers blood sugar levels); and the delta cells, which secrete somatostatin (a hormone that inhibits gastric-acid release important in proper digestion). Somatostatin is also secreted in other parts of the body.

Each hormone has an important role in maintaining the balance of blood glucose concentration and supplying cells with energy. Glucose is burned to produce energy for cells in the form of adenosine triphosphate (ATP), the “energy molecule” that runs body functions.

Insulin decreases the concentration of glucose in the blood. First, it stimulates the conversion of glucose to be stored as glycogen in the liver and muscle tissue.

Insulin facilitates the transport of glucose across the cell membranes of cells. These cells, including skeletal and cardiac muscle, the brain as well as cells in adipose (fat) tissue, have insulin receptors. Glucose uptake by these cells results in a decrease in the blood glucose concentration.

Under certain conditions people will begin to release too much insulin because cells begin to become “resistant” to its signal. This is called insulin resistance.

RELATIONSHIP

Many serious, chronic conditions are associated with impaired blood sugar regulation. One of the more serious is type 2 diabetes and its complicating factors. The inability to lower blood sugar in people with type 2 diabetes is linked to several predisposing conditions, including impaired insulin secretion, hyperinsulinemia, insulin resistance, impaired glucose tolerance, and increased glucose production by the liver. All these conditions occur when the pancreas is not working efficiently. The two glands that most influence the metabolic performance of the pancreas are the thyroid gland and the adrenal glands.

HYPERINSULINEMIA

Hyperinsulinemia is an overproduction of insulin by the pancreas. The causes of Hyperinsulinemia include obesity, with age, chronic stress, low thyroid hormone, environmental pollutants, dietary deficiencies and a high-carbohydrate or high-sugar diet, lack of exercise. Frequent spikes in blood sugar require the pancreas to release insulin, resulting in overstimulation of the beta cells and increased insulin secretion. This promotes excessive storage of visceral fat which has drastic effects on your metabolic health.

INSULIN RESISTANCE AND THE DEVELOPMENT OF TYPE 2 DIABETES

Insulin resistance (IR) is defined as an inability of insulin to bind to the insulin receptor on a cell and carry glucose from the blood into the cells to be used as fuel.

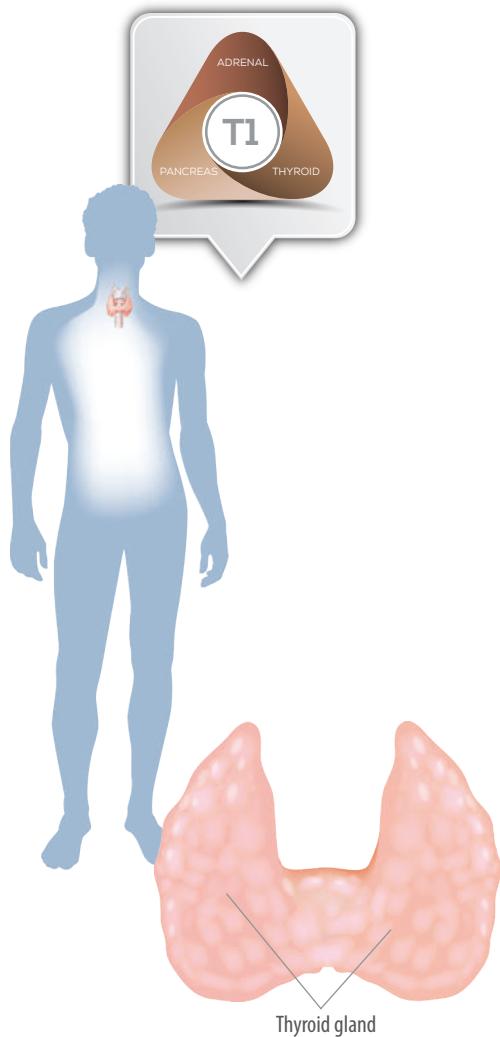
Consequently, blood sugar remains elevated. To compensate, the pancreas initially releases more and more insulin (hyperinsulinemia). Blood glucose can be maintained within normal limits for years if enough insulin is produced. So part of the problem from IR occurs as a result of the build up insulin and glucose in the bloodstream. The other part of the IR problem

is that it rapidly causes the accumulation of belly fat. Insulin is the most inflammatory chemical that your body makes. It causes devastating damage to the eyes, kidneys, brain, heart, and all the capillaries of your cardiovascular system.

You should know that belly fat is not just hanging around! It is a factory for making hundreds of inflammatory chemicals, hormones, enzymes, and signaling substances that begin to accumulate and accelerate the march toward chronic illnesses. Eventually the pancreas can no longer make enough insulin or the insulin signal cannot be heard efficiently. At this point you become a Type 2 diabetic.

INSULIN RESISTANCE LEADS TO:

- Chronic inflammation
- Kidney damage
- Cardiovascular damage
- Erectile dysfunction
- Hypertension
- Weight gain and obesity
- Sleep disturbances; sleep apnea
- Neurochemical imbalances
- Hormonal imbalances
- Dementia
- Arterial damage
- Premature aging
- Macular degeneration



THYROID

LOCATION

The thyroid gland is the largest gland in the neck. It is situated in the anterior (front) neck below the skin and muscle layers. The thyroid gland takes the shape of a butterfly with the two wings being represented by the left and right thyroid lobes, which wrap around the trachea.

FUNCTION

The thyroid gland releases thyroid hormones that are the driving force in your metabolic rate. Everything from the utilization of carbohydrates and fat in your food, to promoting protein synthesis needed for cell growth and the production of key biochemical compounds, like neurotransmitters Thyroid hormones activate nearly every receptor to hormones and neurotransmitters in your body. They also are responsible for activating your genetic transcription. Subtle changes in thyroid hormone balance can have a dramatic impact on your metabolic code. Low hormones can turn off your insulin receptors leading to weight gain, reduce absorption of nutrients, and even cause you to become depressed.

Thyroid hormone production starts in the hypothalamus located in the brain. Initially, the hypothalamus responds to a metabolic change, such as low body temperature, by releasing thyrotropin releasing factor (TRF), which then signals the pituitary gland to release thyroid stimulating hormone (TSH.) TSH stimulates the thyroid gland to then make thyroid hormone (T4).

The thyroid gland needs the amino acid tyrosine and iodine to make thyroid hormones. The thyroid gland captures these two nutrients from the blood stream and keeps them stored and ready for production, whenever it gets the signal to make the two major hormones, thyroxine (T4) and triiodothyronine (T3). T3 is the more active form of thyroid hormone, while T4 is the most abundant. Factors like low selenium and iron as well as chromium influence your ability to make thyroid hormone. Chronic stress can lower your ability to make T3 resulting in a drop in metabolic rate

as much as 40%. Also your immune system can begin to attack your thyroid leading to the production of antibodies.

Within the thyroid gland are also two nodules called the parathyroid gland that secrete calcitonin, which regulates your calcium and phosphate levels in your blood and bones. Any number of shifts can occur in your thyroid hormone numbers. Your measurements included Free T3, Free T4, TSH as well as antibodies TPO and thyroglobulin.

RELATIONSHIP

Major triggers that can lead to changes in optimal thyroid hormone production can include:

- Elevated stress
- Environmental exposure, such as pesticides, chemical additives in foods and heavy metals
- Essential Nutrient deficiencies
- Inflammation of the GI tract and loss of beneficial flora
- Exposure to halogens, like fluorine, chlorine and bromine
- Sex hormone imbalances

Symptoms of low thyroid (hypothyroidism) include:

Here is a more comprehensive list of the signs and symptoms of low thyroid:

- | | |
|-----------------------------|---------------------------------|
| • Slow heart rate | • Aching muscles |
| • Insulin resistance | • Poor coordination |
| • Weight gain | • Fatigue, insomnia |
| • Decreased metabolic rate | • Poor concentration |
| • Depression | • Infertility |
| • Cold hands and feet | • Menstrual Irregularities |
| • Elevated cholesterol | • Low body temperature |
| • Hoarseness | • Heartburn |
| • Dry hair, skin, nails | • Slow to start in the morning |
| • Constipation | • Mental fogginess, memory loss |
| • Reduced rate of breathing | • Heart failure |

Symptoms of high thyroid hormone levels (hyperthyroidism) include:

- Palpitations
- Heat intolerance
- Nervousness
- Insomnia
- Breathlessness
- Increased bowel movements
- Light or absent menstrual periods
- Fatigue
- Fast heart rate
- Trembling hands
- Weight loss
- Muscle weakness
- Warm moist skin
- Hair loss



METABOLIC CODE®



Your Next Scheduled Assessment Date

DATE: 4/27/2017