Alkaline phosphatase

Low　　　　optimal　　　Supra-optimal　　High

About this marker

The total alkaline phosphatase (ALP) test is done to determine all types of ALP in the blood to detect bone and liver disorders.

Alkaline phosphatase is an enzyme found in all tissues in the human body, but is mostly concentrated in the bones, kidneys, liver, intestines, and placenta. It exists in different forms, depending on where it originates [R].

Its major function is to protect your intestinal tract against bacteria, aid in digestion, breakdown fats and some B vitamins, and promote bone formation [R].

The correct balance of ALP is required for healthy functioning, excess or insufficient levels of this enzyme can lead to a broad range of diseases [R].

When the liver is not functioning properly, ALP is released into the bloodstream. Additionally, any condition that affects bone growth or causes the increased activity of bone cells can increase ALP levels in the blood. For this reason, an ALP level test is commonly used to help diagnose liver/gall-bladder disorders and bone disorders [R].

ALP levels also vary with age and gender, with levels higher in children and pregnant women [R].

Higher ALP levels can occur in people with blood group B or blood group O [R].

Health effects based on your result of: 77U/L

Your ALP level is optimal!

Based on this marker, you are able to metabolize and absorb the proper nutrients from the food you eat and have strong healthy bones.

ALP in this range is linked to the lowest risk of all-cause mortality [R, R, R, R].
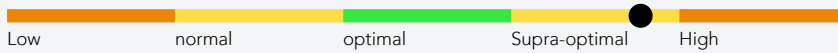
Lifestyle suggestions based on your result of: 77U/L

Your results are optimal, you don't need any recommendations here!

ALT (SGPT)

Low   normal   optimal   Supra-optimal   High

About this marker

The alanine aminotransferase (ALT) test measures the amount of ALT enzyme in the blood
ALT is an enzyme involved in the breakdown of proteins for energy in the body. It is mainly found in the liver, but also in smaller amounts in the kidney, heart, muscles, fat tissue, intestines, and pancreas [R].
Normally, ALT levels in the blood are low. However, when the liver is injured, ALT is released into the bloodstream [R].
ALT levels vary with gender, with higher values in men compared to women [R].
An ALT test is done to monitor liver health and determine if the liver is damaged or diseased [R].

Health effects based on your result of: 37U/L

You have higher than optimal ALT levels.
Do not worry if your value is slightly elevated, ALT blood levels can fluctuate throughout the day. A variety of personal and environmental factors that can affect your results including your diet, exercise, alcohol use, and the drugs/supplements that you take.
Mexican-Americans had a higher prevalence of elevated ALT levels compared to other ethnicities [R, R].
Values in this range increase your all-cause mortality, and liver and heart disease-associated mortality [R, R, R].
High ALT can be caused by:
• Excessive alcohol intake [R]
• Strenuous exercise [R]
• High cholesterol [R]
• High blood pressure [R]
• 2nd trimester in normal pregnancy [R]
• Muscle disease or injury [R, R]
• Lead or mercury exposure [R]
• Pesticide exposure [R]
• Anorexia [R]
• Underactive and overactive thyroid gland (hypothyroidism and hyperthyroidism) [R, R]
Drugs that elevate ALT levels include:
cholesterol-lowering drugs (e.g., statins) [R]
• Acetaminophen (Tylenol, Panadol) [R, R]
• Antibiotics [R]
• Antituberculosis drugs [R]
• Non-steroidal anti-inflammatory drugs (i.e., aspirin) [R, R]
• Chemotherapy [R]
• Opioids [R]
Supplements can also increase ALT, such as:
• Kava [R]
• Black cohosh [R]
• Red yeast rice [R]
• Iron [R]
• Aloe [R]

Lifestyle suggestions based on your result of: 37U/L

Drinking moderate amounts of coffee (regardless of caffeine content) on a regular basis may benefit liver health and lower liver enzymes in the blood, such as ALT [R, R].

Attempt to buy organic meats and vegetables whenever possible to avoid the chemical additives and pesticides [R].

Increase foods that can help detoxify the liver and kidneys such as asparagus, cabbage, and broccoli [R].

Go to the sauna - saunas are beneficial for decreasing toxins in the body. Sweating is your body's method of detoxification [R].

Avoid drinking alcohol until your ALT levels return to the normal range, even if the cause is not alcohol related. Over consumption of alcohol can directly damage liver cells and worsen existing liver conditions [R].
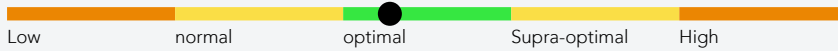
Supplements that can help:
• Alpha lipoic acid [R]
• Green tea extract [R]
• Milk thistle [R]
• Probiotics [R]
• N-acetyl cysteine (NAC) [R]
• Tudca [R]
• Curcumin [R]
• Capsaicin [R]

AST (SGOT)

| Low | normal | optimal | Supra-optimal | High |

About this marker

This is a blood test used to check for organ damage (usually the liver, but sometimes also the heart, kidneys, and muscle).

Aspartate aminotransferase (AST) is an enzyme that is involved in the breakdown of proteins for energy. It is found mainly in the liver and heart, but also in many other tissues of the body including the muscles, red blood cells, kidney, and brain. When any one of these tissues are damaged or diseased, AST is released into the blood [R, R].

AST levels are measured in liver function tests to help determine overall liver health. However, increases in AST levels can also indicate damage to other organs, such as the heart and kidneys, as well as muscle tissue damage. Therefore, in a medical setting, AST is often paired with other tests in order to determine the specific location of the health problem.

Health effects based on your result of: 21U/L

Your AST level is optimal!

Based on your AST, you have a healthy liver, and you are able to absorb and metabolize the proper nutrients from the food you eat.

AST in this range is associated with the lowest risk of all-cause mortality [R, R, R].

Lifestyle suggestions based on your result of: 21U/L

Your results are optimal, you don't need any recommendations here!

Albumin

Low   normal   optimal   High

About this marker

This test measures the amount of albumin in your blood.

Albumin's main function is to keep fluids inside blood vessels and maintain blood volume. It also binds to hormones, vitamins, fatty acids, and minerals and transports them around the body [R, R, R].

In addition, it serves as the main antioxidant in the blood [R].

Albumin is made by liver in large amounts. Its production decreases in response to infection, inflammation, environmental toxins, nutritional deficiencies, and liver and kidney diseases [R].

It is routinely tested with your comprehensive metabolic panel (CMP) at your doctor's office. Individuals with albumin imbalances are usually those with kidney dysfunction or those who have chronic diarrhea.

Health effects based on your result of: 4.7g/dL

Your albumin is within the optimal range! This indicates that your liver is working well. Nutrients and hormones are being transported within your body efficiently. It also means you are unlikely to have a serious infection, inflammation, nutritional deficiencies, liver, or kidney disease.

Albumin values in this range are linked to maximally reduced risk of death from all causes [R].

Lifestyle suggestions based on your result of: 4.7g/dL

Your results are optimal, you don't need any recommendations here!

A/G Ratio

| Low | normal | optimal | High |

About this marker

This test measures the ratio of albumin to globulin in the blood.

The albumin/globulin ratio, or A/G, measures the amount of albumin in the blood compared to the amount of globulins in the blood. Most of the time, it is used to diagnose inflammatory, immune, or digestive disorders.

Albumin is produced in the liver, and helps with fat metabolism. It also helps prevent fluid from leaking out of blood vessels (maintain osmotic pressure) and transports hormones, bilirubin, metals, vitamins, and drugs. Globulin proteins are produced in the liver or by the immune system. They include carrier proteins, enzymes, antibodies (immunoglobulins), and other proteins [R].

Health effects based on your result of: 1.7:1

Your albumin/globulin ratio is optimal!

You are probably enjoying the benefits of a healthy liver and kidneys [R].

You also have a lower risk of:

• Cancer incidence, cancer-cause and all-cause mortality [R]

• Heart disease and heart-disease related death [R]

• Poor outcome after stroke [R]

Lifestyle suggestions based on your result of: 1.7:1

Your results are normal, you don't need any recommendations here!

BUN

| Low | optimal | Supra-optimal | High |

About this marker

This test measures the amount of urea in the blood.

Urea is a waste product made after the body processes protein [R]. It is produced in the liver and removed by the kidneys [R, R].

Essentially, BUN/urea is an indicator of how well your kidneys are functioning. Overall kidney function is best evaluated when looking at BUN and creatinine together - which is called the BUN/creatinine ratio [R]. It is important that you keep track of your kidney function, especially if you are dealing with chronic issues such as obesity or diabetes.

Health effects based on your result of: 15mg/dL

Your BUN (Urea) is within the optimal range! Make sure you check your creatinine level as well!

According to your urea levels, your kidneys should be functioning well and should be able to eliminate toxins efficiently.

Good kidney function is essential for the health of all of our organs. If you are on a diet, exercise, or a supplement regime, keep that up - it's working well!

Levels in this range are linked to the lowest risk of all-cause mortality [R].

Lifestyle suggestions based on your result of: 15mg/dL

Your results are optimal, you don't need any recommendations here!

BUN/Creatinine Ratio

Low   normal   optimal   High

About this marker

This test measures the ratio of blood urea nitrogen (BUN) to creatinine.
Urea is a product of the dietary and tissue protein turnover. Creatinine is the product of the muscle creatine metabolism. Both are processed by the kidneys. However, while kidneys can return urea into the bloodstream depending on body's needs, creatinine gets removed at a constant rate [R].
BUN/creatinine ratio increases with age, with decreasing muscle mass [R].

Health effects based on your result of: 20:1

Congratulations! Your BUN/creatinine ratio is optimal!
Levels in this range are associated with the lowest risk of all-cause mortality [R].

Lifestyle suggestions based on your result of: 20:1

Your results are optimal, you don't need any recommendations here!

Basophils (%)

Normal   High

About this marker

This test measures the percentage of your white blood cells that's made of basophils.

Basophils are a type of white blood cell. They protect the body and help it to get rid of bacteria and parasites. They release granules (small particles) with enzymes during asthma and allergic reactions. They help protect against infections, but they can also play a role in immune diseases [R, R].

Normally, basophils constitute less than 2% of all your white blood cells.

High basophil activation can contribute to the onset of and worsen these conditions [R]:

• Dermatitis

• Allergic drug reactions

• Asthma

• Lupus nephritis

• Crohn's disease

• Chronic myelogenous leukemia

Health effects based on your result of: 0.8%

Your basophil percentage is within the normal range!

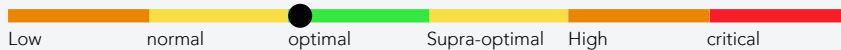Make sure to also check your absolute basophil count.

Lifestyle suggestions based on your result of: 0.8%

Your results are normal, you don't need any recommendations here!

Bilirubin, Total

| Low | normal | optimal | Supra-optimal | High | critical |

About this marker

This test measures bilirubin, a yellow pigment that is produced by the normal breakdown of hemoglobin found in red blood cells.

Bilirubin is produced by the normal breakdown of hemoglobin, the compound in red blood cells that allows them to carry oxygen. As red blood cells are broken down, the iron-containing part of hemoglobin (heme) is converted to bilirubin.

Bilirubin passes through two phases. In the first phase, bilirubin binds to albumin, which allows it to be carried from the blood and into the liver. Bilirubin in this phase is called "indirect" or "unconjugated" bilirubin.

The second phase takes place in the liver, which attaches sugar molecules to the "unconjugated" bilirubin. This makes it water-soluble, which helps the small intestines to eliminate the bilirubin in the stool. Bilirubin in this phase is called "direct" or "conjugated" bilirubin.

Total bilirubin is the sum of your direct and indirect bilirubin levels. Its yellow color is responsible for yellow skin in jaundice, as well as the yellow color of urine and feces [R].

However, bilirubin is not just a waste product. In recent decades, science has been uncovering the beneficial roles bilirubin plays in our bodies. This research indicates that bilirubin acts as a powerful antioxidant and anti-inflammatory agent that may protect us from conditions such as heart disease, diabetes, and cancer [R, R, R, R, R, R].

Consuming high doses of vitamin C (>4 g) within one day of testing your bilirubin levels will interfere with the test [R].

Health effects based on your result of: 0.5mg/dL

Your bilirubin levels are optimal! This suggests your liver is functioning optimally.

Bilirubin is an important antioxidant and anti-inflammatory agent that helps prevent metabolic, inflammatory and some autoimmune diseases. The higher your levels are within the optimal range, the lower your risks are for developing conditions such as:

• Heart disease [R, R]
• Diabetes [R]
• Metabolic syndrome [R]
• Fatty liver disease [R]
• High cholesterol [R]
• Respiratory diseases[R]
• Hardening of the arteries [R]
• Kidney disease [R]
• Inflammation in psoriasis and ulcerative colitis [R, R]
• Positive systemic lupus erythematosus (SLE) status [R]

Bilirubin within the optimal range is associated with the lowest risk of all-cause mortality [R, R, R].

Lifestyle suggestions based on your result of: 0.5mg/dL

Your results are optimal, you don't need any recommendations here!

Bilirubin, Urine
● Negative

About this marker

This test detects the presence of bilirubin in your urine.

Bilirubin is a yellow pigment that is produced by the normal breakdown of hemoglobin from red blood cells [R].

Before bilirubin is eliminated from the body, it is first processed by the liver. In the liver, bilirubin attaches to sugars, becoming water-soluble, and is then removed via the gallbladder [R, R].

This form of bilirubin is called conjugated (direct bilirubin). Normally, a small amount of conjugated bilirubin is present in your urine. Urine levels increase when blood levels rise [R, R].

When the liver is damaged or when a blockage of the bile duct occurs, conjugated bilirubin enters the circulation, causing elevated blood and urine levels [R, R].

The presence of bilirubin levels in the urine (bilirubinuria) may be an early indicator of liver disease and can precede symptoms [R].

Urine bilirubin levels are commonly assessed as part of a urinalysis, which measures a number of other substances in your urine, including protein, ketones, and glucose.

Health effects based on your result of: Negative

Your result is negative. You don't have a detectable amount of bilirubin in your urine.

False negative results can occur when [R, R, R]:

• Your urine is exposed to light or air
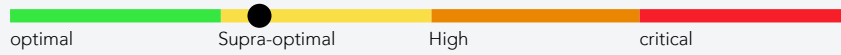• Your urine contains chlorpromazine (Thorazine), selenium, or vitamin C

Lifestyle suggestions based on your result of: Negative

Your result is negative for bilirubin. You don't need any suggestions here!

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C-Reactive Protein

| optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of the inflammatory marker C-reactive protein (CRP) in the blood.

CRP is a protein that rises in response to inflammation and infection in the body. It is a protein made in the liver in response to inflammatory molecules called cytokines, which are released in response to trauma, inflammation, and infection. CRP binds to damaged tissue or pathogens in order to activate the immune system to clear them away. It also serves as a primary defense system against infections [R, R].

In addition to being an indicator of inflammation, CRP also creates inflammation on its own [R].

Highly-sensitive CRP (hs-CRP) is a test that is able to measure CRP levels below <10 mg/L, which a regular CRP test is unable to measure. It therefore allows you to detect elevated CRP levels that would otherwise go unnoticed with a regular CRP test [R].

Health effects based on your result of: 1.26mg/L

Your CRP is in the normal range, but higher than ideal.

High CRP levels can contribute to hardening of the arteries (atherosclerosis, which leads to heart disease), and higher CRP levels are strongly associated with an increased risk of heart disease [R].

Higher CRP levels are associated with:

• Prediabetes [R]

• High blood pressure [R]

• Obesity [R]

• Depression [R]

• Rheumatoid arthritis [R]

• Irritable Bowel Syndrome [R]

• Crohn's disease (but not ulcerative colitis) [R]

• Lupus [R]

• Gum disease [R]

• Liver disease [R]

• Schizophrenia [R]

• Cancer [R]

High CRP levels are also associated with an increased risk of:

• Type 2 diabetes [R]

• Obesity [R]

• Heart disease [R]

• Non-alcoholic fatty liver disease [R]

• Depression and psychosis [R]

• Breast, prostate, and lung cancer [R, R, R]

• Mortality of all-causes, as CRP is often elevated in potentially fatal inflammatory diseases [R]

The most common causes of high CRP levels include:

• Bacterial, viral, and fungal infections [R]

• Chronic inflammation [R]

• Aging [R]

• Chronic stress [R, R, R]

• Vitamin D deficiency [R]

• Vitamin K deficiency [R]

• Vitamin A deficiency [R]

• Smoking [R]

• Alcohol abuse [R]

• Obesity [R]

• Sleep deprivation [R]

Drugs that may increase CRP levels include:

• Estrogen and progesterone replacement therapy [R]

• The nonsteroidal anti-inflammatory drug (NSAID) lumiracoxib (Prexige) [R]

• Antipsychotic drugs (clozapine, risperidone, quetiapine) [R]

• Antidepressant medications (tricyclics like Norpramin and SSRIs including Prozac) [R]

High CRP levels do not cause symptoms directly, and individuals will only show symptoms related to the cause of their high CRP levels, such as obesity or chronic sleep deprivation.

Lifestyle suggestions based on your result of: 1.26mg/L

Increasing the amount of fiber and fruits and vegetables in your diet may help, as high-fiber, fruit and vegetable-rich diets are associated with lower CRP levels [R].

Reduce or quit smoking [R].

Moderate alcohol consumption is associated with lower CRP levels than no, little, or heavy alcohol consumption [R, R].

Exercising regularly may help, as it has been shown to reduce CRP levels [R].

Strength training, if performed properly, will reduce CRP levels [R].

Losing weight has been shown to reduce CRP levels as well [R].

Make sure you are getting enough sleep, as sleep deprivation can raise CRP levels [R].

Reduce your stress levels, as stress has been shown to increase CRP [R, R]. Activities such as yoga, tai chi, and meditation help reduce CRP levels [R, R, R, R, R, R].

Supplements that can help:

• Vitamin E [R]

• Vitamin B3 (niacin) [R]

• Vitamin B9 (folate) and vitamin B complex [R]

• Vitamin C [R]

• Vitamin D [R]

• Astaxanthin [R]

• Selenium and Coenzyme Q10 [R]

• Magnesium [R]

• Chromium [R]

• Calcium [R]

• Omega-3 fats (fish oil) [R, R]

• Probiotics [R]

• Resveratrol [R]

• Quercetin [R]

• Curcumin [R]

• Cocoa and dark chocolate [R, R]

• Milk thistle [R]

• Pomegranate extract [R]

• Garlic and aged garlic extract [R, R]

• Amla (Phyllanthus emblica) [R]

• Ginkgo biloba [R]

Calcium

critical | Low | normal | optimal | Supra-optimal | High | critical
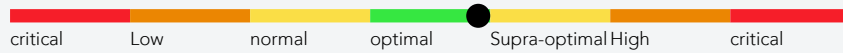
About this marker

This test measures the amount of calcium in your blood.

Calcium is the most abundant mineral in the human body. Approximately 99% of the calcium in our bodies is in our bones and teeth, where it serves to increase bone density and maintain strong bones. The remaining 1% circulates in the blood.

Calcium plays a crucial role in nerve function, blood clotting, proper enzyme function, and energy production by muscles. Calcium levels are tightly controlled by the parathyroid hormone and vitamin D. If blood levels drop, calcium is taken from bone tissue to maintain blood concentrations [R].

45% of calcium in the blood is bound to albumin, and is inactive. 10% is combined with anions. 45% is free and active (used by our bodies for various functions) [R].

Health effects based on your result of: 9.6mg/dL

Your calcium levels are optimal!

An optimal calcium result, together with other optimal results, generally means that your calcium metabolism is good, and properly balanced.
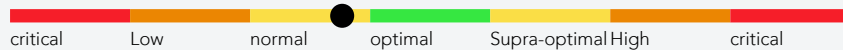
Optimal calcium levels are linked with the lowest risk of all-cause mortality [R, R, R, R].

Lifestyle suggestions based on your result of: 9.6mg/dL

Your results are optimal, you don't need any recommendations here!

Carbon Dioxide, Total

critical Low normal optimal Supra-optimal High critical

About this marker

This test tells you how much carbon dioxide (bicarbonate) you have in the blood.

Bicarbonate is a negatively charged ion that helps maintain the body's acid-base (pH) balance. It is formed from CO2, which is released into the blood as a waste product when your body burns food to create energy. Most of the carbon dioxide in the blood is in the form of bicarbonate (HCO3). Bicarbonate is measured as a part of an electrolyte or metabolic panel. It can help uncover electrolyte imbalance or acidosis (low pH) or alkalosis (high pH) [R].

Lungs and kidneys are the major organs that control the amount of bicarbonate in the blood. Any condition that disturbs the kidneys, lungs (breathing), or metabolism, has the potential to disturb the body's acid/base balance [R].

Health effects based on your result of: 24mmol/L

Your carbon dioxide (bicarbonate) level is within the normal range, but below optimum.

Values that are below optimum are associated with:

• an increased risk of all-cause mortality [R, R]

• lower bone density [R]

• decreased functionality in the elderly [R]

Bicarbonate is decreased when too much CO2 is lost through the lungs due to hyperventilation (overbreathing). It can also be encountered when the body produced or retains too much acid [R, R].

Causes of low bicarbonate include:

• Severe diarrhea [R]

• Dehydration [R]

• High altitude [R]

• Anxiety, stress, and other conditions that cause hyperventilation (overbreathing) [R]

• Thiamine (Vitamin B1) deficiency [R, R]

Some drugs can also cause low bicarbonate levels [R, R]:

• Acetazolamide (diuretic/water pill used to treat glaucoma, epilepsy, altitude sickness, etc.)

• Sulfonamides (drugs derived from sulfanilamide and used to treat bacterial infections)

• Cholestyramine (a cholesterol medication)

• Aspirin (in excess)

• Laxative abuse

Lifestyle suggestions based on your result of: 24mmol/L

Drink plenty of water and fluids [R].

Limit alcohol consumption; it increases acid production in your body and causes dehydration [R].

Decrease stress through yoga, meditation, and exercise. Yoga and meditation help slow/calm breathing, resulting in less carbon dioxide being lost, while exercise increases carbon dioxide production.

Chloride

| critical | Low | normal | optimal | Supra-optimal | High | critical |
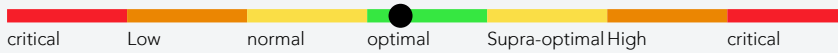
About this marker

This test measures the level of chloride in your blood.

Chloride is a negatively charged ion. Along with sodium, potassium, and bicarbonate it helps balance the amount of fluids in the body. It is also important for the acid-base balance (blood pH).

We get chloride in our diet through food and salt (which is sodium chloride). Chloride levels are adjusted by the kidneys, which adjust how much chloride is going to be released in the urine.

Blood levels of chloride are generally steady, although they can drop off slightly after meals. This is because the stomach produces acid after eating, which it makes using chloride from blood.

Chloride levels usually mirror the level of sodium (high sodium - high chloride). However, if there is an acid-base imbalance in your body, chloride levels can change independently of sodium levels [R, R].

Health effects based on your result of: 102mmol/L

Your chloride is within the optimal range!

Optimal chloride helps maintaining proper fluid balance, normal kidney function, and good mental and physical health.

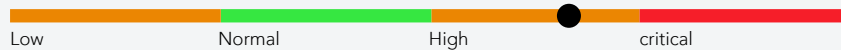Based on your chloride levels, you have the lowest risk of all-cause mortality [R].

Lifestyle suggestions based on your result of: 102mmol/L

Your results are optimal, you don't need any recommendations here!

Cholesterol, Total

| Low | Normal | High | | critical |

About this marker

This test measures the amount of total cholesterol in the blood.

Cholesterol is a key component of cell membranes and is used by the body to create steroid hormones (testosterone, estrogens, cortisol, etc.), bile, and vitamin D, and is involved in balancing salt and water levels in the body (via a hormone called aldosterone) [R].

However, cholesterol is also involved in the process of hardening of the arteries, and contributes to the formation of plaques -- a key part of this process [R].

Total cholesterol is a sum of the three types of cholesterol in your body:

• HDL-Cholesterol (high-density lipoprotein cholesterol, "good" cholesterol)

• LDL-Cholesterol (low-density lipoprotein cholesterol, "bad" cholesterol)

• VLDL-Cholesterol (very-low-density lipoprotein cholesterol, "bad" cholesterol)

A change in any of these markers will affect your total cholesterol score.

Total cholesterol increases during aging up to around 50 years of age, where it remains elevated until about 70 years. It then decreases again gradually [R].

Health effects based on your result of: 230mg/dL

Your cholesterol levels are above the normal range!

High cholesterol levels increased the risk of:

• Stroke [R]

• Coronary heart disease [R]

• Fatal cardiovascular disease [R]

The most common causes of high levels are:

• Obesity [R]

• Lack of physical exercise [R]

• Smoking [R]

• Alcohol consumption [R]

• A diet high in saturated fats [R]

• Too much stress [R]

• Hypothyroidism [R]

Other less common causes of high levels include:

• B12 deficiency [R]

• Familial hypercholesteremia (genetic disorder that causes high cholesterol levels) [R]

Drugs can also cause high cholesterol. These include [R, R]:

• Antipsychotics

• Anticonvulsants

• Corticosteroids

• Growth hormone

• Thiazide and loop diuretics

• Anabolic steroids

• Protease inhibitors (antiviral drugs)

• Beta-blockers

• Immunosuppressive drugs

High cholesterol levels do not cause symptoms directly, and individuals will only show symptoms related to the cause of high cholesterol levels, such as obesity and smoking.

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Lifestyle suggestions based on your result of: 230mg/dL

Address any underlying health issues!

Reduce your consumption of foods high in saturated fat, including cheese, butter, and meat [R].

Reduce your consumption of carbohydrates [R].

Increase your consumption of foods rich in monounsaturated fatty acid such as olives, avocados, and macadamia nuts [R]. Mediterranean diet is a good example of a healthy diet rich in monounsaturated fats. It includes lots of fatty fish, olive oil, and vegetables and fruits [R].

Increase your consumption of foods high in phytosterols (a type of cholesterol made by plants) including nuts, seeds, and legumes. Phytosterols compete with cholesterol for re-absorption in the gut, which lowers cholesterol levels [R].

Losing weight will help lower total cholesterol [R].

Exercise regularly. Engage in activities such as jogging, walking, swimming, and resistance training [R].

Stop or reduce smoking [R].

Stop or reduce alcohol consumption [R].

Supplements that can help:

• Apple cider vinegar [R]

• African mango [R]

• Soluble fiber [R]

• Taurine [R]

• Garlic [R]

• Iodine (if deficient) [R]

• B12 (if deficient) [R]

• Magnesium (if deficient) [R]

• Probiotics and prebiotics [R]

• Alpha lipoic acid [R]

• Ginger [R]

• Black cumin seed (Nigella sativa) [R]

• Ginseng [R]

• Cinnamon [R]

• Green Tea [R]

• Turmeric [R]

• Red yeast rice extract [R]

• CoQ10 [R]

• Broccoli sprouts [R]

• Amla berry [R]

Cholesterol, Total/HDL-C Ratio

| Low | optimal | Supra-optimal | High |
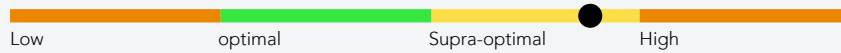
About this marker

This test is the ratio of your total cholesterol and your HDL-c levels (total cholesterol levels divided by HDL-c levels), which is a strong indicator of heart disease risk [R].

Traditionally, the smaller the number the better, as this means that your HDL-c (the "good cholesterol") is high compared to your total cholesterol, which is calculated using VLDL-c and LDL-c levels in addition to HDL-c. This ratio is considered a more reliable indicator of heart disease risk than total cholesterol, LDL-c, and HDL-c levels alone [R].

However, having a total cholesterol/HDL cholesterol ratio that is too low also increases your risk of all-cause mortality [R, R].

Health effects based on your result of: 4.7:1

Your total cholesterol/HDL-C ratio is in the normal range, but above optimum.

A high total cholesterol/HDL-c ratio is associated with:
• Insulin resistance [R]
• Obesity [R]
• High blood pressure [R]
• Vitamin D deficiency [R]
• High hs-CRP levels [R]
• Celiac disease [R]
• Rheumatoid arthritis [R]
• Sleep apnea [R]
• Carotid intima thickness (a measure of narrowing of the arteries in the neck) [R]
• Hypothyroidism [R]

A high TC/HDL-c ratio increases the risk of:
• Type 2 diabetes [R]
• Hardening of the arteries (atherosclerosis) [R]
• Heart disease, including stroke and peripheral artery disease (narrowing of arteries other than those that supply the heart or brain) [R, R]
• Mortality from all causes [R]

One study found that a 1.0 increase in the TC/HDL-c ratio increased the risk of developing heart disease by 21% [R].

Lifestyle suggestions based on your result of: 4.7:1

Check your Total Cholesterol and HDL-C markers for lifestyle and supplement suggestions.

Cortisol

| Low | Normal | High |

About this marker

This test measures the amount of cortisol in your blood.

Cortisol is a steroid hormone in the "glucocorticoid" family that is best known for its role in stress. It is produced by the adrenal glands, which are part of the hypothalamic–pituitary–adrenal (HPA) axis [R].

Cortisol is essential for maintaining health and well-being, and can lead to significant health problems when its levels are too low or too high [R].

Although it has many different functions in the body, cortisol is most widely known as a "stress" hormone that initiates the body's "fight-or-flight" response. This helps the body react to stress by shifting it into an "emergency mode" where resources are conserved and non-critical functions are put on hold. In other words, cortisol makes your body focus more purely on "short-term" processes (such as glucose metabolism) at the expense of "long-term" ones (like growth, digestion, and reproductive and immune system functions) [R].

Cortisol is one of the major regulators of blood sugar levels [R, R]. Cortisol causes stored glucose to be released into the blood supply where it can be used immediately by the body [R]. However, it also signals the body to store any incoming glucose, which is why chronically high cortisol levels can lead to weight gain rather than weight loss [R].

Cortisol also helps control the metabolism of fats, proteins, and carbohydrates, and regulates blood pressure, the immune system, and inflammation [R, R, R, R, R].

Very high- or low- values can be reliable markers of chronic conditions such as hypercortisolism (e.g. Cushing syndrome) and hypocortisolism (e.g. Addison's disease) [R].

Cortisol levels vary naturally throughout the day [R]. Its levels are generally highest in the morning after waking, and gradually decreases throughout the day (however, this is often reversed in people who work at night) [R].

Cortisol levels also rise naturally after eating [R], physical activity / exercise [R, R, R, R, R], and in response to physical and psychological stress [R, R, R, R, R, R].

Most cortisol tests take a single measurement -- ideally during the early morning, shortly after waking -- which presents only a limited picture of one's cortisol activity [R, R]. Because cortisol levels generally peak in the morning and fall throughout the day, one of the most reliable ways to detect abnormally high cortisol activity is by testing it in the evening or night time. If cortisol levels are still high during this period, a disorder is more likely. Also, tracking your cortisol levels over time may be a good idea.

Health effects based on your result of: 6.5ug/dL

Your cortisol levels appear to be within the normal range!
This indicates that your body's stress response is well-tuned.

Lifestyle suggestions based on your result of: 6.5ug/dL

Your results are normal, you don't need any recommendations here!

Creatinine

Low | normal | optimal | Supra-optimal | High

About this marker

This test measures the levels of creatinine in the blood.

Creatinine is a waste product created from the normal wear and tear of muscles [R]. It is produced from creatine, a protein needed to generate the energy for muscle contractions [R]. Its production essentially reflects lean body mass, and because this mass changes little from day to day, the production rate is also fairly constant. Women, children, and older people tend to have lower levels of creatinine compared to adult men because they have less muscle mass [R].

Creatinine is removed from the body by the kidneys, which filter almost all of it from the blood into the urine. That is why blood levels are usually a good indicator of how well your kidneys are working [R, R]. The creatinine level can be tested as a part of your basic metabolic panel (BMP) or your comprehensive metabolic panel (CMP).

Health effects based on your result of: 0.76mg/dL

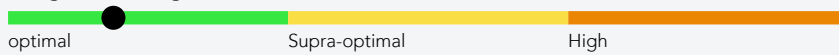Your creatinine is within the optimal range! Your kidneys function well, and are able to remove toxins efficiently!

Lifestyle suggestions based on your result of: 0.76mg/dL

Your results are optimal, you don't need any recommendations here!

Erythrocyte sedimentation rate

optimal　　　　　Supra-optimal　　　　High

About this marker

This test measures the erythrocyte sedimentation rate, or the rate at which red blood cells sink to the bottom of a sample tube.

Erythrocyte sedimentation rate (ESR), or "sed rate," is a test that helps indirectly measure inflammation in the body. It measures how fast red blood cells (erythrocytes) sink in plasma [R].When there is more inflammation, red blood cells stick together and sink faster.

ESR is useful for diagnosing bone and joint infections, and also at monitoring autoimmune conditions such as systemic lupus erythematosus (SLE). However, unlike CRP, ESR is not independent of other diagnostic factors and can be affected by albumin concentration, immunoglobulins, and red blood cells. Thus, it cannot diagnose any conditions, and only provides general information about inflammation [R].

Health effects based on your result of: 2mm/hr

Your erythrocyte sedimentation rate (ESR) is optimal!
This means that you probably do not have any inflammatory conditions [R].
An optimal ESR means you have the lowest risk of:
• Heart disease [R, R]
• All-cause mortality [R]
You are also free of, or have a lower risk of:
• Inflammation [R]
• Anemia [R]
• Infection [R]
• Subacute thyroiditis [R]
• Crohn's disease [R] or ulcerative colitis [R]
• Multiple myeloma [R]
• Temporal / giant cell arteritis (inflammation in blood cells around the scalp) [R, R]
However, a normal result does not always mean that you do not have a health condition. You may want to check your CRP levels to get a more detailed result [R].
Some conditions can cause low ESR, and possibly mask inflammatory conditions.These include [R]:
• Polycythemia (high red blood cell count) can inhibit normal sedimentation [R]
• Protein abnormalities, such as high albumin and low fibrinogen [R, R]
• Hereditary spherocytosis [R]
• Sickle cell anemia [R, R]
• The drug prednisone lowered ESR in patients with arteritis (inflammation in the arteries) [R]
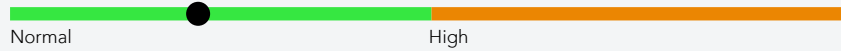A low ESR is normal, and does not cause any symptoms [R].

Lifestyle suggestions based on your result of: 2mm/hr

Your results are normal, you don't need any recommendations here!

Eosinophils (%)

Normal   High

About this marker

This test measures the percentage of white blood cells that are eosinophils.

Eosinophils are a type of white blood cell. They release granules (small particles) with enzymes during parasite infections and allergic reactions. They are important for immune system defense [R].

Normally, eosinophils constitute less than 5% of all your white blood cells.

Health effects based on your result of: 2.1%

Your eosinophil percentage is normal!

This means that you are unlikely to have a parasite infection [R].

For more precise information, check your eosinophil count.

Lifestyle suggestions based on your result of: 2.1%

Your results are normal, you don't need any recommendations here!

Eosinophils (Absolute)

normal   optimal   High   critical

About this marker

This test measures the levels of eosinophils in the blood.

Eosinophils are a type of white blood cell. They release granules (small particles) with enzymes during parasite infections and allergic reactions. They are important for immune system defense [R].

Normally, eosinophils constitute less than 5% of all your white blood cells.

Health effects based on your result of: 0.110^3/uL

Your eosinophil range is optimal!

This means that you are unlikely to have a parasite infection [R].

Optimal levels are associated with the lowest risk of hematological cancers and all-cause mortality [R].

A normal eosinophil percentage is between 0-5% of your total white blood cell count.

Lifestyle suggestions based on your result of: 0.110^3/uL

Your results are optimal, you don't need any recommendations here!

Estradiol

Low   Normal   High

About this marker

This test measures the amount of the estrogen estradiol (E2, 17 beta-estradiol) you have in the blood.

Estradiol is a sex hormone and steroid. Estradiol (E2) is the most active estrogen in the body. The other estrogens are estrone (E1) and estriol (E3). Estradiol is produced mainly in the ovary, however, the brain, fat cells, immune system cells, and bones can also produce estradiol. It is produced from testosterone, androstenedione, and progesterone, which are also sex hormones [R].

In the blood, estradiol exists in two forms. It is either bound to proteins (SHBG or albumin) or is unbound (free). It is difficult to measure or calculate free estradiol levels, and thus, most estradiol tests only measure bound estradiol [R].

Estradiol is important for female and male reproduction, brain and thyroid function, bone health and development, and maintaining a healthy weight.

Health effects based on your result of: 12.7pg/mL

Your estradiol levels are within the normal range!

This means you have a reduced risk of:

• Metabolic syndrome (a condition characterized by at least three of the following: high blood pressure, high blood sugar, excess stomach fat, high triglycerides, and low HDL cholesterol) [R]

• Osteoporosis and bone fractures [R]

• Heart disease [R]

• Breast cancer [R]

• Stroke [R]

Lifestyle suggestions based on your result of: 12.7pg/mL

Your results are normal, you don't need any recommendations here!

FSH

Low   Normal   High

About this marker

This test measures the amount of follicle stimulating hormone (FSH) in the blood.

Follicle stimulating hormone (FSH) is made by the pituitary gland.

FSH production is controlled by a system of hormones produced by the pituitary gland, hypothalamus, and ovaries or testes [R, R].

In men, FSH stimulates sperm production and testicular growth. Testosterone and inhibin controls FSH production - high testosterone levels causes FSH secretion to decrease, and low testosterone levels causes FSH secretion to increase [R].

In women, FSH helps with development during puberty and proper ovarian function. It also controls estrogen secretion. During the first half of the menstrual cycle, FSH rises, and then decreases after ovulation [R].

People normally measure their FSH levels when they are [R]:
• Going through menopause
• Having difficulty getting pregnant
• Having irregular menstrual periods
• Having symptoms of pituitary or hypothalamic disorders
• Having symptoms of testicular or ovarian disease

Health effects based on your result of: 3.2mIU/mL

Your FSH levels are within the normal range!

This means that you most likely do not have any fertility problems, and that you have a lower risk of:
• Polycystic ovary syndrome (PCOS) [R]
• Erectile dysfunction [R]
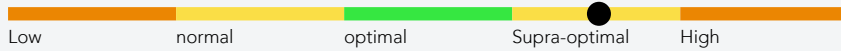• Irregular menstrual cycle [R]
• Infertility [R]

Lifestyle suggestions based on your result of: 3.2mIU/mL

Your results are normal, you don't need any recommendations here!

Ferritin, Serum

Low   normal   optimal   Supra-optimal   High

About this marker

This test measures your levels of ferritin, a protein the body uses to store the mineral iron. This test therefore serves as a measurement of the total amount of iron stored in your body.

Ferritin is an iron-storing protein. It is important for maintaining proper levels of iron, and making sure that iron is available for the different bodily processes that need it.

Iron is critical for the formation of red blood cells, and helps convert oxygen into usable cellular energy. However, iron by itself can be toxic, primarily by producing free radicals that cause oxidative damage to the body's cells. For this reason, your body uses special proteins like ferritin to safely store and transport iron to where it is needed, which protects cells from having their DNA damaged through over-exposure to iron [R].

In the blood, ferritin also plays roles in immune system function, inflammation, and cancer [R].

Ferritin tests can be used to diagnose iron-deficiency anemia, fainting spells (syncope), chronic kidney disease, various infections, and cancers [R].

Health effects based on your result of: 280ng/mL

Your ferritin levels are within the normal range, but are higher than optimal.

High ferritin levels can indicate iron overload (excess iron in the body). Having too much iron can damage cells and organs (via oxidative stress) [R, R].

Even if your iron levels are normal, high ferritin levels can cause problems by "locking away" too much of your body's iron in long-term storage, which can mean that not enough iron is available for important processes like the formation of new blood cells [R].

High ferritin levels and/or excess iron may contribute to chronic conditions such as:

• Type 2 diabetes [R]

• Atherosclerosis [R, R]

• Non-alcoholic fatty liver disease [R, R]

• Hepatitis C [R]

Levels in this range are linked to an increased risk of all-cause mortality [R, R].

The most common causes of high ferritin are:

• Inflammatory conditions, such as rheumatoid arthritis and chronic kidney disease [R, R, R]

• Autoimmune disorders [R, R]

High ferritin can also be caused by:

• Alcohol [R, R]

• Smoking [R, R]

• Infections [R, R]

• Metabolic syndrome [R, R]

• Diabetes [R, R]

Symptoms of high ferritin include:

• Lack of energy and fatigue [R, R]

• Weight loss [R]

• Stomach pain [R]

• Joint pain [R]

• Loss of sex drive [R, R]

Lifestyle suggestions based on your result of: 280ng/mL

Ferritin increases during infections and inflammatory disorders and addressing these can help lower ferritin back to normal.

Regularly exercising will help prevent your iron and ferritin levels from becoming too high [R, R].

Reducing your alcohol intake can help prevent increases in iron and ferritin [R].

Coffee can inhibit iron absorption from food. Thus, drinking more coffee may help prevent high iron and ferritin levels [R].

Drinking more tea can also help inhibit iron absorption. This includes green tea, as well as herbal teas, such as chamomile, lime flower, pennyflower, mint, and vervain [R, R, R, R].

Avoid foods that are high in iron, such as red meat, fish, and poultry [R].

Getting more fibers and grains in your diet can help reduce your iron and ferritin levels. Fiber and phytic acid (from whole grains) reduce iron absorption from food [R, R].

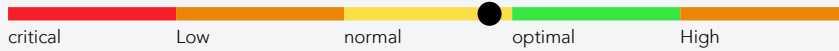Some other foods that can reduce iron absorption are cocoa [R] and chili spice [R].

Supplements that can help:

• Calcium [R]

• Manganese [R]

• Zinc [R]

• Curcumin [R]

• Grape seed extract [R, R]

• EGCG [R]

Folate

critical   Low   normal   optimal   High

About this marker

This test measures the amount of vitamin B9 in the blood.

Vitamin B9, also known as "folate" or "folic acid", is a water-soluble vitamin that is involved in a variety of metabolic functions [R, R, R].

It is required for amino acid metabolism and DNA synthesis [R, R, R]. It also:

• acts as an antioxidant [R]

• helps create and grow blood cells [R]

• maintains the health of the nervous system [R]

Folate cannot be created in the body, and must be consumed from dietary sources or vitamin supplements [R, R].

Vitamin B9 that comes from food sources is generally referred to as "folate," while "folic acid" is the synthetic form that is most commonly found in supplements [R, R].

The liver is responsible for controlling the absorption and metabolism of dietary folate [R]. Folate is also stored primarily in the liver, with the remainder mostly being found in circulating blood, which is what your blood test measures [R].

Folate intake and supplementation have many beneficial effects:

• Getting the recommended daily dietary intake of folate is associated with reduced risk of cancer among healthy populations [R, R, R, R, R, R].

• Folate levels are also correlated with lower blood pressure [R, R], reduced risk of stroke [R, R], and better overall heart and blood vessel health [R, R, R, R, R].

• Folate improves glucose levels in patients with type 2 diabetes [R].

• When combined with zinc, folic acid supplementation may help increase sperm count [R, R].

It has been estimated that the prevalence of folate deficiency among women may be as high as 86% [R].

Supplementing with folic acid during pregnancy may reduce the likelihood of heart defects, autism, and other nervous system defects in children [R, R, R, R, R, R, R, R].

Health effects based on your result of: 15.1ng/mL

Your vitamin B9 levels are within the normal range, but are lower than optimal.

Folate levels in this range are linked with a higher risk of all-cause mortality [R].

The most common cause of mild vitamin B9 deficiency is insufficient dietary intake [R].

Other causes include:

• Aging. The digestive system becomes less efficient at absorbing nutrients with age, meaning that older people are at a higher risk of folate deficiency (as well as nutritional deficiencies in general) [R, R, R].

• Chronic alcohol consumption. Alcohol can interfere with the absorption of folate by the intestines and the kidneys [R, R].

• Smoking [R, R]

• Conditions that decrease gut nutrient absorption, such as celiac disease and inflammatory bowel disease (IBD) [R, R, R]

Symptoms of folate deficiency can include [R]:

• Weakness [R]

• Confusion [R, R]

• Memory problems [R, R]

• Shortness of breath [R]

• Increased oxidative stress [R, R]

• Depression [R, R, R, R, R, R, R, R, R, R]

Lifestyle suggestions based on your result of: 15.1ng/mL

Folic acid (the synthetic version of vitamin B9) is not absorbed as well as naturally-occuring folate in foods [R, R]. That is why it is best to get your vitamin B9 from natural sources.

Natural dietary sources of folate include [R, R, R, R, R]:

• Leafy green vegetables, such as spinach, kale, arugula, broccoli

• Other vegetables including asparagus, okra, brussel sprouts, cauliflower, beets, corn, celery, carrots, and squash

• Beans, peas, and lentils

• Nuts and seeds

• Fruits, including citrus fruits

• Beans

• Yeast

• Meat products including chicken, turkey, lamb, beef, and pork liver

The cooking process can eliminate as much as 90% of the folate content of cooked foods [R]. Therefore, it is best to eat plant sources of folate raw whenever possible.

Many countries (including the US and Canada) have made it a requirement to fortify common foods, such as cereals, pasta, flour, grains, and bread, with folic acid to prevent widespread deficiencies [R, R, R, R, R].

You should also cut back on alcohol, as it can interfere with nutrient absorption by the intestines and the kidneys [R, R].
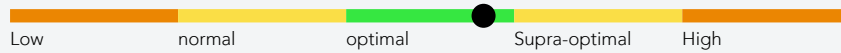
Also, reduce or quit smoking [R, R].

Supplements that can help:

• 5-MTHF [R]

Globulin, Total

| Low | normal | optimal | Supra-optimal | High |

About this marker

This test measures the amount of globulins in your blood, a group of proteins that help transport nutrients and fight infections.
Globulin proteins include carrier proteins, enzymes, antibodies (immunoglobulins), and other proteins. Most globulins are made by the liver, while others are made by the immune system. They help transport nutrients and fight infections. Measuring your globulin levels can help diagnose whether or not you have an inflammatory disorder or infection, because increased antibody production can signal these diseases [R].

Health effects based on your result of: 2.8g/dL

Your globulin levels are optimal! This means that you probably have a good balance of carrier proteins, enzymes, and antibodies that are needed for many biological processes. It also probably means that you do not have a viral infection or an inflammatory or immune disorder [R].
Globulin in this range is associated with the lowest risk of all-cause mortality [R].
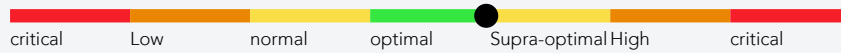
Lifestyle suggestions based on your result of: 2.8g/dL

Your results are optimal, you don't need any recommendations here!

Glucose, Fasting

| critical | Low | normal | optimal | Supra-optimal | High | critical |

About this marker

This test measures the level of glucose in your blood after at least 8 hours of fasting.

Glucose is a sugar that our body uses to make energy. We get glucose by consuming carbohydrate-rich foods, such as bread, pasta, cereals, fruits, and fruit juices. When we fast, our body either releases glucose from internal stores, or it can create glucose from fats, amino-acids, and other available sources [R].

Our levels of glucose are controlled by hormones such as insulin (which helps store glucose from blood into the tissues) and glucagon (which helps release more glucose into the blood). When you eat, insulin is released into the blood, and makes sure that the glucose either gets stored in the liver, or taken to muscles where it is used for energy. When you are fasting, glucagon makes sure your body has enough energy to function properly [R].

This test will tell you if you have a blood sugar regulation problem. Alternatively, blood glucose levels can indicate a metabolic disorder or disease. It can point out issues such as insulin resistance, hormonal imbalances, pancreas, liver or kidney disease.

Health effects based on your result of: 93mg/dL

Your glucose levels are optimal! Make sure to also check your HbA1c and insulin, as these will help you get a more accurate and comprehensive picture of your blood sugar control.

Your optimal glucose levels put you at significantly reduced risk of:

• Blood clots [R]

• Elevated blood pressure [R]

• Metabolic syndrome [R]

• Heart disease [R]

• All-cause mortality [R, R, R, R]

Lifestyle suggestions based on your result of: 93mg/dL

Your results are optimal, you don't need any recommendations here!

Glucose, Urine

● Negative

About this marker

This test checks whether you have glucose in your urine.

Glucose is a sugar that our body uses to make energy. We get glucose by consuming foods rich in carbs, such as bread, pasta, cereals, fruits, and fruit juices. When we fast, our body either releases glucose from internal stores, or it can create glucose from fats, amino-acids, and other available sources [R].

Under normal circumstances, your kidneys recycle all of the glucose from your blood - they send it back into the circulation because it is a valuable source of energy. But when there is either too much glucose in the blood, or your kidneys are not working as well as they should, you will end up with glucose in your urine.

Urine glucose is one of the commonly tested markers in routine urinalysis. It is less commonly ordered on its own, because glucose blood tests are more accurate and easier to use. It may be ordered if blood glucose testing is difficult or not possible. Diabetics can use the urine glucose test to monitor their sugar control [R].

Depending on the method used, the results may be influenced by vitamin C (ascorbic acid), which can cause a false negative reading. It is best to avoid vitamin C-containing supplements before doing this test [R, R].

Health effects based on your result of: Negative

Your urine glucose test is negative. This is good, as it means that you don't have elevated amounts of glucose in your urine. Your kidneys should be working properly, and your blood glucose levels are probably under control.

Lifestyle suggestions based on your result of: Negative

Your value is normal, you don't need any recommendations here.

HDL-Cholesterol

| Low | optimal | Supra-optimal | High |

About this marker

This test measures the amount of cholesterol carried around by HDL particles in the blood.

High-density lipoprotein (HDL) is a group of proteins and fat-like molecules called phospholipids. They transport cholesterol from the cells and carry them back to the liver where they are removed from circulation. Cholesterol is a key component of cell membranes and is used by the body to create steroid hormones (testosterone, estrogens, cortisol, etc.), bile, and vitamin D. HDL-C is a measure of the amount of cholesterol being carried around by HDL particles, not the number of the particles themselves [R].

HDL is made in the liver and released into the circulation where it removes excess cholesterol (and other lipids) from cells and brings them back to the liver where they are removed in bile. Cholesterol transported by HDL is known as "good cholesterol" because it is being removed from cells and artery walls, which helps prevent, reduce, and even reverse the hardening of the arteries (atherosclerosis) and accumulation of fatty plaques [R].

Higher HDL-C levels are associated with lower risk of cardiovascular disease but it is still unclear whether this relationship is causal (i.e. whether HDL-C prevents cardiovascular disease) [R].

There is a misconception that the higher HDL levels get the better. However, higher HDL levels are associated with increased risk of infection, heart disease, and all-cause mortality [R, R,R, R, R, R].

Health effects based on your result of: 49mg/dL

Your HDL-C is optimal!

Based on your HDL-C levels you have the lowest risk of all-cause mortality [R, R, R, R, R, R].

You also have a lower risk of:

• Infection diseases [R]
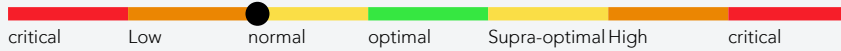
• Heart disease (including heart attack and stroke) [R]

Lifestyle suggestions based on your result of: 49mg/dL

Your results are optimal, you don't need any recommendations here!

HGB

| critical | Low | normal | optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of hemoglobin in your blood.

Hemoglobin is a protein found in red blood cells that transports oxygen from the lungs to the rest of the body. It contains the mineral iron, which helps it carry oxygen. After the oxygen is used, carbon dioxide is carried back to the lungs by hemoglobin, where it is exhaled. Hemoglobin is measured as part of a complete blood count (CBC) test [R].

Hemoglobin levels are used to diagnose anemia and polycythemia (increased production of red blood cells).

Both low and high hemoglobin are bad. They both decrease the tissue oxygen supply, although by different mechanisms. High hemoglobin further increases oxidative stress and inflammation, and the risk of high blood pressure, metabolic syndrome, and blood clots [R, R, R, R, R, R].

Health effects based on your result of: 13.4g/dL

Your hemoglobin levels are below normal!
Low hemoglobin levels indicate anemia [R]. This means that your blood carries oxygen less efficiently.
Low hemoglobin increases the risk of death from all causes [R, R].
The most common causes of low hemoglobin levels include:
• Not consuming enough iron through your diet [R]
• Diets high in phytate (found in grains, nuts, and seeds) and polyphenols (found in nuts, tea, and coffee) - these can decrease iron absorption [R, R]
• Helicobacter pylori infection [R]
• Low stomach acid [R, R, R]
Less common causes of low hemoglobin include:
• Vitamin B12 deficiency [R]
• Folate deficiency [R]
• Vitamin B6 deficiency [R]
• Vitamin A deficiency [R, R]
• Copper deficiency [R]
• Endurance exercise (sports anemia) [R]
• Obesity [R]
• Upper GI bleeding due to stomach and small intestinal ulcers or stomach cancer [R]
• Other types of blood loss, including heavy menstrual bleeding and frequent blood donation [R, R]
• Bariatric and other weight loss surgery [R]
• Autoimmune gastritis (a disease that destroy the cells that produce stomach acid) [R]
• Celiac disease [R]
• Irritable Bowel Syndrome [R]
• Chronic infection (including HIV and malaria) [R, R, R]
• Inflammatory disorders such as rheumatoid arthritis and inflammatory bowel disease [R, R]
• Liver disease [R]
• Kidney failure [R]
• Hypothyroidism [R]
• Heavy metals and toxins [R, R, R]
• Sickle-cell disease [R]
• Beta-thalassemia (a genetic disorder that reduces the production of hemoglobin) [R]
• Aging [R]
• Cancer [R, R]
Hemoglobin is normally decreased in pregnancy [R].
Drugs that may decrease hemoglobin levels include:
• Nonsteroidal anti-inflammatory drugs [R]
• Antiviral drugs (daclatasvir plus asunaprevir) used to treat hepatitis C [R]
Symptoms of low hemoglobin include:
• Fatigue [R]
• Headaches [R]
• Shortness of breath [R]
• Dizziness [R]
• Poor concentration [R]
• Fast or irregular heartbeat [R]
• Intolerance to exercise [R]
• Cold hands and feet (inability to maintain core body temperature) [R]

Lifestyle suggestions based on your result of: 13.4g/dL

Address any potential medical issues!

Iron deficiency is the most common cause of low hemoglobin. You can increase your iron levels by consuming foods high in iron. For example, iron is present in relatively high amounts in red meat, eggs, oysters, spinach, chocolate and legumes. Vegetarians who eat a varied and well-balanced diet are not at any greater risk of iron deficiency anaemia than non-vegetarians [R, R].

Low vitamin B12 levels can also cause low hemoglobin levels, as it is needed to make red blood cells. Foods rich in B12 which include organ meats, clams, oysters, beef, chicken, eggs, milk, cheese [R, R, R].

Folate (vitamin B9) is also necessary to produce red blood cells so it is recommended to increase consumption of folate-rich foods, including dark green leafy vegetables, eggs, beets, broccoli, Brussel sprouts [R, R].

Another vitamin involved in red blood cell production includes vitamin B6. You should consume foods rich in vitamin B6 include brewer's yeast, wheat germ, organ meats, peanuts, potatoes [R].

A deficiency in copper can also cause anemia. If deficient, you should consume foods high in copper, which include organ meats, nuts and seeds, chocolate [R, R].

Reduce your consumption of fish high in mercury (tuna, swordfish, and king mackerel) as these can negatively affect your red blood cells [R, R].

Reduce your consumption of tea/coffee, because they contain chemicals that can bind to iron and decrease its absorption [R].

Reduce the use of antacids and over the counter medications for ulcers because this can lower stomach acid and decrease iron absorption in your body [R].

Alcohol consumption should be limited as it decreases red blood cell production [R].

Exercise should only be performed in moderation as athletes can be more susceptible to iron loss, and over-exercising can cause damage to red blood cells [R].

Supplements that can help:

• Iron. Iron supplements should be taken with caution and only if iron deficient [R]

• Vitamin C - helps the body absorb more iron [R]

• Vitamin A (if deficient) - it stimulates red blood cell production [R, R, R]

• Vitamin D (if deficient) [R]

• Vitamin E [R]

• Zinc (if deficient) [R]

• Copper (if deficient) [R]

• Selenium [R]

• Beta-carotene - it protects red blood cells from damage [R]

Hemoglobin A1c

Low	normal	optimal	Supra-optimal	High	critical
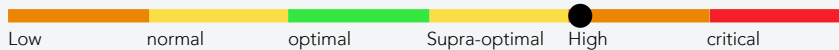
About this marker

HbA1c is a measure of your 3-month average blood glucose levels.

When circulating in the blood, glucose (commonly referred to as blood sugar) sticks to hemoglobin found inside red blood cells and forms glycated hemoglobin (HbA1c). The higher your blood sugar, the more HbA1c there will be in your blood. HbA1c comprises approximately 5% of a normal adult's hemoglobin. Because red blood cells that carry hemoglobin live approximately 3 months, HbA1c can be used as a measure of average blood sugar levels over the past 3 months [R, R].

Health effects based on your result of: 5.6%

Your HbA1c values are in the normal range but slightly above optimal.

You may have a slightly increased risk of all-cause mortality [R, R, R, R]

These factors increase HbA1c:

• Iron deficiency anemia [R, R, R, R]

• Vitamin B12 deficiency [R]

• Being overweight [R]

• Hyperbilirubinemia (high bilirubin) [R]

• Chronic kidney disease [R, R]

• H. pylori infection [R, R]

• Periodontal (gum) disease [R, R]

• Smoking [R, R]

• Chronic exposure to toxins such as polychlorinated biphenyls (PCB) and organochlorine pesticides (OCP) [R]

• Drugs such as statins and opiates [R, R]

Lifestyle suggestions based on your result of: 5.6%

Eat your veggies. They improve blood sugar control and HbA1c levels [R].

Engage in moderate to vigorous exercise. Exercise improves the way our body uses glucose and lowers HbA1c levels [R, R].

Hydrate. Drinking water decreases your odds of having elevated HbA1c [R].

Consider losing weight if overweight [R].

Improve your oral hygiene and address any existing periodontal (gum) issues such as inflammation, as these can increase HbA1c [R, R].

Reduce or quit smoking. Smoking increases HbA1c levels [R, R, R].

Stress and emotions impact many aspects of your body, including your HbA1c levels. Lower life satisfaction is associated with higher HbA1c. Don't neglect your emotional health! Find healthy ways to cope with stress and any emotional issues that may arise [R, R].

If possible, avoid intermediate and long-term exposure (3 months to >1-year) to air pollution. People exposed to higher levels of air pollution tend to have higher HbA1c [R, R, R].
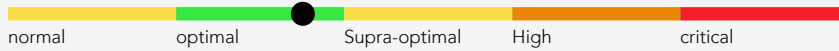
Supplements that can help:

• Carotenoids [R]

• Probiotics (L. fermentum) [R]

• Chromium [R]

• Curcumin [R]

• Dark chocolate [R]

• Iron. Iron supplements should be taken with caution and only if iron deficient [R]

• Vitamin B12 (if deficient) [R]

Homocysteine

normal   optimal   Supra-optimal   High   critical

About this marker

This test measures the levels of the amino acid homocysteine.

This test can help determine if you are folate- or vitamin B12-deficient. It can also tell if you are at increased risk of heart attack or stroke. Finally, it helps diagnose a rare inherited disorder called homocystinuria.

Homocysteine is an amino acid your body produces from another amino acid, called methionine. It is usually found in very small amounts in your body. That's because your body converts it efficiently into other products, such as cysteine, with the aid of vitamins B6, B12, and folate (B9). Higher homocysteine can indicate a deficiency of these vitamins [R].

Higher levels of homocysteine contribute to the narrowing and hardening of the arteries, and may increase the risk of heart disease [R].

Higher levels of homocysteine are also associated with other diseases including:

• Depression [R]
• Dementia [R, R]
• Alzheimer's disease [R]
• Parkinson's disease [R]
• Osteoporosis [R, R]

A high-protein meal can significantly increase homocysteine levels. Therefore, you should fast throughout the night before your blood test to ensure the most accurate results [R].

Health effects based on your result of: 7.7umol/L

Your homocysteine levels are optimal!

This suggest that your body is able to make efficient use of important vitamins in your diet, such as vitamin B6, B9 (folate), and B12.

Based on your homocysteine levels, you have the lowest risk of dying of all causes [R, R, R, R, R, R].
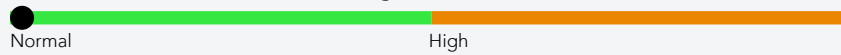
Lifestyle suggestions based on your result of: 7.7umol/L

Your results are optimal, you don't need any recommendations here!

Immature Granulocyte %

Normal High

About this marker

This test measures the percentage of granulocytes in your blood that are immature.
Immature granulocytes are white blood cells cells that are still maturing. They are normally located in the bone marrow, and have not yet matured into granulocytes. Granulocytes are white blood cells that contain small particles (granules) with enzymes, that when released into the bloodstream, kill bacteria, viruses, and fungal cells [R, R].
Under normal conditions, the immature granulocyte percentage (IG%) in our blood is less than 1%. Immature granulocyte levels increase rapidly during infections, inflammation, or cancer [R, R].
The IG % test may be used along with the WBC and CRP tests to predict infection and severity of infections [R].

Health effects based on your result of: 0%

Your immature granulocyte percentage (IG%) is within the normal range!
This means that, based on your levels, you probably do not have any infections or inflammation [R, R].
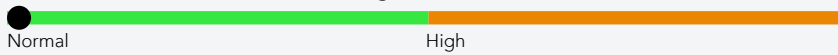
Lifestyle suggestions based on your result of: 0%

Your results are normal, you don't need any recommendations here!

Immature Granulocytes (Abs)

Normal | High

About this marker

This test measures the amount of granulocytes in your blood that are still immature.

Immature granulocytes are white blood cells cells that are still maturing. They are normally located in the bone marrow, and have not yet matured into granulocytes. Granulocytes are white blood cells that contain small particles (granules) with enzymes, that when released into the bloodstream, kill bacteria, viruses, and fungal cells [R, R].

Under normal conditions, the immature granulocyte percentage in our blood is less than 1%. Immature granulocyte levels increase rapidly during infections, inflammation, or some types of cancer [R, R].

This test may be used along with the WBC and CRP tests to check for infections and estimate their severity [R].

Health effects based on your result of: 0x10E3/ul

Your immature granulocytes are within the normal range!

This means that, based on your levels, you probably do not have any infections or inflammation [R, R].
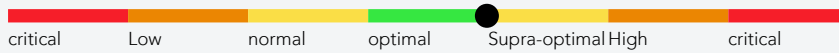
Lifestyle suggestions based on your result of: 0x10E3/ul

Your levels are normal, you don't need any recommendations here.

Iron

critical | Low | normal | optimal | Supra-optimal | High | critical

About this marker

This test measures the amount of iron in your blood.

Iron (Fe) is a metal that plays an essential role in the body. Iron is needed for [R, R, R, R, R, R]:

• Red blood cell production (erythropoiesis)
• Oxygen and carbon dioxide transport in the blood (as part of hemoglobin)
• Oxygen transport and storage in muscles (as part of myoglobin)
• Energy production in the heart and muscles
• Brain development and normal brain function
• Immune system development and immune response
• Resistance to infections
• Production and degradation of DNA

However, blood iron is not a perfect measure of iron status in the body because it fluctuates daily and can increase after you ingest iron-rich foods.

Instead, ferritin, transferrin, and total iron binding capacity (TIBC) measurements are better indicators of your iron status [R, R].

Health effects based on your result of: 119ug/dL

Your iron levels are optimal!

You should be experiencing all the health benefits of proper iron levels, such as healthy red blood cells and normal immune function.

Iron levels in the optimal range decrease your risk of:

• ADHD [R]
• Depression and anxiety [R]
• Bipolar disorder [R]
• Alzheimer's disease [R]
• Lupus [R]
• Thyroid dysfunction [R]
• Eye diseases such as cataracts [R]
• Diabetes [R]
• Heart failure, heart disease, and mortality due to heart disease [R, R]
• Cancer and mortality due to cancer [R, R, R]
• All-cause mortality [R]

Lifestyle suggestions based on your result of: 119ug/dL

Your results are optimal, you don't need any recommendations here!

Ketones, urine

● Negative

About this marker

This test determines if there are ketones in your urine.

Ketone bodies are made by the liver from fatty acids during periods of fasting or in response to low carbohydrate diets, prolonged intense exercise, alcoholism, and untreated diabetes. They belong to a general class of molecules called ketones [R].

When glucose (sugar) is unavailable for cells to use either because blood levels are low, or insulin (which is needed to transport glucose into cells) levels are low, ketone bodies are produced as an alternative fuel source. There are three types of ketone bodies [R]:

• acetoacetic acid/acetoacetate

• beta-hydroxybutyric acid/beta-hydroxybutyrate

• acetone

Ketones are always present in low levels in the blood. But when you are healthy and eat a diet with enough carbohydrates, there are little to no ketones in the urine as they are being used completely by the body. However, blood ketone levels rise considerably in diabetics with very high blood sugar levels and inadequate insulin levels. The kidneys pass these ketones into the urine. This is known as diabetic ketoacidosis, and it is a serious, sometimes life-threatening condition [R].

In people without diabetes, ketones levels mainly rise due to increased fat breakdown and low carbohydrate diets [R]

This test is a part of a routine urinalysis. Ketones are also routinely tested in diabetics to screen for and monitor diabetic ketoacidosis.

Health effects based on your result of: Negative

Congratulations, your result is negative! This means that your body is not producing abnormally high levels of ketones due to high sugar levels and you do not have ketoacidosis.

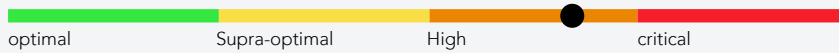Alternatively, if you are on a ketogenic diet, you are not in ketosis.

Lifestyle suggestions based on your result of: Negative

Your results are negative for nitrite. You don't need any suggestions here!

LDL-Cholesterol

| optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of cholesterol that is carried by LDL particles in the blood.

Low-density lipoprotein (LDL) is a group of proteins and fat-like molecules called phospholipids that transports fats including cholesterol in the blood-stream so they can be used by cells and tissues. Cholesterol is a key component of cell membranes and is used by the body to create steroid hormones (testosterone, estrogens, cortisol, etc.), bile, and vitamin D. LDL-C is a measure of the amount of cholesterol being carried around by LDL particles, not the amount of the particles themselves [R].

Very low-density (VLDL, similar to LDL but contains less cholesterol) is produced in the liver from cholesterol, fats, proteins, and phospholipids and is converted into LDL in the bloodstream. The liver also helps control LDL levels by clearing them from circulation. Cholesterol can be made in the liver or it can come from the diet [R].

Low-density lipoprotein cholesterol, or LDL-C, is considered the "bad cholesterol" because it can penetrate arterial walls where it combines with oxygen (oxidizes), a key step in the development of the hardening of the arteries and heart disease. Unsurprisingly, LDL-C level is a strong risk factor for developing heart disease. In fact, LDL-C has replaced total cholesterol (the amount of LDL-C, HDL-C, and VLDL-C combined) as the primary risk factor for heart disease and the main target for clinicians when treating high total cholesterol levels [R, R].

However, studies looking at increased mortality from all causes, including heart disease, have not found a clear association with high LDL-C levels. Indeed, some studies have found that levels above the traditionally recommended amount (100 mg/dl) decrease the risk of mortality from all causes [R, R].

Health effects based on your result of: 168mg/dL

Your LDL-C levels are above the normal range!

High LDL-C levels are strongly linked to an increased risk of both developing and dying from heart disease, heart attack, and stroke [R, R, R].

The most common causes of high LDL-C levels are:

• Lack of physical exercise [R]

• Drinking coffee [R]

• High-cholesterol diet (in about one-quarter of the population) [R]

• High-saturated fat diet [R]

• Smoking [R]

• Vitamin B12 deficiency [R]

• Hypothyroidism [R]

Less common causes of high LDL levels include:

• H. pylori infection [R]

• Kidney damage [R]

• Exposure to toxins (e.g. persistent organic pollutants (POPs)) [R, R]

• Familial hypercholesterolemia (genetic disorder that causes high cholesterol levels) [R]

Drugs that may increase LDL-C levels include [R]:

• Growth hormone [R]

• Estrogen replacement and selective estrogen receptor modulators (SERMS) [R]

• Anabolic steroids [R]

• Retinoids, vitamin A derivatives used to treat skin problems [R]

• Sotalol (Betapace), a beta-blocker), used to treat heart rhythm problems [R]

• Amiodarone (Cordarone, Nexterone), a drug used to treat irregular heartbeats [R]

• Corticosteroids, drugs used to treat inflammation [R]

• Immunosuppressive drugs (cyclosporine (Neoral, Sandimmune) and tacrolimus (Prograf, Advagraf, Protopic), used to treat autoimmune disease [R]

• Protease inhibitors, antiviral drugs used to treat HIV [R]

• Danazol (Danocrine), a drug used to treat endometriosis, fibrocystic breast disease, and hereditary angioedema [R]

• Loop and thiazide diuretics, used to get rid of excess weight in the body and lower blood pressure [R]

High LDL-C levels do not cause symptoms directly and individuals will only show symptoms related to the cause of high LDL-C levels, such as hypothyroidism and vitamin B12 deficiency.

Lifestyle suggestions based on your result of: 168mg/dL

Increase your consumption of foods high in phytosterols (a type of cholesterol made by plants) including nuts, seeds, and legumes. Phytosterols compete with cholesterol for reabsorption in the gut, which lowers cholesterol levels [R].

Consider adopting a Mediterranean diet rich in fatty fish, olive oil, and vegetables and fruits [R].

Increase your consumption of foods rich in monounsaturated fatty acid such as olives, avocados, and macadamia nuts [R].

Engage in aerobic exercise [R].

Lose weight if you are overweight [R].

Reduce or quit smoking [R].

Reduce or stop coffee consumption [R].

Supplements that can decrease LDL-C levels:

• Garlic [R]

• Probiotics and prebiotics (B. Longum, fructoologiosaccharides) [R]

• Alpha lipoic acid [R]

• Ginger [R]

• Cinnamon [R]

• Black cumin seed (Nigella sativa) [R]

• Amla berry [R]

• Green tea [R]

• Vitamin C [R]

• Red yeast rice extract [R]

• CoQ10 [R]

• Broccoli sprouts [R]

• Vitamin B12 (if deficient) [R]

Lymphocytes (%)

Low | Normal | High

About this marker

This test measures the percentage of white blood cells that are lymphocytes.

Lymphocytes are a type of white blood cell, and they are important for immune system function.

There are three different types of lymphocytes – natural killer cells, B cells, and T cells [R].

• Natural killer cells (NK cells) kill tumor cells and cells that have been infected by viruses.

• B cells produce antibodies. The antibodies attack cells foreign to the body (bacteria, toxins, and viruses).

• T cells destroy the body's own cells, including cancerous cells or cell that have been taken over by viruses.

Lymphocytes also produce cytokines, which are small proteins that are important for immune system responses, inflammation, and infections [R].

Lymphocyte levels can vary according to the race, gender, location, and lifestyle factors of the person.

Health effects based on your result of: 51.6%

Your lymphocyte percentage is above normal! This may be due to a high lymphocyte count, or abnormal counts of other white blood cells. Check your absolute lymphocyte count to establish if you have high lymphocytes (known as lymphocytosis).

Bacterial and viral infections can cause lymphocyte levels to increase. However, lymphocytosis does not necessarily mean that there is a problem with the immune system, and may only be temporary [R].

High lymphocyte count can be caused by:

• Viral infections such as hepatitis and Epstein-Barr virus (EBV) [R, R, R]

• Bacterial infections such as whooping cough and tuberculosis [R, R, R]

• Autoimmune disease [R]

• Lymphoma [R]

• Addison's disease [R]

There are rarely any outwardly-obvious symptoms that go along with high lymphocyte count. Instead, most symptoms are related to the infections and disorders that cause the increase in lymphocytes [R].
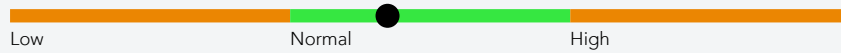
Lifestyle suggestions based on your result of: 51.6%

Address any underlying condition!

Check your absolute lymphocyte count to see if you need any lifestyle, diet, and supplement suggestions.

Lymphocytes (Absolute)

Low   Normal   High

About this marker

This test measures the levels of lymphocytes in the blood.

Lymphocytes are a type of white blood cell, and they are important for immune system function.

There are three different types of lymphocytes – natural killer cells, B cells, and T cells [R].

• Natural killer cells (NK cells) kill tumor cells and cells that have been infected by viruses.

• B cells produce antibodies. The antibodies attack cells foreign to the body (bacteria, toxins, and viruses).

• T cells destroy the body's own cells, including cancerous cells or cell that have been taken over by viruses.

Lymphocytes also produce cytokines, which are small proteins that are important for immune system responses, inflammation, and infections [R].

Lymphocyte levels can vary according to the race, gender, location, and lifestyle factors of the person.

Health effects based on your result of: 1.9x10E3/ul

Your lymphocytes are within the normal range!

A normal lymphocyte count means that you are well protected against infections [R].

It also means that you probably do not have the following diseases:

• Malnutrition [R]

• Autoimmune disorders, such as lupus and rheumatoid arthritis [R, R, R]

• Infections, such a HIV, malaria, hepatitis, and Epstein-Barr virus (EBV) [R, R, R, R, R]

• Bacterial infections, such as whooping cough and tuberculosis [R, R, R]

• Lymphoma (cancer of the immune system) [R]

Lifestyle suggestions based on your result of: 1.9x10E3/ul

Your results are normal, you don't need any recommendations here!

www.labtestanalyzer.com

MCH

Low   Normal   High

About this marker

This test measures the average amount of hemoglobin in your red blood cells. Hemoglobin is the protein that stores (binds) oxygen, which is what allows your blood to transport oxygen throughout your body.

Mean corpuscular hemoglobin (MCH) is normally part of a complete blood count, which measures your hemoglobin, hematocrit, and red blood cell count. It can be used to help diagnose anemias [R].

Health effects based on your result of: 27.5pg

Your mean corpuscular hemoglobin (MCH) is within the normal range!

This means that you [R]:

• Have healthy red blood cells

• Probably do not have anemia

• Are probably not deficient in various nutrients, such as iron, vitamin b12, or folate

Lifestyle suggestions based on your result of: 27.5pg

Your results are normal, you don't need any recommendations here!

MCHC

Low   Normal   High

About this marker

This test measures the average amount of hemoglobin per red blood cell, relative to the size of the cell. In other words, it tells you what percentage of your blood cells are made up of hemoglobin, the protein that helps transport oxygen in the blood.

Mean corpuscular hemoglobin concentration (MCHC) is normally part of a complete blood count, which measures your hemoglobin, hematocrit, and red blood cell count. It can be used to help diagnose anemias [R].

Decreased MCHC causes hypochromia ("hypo-" = low, "chromia" = color), which makes the red blood cells paler. Meanwhile, increased MCHC causes red blood cells to become darker, also known as hyperchromia [R, R].

Health effects based on your result of: 33.8g/dL

Your MCHC is within the normal range!
This means that you probably [R]:
• Have healthy red blood cells
• Do not have anemia
• Are not deficient in various nutrients, such as iron

Lifestyle suggestions based on your result of: 33.8g/dL

Your results are normal, you don't need any recommendations here!

MCV

Low   Normal   High

About this marker

This test measures the average size (volume) of the red blood cells in your body.

Mean corpuscular volume (MCV) is normally measured as part of a complete blood count, which measures your hemoglobin, hematocrit, and red blood cell levels.

Along with the red cell distribution width (RDW), MCV is used to diagnose many diseases, including anemia, thalassemia, liver disease, and iron deficiency [R].

Health effects based on your result of: 81.5fL

Your MCV (mean corpuscular volume) is within the normal range!

This means that you have healthy blood cells, are not deficient in nutrients such as copper or iron, and that you do not suffer from anemia [R].

Lifestyle suggestions based on your result of: 81.5fL

Your results are normal, you don't need any recommendations here!

MPV

| Low | Normal | High |

About this marker

This test measures the average size of the platelets found in your blood. An MPV test is typically included as part of a complete blood count (CBC) test to help diagnose platelet, bleeding, and bone marrow disorders.

Platelets are tiny cell fragments essential for normal blood clotting. They are formed in the bone marrow and are released into the blood to circulate [R].

Platelets are critical in keeping us from bleeding excessively when we are injured. When you cut yourself, for example, platelets stick together to plug the injury site. Other clotting factors are then recruited to the scene to prevent further bleeding [R].

Platelet size is larger when the body is producing increased numbers of platelets, so an MPV test can be used to determine platelet production in the bone marrow or platelet destruction problems [R].

Health effects based on your result of: 9.9fL

Your MPV is within the normal range! This indicates that your platelets are produced normally.

Lifestyle suggestions based on your result of: 9.9fL

Your results are normal, you don't need any recommendations here!

Monocytes (%)

Low | Normal | High

About this marker

This test measures the percentage of your white blood cells that are monocytes.
Monocytes are a type of white blood cell that protect against infections by foreign bodies such as bacteria, viruses, fungi, and protozoans.
These cells kill microorganisms, remove dead cells, and boost immune responses. However, they can also be involved in the development of several inflammatory diseases. They contribute to tissue destruction during infections and inflammatory diseases [R].

Health effects based on your result of: 7.8%

Your monocyte percentage is within the normal range!
This means you should be protected against infections and inflammation, and should be able to launch a healthy immune response when such conditions occur [R].
You should also check your absolute monocyte count, total white blood cell (WBC) levels and other white blood cell subtypes to see if these are also in their optimal ranges.

Lifestyle suggestions based on your result of: 7.8%

Your results are normal, you don't need any recommendations here!

Monocytes (Absolute)

Low   Normal   High

About this marker

This test measures the levels of monocytes in the blood.
Monocytes are a type of white blood cell that protect against infections by foreign bodies such as bacteria, viruses, fungi, and protozoans.
These cells kill microorganisms, remove dead cells, and boost immune responses. However, they can also be involved in the development of several inflammatory diseases. They contribute to tissue destruction during infections and inflammatory diseases [R].

Health effects based on your result of: 0.3x10E3/ul

Your monocyte count is within the normal range!
This means you should be protected against infections and inflammation, and should be able to launch a healthy immune response when such conditions occur [R].
Having an optimal monocyte count means you have a lower risk of:
• Viral, bacterial, and fungal infections [R]
• Heart Disease [R]
• Obesity [R]
• Diabetes [R]
• Death (mortality) [R]
You should also check your total white blood cell (WBC) levels and other white blood cell subtypes to see if these are also in their optimal ranges.

Lifestyle suggestions based on your result of: 0.3x10E3/ul

Your results are normal, you don't need any recommendations here!

Neutrophils (%)

Low   Normal   High

About this marker

This test measures the percentage of white blood cells that are neutrophils.

Neutrophils, also called polymorphonuclear leukocytes (PMNs), are the most abundant immune cells in the body, and play a critical role in fighting against infections. They contain granules filled with components (proteases, oxidants, and antimicrobial peptides) that when released into the bloodstream, kill bacteria, viruses, and fungal cells [R].

Neutrophils are produced by bone marrow. They have a short lifespan, which means the body has to constantly produce new ones [R, R].

Having a stable neutrophils helps protect against autoimmune diseases. However, high neutrophil levels may be a risk factor for developing heart disease, while low neutrophil levels can put you at greater risk for infection by invading organisms [R].

Health effects based on your result of: 37.7%

Your neutrophil percentage is lower than normal! This may be due to a low neutrophil count (known as neutropenia) or disturbances in levels of other white blood cells [R].

The most common causes of low neutrophil levels are:

• Autoimmune disorders, such as lupus and type 1 diabetes [R, R, R, R]

• Bacterial and viral infections, such as sepsis and HIV [R, R]

• Various cancers [R]

Other causes include:

• Vitamin B9 (folate) and B12 deficiencies [R, R]

• Chronic Fatigue Syndrome [R]

• Hepatitis Band C [R, R]

• Bone marrow failure [R, R]

• Radiation therapy [R, R]

• Drugs, including antibiotics, anticonvulsants, and chemotherapy [R, R, R, R]

Low neutrophils don't cause any particular symptoms, and patients usually only show symptoms related to associated diseases [R].
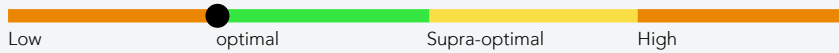
Lifestyle suggestions based on your result of: 37.7%

Address any existing underlying health issues!

Check your absolute neutrophil count for lifestyle, diet, and supplement recommendations.

Neutrophils (Absolute)

| Low | optimal | Supra-optimal | High |

About this marker

This test measures the levels of neutrophils in the blood.

Neutrophils, also called polymorphonuclear leukocytes (PMNs), are the most abundant immune cells in the body, and play a critical role in fighting against infections. They contain granules filled with components (proteases, oxidants, and antimicrobial peptides) that when released into the bloodstream, kill bacteria, viruses, and fungal cells [R].

Neutrophils are produced by bone marrow. They have a short lifespan, which means the body has to constantly produce new ones [R, R].

Having a stable neutrophil count helps protect against autoimmune diseases. However, high neutrophil levels may be a risk factor for developing heart disease, while low neutrophil levels can put you at greater risk for infection by invading organisms [R].

Health effects based on your result of: 1.4x10E3/ul

Your neutrophil levels are lower than normal!

Having a persistently (>6 months) low neutrophil level is a condition known as neutropenia [R].

People with extremely low levels of neutrophils (<0.5 x10^9/L) have a higher risk of infection [R].

The most common causes of low neutrophil levels are:

• Autoimmune disorders, such as lupus and type 1 diabetes [R, R, R, R]

• Bacterial and viral infections, such as sepsis and HIV [R, R]

• Various cancers [R]

Other causes include:

• Vitamin B9 (folate) and B12 deficiencies [R, R]

• Chronic Fatigue Syndrome [R]

• Hepatitis Band C [R, R]

• Bone marrow failure [R, R]

• Radiation therapy [R, R]

• Drugs, including antibiotics, anticonvulsants, and chemotherapy [R, R, R, R]

Neutropenia itself does not have symptoms, and patients usually only show symptoms related to its associated diseases. Some neutropenia patients may get fevers or sepsis due to immune system dysfunction [R].

Lifestyle suggestions based on your result of: 1.4x10E3/ul

Address any existing underlying health issues!

Moderate exercise over an extended period of time (moderate intensity bicycling for 30 min each day for two months) can improve neutrophil function and activity, but high-intensity, short-term exercise (one 30-min exercise session) does not [R].

Since eating a strict vegan or vegetarian diet can lower your neutrophil levels, adding meat to your diet can help increase your neutrophil levels [R].

Having good hygiene and protecting yourself from infections can keep your immune system healthy. This can reduce your chances of getting neutropenia [R].

Supplements that can help:

• Vitamin B9/folate/5-MTHF (if deficient) [R]

• Vitamin B12 (if deficient) [R]

• Garlic [R]

Nitrite, Urine
● Negative

About this marker

This test detects the presence of nitrites in your urine.

Nitrates and nitrites are both forms of nitrogen. They are found naturally in certain vegetables, like leafy greens, celery, and cabbage, but are also added to processed foods as a preservative [R].

Normally, your urine does not contain nitrite. However, if bacteria enters your urinary tract, they can convert nitrates (which are derived from dietary metabolites) into nitrites. For this reason, a urine nitrite test is frequently used to help diagnose urinary tract infections [R].

A nitrite test is usually done as part of a urinalysis test, which measures a number of other substances in your urine, including protein, ketones, and glucose [R].

To ensure reliable results for your test [R]:

• Eat a vegetable-rich diet before the day of the test to ensure that enough nitrate is present in your urine

• Take the test in the morning. Urine must be in the bladder for more than 1 hour for bacteria to convert nitrate to nitrite

• Stop taking antibiotics (if possible) at least 3 days beforehand

Health effects based on your result of: Negative

Your nitrite test result is negative. This means that you do not have nitrite in your urine.

However, a negative nitrite test does not necessarily mean that your urine is free of all bacteria, especially if you have symptoms of a urinary tract infection, because some bacteria do not produce nitrites.

Also, your test results can be falsely negative if you recently urinated or your urine is dilute [R].

Other factors that may cause false negative results include [R, R, R]:

• lack of nitrate in your diet

• acidic urine (pH is less than 6.0)

• blood, urobilinogen, or vitamin C in urine

• certain drugs (e.g. antibiotics)

Lifestyle suggestions based on your result of: Negative

Your results are negative for nitrite. You don't need any suggestions here!

Occult blood, Urine
● Negative

About this marker

This test determines if there is blood in your urine.

Blood in the urine (hematuria) can be either gross or microscopic (also called occult blood). Gross hematuria refers to blood that is visible in the urine, while microscopic, or occult, hematuria is blood in the urine that can only be detected using a microscope [R].

Blood in the urine is one of the most common findings on a urinalysis exam. In about 10-15% of cases, blood in the urine has no real cause, and is not of great concern. In other cases, blood in the urine can be due to many different diseases and conditions involving the kidneys or the bladder. The most common causes include infection, inflammation, and kidney stones [R, R, R].

Further tests are often required to determine the cause of a positive occult blood result [R].

False negative results can occur due to [R]:

• Vitamin C in the urine
• Dehydration (elevated specific gravity)
• Urine pH less than 5.1
• Proteinuria (abnormal quantities of protein in the urine due to kidney damage)
• The drug captopril (Capoten), used to treat high blood pressure

All of the above should be avoided before taking the test.

Health effects based on your result of: Negative

Your occult blood test result is negative! This means you don't have blood in your urine.
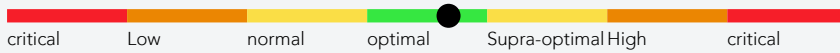
Lifestyle suggestions based on your result of: Negative

Your result is negative, you don't need any suggestions here!

Platelet Count

| critical | Low | normal | optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of platelets you have in your blood.
A platelet, also called thrombocyte, is a type of cell that helps blood to clot. Clotting helps slow down or stop bleeding, and helps wounds heal [R].
Platelets are also involved in immune system defense, inflammation, and tumor growth. Platelet dysfunction may cause problems with blood clots and prevent proper wound healing [R].

Health effects based on your result of: 240x10E3/ul

Your platelet count is optimal!
You are probably enjoying the the benefits of a normal platelet count, such as a healthy immune system, proper wound healing, and a lower risk of death [R].
Values in this range are also associated with the lowest risk of all-cause mortality [R, R, R, R, R, R].
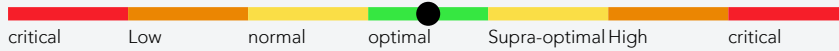
Lifestyle suggestions based on your result of: 240x10E3/ul

Your results are optimal, you don't need any recommendations here!

Potassium

critical   Low   normal   optimal   Supra-optimal   High   critical

About this marker

This test measures the amount of potassium in the blood.

Potassium has many important functions in our bodies. It helps balance fluids, it is important for blood pressure, it helps nerves and muscles communicate, and helps store nutrients (including glucose) inside cells [R, R, R, R]. Potassium is absorbed through the gut and eliminated by the kidneys through urine [R, R]. A potassium level is routinely tested as part of your complete metabolic panel (CMP) and it is important in evaluating heart, kidney, adrenal gland, muscle, and digestive system function.

Health effects based on your result of: 4.4mmol/L

Your potassium level is optimal! You can also check your sodium and chloride to make sure all of your other electrolytes are balanced.

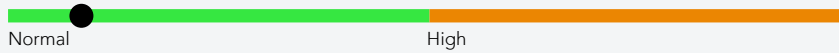Values in this range are linked to the lowest risk of all-cause mortality [R].

Lifestyle suggestions based on your result of: 4.4mmol/L

Your results are optimal, you don't need any recommendations here!

PSA Total

Normal   High

About this marker

This test measures the total amount of prostate specific antigen in your blood.

Prostate specific antigen (PSA) is a protein that is made in the prostate. There are two forms of PSA - complexed and free. Complexed PSA is bound to other proteins, while free PSA is not bound to anything. Total PSA measures the amount of both complexed and free PSA in the blood [R].

PSA tests are mainly used to screen for prostate cancer. However, since other things can influence PSA levels, a total PSA blood test is not specific enough to diagnose prostate cancer and there may be false-negative results. PSA levels increase as you age. Levels can also be high if someone has an enlarged prostate (benign prostatic hyperplasia) or prostate inflammation (prostatitis) [R, R, R].

PSA screening tests are recommended for healthy men over 40 years old, and in high risk groups such African Americans or people who have a family history of prostate cancer [R].

Health effects based on your result of: 0.36ng/mL

Your total PSA levels are within the normal range!

For men, this means that you probably do not have an enlarged prostate, prostate inflammation, or cancer [R]. You also have a lower risk of mortality due to prostate cancer [R].

However, low PSA levels may be caused by:

• Obesity and being overweight [R]

• Heavy alcohol drinking [R]

• NSAIDs, anti-inflammatory drugs including aspirin [R, R]

• Acetaminophen, a pain reliever and fever reducer (paracetamol, Tylenol, Panadol) [R]

These can all interfere with your PSA measurement.

Lifestyle suggestions based on your result of: 0.36ng/mL

Your results are normal, you don't need any recommendations here!

Protein, Total

Low | Normal | High

About this marker

This test measures your albumin and total globulin levels in your blood.

Proteins play an important role in many biological processes. They help with growth and development, nutrient and hormone transport, and immune function [R].

Normally, albumin makes up for more than half of blood proteins, and the remainder of the protein count is the total globulins [R].

Albumin is produced in the liver, and helps with fat metabolism. It also helps maintain osmotic pressure (prevents fluid from leaking out of blood vessels) as well as the transport of hormones, bilirubin, metals, vitamins, and drugs. Globulin proteins include enzymes, antibodies, carrier and other proteins [R].

Total serum protein is used to check for nutritional deficiencies, digestive problems, and dehydration [R].

Health effects based on your result of: 7.5g/dL

Your protein levels are within the normal range!

An optimal total protein level means that your body's biological processes can occur normally [R].

However, you should still check your albumin and total globulin levels. This is because a decreased albumin and increased globulin level can still result in a normal total serum (blood) protein level.

Lifestyle suggestions based on your result of: 7.5g/dL

Your results are normal, you don't need any recommendations here!

Protein, Urine
● Negative

About this marker

This test measures the level of protein that is released in your urine.

Proteins play an important role in many biological processes. They help with growth and development, nutrient and hormone transport, and immune function [R].

A total urine protein test is normally used to help monitor kidney function and diagnose kidney diseases. It may also help detect conditions that cause proteinuria (abnormally high protein levels in your urine) [R, R].

The most basic screening test for protein in the urine is the urine dipstick test, which is frequently measured during a routine physical. If your results show that you have high protein levels in your urine, a 24-hour urine protein test can subsequently be ordered to further determine total urine protein levels [R].

However, since a 24-hour test is time consuming, your doctor might order a protein–creatinine ratio test instead [R].

Health effects based on your result of: Negative

Your urine protein levels are negative!
This means that you do not have proteinuria and that your kidneys are likely healthy [R].

Lifestyle suggestions based on your result of: Negative

Your results are normal, you don't need any recommendations here!

RBC

Low   Normal   High

About this marker

This test measures the number of red blood cells (RBCs) in your blood.

The main function of these cells is supplying oxygen to your tissues. Tissues can't function properly without enough oxygen. Red blood cells bind oxygen in the lungs and deliver it to the tissues, where they pick up carbon dioxide produced by your cells. They release carbon dioxide in the lungs, bind oxygen, and go through the same process over and over again [R, R].

RBCs are made within the bone marrow, but many other factors are involved in their production. For example, iron, vitamin B12, folate, and copper are all necessary for RBC production. So is erythropoietin, a molecule produced by the kidneys [R].

RBCs have a lifetime of approximately 100-120 days [R, R].

The RBC value is a part of your complete blood count (CBC) test.

Health effects based on your result of: 4.87x10E6/uL

Your RBC level is within the normal range! Your tissues and your body should have enough oxygen to function optimally throughout the day.
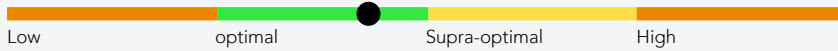
Lifestyle suggestions based on your result of: 4.87x10E6/uL

Your results are normal, you don't need any recommendations here!

RDW

| Low | optimal | | Supra-optimal | High |

About this marker

This test measures the variation of the size/volume of your red blood cells.

Red Blood Cell Distribution Width (RDW) is normally part of a complete blood count, which measures your hemoglobin, hematocrit, and red blood cell count. The RDW test measures how much your blood cells vary in size. Low values mean that your blood cells are roughly similar in size, whereas higher values indicate that there is more variety in how big each red blood cell is. Very high levels mean that your blood cells are very unequal in size -- a condition called anisocytosis [R, R].

Along with the MCV (mean corpuscular volume), a high RDW can serve as a sign of several underlying diseases, including [R, R, R, R]:

• Anemia
• Iron and deficiency
• Inflammation
• Injuries and bleeding/hemorrhage
• Liver disease
• Kidney disease
• Thalassemia

However, RDW can still be at a normal level in patients with leukemia, or certain types of anemia (such as aplastic anemia). Therefore, it is still important to keep an eye on your other blood-cell related test results to fully rule out these possibilities [R].

Health effects based on your result of: 12.5%

Your red blood cell distribution width (RDW) is optimal! This means that your red blood cells are a consistent size, and aren't abnormally shaped.

These results also indicate that you probably do not have anemia, iron deficiency, liver or kidney disease, or thalassemia [R, R].

You also have a lower risk of:

• Inflammation [R, R]
• Dementia and Alzheimer's [R, R]
• Atherosclerosis (plaque buildup in arteries) [R]
• Bloodstream infection [R]
• All-cause mortality [R, R, R, R]

Lifestyle suggestions based on your result of: 12.5%

Your results are optimal, you don't need any recommendations here!

Reticulocytes

Low   Normal   High

About this marker

This test measures the amount of reticulocytes in your blood.

Reticulocytes are newly formed and immature red blood cells. They are formed in the bone marrow.

Normally, a reticulocyte test is used to look at bone marrow function, because it is a good indicator of a person's ability to adequately produce red blood cells. You might also get a reticulocyte test if you have low red blood cell count, hemoglobin, or hematocrit.

Many diseases and conditions can affect red blood cell production and bone marrow function, such as anemia. Although reticulocyte tests can indicate a disease, it cannot be used to diagnose a particular disease on its own [R, R].

Health effects based on your result of: 0.7%

Your reticulocyte levels are within the normal range!

This means that you probably have normal bone marrow function and a healthy red blood cell count. People with optimal reticulocyte levels most likely do not have anemia, nutrient deficiencies, or kidney disease [R].
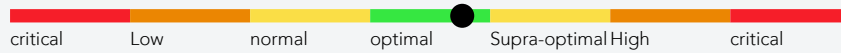
Lifestyle suggestions based on your result of: 0.7%

N/A

Sodium

critical   Low   normal   optimal   Supra-optimal High   critical

About this marker

This test measures the amount of sodium in your blood.

Sodium, as well as other electrolytes including potassium, chloride, calcium, and phosphate play vital roles in blood pressure control, maintaining a healthy fluid balance, and the proper functioning of nerves and muscles.

Sodium is the main electrolyte found outside of cells (potassium is the main electrolyte found inside cells) and the amount of fluids outside of cells is determined by the amount of sodium content. In addition to regulating fluid balance, sodium is important for maintaining the balance between acids and bases and making sure neurons and muscles communicate effectively [R].

Table salt (sodium chloride) and the natural salt content in foods are the main sources of sodium in the diet. Less than 10% of sodium comes from the water we drink. Adults need less than 500 mg/day from their diet in order to maintain normal sodium levels in the body. However, 95% of the world's population consume between 3 and 6 g/day.

Sodium deficiency is very rare, even among individuals on very low sodium diets. Sodium levels may fall below normal under extreme conditions of heavy and continued sweating, or in cases of trauma, chronic diarrhea, or kidney diseases where the body is unable to hold onto sodium [R, R].

Healthy sodium levels in the body are maintained in a tight range by a combination of hormones as well as the kidneys. When sodium intake is high, a hormone called aldosterone decreases, which increases the amount of sodium that is excreted in the urine. When sodium intake is low, aldosterone increases and almost no sodium is lost in the urine [R].

Taking in too much sodium may cause fluid accumulation in the body (edema) and is strongly associated with high blood pressure. Over-consumption of salt is of particular concern because high blood pressure is a strong risk factor for heart disease [R, R].

Health effects based on your result of: 140mmol/L

Congratulations, your sodium is within the optimal range!

This means your body is well able to balance sodium intake and sodium loss through the kidneys, and all sodium-related metabolic processes are functioning optimally.

Based on your sodium levels, you also have a mortality risk that is below average [R].
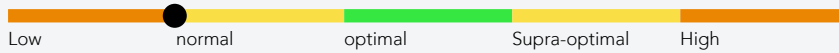
Lifestyle suggestions based on your result of: 140mmol/L

Your results are optimal, you don't need any recommendations here!

TSH

| Low | normal | optimal | Supra-optimal | High |

About this marker

This test measures the amount of thyroid-stimulating hormone (TSH) in the blood.

Thyroid-stimulating hormone (TSH), also known as thyrotropin, is a hormone secreted by the pituitary gland that stimulates the thyroid gland to produce the hormones thyroxine (T4) and triiodothyronine (T3). T4 and T3 control how fast your metabolism runs. T4 and T3 then act to decrease the release of TSH in a negative feedback loop.

TSH is often the first test used to determine whether an individual has too little (hypothyroidism) or, conversely, has too much thyroid hormones (hyperthyroidism).

TSH normally increases as you age [R, R].

Health effects based on your result of: 0.36uIU/mL

Your TSH levels are below the normal range!

Low TSH levels increase the risk of:

• Alzheimer's disease [R]

• Lower bone density and fractures [R, R]

Low TSH can be caused by:

• Primary hyperthyroidism (overactive thyroid due to the autoimmune disease Graves' disease, thyroid nodules, or thyroid tumors) [R, R]

• Secondary hypothyroidism (diseases of the hypothalamus or pituitary gland such as tumors can cause low release of TSH and low thyroid function) [R]

• Surgery [R]

• Low-carbohydrate diets [R]

• Smoking [R]

• Taking too much synthetic thyroid hormone [R]

• Viral meningitis [R]

• Testing levels within 2 hours of a meal instead of in a fasted state [R]

TSH is normally lower in the first trimester of pregnancy [R]. Levels eventually return to normal.

Certain drugs can decrease TSH levels:

• Glucocorticoids [R]

• Dopamine agonists such as bromocryptine (Parlodel), used to treat Parkinson's and pituitary tumors [R]

• Somatostatin analogs [R]

• Rexinoids, used to treat cancer [R]

• Carbemazepine (Tegretol), oxcarbemazepine (Trileptal), and valproic acid (Convulex, Depakote, Epilim, Stavzor), drugs used to treat epilepsy [R, R]

Symptoms of low TSH include [R]:

• Palpitations

• Fatigue

• Anxiety

• Disturbed sleep

• Weight loss

• Heat intolerance

• Sweating

• Excessive thirst

Lifestyle suggestions based on your result of: 0.36uIU/mL

Address any existing underlying health issues!

Stop or reduce smoking, because smoking decreases TSH levels [R].

Reduce or stop alcohol consumption [R]. Alcohol use is associated with decreased TSH production.

If you are on a low-carbohydrate diet, you may need to increase your carbohydrate consumption [R].

Supplements that can help increase TSH:

• Kelp (only if you are not sensitive to iodine) [R]

• Green Tea [R]

• Acetyl-l-carnitine [R]

Testosterone, Serum

Low   Normal   High

About this marker

This test measures the amount of both testosterone bound to proteins (sex hormone-binding globulin and albumin) and free (not bound to any proteins) testosterone in the blood.

Testosterone is a hormone mainly produced by the testes (in men) or ovaries (in women), with small amounts (<10%) produced by the adrenal gland and brain (in both sexes). It is made from cholesterol and is produced in response to the hormone luteinizing hormone (LH), which is released from the pituitary gland [R].

Testosterone has a diverse range of effects on many different organs and tissues. It improves bone health by increasing bone growth and reduces the breakdown of bone, helps to build and maintain muscle mass and strength, increases lean body mass and fat loss, increases red blood cell production, improves libido and sexual function, and increases sperm production. Testosterone even plays a role in mood and brain function and memory [R, R, R]. Total testosterone is a measure of testosterone that is bound to proteins (sex hormone-binding globulin and albumin) and free (not bound to any proteins). Approximately, 2-3% of testosterone is not bound to proteins (free), 33-54% percent is weakly bound to albumin, and the rest (44-65%) is bound to sex hormone-binding globulin (SHBG) [R].

Beginning around age 30, total testosterone levels begin to decline 0.4-2% every year [R].

Health effects based on your result of: 406ng/dl

Your testosterone is within the normal range!

Low levels increase the risk of:

• High cholesterol and triglycerides (fats in the blood) [R]

• Metabolic syndrome (defined as having three or more of the following: high blood sugar, excess fat around the stomach, high blood pressure, high triglycerides levels, and low HDL cholesterol levels [R]

• Developing type 2 diabetes [R]

• Anemia [R]

• Dementia including Alzheimer's disease [R, R]

• Infection, need for transplantation, and mortality in liver scarring (cirrhosis) patients [R]

• Mortality from all causes [R]

Since testosterone levels decline every year, beginning around age 30, the younger you are the higher your testosterone levels should be within the normal range.

Consider increasing your testosterone levels naturally, if you experience symptoms of low testosterone. These include:

• Weakness [R]

• Fatigue [R]

• Depression and irritability [R]

• Decreased libido [R]

• Decreased erectile function [R]

• Decreased muscle mass [R]

• Insomnia [R]

• Osteopenia and osteoporosis [R]

Lifestyle suggestions based on your result of: 406ng/dl

If you experience symptoms of low testosterone, we recommend the following lifestyle changes.

Get enough sleep. Sleep is critical to proper testosterone production [R].

Increase your consumption of fat if you are on a low-fat diet. Low-fat diets lead to decreased testosterone levels [R].

Avoid extremely low carbohydrate diets, as they will decrease testosterone levels [R].

If your zinc levels are low, increase your consumption of foods high in zinc such as oysters, beef, crab, cashews, pumpkin seeds, and cacao [R, R].

Get more sun. Sunlight increases vitamin D levels, which can increase testosterone levels if you are deficient. Supplementing with vitamin D is an alternative to sunning [R].

If your calcium levels are low, increase your consumption of calcium-rich foods such as yogurt, sardines, milk, salmon, and kale [R, R].

If your magnesium levels are low, increase your consumption of magnesium-rich foods such as almonds, spinach, black beans, and avocado [R, R].

Reduce or stop alcohol consumption [R].

Getting at least 200 minutes of moderate-intensity aerobic exercise per week can increase testosterone levels [R].

Sprinting has been shown to increase total testosterone levels [R].

Lift weights or perform resistance training if you are physically able to. Remember to progress in weight slowly and always use proper technique [R, R].

Perform high intensity interval training, a type of training involving short periods of high-intensity exercise followed by a recovery period of less-intense exercise [R].

Supplements that can help increase total testosterone:

• Ashwagandha (KSM-66 extract) [R]

• Zinc (if deficient) [R]

• Vitamin D (if deficient) [R]

• Calcium (if deficient) [R]

• Magnesium (if deficient) [R]

• Tongkat Ali [R]

• Shilajit [R]

• Forskolin [R]

• Trigonella foenum-graecum (fenugreek) [R]

Thyroid Peroxidase (TPO) Abs

Normal   High

About this marker

This test measures the amount of thyroid peroxidase antibodies in the blood.

Thyroid peroxidase (TPO) is an enzyme found mainly in the thyroid gland, where it prepares iodine to be attached to thyroglobulin (Tg), the protein that serves as the building block of thyroid hormones (T4 and T3).

Antibodies to TPO (TPOAb) are commonly found in patients with autoimmune hypothyroidism (Hashimoto's thyroiditis, atrophic thyroiditis, and post-partum thyroiditis) and hyperthyroidism (Graves' disease and postpartum thyroiditis), with more than 80% of patients with these diseases testing positive. They are also sometimes detected in people with normal thyroid function [R].

TPO antibodies tag the enzyme as a harmful substance and cause the body to mount an immune response, damaging the thyroid in the process and causing thyroid dysfunction [R].

TPO antibodies are one of many antibodies directed against components of the thyroid, such as thyroglobulin, thyroid-stimulating hormone receptor (TSHR), and rarely, thyroid hormones themselves. Of these, TPO antibodies are the most common and most indicative of thyroid disease [R].

Women are about twice as likely as men to test positive for TPO antibodies [R, R].

TPO antibody tests are ordered to determine if a patient's hypothyroidism (low thyroid hormones) or hyperthyroidism (high thyroid hormones) is autoimmune in nature.

Health effects based on your result of: 11IU/mL

Your TPO antibody levels are above the normal range!

TPO antibodies are elevated in autoimmune thyroid diseases and play a crucial role in the disease process [R].

The presence of TPO antibodies during pregnancy is associated with developing depression after birth (postpartum depression) [R].

High TPO antibody levels have been linked to:

• BPA exposure [R]

• Decreased bone mineral density [R]

• Insulin resistance and high C-reactive protein (CRP) levels [R]

• Hives (urticaria) [R]

• Sleep apnea [R]

• Polycystic ovary syndrome [R]

• Sarcoidosis [R]

• Vitiligo [R]

• Rheumatoid arthritis [R, R]

• Systemic lupus erythematosus [R]

• Sjogren's syndrome [R]

• Type 1 Diabetes [R]

• Stomach cancer [R]

High TPO antibody levels increase the risk of:

• Bone fractures [R]

• Poorer in-vitro fertilization (IVF) outcomes [R]

• Developing hypothyroidism or hyperthyroidism after giving birth [R]

• Preterm delivery, low birth weight, and miscarriage [R, R, R]

• Thyroid nodules (abnormal growth of cells that forms a lump on the thyroid gland, usually not associated with cancer) [R]

• Developing autoimmune thyroid disorders [R]

• Thyroid cancer [R]

The most common causes of high TPO antibody levels are:

• Vitamin D deficiency [R]

• Excess/high doses of iodine (>200 mcg) [R]

• Having both mercury sensitivity and mercury amalgams [R]

• Heavy metal exposure including lead and cadmium [R]

• Genetics [R]

• H. pylori infection [R]

Other less common causes of high TPO antibody levels include:

• Hepatitis C infection [R]

• Turner syndrome [R]

Drugs that can increase TPO antibody levels include:

• Amiodarone (Cordarone, Nexterone, Pacerone), a drug used to treat irregular heartbeats [R]

• Interferon-⊠ (Multiferon), used to treat viral infections that cause hepatitis [R]

• Interferon beta-1b (Betaseron, Actoferon), used to treat certain forms of multiple sclerosis [R]

• Lithium therapy for depression and bipolar disorder [R]

• Radioactive iodine therapy used to treat thyroid cancer [R]

• Chemotherapy drugs nivolumab (Opdivo), pembrolizumab (Keytruda), and regorafenib (Stivarga) [R, R, R]

TPO antibodies cause destruction of the thyroid by tagging the enzyme as harmful and activating parts of the immune system (T-cells, complement proteins) to help come destroy and remove the tagged enzymes. Thyroid tissue is also damaged in this process, which may initially cause symptoms of hyperthyroidism, including anxiety, sudden weight loss, and rapid heartbeat. Eventually, the thyroid gland shuts down and hypothyroidism develops, symptoms of which include dry skin, weight gain, and cold intolerance [R, R, R].

Lifestyle suggestions based on your result of: 11IU/mL

Address any existing underlying health issues!

Refrain from taking high doses of iodine (>200 mcg) [R].

Eat foods high in vitamin D, such salmon and eggs, and try to get more sun exposure (but don't burn) if you are deficient in vitamin D [R, R].

Low-level laser therapy (830 nm) has been shown to reduce TPO antibodies [R].

If you are sensitive to mercury, removing any silver amalgam fillings you have may help decrease TPO antibodies [R]. Make sure that a qualified dentist removes your amalgam fillings to ensure they are removed correctly without causing further harm.

Eating a low-carbohydrate diet devoid of common carbohydrate sources such as bread, pasta, fruit, and rice reduced TPO antibodies in overweight individuals [R].

Supplements that can help:

• Selenium [R, R]

• Black cumin seed oil (Nigella sativa) [R]

• Vitamin D (if deficient) [R]

• Genistein [R]

T4, Free

Low   Normal   High

About this marker

Free T4 is a measure of the amount of the thyroid hormone T4 (thyroxine) in the blood that is not bound to proteins.

Thyroxine (T4) is hormone made in the thyroid gland from the element iodine and the amino acid tyrosine. It is the most abundant hormone produced by the thyroid gland. T4 indirectly controls the rate of metabolism by serving as a precursor to the more active form called triiodothyronine, or T3. T3 basically affects almost all organs and tissues in the body, including the brain, heart, bones, muscles, liver, pancreas, and fat tissue [R].

Thyroid hormones play critical roles in growth and development (especially the brain), regulating cholesterol levels, energy production, and insulin sensitivity [R].

Most (>99%) of the T4 made by the thyroid gland is transported around the body by different proteins, which is referred to as bound T4. Only a small percentage (~0.03%) of T4 is free. T4 is only active and able to be converted into T3 in it's free form [R].

Free T4 is often measured in conjunction with thyroid-stimulating hormone to help diagnose hypothyroidism (underactive thyroid) and hyperthyroidism (overactive thyroid) [R].

Health effects based on your result of: 1.52ng/dl

Congratulations! Your free T4 is in the normal range. This means you have a reduced risk of:
• Mortality from all causes [R]
• Dementia [R]
• Depression [R]
• Lung, breast, and thyroid cancers [R, R]

Lifestyle suggestions based on your result of: 1.52ng/dl

Your results are normal, you don't need any recommendations here!

Triglycerides

| optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of triglycerides (fats) circulating in the blood.

Triglycerides (TG) are the scientific term for fats, including the fats you eat in your diet and the fat that is stored in your body. They are formed from a combination of a compound called glycerol and three fatty acids.

Triglycerides in food are digested and absorbed in the small intestine and then packaged together with cholesterol and proteins. This package then first enters the lymph system and then the bloodstream where it can enter cells to be used as a form of energy. The liver is also able to produce and store triglycerides [R].

Certain proteins, called very-low-density lipoproteins, transport triglycerides throughout the bloodstream. High triglyceride levels are one of the main risk factors for heart disease and diabetes [R, R].

Health effects based on your result of: 67mg/dL

Congratulations, your triglyceride levels are optimal!

This means that you have a lower risk of:

• Heart disease including coronary artery disease and stroke [R]

• Inflammation of the pancreas (pancreatitis) [R]

• Mortality from all causes [R, R, R]

However, triglycerides can also be low/optimal in these conditions:

• Hyperthyroidism [R]

• Scarring of the liver (cirrhosis) [R]

Lifestyle suggestions based on your result of: 67mg/dL

Your results are optimal, you don't need any recommendations here!

Triiodothyronine (T3), Free

Low   normal   optimal   High

About this marker

Free T3 is a measure of the amount of the thyroid hormone T3 (triiodothyronine) in the blood that is not bound to proteins.

Most of the T3 that is made by the thyroid and released in the bloodstream is attached to proteins that transport T3 around. When T3 is attached to proteins, it is not active. Only the small percentage (0.3%) of T3 that is not attached to proteins is active in the body [R].

Thyroid hormones play critical roles in growth and development (especially the brain), regulating cholesterol levels, energy production, and insulin sensitivity [R].

Free T3 levels are generally normal in patients diagnosed with hypothyroidism, making it an inferior test for the disease compared to total and free T4 levels [R]. Free T3 is therefore mostly used in detecting hyperthyroidism when TSH levels are low [R].

Health effects based on your result of: 3.1pg/mL

Congratulations! Your free T3 is in the normal range.
This means you have a reduced
risk of:

• Heart disease (coronary artery disease) [R]

• Breast cancer [R, R]

• Mortality from cancer, heart disease, and other critical illnesses [R, R]
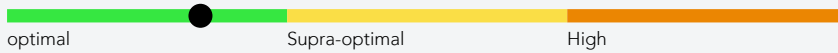
Lifestyle suggestions based on your result of: 3.1pg/mL

Your results are normal, you don't need any recommendations here!

VLDL-Cholesterol

optimal   Supra-optimal   High

About this marker

This test measures the amount of very-low density lipoprotein cholesterol, or VLDL-C, in the blood.

Very-low density lipoprotein (VLDL) is a group of proteins and fat-like molecules called phospholipids. It transports triglycerides (fats) and cholesterol in the bloodstream where they can be used by cells and tissues. Triglycerides (TG) are the scientific term for fats, including the fats you eat in your diet and the fat that is stored in your body. They are formed from a combination of a compound called glycerol and three fatty acids. They serve as an alternative form of energy to glucose. Most of the triglycerides in the bloodstream are carried by VLDL particles. Cholesterol is a key component of cell membranes and is used by the body to create steroid hormones (testosterone, estrogens, cortisol, etc.), bile, and vitamin D [R].

VLDL-C is made in the liver and then released in the blood. In the capillaries, VLDL-C comes into contact with the enzyme lipoprotein lipase, which causes it to lose triglycerides, converting it into LDL-C [R].

VLDL-C, like LDL-C, is considered a form of "bad cholesterol" because it transports fats and cholesterol to cells and contributes to LDL-C levels [R].

Health effects based on your result of: 13mg/dL

Your VLDL-C is within the optimal range! You may want to check your levels of other blood lipids such as Triglycerides, LDL, HDL, and Total Cholesterol.
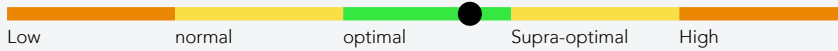VLDL-C in this range is linked with the lowest risk of all-cause mortality [R].

Lifestyle suggestions based on your result of: 13mg/dL

Your results are optimal, you don't need any recommendations here!

Vitamin B12

Low   normal   optimal   Supra-optimal   High

About this marker

This test measures Vitamin B12 levels in the blood.

(Methyl)cobalamin, more commonly known as vitamin B12, is a vital dietary nutrient [R].

Vitamin B12 is involved in the formation of blood cells (hematopoiesis) [R, R]. It also plays a key role in creating, replicating, and repairing DNA [R, R, R]. Finally, it is required for healthy brain and nervous system function [R, R, R].

It cannot be produced naturally by the body, and must come from dietary sources (most commonly from animal products such as meat and dairy) [R, R].

Because vitamin B12 is water soluble, it is extremely difficult to "overdose" on it -- its water-solubility means that any extra B12 that the body does not need is easily excreted in urine [R, R].

The body uses vitamin B12 very efficiently, essentially recycling it as it is used. In fact, a healthy person can store up to 3-6 years' worth of vitamin B12 in their liver! For this reason, vitamin B12 deficiencies are quite rare, and indicate a very long-term shortage of this vitamin in the diet [R].

Some populations at higher risk of B12 shortage include:

• Vegans and vegetarians [R, R, R]

• Pregnant and breastfeeding women [R, R]

• The obese [R, R]

• People who have gastrointestinal disorders that make absorbing B12 from the diet difficult or less efficient [R, R, R]

• Heavy alcohol drinkers [R, R]

• AIDS/HIV patients [R, R]

• Elderly people, as the gut becomes less efficient at absorbing nutrients with age [R, R, R]

Health effects based on your result of: 640pg/mL

Your B12 levels are optimal.

Having B12 levels in the optimal range means that you are protected against:

• oxidative stress [R]

• depression [R, R]

• heart disease and stroke [R, R, R]

• osteoporosis [R]

• dementia and cognitive decline [R, R, R, R]

• cancer [R, R, R, R, R]

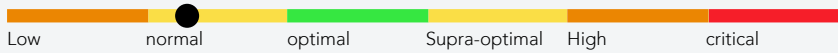• all-cause mortality [R, R, R, R, R, R]

Lifestyle suggestions based on your result of: 640pg/mL

Your results are optimal, you don't need any recommendations here!

Vitamin D, 25-Hydroxy

| Low | normal | optimal | Supra-optimal | High | critical |

About this marker

This test measures the amount of inactive vitamin D (25-hydroxyvitamin D) in the blood to diagnose vitamin deficiency or to monitor response to supplementation.

Known as the "sunshine vitamin," vitamin D helps maintain healthy levels of calcium and phosphorus by increasing their absorption in the gut. In this way, vitamin D is critical for the proper growth and formation of bones [R, R].

Vitamin D also plays a role in muscle strength and performance, immune system function, cell production, blood pressure, and insulin secretion [R, R, R].

Vitamin D is produced by the skin upon exposure to sunlight. It can also be obtained in the diet, or through vitamin supplements [R].

When produced by the skin, sunlight converts 7-dehydrocholesterol in in your skin to vitamin D3 (cholecalciferol), which is then activated in the liver and kidneys. More specifically, vitamin D3 (cholecalciferol) is rapidly broken down in the liver to 25-hydroxyvitamin D (calcifediol), the major circulating form of vitamin D. This inactive form is then converted in the kidneys to the active 1,25-dihydroxyvitamin D form (calcitriol). Vitamin D can be stored in fat tissue and is found throughout the body including bones, kidneys, heart, stomach, liver, skin, brain, ovaries, and testes [R, R].

Although 1,25-dihydroxyvitamin D is the active form of vitamin D, the levels of the active form can be normal (or even high) in people who are otherwise deficient in overall vitamin D. For this reason, it is not the best measurement of vitamin D status. Instead, 25-hydroxyvitamin D (calcifediol) is more often used to determine if your vitamin D levels are healthy or abnormal [R].

Doctors will usually perform a vitamin D blood test to diagnose bone problems, detect potential parathyroid gland dysfunction, or to monitor the condition of people with diseases that interfere with fat absorption in the intestines (such as Crohn's disease). Vitamin D tests are also used to screen people who are at high risk of deficiency, such as older people, people with darker skin, vegans, pregnant women, and breastfed children [R, R, R].

Health effects based on your result of: 23.8ng/mL

Your vitamin D levels are within the normal range, but lower than optimal. Levels in this range are sometimes referred to as vitamin D insufficiency [R, R].

Lower vitamin D levels are associated with heart disease, diabetes, cancer, and bone disorders such as osteoporosis [R]. They also increase your risk of all-cause mortality [R, R].

One of the major causes of low vitamin D levels is inadequate exposure to UVB radiation from the sun, which prevents the skin from being able to produce enough vitamin D. Specific risk factors include:

• Living at high latitudes (>37°) [R, R, R]

• Living in regions where there are large seasonal changes in sun exposure [R]

• Living in areas with high levels of air pollution, which blocks out sunlight [R]

• Over-use of sunscreen [R]

• Having darker skin [R, R]

• Keeping the skin covered up (in colder climates or certain cultures) [R, R]

Inadequate dietary intake is another major cause of lower vitamin D levels [R]. People on a vegan diet, as well as pregnant women and breast-feeding children who are not on vitamin D supplementation are at elevated risk of dietary insufficiency [R, R, R].

Other factors that can lower vitamin D levels include:

• Obesity and old age. These can interfere with the production and absorption of vitamin D [R, R, R].

• Malabsorption of vitamin D in gut diseases (Crohn's disease, ulcerous colitis, and celiac disease) [R, R]

• Smoking [R, R]

• Caffeine [R]

Certain drugs can also lower vitamin D levels, such as:

• Glucocorticoids [R]

• The antibiotic medication rifampin (Rifadin) [R]

• Antiretroviral therapy drugs [R]

• Medications that reduce bile acid, such as cholestyramine (Questran, Cholybar, Olestyr) and colestipol (Colestid, Cholestabyl) [R, R]

• Weight-loss drugs, such as orlistat (Xenical, Alli), which can interfere with the absorption of dietary fats [R]

• Anti-seizure medications such as carbamazepine (Tegretol), phenytoin (Dilantin), and other barbiturates [R]

• Acid-reflux medications, such as ranitidine (Zantac) [R]

Symptoms of low vitamin D levels include [R]:

• Bone pain

• Muscle pain

• General weakness

• Depression

Lifestyle suggestions based on your result of: 23.8ng/mL

Eat more foods that contain vitamin D. Food sources that are naturally rich in vitamin D include [R]:

• Fatty fish, such as salmon and tuna

• Beef liver

• Egg yolks

• Cheese

• Mushrooms

Although relatively few foods naturally contain large amounts of vitamin D, many common foods are often enriched with vitamin D, such as [R]:

• Milk

• Soy milk

• Yogurt

• Margarine

• Orange juice

• Some cereals

It is also recommended that you cut back on your caffeine intake, as caffeine can lower vitamin D levels, and may negatively impact bone formation [R, R].

Aside from dietary factors, you can also boost vitamin D levels by getting more sun, especially if you have a darker skin tone. Be sure not to wear too much sunscreen, as it blocks out the ultraviolet rays that make vitamin D in your skin. Do not go overboard, however, as excess UV radiation can cause skin cancer [R, R, R].

Quit or at least reduce smoking, as it can reduce blood vitamin D levels [R, R].

Implement a healthy diet and exercise program to help you lose weight if you are obese [R].

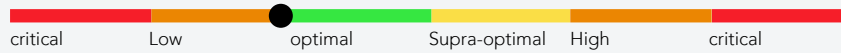If your medications are likely to lower vitamin D levels, discuss alternative options with your doctor [R].

Supplements that can help:

• Vitamin D3 (take these with foods that are high in dietary fats to enhance vitamin absorption) [R, R]

• Calcium [R]

• Phosphorus [R]

• Alpha-lipoic acid [R]

• Magnesium [R]

• Cod liver oil [R]

WBC

| critical | Low | optimal | Supra-optimal | High | critical |

About this marker

This test measures the total number of white blood cells (WBCs) in the blood.

White blood cells are also known as leukocytes. They help fight bacteria, viruses, and other foreign invaders, protecting us against infections and diseases. The different types of white blood cells are neutrophils, lymphocytes, monocytes, eosinophils, and basophils [R].

Having low WBC levels can mean that your body doesn't have adequate resources to fight against infections properly. People who are particularly at risk for low WBC levels include those on a restrictive diets, as well as individuals with bone marrow and/or autoimmune disorders.

However, having high WBC levels can also be bad. White blood cells are inflammation markers, and high WBC levels indicate chronic inflammation in your body. This increases the risk of death or heart disease. However, there is no evidence that WBC is directly involved in causing heart disease, and they might just be a risk marker for other factors that cause heart disease [R].

Elevated WBC levels may indicate an increased risk for the development of type II diabetes and insulin resistance [R].

WBC levels are usually tested during a complete blood count (CBC), which measures your white blood cells, red blood cells, and platelets.

Having a normal percentage of each different type of WBC is also important for your health. If your white blood cells are increased or decreased, it is important that you look at the count of each different type of white blood cell to see the cause of your low or high WBC count [R].

Health effects based on your result of: 3.7x10E3/ul

Your white blood cell levels are lower than normal (a condition known as leukopenia).

People with a WBC count in this range have higher death rates than people whose WBC count are in the normal range [R, R].

A low WBC count can be caused by:

• Alcoholism [R]

• Anorexia [R]

• Autoimmune disorders [R], such as lupus [R] and Graves' disease [R]

• Typhoid fever [R]

• Bone marrow disorders, including aplastic anemia [R]

• Non-Hodgkin's lymphoma [R]

• Sepsis [R]

• HIV [R, R]

• Radiation [R]

• Toxins such as PCBs (polychlorinated biphenyls) [R]

• Organ transplants (including kidney and pancreas transplants [R]

Drugs can also cause low WBC count:

• Antibiotic medications, such as penicillin, cephalosporin, and sulfadiazine [R, R, R]

• Psychotropic drugs (drugs that alter mood, perception, or behavior, used to treat psychiatric conditions) [R]

• Chemotherapeutics, used to treat cancer [R, R]

The symptoms of low WBC count include:

• Fever [R, R, R]

• Aches and pain [R]

• Chills [R]

• Headache [R]

Lifestyle suggestions based on your result of: 3.7x10E3/ul

Address any existing underlying health issues!
You should keep your immune system running by following a healthy lifestyle. This way, your body can defend itself against autoimmune disorders and other diseases that can cause leukopenia. Exercise, a healthy diet, refraining from smoking, and low alcohol consumption can keep your immune system healthy and protect against low white blood cell levels [R, R].
Having good hygiene can reduce your risk of infection. This can prevent the progression of diseases related to low white blood cell count [R].
Going to the sauna can increase your WBC count [R].
Cut back on alcohol [R].
Supplements that can help:
• Vitamin B4 (also known as adenine) [R]
• Vitamin E [R, R]
• Iron [R]. Iron supplements should be taken with caution and only if iron deficient.
• Fish oil [R]
• Garlic [R]

Leukocyte Esterase

● Negative

About this marker

This test measures the amount of leukocyte esterase in your urine.

Leukocyte esterase (LE) is an enzyme that is produced by white blood cells (leukocytes). LE is not typically present in urine [R].

The LE test is normally used to diagnose urinary tract infections (UTIs). It may also be positive as a result of other infections or inflammatory disorders [R].

A dipstick test is frequently used to check your urine sample for LE, but it is not as accurate as microscopic examination [R, R, R].

Health effects based on your result of: Negative

Your leukocyte esterase result is negative!

This means that you don't have elevated white blood cell levels in your urine and you probably don't have a urinary tract infection [R, R].
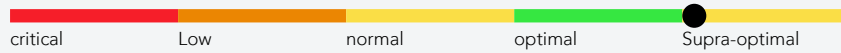
Lifestyle suggestions based on your result of: Negative

Your results are normal, you don't need any recommendations here!

eGFR

critical   Low   normal   optimal   Supra-optimal

About this marker

Estimated glomerular filtration rate (eGFR) is a measure of how well your kidneys function.

GFR is the amount of blood that is filtered every minute by tiny filters in the kidneys called glomeruli [R].

When kidney function declines due to damage or disease, GFR decreases and waste products that are normally released in the urine start to appear in the blood.

Your eGFR is calculated based on your blood creatinine levels, sex, age, and race. Creatinine is a waste product that is normally filtered by the kidneys and released into the urine at a relatively steady rate. When kidney function decreases, less creatinine is removed and levels in the blood increase.

Early detection of kidney dysfunction is important to prevent further kidney damage.

Conditions such as wasting disease and obesity require alternative ways to obtain eGFR. For body builders, high muscle mass may lead to underestimation of eGFR when using creatinine [R].

Health effects based on your result of: 120mL/min/1.73 m2

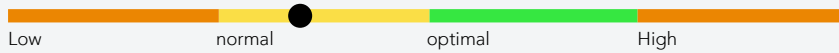Your eGFR is within the normal range!
Your kidneys are likely functioning optimally, and are able to efficiently filter toxins out of your body.

Lifestyle suggestions based on your result of: 120mL/min/1.73 m2

Your levels are normal. You don't need any recommendations here!

pH, Urine

Low   normal   optimal   High

About this marker

This test measures the pH of your urine.

Urine pH is a measure of how acidic or alkaline your urine is. Normally, urine is slightly acidic (5.5 to 6.5). It is slightly more alkaline in the morning than in the night and women tend to have slightly higher urine pH levels than men [R, R, R].

The kidneys control the pH of the urine by filtering acids from the blood and excreting them in the urine. Changes in blood pH are reflected in the urine pH except when the kidneys aren't functioning properly. Having too high or too low urine pH can lead to the formation of kidney stones [R, R].

Diet, certain drugs, infections, and poor kidney function can all affect the urine pH. Diets high in protein from meat, fish, dairy, and grains can decrease urine pH (more acidic), whereas diets high in fruits and vegetables can increase urine pH (more alkaline) [R, R, R].

This test is a part of a routine urinalysis. Urine pH is often used to assess the risk of kidney stones, diagnose UTIs, or determine the effectiveness of antibiotics and other drugs that are affected by urine pH [R, R, R].

Health effects based on your result of: 5:1

Your urine pH level is within the normal range, but is lower than ideal.

Low levels increase the risk of:

• Kidney stones [R]

• Diabetes [R]

• Narrowing of the veins and arteries of the kidneys [R]

• Advanced chronic kidney disease [R]

• Heart attack, stroke, and death in heart disease patients [R]

• Bladder cancer [R, R]

• Mortality from all causes [R]

Low urine pH is associated with:

• High blood sugar and insulin resistance [R, R]

• Obesity [R]

• Metabolic syndrome (a condition characterized by at least three of the following: high blood pressure, high blood sugar, excess stomach fat, high triglycerides, and low HDL cholesterol) [R, R]

• Fat buildup in the liver and non-alcoholic fatty liver disease (NAFLD) [R, R]

The most common causes of low marker include:

• Diets high in meat, dairy, and grains and low in vegetables and fruits [R, R, R]

• Low-carbohydrate, high-protein diets [R, R, R]

• Poor kidney function [R]

• Diarrhea [R]

• Diabetes [R]

Drugs that can decrease the pH of the urine include:

• Furosemide (Lasix), used to treat fluid retention and swelling caused by heart and liver disease [R]

• Ammonium chloride, used in cough medicine [R]

• Thiazide diuretics such as Hydrochlorothiazide (Microzide), used to treat high blood pressure and fluid retention [R]

• Methenamine mandelate (Hiprex, Mandelamine, Urex), an antibiotic used to prevent urinary tract infections [R]

Low urine pH levels do not cause symptoms directly and individuals will only show symptoms related to the cause of low urine pH levels, such as diabetes.

Lifestyle suggestions based on your result of: 5:1

Seek medical attention for any underlying diseases!

Exercising regularly can increase your urine pH [R].

Eat less meat, fish, dairy, and grains and eat more vegetables, legumes, and fruits (especially citrus fruits) [R, R, R].

Eat less protein [R, R, R].

Supplements that can help:

• Potassium citrate [R]. Potassium supplements should be taken with caution and under medical supervision!

• Magnesium [R]

• Apple cider vinegar (malic acid) [R]