



Acupuncture & Natural Health Solutions

Functional Medicine Summer Series #11

Liver Biomarkers - Alkaline phosphatase, AST, ALT and Albumin

To my Wellness Wizards and Healing Enthusiasts,

This is the last week of spring and the last week of our functional medicine summer series about the basic blood labs, the complete blood count with differential and the comprehensive metabolic panel. We are finishing up today, discussing four liver biomarkers. Let's dive in.

Alkaline phosphatase (ALP) is a metabolic enzyme found mainly in the liver and bone but has important functions in the intestine and kidney as well.

Standard ALP Lab Range: 35 - 150 IU/L

The Optimal ALP Range: 44 - 147 IU/L

Low levels of ALP can signify malnutrition, hypothyroidism, celiac disease, and deficiencies in key nutrients like vitamin C, B12, phosphorus, magnesium, and especially zinc. If ALP is low, you need

to improve your nutrition status. Focus on eating more nutrient dense, easily digestible and absorbable foods.

We have discussed these products several times this summer. When in doubt, boost your nutrition and see what changes. The Ultimate Shake comes in three flavors, Vanilla, Chocolate and Pineapple Coconut. The Pro Lean Greens comes in Chocolate or Apple Cinnamon flavors. They mix together very well; Chocolate Pro Lean Greens goes well with the chocolate or vanilla Ultimate Shake. The apple cinnamon Pro Lean Greens mix nicely with the Vanilla or Pineapple Coconut Ultimate Shake. For anyone struggling to get quality nutrition daily, adding in one or two servings per day of the Ultimate Shake plus the Pro Lean Greens powders is a great way to increase a variety of nutrients in a tasty, easy to drink and highly absorbable form without taking a bunch of pills.

Conversely, a high alkaline phosphatase indicates liver and/or gallbladder issues, and possibly a viral infection such as mono aka Epstein Barr virus. The ALP levels can also rise in situation of bone growth and healing, bone diseases, intestinal ischemia, rheumatoid arthritis, fatty liver disease, sarcopenia, and metabolic syndrome. You would want to also look at other liver numbers on the CMP such as AST, ALT, and BUN.

When alkaline phosphatase is high, good nutrition and liver support is required. It is difficult to treat this biomarker alone, so I recommend making an appointment with me or another healthcare practitioner to see what is causing the biomarker to rise and find the proper liver support for your individual case. In the meantime, adding Pro Lean Greens, is helpful, because there is some gentle liver support in the formula.

The next liver biomarker we are discussing today is **aspartate aminotransferase aka AST**. AST is a metabolic enzyme primarily found in the liver, pancreas, kidneys, the heart, skeletal muscles and various other tissues. It is involved in gluconeogenesis, the conversion of amino acids into blood sugar for energy. The AST enzyme also plays a role in maintaining cellular energy balance, and changes in its levels might reflect adverse health conditions, including liver and coronary artery disease (CAD).

Standard AST Lab Range: 0 - 40 IU/L

The Optimal AST Range: 10 - 26 IU/L

Low AST levels are associated with chronic liver disease, kidney disease, and vitamin B6 deficiency. It has been associated with increased cardiac mortality, as well.

Elevated AST levels can indicate tissue damage, muscle breakdown, and liver disease. An increase in AST can be seen in acute liver obstructions or inflammations and can stay elevated with ongoing liver dysfunction. Just like with low AST, a high AST has been associated with increased cardiac mortality.

A high AST value means the liver is congested. Something is congesting the liver. We need to put on our detective hats here and figure out what is causing the liver function to diminish.

Treatment here involves supporting the liver detoxification pathways and to flush the liver and gallbladder. The OmniCleanse Comprehensive Detox Kit is a good starting place and then check the other labs to see what other liver support is required. Now, don't go just start doing a major detox or a gallbladder flush. We need to look at your labs to make sure you can handle these therapies and don't make yourself sicker. This is why it is important to consult a healthcare practitioner about some of these situations, such as elevated liver enzymes.

The third liver biomarker we are discussing today is **alanine transaminase (ALT)**. ALT is an enzyme predominantly found in the liver but also in the heart, skeletal muscle, and kidneys, and it is instrumental in gluconeogenesis, converting amino acids into glucose for energy.

Standard ALT Lab Range: 0 - 44 IU/L

The Optimal ALT Range: 10 - 26 IU/L

Low ALT levels might indicate frailty, aging, and increased mortality risk due to cancer and heart diseases. If ALT is low, the liver doesn't have enough nutrition to do what it needs to do. We need to provide nutrition for the liver and likely use other products for more targeted liver support. The Pro Lean Greens is a great nutrition option and starting place in this situation.

High ALT levels are associated with liver disease, increased cardiovascular risk, and metabolic disorders like insulin resistance, obesity, and type 2 diabetes. Elevations in ALT can be triggered by drinking alcohol, taking certain medications, and various diseases, such as hepatitis, liver cirrhosis, and diabetes.

Only one of the biomarkers, AST or ALT needs to be out of range to indicate that the liver is struggling. If AST or ALT is high or low, you need liver support. High and low are both problems.

The final biomarker we are discussing in our functional medicine summer series is the **total bilirubin** value. Bilirubin, produced during the breakdown of red blood cells, is typically excreted in bile.

Standard Total Bilirubin Lab Range: 0 - 1.2 mg/dL

The Optimal Total Bilirubin Range: 0.1 - 0.9 mg/dL

Low total bilirubin has been linked to heart disease, stroke, metabolic syndrome, and diabetic peripheral neuropathy. A low total bilirubin can indicate there has been trauma to the body or that there is a large bruise somewhere. Low total bilirubin can also be indicative of anemia, so it is important to look at the iron panel and CBC, which we discussed earlier this summer.

Treatment of low total bilirubin would depend on the root cause. If there is a hematoma suspected because there was trauma to the body, arnica and other first aid treatment would be recommended. If the other labs indicate an iron deficient anemia situation, then we

would want to use EZ-Iron by Nutritional Frontiers to raise the iron levels and be sure to rule out internal bleeding.

When total bilirubin is high in the bloodstream, it often signifies liver and/or gallbladder disorders, inflammation, an accelerated breakdown of red blood cells, and/or the side effects of certain medications. Jaundice can also be present if bilirubin gets to a certain level. When we see a high total bilirubin, then we need to distinguish between conjugated and unconjugated forms of bilirubin to help us identify the reason for the elevation.

Treatment for high bilirubin is the same as for high AST and high ALT levels.

In summary, if any of these four liver biomarkers are high or low, the liver needs support. The first place to start is by increasing your nutritional status. The Pro Lean Greens is a great foundational product in any liver treatment plan.

Another great way to support the liver is by using castor oil packs over the liver. It is imperative to use quality castor oil from a glass bottle. I only use Queen of the Thrones brand organic, expeller pressed castor oil. This company has quality castor oil, nice castor oil packs and castor oil pack kits in an assortment of different sizes for the different parts of the body. The original pack is a good choice for over the liver. You cannot hurt yourself by supplementing nutrition or applying castor oil packs over the liver.

If your liver numbers are significantly out of optimal range, in either direction, I recommend scheduling an appointment with me or another health care provider. I will analyze all of the labs and together we can decide on an appropriate treatment strategy to bring you back into balance.

I hope you have enjoyed this functional medicine summer series about the complete blood count with differential and the comprehensive metabolic panel. Next time you get your lab results back and your doctor says everything is normal, but you don't feel normal, sit down and review this summer's articles and learn what your values mean. Tighten up the normal ranges to the optimal ranges and evaluate where your values fall. As you have seen this summer, we can tell so much about where the body is struggling just by looking at these seemingly normal blood lab results.

If you missed any of this summer's articles about the lab values, you could find them on my website: [Lab Test Basics](#). If you haven't listened to my podcast yet, you can find that [here](#).

Functional medicine is one of my passions and I have studied with a variety of doctors to learn different ways to look at labs. I also have effective treatment protocols based on your individual labs to help you achieve vitality.

Optimizing your lab values, one biomarker at a time,

Supporting your health journey,

Toni Eatros, Acupuncture Physician and Functional Medicine Specialist

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