# Optimal Lab Review

Picture This

Picture this. You feel unwell, you can't quite pinpoint why, but you know something is just not right. Maybe its hormones or possible mineral or vitamin deficiency. Whatever it is, you just can't shake the feeling that something is off. You go see your primary care and they run the standard labs. The doctor comes in and says, "all of your lab results are normal." How can this be? Your body is telling you something is wrong and yet standard lab reference ranges say you are "normal".

(Rupa Health, 2022)

Normal vs. Optimal
Lab Ranges For Blood Tests

Many people start to feel unwell long before a traditional reference range result becomes diagnostic (characteristic of an illness). The Optimal Lab review allows us to address these symptoms and issues even when the labs show that, "everything on the blood test looks normal." Using tighter parameters and current evidence based research and clinical findings our RD's can provide recommendations for nutrition support and or follow up with a health practitioner for additonal servicing.

Where you are in the "normal" range tells us much more.

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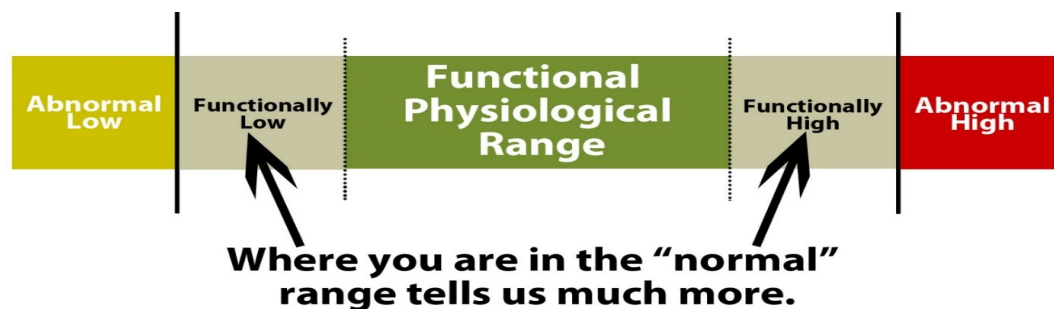
Standard lab reference ranges are broad reference ranges used by the laboratories that analyze samples based on averages of a healthy population. These test help doctors make diagnoses and treatment decisions based on high or low values, but they don't always tell you what's optimal.

Lab test results can fall within the normal reference range in the early stages of the disease due to such a wide reference range on standard lab tests. This can lead to cellular dysfunctions in the body being overlooked.

Functional Medicine lab ranges are usually much narrower than standard lab ranges. They are labeled "optimal lab values," meaning anything outside of those optimal values can show patterns and markers that spot trends toward disease. By catching these markers early on, functional medicine practitioners have a chance at reversing or stopping disease progression altogether.

More About Normal Ranges

What are normal ranges, and how are they different from optimal lab test results? Even if your blood test results are within the normal range, they may not be optimal for your general health, physical and mental performance, and longevity. For many tests, values within the normal range can be associated with an increased risk of mortality and certain diseases. This is why it's important to establish optimal lab test ranges.

Normal lab ranges are values that 95% of a healthy population falls into. They help doctors make diagnoses and treatment decisions. But they don't always tell you what are optimal lab test levels.
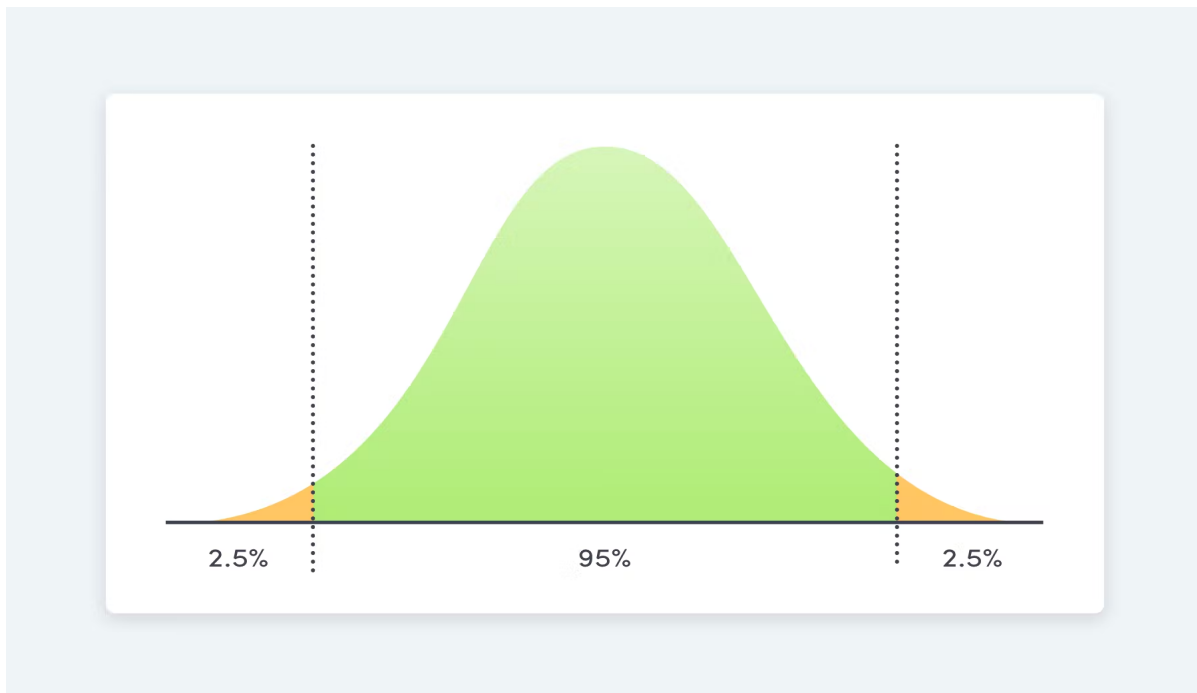
In some cases, normal ranges are created using populations that contain a significant number of unhealthy individuals, leading to ranges that don't reflect a healthy population.

In addition, normal ranges don't take into account the large population research that looks at the association of certain ranges with risks for disease and mortality. That's mainly because there is not enough evidence for a causative link between an optimal lab test level and health for it to guide decision making. When enough evidence accumulates, normal ranges change.

For these reasons, normal ranges for some tests aren't helpful for the person that is trying to take control of their health or live the longest and healthiest life they can.

However, the opposite is also true. Just because your suboptimal lab value is associated with increased mortality or risk of disease, that doesn't imply that you have an increased risk of anything. Observational population-level studies need to be followed up with further studies to corroborate or dismiss these associations.

Remember, a lab value in most cases doesn't mean anything in isolation, your clinician interprets it together with your symptoms, medical history, and other test results, and orders further tests if needed.

Normal reference ranges are still very useful and allow healthcare professionals to make informed decisions about your health. But if you really want to optimise your health, optimal ranges can be really useful.

Issues with normal reference ranges

There are a number of limitations with normal reference ranges, including:

- they're very black and white and they **don't reflect how complex health is**
- they usually don't take into account **how a value links to your risk of developing a disease** or your life expectancy
- the studies the ranges are based on often **don't include many people**
- some of the population used to determine a range **aren't healthy**

A lot of these limitations can be overcome using optimal references ranges.

What are optimal reference ranges?

Using scientific evidence and clinical guidelines, an optimal range is based on whether **a range is linked to better health and longevity**.

So if your blood test result shows that an analyte, like <u>folate</u>, is within the normal range, it still mightn't be optimal for your health — meaning you might still be at increased risk for a certain disease or have a lower life expectancy.

A good example of this is <u>vitamin D</u>. Traditional vitamin D guidelines say that if your levels are:

- less than 25 nmol/L you're deficient
- greater than 50 nmol/L you're sufficient

This range is only based on the relationship between vitamin D, your bone health, and your risk of osteoporosis.

However, vitamin D is important for many other things, like your muscle and <u>immune health</u>. So the evidence suggests that the optimal range for vitamin D is actually between 75 nmol/L and 100 nmol/L — this is associated with the lowest risk of death (from all causes).

3 Markers With Misleading Normal Ranges

TSH (Thyroid-stimulating Hormone)

TSH is a hormone released by your pituitary gland that tells your thyroid to make thyroid hormones, T4 and T3. The normal reference range for TSH is widely debated by researchers. Most labs have a range somewhere between 0.4 and 6 mIU/L, but many researchers have called for the upper limit to be decreased to between 2.5 and 3 mIU/L. One reason for this is that levels above 2.5 mIU/L have been linked to an increased risk for developing an under-active thyroid (hypothyroidism) and even mortality [1, 2, 3, 4, 5].

Another reason is that the population used to create the original normal range contained a significant number of people with undiagnosed autoimmune thyroid disease. This led to higher TSH levels that don't represent a truly healthy population. Indeed, recent studies have found that carefully-screened groups without thyroid dysfunction suggest an upper normal limit between 2.1 and 3.7 mIU/L [6, 5, 7, 8, 9, 10].

As you can see, a TSH value within the normal range does not always mean your thyroid is functioning optimally. Talk to your doctor if your TSH levels are on the high end of the range. Your doctor will interpret this test, taking into account your medical history and other test results.

Triglycerides

The normal upper limit for triglycerides is 150 mg/dL. But there is a lot of research showing that the upper limit should be much lower.

When scientists reviewed 61 studies with over 726k people, levels below 90 mg/dL were associated with the lowest risk of mortality. Another meta-analysis of almost 14k people found that levels below 88 mg/dL were linked to the lowest mortality risk [11, 12].

In addition, levels below 88 mg/dL have been associated with the lowest risk of a heart attack. Levels above this increase the risk of a heart attack when cholesterol levels are also high. In other words, high cholesterol levels become much more dangerous when they are accompanied by triglyceride levels above 88 mg/dL [13].

Triglycerides above 90 mg/dL have also been linked to a higher risk of developing diabetes [14].

As you can see, for markers like this one, relying on normal ranges can be misleading. It can give you a false sense of security and prevent you from taking steps to improve your levels.

If your triglycerides are higher than the optimal lab ranges, work with your doctor or with another healthcare professional to devise a strategy for improving your triglyceride levels and your overall health!

Folate/Folic Acid (Vitamin B9)

Folate is another blood test with an unhelpful normal range. This vitamin is needed for DNA synthesis, red blood cell maturation, cell growth, and proper brain development. It also helps decrease homocysteine, a molecule linked to heart disease [15, 16, 17, 18].

Most labs use a lower limit of 3 ng/mL to diagnose a folate deficiency, but researchers have called for the limit to be raised to as high as 13 ng/mL [19].

What levels should you aim for if you want to be optimal in terms of health and longevity? Research points to an optimal lab test level that's much higher than the established normal one.

For example, in a study of 28.8k people, levels below 17 ng/mL were associated with an increased mortality rate [20].

Another study of 1,921 people found that the lowest risk of heart disease was seen in people with levels above 9.6 ng/mL [21].

Levels above 11.3 ng/mL were associated with a 39% reduced risk of lung cancer compared to levels below 7 ng/mL [22].

This shows that the optimal lower limit for folate is much higher than the current normal lower limit, and is another reason why you shouldn't rely on the established normal range to determine if your levels are truly healthy.

Now bear in mind that folate levels reflect a person's vegetable and fruit intake, so it's not unsurprising that lower folate levels have been linked with adverse health effects. If your folate is on the lower side, that means that it may be a good idea to up your intake of fresh fruits and veggies.

References:
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Labs Self Code https://labs.selfdecode.com/blog/optimal-vs-normal-ranges/

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