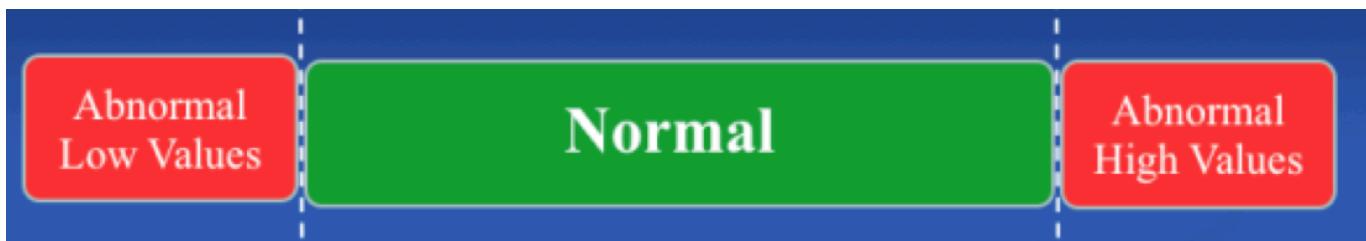


Laboratory Test Result Ranges: Pathological vs. Functional/Optimal

There are two main types of laboratory test result numbers used in blood chemistry analysis: the “**reference ranges**” (given on standard lab reports) and the **functional ranges** that some clinicians use in conjunction with the reference ranges. I am in this group.

Both sets of ranges are valid and useful. It is important to know when to use each and how they can be used together.

The reference ranges are used to look for highly probable pathology - the likely existence of a disease or disease states. So reference ranges are also called “**pathological ranges**”



The body's homeostatic balancing mechanisms work REALLY HARD to keep all the tested blood levels within the reference ranges. **If a test is out of range, it could mean the body's inherent balancing systems have been overwhelmed and a pathological process may be in full swing already.** Or, in the case of nutrients, the body's tissue reserves of a nutrient may have been used up. Nutrients generally disappear **from the blood last**. So anything below the lab reference ranges points to the possibility of a more advanced pathology or a severe, ongoing nutrient deficiency. And, it may be an ‘outlier’; there are many things that could throw off a test without indicating a critical or chronic problem: failure to fast, poor diet or dehydration right before the test, a drinking spree, medications interfere, resulting in false high or low values. The only certainty: we should investigate further.

The functional ranges are also called “**optimal ranges**”. They are used to evaluate health status and to **assess risk for disease BEFORE the disease develops**; they can indicate precursor states that may predispose the body to develop eventual tissue damage and disease -- if the imbalance continues. **Knowing this gives us a much better opportunity to head the disease process “off at the pass”** - to prevent a full-blown disease state from taking hold. Because the more entrenched a condition becomes, the harder it usually is to rectify.



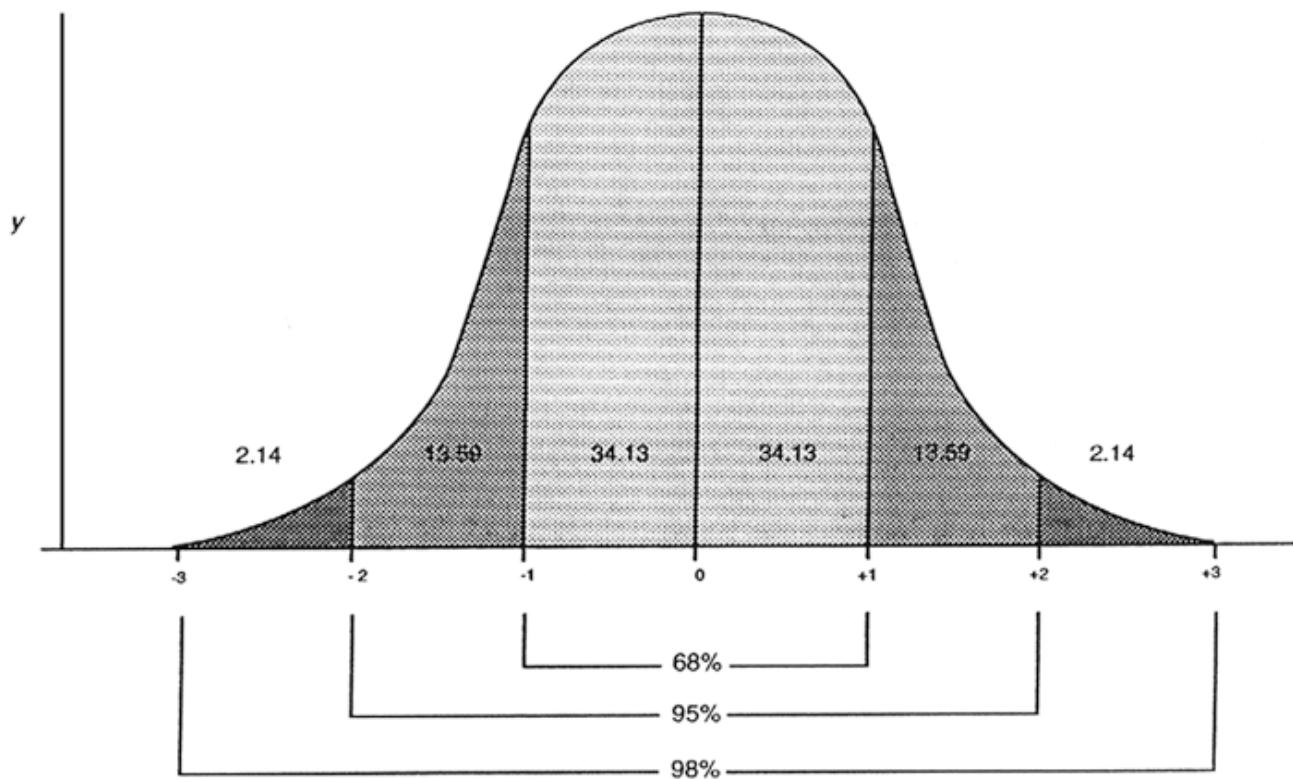
Whether using reference/pathological or functional/optimal ranges, it's important to get a baseline and then retest. **One set of results can never indicate the direction your health is trending.** In preventive medicine, our aim is to shift the trajectory of your health toward increasing wellness and away from chronic degenerative disease processes that can be indicated by lab results that are out of reference or functional range. “Follow-up tests some months later make sure you're still on track and document any trends.”

Who decides what's 'normal'? Statistics.

"In medicine, abnormal values are defined as 2 standard deviations over or under the average level."

We've all known situations where a person has been feeling awful for quite a while and yet his or her "lab tests are 'normal'." Meaning, they are within the norm - the ranges where a 'normal' number of people don't yet show frank pathology / disease. Trouble is, 'normal' is a mathematical term: normal distribution -- the classic Bell curve: It contains well people and the sickest people alike. Where should a healthy person fall? At what point does disease begin? Do I match the statistical curve, or is my particular "**biochemical individuality**" out of the "norm"? (5% of healthy people fall outside the statistical reference range. Clearly, a percentage of people who have brewing health problems will fall within the normal statistical reference range -- and then there's the many people in the grey zone between 'normal' and clearly 'abnormal' -- who may be functionally challenged and on the way to disease.)

Way out • Somewhat out of the norm • Normal - in the norm • Somewhat out of the norm • Way out



pathological low ?dysfunctional low Functional/optimal ?dysfunctional high pathological high

Some of the emphasis on pathological ranges comes from the role of insurance in health care. Only when there is enough disruption to healthy function can a diagnosis code be given for insurance billing purposes; insurance generally reimburses for treatment, not for prevention. Will you have to wait to get a pathological condition before your insurance justifies treating it?

The functional ranges I discuss with you are used to assess **risk for disease** before disease develops. They aim us toward the blood work of healthy people - people with adequate energy and vitality. What are the optimal test ranges for people who don't have disease?