



# **An Actionable Guide to Optimize Your NAD Level**

**Report for** [REDACTED]

Prepared by: Jinfiniti Precision Medicine

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# Hello

Thank you for taking the Intracellular NAD™ test by Jinfiniti Precision Medicine. Our mission is to empower our customers to learn about their bodies and make the most informed decisions so they can avoid chronic diseases and maintain wellness as they age. We operate under the philosophy that you can only improve what you measure, which is why we measure actionable biomarkers of aging found in the blood. With the information in this report, you can change your lifestyle and take specific interventions to improve your NAD level and improve your health.

By taking the Jinfiniti test, you have invested in yourself and enlisted us to provide the most accurate testing and up-to-date information to make your long-term health a reality.

Hopefully this is the first of many reports that we will have the pleasure of sharing with you.

**Thanks,**



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# Your Intracellular NAD<sup>TM</sup> (icNAD) result from the current test

**17.6**  $\mu\text{M}$ , at 44.0% of the lower end of the optimum range (40 $\mu\text{M}$ ), and 17.6% of the higher end of the optimum range (100 $\mu\text{M}$ ). Your NAD value falls into the **Severely deficient** range.



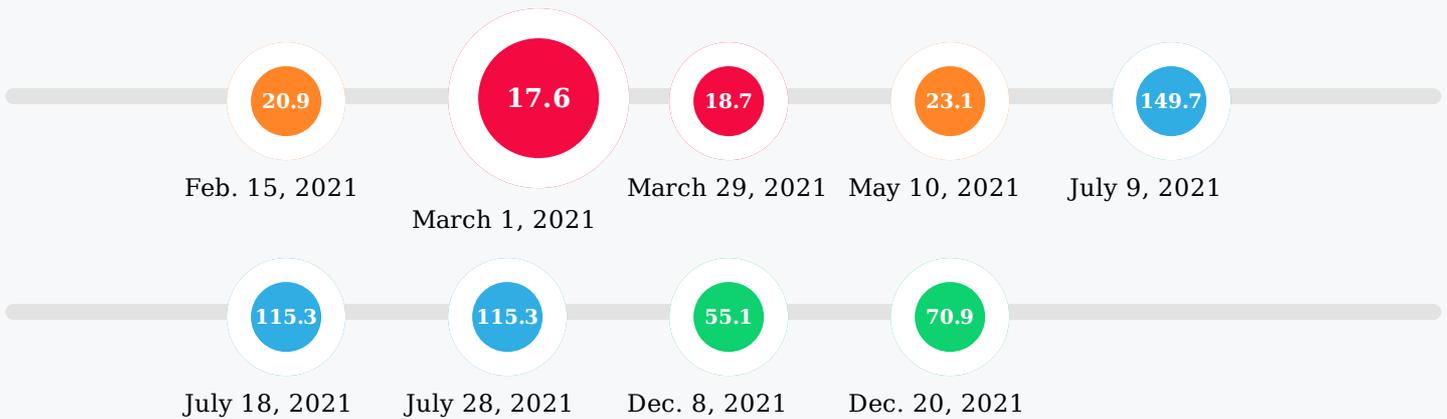
## Definition of categories

- Too High ( > 100 $\mu\text{M}$  )
- Optimal ( 40 $\mu\text{M}$  - 100 $\mu\text{M}$  )
- Suboptimal ( 30 $\mu\text{M}$  - 40 $\mu\text{M}$  )
- Deficient ( 20 $\mu\text{M}$  - 30 $\mu\text{M}$  )
- Severely deficient ( 0 $\mu\text{M}$  - 20 $\mu\text{M}$  )

*Note: NAD values over 100 $\mu\text{M}$  may not have additional benefits and can potentially be harmful.*

*Testing for homocysteine level may be useful to answer this question.*

## Summary of your historical icNAD results



Historical icNAD data for a 68-year young lady in generally good health. Her baseline icNAD levels were determined on 2/15/2021 and 3/1/2021. She started supplementation with NAD precursor after the test on 3/1/2021 and was retested on 7/9/2021. The supplementation had very little effect on her NAD level. She switched to a different supplement and was able to increase her NAD level by about 20% and she remained in the deficient range. She then switched to Jinfiniti's Vitality Booster (1000mg of NMN) and her NAD levels went to over 100uM, which may not be beneficial to her. Subsequently, she decreased her NMN dose to 500mg and optimized her NAD level in a perfect range (50-100uM).

# Details

## Maximize your healthspan

Many factors can influence healthy longevity (your healthspan) and your response to medical treatment for diseases.

Some of these factors are genes that you inherit from your parents that do not change over your lifetime. However, the expression of your genes are constantly altered by many other factors inside and outside of your body. These factors, which can be called non-genetic, extrinsic, environmental, or modifiable factors, interact with your genes (Gene x Environment Interaction), determine your health versus subhealth and disease.

## Modifiable factors for health and longevity

While your DNA is the master code for your health and longevity, there are many factors that affect how you age:

- What, how much, and when you eat and drink
- How much you exercise
- How much and how well you sleep
- How much stress you experience
- How much exposure you have to pollution, radiation, UV rays, toxins, etc.

These factors have a huge impact on your health, and they all are controllable.

But to improve your health, you need a way to measure it. That's where NAD comes in. Nicotinamide Adenine Dinucleotide (NAD) is one of the most important modifiable factors for healthy longevity.

## Nicotinamide Adenine Dinucleotide (NAD)

NAD is a coenzyme found in all living cells. It is essential to life because it catalyzes reactions for more than 400 enzymes, including those involved in the production of cellular energy (ATP).

NAD plays an essential role in six hallmarks of aging: DNA repair, epigenetic alteration, loss of proteostasis, mitochondrial dysfunction, cellular senescence, deregulated nutrient sensing.

NAD declines with age and lower NAD levels are linked to loss of function and vitality, and many age-related diseases.

### Cellular location of NAD: Intracellular vs. Circulating

- NAD is synthesized inside cells, and most NAD stays inside cells to support cellular functions.
- However, a small proportion (about 5-10%) of NAD is also secreted into the bloodstream and circulates throughout the body.
- While most known functions of NAD are attributed to intracellular NAD, circulating NAD does play critical roles that are not yet fully appreciated.
- NAD inside cells is called Intracellular NAD and NAD in the plasma (liquid portion of blood) is called Circulating NAD.
- Jinfiniti Precision Medicine offers two different NAD tests: Intracellular NAD™ (icNAD) and Circulating NAD™ (CirNAD). With both tests, Jinfiniti measures the total level of NAD<sup>+</sup> and NADH.
- The test you took was the icNAD test. It's a great first step in optimizing your NAD level.

## How do we measure your intracellular NAD?

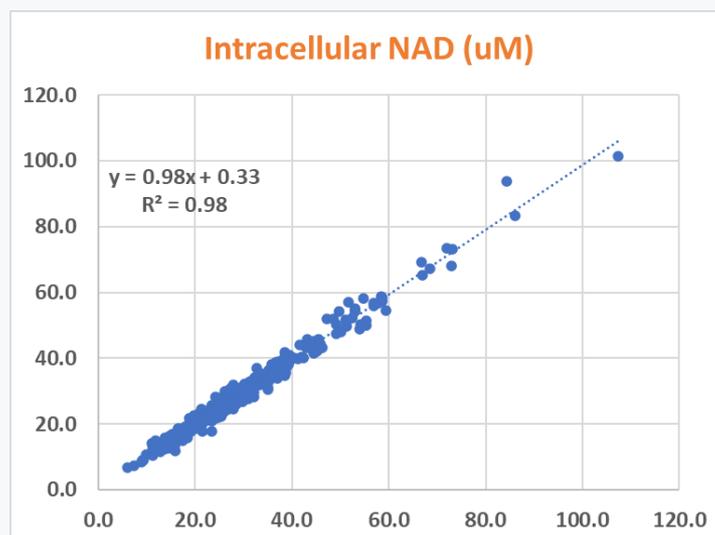
Boosting NAD levels has been shown to improve healthy longevity, but until the development of the Jinfinity test, there's been no way to accurately and easily measure NAD levels.

Jinfinity developed its NAD tests by solving two major problems that hampered NAD testing in the past:

- Invention of a NAD stabilizing buffer that dramatically slows down the degradation of NAD at ambient temperature.
- Development of a high-throughput, accurate, and reproducible testing technology.

The Jinfinity Intracellular NAD™ assay is highly reproducible as illustrated by the correlation plot of duplicate tests for the same samples conducted on consumer samples. The average coefficient of variation is 3.1% and the coefficient of correlation ( $R^2$ ) is 0.98.

### Correlation Chart



### Categories of NAD Levels

0 $\mu$ M - 20 $\mu$ M  
Severely deficient

20 $\mu$ M - 30 $\mu$ M  
Deficient

30 $\mu$ M - 40 $\mu$ M  
Suboptimal

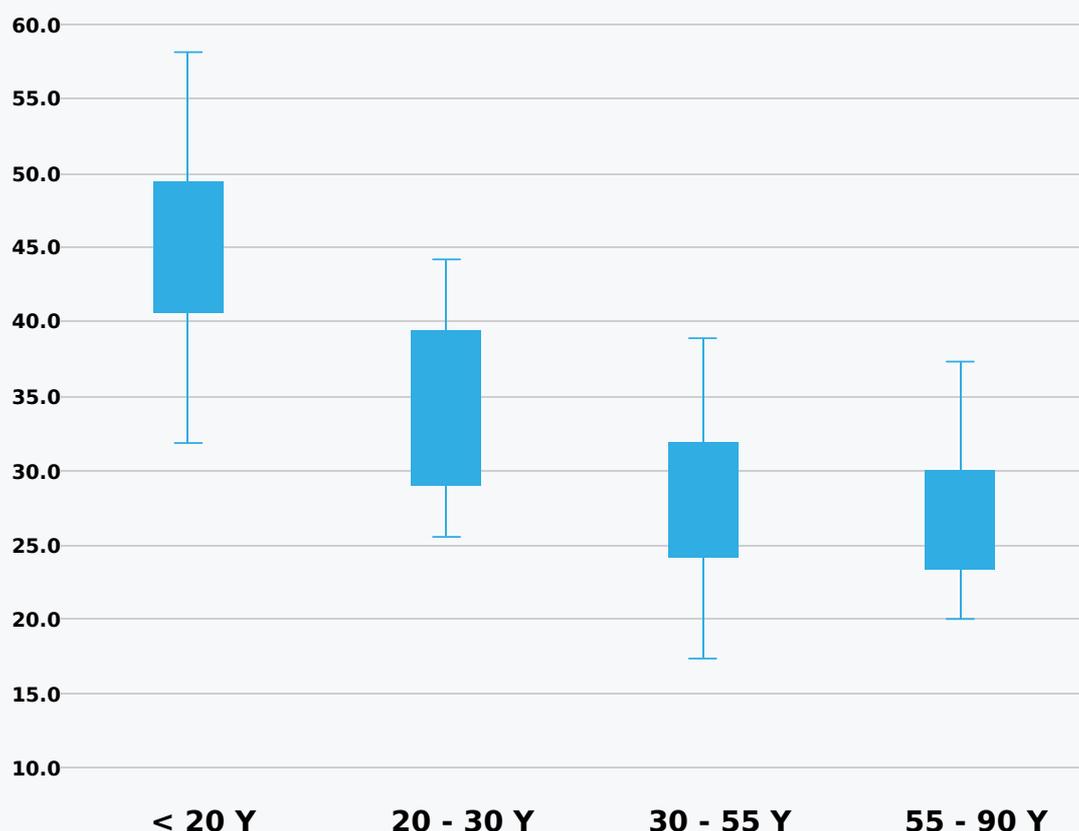
40 $\mu$ M - 100 $\mu$ M  
Optimal

> 100 $\mu$ M  
High

## How do we define the optimum NAD range?

- Because NAD levels decline with age, we define the lower end of the optimum range using the NAD values observed in teenagers.
- The 25th percentile of NAD in this age group is 40 $\mu$ M (micromole), meaning that 75% of teenagers have NAD levels greater than 40 $\mu$ M.
- Therefore, we set the lower end of the optimum range at 40 $\mu$ M, which is the minimum level that one should try to achieve for healthy longevity.
- These values may vary in different people but the current research indicates that a level in the range of 50-75 $\mu$ M is a good target.
- It is not known whether levels above 100 $\mu$ M are beneficial or detrimental.

## Distribution of icNAD Levels in Different Age Groups



## Potential Benefits of Optimal NAD

- Increased cellular energy (ATP).
- Improved endurance and strength.
- Improved DNA repair.
- Reduced oxidative stress.
- Greater ability to fight inflammation.
- Improved bone density.
- Better prevention of age-related diseases, such as cardiovascular disease, cancer, diabetes, infectious diseases, neurodegenerative diseases, etc
- Reduced cellular senescence
- Better immune health.
- Improved brain-cell repair and protection.
- Improved glucose intolerance and insulin sensitivity.
- Improved blood plasma lipid profiles.
- Improved nerve-tissue generation.
- Improved circadian rhythm and intracellular calcium release during sleep.

## Risk factors for suboptimal NAD levels

A number of factors can lower NAD levels.

- Age (NAD declines as we get older).
- Low physical activity.
- Genetic and epigenetic deficiencies (NAD synthesis enzymes).
- Diseases and suboptimal health conditions.
- Alcohol consumption.
- Nutritional deficiencies (vitamin B3, tryptophan).
- Senescence and inflammation (CD38).

## Molecular determinants of intracellular NAD

There are three categories of molecular causes for low NAD levels.

### ○ Building blocks for NAD synthesis

The body creates new NAD from nutrients such as tryptophan or niacin. The body can also recycle NAD metabolites (elements broken down from NAD), including nicotinamide mononucleotide (NMN), nicotinamide riboside (NR), or nicotinamide (NAM) using a salvage pathway (where the body can recycle pieces of NR, NAM, and NMN to create NAD). When cells don't have enough NAD building blocks, NAD production is limited.

### ○ Enzymes for NAD synthesis

Several enzymes are required to make NAD from the NAD building blocks. The production of these enzymes is genetically controlled and can be induced or suppressed by various molecular, physiological, and/or pathological factors.

## ○ **NAD-consuming enzymes**

Enzymes like sirtuins and PARPs are essential for maintaining healthy cells. Sirtuins use NAD to regulate gene expression and how cells function. PARPs aid in DNA repair. As we age, we require more maintenance, which may increase sirtuin and PARP activities thereby depleting NAD. CD38 is an enzyme that increases with inflammation, senescence, and age, and is thought to be a major cause of NAD depletion.

## **Four ways to raise your NAD level**

Since NAD deficiencies can have different causes, different people may require different management strategies to achieve optimum NAD levels.

There are four major approaches.

### **1. Direct delivery of NAD+**

NAD+ can be delivered to the body by one of several delivery routes, including IV infusion, oral formulation, patches, and creams. There is reasonably strong evidence that IV infusion of NAD+ can rapidly raise NAD level in the blood, and therapeutic effects have been seen in many clinical settings.

However, because the NAD molecule is too big to enter the cells, it remains to be seen whether short term NAD+ IV infusion can effectively increase intracellular NAD.

To a much lesser degree, NADH, like NAD+, has also been used to raise NAD levels.

## 2. Supplement with NAD building blocks

Although tryptophan and vitamin B3 (Nicotinic acid and nicotinamide) can be converted into NAD, the efficiency of the process remains to be evaluated by clinical studies.

NMN (nicotinamide mononucleotide) is the most efficient NAD precursor to increase NAD level in humans. NR (nicotinamide riboside) may also increase NAD levels in some people.

## 3. Induce NAD synthesis enzymes

Theoretically, it is possible to boost the production of NAD synthesis enzymes in both the *De Novo* synthesis pathway and the salvage pathway. Certain lifestyle strategies such as exercise, sauna use, fasting, and good sleep can activate AMPK, which increases NAMPT, an enzyme required to make NAD.

Any activities that reduce oxidative stress and inflammation can reduce the consumption of NAD.

Processing alcohol also consumes NAD. However, how much a difference these lifestyle strategies can make in terms of NAD levels remain to be studied. It is possible to elevate NAD synthesis enzymes but there are not yet proven supplements on the market.

## 4. Inhibit NAD-consuming enzymes

CD38 is the most important enzyme that can be targeted to reduce the consumption of NAD. Apigenin and quercetin are among the best known supplements that can inhibit CD38. However, their efficacy in increasing NAD levels in human subjects remain to be demonstrated.

CD38 is induced by inflammation and cellular senescence, therefore, anti-inflammatory and senolytics treatments can boost NAD levels.

## How can you optimize your NAD?

Congratulations! You can now use your test result to guide your NAD management.

Depending on which category your NAD value falls into, and your personal choice for your desired NAD level, you can take one or multiple available actions that were discussed above.

It is also essential that you take the third step, which is to retest your NAD level after intervention to determine whether and how well your NAD management has worked.

Based on the new test result, you may need to adjust your intervention strategy till an optimal level has been achieved.

It is also important to remember to retake the test if you have encountered major changes in your lifestyle, NAD management plan, and/or overall health.

Otherwise, we recommend you take the test in 3-6 months.

## Tips for optimizing your NAD

If you have not been managing your NAD levels, consider one of the available NAD boosting strategies. If you have been actively managing your NAD levels and your value is not in the higher end of the optimum range, you may want to

- Increase your dosage.
- Change the brand of the NAD intervention.
- Change the type of intervention.

## **When should you take a NAD test again?**

Your icNAD test result, like any other test, only reflects your NAD status at the time your blood was drawn. Your NAD status will change with age, external and internal changes, and your NAD optimization strategies. It is therefore critical to take the NAD test again at regular intervals.

If you are in the optimum range and there is no major change in lifestyle, nutrition, health status, and NAD intervention strategies, you may consider taking the test again in 3-6 months.

If your NAD is not within a healthy range, consider taking the test again 2-4 weeks after you've implemented steps to increase your NAD levels.

Most NAD-boosting strategies should raise your NAD levels within 2-4 weeks.

Keep in mind that you may need to try multiple strategies until you find one that works for you. Repeated testing is the only way you can measure progress towards your personal goal.

## Questions?

If you have any questions or concerns, don't hesitate to contact us at:

**info@jinfiniti.com**

**+1 (706)-831-8882**

**1235 Walton Way, Augusta, GA 30901**

We want to thank you for letting us be a part of your journey for optimized health.

## Disclaimer

The Intracellular NAD™ is not a diagnostic test and is not approved by the FDA. The Intracellular NAD™ does not evaluate many other factors that may be important for your health status and disease diagnosis and should NOT be used as replacement for your medical care by your physicians.