

# Archway<sup>®</sup>

a p o t h e c a r y

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## Nicotinamide Adenine Dinucleotide – NAD Therapy

### Brain Repair, Health & Longevity

#### The Brain Restoration CoEnzyme 1 ~ NAD, The Cellular Repair & Replication Catalyst

*“ In an experiment in mice, the team found that giving older mice NAD for just one week made 2-year-old-mice tissue resemble that of 6-month-old mice (in human years, that would be akin to a 60-year-old’s cells becoming more like those belonging to a 20-year-old).”*

**NAD** stands for nicotinamide adenine dinucleotide, which is the chemical term for a molecule that reacts with oxygen in the mitochondria to make cellular energy – the mitochondria is the energy producing “power plant” in every cell of your body and **NAD** is its chemical converter. The mitochondria make the energy your body uses to animate life in every way and this organelle is the most important influence governing your body and brain’s health. Lack of this essential coenzyme in the Krebs cycle is now recognized as a key feature of chronic fatigue, apathy, depression, anxiety, alcohol and drug addiction, weak immune system (infections and cancer), mood disorders, muscle pain and weakness, headaches, memory disturbances, insomnia, focus and concentration defects and other metabolic disorders and other chronic diseases. **NAD** deficiency, in my opinion, is an epidemic cellular disease because each and every disease is fundamentally caused by oxidative stress and an **NAD** deficiency accelerates the negative effects of oxidative stress – cellular function decline and then death.

*NAD plays an essential role in the production of ATP (Adenosine triphosphate), the basic energy molecule in the body, and has more than 100 metabolic functions in our human biochemistry.*

**NAD** is a co-enzyme of Niacin – B3. Enzymes are responsible for every biochemical process that supports life. There are two primary classes of enzymes: digestive and metabolic. Metabolic enzymes are responsible for the structuring, repair, and remodeling of every cell.

**NAD** (nicotinamide adenine dinucleotide) is a metabolic co-enzyme, which continuously varies between the **NAD** and NADH compounds in the body. Metabolic enzymes operate in every cell, every organ and every tissue, and they need constant replenishment. Lifeless, enzymatically void diets today tend not to keep up with metabolic demands. **NAD** levels naturally decline with age, however, in today's world, **NAD** is depleted far more quickly as cells work much harder than even 10 years ago to metabolize toxins, handle stress, and adapt to an unhealthy, over stimulating psychological, emotional, and physically toxic environment. Our environment has changed more in the last 100 years than in the last 20,000 years and the requirements of adapting to those changes, along with the toxic and nutritionally void processed foods that people consume in an environment that requires MORE nutrition to function well places a high demand on our cellular energy performance to keep up with it all. Therefore, degenerative and autoimmune disease, heart disease, cancer, diabetes, mental disturbances – essentially all metabolic disorders and diseases will surface early as cells will age more quickly and succumb to the inherent oxidative stress in our lifestyles, diet and environment.

All human activities require energy. Research has indicated that 90% of our physical energy must be made available from the biochemical processes within our cells. Each cell in your body has a particular function that needs energy to do its job. This energy is produced by various chemical processes in the mitochondria. Glucose derived and fat is the fuel for these power plants and is supposed to be obtained from the food we consume by means of digestion. Today's toxic processed, GMO, and Nutritionally void foods do not supply the required demand to properly deliver and utilize glucose. So it floats around in the blood and becomes food for harmful bacteria, disrupts the neuroendocrine system (insulin and leptin resistance) and produces everything from cancer to harmful neurotransmitter analogues. Don't get me wrong, there is plenty of glucose derived from dead, processed foods; just not the nutrients and enzymes to deliver it to the mitochondria and burn it. This is why people who fill up on grains and junk don't have a lot of energy!

Without sufficient **NAD**, the mitochondria simply cannot function and the cell will die. However, first, a cellular slowing of operation will happen which is when various symptoms will manifest as "brain fog", inability to focus, general fatigue, losing ambition, aspiration, enthusiasm, and inspiration for life, laziness, disinterest in things you once loved, etc. After a period of this, actual diseases and metabolic disorders will begin to manifest.

A chronic **NAD** deficiency results in a metabolic energy deficiency. This metabolic energy deficiency is called an **NAD** Energy Deficiency (NED). NED is insufficient chemical energy which means the body does not have enough **NAD** molecules and accompanying energy nutritional and enzymatic cofactors to generate enough metabolic energy on a cellular level to maintain the body in a constant state of health; ergo, produce the energy required to fuel the biochemical processes that sustain and animate life.

This is the primary reason why those that suffer NED will get a disease in the same environment when others will not. The people who do not succumb to a disease such as those caused by contaminated water, have better **NAD** production and utilization (producing ATP) so cells are able to protect themselves, repair, replicate, efficiently utilize nutrients, and perform the all important task of removing waste – detoxification. This is really important for the brain as waste products can mimic neurotransmitters, and compete for the healthy ones for receptor sites, therefore causing mood issues and even adverse mental health conditions such as schizophrenia in addition to causing actual organic damage resulting in tumors, neurodegenerative and autoimmune diseases.

NED can result in a wide spectrum of diseases (probably all). NED mostly manifests itself as chronic fatigue, chronic fatigue syndrome, substance abuse, depression, stress, anxiety and various other chronic illnesses.

## **NAD and Longevity – The Anti-Aging Neuron Elixir**

It is the environment of the cell that determines how quickly it will age and die, as well as how efficiently it will function. When the environment is full of the raw materials required to produce energy and repair and replicate (supreme unleaded!), they live long, healthy lives. When the environment is toxic and nutritionally non-supportive, they begin to fail and die quickly.

In a paper published in the journal *Cell*, Dr. David Sinclair, professor of genetics at Harvard Medical School, and his colleagues pointed to **NAD** as the naturally occurring catalyst made by young cells that was able to revive older cells and make them energetic and youthful again. In an experiment in mice, the team found that giving older mice **NAD** for just one week made 2-year-old-mice tissue resemble that of 6-month-old-mice (in human years, that would be akin to 60-year-old's cells becoming more like those belonging to a 20-year-old).

As mammals age, says Sinclair, levels of **NAD** drop by 50%; with less of the compound, the communication between the cell and its mitochondrial energy source also falters, and the cell becomes vulnerable to common aging assaults- vulnerability to toxic assault and oxidative stress, inflammation, muscle wasting and slower metabolism. With improved amounts of **NAD**, aging can theoretically be reversed. "When we give the molecule, oxygen delivery is enhanced, and everything revs back up again," Sinclair says.

The **NAD** pathway may become an important target for cancer researchers as well, since tumors typically grow in low-oxygen conditions and are more common in older patients. And because it improves cellular oxygen, communication, detoxification and metabolism, it only makes sense that it would be a good adjuvant therapy for cancer patients.

Because **NAD** is a naturally occurring compound that simply declines with age, Sinclair says that "If a body is slowly falling apart and losing the ability to regulate itself effectively, we can get it back on track to what it was in its 20s and 30s using **NAD**," he says.

## NAD & The Krebs Cycle ~ The Chemistry of Animating Life

**NAD** is an activated form of vitamin B3 that becomes a coenzyme when it is bound with hydrogen, making it NADH. Hydrogen is the explosive power that the body uses, along with oxygen, to make energy. Hydrogen and Oxygen are “sparked” in the mitochondria to make energy.

This is how it works. We eat carbohydrates, proteins and fats that provide the chemicals that enter the Citric Acid Cycle, a biochemical pathway that produces NADH. The **NAD** is now carrying hydrogen (NADH) which in turn enters the electron transport chain in the mitochondria and is “sparked” with oxygen and the outcome is energy (ATP), along with water. ATP, or adenosine triphosphate, is the fuel for the heart to beat, the muscles to contract and for every cellular energy requirement within the 100 trillion cells of the body.

It is clear to see how important NADH is for the body as it is involved in every bodily function and catalyzes more than a thousand metabolic reactions in the organs and tissues. The heart uses the most **NAD** as it beats around 86,000 times daily. The brain consumes about 20 to 35% of the sum total of energy produced by the body. Often an energy deficiency is first detected in the brain with poor concentration, memory loss, short-term retention of information, difficulty focusing, and attention deficit. If the energy shortage lasts long enough, brain neurons cannot synthesize neurotransmitters, the molecules of consciousness, such as serotonin, dopamine, and noradrenaline, and we experience anxiety, depression, sleep disturbance and other mood changes.

Vitamins, minerals, complex carbohydrates, proteins and fats come from our diet and provide the building blocks to citric acid cycle energy production. If any one of the nutritional factors is low, energy production is diminished. Since oxygen is just as important as hydrogen in cellular energetics, lack of exercise can reduce the amount of oxygen at the cell level. Also, most people simply do not eat live foods anymore, which are rich in enzymes; enzymes that catalyze the citric acid cycle. The toxic environment and food people eat today inhibit (due to depletion of required nutritional cofactors) and destroy **NAD**. Chemical or physical toxins that create oxidative, or free radical damage also accelerates the disease and aging process. Free radical damage comes from cigarette smoke, drugs, radio waves from cell phones and Wi-Fi, and the myriad of chemicals found in all humans at this time on earth, including phalates, parabens, pesticides, styrene, benzene, toluene, and thousands more. For example, medical scientists now widely believe that Alzheimer’s dementia and Parkinson’s disease share the common feature of nerve cell degeneration due to impairment of the ATP producing enzymes within the citric acid cycle and mitochondria.

To make all this extremely simple: The brain is a condensed and very sophisticated network of information signals and relays that process environmental and informational messages in the form of “energy”. It depends entirely on a good energy source to do everything from read and breathe to responding to messages from the environment in order to adjust metabolism and keep you alive

while sleeping. It is also the body's "alarm" system and expresses moods from the heart when it is healthy and when it is not will adulterate those authentic moods with chemicals and dying circuits that produce depression, anxiety, insomnia, fear as well as the inability to focus (can't fire sufficient neurotransmitters to keep your attention), addictive biochemistry (trying to mediate the symptoms), lack of follow through, and generally uninspired life. Mental health symptoms are usually your first sign that you are suffering an **NAD** deficiency and that it's time to take change in diet and lifestyle seriously. Treatment is also available for those with the financial resources, however, it can be expensive so it is a good idea to heed the non negotiable laws of health and live as you were designed to; with organic clean food and exercise while closing off all routes of toxic exposures in your food, air (home air cleaners), food containers, hygiene products, water (as well as shower), OTC drugs, and "medicine". The road to recovery can be much slower for some over others, and in the case of psychiatric drug damage, alcohol abuse, or illicit drugs, it is a good idea to seek treatment to minimize the likelihood of not being able to get through the time it takes to heal and relapse, or resume (or never stop) taking a sleeping, antipsychotic, or psychiatric "mood" drug that is destroying your brain many times more aggressively than even illegal drugs.

## Key Neuro/Biochemical Functions of NAD

- Protects and repairs DNA, reducing DNA mutations which are caused from chronic bioaccumulation of biotoxins, age, drug/alcohol abuse, improper diet, stress, etc.
- Increases energy in heart cells.
- Increases energy in brain cells.
- Improves communication between the mitochondria (energy producing organelle in every cell) and the nucleus in which enhances all cellular communication.
- Enhances the utilization of nutrients and removal of waste within the cell.
- Reverses cerebral aging as well as protects the brain from aging by adding mitochondrial organelles within the cell.
- Proven clinical record for dramatically improving neurodegenerative disease such as Parkinson's and Alzheimer's.
- Improves general metabolism.
- The "most powerful antioxidant" in the body according to Dr. Richard Passwater in his book *NADH - The Energizing CoEnzyme*.
- Lowers cholesterol.
- Strengthens the immune system.
- Stimulates production of dopamine, serotonin, and noradrenaline, thereby improving neurochemical communication, moods, concentration, and memory.
- Stimulates nitric oxide production, thereby improving blood flow in the body - this is essential for healthy brain function as the brain is a very dense network of capillaries charged with the responsibility to get blood flow to the brain.
- Reverses insulin resistance quickly when diet is corrected.
- Quickly establishes healthy blood sugar regulation.
- Reduces Brain Inflammation and when diet is corrected, entirely eliminates Brain Inflammation.

**Medical Research has shown the following medical conditions to improve with NAD Therapy:**

- Chronic Fatigue
- Muscle Pain and Weakness
- Joint Pain and Stiffness
- Headaches
- Depression
- Anxiety
- Alcohol and Drug Addiction
- Diabetes
- Sleep Disturbance
- Memory Loss (Forgetfulness)
- Attention Deficit
- Fevers, Sore and Swollen Throats
- Lymph Glands
- Parkinson's Disease
- Alzheimer's
- Cancer

**Research has shown that NAD provides the following benefits in "Healthy" people:**

- Increased Physical Energy
- Improved Mental Performance
- Improved Response to Short Term Memory

**\*\* Archway Apothecary is the only company in the world with a 99.999% PURE NAD Product\*\***

**Please Call Archway Apothecary with any Question Regarding NAD Products and Access the Network of Physicians with experience using NAD !**

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