

NAD⁺clinic[®]

PERSONALISED LONGEVITY

AN INTRODUCTION TO NAD+ THERAPIES

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WHAT IS NAD+?

Nicotinamide Adenine Dinucleotide

Pioneering preventive health

“NAD+ IV Therapy is at the forefront of the exponential growth in preventative health innovation, human performance and the elongating life-span space.”

THE CRITICAL ROLE OF NAD+

NAD+ is an essential housekeeping molecule found in every cell of the body, participating in numerous metabolic pathways. It serves as a vital cofactor and driving force for various critical cellular processes, such as energy metabolism, mitochondrial function, biosynthesis, gene expression, DNA repair, immune function, and ageing.

As a coenzyme, NAD+ performs two crucial functions: it acts as an electron transporter in cellular respiration and adenosine triphosphate (ATP) production, and it also serves as a substrate for poly (ADP-ribose) polymerase (PARP) and sirtuin (SIRT) enzymes, which are involved in DNA repair, gene regulation, and cell signalling - as well as being a substrate for CD38 ectoenzymes.

A sustained imbalance in NAD+ metabolism can disrupt physiological functions, potentially leading to diseases such as metabolic disorders, cancer, premature ageing, and neurodegenerative conditions. The impact of NAD+ deficiency on various diseases through the manipulation of cellular communication networks can be mitigated by NAD+ therapeutic intervention.

In essence, without NAD+, we would die. NAD+ is as vital to our bodies as oxygen. By enhancing and optimising NAD+ levels through therapeutic intervention, we can improve both mental and physical human performance and extend our lifespan.



NAD+ IS CRUCIAL FOR LIFE



KEY FACTS

NAD+



Novel form of Vitamin B



Natural coenzyme found in all living cells



Directly Involved in the ATP (Energy) production



No reported side effects

NAD+...



IS INVOLVED IN ALL BODY FUNCTIONS

NAD+ is involved in hundreds of metabolic functions, ranging from energy creation to maintaining healthy DNA.



IT IS FASTER CONSUMED THAN REPRODUCED

Our body cannot reproduce NAD+ sufficiently as we reach our thirties - and this ability further declines with age.



LEVELS DECLINE WITH AGEING

The decrease in NAD+ levels is the scientific trigger for the decline of many basic physiological functions that leads to early aging and potentially chronic disease.



IS DIMINISHED BY LIFESTYLE CHOICES

The decline of NAD+ levels will be accelerated by poor lifestyle choices such as an unhealthy diet, stress, alcohol and substance abuse.

NAD⁺ & GLYCOLYSIS

Figure a. shows the series of steps that make up glycolysis. These steps all happen in the cytoplasm of a cell.

- Glycolysis is the splitting, or lysis, of glucose. It takes place in the cytoplasm of a cell.
- Glycolysis is a series of reactions (steps) in which a glucose molecule is eventually split into pyruvate (links Glycolysis to Krebs cycle).
- Hydrogen is transferred to the carrier molecule NAD (nicotinamide adenine dinucleotide). The NAD is now reduced NAD. Two molecules of reduced NAD are produced for each molecule of glucose entering Glycolysis. The hydrogens carried by reduced NAD can easily be transferred to other molecules.

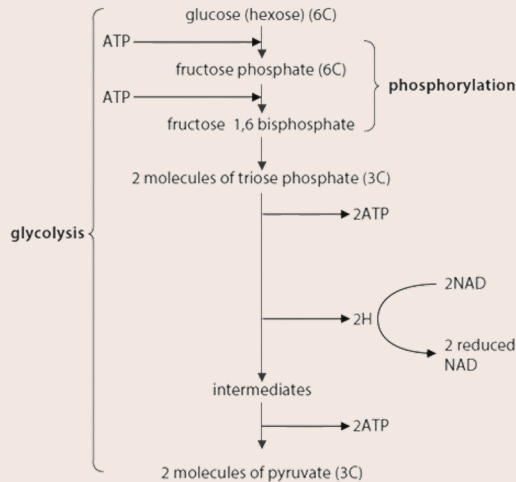


FIGURE A. THE SERIES OF STEPS THAT MAKE UP GLYCOLYSIS

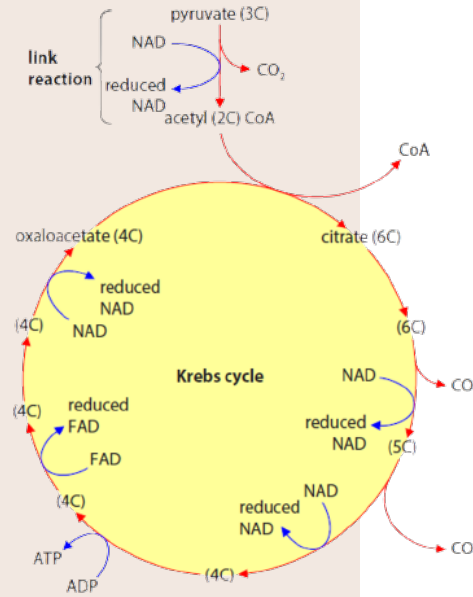


FIGURE B. THE LINK REACTION AND KREBS CYCLE

THE LINK REACTION & KREBS CYCLE

NAD⁺ participates in energy creation by acting as a delivery mechanism. This molecule donates and accepts electrons to and from enzymes in the mitochondrial membrane. It is these electrons that fuel chemical reactions in the mitochondria. Without a sufficient supply of NAD⁺, the mitochondria can't adequately convert the nutrients from the foods we eat into usable energy.

The crucial role of NAD⁺ in different biological functions such as ageing, metabolism, mitochondrial function, immunological pathways, oxidative stress, gene expression, and apoptosis has been extensively investigated. Many studies have found that altered and reduced NAD⁺ levels play an important role in stimulating metabolic disorders, neurodegenerative disorders and tumorigenesis.

ELECTRON TRANSPORT CHAIN & OXIDATIVE PHOSPHORYLATION

Reduced NAD is produced in Glycolysis and in the Krebs cycle. The reduced NAD from Glycolysis was formed in the cytoplasm, but it can pass through the mitochondrial envelope and enter the matrix. These reduced NAD molecules move from the mitochondrial matrix to the inner membrane. Here, the hydrogens that they are carrying are removed. These hydrogens are later used to produce large amounts of ATP-by-ATP synthase.

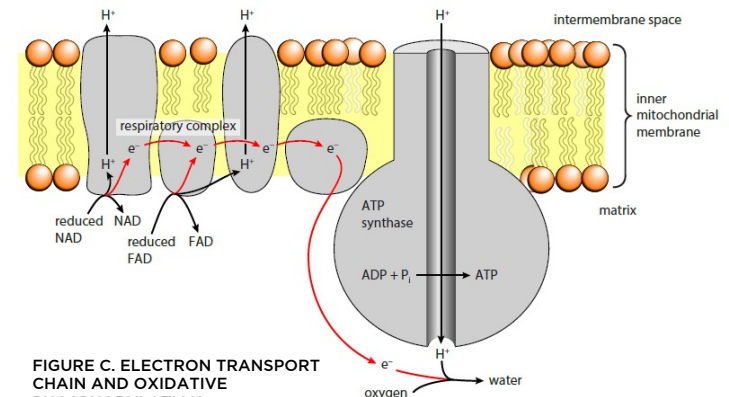


FIGURE C. ELECTRON TRANSPORT CHAIN AND OXIDATIVE PHOSPHORYLATION



THE REDOX REACTION OF NAD

Cells obtain energy during cellular respiration by oxidising food molecules such as glucose. The energy derived from these actions is used to form ATP. The two forms of NAD constitute a redox couple. This term is used to describe reduced and oxidised forms of the same molecule. The NAD⁺ is the oxidised form, that is, a state in which it loses an electron. NADH is a reduced form of the molecule, which means that it gains the electron lost by NAD⁺. The redox reaction described in Figure 1 involves electron transfers which play a central role in energy creation. NAD⁺ is the main carrier of electrons in the energy-producing processes that take place in a cell's mitochondria.

Mitochondria are known as the "powerhouses of the cell." These membrane-bound organelles are found in almost every living cell in the body, including the heart, brain, muscles, and lungs. They generate most of the energy needed to power the cell's biochemical reactions. The energy produced by the mitochondria is stored in the adenosine triphosphate molecule (ATP).

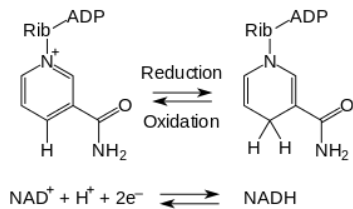


FIGURE 1: THE REDOX REACTION OF NAD

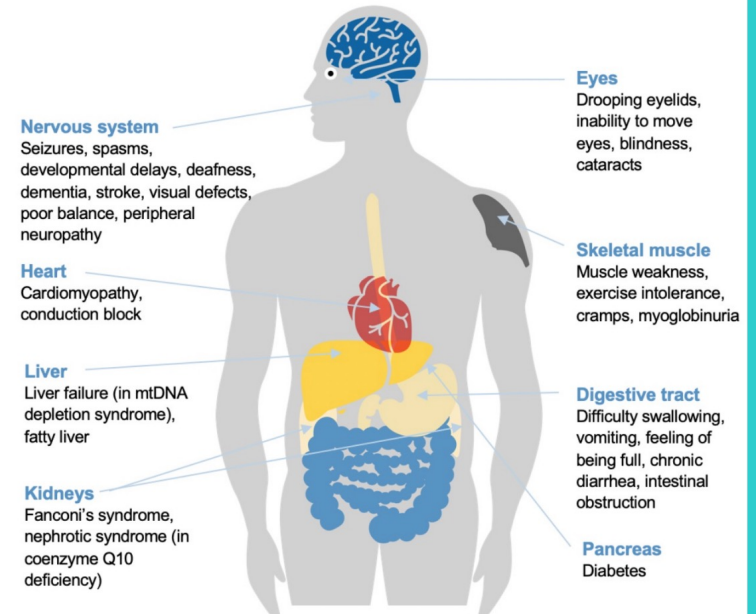
NAD⁺ THERAPY TARGETS ALL KIND OF MITOCHONDRIAL DISEASES



In preclinical, proof-of-principle studies, increased NAD⁺ levels have been shown to induce mitochondrial biogenesis and enhanced natural pathways that are key to improving mitochondrial health, such as sirtuins and PGC1alpha.

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The crucial role of NAD⁺ in different biological functions such as aging, metabolism, mitochondrial function, immunological pathways, oxidative stress, gene expression, and apoptosis has been extensively investigated. Many studies have found that altered and reduced NAD⁺ levels play an important role in stimulating metabolic disorders, neurodegenerative disorders and tumorigenesis.



Over 50 rare diseases are categorised as rare mitochondrial diseases, which can often have serious effects on skeletal muscle, cardiac muscle, or the central nervous system, for which there are few available therapies and a high unmet medical need.



NAD+ THERAPY HELPS DIRECTLY REPLENISH NAD+ LEVELS



The NADclinic Group produces and supplies only pure pharma grade NAD+ through its clinics and partner collaborations. Ensuring maximum efficacy and highly optimised and consistent results.

NAD+ BIOSYNTHESIS

To compensate for a reduction in natural NAD levels, most NAD+ is recycled via salvage pathways from nicotinamide riboside (NR), nicotinamide (NAM) and nicotinic acid (NA), which are the three main B3 vitamins that function as precursors of NAD+ (Figure 2). Each contributes to the generation of NAD+ via distinct metabolic pathways but which may be inadequate to support healthy NAD+ levels.

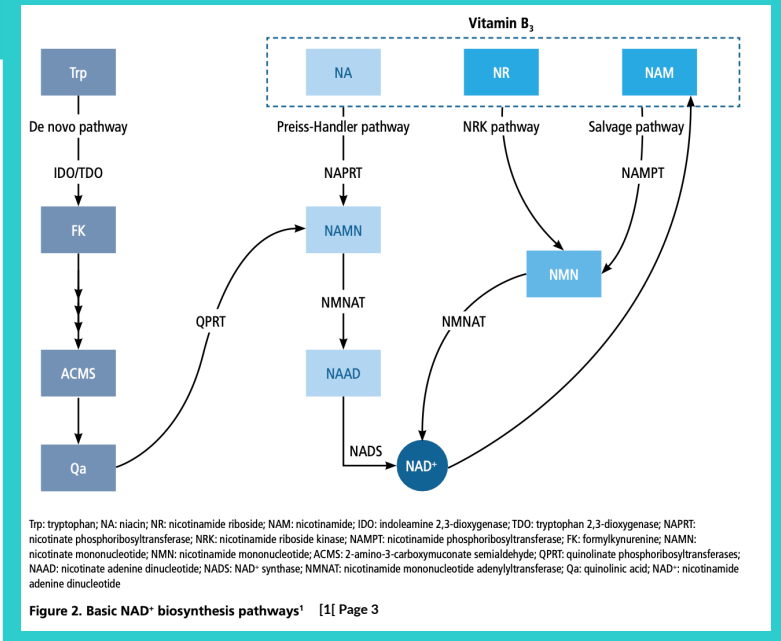
These precursors appear to have differing efficacy as primary sources of sufficient quantities of NAD+ particularly to tissues in which there is high metabolic stress and consequent high demand. Most cells and tissues utilise NR to produce NAD+, however where a deficiency exists, tryptophan catabolism through the kynurenine pathway is the sole route for de novo NAD+ synthesis and interestingly, altered kynurenine pathway activity has frequently been linked to ageing and some age-associated diseases.

CAN DECLINING NAD+ LEVELS BE RESTORED?

Low levels of NAD can be caused by a deficiency in the synthesis/salvage pathways, excessive DNA damage due to free radicals or ultraviolet light, or chronic immune activation. Activation of PARPs in the presence of excessive or accelerated DNA damage leads to depletion of NAD.

When NAD levels become critically low, adenosine triphosphate (ATP) production decreases, ATP stores are utilised and eventually, cell death ensues. The increased activity of CD38 and other NAD-consuming ectoenzymes in chronic immune activation similarly depletes NAD.

Decreased NAD levels may be a major factor in ageing and age-related degenerative diseases of the heart, brain, liver, kidney, and skin.





WHAT IS NAD+ USED FOR PHYSIOLOGICALLY?

- Energy Production (ATP)
- Chromosome Stability
- DNA Repair (PARP 1)
- Immune Cell Signalling
- Telomere Elongating
- Neurotransmitter (Brain Health)
- Longevity Mechanisms (Sirtuins 1-7)



NAD+ LEVELS DROP BY 50% BETWEEN THE AGES OF 40 & 60

NAD+ is constantly being consumed by all physical and mental functions and unfortunately, our physiological system consumes NAD+ faster than it can reproduce it once we are into our thirties. The ageing process, increases chance of DNA damage, inflammation and reduced mitochondrial function which parallelly negatively affects the body's ability to produce NAD+.

Emerging anecdotal and science-based evidence has implicated dysregulated NAD+ metabolism in the age-related functional decline of various tissues and organs, with lower levels of NAD+ correlated with diseases of ageing, other metabolic disorders and neurodegenerative diseases. On average, NAD+ levels drop by 50% between the ages of 40 and 60 which is the scientific trigger for the decline of many basic physiological and physical functions.

Therefore, therapeutically intervening and elevating NAD+ levels offers a solution for preventive health and cellular health optimisation.

WHAT CAUSES DECREASE IN NAD+?



LIFESTYLE CHOICES

Various lifestyle choices might negatively influence our NAD+ levels such as stress, poor diet, irregular working-life-balance and reduced or poor quality sleep.



SUBSTANCE ABUSE

Excessive alcohol, nicotine, recreational drugs, prescribed medication or other substances decrease NAD+ levels.



AGEING

Ageing is most commonly associated with decreased levels of NAD+. Levels decline by half by the time a human is middle aged, with implications for combating age-related conditions and diseases.

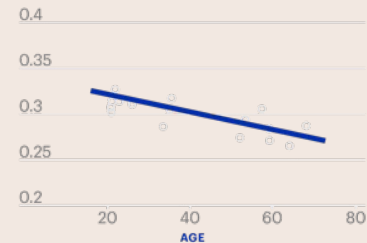


CHRONIC DISEASES

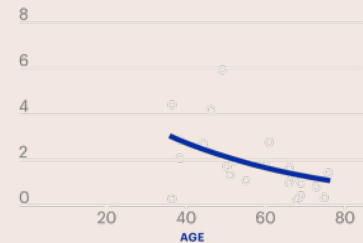
Chronic illness is typically a result of mitochondrial dysfunction, which can be triggered by decreased NAD+ levels.

NAD+ Levels Decline With Age

NAD+ (µmol/g), measured in human brain tissue



NAD+ (ng/mg protein), measured in human skin



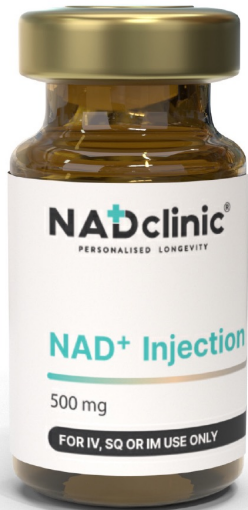
Source: Zhu, Xiao-Hong, et al. "In Vivo NAD Assay Reveals the Intracellular NAD Contents and Redox State in Healthy Human Brain and Their Age Dependences." Proceedings of the National Academy of Sciences, vol. 112, no. 9, 2015, pp. 2876-2881. doi:10.1073/pnas.1417521112.

Source: Masuoli, Hassina, et al. "Age-Associated Changes in Oxidative Stress and NAD+ Metabolism in Human Tissue." PLoS ONE, vol. 7, no. 7, 2012. doi:10.1371/journal.pone.0042357.

FIGURE 3: THE DECLINE OF NAD+ LEVELS WITH AGEING

NAD+ IV IS TYPICALLY USED FOR THE FOLLOWING REASONS:

- Improving Metabolism
- Addressing Chronic Fatigue
- Combatting Ageing
- Fighting Chronic Conditions
- Improving Concentration & Focus
- Relieving Burnout & Stress
- Lifestyle Detoxing
- Increasing Fertility Levels



Recommended to start with five sessions

NAD+ IV SOLUTION

Available in 200mg & 500mg per Vial

NADclinic produces and supplies NAD+IV as an intravenous solution, the most effective and efficient way of increasing the body's own NAD+ levels.

Studies prove that restoring levels of NAD+ in your cells has benefits for your brain and body, helping repair DNA, protect brain cells from damage, reduce inflammation and prevent ageing.

- **Prescription only**
- **Available in 500mg and 200mg**
- Infusion duration: 60 - 90 minutes
- Pharma grade NAD+ solution
- 18-months stability
- Storage between 2-8 degrees
- Distributed via our accredited pharmacy partners

NADclinic NAD+ Iv Solution is available in 500mg and 200mg vials. Please contact NADclinic directly for details of your local Pharma distributor. NAD+ IV is available on prescription only and supplied to licensed medical practitioners only.



NAD+ OPTIMA MAX

Available in 100mg & 250mg per Tablet

Optima Max is a daily oral supplement, clinically developed by our research and development team and based on the same formulation as NADclinic's best in class NAD+ IV protocol.

Optima Max is proven to increase and sustain NAD+ to optimum levels, energising the mitochondria in our cells and improving focus, concentration and cognitive function. Optima Max has the highest purity and potency of any nonprescription NAD+ supplement available.

NADclinic Optima Max is vegetarian, vegan and contains no artificial flavors. Optima Max is produced in a GMP-compliant and registered facility with rigorous third-party testing by independent labs during and after manufacturing.

- **Prescription free**
- Organic product
- Contains no World Anti Doping Agency (WADA) banned substances
- Manufactured in GMP production facility
- Two tablets daily
- Optima oral formulation 99% equivalent to NAD+ IV for maximum efficacy
- Stability 24 months
- Global distribution network



WHAT CAN PATIENTS EXPECT FROM THE BIOAGE TEST?

- Development of an individual therapy plan based on results
- Complete and targeted support of the ageing process throughout your life
- Individual food, lifestyle and nutrient recommendations to slow down the ageing process
- Recommendations for tailored customised supplements according to the patient's individual needs

Reduce your patient's true age with NAD+ therapy



BIOAGE DNA TEST

With the BioAge DNA test, we can accurately determine the body's biological age. In other words - this test measures how well or poorly the body is functioning relative to chronological age. With this information, it's possible to build a plan to reduce or maintain this number for patients.

The BioAge DNA Test functions by measuring the length of telomeres. Telomeres are organic 'caps' covering the ends of each DNA strand, safeguarding it during cell replication. Every time a cell divides, this 'cap' shortens, eventually becoming too short to enable proper cell function - which results in cell death.

Although this is a natural occurrence during our lifespan, specific factors can hasten the process, such as poor diet, lack of exercise, smoking and alcohol consumption, obesity, and stress.

Through DNA screening and subsequent comprehensive DNA analysis with Fagron Genomics, you will have the information to develop a bespoke NAD+ Anti-Ageing IV Infusion Regimen. This in turn will help maintain or improve the age of your patients' cells.

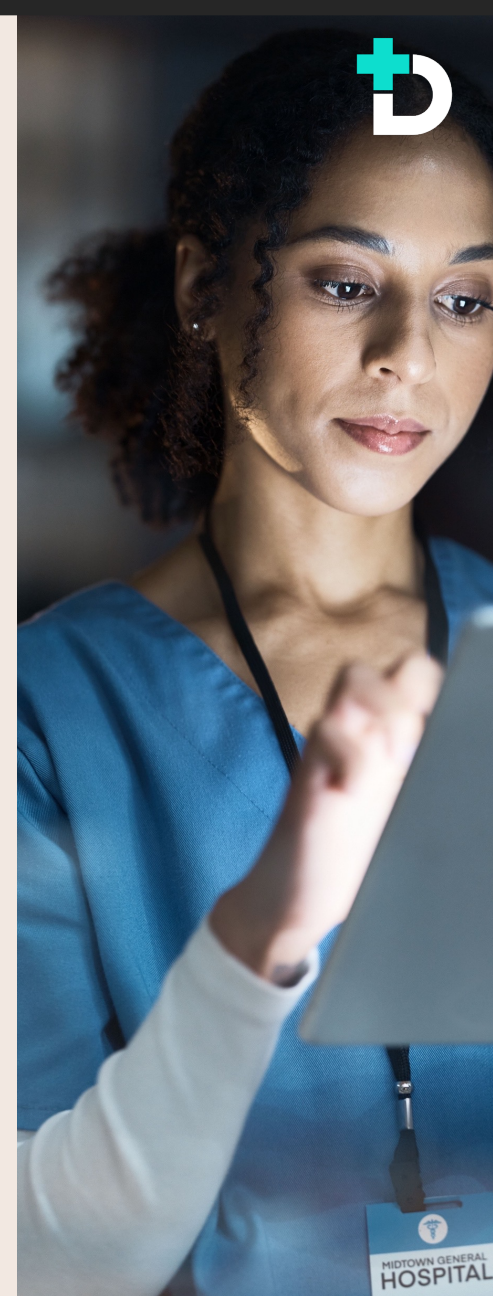
***RESULTS AVAILABLE BETWEEN 10-14 WORKING DAYS**

BIOGENETIC 360° DNA TEST

This test analyses 384 genetic variations, to provide a deeper understanding of the body. It will also provide information detailing what patients would need to focus on to provide their body with the nutrients it really needs. It is the most complete nutrigenetic analysis on the market.

The BioGenetic 360° DNA Test is an innovative two-parametric genetic test. It identifies significant genetic variations related to an individual's predisposition to metabolise particular nutrients and determines the telomere length of chromosomes. Specific gene polymorphisms can predict the likelihood of obesity and its related diseases. Individuals who store fat more efficiently are more prone to obesity. Other gene variations can also indicate the ability to digest lactose, allowing for the prediction of potential discomfort after consuming foods containing it.

- Development of an individual therapy plan based on patient's results
- Complete and targeted support across the ageing process throughout a patient's life
- Individual food, lifestyle and nutrient recommendations to slow down the ageing process
- Recommendations for tailored customised supplements according to the patient's individual needs
- Biological age
- Genetic cause of overweight and obesity
- Macro and micro metabolism
- Intolerances and deficits



OUR PRODUCTS & SERVICES

Supply of NAD+ IV Solution

Supply of NAD+ Supplements

NADclinic Clinical Partnerships

Marketing & Business Development

Genomics Testing & Diagnostics



TURNKEY SOLUTION FOR NAD+ THERAPY

At NADclinic, we're proud to be an innovative, forward-thinking transformational company. Staffed with a team of expert medical professionals specialising in functional medicine, nutrition, neurology and complementary therapies. NADclinic's core philosophy is optimising psychological and physical health and elevating human performance.

Fundamentally, we achieve this through harnessing the unique power of NAD+ - supporting a range of proprietary therapeutic protocols and therapies developed by our in-house scientific R&D team. Each one of our clinical locations or partner locations are centres of excellence, adhering to and delivering the latest cutting-edge NAD+ innovation via our Gold standard, lifestyle-orientated science led protocols and programmes.

NADclinic Group are internationally recognised as the world leaders in preventative health innovation and suppliers of accredited NAD+ IV, NAD+ Therapeutics, and NAD+ supplements.

ABOUT NADCLINIC



IAIN DE HAVILLAND
CEO & Founder

An experienced CEO, entrepreneur, investor and lifestyle-aficionado, Iain is also a passionate NAD+ Pioneer driving the business globally, since inception.



DR. LUKAS H. KOHLER

Chief Medical Officer

Lukas is focused on a holistic, non-surgical approach, combining minimally invasive procedures with other anti-ageing treatments to achieve the best possible results.



LEONA KROEHLE

Chief Medical Advisor

After working for many years in oncology, Leona now specialises entirely in human performance and longevity focused infusion protocols and complementary treatments.



NAD+clinic[®]
PERSONALISED LONGEVITY

ESTABLISHED
SINCE 2018

2

PROPRIETARY
CLINICS IN LONDON &
CAPE TOWN

15

PARTNER CLINICS IN
EUROPE & UK

100K

TREATMENTS ANNUALLY WITHOUT
ANY RECORDED SIDE EFFECTS

500+

DOCTORS & THERAPISTS IN EUROPE
USING OUR NAD+ PRODUCTS

WE OFFER NAD+ THERAPY END-TO-END

In 2016, there were estimated to be less than a dozen clinics in the United States offering NAD+ therapy. In 2022, there are over 1,100 available clinics. Currently, NADclinic Group supplies NAD+ products to over 500 doctors, clinics and therapists globally in over 30 countries.

NUMBER	BENEFITS
1	Preferential prices for NADclinic partners
2	NAD+ education
3	Best-in-class proprietary NAD+ IV protocols
4	Be part of a strong community and recognised global brand
5	Access to promotion materials and merchandise
6	Direct line to NAD+ experts
7	Dedicated website and landing pages
8	Become part of the NADclinic network



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