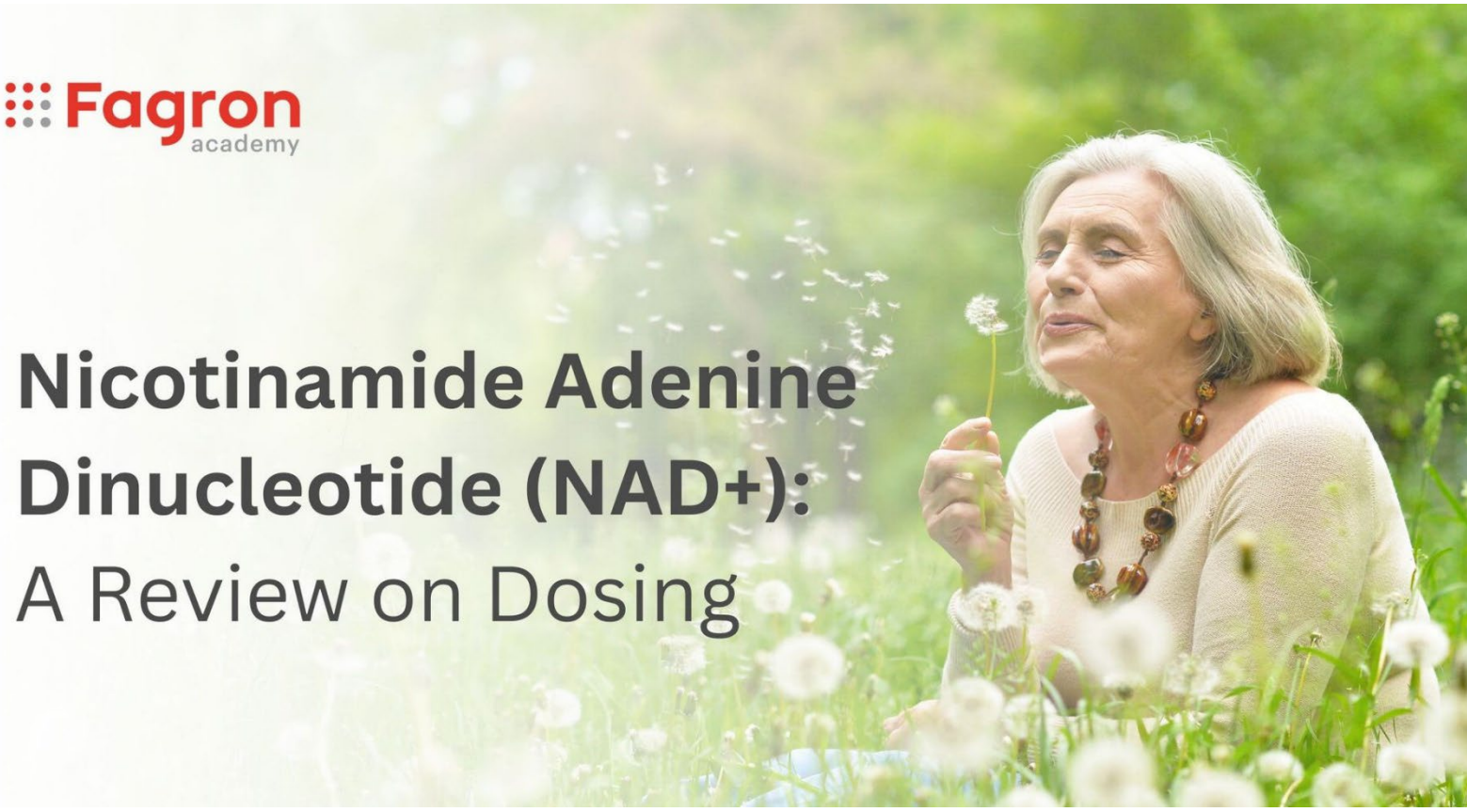

Nicotinamide Adenine Dinucleotide (NAD+): A Review on Dosing

June 19,2025

Sarah Taylor, PharmD
Academy Director

Nicotinamide adenine dinucleotide (NAD) is comprised of a redox pair of NAD+ (oxidized) and NADH (reduced). NAD is essential for cellular oxidative metabolic reactions and energy generation. NAD+ also functions as an essential co-substrate for many key enzymes that regulate gene expression.

As we age, NAD+ levels decline in the brain and other organs, and this decrease in NAD+ is associated with various disease states including neurodegeneration and other age-related disease.1 The NAD+ to NADH ratio is found to be reduced in some neurodegenerative diseases such as Parkinson's Disease, leading researchers to hypothesize that NAD+ replacement may lead to improvements. A decreased NAD+ to NADH ratio may also be associated with increased oxidative stress.2

Though theoretically the use of NAD+ via various routes of administration for various conditions is promising, data is primarily limited to case studies at this time. In this review, we discussing dosing evaluated in currently existing case studies on NAD+, and some limited animal study data.

Intravenous Dosing

Limited studies have evaluated NAD+ for conditions such as Parkinson's Disease. One case study evaluated:

Day 1 : 1500mg

Day 2 : 1000mg

Days 3 : 750mg

Day 4 and 5 : no treatment

Days 6 and 7 : 750mg

Day 8 and 9 : 500mg

Day 10 : 750mg

Ongoing treatment: 1000mg infusion every 4-6 weeks and 120mg NAD+ nasal every day

The study found patient's hand tremors decreased over treatment and visual hallucinations were absent on days two through seven of treatment. Given the success for the patient, treatment was continued with IV NAD+ every 4-6 weeks along with NAD+ administered nasally daily.4 Other trials on NAD+ for addiction typically had patients use 500-1000mg of NAD+ in 300mL of normal saline typically with a loading period of daily dosing for four days, followed by a taper period of twice weekly dosing for a month, and finally reducing to just twice monthly dosing until resolution of addiction.5

A recent cohort study of NAD+ and a proprietary combination of B vitamins, amino acids, and DL-phenylalanine (an enkephalinase inhibitor) IV for substance abuse disorder found statistically significant improvement in cravings, anxiety, and depression scores for patients on IV NAD+.5 Another study on patients with alcohol or opiate addiction found doses of 500-1500mg per day (in combination with some vitamins, amino acids, and n-acetylcysteine) for 10 days to reduce cravings and number of relapses when patients were surveyed 12-20 months post treatment.9

Intramuscular Dosing

Though studies have evaluated NADH IM for some conditions, very limited data exists on NAD+ for intramuscular use. One study of the impact of NAD+ on hangover did evaluate 200mg IM or 1000mg IV and found these doses to prevent hangover associated with alcohol intoxication.6 However, this was a limited study with just two patients, more information is needed on IM dosing. Anecdotally, NAD+ is sometimes used IM at 25-50mg to start, with doses up to 100mg per IM injection in some protocols dosed up to twice weekly. Unfortunately, safety and efficacy data of these protocols is currently unavailable.

Intranasal Dosing

One case study in a patient with Parkinson's Disease found success with daily NAD+ intranasal coupled with monthly IV NAD+. The patient was on an NAD+ 300mg/mL product and received 30mg in each nostril twice daily (120mg total per day) for ongoing treatment.4 Two other case reports have evaluated NAD+ nasal for migraines. Though the mechanism of action for this indication is unclear, both patients reported improvement with combination NAD+ and lidocaine nasally.

In one case the patient applied 0.5mL of NAD+ 100mg/mL and Lidocaine 0.5% in each nostril (a total of 100mg NAD+ for a single dose) along with NAD+ 150mg per day used sublingually. In another the patient applied 0.375mL of 100mg/mL NAD and 0.25mL of lidocaine 2% into each nostril (a total of 75mg NAD+ for a single dose). The case studies do not report frequency of administration.10,11

Other studies on nasal dosing are mainly animal studies looking at higher relative doses. One study of NAD 10mg/kg nasally administered to rats, two hours after ischemic brain injury, found significantly reduced ischemia-induced neurological deficits.7 Follow up studies on 20mg/kg intranasal dosing administered after induced brain injury in rats have also found reduction in traumatic brain injury induced neuronal death.8

Oral and Sublingual Dosing

Oral dosing of NAD+ is generally not recommended. Some older studies have evaluated NAD+ at high doses (1-2g daily) for conditions such as chronic schizophrenia, but no improvement was noted in these studies.3 This may be because NAD+ is expected to have poor oral bioavailability.12 For this reason, when trying to boost NAD+ levels using an oral route, precursors such as nicotinamide or nicotinamide mononucleotide are typically used instead of NAD+.12,13

One case study looked at NAD+ 150mg sublingually daily for migraine, and though the patient reported good control of migraines with ongoing treatment, bioavailability was not assessed.10 A recent study of 100mg sublingual NAD+ in healthy patients found that with daily use NAD+ levels increased by 59% over two weeks and 76% over six weeks compared to baseline, but this data has yet to be officially published in a peer reviewed journal.14

Topical Dosing

Limited studies have evaluated NAD+ topical for various conditions. One study looking at NAD+ for psoriasis evaluated NAD+ 1% or 0.3% daily for 4 weeks and found similar efficacy to anthralin.3 Recently, NAD+ has also been the subject of studies for topical use for aging.15 Though in vivo human trials on topical use for aging are not currently available, high concentrations such as NAD+ 10% are sometimes used for this indication.

For further information or questions, please feel free to reach out to us by heading to www.fagronacademy.us!

References

1. Griffiths HBS, Williams C, King SJ, Allison SJ. Nicotinamide adenine dinucleotide (NAD+): essential redox metabolite, co-substrate and an anti-cancer and anti-ageing therapeutic target. Biochem Soc Trans. 2020;48(3):733-744. doi:10.1042/BST20190033
2. Xie, N., Zhang, L., Gao, W. et al. NAD+ metabolism: pathophysiologic mechanisms and therapeutic potential. Sig Transduct Target Ther 5, 227 (2020). https://doi.org/10.1038/s41392-020-00311-7
3. Radenkovic D, Reason, Verdin E. Clinical Evidence for Targeting NAD Therapeutically. Pharmaceuticals (Basel). 2020;13(9):247. Published 2020 Sep 15. doi:10.3390/ph13090247
4. Gadol E, Mestayer R, Grant R et al. A Case of Parkinson's Disease Symptom Reduction with Intravenous NAD+. 2019. A Case of Parkinson's Disease Symptom Reduction with Intravenous NAD+. Accessed 3/20/2025.
5. Blum K, Han D, Baron D, et al. Nicotinamide Adenine Dinucleotide (NAD+) and Enkephalinase Inhibition (IV1114589NAD) Infusions Significantly Attenuate Psychiatric Burden Sequalae in Substance Use Disorder (SUD) in Fifty Cases. Curr Psychiatry Res Rev. 2022;18(2):125-143. doi:10.2174/2666082218666220527114427
6. O'Hollaren P. Pyridine nucleotides in the prevention, diagnosis and treatment of problem drinkers. A preliminary report. Western Journal of Surgery, Obstetrics and Gynecology. 1961;69(2):101-104.

7. Ying W, Wei G, Wang D, et al. Intranasal administration with NAD+ profoundly decreases brain injury in a rat model of transient focal ischemia. Front Biosci. 2007;12:2728-2734. Published 2007 Jan 1. doi:10.2741/2267
8. Won SJ, Choi BY, Yoo BH, Sohn M, Ying W, Swanson RA, Suh SW. Prevention of traumatic brain injury-induced neuron death by intranasal delivery of nicotinamide adenine dinucleotide. J Neurotrauma. 2012 May 1;29(7):1401-9. doi: 10.1089/neu.2011.2228. Epub 2012 Apr 17. PMID: 22352983; PMCID: PMC5972775.
9. Broom S, Mestayer R, Stuller E et al. Intravenous Administration of Nicotinamide Adenine Dinucleotide Significantly Reduces Self Report Craving Ratings Associated with Opiate and Alcohol Withdrawal. BR+NAD Reduces Cravings - Nad Research, Inc. Accessed 3/20/2025.
10. Thompson A, Diblasio P, Dyess G et al. Intranasal Administration of Nicotinamide Adenine Dinucleotide Alleviates Headaches Associated with Migraine Pain: A Case Report. IN NAD and Migraine Headaches: A Case Report - Nad Research, Inc.. Presented March 2022. Accessed March 2025.
11. White J, Podesta A, Dyess GA et al. Intranasal Administration of nicotinamide adenine dinucleotide alleviates headaches associated with migraine pain and reduces adverse effects of anxiety disorders: a case report. IN NAD, Migraine Headaches and Anxiety Disorders: A Case Report - Nad Research, Inc.. Presented November 2022. Accessed March 2025.
12. Ito T, Sato T, Takanashi Y et al. A single oral supplementation of nicotinamide within the daily tolerable upper level increases blood NAD+ levels in healthy subjects. Translational Medicine of Aging. 2021; 5: 43-51.
13. Okabe K, Yaku K, Uchida Y, et al. Oral Administration of Nicotinamide Mononucleotide Is Safe and Efficiently Increases Blood Nicotinamide Adenine Dinucleotide Levels in Healthy Subjects. Front Nutr. 2022;9:868640. Published 2022 Apr 11. doi:10.3389/fnut.2022.868640
14. Breakthrough Sublingual Wafers Raise NAD+ Levels by 76% and Enhance Well-Being in Human Trial. Press Release - SL-NAD Human Trial Results - final.ashx Accessed March 2025.
15. Kang S, Park J, Cheng Z, Ye S, Jun SH, Kang NG. Novel Approach to Skin Anti-Aging: Boosting Pharmacological Effects of Exogenous Nicotinamide Adenine Dinucleotide (NAD+) by Synergistic Inhibition of CD38 Expression. Cells. 2024;13(21):1799. Published 2024 Oct 30. doi:10.3390/cells13211799