NAD+ — Research Summary

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1. What It Is

NAD+ (nicotinamide adenine dinucleotide) is a coenzyme found in every living cell, central to mitochondrial energy production (electron transport chain, ATP synthesis) and to DNA repair enzymes (PARPs) and sirtuin signaling. It is not a peptide, but is commonly stocked alongside peptides in longevity-focused RUO catalogs. Human tissue NAD+ levels are reported to decline by roughly 50% between ages 40 and 60, which underlies the research interest in NAD+ repletion.

- **Administration routes studied:** intravenous (IV) infusion, subcutaneous/intramuscular injection, and oral precursor supplementation (nicotinamide riboside/NR, nicotinamide mononucleotide/NMN).

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2. Reported Effects in Research Literature — an important evidence gap to flag

This is one of the more heavily marketed compounds in the longevity space, and it’s worth being precise in documentation about where the evidence actually is:

- **A 2026 PRISMA-guided systematic review** (Ageing Research Reviews) screening human and rodent studies from 2010–2025 found: of 33 human studies (28 RCTs, 5 nonrandomized), interventions overwhelmingly evaluated oral NAD+ precursors (NR, NMN, niacin/nicotinamide) — **no eligible outcomes trials evaluated intravenous or intramuscular NAD+ itself** for anti-aging or wellness indications. Only one nonrandomized IV NMN study met inclusion criteria (short-term safety/biomarker data only), and one IV NAD+ pharmacokinetic pilot was identified as contextual evidence only, lacking clinical outcomes.
- **Oral precursors (NR/NMN):** Consistently demonstrated biochemical target engagement (raised circulating/cellular NAD-related metabolites) and were generally well tolerated over weeks to months. Effects on functional, metabolic, and vascular outcomes were heterogeneous — often null or endpoint-specific.
- **IV NAD+ pharmacokinetics:** A pilot study of a 6-hour IV NAD+ infusion (750mg) found no measurable change in plasma NAD+ or its metabolites until after 2 hours into the infusion — direct human pharmacokinetic data for infused NAD+ remains sparse.
- **Preclinical (rodent):** NAD+ augmentation was frequently associated with improvements across metabolic, mitochondrial, inflammatory, and functional outcomes, though effects varied by model and endpoint — this is a case of a strong animal signal not yet matched by controlled human outcome data.
- **Historical/clinical use:** IV NAD+ has been used clinically in some settings for alcohol withdrawal, with reported clinical benefit noted in older literature, though rigorous modern trial data is limited.
- **Neurological research interest:** Preclinical Parkinson’s and Alzheimer’s models show cognitive/motor improvements with NAD+ repletion; NR trials for Parkinson’s disease are ongoing. Clinical reports (uncontrolled) describe improvements in brain fog/fatigue, including in long-COVID contexts, but controlled trial data specific to this use is limited.

Bottom line for documentation purposes: NAD+’s mechanistic biology is well established, but the injectable/IV form specifically has a notably thin controlled human trial base compared to how it’s marketed — this is a case where the gap between mechanism-level rationale and outcomes-level clinical proof is unusually wide, even by RUO peptide standards.

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3. Clinical & Preclinical Study References

- Massudi H, et al. Human tissue NAD+ decline with age. (2012). PMID: 22870241
- Systematic review: "NAD+ supplementation for anti-aging and wellness: A PRISMA-guided systematic review of preclinical and clinical evidence." *Ageing Research Reviews.* 2026;103057. ScienceDirect
- Grant R, et al. "A Pilot Study Investigating Changes in the Human Plasma and Urine NAD+ Metabolome During a 6 Hour Intravenous Infusion of NAD+." Full text (PMC)
- Randomized pilot trial comparing IV NR vs. IV NAD+ vs. oral NR vs. placebo: medRxiv, 2024

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4. Reconstitution Process

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NAD+ is typically supplied as a lyophilized powder for IV/injectable research use, similarly to peptides.

1. **Materials needed:** lyophilized NAD+ powder, bacteriostatic water or sterile water/saline per supplier instructions, alcohol swabs, syringe with needle.
2. **Bring the vial to room temperature** before reconstitution.
3. **Sanitize** the rubber stopper of both vials with an alcohol swab.
4. **Add the diluent slowly** down the *inside wall* of the vial, to reduce shear/foaming.
5. **Do not shake.** Gently swirl until fully dissolved. NAD+ is light-sensitive — minimize light exposure during and after reconstitution.
6. **Inspect the solution** — should be clear and free of particulates.
7. **Label the vial** with reconstitution date and concentration.
8. **Storage:** refrigerate (2–8°C) and protect from light; avoid freeze-thaw cycles. NAD+ solutions are generally less stable over time than most peptides — follow supplier-specific stability guidance closely.

Reference: Diluent Volume by Vial Size (Larger Fills — Matches Order Sheet)

Your order sheet carries NAD+ at 100mg and 500mg fills, larger than the typical 5mg/10mg peptide vial — reference table below scaled accordingly.

Vial Size	Diluent Added	Resulting Concentration
100 mg	2 mL	50 mg/mL
100 mg	5 mL	20 mg/mL
100 mg	10 mL	10 mg/mL
500 mg	10 mL	50 mg/mL
500 mg	20 mL	25 mg/mL
500 mg	50 mL	10 mg/mL

Notes: Higher water volume = more dilute solution; lower volume = more concentrated. Follow supplier COA guidance where provided, since NAD+ solubility and stability characteristics differ from typical small peptides.

Document created: July 16, 2026. **Revision 1:** July 29, 2026. Regulatory status (FDA compounding lists, WADA lists) is actively shifting; re-verify against current sources before any customer-facing use.
