💉 HOW TO CLARIFY A PROPER NAD⁺ FOR INTRAVENOUS USE

Pharmaceutical-grade NAD⁺ intended for **intravenous (IV) or subcutaneous use** must meet strict safety, purity, and stability standards. Below are the essential quality criteria and why each one matters:

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1. Hygiene & Sterility (Beyond-Use Date / BUD)

Once sterile NAD⁺ powder is reconstituted (mixed with a diluent), it is exposed to environmental risks. Without proper preservatives, the risk of microbial contamination increases rapidly.

- At room temperature, it should be used within **4 hours**.
- If refrigerated (2–8 °C), it should be used within **24 hours**.
- Longer storage is only acceptable if backed by **validated sterility and stability testing**.

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2. Stability of Reconstituted NAD⁺

NAD⁺ is highly sensitive to **heat, light, and oxidation**. Once diluted:

- It can degrade quickly, reducing its effectiveness.
- Even in refrigeration, the solution typically remains stable only for **a few days to a week**, unless validated.

This is similar to how other delicate biomolecules like **peptides** are handled in clinical and lab settings.

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3. Regulatory and Pharmaceutical Standards

Medical and compounding standards (e.g., USP, FDA, NPRA) do not recommend extended storage of injectable biologics unless there is **batch-specific, validated data** to support it.

- The **default practice** for most sterile injectable is **single-use** or use within 24–48 hours.
- Multi-dose or extended use **requires proof of stability and sterility**.

✅ Quality Tests Required for IV NAD⁺

Test / Certification	Purpose
Sterility Test	Confirms product is free of microbial contamination (critical for injection)
Endotoxin (Pyrogen) Test	Detects bacterial toxins (LPS); ensures safety in bloodstream
pH Test	Confirms compatibility with blood pH for safe IV administration
Stability / Shelf-life Test	Verifies product remains safe and effective over time
HPLC Purity Assay	Confirms identity, purity, degradation profile of NAD⁺
Certificate of Analysis (COA)	Formal proof of compliance from GMP-certified lab or manufacturer

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📚 References

- **FDA – Sterile Drug Products Guidance** (Aseptic Processing & BUD insights) ResearchGate+15U.S. Food and Drug Administration+15U.S. Food and Drug Administration+15GenScript+4GenScript+4fastbio.com.br+4ASHP+11Wittmer Rejuvenation Clinic+11Wittmer Rejuvenation Clinic+11ASHP+3Wittmer Rejuvenation Clinic+3ResearchGate+3Wittmer Rejuvenation Clinic+3U.S. Food and Drug Administration+3GenScript+3

- **USP Beyond-Use Date Guidelines (<797>)** U.S. Food and Drug Administration+7USP+7RxCe+7

- **GenScript / MilliporeSigma – Peptide Storage & Handling protocols** Wittmer Rejuvenation Clinic+15GenScript+15ResearchGate+15

- **Wittmer Rejuvenation Clinic – Bacteriostatic water shelf life** (28-day rule) reddit.com+9Wittmer Rejuvenation Clinic+9Wittmer Rejuvenation Clinic+9