CIRCADIAN HORMONE / ANTIOXIDANT

Melatonin (Injectable)

N-acetyl-5-methoxytryptamine, Melatonin

Category	Circadian Hormone / Antioxidant
Available Specifications	10mg/mL solution

1. OVERVIEW

Injectable melatonin provides direct systemic delivery of the circadian-regulating hormone with potent antioxidant properties, supporting sleep quality, circadian rhythm optimization, and mitochondrial function through ROS scavenging.

2. MECHANISM OF ACTION

Melatonin is the primary hormone of the pineal gland, controlling circadian rhythm regulation and sleep-wake cycles through MT1 and MT2 receptor signaling in the suprachiasmatic nucleus. Injectable melatonin provides systemic delivery and potent antioxidant effects. Melatonin scavenges reactive oxygen species (ROS) and free radicals, regulates mitochondrial function, reduces oxidative stress, and modulates immune function.

3. CLINICAL EVIDENCE & RESEARCH

Extensive research demonstrates melatonin's circadian regulatory properties and antioxidant capacity. Studies document melatonin's ability to cross the blood-brain barrier and accumulate in mitochondria. Research confirms ROS scavenging and reduction of oxidative stress markers. Clinical and preclinical studies show immune-modulating effects. Evidence supports melatonin's role in sleep architecture improvement.

4. THERAPEUTIC BENEFITS

- Circadian rhythm optimization and sleep quality enhancement
- Potent antioxidant protection
- Mitochondrial function support
- Immune modulation and regulation
- Anti-inflammatory effects
- Neuroprotection
- Tissue regeneration support
- Potential anti-aging effects

5. INDICATIONS

- Research in circadian rhythm modulation
- Investigation of sleep-wake cycle optimization
- Oxidative stress reduction research
- Immune function studies
- Neuroprotection research
- Mitochondrial health investigation
- Aging research

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
Research: circadian optimization	2-5 mg	Evening IV/SC	Intravenous or Subcutaneous	
Sleep architecture studies	5-10 mg	Evening SC	Subcutaneous	
Antioxidant research	10 mg	Daily or every 2-3 days IV	Intravenous	

Reconstitution

Injectable melatonin supplied as 10 mg/mL in sterile solution. For additional dilution if needed, use sterile 0.9% sodium chloride for injection. Gently mix if diluting—do not shake vigorously. Solution should be clear to slightly yellow.

Administration

Administer intravenously as slow bolus (over 1-2 minutes) or intravenous infusion diluted in saline over 5-15 minutes. Subcutaneous injection acceptable for maintenance dosing; rotate injection sites. Evening administration preferred to synchronize with natural circadian melatonin elevation.

7. SIDE EFFECTS & SAFETY PROFILE

- Extremely safe with minimal side effects
- Possible transient drowsiness (expected and desired)
- Some individuals report vivid dreams or enhanced dream recall
- Rare reports of mild headache or dizziness (resolving within 30 minutes)
- Local injection site reactions uncommon
- No significant drug interactions documented
- Well-tolerated across all age groups

8. CONTRAINDICATIONS & PRECAUTIONS

- Hypersensitivity to melatonin
- Active autoimmune conditions (melatonin immune stimulation may exacerbate)
- Concurrent immunosuppressive therapy requiring careful monitoring
- Severe liver disease
- Pregnancy
- Concurrent use with sedating medications (enhanced CNS effects)
- Acute fever or active infection

9. STORAGE & HANDLING

Store injectable melatonin at 2-8°C (refrigerated) in original vial, protected from light in opaque container. Melatonin is light-sensitive—maintain protection from direct sunlight. Protect from freezing. Once opened, use within 30 days.

10. KEY REFERENCES

1. Reiter RJ, et al. Melatonin as an antioxidant: under promises, over delivers. J Pineal Res. 2016;61(3):253-278.

2. Cipolla-Neto J, Amaral FG. Melatonin as a hormone: new physiological and clinical insights. Endocr Rev. 2018;39(3):990-1028.

3. Hardeland R, Pandi-Perumal SR. Melatonin, a pleiotropic, orchestrating regulator molecule: implications for ridding oxidative stress and inflammation. Int J Biochem Cell Biol. 2013;45(12):2806-2814.

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