



# Quick Start Guide – 24-HR

Dim Light Melatonin Testing from [biologyofsleep.com](https://biologyofsleep.com)

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## + Overview

A 24-HR Circadian Phase Map (24-HR CPM) is used as an objective, comprehensive assessment of an individual's circadian rhythm function and the timing of their biological clock. A 24-HR CPM is typically measured by collecting saliva samples over a full 24-HR cycle, at regularly timed intervals in a dimly lit environment, and analyzing the melatonin levels in those samples. The 24-HR CPM provides the most robust information about an individual's natural sleep-wake pattern and can be used to:

- Distinguish between sleep physiology and behavioral factors
- Establish if an individual's circadian rhythm is too long, too short, unstable, or misaligned
- Screen for insufficient or overproduction of melatonin or idiosyncratic drug interactions
- Identify optimal timing for sleep therapies (supplementation/bright light) that could otherwise negatively affect an individual's sleep-wake cycle

## + Use For

Irregular day or night symptoms, alternating symptoms, or symptoms spanning a long duration (7+ hours):

- Irregular Sleep/Wake Disorder (recommended x2 tests, 1 week apart)
- Non-24 (recommended x2 tests, 1 week apart)
- Severe ASPD, DSPD
- Insomnia/Hypersomnolence
- Extended Pre- and/or Post-Sleep Fatigue

## + Evaluation Criteria

During the evaluation of a patient, it is advised to acquire the temporal aspects and duration of symptom precipitation, combined with the extent of variability observed in routine bedtime and/or wake times. A patient reported index of the variability in their sleep-wake cycle is often helpful in determining if multiple tests should be included in the initial assessment.

## + Patient Collection Schedule

The standard protocol involves anchoring sample collection to the individual's wake time and collecting samples every 2.75 hours for approximately 24 hours, allowing for a comprehensive evaluation of a complete 24-hour circadian cycle. However, healthcare providers maintain the flexibility to customize any sampling schedule to accommodate specific needs, either by reducing or extending the test duration.

For individuals with Irregular Sleep-Wake Disorder or Non-24 Sleep-Wake Disorder, it is recommended to perform two assessments, each one week apart, using an identical sampling schedule for comparison. Non-24 Sleep-Wake Disorder typically exhibits a similar profile with shifting circadian timing, while Irregular Sleep-Wake Disorder typically exhibits completely sporadic production cycles. Additionally, salivary cortisol can be included as a multi-level assessment to evaluate the melatonin/cortisol ratio and any physiological aspects that may display a rhythmic pattern.



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## + Medication

There are two prevailing modalities among healthcare providers regarding the assessment of melatonin production levels in the context of prescription medication and supplements:

1. Discontinue all medications and supplements to determine the baseline circadian profile (increases patient burden) to rule out physiological dysregulation first.
2. Discontinue sleep-related medications only and determine an individual's current circadian profile to rule out physiological dysregulation last. In the event of atypical results, you may discontinue or invert dosing schedules based on the timing of the results to observe effects on sleep behavior.

While most medications do not impact the circadian rhythm directly, there are several classifications of pharmacological compounds that do impact melatonin production, depending on the dosage and the individual's physiology. A general recommendation is to stop any medication that your patient can safely and comfortably discontinue under your care for 3-5 days before beginning the assessment.

Visit <https://biologyofsleep.com/sleep-medicine-interactions> to see the latest index of medications.

## + Melatonin Supplementation

While measurable levels of exogenous melatonin or melatonin-containing supplements typically persist in saliva for up to 24 hours, we frequently observe prolonged circadian dysregulation for a duration of up to 10 days or more, even after discontinuing supplementation. This can manifest as elevated melatonin levels, phase shifts, and oscillating profiles. This phenomenon is inter-individual dependent and influenced by the duration and dosage of routine supplementation. It is recommended to follow a discontinuation/withdrawal protocol for melatonin supplementation as outlined below:

- 3 days (minimum) for  $\geq 1.5$  mg dosing as needed
- 5 days (better) for  $\geq 1.5$  mg routine dosing to  $\geq 3$ mg and dosing as needed
- 10 days (best) for  $\geq 3$  mg routine dosing to  $\geq 5$ mg dosing as needed
- 15 days (ultimate) for  $\geq 5$  mg routine dosing



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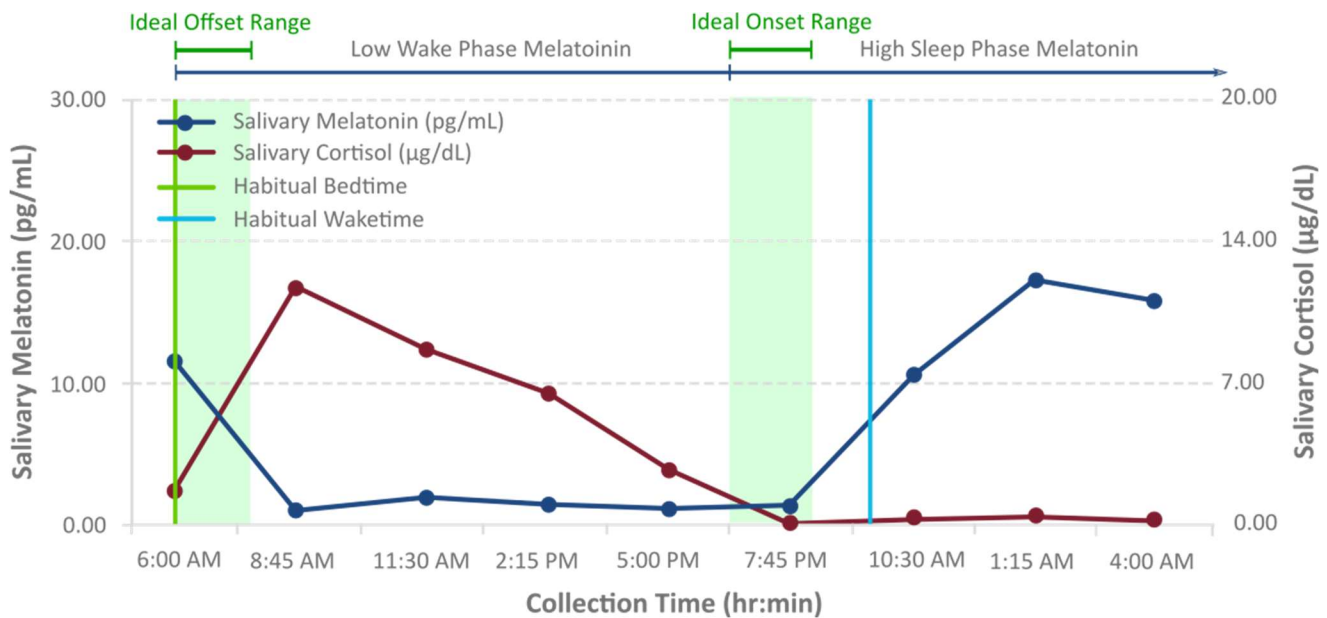
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## + Typical Results Profile

A 24-Hour Circadian Phase Map (CPM) should demonstrate both an onset (the beginning of the biological night) and an offset (the end of the biological night) that align with the ideal ~2-hour range increase for pre-bedtime (onset) and decrease for post-awakening (offset) phase changes. A typical profile exhibits lower melatonin levels during the wake phase and higher melatonin levels during the sleep phase, with clear transitions between these phases. The magnitude of these phase shifts can vary among individuals and tends to decrease with age but are generally present in most healthy individuals.

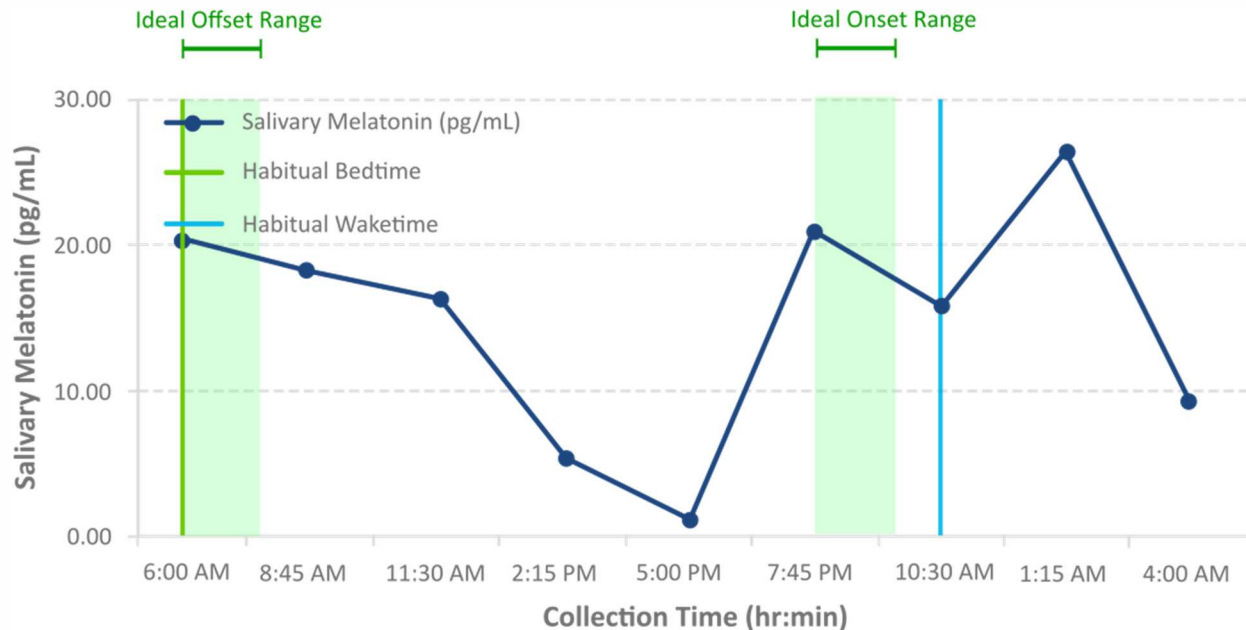
When analyzing cortisol in conjunction with melatonin, the cortisol profile should exhibit a sharp increase after waking, followed by a gradual decline throughout the waking hours until bedtime, assuming no significant stressors are present. By bedtime, cortisol levels should return to baseline. Often, the cortisol rhythm appears as the inverse of the melatonin rhythm, demonstrating an opposing pattern.



# Example Profiles

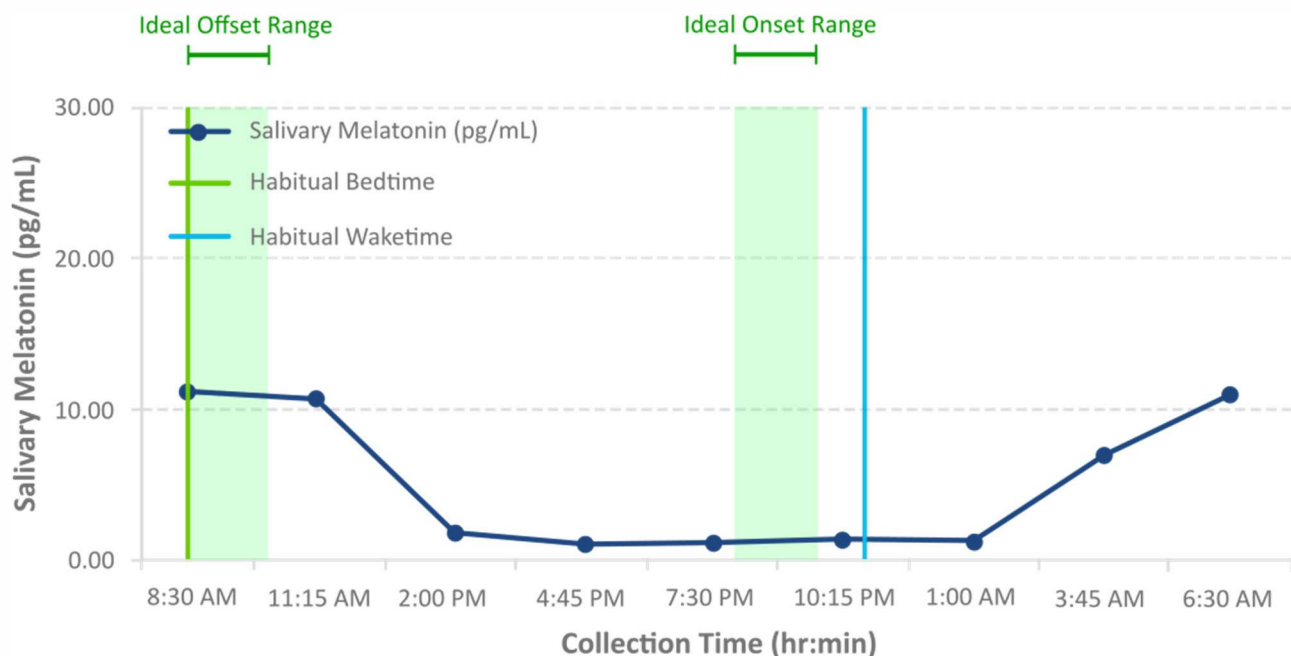
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## + Irregular Sleep-Wake Profile Example



This profile exhibits an irregular sleep-wake cycle, demonstrating an extended biological night and overproduction of melatonin. This indicates that the body would not be physiologically prepared to be awake until ~3:30 PM after waking. This profile is common in individuals with idiosyncratic drug interactions or high-dose supplementation, but can also present biologically.

## + Phase Delayed Sleep-Wake Cycle Profile Example



This profile exhibits a DLMO ~2.75 hrs **after bedtime**, and an DLMOFF ~5.5 hrs **after waking** which indicates that the body was not physiologically prepared for sleep or waking around their intended sleep-wake time. This is often reflective of individuals with a delayed sleep phase.