

COMPOUNDED SOLUTIONS FOR SLEEP

With more than one-third of adults sleeping fewer than seven hours each night, sleep deficiency is among the top symptomatic concerns for the modern patient. Your patients' ability to fall asleep, stay asleep, and wake up feeling rested extends beyond the repercussions of a busy lifestyle. Stress, anxiety, pain level, hormone balance, adequate oxygen delivery, and blood flow are all key players for restful and restorative sleep.

At Physicians Preference Pharmacy, we have many compounded prescription options available to improve sleep, but here we will highlight two frontrunners: melatonin and oxytocin.

Melatonin

Melatonin is a hormone naturally produced by the pineal gland in response to darkness, but its production decreases with age. Known as a chronobiotic, melatonin corrects a disrupted circadian rhythm and can be used to treat circadian-based sleep disorders such as jet lag, night shift work, and delayed sleep phase syndrome.

Appropriately elevated evening melatonin levels stimulate target organs to enter suitable homeostatic metabolic rhythms and act as a potent antioxidant, boost cellular autophagy, and help protect the body from developing chronic diseases and cancer. However, when melatonin levels are suboptimal, inflammation and chronic disease may ensue. Reduced melatonin levels are notably found in patients with dementia, mood disorders, severe pain, cancer, and type 2 diabetes mellitus.

In addition to chronic disease, dysregulation of melatonin production is likely to disrupt sleep, which is why physiological replacement of melatonin may be helpful. In fact, 88% of adults who take melatonin say it helps them fall asleep faster.¹

Know Your Melatonin Source

A primary deciding factor for patients when choosing a melatonin product is price. Most people select the "cheaper" option without consideration of the quality and potency of their

HOW TO ORDER

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NEED SUPPLIES?


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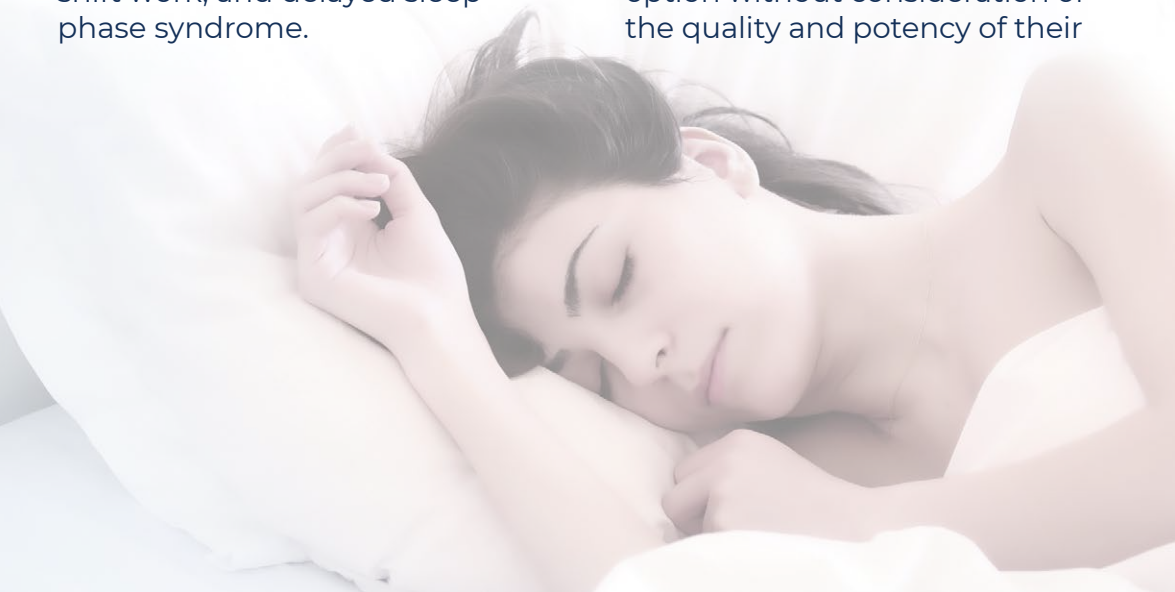
TAKE A VIRTUAL TOUR

 [Click here to view an inside look at our compounding labs.](#)



ACCREDITED

Physicians Preference Pharmacy is a Houston-based, PCAB-accredited compounding pharmacy serving physicians and patients since 2001. We are licensed to work with and ship to doctors and patients in 49 states (excludes AL). Our standards are more stringent than those of the United States Pharmacopeia (USP). Physicians Preference Pharmacy ranks first in Houston for the number of samples sent for potency testing and in the top 8% of pharmacies nationwide.



melatonin. Supplements available over the counter should be chosen with caution, and a prescription should strongly be considered when available. The Food and Drug Administration (FDA) evaluates the safety of supplements, not the potency. So, if a bottle of over-the-counter melatonin claims to contain 1 mg of melatonin per tablet, the FDA will evaluate if that supplement is safe to take but does not verify that the product indeed contains 1 mg of melatonin per tablet. According to a 2023 JAMA study, 88% of melatonin products are inaccurately labeled. An analysis of over-the-counter melatonin supplements found that they may include 347% more melatonin per dose than what is on the label.² However, compounding pharmacies are required by law to include 1 mg of melatonin in each tablet if that is what the prescription label reads.

Long-Term Use of Melatonin

Patients frequently ask if there are repercussions of using melatonin long term. Does it reduce endogenous production? Research on long-term melatonin administration has found no difference between exogenous melatonin and placebo in terms of long-term negative effects. In fact, long-term usage appears to benefit certain patient populations, such as those with autism spectrum disorder.³ Additionally, melatonin has a stated LD50 of infinity (the dose that would be required to kill half the sample group of test animals in a study), indicating its overwhelmingly high safety profile. Side effects are few and include drowsiness or bad dreams if the dose is too high.⁴

Compounded Melatonin

At Physicians Preference Pharmacy, we compound immediate-release melatonin sublingual tablets as well as sustained-release melatonin capsules. Patients who have trouble falling asleep should be prescribed an immediate-release formulation whereas those who have trouble staying asleep or are seeking melatonin's additional benefits, should be prescribed sustained-release capsules.

Oxytocin

Oxytocin is a neuropeptide commonly known as the "love hormone" for its role in physical touch, sexual intimacy, childbirth, lactation, and social bonding. Although oxytocin receptors are present throughout the body, in the brain they are located primarily within the nerve fibers, which indicates oxytocin's role in cognitive functioning, the fight-or-flight response, and therefore sleep.

Oxytocin levels naturally decline with age. However, individuals may become radically depleted in oxytocin for a variety of reasons. Root causes of oxytocin deficiency include the modern American diet high in carbohydrates and sugars, environmental endocrine disruptors such as BPA, childhood trauma, social isolation, and prolonged cortisol release in response to chronic stress.

Oxytocin, Stress, and Sleep

Insomnia is a common result of oxytocin deficiency and excess cortisol release. Oxytocin and cortisol share an inverse relationship, so when cortisol levels are high and approaching burnout, oxytocin levels decrease. Chronically elevated cortisol has a notably

negative impact on mental and physical health including sleep, memory, mood, and the immune system. ACTH (adrenocorticotropin hormone), which signals the adrenals to release cortisol, is slowed down when oxytocin is given. By regulating cortisol, symptoms of poor sleep and anxiety may be improved.

Oxytocin and Obstructive Sleep Apnea

Oxytocin released from the hypothalamus activates neurons in the brainstem respiratory network and increases respiratory drive to the tongue genioglossus muscle and diaphragm to improve openness of the upper airway throughout the respiratory cycle.^{5,6} Nocturnal administration of oxytocin has been shown to increase parasympathetic activity, restore autonomic nervous system balance, and prevent or mitigate the repeated involuntary airway closures that occur during sleep in patients with obstructive sleep apnea.⁷

Routes of Administration for Compounded Oxytocin

Oxytocin is available in two types of formulations at Physicians Preference Pharmacy, intranasal spray and sublingual tablets. Oxytocin is a very delicate compound and would be destroyed by stomach acid if oral administration was attempted.

Patients experiencing cognitive or psychological symptoms such as depression or anxiety in addition to insomnia should be prescribed the intranasal spray, as oxytocin successfully penetrates the blood-brain barrier and is delivered to the site of action. Oxytocin

sublingual tablets should be prescribed for those who have challenges with dexterity, travel often (due to the extended beyond-use dating of six months), or have compromised nasal passages.

Clinical Pearls of Prescribing Oxytocin

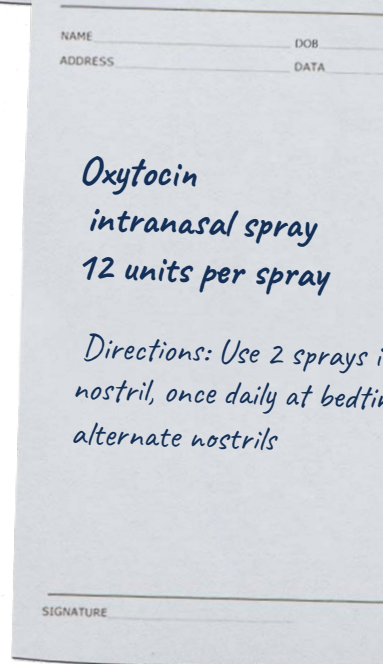
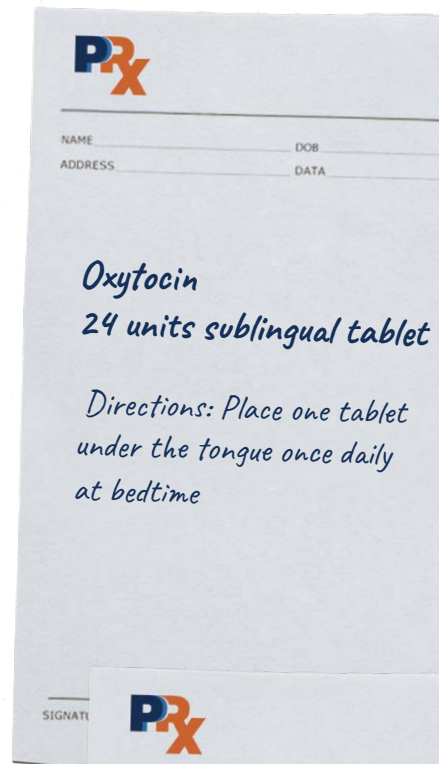
- Oxytocin follows a positive feedback pattern, and patients may require less over time.
- More is NOT always better.
- It can be dosed based on timing of patient symptoms.
- Nasal spray is generally chosen for sleep, mood, and mental health-related conditions (e.g., anxiety, depression), but dosage form primarily depends on patient lifestyle, dexterity, and compliance.
- Intranasal dosing is roughly 1:1 to sublingual dosing.
- Oxytocin can be dosed to all ages.
- Take precaution in prescribing to women who are pregnant or who have a hypertonic or hyperactive uterus.

Oxytocin is a versatile neuropeptide hormone that offers significant potential improvement to patients with insomnia and auxiliary symptoms which impact their sleep. One of the many benefits of oxytocin is that when dosed exogenously, a patient generally requires less oxytocin over time as his or her body recalls how to produce and assimilate oxytocin on its own.

One of the beauties of the human body is that it is adept in healing itself. Sometimes we just have to urge the healing process with tools such as compounded oxytocin.

DOSING OXYTOCIN FOR INSOMNIA

Dosing of oxytocin intranasal spray and sublingual tablets is roughly 1:1 with patients usually benefiting from 24 units daily for improved sleep. Patients may use either of the following:



SLEEP STATISTICS

- In a normal sleep period, a person experiences **four to six sleep cycles**.
- On average, we spend about **two hours per night dreaming**, mostly during REM sleep.
- More than **one-third of adults** sleep **fewer than seven hours per night** on average.
- **54%** of adults say **stress and anxiety** were the top reasons they have trouble falling asleep.
- As many as **91%** of adults with post-traumatic stress disorder (PTSD) have symptoms of insomnia.
- **Up to 70%** of snorers have been diagnosed with **sleep apnea**.
- Women are **40%** more likely to have insomnia than men.
- **95%** of adults lose at least an hour of sleep to pain in any given week.
- Sleep disorders affect **39% to 47%** of perimenopausal women and **35% to 60%** of postmenopausal women.
- An estimated **50 to 70 million people** have ongoing sleep disorders. The most common are insomnia, sleep apnea, and narcolepsy.
- One study estimates the annual cost of workplace errors and accidents linked to insomnia is **\$31.1 billion**.

Source: <https://www.sleepfoundation.org/how-sleep-works/sleep-facts-statistics>⁸



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