

MELATONIN

For Sleep & the Rhythm of Life

by Margy Squires

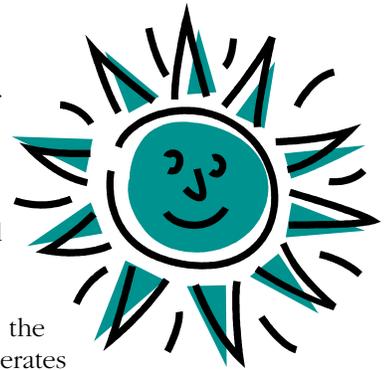


The room is dark, the pillow fluffed and yet you're wide awake. Instead of counting sheep, you're wondering who the first person to suggest that was anyway? You might fall asleep faster by spelling *n-acetyl-5-methoxytryptamine*, better known as melatonin. Perhaps the fairy tale princess tossing and turning on her many mattresses was in fact an analogy to the pea-sized pineal gland keeping her from restful sleep.

What's behind the secret of melatonin? In the mid-90s, reports of its ability to prevent aging, improve your sex life, boost immunity and solve your sleep problems made melatonin sound like a miracle. Skeptics reminded us that if it sounds too good to be true, chances are it is. But science and thousands of research papers later show that melatonin deserves respect as a helpful supplement, with benefits for sleep and beyond.

CIRCADIAN RHYTHM

Inside each of us is a master biological clock that keeps time with the 1) 24 hour rotation of the earth and 2) the yearly seasonal changes of its orbit around the sun. These time cycles affect when humans wake and sleep, animals hibernate and birds migrate and so on. This master clock, called the suprachiasmatic nucleus or SCN, is a tiny one-square millimeter area in the brain. The SCN regulates the 24 hour clock or circadian rhythm with the help of the pineal gland, light and neurotransmitter signaling.



When light, particularly blue light, enters specialized cells in the retina, the SCN prompts the pineal gland to stop producing melatonin, issuing a "wake up" call. In fact, the sun cooperates by providing necessary blue light wavelengths early in the day to trigger the wake cycle. About two hours before sleep, melatonin is released to promote sleepiness. Correspondingly, melatonin levels are lowest during the day and highest at night. Disruptions in this natural rhythm can cause delayed sleep onset and/or frequent awakenings, and failure to reach restorative Deep and REM stages.

The study of circadian rhythm is known as *chronobiology* or simply the study of *time and life*. Certainly, good sleep is vital to repair brain neurons, other cells and tissues, release hormones and to wake up refreshed, all the things the body needs to do at rest. Sleep deprivation is associated with next day grogginess, poor cognition and motor coordination, low body temperature, mood and immune resistance. A report from the Center for Sleep and Circadian Biology at Northwestern states, "Only recently has the medical community, as well as the general public, become aware of the importance of circadian rhythms for human health, safety, performance and productivity". Without melatonin, your body clock can't tell you the "right" time to sleep.

What else do we know about melatonin? It was first discovered in 1958 by Dr. Al Lerner at Yale University. Levels are highest in childhood and decline around puberty, perhaps a reason for sleep irregularities in teenagers. Studies by Dr. Charles Czeisler, director of the Division of Sleep Medicine for Harvard Medical School, suggest the human cycle is slightly longer than 24 hours so it is melatonin's job to "reset" or synchronize human time to the earth's clock.



USE & BENEFITS

Since melatonin is CR specific, its principle use continues to be as a sleep and jet lag aid to help with CR-related disturbances: Air travel across time zones, particularly West to East. Daylight Savings Time or other short term schedule changes. Shift work (about 20% of workforce). Excessive lights and electromagnetic energy at night from televisions, computers, electric clocks and blankets. Too little exposure to sun (blue) light during the day. Seasonal Affective Disorder.

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Melatonin

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Melatonin's action also helps calm involuntary night movement in Lewy body dementia, Alzheimer's, Parkinson's and restless leg syndrome, and assist sleep for menopause, ADHD adults and children (see cautions).

There's a long line of other benefits melatonin possesses. Besides the pineal gland, melatonin is in the retina and concentrated 400 times higher in the GI tract. It's found in every cell of the body, making its reach body-wide for immunity, GI and eye disorders, cholesterol, heart health, glucose homeostasis, tinnitus, depression, mood, cluster headaches, withdrawal from nicotine and sleeping pills, and a potent free radical scavenger to protect cells and tissues (leading to its use pre-and during chemotherapy). Whew!

Long time researcher Dr. Russell Reiter has studied melatonin since 1964 and published numerous research, including the use of melatonin for fibromyalgia (FMS) allodynia (all over pain). Melatonin has an anti-nociceptive effect on pain by activating opioid receptors indirectly and by inhibiting the expression of COX-2 and production of other inflammatory cytokines. An Argentinian open study in 2000 involved 21 FMS patients on 3 mg of melatonin for 4 weeks for "disturbed sleep, fatigue and pain" concluded "melatonin can be an alternative and safe treatment" as "sleep scores improved significantly". Given that many symptoms of FMS are influenced by quality of sleep, melatonin is worth a try. Both serotonin and norephrine are low in fibromyalgia which could affect sleep mechanisms. Norephrine plays a dual role in wakefulness arousal and influencing sleep concerning melatonin.

MELATONIN, MAGNESIUM & B6

Melatonin is synthesized from serotonin, with the help of B6. Magnesium is required for the efficiency of the SCN biological clock and pineal gland, and the synthesis of serotonin to melatonin. Conversely, this clock affects magnesium status as well. Perhaps a "reset" may help some who seem "magnesium resistant" or have trouble maintaining a normal level. Melatonin is the clinical marker to determine if CR imbalance is the root cause and can be checked via a blood test.

HOW TO TAKE

For shiftworkers needing daytime sleep, a study demonstrated participants who took 0.5-3.0 mg of melatonin to adjust their body clocks had better sleep efficiency (percent of time asleep) than in the placebo group who had 30 minutes less. Wyatt suggested "melatonin supplements might be a valuable aid for getting more sleep". Taken pre-flight helps "lag" in air travel time.

In a lecture at the American Association of Pain Management, Dr. Rubin Naimen explained that melatonin has a very short half life and taking a sustained released form makes it stay in the system longer. Naiman also advises not to think of melatonin as a sleeping pill to "knock you out" but rather as an antidote to excessive light exposure and for CR-related sleep disruption.

SAFETY & CAUTIONS

According to the National Institutes of Health, "Available trials report that overall adverse effects are not significantly more common with melatonin than placebo". No toxicity has been found for melatonin in test animals at 800 mg/kg, equivalent to 50,000 mg in humans.

As with certain supplements, use in children is advised with medical supervision only. Melatonin may interfere with blood thinners such as warfarin. If you are taking an SSRI or SNRI, consult a physician before combining. Aspirin, NSAIDs, diazepam and beta blockers decrease melatonin levels. Over 75 mg daily can prevent ovulation in women and lower sperm count in men. Melatonin is contra-indicated in those with severe liver or kidney disease.

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Melatonin *Some Suggested Dosages**

- Jet lag 1 mg for each time zone crossed & 4 days post travel
- Sleep 1 mg time release to start; up to 3 mg ½ - 1 hour before bed
- Cluster headaches..... 10 mg before bed daily
- Cancer Chemotherapy..... 10-50 mg daily prior to & during therapy
- IBS..... 3 mg at bedtime daily
- Fibromyalgia..... 0.5-3 mg, (up to 10 mg) before bed daily



**For information purposes only. Medical supervision may be required.*