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# Melatonin

## Overview:

Melatonin is a hormone secreted by the pineal gland in the brain. It helps regulate other hormones and maintains the body's circadian rhythm. The circadian rhythm is an internal 24-hour "clock" that plays a critical role in when we fall asleep and when we wake up. When it is dark, your body produces more melatonin; when it is light, the production of melatonin drops. Being exposed to bright lights in the evening or too little light during the day can disrupt the body's normal melatonin cycles. For example, jet lag, shift work, and poor vision can disrupt melatonin cycles.

Melatonin also helps control the timing and release of female reproductive hormones. It helps determine when a woman starts to menstruate, the frequency and duration of menstrual cycles, and when a woman stops menstruating (menopause).

Some researchers also believe that melatonin levels may be related to aging. For example, young children have the highest levels of nighttime melatonin. Researchers believe these levels drop as we age. Some people think lower levels of melatonin may explain why some older adults have sleep problems and tend to go to bed and wake up earlier than when they were younger. However, newer research calls this theory into question.

Melatonin has strong antioxidant effects. Preliminary evidence suggests that it may help strengthen the immune system.

If you are considering using melatonin supplements, talk to your doctor first.

## Uses:

### Insomnia

Studies suggest that melatonin supplements may help people with disrupted circadian rhythms (such as people with jet lag or those who work the night shift) and those with low melatonin levels (such as some seniors and people with schizophrenia) to sleep better. A review of clinical studies suggests that melatonin supplements may help prevent jet lag, particularly in people who cross five or more time zones.

A few clinical studies suggest that when taken for short periods of time (days to weeks) melatonin is more effective than a placebo in reducing the time it takes to fall asleep, increasing the number of sleeping hours, and boosting daytime alertness. It's not clear how well melatonin works, however – some studies suggest that it only reduces the amount of time to fall asleep by a few minutes.

A number of human studies have measured the effects of melatonin supplements on sleep in healthy people. A wide range of doses has been used, often taken by mouth 30 - 60 minutes prior to sleep time. Results have been mixed. Some evidence suggests that melatonin may work best for people over 55 who have insomnia. One study of 334 people aged 55 and older found that sustained-release melatonin seemed to help people fall asleep faster, sleep better, be more alert in the morning, and improve quality of life in people with primary insomnia.

### Menopause

Melatonin supplements may help with sleep problems associated with menopause. However, it does not appear to relieve other symptoms of menopause, such as hot flashes. Peri- or postmenopausal women who use melatonin supplements should do so only for a short period of time since long term effects are not known.

### Benzodiazepine Withdrawal

Some clinical research has found that melatonin may help elderly people with insomnia who are tapering off or stopping benzodiazepines such as diazepam (Valium), alprazolam (Xanax), or lorazepam (Ativan). Taking controlled-release melatonin improved sleep quality in those stopping benzodiazepine use. More study is needed.

### **Breast Cancer**

Several studies suggest that melatonin levels may be associated with breast cancer risk. For example, women with breast cancer tend to have lower levels of melatonin than those without the disease. Laboratory experiments have found that low levels of melatonin stimulate the growth of certain types of breast cancer cells, while adding melatonin to these cells slows their growth. Preliminary evidence also suggests that melatonin may strengthen the effects of some chemotherapy drugs used to treat breast cancer. In a study that included a small number of women with breast cancer, melatonin (given 7 days before beginning chemotherapy) prevented the lowering of platelets in the blood. This is a common complication of chemotherapy that can lead to bleeding.

In another small study of women who were taking tamoxifen for breast cancer but seeing no improvement, adding melatonin caused tumors to modestly shrink in more 28% of the women. Women with breast cancer should ask their doctors before taking melatonin.

### **Prostate Cancer**

Studies show that people with prostate cancer have lower melatonin levels than men without the disease. In test tube studies, melatonin blocks the growth of prostate cancer cells. In one small-scale study, melatonin -- combined with conventional medical treatment -- improved survival rates in 9 out of 14 men with metastatic prostate cancer. Interestingly, since meditation may cause melatonin levels to rise it appears to be a valuable addition to the treatment of prostate cancer. More research is needed before doctors can make recommendations in this area.

### **Attention Deficit Hyperactivity Disorder (ADHD)**

Some evidence suggests that melatonin may help promote sleep in children in ADHD, although it does not seem to improve the behavioral symptoms of ADHD.

### **Other Uses**

- **Sunburn** -- A few small clinical studies suggest that gels, lotions, or ointments containing melatonin may protect against sunburn and other skin damage. Studies examined using melatonin alone or combined with topical vitamin E prior to UV light exposure from the sun.
- **Irritable Bowel Syndrome** -- Some preliminary studies suggest that people with IBS who take melatonin reduce some symptoms of IBS, such as abdominal pain. But results are mixed as to whether melatonin may help improve other symptoms, such as bloating and frequency of bowel movements.
- **Epilepsy** -- Some studies suggest melatonin may reduce the frequency and duration of seizures in children with epilepsy. But other studies suggest melatonin may increase the frequency of seizures. Do not take melatonin for epilepsy or give it to a child without talking to your doctor first.

### **Available Forms:**

Melatonin is available as tablets, capsules, cream, and lozenges that dissolve under the tongue.

### **How to Take It:**

There is currently no recommended dose for melatonin supplements. Different people will have different responses to its effects. Lower doses appear to work better in people who are especially sensitive. Higher doses may cause anxiety and irritability.

The best approach for any condition is to begin with very low doses of melatonin. Keep the dose close to the amount that our bodies normally produce (< 0.3 mg per day). You should only use the lowest amount possible to achieve the desired effect. Your doctor can help you determine the most appropriate dose for your situation, including how to increase the amount, if needed.

### **Pediatric**

- Always ask your doctor before giving melatonin to a child. Keep doses to less than 0.3 mg/day. There is not enough information to say that doses greater than 0.3 mg per day are safe in children under age 15. In fact, doses between 1 - 5 mg may cause seizures in this age group.

## Adult

- Insomnia: 1 to 3 mg 1 hour before bedtime is usually effective, although doses as low as 0.1 -0.3 mg may improve sleep for some people. If 3 mg per night does not work after 3 days, try 5 - 6 mg 1 hour before bedtime. You should work with your doctor to find the safest and most effective dose for you. The right dose for you should produce restful sleep with no daytime irritability or fatigue.
- Jet lag: 0.5 - 5 mg of melatonin 1 hour prior to bedtime at final destination has been used in several studies. Another approach that has been used is 1 - 5 mg 1 hour before bedtime for 2 days prior to departure and for 2 - 3 days upon arrival at final destination.

## Precautions:

Because of the potential for side effects and interactions with medications, people should take dietary supplements only under the supervision of a knowledgeable health care provider.

Some people may have vivid dreams or nightmares when they take melatonin. Taking too much melatonin may disrupt circadian rhythms (your "body clock").

Melatonin can cause drowsiness if taken during the day. If you are drowsy the morning after taking melatonin, try taking a lower dose.

Additional side effects include stomach cramps, dizziness, headache, irritability, decreased libido, breast enlargement in men (called gynecomastia), and decreased sperm count.

Pregnant or nursing women should not take melatonin because it could interfere with fertility.

Some studies show that melatonin supplements worsened symptoms of depression. For this reason, people with depression should consult their doctor before using melatonin supplements.

Although many researchers believe that melatonin levels go down with age, newer evidence has brought this theory into question. People older than 65 should ask their doctor before taking melatonin supplements, so blood levels of this hormone can be monitored.

## Possible Interactions:

If you are being treated with any of the following medications, you should not use melatonin without first discussing it with your health care provider.

**Antidepressant medications** -- In an animal study, melatonin supplements reduced the antidepressant effects of desipramine and fluoxetine (Prozac). More research is needed to know if the same thing would happen in people. In addition, fluoxetine (a member of a class of drugs called selective serotonin reuptake inhibitors, or SSRIs) can cause low levels of melatonin in people.

**Antipsychotic medications** -- A common side effect of antipsychotic medications used to treat schizophrenia is a condition called tardive dyskinesia, which causes involuntary movements. In a study of 22 people with schizophrenia and tardive dyskinesia caused by antipsychotic medications, those who took melatonin supplements had fewer symptoms compared to those who did not take the supplements.

**Benzodiazepines** -- The combination of melatonin and triazolam (Halcion) improved sleep quality in one study. In addition, a few reports have suggested that melatonin supplements may help people stop using long-term benzodiazepine therapy. (Benzodiazepines are habit-forming.)

**Blood pressure medications** -- Melatonin may make blood pressure medications like methoxamine (Vasoxyl) and clonidine (Catapres) less effective. In addition, medications in a class called calcium channel blockers may lower melatonin levels. Calcium channel blockers include:

- Nifedipine (Procardia)
- Amlodipine (Norvasc)
- Verapamil (Calan, Isoptin)

- Diltiazem (Cardizem)
- Felodipine (Plendil)
- Nisoldipine (Sular)
- Bepridil (Vascor)

**Beta-blockers** -- Use of beta-blockers may lower melatonin levels in the body. Beta-blockers include:

- Acebutolol (Sectral)
- Atenolol (Tenormin)
- Bisoprolol (Zebeta)
- Carteolol (Cartrol)
- Metoprolol (Lopressor, Toprol XL)
- Nadolol (Corgard)
- Propranolol (Inderal)

**Blood-thinning medications (anticoagulants)** -- Melatonin may increase the risk of bleeding from anticoagulant medications such as warfarin (Coumadin).

**Interleukin-2** -- In one study of 80 cancer patients, use of melatonin along with interleukin-2 led to more tumor regression and better survival rates than treatment with interleukin-2 alone.

**Nonsteroidal anti-inflammatory drugs (NSAIDs)** -- NSAIDs such as ibuprofen (Advil, Motrin) may lower levels of melatonin in the blood.

**Steroids and immunosuppressant medications** -- Melatonin may cause these medication to lose their effectiveness. Do not take melatonin with corticosteroids or other medications used to suppress the immune system.

**Tamoxifen** -- Preliminary research suggests that the combination of tamoxifen (a chemotherapy drug) and melatonin may benefit some people with breast and other cancers. More research is needed to confirm these results.

**Other** -- Caffeine, tobacco, and alcohol can all lower levels of melatonin in the body.

- Reviewed last on: 12/8/2009
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## Supporting Research

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