



“The amount of sleep required by the average person is 5 minutes more”- anon

Sleep is by no means a luxury. Sleep is necessary for all of us to synchronize to the earth's rhythm. It grants us access to an expanded consciousness and to greater creativity. Sleep allows short-term memory to meld into long-term memory. Sleep and dreaming create a physiological and emotional balance to our being. Without it, immunity to disease plummets, anxiety and depression grows, blood pressure increases, we gain weight and the overall sense of well-being is lost.

Eighty percent of my patients complain of problems with lack of sleep. Either they have problems with getting to sleep and then are tired during the day, or they get to sleep and then wake up during the night and are unable to get back to sleep. Although there may be medical issues that need to be addressed, most of these patients are just out of synch with the earth's, and therefore their own, natural biological rhythms.

Circadian rhythms

Deep within the brain there is a group of cells called the suprachiasmatic nucleus (SCN). These cells are within the pineal gland. They regulate the body's rhythms, adjusting all functions, especially hormones, to the light/dark cycle of our day. These circadian rhythms (circa = around, dies = day) are entrained to our artificial day by the light and dark cues and social cues that allow us to live and work within a 24-hour day. Your entire physiology becomes aligned with your environment in this way.

We are aware of changes that affect this cycle when we become sleep-deprived. When we change the clock and “Spring ahead or Fall behind”, it may take a week or more for your body to adapt to the time change and feel less tired during the day. Jet lag presents a similar challenge when we change time zones.

Did you know?

When people are put in a dark-only environment, say a cave, and have limited social cues, their natural free-running rhythm is a 23.5 to 27.5 hour day length. The synchronization of this rhythm through cues received and acted upon by the brain allows us to live in a 24-hour day.

The pineal gland secretes a hormone called melatonin that promotes sleep. It is higher during the night and lower during the day. But here in Seattle, our days are dark and sunlight is low much of the year. So your brain's sleep-producing chemistry is deficient in some way.

It is no wonder that Seasonal Affective Disorder (SAD) is rampant in the Northwest. There is a lack of entrainment of the melatonin rhythm when melatonin is produced during the day, leading to daytime fatigue, digestion problems, emotional instability, depression and anxiety.



Add to this the physical and emotional stress many of us experience, combined with a depleted nutritional status, and our sleep chemistry becomes drastically altered.

Melatonin, the sleep hormone, normally declines rapidly with age and is minimal by age 70. Caffeine, alcohol, nicotine, beta-blocker medications, some anti-depressants, sleeping pills, tranquilizers and of course chronic stress all lower melatonin. So do over-the-counter NSAIDs, such as ibuprofen.

Measuring and testing:

There are 3 tests which I find useful in evaluating sleep related problems.

1. Melatonin can be easily measured using a saliva test. Since melatonin should be high at night and low after arising in the morning, changes in the rhythm of melatonin, and/or the amount of melatonin, will help determine if changes in diet, light/dark cycles, or nutrition supplementation are needed. (see attached example)
2. I always like to do a saliva test for adrenal stress hormones (see attached). If the rhythm of the stress hormones, cortisol and DHEA, is changed, the sleep rhythm of melatonin secretion will be affected.

The normal daily rhythm of cortisol is nearly opposite to that of melatonin: high in the morning, as it readies your physiology to face the day, and low in the night, to allow the body to settle into restful sleep. If this rhythm is changed due to stress or changes in nighttime blood sugar, the adrenals sound the alarm and create a wakeful state. If cortisol is abnormally high, it will also decrease melatonin.

3. If needed, testing for nutrient absorption using metabolic panels may pinpoint just what amino acids, the building blocks of neurotransmitters in the brain that promote relaxation and sleep, are necessary for restoration of the normal pattern of sleep. It also measures the nutritional precursors necessary for your body to create melatonin. We can then create a diet and supplementation to help facilitate better sleep.

Did you know?

Many of my patients display an upside-down melatonin rhythm, resulting in sleeping during the day and being awake at night. This is a common pattern found in bipolar individuals.

Ways to change melatonin

Light: If the problem is an abnormal rhythm, consider light therapy. Based on feedback from testing and listening to my patients, it may be necessary to use bright light at the beginning of the day to shut down melatonin production. I like to read under bright light each morning. Light is measured in units called lux. The sun is about 20,000 lux on a bright morning. A light bulb is about 200 lux. The stronger light cue created by the sun shifts the melatonin rhythm by shutting it down. People require different amounts of light to accomplish this goal. Some can use two 100-watt light bulbs to accomplish this. Others need to buy special high-intensity light lamps made especially for SAD. You will have to experiment and see which works best for you. It is the blue spectrum of light that effects change of this rhythm.

****Never look directly into the sun—you just have to be outside in the sun about 20 minutes to shut down the melatonin rhythm.**

Today we rely on electronic devices to organize and entertain us. A recent study by the National Sleep Foundation found that 95% of us use some type of electronics like a television or computer, video game or cell phone within one hour of going to sleep. What this does is direct blue light through the eyes to the pineal, shutting down or lowering melatonin production just at the time we need it to go to sleep. So what is the solution? Stop using these devices at least 2 hours before bedtime. Read in a dimly lit room at night. Amber-colored light seems to preserve melatonin production better than most. I have had patients buy simple amber-colored work goggles to use late at night to accomplish the same results.



Sleep your way to better health

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Sleep in a pitch black room or wear an eye mask that blocks light. This will help insure that more melatonin is produced by the brain while sleeping. Never use an electric blanket. It has been shown to decrease serotonin levels.

Which is better?

The use of the IPAD or notebook computer seems to emit more direct blue light into the eyes than the Kindle or other similar devices. Therefore it more strongly inhibits melatonin production.

Nutrition and amino acids:

Ask yourself the following:

Do I regularly experience :

- Negativity and/or depression
- Worry, anxiety
- Panic attacks
- Rage, irritability
- Insomnia or disturbed sleep
- Winter sadness and depression (SAD)
- Fibromyalgia symptoms, TMJ, migraines
- A dislike for hot weather
- Cravings for sweets, starches, alcohol, or marijuana

If the answer is yes to more than one or two of the above, you may have low serotonin levels. Serotonin is our natural antidepressant. It is also the precursor to melatonin.

Did you know?

Most of the serotonin made in the body is made and used in the gut. The brain only makes and uses a small percentage of serotonin.

Tryptophan and 5-HTP:

Melatonin production requires two amino acid precursors, tryptophan and 5-HTP (5-hydroxytryptophan). Tryptophan is found in protein-rich foods. Here's how it goes: Your body converts tryptophan into serotonin. Then serotonin is converted into melatonin within the eye cells and within the pineal gland of the brain. Both tryptophan and 5-HTP have been shown to raise melatonin levels by over 300% in twenty minutes.*

Next, do you experience adrenal stress as indicated by your labs and by:

- Cravings for sweets
- Bouts of low blood sugar over stressed, burned out
- Inability to relax or slow down
- Endless monkey mind and anxiety just before sleep

You may be experiencing a depletion of GABA, another amino acid that acts as our own natural tranquilizer. Together with the addition of tryptophan and/or serotonin, GABA sometimes quiets the racing mind and promotes restful sleep. Both GABA and serotonin may be used together to aid sleep, since they work on different parts of the brain.

If your adrenal labs show a spike at night, the amino acid phosphatidyl serine can be used to dampen the surge of cortisol when taken before bed. I always ask my patients if they awake at night shaky or hungry for sugar and carbs, indicating low blood sugar. If you have a blood sugar crash, like the one you may experience at 2-3 p.m. in the afternoon, the adrenals react by releasing cortisol to force the liver to let go of stored sugar. It also increases hunger, sometimes resulting in bingeing later in the day. If this occurs during sleep time, I often have my patients eat half of a ripe banana or a



tablespoon of peanut butter before bed to stave off cravings and blood sugar drops until a better long-term diet plan is developed.

This is also one mechanism that leads to weight gain. If your blood sugar drops during the day or at night, the adrenals sound the alarm for more glucose needed for body function. It increases cravings for sugar and carbohydrates. Any extra sugar that is not able to be stored in the liver is shunted into fat cells and stored as fat due to this cascade of reactions started by the adrenals.

Dosage: 5-HTP = 50 mg in the evening on an empty stomach and 50mg before bed. You can take up to 200 mg of 5-HTP per day with little negative effects, but always try to use the smallest dosage you can in order to get the desired effect. If there is no effect within an hour, you can take more.

Some people feel energized by 5-HTP and can't sleep as well. For those folks I use tryptophan instead. Tryptophan seems to work best at a dosage of 500 to 1500 mg per day with a similar schedule to the 5-HTP. Rarely will I use both 5-HTP and tryptophan together.

Melatonin

Taking melatonin by itself may be a great aid to sleep. I usually recommend that you take the tryptophan or 5-HTP first to allow the body to make the melatonin it needs, but this does not always work. I usually start a patient on the smallest amount possible and build up the dosage from there. There are some who need as little as 0.5 mg, although the usual dosage is between 1-4mg. When possible, I like to use a time-release capsule to insure that it works throughout the night.

Remember, testing for melatonin and adrenal hormones is a great idea to better understand your challenges to sleep.

Other nutrients

Calcium and magnesium need to be taken regularly as a basic support. Try to take about a 2:1 ratio of calcium to magnesium. I usually recommend calcium lactate (made from beets, not milk) because it is very absorbable.

Vitamin B, especially B6 and B12, are "anti-stress" vitamins. The brain needs B vitamins to manufacture serotonin and GABA. When B6 is taken in the morning, it often stimulates an increase in serotonin later in the day. Often patients note an increase in dreaming and dream memory, especially in the second half of the night, when taking a B6 complex of vitamins and tryptophan or 5-HTP later in the day.

Essential fatty acids, such as EPA and DHA, are very calming for the brain. They tend to decrease overall inflammation throughout the body, especially in the gut and brain. They facilitate the passage of nutrients into the cells and result in a myriad of beneficial effects throughout the body. I personally like high-grade krill oil. It seems to be better absorbed and easily helps improve your lipid profile.

L-theanine is an amino acid commonly found in green tea. It is known to increase beneficial alpha waves in the brain, promoting a feeling of relaxation.

Reishi mushroom extract reduces anxiety and insomnia. It enhances immune response and strengthens the adrenals. I am very partial to Reishi. It has virtually no side effects and can be used in conjunction with other supplements.

Valerian root is another herb which is very safe and gentle. It helps relax you before bed and reduces anxiety. It may be taken as a tea or a tincture for best results.

There are many other herbs and teas which help to relax and promote sleep. My grandmother drank chamomile tea each night before sleep. She swore that it was the reason she slept so well.

Caution should always be taken when attempting to use amino acids and other supplements while you are taking medications. Always check to see if there are any drug/nutrient interactions to be aware of. There are many medications and disease processes that interfere with sleep. If in doubt, ask your physician for some guidance.