New Science on the Health Benefits of Melatonin

How well does it really work for sleep?

January 29, 2020 By Michael Breus, PhD

Most people think of melatonin as primarily—or even exclusively—a sleep remedy. Melatonin, of course, is critical for healthy sleep. The body's own melatonin production is essential to circadian rhythm regulation, and the maintenance of daily sleep-wake cycles.

As a supplement, melatonin has grown tremendously in popularity, largely on the basis of its reputation as a sleep promoter. Indeed, melatonin is among the top 5 natural products used in the United States, according to the National Institutes of Health. Between 2007 and 2012, use of melatonin doubled among adults in the US, rising to slightly more than 3 million.

Here's what's fascinating: some of the most broad and potent benefits of melatonin may lay outside the sleep realm. As this interesting Medscape article explains, scientists are learning more and more about the role melatonin can play in treating and preventing disease. At the same time, the effectiveness of melatonin's most well-known use—sleep—remains something of an open question in the scientific community, even as millions of people take melatonin regularly for sleep.

Read on to learn what the latest science is telling us about how melatonin's therapeutic reach may extend way beyond sleep, and how I think melatonin can be deployed most effectively in treating sleep problems.

Potential health benefits of melatonin beyond sleep

It's almost getting easier to ask: What chronic diseases doesn't melatonin play a role in? Recent years have seen a flurry of studies showing the protective and therapeutic benefits of melatonin in the fight against the most significant chronic diseases of our time—heart disease, cancer, dementia, diabetes. It's role as an antioxidant and anti-inflammatory, as an anti-tumor agent, and its importance in maintaining circadian clock timing are some of the critical ways melatonin appears to have a far-reaching impact on health and disease, especially as we age.

Melatonin protects cardiovascular health. Melatonin has powerful antioxidant capabilities. Antioxidants work to protect cells and genes from damage, which can lead to dysfunction and the onset of disease. Antioxidant action reduces harmful inflammation and limits cellular and DNA damage from a process known as "oxidative stress," which occurs when volatile chemicals known

as “free radicals” proliferate in the body. Substances that function as antioxidants can neutralize the damaging effects of free radicals to hurt the integrity and proper functioning of cells and genes.

Melatonin’s antioxidant abilities are one mechanism by which this hormone may prevent and treat the damage of chronic and age-related diseases, from cardiovascular disease to cancer and neurodegenerative diseases like Alzheimer’s. (More on the melatonin-cancer connection in a minute.)

Recent research continues to demonstrate that melatonin may protect against and treat range of cardiovascular conditions, including heart attack, stroke, high blood pressure and atherosclerosis (the accumulation of fat and cholesterol in the arteries).

Melatonin affects diabetes risk. Melatonin has been shown to have an influence over both blood sugar and insulin, key markers for metabolic health and drivers of metabolic disease, particularly type 2 diabetes. The science of melatonin’s role in diabetes risk and treatment is complicated, and not yet well enough understood. There’s a robust body of research that indicates melatonin has a protective effect over metabolic health and can lower diabetes risk. The body’s own natural nighttime levels of melatonin have been linked to risk for developing diabetes. According to research, maintaining healthy nocturnal melatonin levels may cut one’s risk for diabetes in half, compared to people with low nighttime melatonin production. And other recent research has shown that supplemental melatonin may help to regulate blood sugar, keeping it from rising too high.

Still, other recent research has shown melatonin may complicate risk for diabetes by interfering with insulin, a hormone that helps cells access glucose from the bloodstream, thereby regulating blood sugar levels. Elevating levels of melatonin may in some people may reduce the ability of specialized cells to release insulin, leading to higher blood sugar levels. These insulin-limiting effects of melatonin were shown to be particularly strong in people with a specific genetic variation that affects melatonin receptor cells. That same genetic variation has also been linked to higher risk for type 2 diabetes.

Melatonin protects against age-related brain disease, including Alzheimer’s. Melatonin levels have been associated with Alzheimer’s disease for decades. People with Alzheimer’s tend to show lower levels of melatonin compared to age peers without the disease. And melatonin loss continues to escalate as the neurodegenerative disease progresses. A growing body of research shows melatonin has significant neuroprotective capabilities, and may help to prevent Alzheimer’s in part by slowing or stopping the accumulation of damaging amyloid plaque and other harmful proteins in the brain, which many scientists think are behind the onset of the disease. Other research suggests that supplemental melatonin may help to reverse cognitive decline when Alzheimer’s disease is already present.

As it does throughout the body, melatonin functions as a powerful antioxidant in the brain.

Oxidative stress that damages brain cells is believed to be one significant contributing cause for

age-related cognitive problems, and a factor in the development of neurodegenerative diseases including Alzheimer's disease and others. Another likely reason for melatonin's ability to protect brain health, according to scientific study? Its role in keeping circadian rhythms in sync.

Melatonin is an anticancer agent. Exciting research over the past several years has demonstrated the many ways that melatonin halts the onset and progression of several types of cancer. Studies have shown that melatonin can:

- Suppress cancer cell and tumor growth
- Inhibit cancer metastasis
- Help boost the effectiveness of cancer treatment, including for some treatment-resistant cancers
- Reduce the severity of side effects from radiation and chemotherapy
- Prevent cancer from developing in the first place

Why is melatonin so effective in combating cancer at every phase of its development, from prevention to limiting progression and improving treatment? Scientists are still unpacking the complicated answer to that big question. Melatonin's influence over circadian rhythms is one likely important factor. So is melatonin's role in protecting cellular health, including limiting the effects of oxidative stress and promoting the orderly death of damaged and aged cells—a biological process known as "apoptosis." When cells die of in an orderly, systematic way, it eliminates them as live, but damaged and dysfunctional cellular actors in the body, reducing the risk for cancerous cells to grow and replicate. Apoptosis protects against cancer, and melatonin supports apoptosis of cancer cells.

How well does melatonin work for sleep, really?

There are more than 3 million adults in the US currently using melatonin for sleep. Despite its popularity, there remains an ongoing debate—and a certain amount of confusion—about how well melatonin actually helps sleep. I've seen melatonin be very effective in treating sleep issues—and I've used it myself, specifically for jet lag. The key to using melatonin successfully for improving sleep begins, I think, with understanding how this hormone affects sleep—and how it doesn't.

First, let's address what I think is most confusing for people about melatonin. Melatonin is not a sedative. Rather than being a sleep inducer, melatonin is a sleep regulator or sleep facilitator, by helping to regulate the body's bio clock and sleep-wake cycles. Scientific research shows that melatonin supplementation can strengthen and improve sleep-wake cycles. With stronger, more regular sleep-wake cycles typically comes more healthful sleep patterns, including an easier time falling asleep and sleeping on a regular schedule. Melatonin has been shown to be particularly effective in addressing insomnia symptoms (including trouble falling asleep and staying asleep) in older adults. Given its role as a circadian rhythm booster, this makes a ton of sense. As we age, our circadian clocks are more likely to fall out of sync, making older adults especially open to benefiting from supplemental melatonin to shore up their bio clocks and keep them ticking in sync.

Another group of people whose sleep may be particularly helped by melatonin supplementation? Adults and children with autism spectrum disorder (ASD). That's because people with ASD have been shown to have lower levels of melatonin than people without ASD. There's a pretty robust body of research showing melatonin can help children and adults with ASD sleep longer, get higher quality sleep, and fall asleep more easily, with additional benefits to daytime behaviors.

Does this mean melatonin can only be effective in treating sleep issues among these specific groups? Definitely not. But you've heard me say it before: there is no single bullet or magic pill that erases everyone's sleep issues. We've got plenty more to learn about how melatonin therapy might affect sleep. I think, knowing what we do today, it's reasonable to say that melatonin is likely to be most effective in people whose sleep problems, including insomnia symptoms, stem from out-of-sync bio rhythms. That's why melatonin can be so helpful in treating jet lag. For people whose insomnia or other sleep issues stem from other issues, such as stress or anxiety or chronic pain, other treatments—including CBD and other forms of cannabis, magnesium, and other natural sleep-boosting supplements—may work better. If you're using melatonin and not getting the improvements you want to your sleep, don't assume your sleep issue is un-treatable; look to other therapies for help.

Other issues that complicate melatonin's effectiveness for sleep

Always consult your doctor before you begin taking a supplement or make any changes to your existing medication and supplement routine. This is not medical advice, but it is information you can use as a conversation-starter with your physician at your next appointment.

One of the biggest obstacles to effective melatonin use is, unfortunately, the quality of the supplements themselves. A recent scientific investigation found that the actual melatonin content found in many supplements on the market may vary significantly from what product labels claim. Scientists at Ontario's University of Guelph found that in more than 71 percent of melatonin supplements, the amount of melatonin was more than 10 percent different from what the product label indicated. Some products contained as much as 83 percent less melatonin, while other products contained as much as 478 percent more melatonin. That means a great many consumers aren't taking what they think they are, when they use a melatonin supplement. Before you begin using melatonin, be sure to do your research and get your melatonin from a trusted source.

Getting the dosage right—and the timing of when to take melatonin—will also have a huge impact on how well it works to treat sleep issues.

Many people take too much melatonin, which can throw bio rhythms even further out of sync and may disrupt the body's own melatonin production. Rather than automatically taking a 3 or 5 mg dose right from the get-go, work with your physician or sleep specialist to pinpoint the dose that's right for you. Start small, at as low as .3 mg, working gradually upward until you reach your optimal dosage.

As a treatment for jet lag in healthy adults, I recommend start 0.5 mg, ninety minutes before you want to go to sleep in your new destination, followed up with 20 minutes of light therapy in the

morning. Check out www.timeshifter.com to see an app that will help you schedule your melatonin perfectly.

If you plan to take melatonin at bedtime—which is convenient for a lot of people—make sure to use the timed-release supplements, rather than the standard-release tablets. Otherwise, your melatonin levels will peak and drop off too early, rather than reaching their nightly peak in the final third of a night's sleep, as the body's natural melatonin does.

And stay tuned, because we're surely going to be learning more about how melatonin affects the body's health and disease risks, and ways this hormone may be used as therapy to treat and prevent illnesses, including the many that become more common with age.

Sweet Dreams,

Michael J. Breus, PhD, DABSM

The Sleep Doctor

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