

Part 3 - Restore Your Circadian Rhythm and Improve Your Sleep

by Scott Jeffrey

Do you take an energy jolt of caffeine in the morning or a sugary drink midday? Do you often sedate yourself with food, alcohol, Internet, TV, or “recreational” drugs in the evening? Do you frequently feel wired when you go to sleep?

Most high achievers I have surveyed say “Yes” to at least two if not all three of the above questions. All of these habits relate to our quality of sleep. More specifically, the issue has to do with our pineal gland and how it regulates our internal clock.

We are going to explore here:

- The important role light plays for the pineal gland,
- How our modern lives are hijacking this gland, and
- What we can do about it starting *right now*.

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Quality Sleep is Vital for High Performance

We tend to think that the less we sleep, the more productive we can be. But, as the director of the sleep and neuroimaging lab at UC Berkeley, Matthew Walker, explains:

“We all think we have to stay awake to get more done. I think that’s simply not true. In fact, if you have a good night of sleep, what you’ll find is that you can get more done than if you simply stay awake.”

Do you ever sleep a mere five hours a night, day after day, when you’re working on a project or trying to grow your business? A study published in [Occupational and Environmental Medicine](#) found that after 17 hours without sleep, our alertness is similar to the cognitive effects of being “impaired”.

According to the [CDC](#), over 50 million adults in the United States have chronic sleep disorders, and less than a third of adults sleep the optimal amount. There are so many ways to improve our [mental performance](#), enhance our memory, expand our cognitive capacities, [increase our energy](#), and so on. But without quality sleep, we don’t have a foundation from which to transform in any of these areas.

How much quality sleep do we need?

According to research from [The National Sleep Foundation](#), approximately 95 percent of test subjects, under ideal conditions, sleep seven to nine hours out of a 24-hour period. Interestingly, numerous research studies of high performers, including [Anders Ericsson’s study of top violinists](#), suggest they sleep *more* than the rest of us, not less.

What is Circadian Rhythm?

In 1981, Harvard sleep researcher Charles Czeisler showed that a person’s internal clock aligns with the environment via daylight. *Circadian rhythm* is the approximate 24-hour cycle of biological activities linked with natural periods of light and darkness. “Biological clock” is another term for the circadian rhythm.

The pineal gland, if you recall from [Part 1](#), is the body’s light meter. The pineal synthesizes and secretes melatonin. Melatonin is a hormone that plays a central role in regulating circadian rhythm. How does the pineal gland know how much melatonin to secrete?

Light exposure to our eyes is the major factor. Normally, the pineal produces less melatonin in daylight hours and increases secretion during the night. Besides regulating circadian rhythm, melatonin is an important hormone that:

- [Helps us sleep](#),
- Reduces pain in chronic conditions,
- Acts as an anti-inflammatory agent,
- Supports cellular immune responses, and
- Promotes healing in damaged tissues.

Studies by Walter Pierpaoli and Georges Maestroni show that melatonin also increases performance and [longevity in rats](#). *But the pineal now tends to produce an insufficient amount of melatonin.*

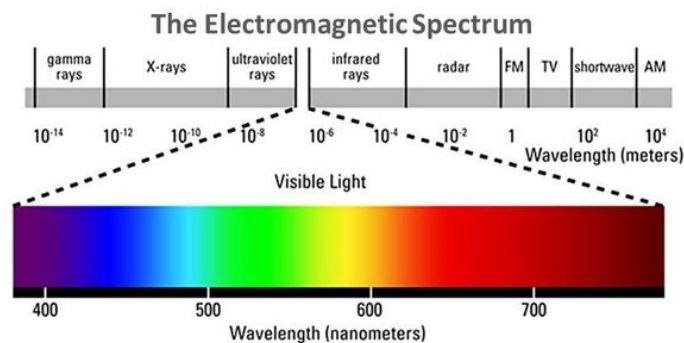
Circadian Rhythm Gone Wrong

What did we do before the advent of artificial light? The sun used to be our primary source of lighting. Our evenings were spent in relative darkness. Living under nature's time clock, the pineal gland secretes melatonin correctly, and our bodies stay in alignment with the circadian rhythm.

Now, however, artificial lighting suffuses our homes, offices, and virtually everywhere else. We stare at back-lit screens, phones, tablets, monitors, and televisions all day and evening. And, it turns out, this abundance of lumens come at a high price. It throws the circadian rhythm out of alignment. Our sleep suffers, and research shows, that it may contribute to causing cancer, heart disease, obesity, diabetes, and more.

The Benefits of Blue Light

Not all colors of light have the same effect on our biology.



For high achievers, blue wavelengths are beneficial during daylight hours.

Blue light:

- Improves attention
- Increases [reaction time](#)

- Boosts energy
- Enhances mood
- Helps [fight fatigue](#)

All of these things support high performance. But come sundown, this blue light becomes disruptive.

The Dangers of Blue Light

Blue light causes the pineal gland to suppress melatonin production for up four hours. In one [Harvard study](#), they compared the effects of 6 1/2 hours of blue light and green light exposure. They found that blue light suppresses melatonin twice as long as the green light, shifting circadian rhythms by twice as much (3 hours versus 1 1/2 hours).

A recent [University of Oxford study](#) found that green light promotes sleep while blue light delays it. While our interests here are supporting the pineal, it's worth noting the growing body of research linking blue light exposure to various health risks:

- Cancer risks ([melatonin reduces risk of death from cancer](#))
- [Diabetes risks](#) (messes with blood pressure)
- [Increased hunger/obesity](#) (disrupts our metabolism)
- [Higher risks of breast cancer](#)
- [Bipolar disorder](#) in kids

Poor sleep, in general, is linked to [heart disease](#), [depression](#), [type-2 diabetes](#), and [obesity](#). Let us see what we can do to reduce blue light exposure and begin getting better quality sleep.

Get Rid of Junk Light in Your Home and Office

Light researcher, Dr. John Ott, coined the term *malillumination* to reflect the malnourishment we are getting from artificial light. Now, it is being called *junk light* (think "junk food").

Compact fluorescents (CFLs) and LEDs became popular because of their superior energy-efficiency to traditional incandescent bulbs. It turns out these new artificial "white light" bulbs are not only more toxic for the environment; they are toxic to our eyes and pineal gland too. Most of these artificial light bulbs lack many of the frequencies of natural light. These bulbs amplify blue light while they reduce or eliminate infrared, red, and violet light found in sunlight. In fact, CFLs and LEDs emit *five times more blue light* than our eyes are accustomed to seeing.

[This study](#) from the University of Haifa shows that the bright white light from LEDs suppresses melatonin production five times more than bulbs that emit a yellow-orange light. Junk light in the evenings increases eye strain, causing fatigue. This white light

slows down ATP production and increases free radical production, reducing mental performance.

My home was designed to be highly energy efficient, and the prior owners had CFLs installed throughout the house. Instead of replacing them all at once, I have chosen to replace them as they burn out (except in high-use areas).

Action: Ditch your CFLs and LEDs. Replacement them with halogen or traditional incandescent bulbs. Although halogens and incandescent are not as energy-efficient, they have significantly less harmful chemicals (like mercury) and give off less artificial blue light.

Wear the Best Blue Light Blocking Glasses

We cannot always control our environments. And blue light is *everywhere*. Thankfully, we can wear the best blue light blocking glasses (often called *blue blockers* or *amber glasses*) that block out most of the blue light wavelengths.

Do these blue light blocking glasses work?

A study published in [The Journal of Biological and Medical Rhythm Research](#) shows that these amber-tinted glasses do indeed improve sleep. Studies also show these blue light blocking glasses help with [ADHD symptoms](#) and [bipolar disorder](#).

My Own Experience Wearing Blue Light Glasses

Although I began experimenting with the best blue light blocking glasses years ago, I started wearing them consistently about four months ago. The effects on my quality of sleep are undeniable. If you ever feel wired with a racing mind when you go to bed as I used to, these glasses will help. I found that my eyes stayed more relaxed in the evenings.

And when it was time to sleep even if I was on the computer for hours that evening I still felt calmer and easily slipped into a restful night's sleep. Wearing blue light blocking glasses is one of my favorite sleep solutions for a better night's rest.

How to Select the Best Blue Light Blocking Glasses

When I purchased my first pair of blue light blocking glasses, there were not many options on the market. How things have changed in the last five years. As more people are becoming aware of the effects of blue light exposure, the market of products has grown to meet the demand. The challenge is that not all anti-blue light glasses are

created equal. And most of the brands on the market don't quote or measure exactly how much blue light their glasses filter.

According to Charles Czeisler, M.D., chief of the Division of Sleep and Circadian Disorders at Brigham and Women's Hospital in Boston, these glasses should block almost *all* blue light to be effective. Our eyes are sensitive to a small region of the electromagnetic spectrum. Visible light corresponds to a wavelength of 400 – 700 nanometers (nm). Visible blue light has a wavelength of about 475 nm. The most disruptive range of blue light is between 450 to 510 nm. Theoretically, the later in the evening, you want your glasses to filter more blue light.

My Top Picks for the Best Blue Light Blocking Glasses

I have purchased over ten different pairs of the best blue light blocking glasses to experiment with and use and tested each of them with two methods described below.



[Night Shades Blue Blocking Amber Glasses](#) by Spectra479

These are my personal favorites. These amber-tinted glasses are tested to block 100% of light from the 280-490 nm range and 99.82% in the critical 450-510 nm range. If you're only going to get one pair of anti-blue light glasses, this would be my recommendation. These blue light reading glasses are also light-weight, comfortable, and wrap around your head, which means they block more blue light from the sides.



[Skyper Blue Light Blocking Computer Glasses](#) by Uvex

These blue blocker reading glasses have orange-tinted lens and claim to absorb over 98% of blue light from computers.

[Consumer Reports](#) tested three different blue light glasses, and Uvex were the only ones that cut out almost all blue light. Similar to the [Spectra479](#), these anti-blue light glasses wrap-around your head. They are a long-time favorite of many biohackers and the cheapest option ([less than 10 bucks on Amazon](#)).



[Official BluBlocker Eagle Sunglasses](#) by BluBlocker

I've owned several pairs of glasses from the BluBlocker brand. They claim that their lenses block up to 500 nanometers, but they do not publish this information. These ventilated, amber-tinted glasses did pass my blue light tests.



[TrueDark Twilight](#) by Biohacked

TrueDark is a product creation of Dave Asprey (the Bulletproof guy). These patent-pending glasses claim to be the “only solution on the market that goes beyond a simple blue light filter to cover all of the ‘junk light’ spectrum that impact sleep and performance, including greens and yellows.”

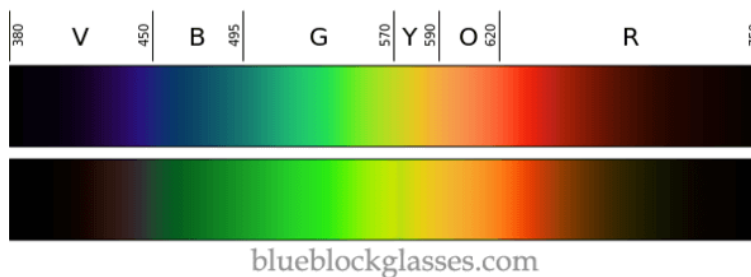
You only wear TrueDark the last few hours before going to sleep. Of all the blue light glasses I've experimented with, these provide the most intense experience. You can feel the effects almost right away. If you travel and are prone to jet lag, these glasses can help with that too. [TrueDark Twilight](#) comes with a pair of Daywalkers designed for use in artificial light during the day and in the early evenings.

This set is more expensive (retail together for \$130) than the other anti-blue light glasses listed above, but they work. (*Disclaimer: affiliate links above*)

How to Test the Best Blue Light Blocking Glasses

I thought this was interesting. I found this blue light glasses test on [this post](#) by Siriya Mitsattha. When you look at these strips of the colored spectrum with the naked eye, you will notice they are different. The top light wavelength spectrum is the common one.

From about 520 nanometers and down, the bottom light spectrum is different: there's no visible blue light. What should happen when you look at these two spectrums with your anti-blue light glasses? They should appear *identical*.



I discovered another way to test blue blocking glasses accidentally. Over the winter, we had multicolored LED holiday lights draped around the house. (I know, we just talked

about the harmful effects of LEDs above.) These LED string lights have five different colors including blue that repeat along a copper cord.

When I look at them through my blue blocking glasses, I thought that one out of every five lights was dim or not working properly. Looking at a blue LED light with anti-blue light glasses, all of the blue light was filtered, leaving only a dim white light.

Light Hacking Tips to Improve Sleep

Besides eliminating or reducing junk light and wearing the best blue light blocking glasses, what other sleep solutions will support your pineal gland?

Simple Tricks to Reduce Blue Light Exposure

Here are a few things you can set up right away:

- Keep your screens (computer, phone, tablet) as dim as you comfortably can. Unless you are viewing your screen in direct sunlight, you'll be surprised how little backlight you need. You can train yourself to use less and less.
- If you have an iPhone, use the Night Shift feature. It will detect the time of day and adjust your screen accordingly.
- For Android users, get the f.lux app or something similar.
- Download the [f.lux app](#) for your computer too. It's free and super easy to setup. Your screen will turn more amber when the sun goes down. You won't have to think about it.

Take a couple of minutes to setup your devices. With these tips, you can "set it and forget it." Also, Dr. Charles Czeisler and other experts advise avoiding staring into computer screens, smartphones, or televisions *for at least two hours before going to sleep.*

Increase Your Exposure to Sunlight

In this [preliminary study](#) at Uppsala University, students exposed to bright daytime light were able to use tablets for two hours in the evening without affecting their sleep. A little sunlight in your eyes increases melanin, which supports proper pineal functioning. There are [tremendous benefits to sunlight](#), which we'll cover in [part 4 of this series](#). Sunlight will boost your mood and improve your sleep at night.

Go outside in the morning and throughout the day and gaze up at the sky. You don't need to look directly at the sun. Increasing melanin in this way will improve cognitive function, reaction times, and light sensitivity. [Direct sunlight exposure](#) will also make you more resilient to the harmful effects of blue light in the evenings. Also, if you stare at a computer screen for long periods, periodically shift your gaze out the window and into the distance. Better yet, take more breaks, walk outside, and look around!

Sleep in Total Darkness

Sleeping in total darkness is surprisingly important. Harvard sleep researcher Stephen Lockley notes that a mere eight lux about twice as much light as the average night light affects our circadian rhythm and melatonin secretion.

Any light, while we sleep, seems to confuse our pineal gland as to what time of day it is. Night-time light is part of the reason many people do not get quality sleep. Creating total darkness can be an investment, but of all the lighting hacks available to support your sleep, this is arguably the most essential.

- Consider investing in blackout shades.
- Get rid of your alarm clock. (Use your alarm clock on your phone but keep it on Airport mode and at least 10 feet from where you sleep.)
- If you have any other electronic devices in your bedroom, unplug them before going to sleep.
- Put electrical tape over any other lights.

You can wear an eye mask, but I do not recommend it. Besides being uncomfortable, your skin is photosensitive too, so total darkness is preferred. The darker the room, the better you will sleep. If you have kids and use night lights, try [SCS Lighting Sleep Mode Night Light](#). It has no blue light and is motion-sensitive. (But keep even night lights in the hallways and out of your children's bedrooms.)

3 More Sleep Solutions to Try

Change Your Pillow

Try sleeping on an [organic buckwheat pillow](#). (I use two of them.) Counter-intuitively, these harder pillows help alleviate tension in your head and neck while you sleep. They also keep your head cooler (no need to flip over your pillow anymore). It could take a little getting used to, but once you do, you would not want to sleep with a cotton or feather pillow anymore. (At least, that is my experience and I switched to buckwheat over 3 years ago.)

Note: some buckwheat pillows are sourced in China and fumigated. [This one](#) is organic, non-toxic, and made in the United States.

Avoid Caffeine in the Evening

Perhaps this goes without saying, drinking caffeine in the evening will also disrupt your sleep cycle. [This study](#) found that having a double espresso before sleep caused a 40-minute delay to the circadian rhythm.

Experiment with Binaural Beats and Isochronic Tones

Audio programs that use alpha, theta, and delta brainwave frequencies can help entrain your brain to these target frequencies that support restful sleep. iAwake Technologies produces some of the most powerful multi-layered brainwave entrainment programs on the market. Their new program [Sound Asleep](#) is a guided sleep meditation by hypnotist Joseph Kao with embedded brainwave frequencies for restorative, sound sleep.

Recap: Sleep Solutions to Restore the Circadian Rhythm

I've been a [business coach](#) to high-performing entrepreneurs for over two decades. Many high achievers believe that sleeping less is a key to success. The opposite is true.

High performers in any field tend to sleep more than the average person. And learning how to improve the quality of your sleep is foundational for peak performance.

Improving your quality of sleep will help restore the circadian rhythm. And doing so will promote healthier pineal gland functioning and higher mental and physical performance. The key to improving your sleep is to reduce exposure to blue light in the evening.

Here are the main [sleep solutions](#) we reviewed in this guide:

1. Wear the best blue light blocking glasses in the evenings.
2. Get rid of artificial white light LEDs and CFLs in your home.
3. Use blue-light modulating apps on your phone and computers.
4. Avoid staring at screens at least 2 hours before going to sleep.
5. Get more direct sunlight exposure during the day.
6. Sleep in total darkness.
7. Avoid caffeine in the later afternoon and evening.
8. Try a buckwheat pillow.

Making these lifestyle changes takes a little time and effort, but the effect you will experience on your quality of sleep and overall mental and physical performance are worth it.