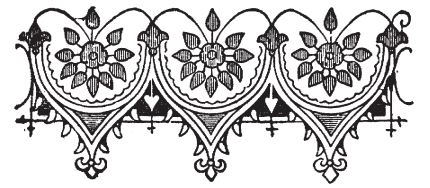


# Health & Wellness



## Bring on the Light!!



Dr. Kate Thomsen and Silky

Is sunlight good for you or bad for you? It depends on where you are in the world, what setting your circadian rhythm is at and what exact kind of light you are referring to. It's a pretty good guess though, that most of us could use a lot more sunlight. In general the health benefits of sunlight far outweigh the risks and yet, our modern lifestyle has greatly reduced our accessibility to natural, health-promoting light therapy.

### What is Light?

Einstein proposed that light travels in small packets of energy and each packet is referred to as a photon. It was Dr. Fritz Albert Popp, founder of the International Institute of Biophysics in Germany, that proved the existence of biophotons, the light particles that transmit information within each cell and between cells. He showed that the DNA of living cells store and release light and called this "biophoton emission". When a molecule absorbs a biophoton, it becomes reactive and the biophoton is given back to the field. Popp developed an instrument called a photon multiplier which could detect biophoton emissions in the field.

Popp said, "We know today that man, essentially, is a being of light. And the modern science of photobiology ... is presently proving this. In terms of healing the implications are immense. We now know, for example, that quanta of light can initiate, or arrest, cascade-like reactions in the cells, and that genetic cellular damage can be virtually repaired, within hours, by faint beams of light. We are still on the threshold of fully understanding the complex relationship between light and life, but we can now say emphatically, that the function of our entire metabolism is dependent on light."

Wow.

### Light and Sleep

We know that melatonin is the "sleep hormone". It is secreted from the pineal gland in the brain when we are in dim light situations preparing to sleep. Melatonin is released around 9pm and shuts off ideally around 7:30am. The cue for turning melatonin production off in the morning is short wavelength light in the blue section of the visible spectrum (daylight). Your thin eyelids will allow light to pass through. This light must come into your upper visual field to strike the lower portion of the retina in the back of your eye. From there it projects to the Supra Chiasmatic Nucleus (SCN) in the brain which messages the pineal gland to shut down production of melatonin. With melatonin levels lowering, we wake up and, as the light in the environment becomes brighter, we secrete cortisol, peaking around 8 – 9am and lowering slowly throughout the rest of the day.

### Light and Circadian rhythm

Chronobiology is the study of circadian rhythms – the physical, mental, and behavioral changes that follow a 24 hour cycle. These inner rhythmic clocks are found in most living things including plants, animals and microbes. Functions of the human body like hormone release, eating and digestion, body temperature, sleeping and waking are cyclical. They are regulated by inner clocks that respond primarily to light and dark. Finding an illustrated circadian rhythm clock on Google can show you the optimal times for your daily activities.

Our bodies function much better when we align with natural circadian rhythms but unfortunately most of us don't. We can "override" our inner clocks but they are always resetting according to external cues. For example, jet lag is an out of sync circadian rhythm. Passing through different time zones results in your inner clock being different from the local time. Flying east (from California to New York) "loses" 3 hours. You wake up on the east coast at 7am but your inner clock still thinks you are on west coast time – which is 4am. Your circadian rhythm (your biological clock) will reset to your new time zone but it will take days and you may not feel optimal during this adjustment. We have come to expect this.

Now imagine how much resetting our inner clocks are doing when we:

- See blue light (computer, iPad and mobile phone screens) in the evening and nighttime after 9pm when we should be surrounded by dim light to turn melatonin on and help us get to sleep
- Sleep with all kinds of artificial light both in our rooms and filtering in through our windows when it should be dark
- Wake up to an alarm when we should wake after daylight stimulates our eyes
- Work under artificial lighting during the day, when our inner clocks are waiting for sunlight to turn melatonin off.

### Light and mood

Light coming into the eyes also affects mood. Studies have shown that seasonal affective disorder (SAD) and bipolar depression can improve with bright light therapy. The light box should be around 10,000 lux (a bright sunny day is 100,000 lux) and be relatively close to the face (within 15 inches). Sessions should last 15 to 60 minutes 4 – 7 days per week. Dawn Stimulation lights (gradually brightening light over 60 + minutes at waking time in the morning) have been shown to improve mood, sense of well-being, and cognitive performance.

Bright light is a strong stimulus for adrenal gland production of cortisol as long as exposure time is adequate. Anxiety and depression have been shown to occur when the peak level of cortisol is shifted to later in the day vs first thing in the morning. Proper levels of cortisol also support energy and immune system function. High levels of stress increase cortisol and imbalance levels of other hormones.

### Melatonin as an antioxidant

Melatonin is more than just a sleep hormone. In fact 95% of melatonin is produced in the daytime. It turns out that melatonin's primary function is as an anti-oxidant. Melatonin regulates the major liver detox molecule, glutathione. Melatonin is at least twice as strong an antioxidant as Vitamin E. There is evidence that melatonin protects against cancer.

- Low levels of melatonin have been associated with hormone receptor negative breast cancer

### Kate Thomsen MD, MPH

INTEGRATIVE AND HOLISTIC HEALTH AND WELLNESS

#### Americans spend 93% of their time indoors:

- 87% inside buildings
- 6% of the time inside automobiles

#### How to Get More Light in Your Life:

*Go outside every day for some near infrared light felt as warmth or reflected off the green leaves and grass. Avoid nature deficit disorder.*

- Get bright light in your eyes within 30 minutes of waking or before 9am to shut the melatonin off. This will reset your master clock to be in sync with the natural circadian rhythm. Don't look at the sun but you need bright light in your eyes for 10 minutes or overcast light for as long as 30 minutes. You can't get this from behind a window or through sunglasses. It's easy – walk your dog every morning or have your coffee on your patio. Light boxes or dawn stimulating lights are an alternative.
- Light in the evening should resemble campfire or sunset light. It should be low in your visual field and at the red end of the visible light spectrum to allow melatonin to be produced. This is the opposite type of light stimulus that turns off melatonin in the morning.
- Use Blue Blocker glasses if you need to use screens in the evening/night. Use a Sleep Crown pillow or eye mask to block room light during sleep.
- You can check your lux (high enough or low enough) by getting a lux light meter App for your phone.
- f.lux is software for your computer or phone that adapts your computer display colors to ones that are appropriate for the time of day.
- Experience light as healing tools: Red light therapy (usually both red and near infrared) is bulbs or lasers used to relieve pain or heal wounds. Recently near infrared light helmets are being used to heal brain disorders (and grow hair).



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*Additional articles on holistic health topics can be found on the website*

- Totally blind people have a reduced risk of cancer, and
- WHO has classified circadian rhythm shift work as a probable carcinogen

It appears that melatonin's antioxidant action takes place in the mitochondria – the batteries in our cells. Mitochondria produce energy in the form of ATP to fuel the cell's actions. Producing cell energy also makes a by-product called free radicals which are harmful to the cell if not neutralized by antioxidants. Turns out that melatonin is the major antioxidant in the mitochondria at night.

Melatonin has been shown to be protective against a whole range of chronic diseases besides cancer: cardiovascular disease, diabetes, COVID-19 and neurodegenerative diseases like Alzheimers and Parkinsons disease. And where darkness is the stimulation for the pineal gland to secrete melatonin that travels through the bloodstream to our cells at night time, light is the stimulation for melatonin to be produced within the cells mitochondria in the daytime. It is the near infrared spectrum of light that does this. This is the light

that you do not see but you feel as warmth from the sun. Near infrared light can penetrate into the body up to 8cm, allowing many tissues and cells to produce melatonin to neutralize free radical stress. Near infrared light can even pass through the skull to stimulate brain cell mitochondria to produce melatonin. Melatonin should no longer be called the sleep hormone as it's abundance is greatest in the daytime and it's major function appears to be as an antioxidant!! And studies showing the benefits of sunlight imply that sacrificing exposure to the vast healing potential of near infrared light, due to fear of the skin damaging effects of ultraviolet light, might be misguided.

*Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, and Board Certified in Integrative Medicine. She is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 23 years. For more information see [www.drkatethomsen.com](http://www.drkatethomsen.com) or call the office at 609-818-9700.*