

NOT SLEEPING WELL? MAYBE IT'S YOUR HOUSE

By Danny Gough

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It's no secret that a good night's sleep helps you feel better. But the importance of sleep goes much further than improving your mood and preventing dark circles under your eyes.

Sleep is essential for a healthy lifestyle. It's beneficial for both the mind and the body. Healthy sleep improves brain function, memory, comprehension and learning. It supports growth and development in children. It spurs creativity and promotes better grades and test scores. Healthy sleep reduces stress, and irritability; helps control your emotions and behavior. It inhibits inflammation and lowers your risk of kidney disease, high blood pressure, heart disease, stroke, diabetes and arthritis and even obesity.

Sadly, some 60,000,000 Americans are deprived of the restorative and healing benefits of a good night's sleep, causing a general decline in their physical and mental health. Sleep disturbances get worse with age. Some 40% to 70% of people over 65 have serious problems dropping off. They frequently wake up during the night and struggle to keep their eyes open during the day.

If sleep problems are a regular occurrence interfering with your quality of life, maybe your house is to blame. This article examines the first of four possible ways your house could disrupt a restful night of sleep.

Light – Sleep is regulated by exposure to light and darkness. When the sun comes up in the morning, our eyes are flooded with light. Light activates neurons in the retina, which converts light particles into electrical impulses. These impulses carry information along the optic nerve into an area of the brain called the suprachiasmatic nuclei or SCN. The SCN is located in the hypothalamus and contains several thousand neurons that act as our internal biological clock.

Every morning, our internal clock resets itself and tells the body its time to wake up and prepare for the day. At the same time, signals from the SCN travel to other regions of the brain, including the "pineal gland" which switches off the production of melatonin. Melatonin is a hormone that makes us drowsy and invites sleep. Normal daytime levels of melatonin are barely detectable. This keeps us alert and attentive.

As the sun goes down and darkness falls, the pineal gland switches on and begins to produce melatonin. When melatonin levels rise in the blood, we start to feel less alert and sleepy. Ideally, melatonin levels stay elevated for about 12 hours. This allows a good restful night of sleep. Then right before the light of a new day, they begin to fall back to low daytime levels. This typically happens around 8-9 am. Amazingly, the body's normal sleep-wake cycle closely mirrors a 24-hour day.

As humans we are really bad at judging how much light we get. Our poor judgment is further impaired because we need more light to synchronize our internal clock than we do to see. A lot of the time we are fooled into thinking we've had enough light to reset our internal clocks. But many times, it's simply not so.

Seniors have a tougher time. That's because at age 58 to 60 our corneas have "yellowed" and our pupils are smaller. These limitations leave our eyes about one-third as good at receiving light as a 20-year-old lens. So what does this have to do with your house?

Most people have no idea that light exposure inside our homes differs greatly from light exposure outdoors. Light can naturally flood the interior of a home or be unnaturally inhibited and restrained. The determining factor is the size, placement and orientation of windows and skylights. But a critical and largely unaddressed factor is window selection.

Energy conservation has demanded builders and re-modelers use higher efficiency windows in our homes. High efficiency windows offer superior insulation performance by using two layers of glass with an airspace between. This added insulation reduces heat loss through the glass about 50%.

Another remarkable development is low emissivity or Low E glass. Low E windows include glass that's treated with a nearly invisible metallic coating, creating a surface that reflects heat, while only allowing certain spectrums of light to pass through. This boosts energy efficiency about another 50%.

But our myopic mission of saving energy has now created products that consistently block too much natural light. Double glass along with a poor choice in low E film can reduce healthful light transmission as much as 70%. Consequently, this leaves you with insufficient natural light to suppress melatonin, increasing the likelihood of sleep disorders.

Is it possible to have reasonable energy bills and a good night's sleep? Sure. The secret lies in selecting windows to provide healthful light by using the right combination of glazing and films. All the information you need is available from most window manufacturers.

A second challenge to better sleep involves artificial light. The incandescent light bulb was introduced in late 1880. Up until that time, most people spent their evenings in relative darkness. Now 130 years later, our world is continuously illuminated. Could basking in all that light be compromising our health and well-being? According to the National Sleep Foundation Americans, on average, sleep about 20% less than a century ago. One third of our population sleeps six hours or less each night.

Having sufficient natural light in the morning to reset our internal clock, allows us to enjoy a fruitful and productive day. Then our brains begin to prepare for sleep sometime after dusk. But the continued exposure to light in our homes could throw off our internal clock and fool our brain into acting as if its morning all over again. This throws our sleep rhythms completely out of whack and opens the door for countless sleep disorders.

Just about any kind of light can suppress the production of melatonin and keep you awake. But blue light suppresses it about twice as long. Here's another problem. In our quest to save energy, we replaced many of the old style incandescent bulbs in our homes with new energy saving compact fluorescent or LED lights. Although these lights use less energy, they also tend to produce more blue light. It's not likely that people will revert back to incandescent bulbs, oil lamps or candles. And we cannot change the physics of CFL and LED lights. So what can you do to encourage better quality sleep?

First of all, get plenty of light during the day. If you are building a new home insist on smarter window selections and better day lighting design. Remember its your house and your health is important. So be firm in your determination for better quality natural light.

If you're stuck with windows that inhibit natural light, remove insect screens in the winter. Then start each day by opening blinds and draperies that allow as much natural light inside as possible. Have your morning coffee sitting by a window. Or better yet, enjoy your cup on an outdoor patio. Perhaps you could take a morning walk. Give your body every opportunity to reset its internal clock with an abundance of natural light.

Secondly, daylight is not intrinsically better for us than electric light and sunlight is not always available. But getting artificial light to do the same job is more expensive, uses more energy and is especially difficult to get right. This is where a well-considered lighting plan is enormously helpful. Spend the time to get it right. Study every room and you will find each one has different needs. Different needs demand different types of lighting. Thankfully, techniques like ambient, indirect, accent, task lighting and wall washing can improve visibility and appearance in your home while supporting better quality sleep.

Some more tips that may help you develop better sleep hygiene are:

- (1) Include some physical activity in your daily routine. But don't exercise too close to bedtime. You may too energized to fall asleep.
- (2) Stick to a regular routine. Go to bed and get up at the same time every day, even on weekends.
- (3) Be smart about napping during the day. Nap early or not at all.
- (4) Create a ritual to manage stress. Spend some time to unwind and de-stress an hour before bedtime.
- (5) Stay clear of computer screens, tablets and TV's. These devices are a source of blue light. Stop checking your email right before bed.
- (6) Avoid caffeine, alcohol and food 4 hours before bedtime.
- (7) Keep your bedroom dark. Use red or green light if you need a nightlight.

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