SECRETS to SLEEP SUCCESS
with Dr. Michael Breus

10 *Things Great Sleepers Do*

Get the inside scoop & learn:

To stay on beat with your sleep rhythm & drive

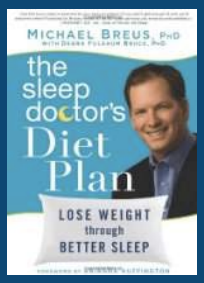
All about your brain- Night Owl or Early Bird?
Neurology behind Our Habits

Curb your caffeine addiction

...and more

Further Reading

Books By Dr, Breus



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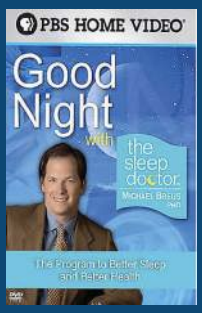

Good Night with the Sleep Doctor

Tune in for Dr. Breus' Secrets to Sleep Success Podcast

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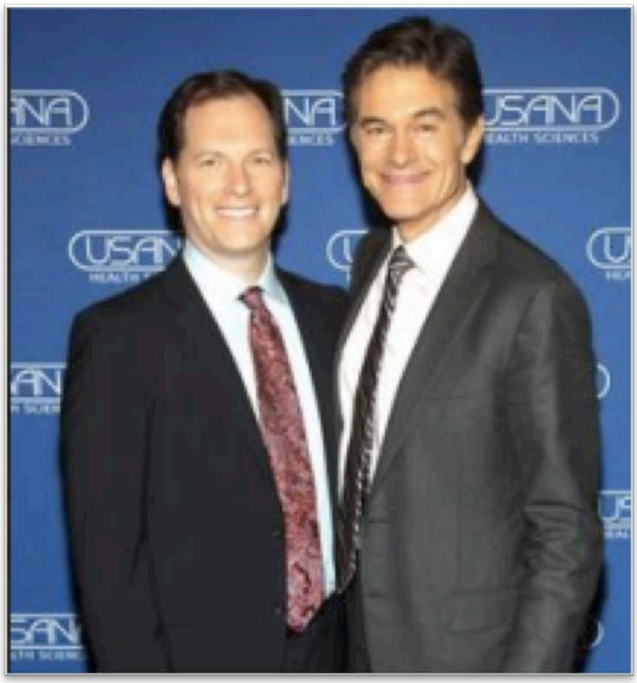
ABOUT DR. BREUS

Michael J. Breus, Ph.D., is a Clinical Psychologist and both a Diplomat of the American Board of Sleep Medicine and a Fellow of The American Academy of Sleep Medicine. He was one of the youngest people to have passed the Board at age 31 and, with a specialty in Clinical Sleep Disorders, is one of only 160 psychologists in the world with his credentials and distinction.

In addition to his private practice, he not only treats athletes and celebrities, Dr. Breus also trains other sleep doctors and consults with major airlines, hotel chains, mattress manufacturers and retailers to provide the optimum sleep experience for their customers.

For over 14 years, Dr. Breus has served as the Sleep Expert for *WebMD* which includes a monthly column called "Sleep Matters". Dr. Breus also writes *The Insomnia Blog* and is a regular contributor to *The Huffington Post, Psychology Today, MedPedia, Organized Wisdom,* and *Furniture Today.*

With more than a dozen appearances on *The Dr. Oz Show,* Dr. Breus has been dubbed his "Sleep Expert" and holds a seat on his Clinical Advisory Board. Additionally, Dr. Breus' audio relaxation CD, created for Crown Plaza Hotels, helps millions of people fall asleep each year.



1. Be Educated about Sleep

To understand why getting enough good-quality sleep is so important to maintaining a healthy weight—not to mention a host of other health considerations—it's useful to know a little bit about sleep itself. Have you ever wondered what really happens when you sleep? After all, you can't watch yourself sleep. Even if you could, you wouldn't be able to see the well-orchestrated physiological processes that occur during sleep without some fairly sophisticated equipment. Let's start with two simple questions about sleep that have somewhat complex answers.

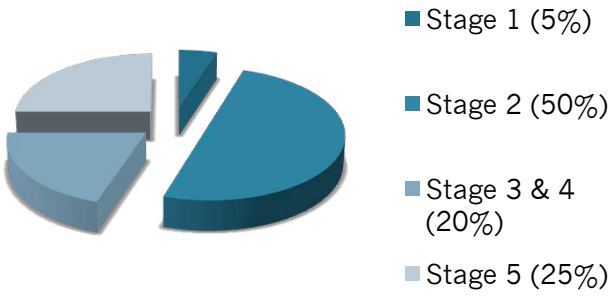
1. What are sleep stages? Cycles?
2. What happens when you sleep?

Even though sleep seems like a passive process, it's not. Sleep is an *active state* that is as complex as wakefulness. Your brain doesn't shut down during sleep; rather, your brain is involved in a wide variety of activities.

The Stages of Sleep

Sleep is made up of specific stages with distinctive characteristics of eye movement and muscle tension that are prompted by natural cycles of brain activity. These sleep stages can be identified through the use of an electroencephalograph (EEG), which measures brain wave patterns during a sleep study (polysomnograph). The two broad categories of sleep include non–rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep.

NREM sleep is composed of four different levels, or stages. Each stage is characterized by different combinations of brain waves, eye movements, and degrees of reduced but not absent muscle tension.



Stage 1 sleep

The beginning of the sleep cycle. This sleep stage is the transition from wakefulness to light sleep. If someone wakes you up from Stage 1 sleep, you may not even believe you were really asleep. Stage 1 sleep usually makes up about 5 percent of total sleep time.

Stage 2 sleep

Slightly deeper than Stage 1 sleep, but it is still a stage from which you can awaken easily. Stage 2 sleep typically accounts for 40 to 50 percent of total sleep time.

Stages 3 and 4 sleep

Also known as deep sleep or delta sleep, these stages account for 20 percent of total sleep time in young adults. Older adults spend about 10 to 15 percent of total sleep time in this sleep stage, depending on their medical conditions and medications.

Delta sleep is the deepest level of NREM sleep and usually occurs during the first third of the night. Growth hormone is secreted by your pituitary gland in the deep-sleep stage. During this stage, your body heals itself and you experience metabolic and tissue regeneration; **this is the physical restoration stage of sleep**. When you get enough delta or deep sleep, you awake refreshed and ready to meet the day.

REM sleep takes place mostly during the last third of your night's sleep and usually makes up 25 percent of your sleep time, though this may decrease with age. During REM sleep, there are small, variable-speed brain waves; rapid eye movements like those that occur during eyes-open wakefulness; and no muscle tension. All voluntary muscles are paralyzed (so you don't act out your drams), but your heart and the muscles that power the lungs and eyes remain active during REM sleep. It's during this stage that you restore your nervous system, process information, and store memories. Although dreams can occur in any sleep stage, you have your most vivid dreams during REM sleep. If you are awakened from REM sleep, you can recall vivid imagery. **This is the mental restoration stage of sleep.** When you get enough REM sleep, you think more quickly and creatively and are able to organize your thoughts better.

Your Sleep Cycle or what happens with sleep stages

After you fall asleep, a normal sleep cycle takes you from light sleep into deep sleep and then back to light sleep and then on to REM sleep. After REM sleep, your body awakens briefly and then returns to Stage 1 sleep to repeat the process. Throughout the night, you cycle through the sleep stages, with REM sleep increasing in length with each cycle and deep sleep decreasing toward morning. **To be fully renewed and feel refreshed in the morning, you need ample amounts of each type of sleep.**

Each sleep cycle—one complete run through all the stages—lasts about 90 minutes. For sleep to be restorative, you need several complete sleep cycles every night; most people require four to five complete cycles. Many of my patients feel powerful and productive after 7.5 hours of sleep, or five 90-minute sleep cycles; others claim to be at their best with more or less sleep. This depends upon the length of their personal sleep cycles.

News You Can Use

It is easiest to wake up in stage 1 or 2 or at the end of a sleep cycle. If it is hard for you to wake up, try getting up 30 minutes earlier.

2. Know how to use your Sleep Rhythm & Drive

Your sleep and its daily relationship with wakefulness are controlled by two systems:

1. *Your biological clock* or *circadian rhythm*, which is the biochemical cycle that repeats roughly every 24 hours and governs sleep–wake times, hunger, body temperature, hormone release, and other subtle rhythms that mesh with the 24-hour day

2. *Your sleep drive* (*the need for sleep*) dictates the amount and intensity of sleep you need based on how long you've been awake. Think of your sleep drive like hunger; it builds throughout the day until it is satisfied.

Morning Lark or Night Owl?

Everyone's circadian clock or "sleep pacemaker" ticks at a slightly different rate. You probably have some idea of whether you are an early bird or night owl. Your sleep–wake schedule is influenced by your personal body clock, and early birds have a different circadian cycle than night owls. We believe that there are two body clocks—one that is set by the outer cues of light and darkness and a neurological clock that follows a schedule set by the brain.

When these two clocks aren't on the same schedule and compete with one another, you feel out of sorts, as you do when you have jet lag, for example, or when you change your work schedule.

Melatonin Sets the Brain's Biological Clock

The hormone most closely linked with the circadian system is melatonin, which is made by the pineal gland in the center of the brain. Along with sunlight, the body's primary timekeeper, melatonin helps to set the brain's biological clock. During the biological night, melatonin is secreted, the body temperature lowers, and sleep propensity increases. Supplemental melatonin is available over the counter, without a prescription. It's been cited in the media as a breakthrough for everything from anti aging and cancer prevention to treatment of sleep disorders.

In some sleep research studies, scientists report that subjects who take melatonin an hour before bedtime fall asleep more quickly and sleep longer than those given a placebo. Yet all an over-the-counter melatonin supplement does is change the timing of the presence of melatonin in the sleep system. If you went into a dark room when your core body temperature was dropping, the pineal gland would likely produce enough melatonin to get you to sleep.

It is incredibly rare to have a melatonin deficiency, and taking too much of a supplement at the wrong time could make you very sleepy when you need to be wide-awake! Richard Wurtman, MD, and colleagues from MIT have discovered that an effective level of melatonin for sleep regulation. Still, I caution you on the use of melatonin. Since it is not regulated by the FDA, producers are not held to specific purity standards during manufacture, nor is the melatonin supplementation of between 0.3 and 1 mg will give you dosage regulated, which can be dangerous.

Remember: Melatonin is a circadian clock regulator, not a sleeping pill. If you use it, only do so if your biological clock needs a temporary adjustment. Also, it is not something I recommend for use by children of any age. Melatonin has documented effects on the regulation of ovarian function—at high dosages, it has been used as a contraceptive—and we have no idea what effects it could have on a young reproductive system.

Sleep Rhythms and Sleep Drive

Your sleep quality or intensity is reflected by:

- The amount of delta or deep sleep (Stages 3 and 4) you get each night
- Your ability to stay continuously asleep
- The overall number of minutes of sleep, whether or not you sleep at the right times in your circadian cycle

When all of these factors come together, you have great sleep quality. zzz

News You Can Use

1. If you are going to use Melatonin, consider a lower dose (0.5-1mg) 90 minutes before bed.
2. Right when you wake up, get 15 min, if sunlight
3. Stick to one schedule to keep you sleep drive ready to help you sleep

3. Know Your Sleep Need Number

That's the nightly sleep recommendation you hear most frequently, the gold standard for a healthy sleep routine. But what if it isn't? An article in the *Wall Street Journal* points to recent research that suggests the eight-hour model may not be the ideal one for most healthy adults.

Although eight hours is the number most often associated with a full night's sleep, sleep experts know that there is some degree of variation when it comes to individual sleep needs. Most often, the recommendation for sleep times comes in a range of 7-9 hours, depending on the individual. The National Sleep Foundation currently recommends this 7-9 hour range as ideal for healthy adults.

But there is a growing body of research that suggests the ideal amount of sleep may in fact be at the very low end of that range. **A number of studies indicate that 7 hours—not 8—may be the most healthful amount of nightly sleep.** There's no broad consensus about this among sleep experts—but there's an increasingly compelling case that's being made by studies that for many people, 8 hours may be more sleep than they need, or than that's healthy for them.

We hear a lot more about the dangers of too little sleep, but sleeping too much can be hazardous to your health as well. Both too little sleep and too much sleep are associated with greater mortality risks. So understanding as much as we can about the overall "best" amount of sleep has real importance.

The National Sleep Foundation is currently at work examining and analyzing sleep data in preparation to release new guidelines for sleep. And the Centers for Disease Control has funded a panel to explore all manner of issues related to sleep, including updated recommendations for healthy sleep amounts. Both are expected to release their recommendations soon.

Those guidelines are important, for medical professionals and the general public. But the right amount of sleep is always going to be a personal and individual determination. The most important information in determining your sleep needs is what your body and mind tell you. Pay attention to how much (and how well) you're sleeping at night, and also pay attention to how you feel during the day. A sufficient night of sleep should leave you feeling alert and energized throughout the bulk of the day, and ready for bed at roughly the same time every night.

In order to read your body's need for sleep, it's important to practice good sleep habits. That includes consistent bed times and wake times, a dark, cool, and comfortable bedrooms, and quiet time away from bright light and electronics in the hour before bed. Give yourself ample time for sleep, and create a sleep-friendly environment and routine, and your body can tell you a great deal about how much sleep you need.

How Much Sleep Do *You* Really Need?

Let's assume that you have determined that you need 8 hours of sleep every night to feel rested. Throughout the course of the day you withdraw about 8 hours from your sleep bank account, generating a sleep debt (similar to an overdraft on your checking account). At night, as you snooze, you replenish your account by making regular deposits of z's. If your deposits keep pace with your withdrawals, all is well.

If, however, you sleep only 6.5 hours on a given night, you will still owe 1.5 hours to your sleep bank account. If you do this for 5 nights in a row, you will have lost almost an entire night's sleep! You will then need extra sleep over the next few days to replenish your sleep debt. But be warned: *Sometimes sleep debts get so large that you can't repay them entirely.* Note also that sleep is not something you can bank in advance; if you know you are going to be out late, you cannot get extra sleep for a few evenings prior to "save up" for a big night on the town. You can replenish some or most of your prior sleep debt, but you can't stockpile extra sleep for the future.

Stick to One Sleep Schedule

Of all the sleep tips you could ever read or hear about, the most important one is to *stick to one sleep schedule—every day*. This means going to bed and waking up at the same time each day. When sleep has a regular rhythm, your biological clock will be in sync and all of your other bodily functions will go smoother, including your sleep.

You are probably squirming as you read this, thinking about your own sleep issues and how you have anything *but* a regular sleep routine. To establish a sleep routine, there are some facts you need to know about yourself. For example, do you know how long you should sleep?

Figure Out *Your* Bedtime

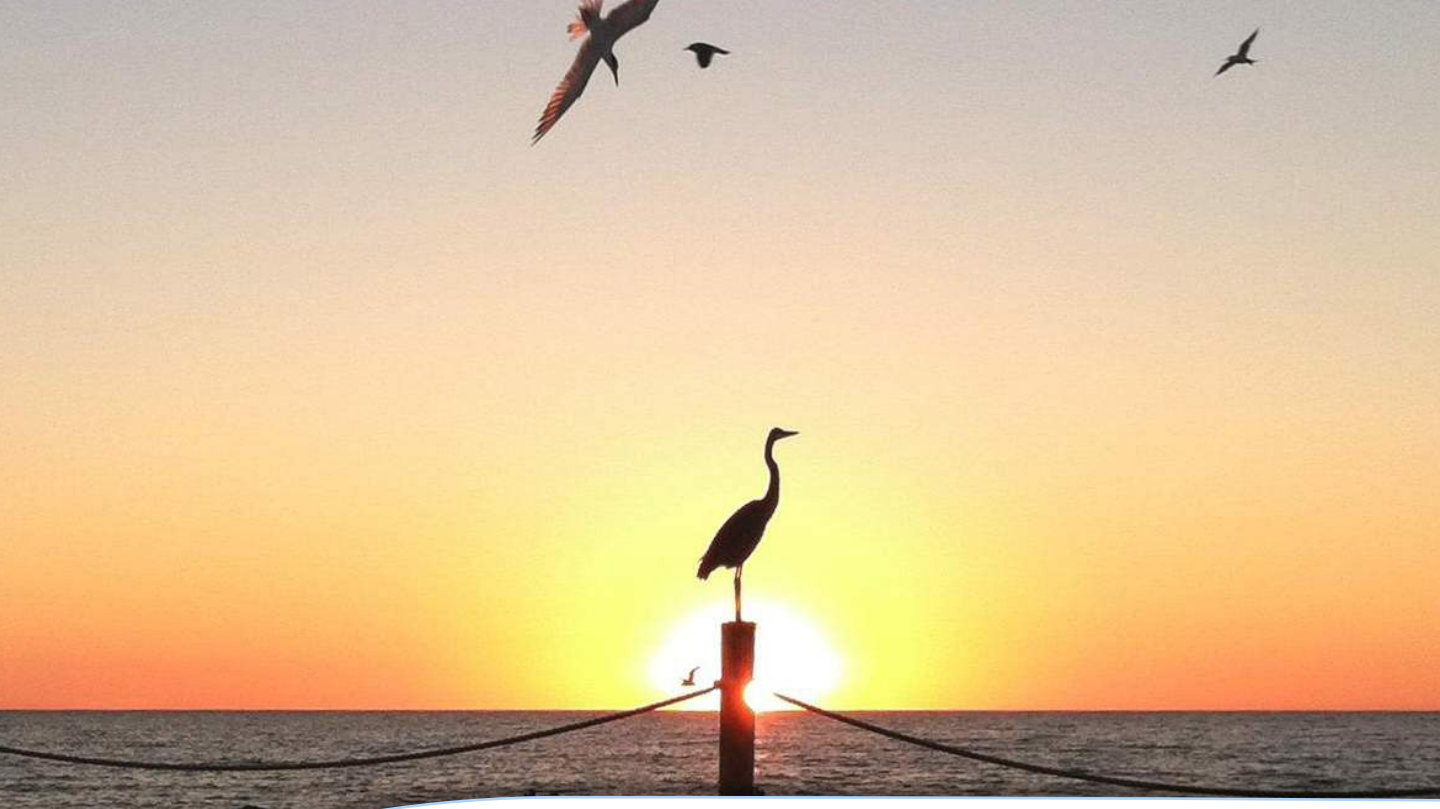
When was the last time someone told you when to go to bed? Age 8 or 10 maybe? It turns out that going to bed at the right time is one of the most important factors in getting good sleep. Pick the right bedtime for you and stick to it. How do you know what this is? I have a formula that I give to my patients.

Try Dr. Breus' Sleep Formula

Sleep cycles are 90 minutes long and the most satisfying sleep includes a set number of full cycles—ideally, five. If you multiply 5 and 90, it equals 450 minutes, or 7.5 hours. Since most of us have a wake-up time that's determined by kids or work, count backward *7.5 hours* from that wake-up time to find your real bedtime, the time when you should be turning off the lights. (For example, if you wake up at 7:30 a.m., it's lights out at midnight.) If you wake up a few minutes before your alarm, you have found your bedtime. If not, then try going to bed 20 minutes earlier each night until you find the right bedtime for you. zzz

News You Can Use

7 is the new 8. Your sleep need is determined by how you feel when you wake up. If refreshed after 7 hours then that is what you need.



4. Know your Chronotype: Night Owl or Early Bird

Night owls and early risers have different brain structures

Are you one of those people who rises before dawn and never needs an alarm clock? Or would you happily sleep until midmorning if you could? Do you feel like you are just hitting your day's stride by late afternoon, or do you like to get the big tasks of the day accomplished early?

Most of us have some degree of preference for late nights or early mornings. Where an individual falls on this spectrum largely determines his or her chronotype—an individual disposition toward the timing of daily periods of activity and rest. Some of us are clearly "early birds"—early risers—while others of us are distinctly night owls. The rest of us fall somewhere in between the two.

We're learning that these night owl and early riser tendencies are driven by some significant degree by biological and genetic forces. Different chronotypes are associated with genetic variations, as well as differences in lifestyle and mood disposition, cognitive function and risks for health problems, including sleep disorders and depression.

New research has now found evidence of physical differences in the brains of different chronotypes. Scientists at Germany's Aachen University conducted brain scans of early risers, night owls, and "intermediate" chronotypes who fell in between the two ends of the spectrum. **They discovered structural differences in the brains of people with different sleep-wake tendencies**. Researchers observed a group of 59 men and women of different chronotypes: 16 were early risers, 20 were intermediate sleepers, and 23 were night owls. They found that compared to early risers and intermediates, night owls showed reduced integrity of white matter in several areas of the brain. White matter is fatty tissue in the brain that facilitates communication among nerve cells. **Diminished integrity of the brain's white matter has been linked to depression and to disruptions of normal cognitive function.**

The cause of this difference in quality of white matter among night owls compared to other sleepers is not clear.

Researchers speculate that the diminished integrity of white matter may be a result of the chronic "social jet lag" that characterizes the effects of the sleep-wake routines of many night owls. People who are disposed toward staying up late and sleeping late often find themselves a constant odds with the schedule of life that surrounds them, particularly work and school schedules that require early-morning starts. This can leave night owls chronically sleep deprived, and experiencing many of the same symptoms —fatigue and daytime sleeplessness, difficulty focusing, physical pain and discomfort—of travel-induced jet lag.

Research indicates that people who stay up late are at higher risk for depression. Studies have also shown **night owls more prone to more significant tobacco and alcohol use, as well as inclined to eating more, and also less healthful diets than early risers or people with intermediate sleep patterns.** But research on the influence of chronotype isn't all bad news for night owls. **Some studies have shown that people who stay up late are more productive than early risers, and have more stamina throughout the length of their days.** Other research has shown that **night owls display greater reasoning and analytical abilities than their earlier-to-bed counterparts. Stay-up-late types, according to research, achieve greater financial and professional success on average than those people with earlier bedtimes and wake times.**

This latest study is the first to offer physical evidence of neurological differences among people with different sleep tendencies. But other research has also shown that the inclinations toward staying up late or rising early are deeply rooted in biological and genetic differences:

Scientists have discovered an "alarm clock" gene that activates the body's biological clock in the morning from its period of overnight rest. Identifying this gene and its function may eventually tell us important new information about the influence of chronotype and circadian function on sleep and health.

Research has also revealed differences in brain metabolic function among night owls compared to early risers and middle-of-the-road sleepers. These metabolic differences were discovered in regions of the brain involved in mood, and may be one reason why night owls are at higher risk for depression related to insomnia.

Recently, scientists identified a gene variant that exerts a strong influence over the circadian clock, and with the inclination to stay up late or rise early. This genetic variation—which affects nearly the entire population—can shift the timing of an individual's 24-hour sleep-wake cycle by as much as 60 minutes.

If our preferences for sleep and wake times are strongly influenced by genetics and biology, what are we to do when faced with inclinations that don't match up with the demands and responsibilities of our lives? Genetic forces appear to play an important role in our preferences, but we're still working to understand just how, and how much. And we're far from powerless: the choices we make about our sleep environments and sleep habits can also make a significant difference. **A recent study showed that limiting nighttime exposure to artificial light and increasing exposure to daytime sunlight can shift sleep-wake cycles earlier—even for night owls**. Strong sleep habits—being careful about alcohol consumption close to bedtime, sticking to regular sleep and wake times, making sure your bedroom is dark and electronic-gadget free—can help reinforce your sleep schedule, even if it doesn't align perfectly with your natural tendencies. ZZZ

News You Can Use

Early Birds:
Schedule important decision making opportunities before 11am

Night Owls:
Schedule important meetings after 3pm

5. Drink your Caffeine at the Right Times, For Sleep

patient **STORY**

My Patient Lynn, had an enormous sleep debt that made it hard for her to perform well at her job. After cutting back on caffeine, her health and sleep improved significantly. The most impressive outcome was that she lost 6 pounds in 1 month without making any dietary changes.

You hear it all the time, when it comes to sleep: Don't drink caffeine too late in the day. It's among the most common sleep tips—and it's a good one. Caffeine, with its stimulant effects, is disruptive to good sleep. And these days, with the popularity of energy drinks and other caffeine-laden beverages and snacks, it's not difficult to wind up consuming caffeine throughout the day, even if you've set your coffee cup aside. The negative health consequences of too much caffeine also extend beyond sleep problems. Research shows that caffeine may contribute to cardiovascular problems. A recent large-scale study also suggests that heavy caffeine consumption—more than four 8-ounce cups of coffee per day on a daily basis—is linked to higher mortality rates in men and women.

Eliminate Caffeine by 2pm

I know what you are thinking: Is he serious? How can stopping my caffeine intake at 2:00 p.m. help me lose weight? It's simple! Caffeine has what's called a "half-life" of about 8-10 hours, which means that its level is reduced but still somewhat effective in your system after this time. Caffeine is a stimulant, and it will prevent you from either falling asleep or having good sleep. **Sleep helps you lose weight!**

"But I love my lattes and diet colas!" I hear you pleading. Of course you do! But many insomniacs and disordered sleepers struggle with all-out addictions to caffeinated drinks. The need for caffeine creates a catch-22: If you don't sleep well at night, you're tired during the day and drink caffeinated drinks to stay awake and alert; this then impairs your ability to sleep at night. That is why this diet does not ask you to eliminate caffeine altogether, just to abstain from it in any form after 2:00 p.m.

It's true that caffeine boosts your energy for a little while as it blocks sleep-inducing chemicals in the brain and increases the production of adrenaline. Interestingly, caffeine also increases dopamine levels in the same way that amphetamines do. Dopamine is a neurotransmitter that activates the pleasure centers in certain parts of your brain.
It is suspected that the dopamine connection is what's behind caffeine addiction.

But when you depend on caffeine day after day for your "supercharge," your sleep (and your weight) will pay a steep price for this addiction. As anyone who's tried to cut out caffeine cold turkey knows, withdrawal symptoms can be difficult to unbearable, bringing headaches, fatigue, irritability, concentration problems, and sometimes even flulike symptoms such as nausea, muscle aches, and vomiting. I'll show you an easier way to withdraw from caffeine in 3 steps.

Remember, limiting caffeine doesn't mean removing it entirely from your daily routine. I drink coffee every morning!!

A moderate amount of caffeine, consumed at the right times, can be useful and even healthful, stimulating alertness and energy. These new findings provide us with some really important specifics about just how significantly late-in-the-day caffeine can undermine a good night's sleep.

Want to enjoy your coffee without wrecking your sleep? Follow these basic suggestions for consuming caffeine in a sleep-friendly way:

Stick to a 2 o'clock cut off. As study shows (see Further Reading below), late afternoon caffeine can cause problems for your sleep, even if you aren't aware of it. To avoid sleep disruption, restrict your caffeine consumption primarily to the morning hours**. If you do have a midday cup of coffee, make sure to drink it before 2 p.m. Taper caffeine as the day progresses.** Start your day with your most highly caffeinated beverage and ease up on the caffeine as the morning goes on. First thing in the morning is likely when you'll crave caffeine the most, and when it can do you the most good in terms of boosting energy and shaking off the effects of a night's sleep. Switch over to tea or decaffeinated coffee as the morning continues, to keep overall daily caffeine amounts moderate and be comfortably caffeine-free by mid-afternoon.

Avoid jumbo drinks.
These days, everything seems to be "super-sized"—and caffeinated drinks are no exception. From a 20-plus ounce latte or soda to a caffeine-packed energy drink, a lot of caffeine products deliver way more of the stimulant than is healthful. Stick to something much closer to the old-fashioned 8 ounce cup, and savor it.

Don't ignore your sleep problems.

Being tired makes us more likely to feel the need for caffeine, and that extra consumption can in turn make sleep problems worse. Avoid this sleep-disruptive cycle by making sleep a daily priority. Practice good sleep hygiene and talk to your doctor about how you are sleeping, particularly about any problems that arise.

Warning: Energy Drinks Steal Your Sleep and Sanity

No longer targeted at only athletes, energy drinks became an enormous market as they found their way into the everyday lives of many Americans. Funny how energy drinks first emerged on the scene as "dietary supplements"; now we recognize that they are merely revved-up versions of soda.

There's a growing movement to require warning labels on energy drinks that contain large amounts of caffeine (yes, more than coffee in some cases) as a result of researchers' findings on these high-octane beverages.7 The industry, of course, doesn't want to reveal much information about its products.

You may be surprised to learn that although the FDA limits the caffeine content of soft drinks to 71 milligrams per 12 fluid ounces, there's no limit on caffeine in energy drinks. And between the lack of information on most labels and the lack of regulation, it can be hard to know what's in an "energy" drink. That said, I believe that the names of popular energy drinks give good hints about what their contents are. zzz

Interestingly, caffeine also increases dopamine levels in the same way that amphetamines do.

News You Can Use:

3 Easy Steps to Curtail Your Caffeine Addiction

Regular caffeine intake is linked to disturbed sleep and the daytime sleepiness that results from it. If you need to cut back on caffeine, here are three easy steps to help you.

Step #1: Consume caffeine as you normally do for a week while keeping a precise log of when you ingest anything that contains caffeine, as well as how much of it. Include items such as chocolate, tea, and caffeinated sodas and headache pills.

Step #2: At the end of the week, start reducing your caffeine intake little by little by eliminating the equivalent of ½ cup coffee (40 milligrams of caffeine) a day. **Start with end-of-the-day caffeinated beverages.** Remember to have reduced- or zero-caffeine substitutes (such as decaf hot chocolate or herbal tea) on hand for those times of day when you're accustomed to drinking caffeinated beverages.

Step #3: When you can tolerate that lesser amount of caffeine, start replacing some of the other caffeinated drinks with lower-caffeine drinks such as tea. Black tea has about 40 to 60 mg of caffeine per cup (about half the caffeine of 1 cup coffee and carbonated caffeinated drinks like Coke and Pepsi). Black tea is also easier on the digestive system and rich in antioxidants, which can help prevent cancer and heart disease. Avoid adding sugar to teas and other caffeine substitutes. This only adds calories and causes upheavals in your blood glucose level, spiking it initially but then making it fall so low that you will be ravenous.

6. Don’t Miss Your Sleep Window

Have you ever been really hungry, only to have the hunger pangs disappear after an hour or so even though you haven’t eaten anything? The same thing happens with sleep. You can be so tired at night that you can barely keep your eyes open, and then all of the sudden you get a second wind. What really happens is that you miss your window of opportunity for sleep, your “sleep window.” Since you’re not in bed or already asleep, your nervous system kicks in and gets you going again. Trying to sleep once you get that second wind is often a lesson in frustration. If you stick to your ideal bedtime, you will find that your sleep window will move to your bedtime! This may take a while to happen. But I promise that finding your proper sleep window does work!

The Catch Up Game

In our hectic day and age, its one of the most common strategies for managing sleep: after a busy, sleep-deprived work week, many people use the weekend to catch up on their rest. Whether its sleeping in on the weekend mornings, or taking an afternoon nap, weekend are frequently a time when people try to bank extra sleep—to make up for not getting enough the week before and to prepare for sleep challenges of the week ahead.

It's a strategy that's only partially successful. New research indicates that although some of the negative effects of a week of insufficient sleep can be remedied with extra sleep on the weekend, others cannot. Researchers at Penn State University College of Medicine studied the effects of weekend recovery sleep after a week of mild sleep deprivation. They found that make-up sleep on the weekends erased only some of the deficits associated with not sleeping enough the previous week.

Calculate Your Sleep Debt

To see if you have a sleep debt, you need to check how long it takes you to fall asleep. **If you fall asleep in less than 5 minutes, you are probably sleep deprived!** This can indicate that your sleep debt is quite large. But this is not the only test, since some of my sleep-deprived patients have trouble falling asleep even though they are exhausted.

To figure out your sleep debt, start on a Friday evening. Now go to sleep at the same time for the next 6 nights. During this week, give yourself the opportunity to get 7 to 8 hours of uninterrupted sleep each night. Then, on the next Saturday morning 1 week later, I want you to sleep in. See how long your body will let you sleep. If you sleep longer than you did during the week, then you can still have a sleep debt. That's a sign that you should get more sleep each night during the week. If you cannot do this sleep debt exercise, try another simple task: See what time you awaken *without an alarm*. If you need an alarm to wake up, there is a good chance that you are sleep deprived and have a sleep debt.

The takeaway?

Relying on weekends to make up sleep lost during the week won't fully restore health and function. In particular, you should not expect your attention and focus to bounce back after a couple of days of extra sleep. It's important to note that this study measures the effects of only a single cycle of work-week sleep deprivation and weekend sleep recovery. The effects of an extended pattern of sleep deprivation and recovery followed by more sleep deprivation are not yet known. The benefits seen here in this study may not be replicated over the long term.

Recovery sleep

Recovery sleep can be a useful short-term or occasional strategy. But the best sleep strategy is one that avoids sleep deprivation as a regular occurrence. It doesn't take long for the adverse effects of insufficient sleep to appear. The health consequences of just a week of mild sleep deprivation can be seen in the current study and in other research, which shows insufficient sleep associated with diminished cognitive performance, reduced alertness, and mood problems. Modest sleep deprivation increases inflammation, interferes with healthy immune function, triggers metabolic changes and drives up the impulse to overeat. Even a single night of partial sleep deprivation can increase insulin resistance, disrupt hormone levels, and elevate blood pressure. None of us may be able to avoid the occasional night or period of insufficient sleep. But a healthy work-week sleep routine can and should leave you with nothing sleep-related to catch up on when the weekend arrives. zzz

News You Can Use

On a short-term basis catching up on sleep can reverse some of the problems associated with insufficient rest. Getting extra sleep on a weekend after a particularly busy, sleep-scarce week is one option. Naps are another. Studies show that napping after a single night of sleep deprivation also can reverse some of the adverse effects of sleep loss.

7. Check your Vitamin D Level & Supplement if needed!

Vitamin D has received a great deal of attention recently. Vitamin D has long been recognized as primarily a regulator of calcium and phosphorus, helping to protect bone density. In recent years, however, our understanding of the functions of Vitamin D in the body has expanded. Vitamin D is now understood to play an important role in metabolic and immune system functions. Vitamin D deficiency has been linked to a number of illnesses and chronic conditions, including high blood pressure, diabetes, metabolic syndrome, pulmonary disease, and chronic pain.

We've seen evidence that Vitamin D deficiency is associated with sleep problems, particularly with daytime sleepiness. A new study examined the link between daytime sleepiness and Vitamin D, and also considered one of the major risk factors of Vitamin D deficiency: skin pigmentation.

Researchers at Louisiana State University investigated the relationship between Vitamin D and daytime sleepiness with two specific goals in mind. First, they wanted to determine whether a correlation exists between Vitamin D levels in the body and excessive daytime sleepiness. Second, they sought to evaluate the role that race might play in the relationship between daytime sleepiness and Vitamin D.

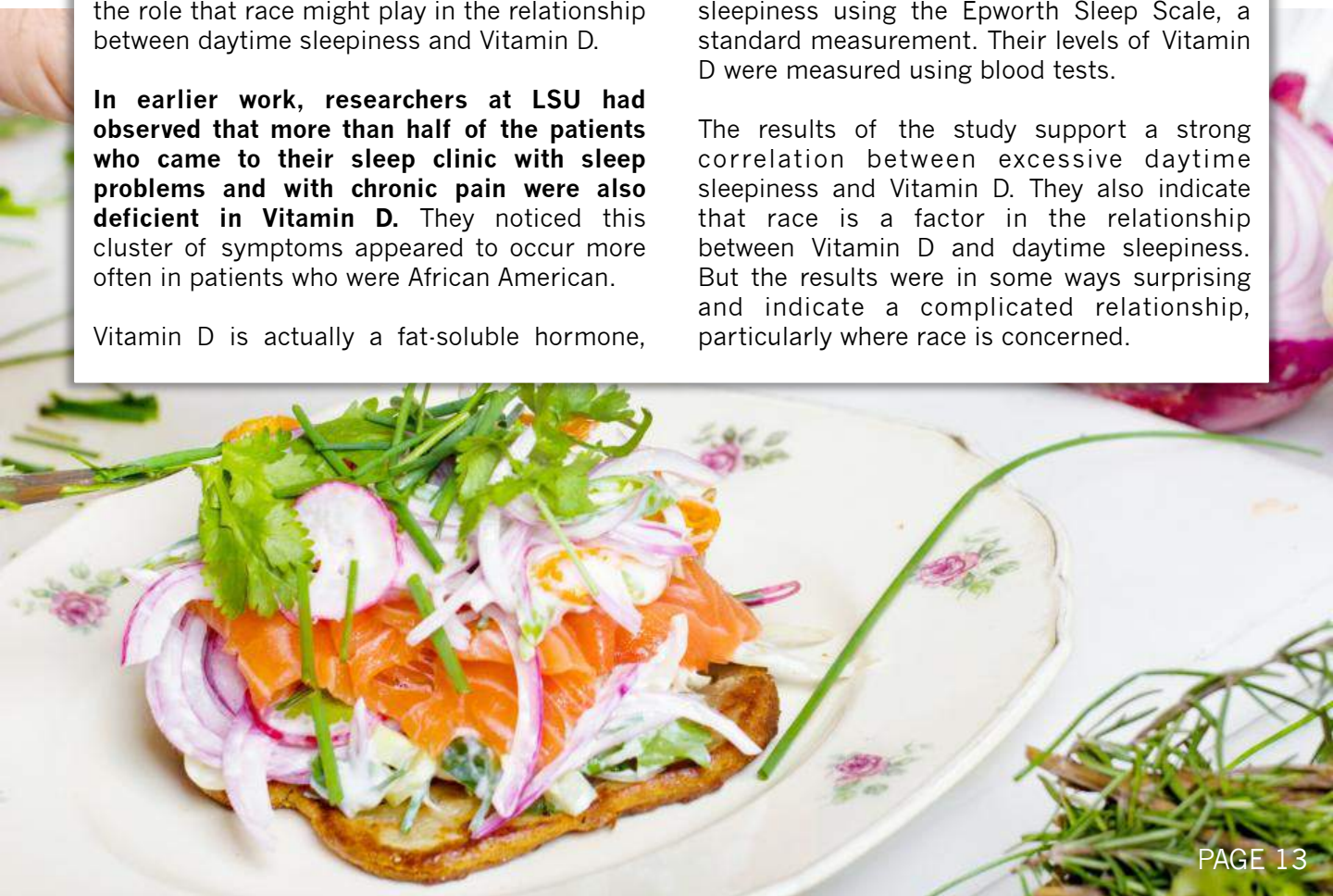
In earlier work, researchers at LSU had observed that more than half of the patients who came to their sleep clinic with sleep problems and with chronic pain were also deficient in Vitamin D. They noticed this cluster of symptoms appeared to occur more often in patients who were African American.

Vitamin D is actually a fat-soluble hormone, which the body can receive in food and also through supplements. But the primary—and most effective—way the body accumulates Vitamin D is during exposure to sunlight. Exposure to sunlight prompts our skin to self-manufacture Vitamin D. Increased skin pigmentation lowers the rate of manufacture of Vitamin D. Therefore, greater levels of skin pigmentation are considered a risk factor for Vitamin D deficiency.

The Centers for Disease Control estimates that nearly one-third of African Americans are deficient in Vitamin D. Other groups at risk of Vitamin D deficiency include the elderly, the obese, pregnant and lactating women, and people who receive limited exposure to the sun.

The LSU study involved 81 patients, all of whom had either sleep problems or musculoskeletal pain either in the day or the evening, or both. Sixty five percent of the patients in the study were white, and 35% were African-American. All of the patients in the study group were diagnosed with a sleep disorder. Nearly three-quarters had obstructive sleep apnea, while others suffered from insomnia, or restless leg syndrome. All patients were evaluated for excessive daytime sleepiness using the Epworth Sleep Scale, a standard measurement. Their levels of Vitamin D were measured using blood tests.

The results of the study support a strong correlation between excessive daytime sleepiness and Vitamin D. They also indicate that race is a factor in the relationship between Vitamin D and daytime sleepiness. But the results were in some ways surprising and indicate a complicated relationship, particularly where race is concerned.



Get 15 minutes of Sunlight for Better Rest

Getting outside in the sun for 15 minutes each morning helps to regulate the production of melatonin, the sleep hormone. Your internal body clock (the circadian rhythm) runs on a 24-hour schedule and functions best when you are exposed to a regular pattern of light and dark. Malfunctions in your circadian rhythms because of changes in light and dark exposure can negatively impact your ability to get a good night's sleep.

Unfortunately, unlike our cave-dwelling ancestors who rose with the sun and retired with the moon, most of us let the demands of everyday life dictate the times for sleeping and rising. Millions of people today force their bodies to adjust to artificial sleep schedules, negatively affecting both their sleep and their health.

The Science Behind Light and Sleep

Research has shown that exposure to morning light and evening light can have profound effects on circadian rhythms. For instance, in the shorter, darker days of winter, especially in the northernmost states, women often become depressed as a result of the decrease in sunlight. In the absence of daily bright light at the right time, hormones can be released at the wrong times of day. This causes the circadian rhythms to go awry, and negative mood symptoms can result. Even a small amount of light exposure in the evening (like when you take your makeup off or turn on the light to use the bathroom at 2:00 a.m.) can cause your brain to think that morning has come. Once the light signals the brain to stop producing melatonin, you will have difficulty falling asleep again. zzz

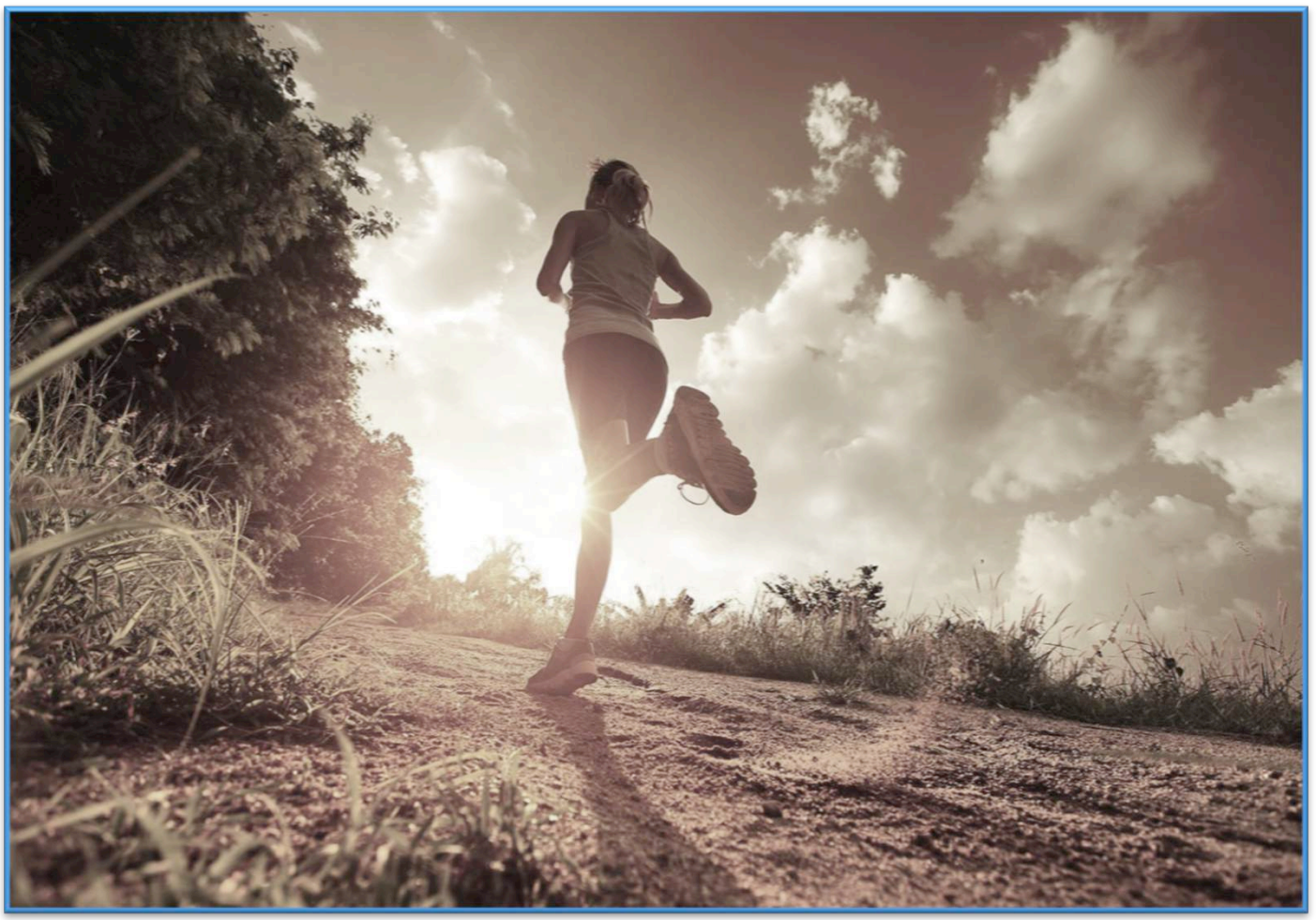
News You Can Use

If you're at risk for Vitamin D deficiency, talk to your doctor. Supplements, dietary changes, and safe and controlled exposure to sun can all help boost levels in the body. Making sure your body has sufficient levels of Vitamin D offers important health protections and, perhaps, a welcome boost of energy in place of daytime sleepiness. Consider speaking with your doctor to see if you are vitamin D deficient.

Food with high levels of Vitamin D

- Salmon
- Tuna
- Sardines
- Cod Liver Oil
- Swordfish
- Liver
- Egg Yolks
- Fortified Milk, Yogurt
- Fortified Cereal
- Fortified Orange Juice

8. Sync Your Exercise with your Sleep



You've heard it before: exercise is good for sleep. Research has documented the benefits of exercise to improving sleep patterns. Exercise lifts mood and reduces stress. It can strengthen circadian rhythms, promoting daytime alertness and helping bring on sleepiness at night. Exercise has been shown to improve sleep for people with sleep disorders, including insomnia and obstructive sleep apnea. A recent National Sleep Foundation poll found that regular exercisers were significantly more likely to report sleeping well on most nights than people who were not physically active. Research has shown exercise can help to improve not only the quantity of sleep but also the quality: studies show daytime physical activity may stimulate longer periods of slow-wave sleep, the deepest and most restorative stages of sleep.

Exercise guidelines for better sleep

We all know exercise is good for us. Good for our health, good for our waistlines, good for stress and for our clarity of mind. Exercise is also very—very—good for sleep. Research has shown that exercise can improve sleep, including for people with sleep disorders and other sleep-related illnesses. And now there's even more evidence of the sleep benefits that can come with regular physical activity.

The National Sleep Foundation devoted its annual *Sleep in America* poll to exploring the relationship between exercise and sleep. Their results found that people who exercise regularly experience better quality and more consistent sleep than those who do not. People who exercise are also significantly less likely to feel sleepy during the day, and to experience symptoms of sleep disorders such as insomnia and obstructive sleep apnea.

And the news gets better: while more vigorous exercise is best, people participating in light exercise—as little as 10 minutes of walking a day—reported substantially better sleep than non-exercisers.

The NSF interviewed a nationally representative sample of 1,000 adults between the ages of 23-60. Participants were asked to report on their physical activity in the past week, providing details on the frequency, duration, and intensity of their exercise. They also were asked to report on the quantity and quality of their sleep, as well as sleep problems including symptoms of disordered sleep and daytime drowsiness.

Participants provided information about their overall health , and personal habits including alcohol and smoking.

Based on the reports of physical activity, respondents were divided into four categories, according to their exercise habits:

Vigorous: These people participated in activities like running, biking, swimming, and other pursuits that require significant physical exertion.

Moderate: Respondents in this category spent time doing activities that included higher-than-normal levels of physical exertion, including yoga and weight training.

Light: People in this category were physical active at normal levels of exertion, getting their exercise primarily by walking.

No activity: The respondents in this category did not engage in exercise.

The results were striking. **All respondents—from vigorous exercisers to non-exercisers—reported getting roughly the same amount of sleep on a nightly basis, an average of 6 hours and 51 minutes on workdays, and 7 hours and 37 minutes on non-workdays.** All groups also reported needing about the same amount of sleep to meet the demands of their daily lives: an average of 7 hours and 17 minutes. **But exercisers at all levels reported sleeping substantially better than those who did not exercise:**

More than half of exercisers (56-67%) reported getting a good night's sleep every night or almost every night, compared to 39% of non-exercisers.

Exercisers at all levels also reported higher quality of sleep than non-exercisers. More than three-quarters (76-83%) said their sleep was "very good" or "fairly good," compared to 56% of non-exercisers.

More than half of exercisers at all levels also reported feeling their quality of sleep improve on days they engaged in physical activity.

While all exercisers reported significantly better sleep, the highest quality sleep was reported by those who engaged in the most vigorous physical activity. **Vigorous exercisers reported the highest sleep quality, and the most robust daytime energy levels**. And they were least likely to have problems with their sleep:
26% of vigorous exercisers said their quality of sleep was "very good," compared to 16% of light exercisers.
66% of vigorous exercisers said they got more sleep than they needed, compared to 53% of moderate and light exercisers.

Vigorous exercisers had fewer sleep problems than moderate and light exercisers, including less difficulty falling asleep and staying asleep, waking too early and not being able to fall back asleep. All exercisers reported fewer of these problems than people who did not exercise at all.

50% of vigorous exercisers said they had no problems maintaining enthusiasm for the demands of their daily lives, compared to 40% of moderate and light exercisers and 33% of non-exercisers.

People who engaged in no exercise didn't just report lower quality sleep, they also reported in greater numbers a range of difficulties with their health and their daily lives:

Non-exercisers were significantly more likely to say they experienced "very bad" sleep than exercisers. Fourteen percent of non-exercisers categorized their sleep as very bad, compared to 3-4% of exercisers.

More than half—61%--of non-exercisers reported "rarely" or "never" getting a good night's sleep on workdays, compared to 29% of vigorous exercisers.

Non-exercisers were more likely to feel sleepy during the day. Nearly twice as many non-exercisers reported daytime sleepiness as exercisers.

Daytime sleepiness interfered with non-exercisers daily activities and their safety more often than for those who exercised. 14% of non-exercisers reported having trouble staying awake while driving, eating, or engaging in social activity 1 or more times in the previous two weeks, compared to 4-6% of exercisers.

Non-exercisers were significantly more likely to have symptoms of sleep disorders including obstructive sleep apnea. Forty-four percent of non-exercisers demonstrated a moderate risk for sleep apnea, based on standard clinical indications for the sleep disorder. This number was more than twice as high as for vigorous exercisers, only 19% of whom indicated a moderate risk of sleep apnea.

There's some more good news in these poll results. **The survey found that exercise at any time of day was good for sleep, including within 4 hours of bedtime.** It's been a common recommendation—including from the National Sleep Foundation itself—to avoid exercise during the final 4 hours of the waking day, in order to prevent physical exertion from interfering with sleep. Based on these results, the NSF has revised its recommendation, and encourages normal sleepers to exercise at any time of day, provided that their exercise does not interfere with their sleep. **People with insomnia and other sleep disorders should continue to schedule their exercise earlier in the day.** And anyone who finds their sleep diminished by late-day exercise should do the same.

So, where do you fit in the sleep-exercise picture that these survey results illustrate? Are you sleeping as much, and as well, as you need? If you're looking for ways to improve your sleep, your daily exercise routine is a great place to start. zzz

News You Can Use

Put some time every day toward exercise, and when bedtime comes around you'll sleep better. For those trying to juggle a regular exercise routine amid busy schedules, exercise even within 4 hours of bedtime is good for sleep.

9. Stick to An Early Happy Hour

For years sleep researchers have known that *alcohol is the number one sleep aid in the world*. If you look back at the results of the 2005 *Sleep in America* poll, you will find that 11 percent of those polled used alcohol as a sleep aid at least a few nights a week. Another study conducted in the Detroit area showed that 13 percent of those polled had used alcohol as a sleep aid in the past year. And alcohol is *not* the answer to getting better sleep. While alcohol can make you sleepy, it also does the following to detract from sound sleep.

- Keeps you from reaching the deep stages of sleep
- Dehydrates you
- Awakens you in the middle of the night (usually to go to the bathroom)

Having a few drinks before bedtime will increase your NREM sleep (Stages 1 and 2) and reduce your REM sleep. You'll remember that REM sleep helps you organize and store your memories. Too little REM sleep can be devastating for the brain and body. In addition, REM sleep is the sleep stage where the most calories are burned. And alcohol is filled with empty calories, so drinking is never a good idea when you're trying to lose weight.

Don't get me wrong. Having a glass of red wine with dinner is fine and may be healthful. Some studies indicate that the antioxidants in red wine may have some health benefits. Why have I chosen to prohibit alcohol intake 3 hours before bed?

Simple. To account for the rate of metabolism. Alcohol is metabolized at a rate of 0.015 of your blood alcohol level per hour. So if you have a blood alcohol level of 0.05, it will take you 3.3 hours to metabolize it all and then eliminate it through urination. Your height and weight determine how many drinks this is for you.

Many people who rely on alcohol for sleep report multiple awakenings and shallow sleep. Some also experience vivid nightmares, night sweats, and inability to relax. So it is simply a bad idea to have alcohol in your system while you're sleeping.

Do you have a drink or two in the evening as a way to relax and help you to fall asleep? If so, you've got plenty of company. Alcohol is among the most common "sleep aids" that people employ to help them drift off at night. We know that alcohol doesn't solve problems for sleep: it creates them. And a new study suggests yet another reason that alcohol can be a roadblock to good sleep: the stimulating effects of alcohol are felt more strongly in the early evening hours. That evening drink you think is sending you toward slumber? It's likely doing just the opposite.

The effects of alcohol in the body are what are known as *biphasic*, meaning "in two phases." **When first consumed, alcohol has a stimulating effect. Later, after alcohol has been in the system for a period time, its effects are sedating.** But as this new research indicates, the effects of alcohol—particularly the stimulating effects—are magnified during certain periods of the body's 24-hour circadian cycle.

Many people are drawn to alcohol for both its stimulating effects and its sedating ones. Often people drink in the evenings to help them unwind and fall asleep at night. It may feel as though a drink or two in the evening can help to relax and pave the way for a good night's sleep. But it's actually not the case. Alcohol consumption, in excess or too close to bedtime, diminishes the quality of sleep, often leads to more waking throughout the night, and lessens time spent in REM sleep and slow wave sleep in the later part of the night, the deepest and most restorative phase of sleep.

This latest study sheds some interesting and important light on how the timing of alcohol consumption may influence how strongly its biphasic effects are experienced. Researchers at Brown University investigated how the effects of moderate alcohol consumption might vary depending on the phases of the body's circadian clock, and the timing of drinking. They found that the timing of drinking appeared to make a difference in the effects of alcohol. In their results, drinking in the evening and before bedtime is associated with significant stimulating effects, compared to other times of day.

Researchers conducted a study using 27 men and women between the ages of 21-26. While in the laboratory, researchers were able to isolate and analyze the effects of alcohol during several distinct periods within each participant's circadian cycle. At four times throughout the day and night, participants were given a drink, either a mixed alcoholic drink or a placebo that mimicked the taste of the alcoholic drink. Researchers took several measurements throughout each day and night, including: Breath alcohol concentration, to measure amount of alcohol in the bloodstream.

Their results:
Confirm the biphasic nature of alcohol as it is processed in the body. **People who drank took longer to fall asleep as their blood alcohol content rose.** They also reported feeling more stimulated, compared to people who drank the placebo. As blood alcohol content fell, those people felt sleepier and fell asleep more quickly than those who drank the non-alcoholic placebo beverage. Indicate that the timing of drinking, relative to the body's circadian clock, matters in how alcohol affects sleepiness and sleep onset. **During the late day and early evening circadian phase (Happy Hour), people who drank alcohol experienced longer sleep latency onset compared to other points in the circadian cycle**. The same was true for the subjective, self-reported measurement of stimulation and sedation: the ratings of stimulation were not only higher among people who drank than those who didn't, but they also were highest during the late-afternoon/early-evening circadian period.

We've seen other research that shows the influence of time of day on the impact of alcohol as a stimulant and a sedative. We've also seen research that indicates circadian timing plays a role in alcohol's effects on sleep. This latest study is the first to pinpoint the varying effects of alcohol in specific circadian phases, and to isolate the significant stimulating effects of alcohol consumed in the late day and early evening. *This, of course, is precisely the time when people are most likely to drink (think: happy hour) and also most likely to use alcohol as a sedative toward sleep.*

These results are an important step forward in understanding the effects of alcohol in the body. They provide another compelling piece of evidence that alcohol's role as an "aid" to sleep is misguided. I'm not suggesting that people shouldn't drink in moderation. But we all need to be aware of the effects alcohol has on our ability to sleep well. zzz

News You Can Use

Wait 1 hour for each beverage before lights out, and drink 1 glass of water for each beverage to avoid dehydration.

10. Limit Exposure to blue light at night

Blue light hazardous to sleep, but helpful to daytime functioning?
We're continuing to learn more about the stimulating effects of blue wavelength light and its capacity to disrupt sleep. Exposure to artificial light at night is recognized as a hazard to sleep, contributing to rising rates of disrupted and disordered sleep. Different wavelengths of light have been shown to affect human physiology and sleep cycles in different ways. Blue light, a short-wavelength light, has been singled out as more significantly disruptive to sleep than other colors on the light spectrum. Research has shown blue light delays release of the sleep hormone melatonin, disrupts circadian rhythms, and may influence negative changes to mood.

In our pursuit of energy efficiency, we're finding ourselves exposed to greater amounts of blue light than ever before. High-efficiency light bulbs, as well as digital devices including smartphones, tablets, and computers, emit high concentrations of blue light. Blue light appears to be uniquely detrimental to our sleep. But can it also be singularly beneficial during to our waking lives?

A new study further examines the stimulating effects of blue wavelength light, focusing on the effects of daytime exposure to the short-wavelength light. Researchers at Boston's Brigham and Women's Hospital and Philadelphia's Thomas Jefferson University investigated the effects on alertness and cognitive performance from prolonged daytime exposure to blue light. They also compared the daytime effects of blue light exposure to the effects of evening exposure to the same degree of light. Their findings confirm that blue light at night stimulates alertness and diminishes feelings of drowsiness, interfering with sleep. **Exposure to blue light during the day, however, results in a similar, more welcome boost to alertness and reduction to fatigue, which stand to benefit both daytime function and nighttime rest.**

The study included 16 healthy young adult men and women. To evaluate the impact of blue light in the day and evening, researchers compared the stimulating effects of blue wavelength light to green wavelength light. Participants were exposed to equal amounts of blue light or green light for a period of 6.5 hours in the middle of a 16.5-hour waking day. Researchers measured fatigue, alertness, and performance using ratings from participants themselves, as well as tests to measure attention, response, and reaction times. Researchers also measured brain activity during periods of light exposure using EEG. Their results indicate that across all measures, extended exposure to blue light during both day and night significantly increased alertness:

People exposed to blue light during the day reported less sleepiness than those exposed to green light during the same daytime period.
People exposed to daytime blue light displayed quicker reaction times, higher levels of alertness, and greater attention spans in performance tests, compared to people exposed to green light.

EEG tests showed alterations to brain activity that indicated heightened alertness among people exposed to blue light during the day.
The nighttime effects of blue light exposure were also significantly more potent than green light exposure, in ways that are disruptive to sleep:

People exposed to blue light at night reported feeling significantly less sleepy than those exposed to green light in the evening hours.
EEG results showed heightened alertness among people exposed to blue light in the evening.

People exposed to blue light at night scored higher on attention and reaction performance tests than people exposed to green light during the same period.

Overall alertness among people exposed to blue light at night was nearly as high as daytime levels of alertness.

These results suggest that blue light spurs alertness and reduces sleepiness in ways that are detrimental to sleep at night but may be beneficial during waking hours, in improving daytime performance and reducing daytime fatigue. What's more, this boost in daytime alertness and decrease in sleepiness may actually help improve sleep at bedtime. Most of the research into the effects of blue light has focused on its capacity to disrupt sleep. This is one of the first studies to explore the possible benefits of blue light to daytime functioning. There is limited earlier research that supports these current results, including a 2008 study conducted in the United Kingdom. Office workers who were exposed to blue light in the morning experienced both a reduction to daytime sleepiness and improvements to the quality of their nighttime sleep, according to the results of that investigation.

These current finding also indicate that blue light hinders sleep in ways beyond the delayed release of melatonin, and alteration to circadian rhythms. Exposure to blue light at night spurs cognitive function and alertness in ways very similar to daytime stimulation, a change that can make sleep significantly more difficult to achieve.

Exposure to artificial light at night—especially to the high concentrations of blue light coming from digital devices—will interfere with the ability to sleep. Too often, these devices find their way into our bedrooms, in many instances even to be used as alarm clocks. The presence of artificial light from devices like smartphones and tablets in the bedroom poses a challenge to the darkness that is so important to normal circadian rhythm function. This nighttime light intrusion also stimulates alertness and brain activity that is counterproductive to the mind and body's natural pull toward sleep.

We're at the relative beginning of our understanding of how different forms of light affect sleep and health—and how light might be manipulated not only to protect sleep but also to enhance waking performance. With new technologies appearing to help provide effective lighting during the day and provide solutions for the effect of light's interference before sleep, these issues only stand to grow in importance. As we continue to explore the effects of exposure to different forms of light, we may find that blue light poses both problems *and* solutions for sleep. ZZZ

News You Can Use

There are now light bulbs available that filter blue light and make it easier to fall asleep

SECRETS to SLEEP SUCCESS
with Dr. Michael Breus

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