Brad Lemley's
Natural Health Solutions

The 12 Golden Keys to Perfect Sleep

Thank you for requesting this sleep guide.

If your sleep isn't optimal, you're far from alone.

The CDC (Centers for Disease Control) now regards insufficient sleep a "public health epidemic."

On its website, it states:

> Sleep is increasingly recognized as important to public health, with sleep insufficiency linked to motor vehicle crashes, industrial disasters, and medical and other occupational errors. Unintentionally falling asleep, nodding off while driving, and having difficulty performing daily tasks because of sleepiness all may contribute to these hazardous outcomes. Persons experiencing sleep insufficiency are also more likely to suffer from chronic diseases such as hypertension, diabetes, depression, and obesity, as well as from cancer, increased mortality, and reduced quality of life and productivity. [1]

Clearly, insufficient sleep causes much bigger problems than making you feeling a bit tired at work. It can put your health at risk, as well as risk the safety of others if you're behind the wheel. And when you consider that, as reported by to *Time* magazine, "spending related to sleep has increased 8.8 percent annually since 2008, reaching about $32 billion in 2012"… [2]

Is it time to wake up?

The fact is Big Business makes more money when you remain in the dark when it comes to getting enough deep, restful sleep. They don't want you to know the answers to your problems. They'd prefer that you pay them for a pill.

We're not Big Business. Your health is our primary concern. That's why I've written this guide for you: to ensure that you have everything you need to get a good night's rest.

The Three Main Problems With Sleep

When it comes to trouble sleeping, you may experience any of these three common complaints:

1) You Can't Fall Asleep

We've all been there. When it's time for you to sleep, your mind is either racing or filled with thoughts. You're thinking about an upset, the things you have to do tomorrow, worries about the future, or a conflict you had earlier in the day.

When you lie down to sleep, it can take a long time to actually fall asleep. For some of you, it can be over an hour.

This seems innocent enough, but it can really add up. Just think, if you've set aside eight hours to sleep, you lose an hour right off the bat. That is how millions of you go through your days — sleep deprived without knowing it.

2) You Can't Stay Asleep

This problem has to do with frequent sleep interruptions. After you fall asleep, you wake up at around 3 a.m. on the dot, no matter what time you went to bed; wake up frequently to use the restroom; or wake

1. "Insufficient Sleep Is a Public Health Epidemic." CDC. 13 Jan 2014.
2. Yarrow, Kit. "The Sleep Industry: Why We're Paying Big Bucks for Something That's Free." Time. 28 Jan. 2013.

up frequently for no apparent reason.

Many of you are also unable to fall back asleep quickly when you do wake up in the middle of the night.

3) You Don't Feel Rested When You Wake Up

A third complaint is not feeling rested when you wake up. This is intricately tied to the two problems above. To solve it, you need to first fix those.

When you are sleep deprived — either because you are not able to fall asleep right away or because you wake up frequently at night — you deprive yourself of the invigorated, fresh, alert feeling so necessary for productivity and overall happiness.

As a result, many people resort to pills — either over-the-counter medications, prescriptions, or natural herb supplements.

All of these may help. But they do not address the root cause of the problem.

At its core, our sleep is dictated by our hormones. That's what I'll be getting into right now…

Sleep & Hormones

When we feel sleepy to the point where we can't keep our eyes open any longer, it is because of certain hormones.

When we stay in a deep, restful sleep all night, it is also mainly due to certain hormones.

The same is true for when we feel alert, awake, and focused.

Hormones are nothing more than chemical messengers our body produces. They tell different parts of our body what to do.

Think of hormones like emails in an organization. If you are running a company, you will send an email out to the marketing department to do certain things. Then you may send an email out to the accounting department to do other tasks. You dictate which department handles what responsibilities. The different departments in the organization are like the organs of our body. They are waiting to take emailed orders from the brain.

When it comes to sleep, there are hormones that prepare your body to become immobile, to breathe more slowly, to slow your pulse, even to dream. And then there are hormones that prepare your body to wake up.

In a healthy and fit person, the sleep hormones are secreted at the same time every day. They help you fall asleep at the appropriate time, and keep you asleep through the night.

Then the "awake hormone" is secreted just in time to slowly wake you up in the morning.

I'll go through the sleep hormones first.

GABA

GABA stands for gamma-aminobutyric acid. We'll just call it GABA.

It is a hormone that starts the process of making you feel sleepy. It inhibits your nervous system from sending "excitability" signals.

You know those "stressful thoughts" you have that prevent you from falling easily and effortlessly to sleep? Those thoughts create "excitability" signals through your nervous system.

When GABA is high, these signals are suppressed.

GABA also makes your muscles feel relaxed. You may not be aware of it, but as you are about to fall asleep, your body becomes more limp. Muscles cannot flex easily or as firmly.

The release of GABA is the first step in feeling sleepy.

If you are having trouble falling asleep, your GABA levels are too low.

Melatonin

This a hormone that also makes you feel sleepy. But it has a different function than GABA. Melatonin KEEPS you asleep. If you wake often in the middle of the night, it is probably because melatonin is low.

Melatonin also helps you feel sleepy. But its primary role is to keep you asleep.

In a fit and healthy person, this hormone is also secreted at roughly the same time every night (or day, depending on when you sleep).

When it is released, it can make you feel groggy and dull.

These are the two "sleep hormones."

Next is the "awake hormone."

Cortisol

Cortisol is often called the "stress hormone." It prepares your body for a stressful situation.

If you remember the last time you nearly got into a car accident, you'll recall that your adrenaline was pumping.

After the incident passed, you still felt "wired." That feeling lasted much longer. Your mind was racing long after the incident passed.

THAT is cortisol.

When we are stressed, adrenaline spikes. But it is metabolized quickly and goes back to normal quickly. Cortisol, on the other hand, lasts longer.

When you wake up in the morning without an alarm clock, it is a spike in cortisol that wakes you up.

However, when you wake up several times at night, it is because your melatonin is low AND your cortisol is spiking when it should not.

When you can't fall asleep because your mind is racing, cortisol has a lot to do with that. Just like in the accident example above, it can make your mind race.

How Hormone Imbalances Affect Our Sleep

When we sleep deeply and without interruption, it is because the sleep hormones are high and the awake hormone is low. Winning the game of sleep is all about getting control of these two sets of hormones.

The relationship between our sleep hormones and awake hormone is complicated. The balance between them can easily be offset, either by internal imbalances or external factors.

When this happens, it can seriously affect our sleep.

Let's take a look at three of the most common causes of interrupted sleep.

1. High Cortisol

I've already explained that cortisol is a stress hormone, which leaves us feeling anxious and wired.

Ideally, cortisol levels peak in the early morning, around 8 a.m. That helps give us energy throughout the day. Cortisol should be at its lowest level in the middle of the night, from midnight to 4 a.m. If this cycle gets thrown off and cortisol levels are too high at night, it can be difficult to calm down and fall asleep.

But high cortisol levels are not the only issue. Cortisol also decreases the levels of GABA and serotonin when it's

chronically elevated.[3] So while it works to keep you alert and awake, it also lowers one of the sleep hormones designed to help you drift off.

Prolonged, heightened levels of cortisol can lead to more long-term problems. One example of this is Cushing syndrome. This is often a result of medication that is high in cortisol, such as mitotane and Cytadren. Symptoms can be drastic and painful, including rapid weight gain, sweating, dilation of capillaries, various skin irritations and infections, and insulin resistance, as well as sleep problems like insomnia.

Cognitive problems like memory and attention deficits and depression are also results of high cortisol levels.

High cortisol levels are a common and often overlooked cause of sleep problems.

Later on, I'll show you how to take control of your cortisol levels.

2. Hypoglycemia

You might not expect it, but nocturnal hypoglycemia is a major cause of waking up at night.

Hypoglycemia is a condition in which a person has chronically low levels of blood sugar, or glucose.

Our blood sugar is controlled primarily by two hormones, insulin and glucagon. Generally, these two work well together. When blood glucose levels are too high, the pancreas produces insulin to help lower it. When blood glucose is too low, the pancreas sends out glucagon to make the liver release more glucose.

When this process gets thrown out of whack, it can result in a number of health problems. The most well-known is diabetes. People who have Type 1 or Type 2 diabetes often suffer from hypoglycemia, particularly when they take too much insulin.

However, few people know that it can also lead to trouble sleeping.

They symptoms of hypoglycemia include hunger, sweating, anxiety, irritability, accelerated heart rate, and heart palpitations. These symptoms can also occur when sleeping. If you cry out in the middle of the night; wake up with sheets damp from perspiration; or feel tired, irritable, and confused upon waking up, this might be the explanation.

GOLDEN KEY 1 — PREVENT A SUGAR CRASH

How can you fix this?

It's all about what you eat before bed. It helps to eat a small snack that's high in fat or protein to help even out your glucose levels.

Make sure that you avoid eating sugary or starchy meals close to bedtime. Food high in sugar, starch, and carbohydrates spikes your insulin, only have to it come crashing down again in the middle of the night.

3. Frequent Urination

A simple complaint of people with sleep problems, but one that is annoying nonetheless, is frequent urination.

It turns out that this could be a sign of more than just a small bladder or drinking too much water.

The official term for it is "nocturia."

According to the American Sleep Apnea Association, over 84 percent of patients with sleep apnea reported nocturia.[4] Some patients report six or more trips to the bathroom during the night.

Researcher Mary Umlauf, Ph.D., explains the connection:

3. Ross, Julia. "Eliminating the Top Causes of Insomnia: Neurotransmitter Deficiency and Cortisol Excess." Mood Cure. Web. 10 Sept. 2015

4. Nasca, T.R. "Nighttime Urination and Sleep Apnea." American Sleep Apnea Association. 2 Sept. 2015.

Oxygen decreases, carbon dioxide increases, the blood become more acidic, the heart rate drops and blood vessels in the lung constrict. The body is alerted that something is very wrong. The sleeper must wake enough to reopen the airway. By this time, the heart is racing and experiences a false signal of fluid overload. The heart excretes a hormone-like protein that tells the body to get rid of sodium and water, resulting in nocturia.

Furthermore, while waking up once in the middle of the night is considered normal, twice or more can be associated with sleep deprivation.

GOLDEN KEY 2 — GET YOURSELF CHECKED FOR SLEEP APNEA

If you're suffering from frequent nocturia, you may want to speak with your doctor about the possibility of having sleep apnea. It's a condition that not only leads to poor sleep but can also cause heart problems over time.

Meanwhile, some things that you can try to help relieve nocturia and sleep apnea on your own are to lose excess weight, exercise, stop smoking, sleep on your side or abdomen, and use a saline nasal spray to try to keep your nasal passages open. [5]

The Circadian Rhythm

Circadian rhythms are all about balance. They are what keep our sleep and our awake hormones in check and ensure that neither one overcomes the other.

A circadian rhythm generally follows a 24-hour cycle, governed primarily by sunlight and darkness. It encompasses not just sleep but also mental, physical, and behavioral changes.

Humans aren't the only ones to have circadian rhythms. Almost all living things have them, from plants and animals down to the tiniest of organisms.

Your circadian rhythm is controlled by something called a "master clock." This master clock coordinates all of the individual biological processes in the body to make sure that they are in synch. Sleep is a huge part of this internal clock.

The "master clock" that is in charge of our circadian rhythm is called the suprachiasmatic nucleus, or SCN. The SCN is a group of nerve cells in the hypothalamus.

The hypothalamus is located just above the optic nerve. This is why our internal clock is so closely linked to light and darkness. The SCN receives information from the amount of light coming into the optic nerve and can thus determine whether it's time for waking or sleeping.

The SCN also is in charge of producing melatonin, the sleep hormone we discussed earlier. When it senses less light coming it, it releases melatonin and helps the body rest. Alternatively, when it gets a lot of light signals through the eyes, it interprets this as daytime, causing it to release the awake hormone and reduce sleep hormones.

The intricate relationship between our circadian rhythms and light is no small matter. It can also be thrown off balance in ways that you wouldn't expect.

Is All Light Created Equal?

The truth is, not all light is the same. Natural sunlight has been around for a heck of a lot longer than humans. We evolved to respond to it by being energetic and active during the day and renewing ourselves with sleep during the night. It's new, artificial light sources that you need to look out for.

According to Steven Lockley, a Harvard sleep researcher, even the dimmest light — such as that emitted by a table lamp or a night light — can have an effect on your sleep.[6] This can, in turn, affect your health. Harvard studies have linked shortened sleep to depression, diabetes, and cardiovascular problems.

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5. "Sleep Apnea: Lifestyle and home remedies." The Mayo Clinic. 25 Aug. 2015.

6. "Blue Light Has a Dark Side." Harvard Health Publications. 1 May 2012.

In particular, the blue light emitted by cellphones, televisions, and tablets can be damaging.

Harvard researchers found that when exposed to blue or green light of similar brightness for 6.5 hours, those who were exposed to blue light had suppressed melatonin for twice as long as those exposed to green light. In addition, blue light shifted the subjects' circadian rhythms twice as much — by three hours versus 1.5.

So what does this mean for us? Most of us spend our time before bed winding down by watching TV or scrolling through our phones. These devices are even in the bedroom, often the last thing we look at before we close our eyes, even after we turn our lights off.

This constant access to technology is negatively impacting our sleep habits.

A 2015 study from the University of Washington directly links access to electricity to reduced sleep.[7] Researchers compared two indigenous communities in northern Argentina that lived traditional lifestyles. The only difference was that one community had round-the-clock access to electricity while the other had none at all. The result? The community with electricity slept about an hour less than the one without it.

It's clear that electricity and other technology has changed the way that we sleep, even in just the last few decades. But what can you do about it?

GOLDEN KEY 3 — REMOVE BLUE LIGHT AT NIGHT

Luckily, there are a number of simple steps that we can take to eliminate harsh light from our lives and improve our sleep.

1. **Remove blue light from your night life** whenever possible. Stop looking at bright screens about two–three hours before you go to sleep. This change can be simple: Instead of vegging out by the TV, read a book by a less harsh light bulb. Replace any night lights in your home with red lights bulbs, which are the least powerful. If you do have to use electronics at night, try getting a pair of blue-blocking glasses, **like these**.

2. **Get f.lux.** I'm not living in a fantasyland. I know most of us have to catch up on work at night, or at least check email. Luckily, there are programs that can change the light on your screen so that it's less harsh. One free program called f.lux is available for Windows, Mac, and Linux and can be used on iPhones and iPads.[8] It works by changing the color temperature of your screen. After sunset, f.lux suppresses blue wavelengths and shifts your screen to warmer light, to match indoor lighting. How-To Geek has great instructions on how to download and use the program, **here**.

3. **Sleep in absolute darkness.** It turns out even exposure to small night lights in your bedroom can suppress the crucial sleep hormone melatonin. But what many don't realize is that even if you've installed blackout curtains in your bedroom and you're sleeping with a giant sleep mask, the photoreceptors in your skin are also sensitive to light. When the light receptors on your skin are exposed to even small amounts of light, they send a signal to your brain that reduces melatonin. This means that your sleep can be deleteriously affected by a light flashing from a Wi-Fi router, phone, computer, digital clock, or other device in your bedroom, even if you can't see that light. So make your room completely dark and unplug as much as possible.

GOLDEN KEY 4 — USE BLUE LIGHT IN THE MORNING

4. **Look at blue light in the morning.** By exposing yourself to bright blue light in the morning rather than at night, you can successfully shift your sleep schedule. By exposing yourself to this light early on, you're able to jump-start your circadian rhythm so that you wake up more quickly in the morning and can fall asleep more easily at night.[9] One study found that "exposure to an artificial morning

7. Ma, Michelle. "Access to electricity is linked to reduced sleep." University of Washington. 19 June 2015.

8. "Reduce Eye Strain and Get Better Sleep by Using f.lux on Your Computer." How-To-Geek. 1 Sept. 2015. Web.

9. Circadian Sleep Disorders Network. 1 Sept. 2015. Web.

dawn simulation light improves subjective well-being, mood, and cognitive performance."[10] Or if you favor a more natural, low-tech solution, get in the habit of going outdoors to expose your eyes and body to sunlight immediately upon waking, even if just for just a few minutes. There are also products by a brand called Verilux, **found here**. They are light therapy bulbs that emit light similar to bright daylight. If you live in an area where there is not a lot of sunlight at the time you wake up, you can use these products to give yourself the equivalent of daylight.

Taking these steps to control and limit your light exposure can help get your sleeping patterns back on the right track.

Other "Resets" for the SCN Nucleus

GOLDEN KEY 5 — USE MEALS TO RESET YOUR FOOD CLOCK

Light is not the only influence on your circadian rhythm and SCN nucleus. Scientists at Beth Israel Deaconess Medical Center discovered that there is also a "food clock," which can often override the "master clock" controlled by light.

This idea is based in the body's need for survival. When food is available and being eaten at normal times, our master clock and our food clock work well together.

But if food is not available, animals (and humans) will stay awake past their normal waking period to find it.

You see, scientists have found that when food is abundant, the SCN behaves normally — using light to tell when it's day or night.

But when food is scarce, the SCN adjusts to use the time of meals to tell when it's daytime. The theory is that we will start to eat when we are awake.

So if you want to reset your body's clock, try fasting for a period of time. Then when you eat your first meal in the "morning," your SCN will act as though it's daytime.

You can learn more about exactly how to use this to reset your SCN in our bonus report *The Jet Lag Cure*.

In general, though, this means it's usually a bad idea to go to bed hungry. In doing so, your body will continue to stay alert, "believing" (even if you have a fully stocked pantry) that it needs to find food in order to survive.

If you're still finding that you have trouble sleeping, you may want to shift your eating habits for a day or two to try to reset yourself.

GOLDEN KEY 6 — USE EXERCISE TO RESET YOUR SLEEP CLOCK

The time of day that you choose to exercise can also shift your circadian rhythm.

In one study published in the *American Journal of Physiology,* men either did no formal exercise or took part in morning, afternoon, evening, or nighttime exercise.[11] The researchers found that early-evening, high-intensity exercise shifted the subjects' circadian rhythms back in time. This was measured by the onset of melatonin

So instead of feeling sleepy around 8 or 9 p.m., which is ideal, the subjects weren't feeling tired until 11 p.m. or midnight. Exercising in the evening gave them a rush of adrenaline and energy that most people don't want before bed.

Working out late in the day can cause you to lie in bed wanting to fall asleep at your normal bedtime but being unable to do so.

In another study, people working the night shift were asked to exercise for 15 minutes every hour of their shift.

10. Gabel, V. et al. "Effects of artificial dawn and morning blue light on daytime cognitive performance, well-being, cortisol and melatonin levels." Chronobiology International. Oct. 2013.

11. Buxton OM et al. "Exercise elicits phase shifts and acute alterations of melatonin that vary with circadian phase." American Journal of Physiology. Mar. 2003.

They found that 63 percent were able to shift their circadian rhythms as well to align more with a daytime sleep schedule.[12] Exercise allowed people to better adapt to the light-dark cycle and readjust to a daytime schedule more easily. This is because working out throughout the night gave them more energy. This energy got them through the day and helped to establish their bedtime closer to the next night, like a normal schedule would be.

People on normal schedules can use this information to sleep better. The key is to work out early in the morning. That gives the body enough time to adjust and ensure that you're feeling tired around 8 or 9 p.m. or your natural bedtime.

There is one exercise in particular that has been found to increase sleep hormones and lower stress hormones.

GOLDEN KEYS 7 & 8 — INCREASE SLEEP HORMONES AND LOWER AWAKE HORMONES

Yoga and Meditation

One pilot study from Boston University showed that participants who completed a 60-minute yoga session had a 27 percent **increase in GABA levels**.[13] Comparatively, a group of people who read for 60 minutes experienced no heightened GABA levels.

The researchers explained that "the practice of yoga should be explored as a treatment for disorders with low GABA levels such as depression and anxiety disorders."

Another study from that team, conducted over 12 weeks, showed that a regular yoga practice resulted in better improvements in mood and anxiety than a similar program of walking exercise.[14] This was also measured in heightened GABA levels.

A study conducted over three months in India found that a routine of daily yoga and meditation **also increased melatonin secretion**, along with cardiorespiratory performance and psychologic profile.[15]

The best part is yoga does more than increase the sleep hormones GABA and melatonin. It has also been **shown to lower cortisol levels**, packing a one-two punch to defeat anxiety.

A study from India's National Institute of Mental Health and Neurosciences reported that patients suffering from various degrees of depression saw their cortisol levels drop as a result of yoga practice.[16] They have hopes that it could bring about an anti-stress effect and relieve depression.

As a result of all of this, yoga can be considered a positive exercise that will help to improve sleep by lowering anxiety and improving our hormonal balance for sleep. It's been proven, too. According to *Psychology Today*, "Researchers at Harvard Medical School investigated how a daily yoga practice might affect sleep for people with insomnia and found broad improvements to measurements of sleep quality and quantity."[17] These results occurred after eight weeks of daily yoga practice.

Other studies have shown yoga to improve sleep quality, reduce fatigue, and improve the quality of life among cancer survivors[18], post-menopausal women, and women with osteoarthritis tied to sleep problems.

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12. Eastman CI. "Phase-shifting human circadian rhythms with exercise during the night shift. Physiology & Behavior. Dec. 1995.
13. Streeter, CC et al. "Yoga Asana sessions increase brain GABA levels: a pilot study." Journal of Alternative and Complementary Medicine. May 2007.
14. Streeter, CC et al. "Effects of Yoga Versus Walking on Mood, Anxiety, and Brain GABA Levels: A Randomized Controlled MRS Study." Journal of Alternative and Complementary Medicine. Nov. 2010.
15. Harinath K. "Effects of Hatha yoga and Omkar meditation on cardiorespiratory performance, psychologic profile, and melatonin secretion." Journal of Alternative and Complementary Medicine. Apr. 2004.
16. Thirtalli, J et al. "Cortisol and antidepressant effects of yoga." Indian Journal of Psychiatry. Jul. 2013.
17. Breus, MJ. "Yoga Can Help With Insomnia." Psychology Today. 4 Oct. 2012.
18. "Yoga Regulates Stress Hormones and Improves Quality of Life for Women with Breast Cancer Undergoing Radiation Therapy." The University of Texas MD Anderson Cancer Center. 3 mar. 2014.

GOLDEN KEY 9 — NEED HELP SLEEPING? ASK YOUR GUT

When I first started researching sleep, a lot of the information I came across fell in line with what I expected.

That's not to say I knew it all. I didn't, and certainly still have much to learn!

What I mean is that to me, some tips just made sense. Sleeping in a dark room, for instance — although I never understood the full biological effect that light has on our bodies before I looked into it. Practicing yoga made sense to me as well, since it's such a relaxing and mindful pastime.

But one thing truly shocked me. I honestly never realized how intricately the food we eat can impact our sleep… on a microscopic level.

You already know that your gut is full of bacteria that help you digest food. But that's not all they do. Scientists are uncovering the ways that these bacteria produce bodywide effects, including playing a role in immune system response and hormone production.

And stunning research is now showing that gut bacteria directly communicate with the brain and central nervous system, effectively influencing our mood, behavior, and even the types of foods we crave.[19]

Anxiety, and depressive symptoms specifically, seem to be greatly influenced by gut bacteria.

Do you see where I'm going here?

In 2011, researchers demonstrated that the gut bacteria in mice can influence whether they display anxious behavior or not. They took two groups of mice, one that showed anxious behavior and one that did not, and performed fecal transplants so that the bacteria from each mouse group were swapped. Then they watched as the previously anxiety-free mice displayed anxious behavior and the previously anxious mice were calm.[20]

Other research has shown that altering the bacterial balance in the guts of mice has produced or inhibited anxious behavior.

So just how do the bacteria in the gut affect the brain?

One way may be through the byproducts of bacterial fermentation. A certain class of bacteria produce a compound called butyrate, which is believed to have antidepressant properties. In one study, researchers compared the bacterial profile of feces from people that were depressed and people that weren't. Sure enough, the depressed folks had fewer butyrate-producing bacteria.

Another way gut bacteria may affect the brain is by directly communicating with the brain via the vagus nerve. The vagus nerve network extends from the brainstem throughout the body to every organ, including the GI tract.

Some bacteria appear to use the vagus nerve to communicate directly to the brain and alter the expression of GABA receptors. That means that it could have a direct impact on one of our primary sleep hormones.

But what about human studies? Is there any evidence that we can alter our brain function by modulating the gut?

I was actually surprised at the number of studies in humans showing positive results on brain health by addressing gut health. There are many more out there, but here are some I found most interesting.

In one study, folks with chronic fatigue syndrome and anxiety were given 24 billion colony-forming units of *Lactobacillus casei* or a placebo for two months. Those that were given the probiotic reported a significant decrease in anxiety symptoms.

Interestingly, the researchers also noted that the subjects given the probiotics had not only increased levels

19. Slyepchenko A. et al, "Gut emotions- mechanisms of action of probiotics as novel therapeutic targets for depression and anxiety disorders." CNS & Neurological Disorders Drug Targets. 2014.

20. Friedrich, M.J. "Unraveling the Influence of Gut Microbes on the Mind." JAMA. 5 May 2015.

of *Lactobacillus* bacteria in their stool but also higher levels of *Bifidobacteria*, indicating a positive change in overall gut health.[21]

As you already know from the previous sections in this report, anxiety and sleep are intricately and inextricably tied together. If someone is suffering from chronic fatigue syndrome and anxiety, as they were in this particular study, you can bet that they also aren't getting the amount of quality sleep that they need.

So what does this mean for you? While taking probiotic capsules is not a bad way to go, they can be expensive. Luckily, research is showing that foods rich in probiotics can have the same mood-boosting effect.

What to Eat

A study published in April 2015 found that both probiotic yogurt and probiotic capsules improved depression and anxiety scores in petrochemical workers.[22]

In another recent observational study, researchers found that women who ate the most fermented foods had lower rates of social anxiety.[23]

Fermented foods and drinks naturally rich in probiotics, such as sauerkraut, kombucha, yogurt, and kefir, are all great options to support the gut-brain axis. If you want to make one change to your diet that can potentially improve your mood, this is it.

GOLDEN KEY 10 — FOODS THAT INCREASE SLEEP HORMONES

There are also a number of foods that naturally contain melatonin.

Researchers in the U.K. found that tart cherry juice, which has a high level of melatonin, can help to improve sleep quality.[24] They found that it successfully raised melatonin levels in the participants, and that there were increases in total sleep time as well as sleep efficiency.

Funny enough, sweet cherries have 50 times less melatonin than tart ones, so make sure you select carefully.

Tomatoes also contain a high amount of melatonin. In fact, it's been speculated that the melatonin content could be one of the reasons the Mediterranean diet is so healthy.

One report explains that "melatonin present in edible plants may improve human health, by virtue of its biological activities and its good bioavailability. Plant melatonin... may be involved in nutritional therapy to reduce the risk of cancer, cardiovascular, and neurodegenerative diseases in Western populations."[25]

The report also notes that it helps to "optimize the physiological functions" of the body, such as sleep.

Most plant foods, like fruits and vegetables, contain some amount of melatonin. However, some are better than others.

In addition to tart cherries and tomatoes, researchers at Thailand's Khon Kaen University found that pineapples, bananas, and oranges are particularly good at boosting melatonin levels.[26]

Adding more of these foods to your diet will help to boost your overall health as well as improve your sleep. A Swiss study reports that the administration of melatonin is enough to induce sleep, stop feelings of wakefulness or waking up in the night, and potentially spark a change in the circadian rhythm so that you sleep at a new de-

21. A Venket Rao et al. "A randomized, double-blind, placebo-controlled pilot study of a probiotic in emotional symptoms of chronic fatigue syndrome." Gut Pathogens. 19 Mar 2009.
22. Mohammadi AA et al. "The effects of probiotics on mental health and hypothalamic-pituitary-adrenal axis." Nutritional Neuroscience. 16 Apr. 2015.
23. Hilimire MR. "Fermented foods, neuroticism, and social anxiety: An interaction model." Elsevier Ireland. 15 Aug 2015.
24. Howartson, G. "Effect of tart cherry juice on melatonin levels and sleep quality." European Journal of Nutrition. 30 Oct. 2011.
25. Iriti M et al. "Melatonin in traditional Mediterranean diets." Journal of Pineal Research. Sept. 2010.
26. Johns NP et al. "Dietary intake of melatonin from tropical fruit altered urinary excretion of 6-sulfatoxymelatonin in healthy volunteers." Journal of Agricultural and Food Chemistry. 30 Jan 2013.

sired time — something those working night shift or suffering from jet lag would greatly benefit from.[27]

Getting melatonin through your diet is a simple way to achieve these results.

The Ancient Sleep Secret

In modern America, we have a tendency to turn to medications as the solution to everything.

Unfortunately, our bodies have no evolutionary history with these synthetic chemical creations. As a result, the side effects often outweigh the medical benefit.

Take sleeping pills, for instance. According to the CDC, 50–70 million Americans suffer from sleep disorders, and about 4 percent of adults turn to prescription medication to help them fall asleep. While this may sound innocent, it can come with ugly results. An article published in 2014 in *The Atlantic* explains that the number of ER visits from overdosing on sleeping pills nearly doubled from 2005–2010.[28]

The reasons for the overdoses vary, but the truth of the matter is that most people take more pills because they're simply not effective. On average, sleeping pills add only about 11 minutes of sleep time!

It's senseless to risk overdosing for a medication that is most likely not going to help you sleep.

We are trying to reinvent the wheel here. The truth is that people have been using natural remedies and medications to improve their health and wellness for a long time.

Sleep is no exception.

For thousands of years, people have been turning to adaptogenic herbs for many medicinal uses.

GOLDEN KEY 11 — NATURAL HERBS THAT LOWER CORTISOL AT NIGHT

Adaptogenic herbs help to increase the body's defenses and improve its function. Basically, when the body encounters a stressor (whether it's emotional or environmental), adaptogens help moderate our body's reaction and bring us back to normal.

They also have a huge impact on our adrenal system, which is the system that manages your body's response to stress. It helps us adapt to whatever situation we may be in.

Adaptogens are great at helping us to cope with anxiety in a healthy way and also fight fatigue. They keep us balanced.

Adaptogenic herbs also lower cortisol levels. By lowering anxiety, calming our adrenal system, and generally helping to balance us, adaptogens are an excellent addition to your diet. Not only for the sleep benefits, but for a multitude of health reasons. They can lower blood pressure, increase energy and endurance, boost the immune system, and act as an overall antioxidant for the body.

Some of the most popular and effective adaptogens include ginseng, holy basil, ashwagandha (Indian ginseng), astragalus root, licorice root, and Rhodiola rosea.

Rhodiola in particular has been shown to have benefits for those with sleeping problems. Studies have shown that it suppresses the production of cortisol, making the body better able to resist stress.[29] It also helps to restore normal patterns of sleeping and eating after one experiences stress. Rhodiola, along with the other adaptogens, can also fight off mental and physical fatigue. Rhodiola is already used pretty widely in Russia and Scandinavia to improve poor sleep and has been shown in studies to relieve sleep disturbances.[30]

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28. Romm, C. "Americans Are Getting Worse at Taking Sleeping Pills." The Atlantic. 12 Aug. 2014.
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30. Whiticomb, J. "Reducing the Risks of High Cortisol." Life Extension Magazine.

GOLDEN KEY 12 — COOL DOWN

I don't know about you, but I grew up in a bedroom with no air conditioning.

I distinctly remember lying on my bed as a child, wide awake in the summer heat, with a big box fan blowing warm air over my body. It was almost impossible to fall asleep during those nights. I'd wake up feeling cranky.

It turns out that it wasn't just me. The temperature of your room affects your cortisol levels and has a direct impact on how you sleep.

In the circadian cycle, there is something called a "thermoregulatory cascade." Basically, as the body settles into sleep, there is a decrease in heat production and an increase in heat loss — the body gets cooler.[31] This correlates with the rise of melatonin each evening.

Recent evidence also suggests that yawning, the ultimate sleep signifier, is a part of this thermoregulatory cycle. One study set out to find whether yawning is a social function or related to controlling brain temperature. Participants shown pictures of other people yawning were far more likely to yawn themselves in the winter than they were in the spring.[32] Overall, yawning occurred more frequently at lower temperatures and was not found to be greatly impacted by other variables.

Studies in rats have also shown that "yawning is preceded by rapid increases in brain temperature and followed by corresponding decreases in brain temperature," which suggests that the act of yawning occurs to help cool off the brain.[33]

Across the board, cooler temperatures seem to be better suited for sleeping.

Researchers at the University of Pittsburgh School of Medicine even created a "cooling cap" — a temperature-controlled cap with cool water flowing through it.[34] They had insomnia patients sleep for two nights without a cap, two nights with the cap set at neutral (86 degrees F), two nights with the cap at a moderate temperature (72 degrees F), and two nights at the coolest temperature (57 degrees F).

While wearing the cap, three-quarters of the participants reported being able to sleep better when the cap was set to the coolest setting—57 degrees F.

To back up these findings, the researchers were able to determine that it took insomnia patients 13 minutes to fall asleep and that they spent 89 percent of their night sleeping when they were wearing the cooling cap. They also had an increased amount of slow-wave, deep, restorative sleep.

I'm not suggesting that you craft yourself a cooling cap, although I suppose that wouldn't hurt. Instead, try keeping your room at that ideal 57 degrees F.

As an added bonus, sleeping in a cool room has been shown to burn more fat. So it could help you lose weight as well as sleep through the night!

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31. Cajochen, C. et al. "Role of Melatonin in the Regulation of Human Circadian Rhythms and Sleep." Journal of Neuroendocrinology. 2003.
32. Gallup and Eldakar. "Contagious Yawning and Seasonal Climate Variation." Frontiers in Evolutionary Neuroscience. 22 Sept. 2011.
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34. Goodwin, J. "Sleeptime Head-Cooling Cap Eases Insomnia, Study Finds." Health Day. 14 June 2011.