

Mastering the Mystery of Sleep

HOW BETTER SLEEP CAN MAKE YOU SMARTER, SLIMMER,
YOUNGER...AND MAY EVEN SAVE YOUR LIFE



DR. MERCOLA

Sleep is one of the great mysteries of life. Like gravity or the quantum field, sleep is so fundamental that scientists still don't know exactly what it is. We are learning more about sleep every day, but we still don't understand exactly why we sleep at all.¹

This report will not solve the mystery of sleep, but will seek to show you how you can get into harmony with the natural cycles of your own brain and body.

There is no better example of optimal wellness than to be in harmony with your deepest function...sleep.

The first step is to value sleep as one of your most precious resources for health and happiness. If you do that, you could figure out all the other things that would help you to sleep really well. So the bulk of this report will be all about that first step...but you will also get some of my favorite tips.

SLEEP IS AN ACTIVE PROCESS

We used to think the brain simply shut down for a rest once a day. But the brain doesn't shut down at all during sleep...not like it does under general anesthesia or in a coma.² Sleep is an active process, which might better be described as a deeper form of consciousness than as a lack of it.

There are respected spiritual traditions that describe deep sleep as a vast field of consciousness without content.³

And advanced meditators have done their thing wired to an EEG machine. Guess what? They go right into slow high amplitude brain waves all over the cortex.⁴ They are sitting there on a cushion with the EEG of dreaming or even of deep sleep⁵...and then proceed to describe their experience.



SLEEP AWAY STRESS

Good sleepers and poor sleepers experience about the same number of daily minor stressful events. But good sleepers are less disturbed by these events.⁶ Poor sleepers experience both their minor and major life events as being more negative than do good sleepers.

POOR SLEEPING MAKES YOUR LIFE MISERABLE

Scientists call this mindset “negative affective reactivity”.

They can actually predict whether or not a person will rate an upcoming event as being emotionally negative...just by looking at the person’s brain waves ahead of time.⁷ High frequency brain waves on EEG, particularly in the right prefrontal cortex, are a sign of negative emotional arousal.

The problem with high neurological arousal is that it can turn into a bad habit. An overly aroused right prefrontal cortex calls for the release of cortisol and other stress steroids that initially help the body in stress.

But continuous high levels of these powerful hormones ultimately cause some of our most serious health concerns...including heart attack and stroke.



DOES STRESS CAUSE POOR SLEEP, OR DOES POOR SLEEP CAUSE STRESS? ANSWER: YES

We’ve known for quite some time, that activation of the hypothalamic-pituitary-adrenal axis increases arousal and causes sleeplessness.

Stress causes poor sleep. And research shows that insomniacs do have elevated cortisol in the middle of the night, when cortisol should be at its lowest.⁸ Conversely, poor sleep causes stress.

But more recently, researchers have discovered that **GOOD QUALITY SLEEP THE NIGHT BEFORE A STRESSFUL EVENT CAN PROTECT YOU FROM NEGATIVE HEALTH CONSEQUENCES.** Even though you will still encounter stressful events in your life, good quality sleep gives you better brain chemistry to deal with those events.

Would that be of value to you?

WOULD ENHANCING YOUR IMMUNE SYSTEM BE OF VALUE?

What is true for brain chemistry is also true for the immune system. Ordinarily, a stressful event will trigger the release of natural killer cells, but in one study, **WOMEN WHOSE**

SLEEP WAS INTERRUPTED FOR JUST ONE NIGHT PRIOR TO A STRESSFUL EVENT HAD SIGNIFICANTLY WEAKER IMMUNE RESPONSES.⁹ The poor sleepers failed to recover from the stress as well as those who slept well.

And researchers have found that less time spent dreaming (REM sleep) was associated with higher evening cortisol levels for healthy men of all ages.¹⁰

SLEEPING WELL CAN PROTECT YOU FROM STRESS INDUCED DEPRESSION . . . AND A VARIETY OF OTHER MOOD DISORDERS

Serotonin is an important brain neurotransmitter. Altered serotonin activity has been associated with a host of problems such as aggressive and angry behaviors, clinical depression, obsessive-compulsive disorder, migraine, irritable bowel syndrome, tinnitus, fibromyalgia, bipolar disorder, and anxiety disorders.¹¹

In a study reported in *Journal of Sleep Research*, stress plus restricted sleep caused serotonin receptors in the brain to become less sensitive, while **STRESS FOLLOWING SLEEP HAD NO SUCH NEGATIVE EFFECT.**¹² It is not known how sleep provided this beneficial influence on brain chemistry.

SLEEP IMPROVES PERFORMANCE AND MEMORY

Whenever you are trying to learn something new, such as important information or a new skill—and especially if you are going to be tested on it—please get good quality sleep after the training period and **BEFORE** the test.

In a very interesting study, there were two groups of individuals who trained for a new keyboard skill and were tested on it 12 hours later. One group trained at 10 AM and was tested at 10 PM. The other group trained at 10 PM and was tested the next morning at 10 AM...after sleep.

Guess what? Sleep increased motor speed by 20% without loss of accuracy.¹³ Remember... group one was not impaired in any way. You might have thought they would do better having trained when they were fresh in the morning.

But sleep proved to be the valuable variable.



WOULD A 20% INCREASE IN PERFORMANCE BE USEFUL TO YOU?

SLEEP IS ABSOLUTELY ESSENTIAL FOR LONG-TERM MEMORY FORMATION . . . AND MORE.

You may have heard that everything you have ever seen, heard, tasted, smelled, or touched is recorded in your unconscious mind. Actually, that is false.

The vast majority of sensory input is deleted and lost forever. Only the information your brain recognizes as important to your life ever makes it into your memory. Even then . . . the important stuff is held in temporary memory only **UNTIL YOU SLEEP ON IT.**¹⁴

VALUABLE NEW INFORMATION AND VALUABLE NEW SKILLS ARE ADDED TO YOUR LONG-TERM MEMORY—ONLY DURING SLEEP. BUT SLEEP TAKES IT ONE STEP FURTHER . . .

While you are sleeping, your brain integrates the day's new information along with existing memories and **IN LIGHT OF YOUR VALUES, YOUR GOALS, AND YOUR PURPOSE.**

That is why I have strongly suggested, in my paper on goal setting, that you do a visualization exercise on your goals just before going to bed each night.

HOW TO GET YOUR BRAIN TO SOLVE PROBLEMS WHILE YOU SLEEP!

Do you remember how the phrase, “think outside the box” got started? It came from the nine dots puzzle, where you had to connect three rows of three dots forming a square.

You had to connect all the dots without lifting the pencil off the paper.¹⁵ The solution requires an insight: you have to extend your lines beyond the box formed by the dots.

You have to “think outside the box” to solve the puzzle.

In research involving a similar task, progress could be made in two ways. Slow and laborious—or with sudden insight. Subjects who slept for 8 hours after being presented with the puzzle were **TWICE AS LIKELY TO GAIN THE KEY INSIGHT.**¹⁶ Valuable information, isn't it?

Now you know why visualization before sleep works so well. While you are sleeping, your brain searches for new ways to view the information you gained during the day. And it does so according to the vision you provide during the visualization.

Are you starting to get the idea?

SLEEP IS A PRECIOUS RESOURCE, and you are learning how to get into harmony with it...to neutralize stress, improve your mood, boost your performance and memory, and gain valuable insight into whole new possibilities for your life!

What else could you possibly ask for?

HOW ABOUT SLEEPING AWAY THOSE EXTRA POUNDS?

If you're like most people in modern society, you have to keep an eye on your weight. Americans alone spend \$35 billion (each year) on weight-loss products.¹⁷ And what do we have to show for it? 119 million Americans are overweight or obese. And 64% are losing the body fat battle.¹⁸ Why?

America's trend toward obesity just happens to match its trend toward voluntary sleep restriction. And 70 to 75% of Americans report having one or more persistent symptoms of dis-harmonious sleep.^{19, 20}

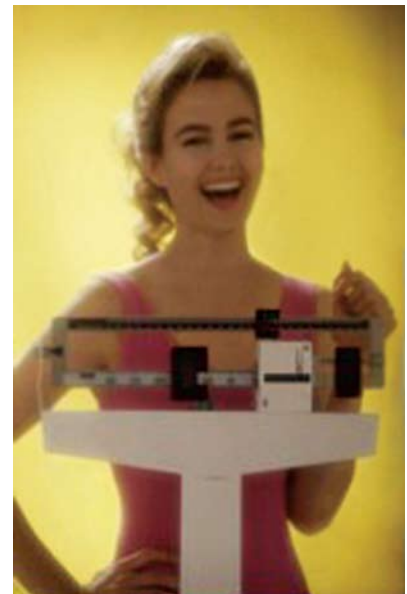
Any connection between obesity and sleep loss?

It turns out sleep-loss is a double whammy for anyone looking to shed pounds because of two hormones that regulate hunger and appetite.

Cells in the lining of your stomach secrete the hormone ghrelin. Ghrelin travels to your brain and gives you the urge to eat. Leptin does just the opposite. Fat cells produce it when you've had enough to eat. Leptin in your bloodstream gives you the feeling of satiety. It's a good thing if you're trying to lose weight.

Just two days of restricted sleep caused an 18% decrease in plasma leptin levels and a 28% increase in ghrelin levels in young healthy men.²¹ The result was increased hunger and an appetite for carbs. Definitely not good if you're trying to lose weight.

So in addition to regular exercise and eating according to your metabolic type, getting enough **GOOD QUALITY SLEEP IS EXTREMELY VALUABLE FOR MAINTAINING YOUR IDEAL WEIGHT.**



GOOD SLEEP HELPS PREVENT DIABETES MELLITUS AND METABOLIC SYNDROME

In one clinical experiment, healthy young men were restricted to just 4 hours of sleep for 6 nights and then allowed to recover for six nights. During the sleep-debt period thyroid function went down, while cortisol levels and sympathetic activity went up.²² But the most important finding in the study was that glucose tolerance tanked during the temporary sleep-debt.

So chronic sleep-loss could be expected to contribute to the onset of diabetes.²³ And indeed, when a group of men were followed from roughly 1988 through 2004, those who got only 5 and 6 hours of sleep per night were twice as likely to develop diabetes.²⁴

Poor sleep was associated with a 44% increase in the odds of having pre-diabetes among 210 volunteers averaging 46 years of age.²⁵

Metabolic syndrome is not only the precursor to diabetes, but also to high blood pressure, cardiovascular disease, and other life-threatening diseases.

SLEEP IS A VALUABLE MEANS TO COMBAT THESE PROBLEMS AS WELL.

SLEEPING WELL COULD SAVE YOUR LIFE

SLEEPING TOO LITTLE OR TOO MUCH INCREASES YOUR CHANCES OF DYING FROM ALL CAUSES BY UP TO 15%.²⁶ People who have normal sleep patterns get less cancer.²⁷ For every hour a woman sleeps more than the recommended 7–8 hours per night, the chances of her getting breast cancer go up by 6%.²⁸



Tumors grew two to three times faster in laboratory animals with severe circadian rhythm dysfunction.²⁹

And working the night shift robbed nurses of a normal dose of melatonin, a powerful anti-oxidant known to protect DNA. The research suggests a correlation between decreased melatonin, elevated estrogen, and the observed higher incidence of breast cancer among night shift nurses.³⁰

Your chances of having a heart attack go up by 45% if you sleep 5 hours a night or less...and by 38% if you sleep more than 9 hours a night.³¹

Getting either too much sleep or too little sleep are both out of harmony with a natural circadian rhythm.

Likewise, shift workers run a much higher risk of heart attack as compared to people whose waking and sleeping hours are more normal.³² Having to change shifts frequently and having to sleep during daylight hours are quite damaging...possibly even deadly.

Here is another interesting study: healthy subjects restricted to 4 hours sleep had 8 hours of high blood pressure the next day. Good quality sleep resulted in normal blood pressure the next day in the control group.³³

Sleep is valuable here again because the hormone melatonin signals the entire body to shift from daytime running-around mode into night-time healing mode.

Melatonin, which is secreted only in total darkness, also stimulates the nighttime release of another equally valuable hormone...growth hormone.³⁴

SLEEP AND GROW YOUNGER?

Another great benefit of sleep is the nightly release of growth hormone. Growth hormone is vital for normal development of children, but it has wonderfully beneficial effects in adults as well:

- Makes your bones stronger
- Increases your muscle mass through the creation of new muscle cells
- Promotes lipolysis, which helps you lose body fat
- Increases protein synthesis and stimulates optimal maintenance of all internal organ
- Supports your pancreas' ability to make insulin
- Stimulates your immune system.



All together, growth hormone makes you look and feel younger. Which is why you hear so much about supplements containing growth hormone precursors, and why professional body builders and athletes sometimes risk injecting synthetic growth hormone in artificially high amounts.

But **YOU ALREADY HAVE A NATURAL WAY TO GET YOUR VERY OWN GROWTH HORMONE** delivered in just the right concentration at just the right time, every night...**IF YOU SLEEP WELL.**

Growth hormone is released from your pituitary gland just as you enter the deep sleep part of your normal sleep cycle.³⁵

A normal sleep cycle goes from light sleep into deep sleep and then back out to the lighter dreaming REM sleep. Most people have about four of these cycles during an optimal 7–8 hour night's sleep.

But if you stay up to watch Letterman and still have to get up at 6 AM...you just performed your own voluntary sleep deprivation experiment on yourself. And you just cut your normal dose of growth hormone in half.

And you wonder why you feel old on some mornings? It could be because you're hung over with yesterday's half-repaired cellular damage.

Sleep is for re-growing all the tissues of your body so you can feel and be ready to go in the morning. But you need to value sleep enough to go to bed.

NOW YOU KNOW WHY I BELIEVE SLEEP BELONGS AT THE VERY TOP OF YOUR LIST—EVERY DAY

If you want to maximize your health and effectiveness, live long and be fulfilled in your purpose...try as many of these **33 STRATEGIES** as possible:

- Review all the benefits you get from sleep—and put it at the top of your list. Value sleep highly as the magical resource it is for you. Whether you consider sleep to be a purely physiological function or a more spiritual encounter with your deeper consciousness...**VALUE IT HIGHLY.**
- Go to bed around the same time each night, ideally around 10 PM. But take time before that to prepare. Some researchers even feel that every hour of sleep before midnight is equal to two hours of sleep after midnight.
- Create your own pre-sleep ritual that goes beyond your normal teeth brushing and other practical activities. Make this a special time to set the tone for your journey into deep consciousness. Light candles, read inspirational or spiritual literature, and let your mind consider the big picture.
- This is a good time for spiritual practices, or emotion healing work, like Emotional Freedom Technique (EFT) and the Meridian Tapping Technique (MTT). It is very effective at clearing the way for sound sleep.

- Take some time to visualize how you would like tomorrow to be for you. See, hear, and feel what it will be like when you reach your goals. Connect with your overall mission and purpose. Remember, this will tell your brain which of the data stored in temporary memory should be flagged for transfer into long-term memory. New insights may be waiting for you in the morning.
- Create a morning ritual designed to capture these insights, perhaps a special journal on your bedside table. Taking time to record any impressions upon awakening sends a powerful message to your deep consciousness. It says you do in fact value the entire sleep process. It also says you expect results.
- Design your bedroom primarily to support good sleep. Keep it clean and uncluttered...no overflow storage in there, please. Get high quality linens and pillows. Sleep is far more important than half the things you spend money on now. Have complete control of the lighting in your bedroom. Be able to make the room totally dark.
- Avoid turning on the light if you have to go to the bathroom. Any bright light will shut off melatonin production.
- Listen to white noise or relaxation CDs. Some people find the sound of white noise or nature sounds, such as the ocean or forest, to be soothing for sleep.
- If possible try to awaken naturally without the use of an alarm. Your brain will know when it has had enough sleep. Ideally you should wake up with the sunrise. If you must get up before dawn, use a dawn simulator alarm clock which either comes with a light or causes one of your lights to gradually increase in intensity to mimic the rising sun. Many people find these very effective and certainly less disturbing than a loud alarm that can disrupt your adrenal glands and cortisol levels.
- If you must sleep during the day, make the extra effort to completely block all daylight from your bedroom.
- Dim the lights in your house around 8 PM. Light stimulates the release of cortisol and shuts down the release of melatonin.
- Stop watching TV or using your computer by 8 PM.
- Avoid snacking just before bedtime, particularly grains and sugars. These can raise your blood sugar and inhibit sleep. Then later, when your blood sugar drops, you might wake up and not be able to fall back asleep.
- Keep the temperature in your bedroom no higher than 70 degrees F.

- Wear socks to bed. Due to the fact that they have the poorest circulation, the feet often feel cold before the rest of the body.
- Eat a high-protein snack several hours before bed. This can provide L-tryptophan, a precursor to melatonin and serotonin.
- Talk to your doctor about reducing or avoiding as many drugs as possible. Many medications, both prescription and over-the-counter, may have effects on sleep.
- Avoid caffeine as much as possible.
- Keep electrical devices as far away from the bed as possible so their electromagnetic fields do not interfere with your nervous system.
- Avoid alcohol. Too much alcohol interferes with deep sleep and will prevent you from getting its healing benefits.
- Avoid foods that you are sensitive to.
- Don't drink any fluids within 2 hours of going to bed so you won't have to get up to go the bathroom.
- Take a hot bath, shower or sauna before bed if you have trouble falling asleep.
- Journaling may be helpful if you often lay in bed with your mind racing. Writing you thoughts down may allow you to let go of your concerns before bed.
- Lose weight. Being overweight can increase the risk of sleep apnea, which will prevent a restful night's sleep.
- Remove your clock from view. It will only add to your worry when constantly staring at it...2 AM...3 AM...4:30 AM...
- Keep your bed for sleeping. If you are used to watching TV or doing work in bed, you may find it harder to relax and to think of the bed as a place to sleep.
- Have your adrenals checked by a good natural medicine clinician. Scientists have found that adrenal stress can interfere with sleep.
- If you are menopausal or peri-menopausal, get checked out by a good natural medicine physician. Hormonal changes at this time may cause problems if not properly addressed.
- Don't change your bedtime. You should go to bed, and wake up, at the same times each day, even on the weekends. This will help your body to get into a sleep rhythm and make it easier to fall asleep and get up in the morning.

- Make sure you are exercising regularly. Try to make it part of your morning ritual. Exercising in the evening—within a few hours of sleep—may actually serve to stimulate your nervous system and make it more difficult to easily fall asleep.
- Get help if you need it. If after trying everything we have discussed, you still cannot get good quality sleep, by all means do discuss your problem with your physician.

After experimenting with these strategies, feel free to cross out those that do not make sense to you. Use the rest as seeds to develop your own style of sleeping.

I hope you will continue learning about sleep and how you can improve this important part of your life.

Pleasant dreams...

REFERENCES

1. Goode, Erica “Why Do We Sleep? ,” New York Times, November 11, 2003
2. “Brain Basics: Understanding Sleep: National Institute of Neurological Disorders and Stroke (NINDS),” http://www.ninds.nih.gov/disorders/sleep_apnea/detail_sleep_apnea.htm (accessed March 26, 2007).
3. Levels and Dimensions of Consciousness in Yoga. Retrieved March 23, 2007, from <http://www.swamij.com/levelsdimensions.htm>.
4. “Genuine Mysticism,” <http://www.integralscience.org/EEGmeditation.html> (accessed March 31, 2007).
5. Wilber, K. One Taste, The Journals of Ken Wilber, pp 75–77. Shambala Boston & London, 1999.
6. Morin, C.M., Rodrigue, S., & Ivers, H. Role of stress, arousal, and coping skills in primary insomnia. *Psychosomatic medicine*, 65(2), 259–67.
7. Sutton, Steven K and Richard J. Davidson “Prefrontal brain electrical asymmetry predicts the evaluation of affective stimuli.” *Neuropsychologia* 38 (2000) 1723–1733

8. Vgontzas, A.N., Bixler, E.O., Lin, H., Prolo, P., Mastorakos, G., Vela-Bueno, A., et al. (2001). Chronic Insomnia Is Associated with Nyctohemeral Activation of the Hypothalamic-Pituitary-Adrenal Axis: Clinical Implications. *J Clin Endocrinol Metab*, 86(8), 3787–3794.
9. Wright, C.E., Erblich, J., Valdimarsdottir, H.B., & Bovbjerg, D.H. (2007). Poor sleep the night before an experimental stressor predicts reduced NK cell mobilization and slowed recovery in healthy women. *Brain, behavior, and immunity*, 21(3), 358–63.
10. Van Cauter, E., Leproult, R., & Plat, L. (2000). Age-Related Changes in Slow Wave Sleep and REM Sleep and Relationship With Growth Hormone and Cortisol Levels in Healthy Men. *JAMA*, 284(7), 861–868.
11. Serotonin—Serotonin Neurotransmitter overview, chemical imbalance and treatment —Serotonin Level and Balance. http://www.anxiety-and-depression-solutions.com/insight_answers/serotonin.php.
12. Roman, V., et. al. (2006). Differential effects of chronic partial sleep deprivation and stress on serotonin-1A and muscarinic acetylcholine receptor sensitivity. *Journal of Sleep Research*, 15(4), 386–394.
13. Walker, M.P., Brakefield, T., Morgan, A., Hobson, J.A., & Stickgold, R. (2002). Practice with sleep makes perfect: sleep-dependent motor skill learning. *Neuron*, 35(1), 205–11.
14. Zhang, J. (2004). [Memory process and the function of sleep]. *Journal of Theoretics*, 6(6). Retrieved March 18, 2007.
15. Thinking outside the box—Wikipedia, the free encyclopedia. Retrieved April 1, 2007, from http://en.wikipedia.org/wiki/Outside_the_box.
16. Wagner, U., Gais, S., Haider, H., Verleger, R., & Born, J. (2004). Sleep inspires insight. *Nature*, 427(6972), 352–5.
17. Diet Industry Is Big Business, Americans Spend Billions On Weight-Loss Products Not Regulated By The Government—CBS News. Retrieved April 1, 2007, from <http://www.cbsnews.com/stories/2006/12/01/eveningnews/main2222867.shtml>.
18. Obesity2005Report.pdf (application/pdf Object). Retrieved April 1, 2007, from <http://healthyamericans.org/reports/obesity2005/Obesity2005Report.pdf>.
19. Walsleben JA, Norman RG, Novak RD. (1999). Sleep habits of Long Island Rail Road commuters. *Sleep*(22), 728–734. Retrieved March 21, 2007.
20. Sleep Facts and Stats—National Sleep Foundation. Retrieved April 1, 2007, from http://www.sleepfoundation.org/site/c.huIXKjM0IxF/b.2419253/k.7989/Sleep_Facts_and_Stats.htm.

21. Spiegel, K., Tasali, E., Penev, P., & Cauter, E.V. (2004). Brief Communication: Sleep Curtailment in Healthy Young Men Is Associated with Decreased Leptin Levels, Elevated Ghrelin Levels, and Increased Hunger and Appetite. *Ann Intern Med*, 141(11), 846–850.
22. Spiegel K, Leproult R, Cauter E. Impact of sleep debt on metabolic and endocrine function. *Lancet*, 1999(354), 1435–1439. Retrieved March 21, 2007.
23. Spiegel, K., Knutson, K., Leproult, R., Tasali, E., & Cauter, E.V. (2005). Sleep loss: a novel risk factor for insulin resistance and Type 2 diabetes. *J Appl Physiol*, 99(5), 2008–2019. Retrieved March 30, 2007, from <http://jap.physiology.org/cgi/content/abstract/99/5/2008>.
24. Yaggi, H.K., Araujo, A.B., & McKinlay, J.B. (2006). Sleep Duration as a Risk Factor for the Development of Type 2 Diabetes. *Diabetes Care*, 29(3), 657–661. Retrieved March 26, 2007, from <http://care.diabetesjournals.org/cgi/content/abstract/29/3/657>.
25. Jennings, J.R., Muldoon, M.F., Hall, M., Buysse, D.J., & Manuck, S.B. (2007). Self-reported sleep quality is associated with the metabolic syndrome. *Sleep*, 30(2), 219–23.
26. Kripke, D.F., Garfinkel, L., Wingard, D.L., Klauber, M.R., & Marler, M.R. (2002). Mortality associated with sleep duration and insomnia. *Archives of general psychiatry*, 59(2), 131–6.
27. Sephton, S., & Spiegel, D. (2003). Circadian disruption in cancer: a neuroendocrine-immune pathway from stress to disease? *Brain, behavior, and immunity*, 17(5), 321–8.
28. McElroy, J.A., Newcomb, P.A., Titus-Ernstoff, L., Trentham-Dietz, A., Hampton, J.M., & Egan, K.M. (2006). Duration of sleep and breast cancer risk in a large population-based case-control study. *Journal of sleep research*, 15(3), 241–9.
29. Filipinski, E., King, V.M., Li, X., Granda, T.G., Mormont, M., Liu, X., et al. (2002). Host circadian clock as a control point in tumor progression. *Journal of the National Cancer Institute*, 94(9), 690–7.
30. Schernhammer, E.S., Rosner, B., Willett, W.C., Laden, F., Colditz, G.A., & Hankinson, S.E. (2004). Epidemiology of urinary melatonin in women and its relation to other hormones and night work. *Cancer epidemiology, biomarkers & prevention: a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology*, 13(6), 936–43.
31. Ayas, N.T., White, D.P., Manson, J.E., Stampfer, M.J., Speizer, F.E., Malhotra, A., et al. (2003). A prospective study of sleep duration and coronary heart disease in women. *Archives of internal medicine*, 163(2), 205–9.
32. Knutsson, A., Hallquist, J., Reuterwall, C., Theorell, T., & Akerstedt, T. (1999). Shiftwork and myocardial infarction: a case-control study. *Occup Environ Med*, 56(1), 46–50.

33. Lusardi, P., Mugellini, A., Preti, P., Zoppi, A., Derosa, G., & Fogari, R. (1996). Effects of a restricted sleep regimen on ambulatory blood pressure monitoring in normotensive subjects. *American journal of hypertension : journal of the American Society of Hypertension*, 9(5), 503–5.
34. Valcavi, R., Zini, M., Maestroni, G.J., Conti, A., & Portioli, I. (1993). Melatonin stimulates growth hormone secretion through pathways other than the growth hormone-releasing hormone. *Clinical endocrinology*, 39(2), 19–9.
35. Takahashi Y, K.D. (1968). Growth hormone secretion during sleep. *J Clin Invest*, 47(9), 2079–90.