

# SLEEP

by

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Sleep is a primal biological drive that has been programmed into our brains and bodies over centuries of evolution. I can think of few plants or animals which do not go through a daily cycle of heightened activity followed by prolonged rest. Plants, in particular, are extremely sensitive to this cycle as the sun appears only during daylight hours. Plants use photosynthesis to combine carbon dioxide and water into carbohydrates, rich food sources for themselves and the organisms which feed upon them. Through photosynthesis, sunlight is converted to carbohydrates, a food both plants and animals use to survive. Plants, therefore, are the great harvesters of sunlight, turning its energy into edible food for all of us to enjoy.

The earth makes one revolution around its north-south axis every day. We experience this as the sun rising in the east each morning and setting in the west each evening, with roughly half of every day spent in sunlight while the remainder is spent in darkness. For this reason, plants can perform photosynthesis only during the half of each earth rotation when they face the sun. Plants must convert enough sunlight to carbohydrates during this period to last the entire day, otherwise they would die before the next morning. Thus, plants must produce in roughly twelve hours the food needed to survive for twenty-four. They must make twice the amount of food they need in daylight so they will have enough energy to survive through the night. Therefore, plants work extra hard when the sun is shining to produce an excess of food so that they may rest at night to conserve energy and recuperate from their hard work.

If the earth were stationary and did not spin on its axis each day, then plant life would be quite different. Under this condition, plants would only grow on the side of the earth continually exposed to sunlight, the other, dark half becoming a barren desert. In addition, as the lighted side of the planet would have continual access to the sun and its energy, plants could produce carbohydrates twenty-four hours a day. They would not have to produce food stores to last through the dark nights, and would only make more carbohydrates as they used them. With no need for reserves, no need to overwork during the daylight to produce food to last them the evening, plants could produce food continually at a slow, steady pace which would neither tire them nor require them to rest. However, this is not the case, and our spinning earth demands that they rest every night after overworking each day.

Evolution has instilled the same work-rest cycle in humans as it has in plants, but for different reasons. Unlike plants, we are mobile creatures which can easily travel from one place to another. The only traveling most plants ever do is as a seed when they are carried by the wind or some animal to the place where they will spend their entire lives. Unlike plants, however, animals cannot convert sunlight to carbohydrates. We are, therefore, dependent upon plants to create the basic food source for our survival.

Thus, we either eat plants such as fruits or vegetables, or feed upon vegetarian animals such as cows which have already eaten the plant life for us. For this reason, humans are classified historically as hunter-gatherers: hunters of animal meat and gatherers of plant food.

As hunter-gatherers, people rely heavily upon their senses to obtain their food. From amongst our five senses - sight, smell, sound, touch and taste - vision is the most important for satisfying our biological need to eat. Of course, all our senses are useful in acquiring food, however, under most circumstances, a blind person would have a much harder time finding sustenance than say a deaf person or one who could not smell. Because of this, as with plants, the earth's daily spin has impacted our evolution and the way we live.

When people first evolved on this planet, their greatest concerns were the acquisition of daily food and the avoidance of becoming food for something else: eat without being eaten. Sight was the most valuable asset we had in accomplishing both of these goals. Not only could we use it to find our food, we could rely on it to warn us of an approaching predator who might find us tasty. With the earth spinning round and round each day, the best time for us to hunt meat or gather plants was during sunlight hours when we could make the best use of our vision. The darkness of night decreased our sight, thereby lessening our abilities to both see food and avoid becoming food. It was not enough, however, to simply be awake during the day. People, like plants, had to capitalize upon daylight to acquire enough food to last them an entire twenty-four hours. Then at night, when our vision and hunter-gatherer abilities were limited, we could sleep to conserve energy and recover from the hard day's work. Due to the earth's spin, people and plants both evolved daily cycles of work followed by rest which still drive us today.

Our spinning planet has influenced our evolution for millions of years. It has only been since the late eighteen hundreds, with the advent of electric light bulbs, that we have been able to free ourselves from this sight limiting spin. With electric lights we can now turn night into day and make full use of our vision, even when we cannot see the sun. We may now walk about at midnight, lighting our way with flashlights or street lamps, go to a brightly lit convenience store, buy our food instead of harvesting or killing it ourselves, and then take it home to eat in a kitchen bathed in electric luminance. Not only can we find our food twenty-four hours a day, but we can easily see to avoid oncoming cars, trucks and trains, the last great predators of humankind. We may now eat without being eaten, or run over as it were, at anytime of the day we choose. Why then are we unable to stay awake twenty-four hours around the clock to take advantage of this new found freedom?

Evolution is a slow, painstaking process which takes millions of years to develop, and millions of years to change. We as a species have genetically selected over the countless centuries those qualities which improved our chances of surviving the conditions we lived in. For millions of years this has meant increased activity during the day and sleeping at night. Only in the past hundred years or so have we had access to reliable twenty-four hour lighting. It is not possible to alter in one century what has been genetically inbred into us over millions of years. The chance that we could remove ourselves from the daily sleep cycle in such a short period is as likely as that of our growing another eye in the middle of our foreheads to better see the flood off light we are now awash in. Perhaps over many centuries we will biologically adapt to non-stop lighting, slow down and lose our need to rest. For now, however, we are just at the starting line for such dramatic change, and our need for sleep is as strong as when people were hunter-gatherers living in caves. It is remarkable to think that when your mother told you to get plenty of sleep, she was actually invoking millions of years of evolution.

Sleep is an incredibly important time in our lives. Though it may appear that we are doing little on the outside, our bodies are actively involved in daily maintenance we need to perform our best when awake. Like department stores which close for the night, we take this time to restock our shelves and attend to any internal cleaning chores that may have been neglected during the daytime. It is an opportunity for our bodies to assess where we have deficits, where we have reserves, and then shuffle the excess off to where it is needed most. Trillions of cells actively refuel our energy supplies so that we will not only be awake the next

day, but also be able to perform extraordinary amounts of work as the need arises. If we deny them the chance to do this life sustaining work, then, like any building which is not properly maintained, we will become ragged, run down, and crumble back into the dust from which we came. Evolution demands it of us, our cellular citizens require it for us, yet many people fail to get enough rest.

The average person needs between six and eight hours of good quality sleep each night to feel rested the following morning. Both the quality and quantity of this sleep are equally important and unique for each person. I find that I feel best if I sleep seven to eight hours per night, waking briefly two to three times during that period. Curiously, if I sleep an entire eight hours straight through, I actually feel less rested than if I had awakened a few times while sleeping. There is no necessarily apparent rhyme or reason why an individual needs a particular amount and type of sleep. Some people need six hours, while others cannot do without eight. Certain individuals can only fall asleep if there is music playing, while others need complete silence to properly relax. The din of city traffic annoys those who move there from the country, while the rural thunder of evening crickets keeps visiting city folk awake. As we each have individual requirements for falling asleep and how much we sleep, it is impossible to claim that everyone should sleep the same way as everyone else. However, there is an individual way which is best for each person to get the rest they need. By appreciating your biological drive for and health benefits from sleep, you can start changing your behavior to attain the amount and type of rest that you require to feel your best each morning.

Anyone wishing to avoid illness, or improve their state of health if diseased, can best accomplish these goals by first attaining adequate sleep. Even when healthy, our bodies require many hours of rest each night. Illness further taxes our bodily resources, thus increasing our demand for even more sleep. It is easy to see that without proper rest a healthy individual soon runs down, no longer able to maintain and defend themselves from disease. In addition, the ill person who pushes themselves without enough sleep only hastens the progression of their illness. Sleep is the time for your cellular society to recharge and restrengthen itself on a daily basis. Deny your cells this opportunity and you deny yourself, and the trillions who depend upon your leadership, the chance to be healthy.

I often find it difficult to help my patients understand the importance of regular, good quality rest. Many ignore my advice by claiming there is nothing wrong with how they sleep or how much they sleep. They add, to my dismay, that no matter how much sleep they get, after that first cup of coffee in the morning they are rearing and ready to go. This is very sad. Caffeine merely releases chemical reserves in your body that would otherwise be used much slower and over longer periods of time. It provides in a relatively short burst, the energy that should be available to you for a better part of the day. If you sleep too little and do not replenish your chemical energy stores adequately, only to ingest a stimulant which forces out what remaining energy you have left, then you are sacrificing the reserves that you might otherwise use for fighting off infections and illnesses. We are limited beings with limited energy reserves. Resting helps to restore these resources, while caffeine works in ways which deplete them. Dependence upon that cup of coffee, rather than adequate sleep, to help get you through the day may hurt your chances of staying healthy or becoming well when challenged by disease.

There is no substitute for good sleep. As a matter of fact, I have never heard of anyone staying continually awake for longer than four or five days in a row. People who have tried often end up in a state of psychosis, some even dying from electrolyte imbalance induced strokes or heart attacks. We are programmed by evolution to sleep on a daily basis in order to survive. Substances like caffeine can only be used safely over very short periods to extend our awakened hours. However, when used daily, they deplete our energy and lower our defenses. Not only is there little or no know nutrient value to these compounds, their side effects ultimately weaken rather than strengthen us. If you depend upon any such stimulants to get through the day, then the first place to start towards improving your health is to get rid of them and get more sleep.

Resting better is often just a matter of sleeping more. Many people simply do not get enough rest to satisfy their basic needs. On the other hand, sometimes it is not how much you sleep, but how well you

use that time you set aside for sleeping that matters. If three out of your seven sleeping hours are spent awake tossing and turning, then chances are you will not feel rested when you rise in the morning. Just as our requirements for sleep are unique to each person, so are the reasons that people do not get enough of it. However, if you require chemical stimulants to wake up or stay awake during the day, or begin to fall asleep halfway through the day, then you are not getting the sleep your body needs.

Sleep deficits and their consequences may be transient or long term. Consider the person who regularly gets adequate sleep without using stimulants. If they stay up late once a week to have fun, it is usually simple for them to replenish their energy reserves by sleeping a bit later the following morning. Overall, they have made a shallow dip into their back-up stores, a deficit quickly and adequately replaced through an extended period of rest. Barring an accident or overwhelming acute infection, they retain the reserves needed to maintain their health and fight off common illnesses. On the other hand, habitual coffee drinkers who sleep less than necessary, then pick themselves up each morning with a cup of java, have likely been nurturing a long term sleep deficit for many years. This type of bad habit develops slowly and constantly into a chronic addiction, leaving the body in a permanent state of depletion. They stay awake longer than they should by depending upon caffeine to release their chronically low back-up energy - a loss for which they never get enough sleep to adequately replenish themselves. When they finally come down with the common cold or some other ailment, they do not have the internal resources needed to fight back quickly and effectively. Like the person who gambles away all their money and does not save for a rainy day, they cannot pay their energy bills when they come due.

While I do not wish to topple the coffee industry or any foreign governments, I would say that the average coffee drinker drinks coffee for the wrong reason. Neither caffeine nor the invention of electric lights has significantly altered our millions of years of evolution. We need to sleep. We must sleep. Anyone concerned about their health owes it to themselves to be sure they get proper sleep each and every night. If you are not getting enough rest, then take the time to think about what you are doing which prevents you from getting it. Perhaps it is your use of coffee, or maybe stress issues that keep you awake. Maybe it is the neighbor's dog barking at night, or even your own mattress which lacks proper support for you to get a good night's rest. Whatever the reasons, chances are you can identify several factors in your life, which if changed would allow you to sleep as you should.

Proper rest is one of the best means for investing in your health. As there are countless ways in which to sleep, it is beyond the scope of this writing to list solutions that will work for everyone. In the final analysis, it all comes down to your motivation and confidence. Lack of proper rest results from inappropriate behavior. However, if you value your rest and have the self-esteem to change your behavior, then you can eliminate bad habits which detract from your sleep and diminish your health. Since there is no substitute for adequate rest, think about your sleep and ways to improve it, then start experimenting with new behaviors and learn how to become a better sleeper. You may make some mistakes along the way, but your motivation and confidence will see you through.