Neels Pharmacy
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Healthy and Happy Monthly Newsletter

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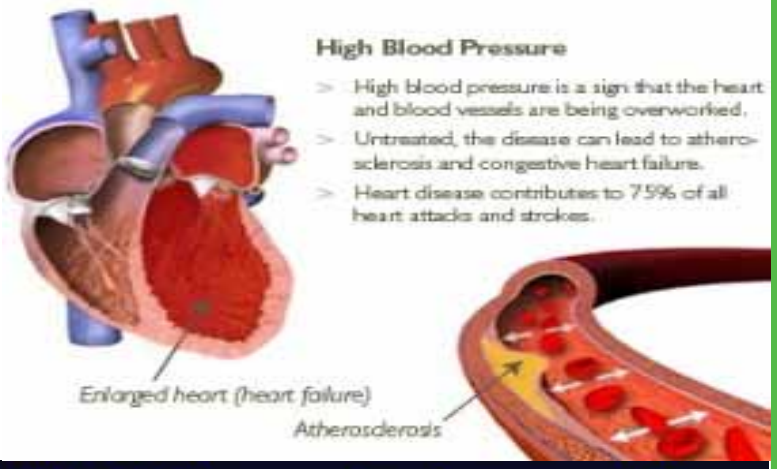
WAKE UP! The Truth about Sleep…It is not Overrated

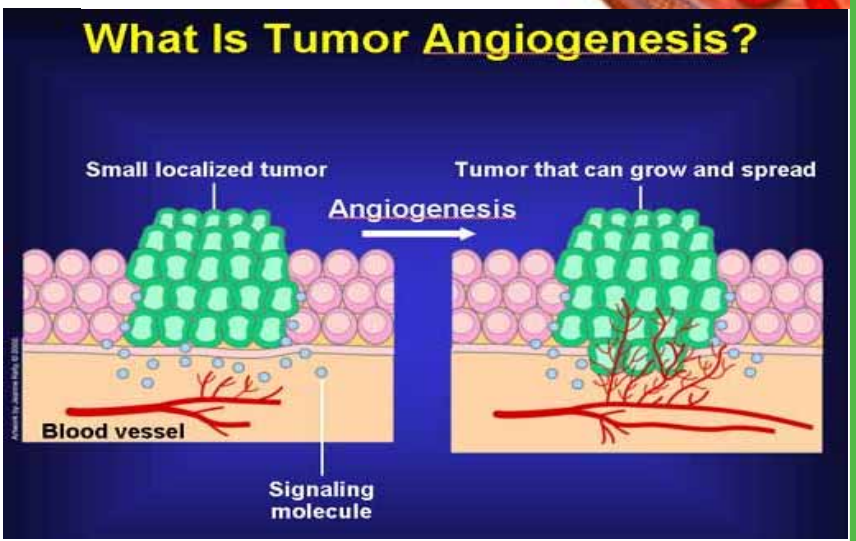
Establishing and maintaining consistent sleep habits is a form of hygiene, much like brushing your teeth after each meal, and showering at least once a day. Can you imagine the halitosis and tooth decay that you would have if you only brushed your teeth once a week, or the way that your skin and hair would look, not to mention the ripe odor, if you showered or bathed yourself once a week or less. The same goes for sleep. Yet, many people that come into the pharmacy relay that they seldom get a good night of sleep, either from having a difficult time falling asleep, or staying asleep, and many people say that they've slept poorly for years. Would you be interested to know that proper sleep hygiene is vitally important to your overall health, and that improper sleep over even a short duration of time can be detrimental to your body in a variety of ways? If so, read on as we highlight and explore sleep related health risks, and in the March newsletter, some safe, effective, and inexpensive ways to establish and maintain consistent, healthy sleep habits.

Sleep is no different than diet and exercise. A poor diet and a lethargic lifestyle are risk factors to your health, that if not corrected, will increase your likelihood of experiencing weight gain and developing heart disease, several types of cancer, low energy, loss of muscle, brain fog, irritability, and more. The same goes for sleep. In fact, diet, exercise, and sleep are all independent and interdependent upon one another in that all three enable the body to stay healthy by helping it to produce energy and repair itself. So, let's explore this relationship from the sleep perspective in more intimate detail.

If you get less than thirty minutes of exercise a day and you have a poor diet (approximately 62% of Americas diet consists of processed foods), then you put yourself at risk for higher cholesterol, higher triglycerides, and your blood becomes stickier. These lifestyle choices increase your blood pressure and create a buildup of plaque on the walls of your veins and arteries. Over time, the result is that you can develop hypertension and put yourself at increased risk for stroke, heart attack, and sudden death, due to hardening of the arteries, not to mention promoting obesity, diabetes, and inflammation just to name a few.



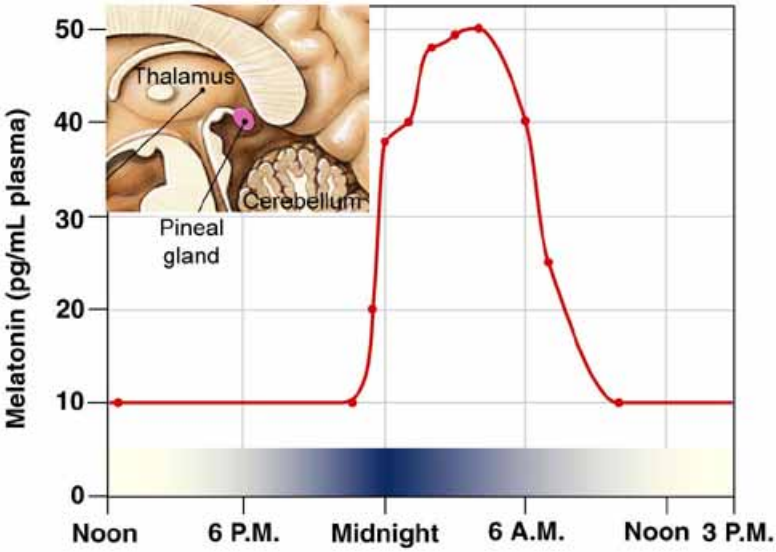
The more weight that you gain, the more capillaries and veins your body has to create to provide a blood supply for your fat cells in order to keep them alive. This phenomenon is known as angiogenesis, or the formation of new blood vessels. Interestingly enough, this is how tumors and cancer develop. Abnormal cell growth from stress on the body can cause a tumor, which in turn releases certain chemicals that trigger new blood vessels to grow into it, providing nutrients and oxygen to assist its growth. If tumor angiogenesis proceeds, the tumor has the potential to shed cells causing the cancer to metastasize, and spread to other areas in the body. So how do cancer, stress, stroke, heart disease, diabetes and obesity and inflamation relate to sleep?



Along with proper diet, and regular exercise, sleep helps to keep your heart healthy. Statistically, heart attacks and strokes are more common during the early morning hours. This fact may be explained by the way that sleep interacts with the blood vessels of the body. Poor sleep, even over a short period of time, has been linked with increased blood pressure and cholesterol, which are primary risk factors for heart disease and stroke. The reasoning behind this is that lack of sleep results in greater stress on the body's nervous system (brain) and cardiovascular system (heart), which also occurs when a person's blood pressure does not fall during the night. Based on these observations, individuals with a family history of high blood pressure or hypertension should monitor their sleep habits more carefully.

Sleep can help to prevent cancer. At some point you may have heard of the dietary supplement melatonin being recommended as a sleep aid. Known as "the hormone of darkness", light exposure reduces your body's level of melatonin, a hormone that makes us sleepy and is thought to protect the body against cancer. Melatonin is a primary regulator of the immune system and a powerful anti-oxidant. Anti-oxidants are pro-immune system, anti-aging and anti-cancer. Melatonin has been clinically shown to inhibit cancer cell growth, and can directly reduce the survival rate of many different types of tumor cells.

Melatonin is produced mainly in the brain by the pineal gland during deep sleep and in periods of darkness. Disruption of sleep patterns, usually due to stress, be it physical or emotional, results in significantly lower melatonin levels, putting those individuals with poor sleep hygiene at increased risk of developing cancer. Several studies have revealed that individuals with cancer have very low levels of melatonin. Individuals who work the night shift should pay particular attention to being melatonin deficient and consider supplementing with melatonin, as they are exposed to artificial light during this period of natural darkness, and then they usually try to get sleep during the daylight hours.



Melatonin is the "darkness hormone," secreted at night as we sleep. It is the chemical messenger that transmits information about light-dark cycles to the brain center that governs the body's biological clock.

(Adapted from J. Arendt, *Clin. Endocrinol.* 29: 205–229, 1988.)

Figure 7.22

Sleep can help to reduce stress. When your body is sleep deprived, it puts increased stress on your nervous system, cardiovascular system, endocrine system and immune system. But is it stress that is causing you to get poor sleep, or is it poor sleep that is causing you to become more stressed? The answer to both of these questions is yes. When the body becomes stressed, the body's functions go into a state of high alert which causes an increase in blood pressure, a primary risk factor for heart attack and stroke, and a release of the stress hormones cortisol, growth hormone, and norepinephrine from the endocrine system. Unfortunately, stress hormones trigger the "fight or flight" response, which increases the heart rate and keeps the body in an elevated state of alertness, ultimately affecting sleep patterns. And so, not getting good sleep can stress the body, and putting the body under increased levels of stress can affect sleep.

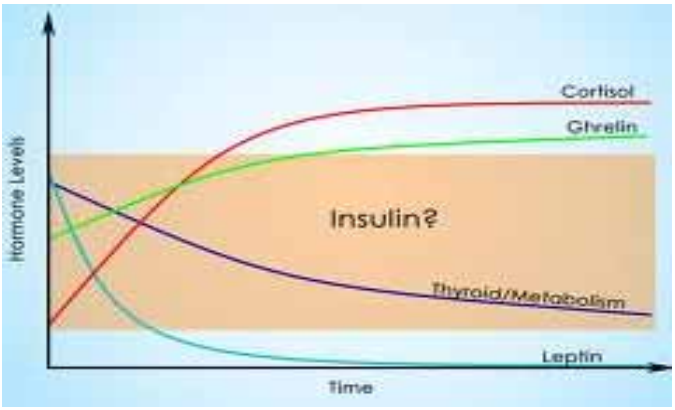
Along with reducing stress, proper sleep can help to reduce inflammation in the body. Inflammation is mainly produced in the gut as a result of poor diet. A steady diet that is high in sugar, carbohydrates, and processed foods will begin to kill off the good bacteria in the intestinal tract, which makes up 80% of the immune system, and promote the growth of bad bacteria. When this happens, the body becomes less efficient at eliminating toxins (stressing the liver), as well as fighting off infections. The result is that the body becomes more toxic and inflammation begins to take place throughout. With an increase in inflammation the immune system becomes more stressed, and stress hormones are released into the blood stream. In this respect, inflammation and stress are one in the same, and a constant release of stress hormones over time will lead to a depletion of energy storage, high blood pressure, stress-induced hypertension, a disruption and decrease in metabolic function, digestive problems like ulcers and constipation, a decrease in testosterone levels in males and irregular menstrual cycles in females, and an increased likelihood of infectious diseases.

During the night when we sleep, our body is hard at work. It undergoes several processes of detoxification that help to reduce inflammation and scavenge free radicals in our brain and vital organs. Depriving the body of a regular sleep pattern increases stress on the body, so not only does the body experience a disruption is it's detoxification and inflammation reducing processes, it releases more of the stress and inflammation producing hormones that the body so desperately needs to eliminate. This inflammation and the resulting health related conditions are ultimately one of the main causes of the deterioration the body experiences as we age.

Not surprisingly, a good night sleep makes you feel more alert the next day. Sleep allows you to be more active and engaged in your day, and narrows the gap between mental perception and reality. When you wake up feeling refreshed, you will have more energy to burn as sleep is the time during which your body undergoes the restorative processes and "recharges your battery". Figuratively speaking, your car may have a full tank of gas, but with a dead battery it will not run. The same goes for your body. You may eat sufficiently throughout the day, but without proper sleep, your food will not be properly digested, and you will consistently have low energy throughout the day.

When you sleep your brain produces serotonin. For serotonin to be produced, the brain needs three key components tryptophan, oxygen, and reduced co-factors. Tryptophan is an essential amino acid, meaning that it cannot be synthesized by the body and therefore must be part of your diet. Along with other amino acids, tryptophan is a building block in the production of proteins by our body's cells, and functions as an important component for the production of serotonin, melatonin, and niacin. Co-factors are substances that are essential for the chemical reaction to take place. Niacin is instrumental in the release of energy from carbohydrates which fuel all the body's cells and systems. Niacin is also important for the proper functioning of the central nervous system (the brain), and helps to regulate cholesterol metabolism, blood sugar, adrenal hormones, anti-oxidant and detoxification reactions.

In order to produce serotonin, melatonin, and niacin, the body must go through a process called glycogenolysis. Glycogenolysis is the breakdown of glycogen into glucose. This takes place in the liver and muscles, making glucose for use as metabolic fuel and maintaining a healthy blood concentration of glucose during the body's fasting state, for example, while we are asleep. Recent scientific studies indicate that glycogenolysis is induced by serotonin in the brain, which is quickly depleted when not produced in sufficient amounts during periods of sleeplessness. Therefore, in order to have enough energy to function during the day and not feel run down and overcome with brain fog, regular and sufficient sleep is the key.



Research also indicates that poor sleep is associated with food addiction, obesity, and increased risk of diabetes. As we've touched on briefly in the paragraphs above, lack of sleep impacts and alters the balance of hormones in the body and impairs metabolism, affecting appetite, blood sugar regulation, and insulin resistance. The hormones ghrelin and leptin are disrupted by lack of sleep and the body's ability to process glucose in the blood declines.

Ghrelin and leptin are two hormones in the body that have a major influence on energy balance. Leptin plays a key role in regulating energy intake and energy use, and it significantly influences appetite and metabolism. Leptin, from the greek word leptos, meaning thin, acts on receptors in the hypothalamus of the brain where it inhibits appetite. The absence of leptin leads to uncontrolled food intake, and the resulting obesity and insulin resistance. The level of leptin falls in individuals who are sleep deprived, which stimulates appetite. Therefore, poor sleep and sleep deprivation can actually increase appetite. Also, the physiological manifestations of sleep, fatigue, and hunger are similar, and often times we confuse them and we eat when we are actually sleepy, because we perceive fatigue as a sign of hunger.

Produced mainly by the stomach and pancreas, ghrelin stimulates hunger. Ghrelin levels increase before meals and decrease after meals. The level of ghrelin increases in individuals who are sleep deprived, stimulating appetite, and further increasing the likelihood of obesity and insulin resistance. Therefore, sleep deprivation decreases leptin, and increases ghrelin, a slippery slope that sets the stage for not only obesity and diabetes, but for heart disease, stroke, cancer, inflammation and infectious diseases.

Along with adequate vitamin D3 supplementation, serotonin plays a significant role in preventing and reducing symptoms of depression. Serotonin is a hormone and a neurotransmitter that is manufactured in the brain, but approximately 90% of the body's supply is found in the digestive tract and the blood platelets. The body converts the essential amino acid tryptophan into serotonin, which helps brain cells to regulate everything from mood, appetite, sexual desire, and sleep, to memory, learning, social behavior and body temperature. In terms of our bodily functions, serotonin can affect the proper function of our cardiovascular system (blood/heart), muscles, endocrine system (adrenal), and Immune system.

Sufficient research indicates that a decrease in serotonin production and availability can influence mood in ways that lead to depression. Possible serotonin deficiency can be a result of low brain cell production, lack of receptor sites available to receive the serotonin that is made, inability of serotonin to reach the receptor sites, or a shortage of tryptophan, the amino-acid from which serotonin is made. Research is inconclusive as to whether a decrease in serotonin causes depression, or whether depression causes a decrease in serotonin. The one thing that is for certain is that sleep deprivation causes a decrease in serotonin, leading to a serotonin deficiency, and serotonin deficiency is believed to play a major role in depression.

While there is still a great deal that has yet to be revealed about the benefits of keeping regular sleep patterns, the general recommendation is to get between seven and nine hours of sleep a night. Sleep is absolutely essential for the body's health and wellbeing, and yet millions of Americans do not get sufficient sleep or suffer from insomnia or chronic lack of sleep. For example, statistics indicate that approximately forty million Americans suffer from over seventy different types of sleep disorders, and that about sixty percent of adults report having sleep problems two nights a week or more. In addition, approximately sixty-nine percent of children experience sleep problems or disruption two nights a week or more. Most of these problems are related to stress and emotions, and often go undiagnosed and untreated. Therefore, in the following March Happy and Healthy Monthly Newsletter, we will expand on the importance of sleep by focusing on sleep techniques, and methods of promoting relaxation and stress reduction in preparation for a good night sleep.

Founded as a traditional apothecary style pharmacy in 1932, Neels Pharmacy is an established compounding and prescription pharmacy in its fourth generation of family leadership. Today, Neels has evolved into the pharmacy of the future , providing regular and innovative custom compounded prescription medications for humans and animals, and the latest and most effective over-the-counter products, including: clinical nutrition, homeopathy (for humans and animals), herbal remedies, therapeutic teas, aromatherapy and essential oils , skin care and high quality personal grooming products.

As a full service pharmacy, Neels Pharmacy offers a variety of services including individualized human and veterinary compounding, and personalized clinical nutrition consultations that are conducted by our in-house clinical nutritionist/ pharmacist, Patty Frieda. Additional services include **free local delivery** of prescription medications and over the counter products, as well as mail, UPS, and express overnight delivery.

Neels Pharmacy accepts most insurance cards, including Missouri Medicaid, Missouri Senior Rx, and more. We want to assure you that your prescription co-pay at Neels Pharmacy will be the same as you pay at any pharmacy location in the area.

Our goal is to help you and your family achieve optimal health, wellness and vitality and provide a relaxing and peaceful atmosphere in which you will receive the highest level of customer service from our knowledgable staff and pharmacists. With each visit to Neels Pharmacy you can depend on a one-on-one pharmacist consultation with every prescription, including drug/vitamin/herb interactions and drug/nutrient depletions. From our family to your family, we respectfully invite you to come experience the Neels Pharmacy difference, and approach your health concerns with confidence.