

HEALTH

Without sleep, students are all out of whack

Cathy Frisinger
MCT WIRE SERVICE

Know somebody who likes to brag that he can get by on six hours of sleep a night?

Tell him that men who sleep less than seven hours a night have a 26 percent greater death rate over a two-decade period than men who sleep seven to eight hours a night.

And children who don't get enough sleep are more likely to be overweight and to have behavioral problems.

And people who do rotating-shift work have lower levels of the hormone serotonin, low levels of which are associated with anxiety and depression.

These findings, all published in the journal *Sleep* within the last seven months, are part of a rapidly expanding body of knowledge about the physiology of sleep and the importance of adequate sound sleep to good health.

"Shift work was just added to the list of risk factors for cancer by the CDC (Centers for Disease Control and Prevention)," says Dr. Jerrold Kram, a member of the board of directors of the National Sleep Foundation. "It just suggests the increasing recognition of how profoundly sleep affects our lives."

And it's not just arcane statistics about risk factors and sleep that are accumulating. There are 83 recognized sleep disorders,

including sleep apnea, insomnia, circadian-rhythm disturbances, narcolepsy, restless leg syndrome and plain old wake-the-neighborhood snoring. Physicians like Kram are putting this knowledge to use, making sleep medicine one of the fastest-growing medical specialties over the past decade.

The American Academy of Sleep Medicine accredited the first clinical sleep lab in 1977. The idea of community medical centers where patients would be hooked up to monitors while they punched their pillows, snored and dreamed about showing up for college exams naked, grew slowly at first — by 1996 there were just 300 AASM-accredited sleep centers — but the concept has exploded in the past decade, resulting in more than 1,000 accredited centers today and many more unaccredited centers.

YOU NEED ALL FIVE STAGES OF SLEEP

"We used to think that sleep was a dormant period of time, and we're finding out that there are a whole lot of things that go on during sleep," says Dr. David Ostransky, a Fort Worth, Texas, pulmonology and sleep-medicine specialist.

Saying "a whole lot" goes on during sleep is like saying that war is "unpleasant."

There are five stages of sleep, according to the National Sleep Foundation,

four non-REM stages and REM (rapid eye movement) sleep, and sleepers cycle through the stages about every 90 to 100 minutes.

Stage 1 is the transitional stage, when you're between waking and sleep. Your brain waves and muscle activity slow. Sometimes people's bodies jerk just before they fall asleep.

Stage 2 is a light sleep stage. Eye movements cease. Body temperature drops, and heart and brain activity slows. National Sleep Foundation NSF material says there are periods of muscle tone and muscle relaxation, and that occasional brain-wave spikes, called sleep spindles, occur during this stage of sleep.

Stages 3 and 4 are called delta sleep. These are the deep sleep stages, and this is when body restoration and repair occurs.

Temperature drops even further during this phase, brain waves are slow and there is decreased muscle tone. Fibromyalgia may be associated with poor delta sleep, Ostransky says. People woken during delta sleep are often groggy and disoriented. Night terrors occur during this sleep stage.

Stage 5 is REM sleep, a period of fast brain waves; rapid, shallow breathing; and the rapid eye movements it's named for. Dreaming, believed to be a way of organizing the day's experiences, Ostransky says, occurs during REM sleep.

Have you ever wanted to scream during a nightmare and been unable to?

Muscles become temporarily paralyzed during REM.

These stages of sleep are repeated four to six times during the night, but not in exactly the same ratio. The first REM sleep is short, just seven minutes or so, but REM sleep takes up a larger and larger portion of the cycles as the night goes on, Ostransky says, which is why you're often dreaming when your alarm clock goes off.

And it's not just the amount of sleep, but the distribution of sleep stages, that's important for health. People who don't get adequate delta sleep, or REM sleep, wake up feeling unrestored, Ostransky says.

DON'T MESS WITH YOUR CIRCADIAN RHYTHM

The suprachiasmatic nucleus, a region in the hypothalamus, regulates the body's sleep/wake cycle, or circadian rhythm, and it needs to be kept in adjustment, just like the alarm clock beside your bed needs to be kept adjusted.

Cycles of light and dark are what keep the suprachiasmatic nucleus properly set so that you will go to sleep at 11 and wake up at 7. The human body, deprived of clues like sunlight and clocks, wouldn't naturally keep a 24-hour schedule. Many people who are totally blind, in fact, have a circadian rhythm disorder,

continually advancing their sleep/wake schedule forward.

Teenagers are particularly prone to circadian-rhythm problems, and their night-owl tendencies are at least partly biological, says sleep foundation spokesman Kram.

Light is the chief, but not the only, clue for the body's inner clock, according to the American Association of Sleep Medicine Web site. Zeitgebers are the name for other circadian-rhythm influences, and they include meals, exercise and routine activities.

People with chronic insomnia may be helped by sticking to regular times for meals, exercise and bedtime routines.

WITHOUT SLEEP, YOUR HORMONES GET OUT OF WHACK

Have you ever been inside the cockpit of a plane? So many dials.

The human body is a far more complicated piece of machinery than a plane, and it has a complex system of hormones that are constantly being adjusted to keep endocrine, metabolic and other body systems functioning properly.

Many of these regulatory hormones are secreted at night or during periods of sleep, and sleep disorders or life situations such as shift work can affect the proper sequence of hormone release, the sleep foundation says.

Melatonin, a hormone secreted by the pineal gland in the brain in reaction to darkness, helps promote sleep, but has other functions as well.

Disruptions in melatonin production may be the reason why shift work is associated with an increased risk of cancer.

Growth hormone, necessary for growth in children, is released during the deep delta sleep stages, Ostransky says. Growth hormone is important for adults, too, who require it to repair the body and regulate muscle mass.

The stress hormone cortisol varies during the night, Kram says. It falls as the body enters sleep and then rises in the morning before waking.

Hormones involved in the reproductive cycle, including luteinizing hormone and follicle-stimulating hormone, are released during sleep, according to the foundation.

And medical researchers now believe that the hormones ghrelin and leptin, which help signal hunger and satiety, are affected by sleep. Low levels of leptin in children and adults who get inadequate sleep may be the reason for the link between insufficient sleep and obesity.

Kram says people with interrupted sleep are more likely to develop insulin-resistance because the balance of these hormones is off.

A mind is responsible

for the traffic light, the blood bank, ice cream, peanut butter, the doorknob, the microphone, the elevator, clothes dryer, lawn mower, pacemaker, the typewriter, guided missile, mailbox, the air conditioner, automatic transmission, curtain rod, baby carriage, lawn sprinkler, fountain pen, dust pan, the hand stamp, first open-heart surgery, cataract laser, fire extinguisher, doorstop, home security camera, the golf tee, fire escape, potato chip, food preservation, synthesized cortisone, the guitar, railroad telegraphy, envelope seal, printing press, bicycle frame, rocket catapult, insect destroyer gun, ice cream scoop, window cleaner, laser fuels, folding chair, gas mask, mop, refrigerator, pressing comb, urinalysis machine, door lock, electric cutoff switch, telephone transmitter, stair-climbing wheelchair, hairbrush, egg beater, eye protector, electric lamp bulb, biscuit cutter, chamber commode, almanac, horse shoe, lunch pail, motor, lantern, key chain, furniture caster, ironing board, sugar-refining system, lemon squeezer, portable weighing scales, wrench, airplane propeller, ore bucket, steam boiler, portable x-ray machine, cotton chopper fertilizer, street sweeper, cattle-roping apparatus, spark plug, galoshes, casket-lowering device, clothes wringer, disrail car coupling, riding saddles, and so on and so on. The list is endless. Indeed, it's time to stop and celebrate the fact that each and every one of the wonderful innovations mentioned here came from the mind. The mind of an African American. By supporting minority education, you keep open the possibility of tomorrow's great ideas.

Because of all the things that the human mind has created, perhaps the most amazing is the one that has yet to be created. And that possibility is

a terrible thing to waste.

To support and to learn more about great African American innovators, please visit us at www.uncef.org or call 1-800-332-UNCF.



Five things you didn't know about emergency contraception

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1.) Emergency contraception, sold under the brand name Plan B, is "the best-kept secret in all of health care," says Carol Cohan, director of the Women's Emergency Network. About a year and a half ago it was approved for over-the-counter sales in the United States, but advertising was focused on "glossy magazines like *Vogue*, targeting college age, young professional women and missing low-income women of color, who have the highest rate of unplanned pregnancies in the United States."

2.) The South Florida Coalition to Promote Emergency Contraception is working to get the message out to those who need it most, through a new ad campaign promoting Plan B, which is backup birth control. Images of an emergency box with a pill inside will be placed on billboards, bus cards and fliers in areas of Miami-Dade County that are populated with low-income people of color.

3.) Plan B is sold behind the counter at many drug stores. Call your pharmacist to see if Plan B is in stock. You must be 18 or older to get it without a prescription. Men can buy it. Girls younger than 18 can get it with a prescription without parental notification. The Web site lists one-stop-shop clinics where girls can get the prescription. Another resource: 888-not-2-late.

4.) Plan B is most effective if taken immediately after sex when/if the condom breaks, you miss your birth control pill or you're late for a Depo-Provera shot. So, it's good to have it on hand before it's needed. Side effects include vomiting, abdominal cramps and headaches. It can change the time of month when a woman is fertile, so after taking it, birth control must be used on a consistent basis.

5.) "Emergency contraception is not an abortion," Cohan says. Unlike the abortion pill, RU486, Plan B "will not work if you are already pregnant and it will not harm a developing fetus," she says. It impedes ovulation or fertilization, not implantation. The Archdiocese of Connecticut consents to having Catholic hospitals provide emergency contraception for rape survivors without requiring an ovulation test.