Sleep well, enhance health
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Sleep is a widespread biological phenomenon in the animal kingdom, yet we don’t really know what sleep is. Scientists suspect that most species require sleep, although sleep patterns among animals are highly variable. While we humans spend about one third of our lives sleeping, giraffes sleep less than two hours per day; brown bats, on the other hand, average twenty hours. Some fish, which need to keep moving in order to take in a constant supply of oxygen, sleep with only one half of the brain at a time, while the other half keeps them moving.

Blood courses through our language. Whether we say of a friend that “music is in her blood,” or muse to a family member that “blood is thicker than water,” whether something makes our blood boil or run cold—we are reflecting the deep-seated human recognition that blood is central to our existence. The ancients knew that blood was the stuff of life and, in the Middle Ages, blood was regarded as one of the four bodily humors, associated with confidence and optimism [reflected in the word “sanguine,” derived from the Latin and Old French words for “blood.”]

The actual nature of blood is complex. Blood appears to the naked eye to be a red fluid, but it is made up of a number of individual elements. The fluid part, called serum or plasma, is nearly colorless. Among the most common blood tests are those that measure the levels of elements, such as sodium and potassium, in the serum. Within the plasma component of blood are many proteins, including some that help the blood to clot and others that, like immune globulin, help fight infections.

The other major components of blood are the various types of blood cells. Individual blood cells are microscopic, but together they make up about half the volume of whole blood. The measurement of the percentage of blood volume made up by the blood cells is a commonly-used blood test called the “hematocrit.” Since the vast majority of blood cells are red blood cells, the hematocrit is essentially a measure of the number and size of the red blood cell population.

Red blood cells carry the protein hemoglobin, which gives blood its color and can combine with oxygen, allowing oxygen to be carried from the lungs to all other parts of the body. The average life span of red blood cells is about 120 days, so there is constant production of new cells in the bone marrow. Old red blood cells are removed from the blood by the liver and spleen. If there are not enough red blood cells, or if red blood cells are damaged or malformed, the rest of the body is deprived of life-sustaining oxygen.

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In humans, infants average sixteen hours per day and adults generally require between seven and eight hours daily for optimal health and functioning. A decrease in the need for sleep is common in older people, who may require only 5.5 hours per night.

While the current medical recommendation is that most adults obtain eight hours of sleep per night, some historical figures—including Napoleon Bonaparte, Florence Nightingale and Margaret Thatcher—claimed they got only six hours per night. President Bill Clinton declared that he needed only 5.5 hours, and Thomas Edison considered sleep to be a “waste of time.”

In fact, Edison’s invention of the electric bulb in 1879 caused us to increase significantly the number of “productive” hours in our days because our lives were no longer governed by the setting and rising of the sun.

This disengagement of sleep from the natural cycle of light and darkness led to a gradual decrease in the length of the average American’s night sleep from nine hours to seven hours. A 2005 poll by the National Sleep Foundation indicated that U.S. adults average 6.8 hours of sleep on weeknights. Many of us obtain only five hours per night during the week and then try to compensate by sleeping longer on weekends.

This change in sleep patterns presented a host of possible medical problems, many of which we are just beginning to investigate. One way the body keeps itself awake when it needs sleep is to activate the stress response, potentially weakening the immune system. Researchers at the University of Chicago showed that college students purposely deprived of sleep produced only half the expected numbers of antibodies when administered the flu vaccine and demonstrated an increase in cortisol levels, heart rate and blood pressure. Sympathetic nervous system activity increased, as did insulin resistance (a condition that may precede diabetes, affect glucose metabolism, and encourage weight gain).

The mechanisms are not fully understood, but when we don’t get enough sleep we are more at risk of developing diabetes, heart disease, depression and stomach ulcers. Even weight gain and obesity may be related to sleep deprivation.

One recent research finding is that leptin, a protein hormone related to satiety [feeling satisfied after eating], is released by fat cells during sleep. When we deprive ourselves of sleep we therefore decrease this satiety and run the risk of gaining weight.

Obtaining adequate sleep also increases longevity. Death from all causes is lowest among adults who sleep seven to eight hours per night, and is significantly higher for people who sleep less than seven hours nightly.

Lack of sleep affects brain functioning in short order. Students who pull “all-nighters” will experience increased irritability the next day, forgetfulness, grogginess, shortened attention span, and significant trouble with focusing and concentration.

Sleep-deprived individuals will also experience decreased reaction time and difficulty tracking and responding to rapidly changing circumstances. Lack of sleep was thought to be a contributing factor to a number of major disasters, including the Challenger explosion, the Exxon Valdez oil spill, Three Mile Island, and Chernobyl.

We have known since the 1920s that sleep improves recall, and recent research at the Massachusetts Mental Health Center demonstrated that sleep is necessary for learning, especially of visual and motor skills.

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A stroll through the Yale campus presents us with an institution undergoing extraordinary renewal and renovation. Whole blocks have become construction sites as the University continues with its ambitious program of re-investment in the rich architectural legacy of Yale’s dormitories, libraries, museums, laboratories, lecture halls and other facilities.

As renovations proceed, new buildings are also being constructed and Yale University Health Services looks forward to the completion of our new building in late 2009. We are now deep into design, and making decisions about how we will provide our members and staff with both welcoming, accessible public spaces and state-of-the-art clinical facilities.

One example of a design decision which will provide direct clinical benefit and improved access is that clinicians will have multiple examination rooms rather than just one, allowing more clinic time to be devoted to patients, with less downtime between patient visits.

We will be improving customer service in our Pharmacy, which has long operated in tight space while our daily prescription volume is often triple that of commercial drugstores. The new University Health Services Center will provide space to support this high volume, with faster service and greater privacy.

We will also use the new Health Services Center to capitalize on the convenience of care in comfortable clinical spaces. We will offer new services on-site, including tests such as CT scans, MRI, mammography screening and ultrasound. Our endoscopy program, already available at 17 Hillhouse, will move to expanded quarters. We will have the capacity to perform many one-day procedures—especially in gynecology—that we now perform elsewhere.

On the non-clinical side, we are planning a large structured parking facility—welcome news for those who have tried to find parking when visiting 17 Hillhouse. Yale University has identified the new health center as a strategic site that will link the science area with the residential colleges and athletic facilities.

If you have an opportunity, turn down Canal Street; in 2009 you will be facing the new University Health Services Center, which will look out across the Farmington Canal to the Sachem Street foot path and to areas of Yale that will be the focus of future development. The new location will be a safe, well-lit thoroughfare. The creation of a convenient traffic route for pedestrians and drivers has been a priority in the plan for campus development. A welcoming and accessible health center, available to members at all hours, is an integral part of Yale’s plan for uniting the eastern and western sides of campus.

In coming months, we will have plans and images to share. Meanwhile, please consider which features of the new University Health Services Center are most important to you. The primary goal in building this new facility is to better meet your medical needs, and we are eager for feedback and suggestions from our members.
While the winter holidays can present a nutritional minefield, many traditional holiday foods can be healthy as well as tasty choices. For instance, turkey—the centerpiece of many holiday meals—is a healthy food that can easily fit into almost everyone’s eating goals. Skinless turkey breast is the low calorie champ (160 calories and 3 grams of fat in a 3 ½ oz serving), followed by dark meat without skin (190 calories, 7 grams of fat), then breast with skin (200 calories, 8 grams of fat), and lastly dark meat with skin (221 calories, 12 grams of fat). Note, however, that turkey wings contain 425 calories and 23 grams of fat per wing.

Keep your turkey safe by using proper transporting, storing, preparing and cooking methods. For more information, see http://www.fsis.usda.gov/PDF/Countdown_to_Thanksgiving_Holiday.pdf, which provides the times needed for safe thawing, as well as cooking and other tips.

Sweet potatoes, another popular winter holiday food, are nutritional powerhouses. They are an excellent source of vitamin A and vitamin C, a good source of fiber, and very low in fat, making them great choices for a heart-healthy diet. However, many preparation methods add excessive amounts of fats and sugars to this otherwise nutritious tuber. Stay away from the marshmallows and butter and instead try seasoning your sweet potatoes with the following: oranges, pineapples, cranberries, apples (or the juices of any of these fruits), cinnamon, pecans, cashews, nutmeg, maple syrup or light maple syrup, cilantro, lemon, lime, or curry. Also, try cubing them and adding them to some of your favorite soups or stews—they will add to the color and texture as well as the flavor of many dishes. While sweet potatoes are found in most markets year-round, they are in season in this part of the country in November and December.

Mix and match meds with care

If you take self-help cold remedies, including herbal items, be careful about mixing them with your prescription medications. Always ask a pharmacist about the potential for interactions between prescription and over-the-counter medications. Make sure to read the inserts which come with medications to learn about drug interactions which may make the drugs less effective, cause unexpected side effects or even cause health problems. For instance: decongestants will help your runny nose but may also interfere with your blood pressure, whether you are on blood pressure medication or not. Many over-the-counter cold medications already contain high doses of ibuprofen or acetaminophen, so be very careful if you take either of them while also taking cough syrup. You may end up taking an amount which exceeds the recommended daily doses.

Useful websites on this topic:

http://www.fda.gov/cder/consumerinfo/druginteractions.htm

Provides many examples of drugs you should not take together without clinician approval (example: over-the-counter medications for heartburn if you also have asthma). It also explains some drug interaction warnings with common conditions such as lactose intolerance.


Research articles on herbal medicine.
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The medical term for conditions in which there are too few red blood cells is anemia. There are many different types of anemia, including that caused by a deficiency of iron, which is necessary for normal red blood cell development. A well-balanced diet contains adequate iron for most people, but iron supplements may be indicated for some individuals whose iron intake does not meet the needs of red blood cell production.

White blood cells are of several types—all important to the immune system. Neutrophils help fight bacterial infections. Lymphocytes are key to controlling virus infections and for orchestrating the work of various part of the immune response. Eosinophils help fight intestinal parasites, but are also responsible for some of the inflammation of allergic reactions.

Blood circulates to all parts of the body, propelled by the pumping action of the heart, through a series of arteries and veins. Blood needs to flow freely through this system of vessels, but when a blood vessel is injured—for instance, when you cut yourself—it is equally important for the blood to clot so that bleeding stops. Within the plasma, a number of proteins and enzymes start a complex chain reaction that leads to clotting. Platelets, which are cell fragments, are also part of this process. Thus, effective clotting requires the presence of many different blood elements, and the body must maintain a delicate balance between excessive and insufficient clotting. Some people are born with conditions, like hemophilia, in which some elements are missing and blood does not clot properly. On the other hand, excessive clotting can be harmful or fatal and drugs are used to decrease the development of potentially harmful clots.

The complexity of blood and the fact that it is involved in so many important processes makes it particularly useful for diagnosing many medical conditions. Below are examples of some common blood tests that either test the blood itself or use elements found in the blood to help diagnose problems with other parts of the body.

Hemoglobin and hematocrit. These are two common and important ways of evaluating red blood cell capacity or volume. The hematocrit is the percentage of total blood volume made up by red blood cells. The hemoglobin is a measurement of the “oxygen carrying” molecules of the red blood cells. Low readings of either may indicate various types of anemia; readings that are too high may also indicate health problems.

White blood cell count: The total white blood cell count reflects overall activity and function of the immune system. In response to most bacterial infections, the white blood cell count is elevated, indicating that the immune system is activated to fight the infection. An abnormally low white blood cell count may mean that the immune system is suppressed, either from a disease process or from medication or toxins.

Serum creatinine. Creatinine is a normal product of muscle breakdown, and is removed from the blood by the kidneys. Elevated levels indicate that the kidneys are not working as well as they should to remove toxins and wastes from the body.

Cholesterol. Two components of blood cholesterol numbers are HDL (“good” cholesterol) and LDL (“bad” cholesterol). HDL, or high-density lipoprotein, seems to take the excess cholesterol from the blood vessels and deposit it in the liver. LDL, or low-density lipoprotein, stays in the blood vessels, contributing to atherosclerotic plaques, the substance that causes blood vessel blockages which can contribute to heart attacks and strokes. A healthy total cholesterol reading should be 200 or less.

Blood sugar. Patients with diabetes have higher than normal levels of blood sugar. This can be measured as serum glucose (the predominant type of sugar in the blood). After an overnight fast, higher than normal levels of glucose may signal diabetes or pre-diabetic conditions. Another blood test, called Hemoglobin A1C (or glycosolated hemoglobin) indicates the overall level of glucose over several months as opposed to a single point in time.

Prothrombin time. Many people take coumadin, a drug that prevents and treats harmful blood clots. The prothrombin time (PT) is a measure of the extent to which blood coagulation is inhibited by coumadin. The results are used to adjust coumadin doses to achieve the appropriate level of anti-coagulation.
New Laboratory provider
Quest Diagnostics began providing laboratory services to YHP members as of October 1, 2006.
Phlebotomists will continue to be available at YUHS to obtain and process specimens. Quest maintains an extensive network of patient service centers, with over 80 locations available throughout Connecticut. Many locations are open as early as 7:00 a.m. as well as half days on Saturdays. A complete list of these sites and hours is available at YHP and on our web site at www.yale.edu/yhp.

For additional information, call Quest at (800) 982-6810 or visit them on the web at www.questdiagnostics.com.
Note that if you have a Clinical Laboratory Partners (CLP) requisition form in hand for upcoming or standing lab work, it will be accepted by Quest Diagnostics facilities for six months after the date of the order.

Flexible spending accounts (FSAs)
The Yale flexible spending accounts, administered by ADP, allow you to pay for certain health care and dependent care out-of-pocket expenses with before-tax dollars. You may participate in the health care (medical/dental) expense reimbursement account and/or the child/dependent care expense reimbursement account. This money can be used to cover the pharmacy deductible, coinsurance, and other medical expenses that are not reimbursed under your YHP coverage.
You decide how much you want to contribute to each account based on your anticipated expenses for the year.
You can contribute up to a maximum of $12,000 to the health care (medical/dental) expense reimbursement account and up to $5,000 to a separate child/dependent care expense reimbursement account. Your contributions will be deducted from your paycheck before taxes are calculated.
Flexible spending accounts (FSAs) require annual re-enrollment, and can be elected online during open enrollment by using the employee self service site at www.yale.edu/hronline/selfservice.
Beginning in January 2007, you will have the option to authorize YHP to transfer automatically your pharmacy deductibles, co-insurance and other medical expenses directly to ADP for reimbursement, eliminating the need to submit these claims directly to ADP. Because all members of an enrolled family will be affected by the Yale employee’s opting in or out, do not opt in if you do not want all of your dependent’s FSA eligible claims information automatically transferred to ADP from your health care reimbursement account. Also this feature is not available if you are covering a same-sex civil union partner under your YHP coverage.

Check out our new web site, which will feature information on how to get the most out of your YHP membership, plus the latest health information for the Yale community—all with enhanced search capability and easier navigation.

www.yale.edu/yhp
Madeline S. Wilson, MD, FACP, educated at Harvard College and Harvard Medical School, has extensive experience in both academic and community-based medical practice. Prior to her becoming YUHS’s chief of Internal Medicine in August, Wilson was the director of Yale Internal Medicine Associates and Urgent Care, the primary care practice for the Yale School Of Medicine. She previously served as the HIV coordinator and an internist at Fair Haven Community Health Center, where she later became medical director.

She has also served as the HIV/AIDS consultant at the York Women’s Correctional Facility, as attending physician at Yale New Haven Hospital’s Nathan Smith [HIV/AIDS] clinic, and as attending physician in the YNHH Emergency Department. An assistant professor of Medicine at Yale Medical School, Wilson currently teaches interviewing skills to medical students as a faculty facilitator for a course in “The Doctor-Patient Encounter.” Wilson is a Fellow of the American College of Physicians, and a member of Physicians for Human Rights and the International AIDS Society; she has done overseas medical rotations in Haiti and Zimbabwe and spent two years between college and medical school in the Peace Corps as a health educator and TB control worker in Liberia.

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Experimenters concluded that “memories after sleep are resilient to disruption” and that “sleep orchestrates the strengthening of memories making them less vulnerable to interference.” The old advice to “sleep on it” in order to figure out a problem turns out to have scientific validity.

Developing healthy sleep habits should begin in childhood. Sleep is especially important for children, as it affects mental and physical development. By the age of two, most children have spent more time asleep than awake. The average duration of sleep (including naps) decreases with maturation, although individuals of the same age have variable requirements. If a child is not getting the average amount of sleep for her age but seems rested and healthy and is developing normally, then her sleep duration is most likely appropriate.

Sleep disorders in children are common, can have multiple causes, and are typically categorized as either difficulty falling asleep or nighttime waking. Some clues that a child may be having sleep problems are excessive daytime sleepiness, frequent nighttime awakenings, difficulty falling asleep, or loud snoring accompanied by gasps or breathing pauses.

In adults, sleep researchers have identified 84 different types of sleep disorders in three main categories: insomnias; conditions that result in sleepiness during the day, such as sleep apnea or narcolepsy; and parasomnias, such as walking or talking in your sleep, and REM behavior disorders. The 2005 survey by the National Sleep Foundation revealed that 75% of U.S. adults experience some symptoms of a sleep problem at least a few nights per week. Chronic insomnia affects 10 percent of the adult population, whereas 40 percent have trouble sleeping at least two or three nights per week.

If medical problems are not present, managing sleep issues is generally focused on encouraging healthy patterns of sleeping. The lessons learned from the expanding field of sleep research can be summed up as: “Without a good night’s sleep, you may become sick, fat and forgetful.” For more tips on getting a good night’s sleep, see the sidebar on page 2.
Flu clinics

Yale staff, faculty and students will be able to obtain flu shots at several sites around the university through the middle of December. Below are the times for flu clinics held in the YUHS building. For a full listing of other clinics, please go to www.yale.edu/yhp or call 203-432-0093. Unless otherwise noted, times for clinics below are 8:30–4:00.

Friday, November 10
seniors & high-risk groups

Tuesday, November 14
seniors & high-risk groups

Wednesday, November 15 (4:00–7:00)
faculty & staff

Thursday, November 16
faculty & staff

Wednesday & Thursday
November 29 & 30
faculty & staff

Thursday, December 7
faculty & staff

Tuesday, Wednesday, Thursday
December 12, 13, 14
faculty & staff

Questions or comments about the newsletter? We’d like to hear from you. Drop a note to member.services@yale.edu and put “newsletter” in the subject line.

From the Pharmacy

Medication Mysteries?

Directions on taking your medications may involve instructions on timing as well as on eating and other daily activities. Here are explanations for some common instructions.

**Why do some medications have to be taken on an empty stomach while others have to be taken with food?**

**For medications to be taken on an empty stomach:** The presence of food decreases the body’s absorption of certain drugs (common examples are fosamax and tetracycline), leading to a lessening of the medication’s effectiveness. Also, some medications, such as the antibiotics ampicillin and dicloxacillin, may be inactivated by gastric acid secreted during digestion; taking these medications on an empty stomach increases their effectiveness.

**For medications to be taken with food:** Because some medications can be harsh on the stomach (a common example is Motrin), the presence of food helps to protect the stomach from discomfort. Other medications may require the release of gastric acids in order to be absorbed properly.

**Why can’t I take certain medications with dairy products or fruit juices?**

Some drugs (such as tetracycline and ciprofloxacin) bind with nutrients found in dairy products to form inactive substances. With fruit juice, the acidity of the juice may begin to break down the tablet before it has reached the site where it is meant to be absorbed. This will cause diminished effectiveness. Grapefruit juice in particular has been found to alter the effectiveness of some medications (a common example is Lipitor) because it inhibits the metabolism of certain chemicals. Ask your pharmacist about potential food and beverage interactions for your medications.

**Why do I have to stay out of the sun when taking certain medications?**

Some medications react to sunlight, especially ultraviolet rays, causing an increased absorption of these rays by the skin. It is important that you stay out of direct sunlight when you are taking medications that cause this photosensitivity, and that you wear sun block outdoors.