



Crew Endurance Management Newsletter

An information resource about the Crew Endurance Management System (CEMS) for practitioners and those interested in learning more about it

Crew Endurance Resources

Welcome to the Crew Endurance Management Newsletter, where we bring you the latest in sleep and endurance-related information. Our goal is to support your personal knowledge and application of the principles of Crew Endurance Management.

Much of the information in this issue appears in the National Sleep Foundation's weekly e-newsletter *NSF Alert*. If you'd like to receive this information regularly, sign up with them [here](#) – it's free!

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Meet LCDR Ben Hawkins, The New CEMS Leader

By **DAVE McCALLUM**

Technical Writer/Editor

The Crew Endurance Management System team has a new leader. Meet LCDR Benjamin Hawkins, who arrived recently at Coast Guard Headquarters after the retirement of CDR David R. Bird, the previous Division Chief.

LCDR Hawkins, who reported in mid-July, has plenty of experience at various Coast Guard assignments. His previous assignment was Sector New York, where he served as the Senior Investigating Officer during a four-year tour in the "Big Apple." LCDR Hawkins and his team were responsible for conducting all types of marine investigations including casualty, pollution, violation, and personnel investigations. In addition, his team was responsible for overseeing environmental response efforts for oil discharges and chemical releases.

Before working in New York, LCDR Hawkins was stationed at the Marine Safety Office in Paducah, Kentucky, from June 2000 to July 2003, where he was Chief of Inspections and Senior Investigating Officer. In addition to conducting marine investigations, he and his team were responsible for executing the Commercial Vessel Safety Program conducting vessel inspections to ensure compliance with all applicable laws and regulations.

From May 1996 through June 2000, LCDR Hawkins was assigned to the Marine Safety Center (MSC) in Washington, DC, working in the Major Ves-



LCDR Ben Hawkins

sel Branch. There, he conducted plan review for a wide variety of vessels ranging from Subchapter T passenger boats to foreign-flagged cruise ships. This plan review covered many areas, including stability, fire protection, life-saving and structural design. In addition, LCDR Hawkins worked on the MSC's Salvage Engineering Response Team and spent time overseas assisting field officers with Control Verification Exams.

Prior to his stint in Washington, LCDR Hawkins attended the University of Michigan Graduate School from May 1994 to May 1996, where he earned a master's degree in Naval Architecture and Marine Engineering.

LCDR Hawkins began his Coast Guard career in May 1992, when he

What Do We Mean By “Circadian Rhythms?”

In communications about sleep, the terms *biological clock* and *circadian rhythms* are used frequently. That is because circadian rhythms are truly an important part of our biology. Sleep professionals are very familiar with these terms but may not realize that many people really don't understand what they mean. Sometimes textbooks give explanations such as this: “the term ‘circadian’ comes from the Latin word *circa*, ‘around’, and *dies*, ‘day’, meaning literally ‘about a day’.” Somehow, I don't find that this type of definition really helps to explain much.

To me, what circadian rhythms really mean is that our bodies have internalized a schedule. It is not that we have a “clock” within us, but more importantly we become programmed. This programming is set off by the daily exposure to light. If that light exposure occurs at roughly the same time each day, a pattern is established.

What results from this pattern is

truly important because it affects when we are most alert and when we will feel sleepy. What has been a critical focus of research is understanding how that happens – how the circadian programming or pattern occurs, what genes are involved and how the programming affects metabolic and physiological functions such as changes in body temperature and changes in melatonin levels.

Knowing that we have an internal schedule, a program that will make us feel sleepy at some times and that we will have other times of optimal alertness is the key fact that most people need to know about circadian rhythms. Armed with this information, people can understand the importance of having a regular sleep-wake schedule. They can also schedule their activities, particularly those requiring maximum alertness, for the times of day when their circadian rhythms are primed for alertness.

This is something I have found that sleep professionals understand and in-

corporate into their own lives. They try to reserve their nights for sleeping, their days for activity and they may nap during the afternoon circadian “dip” to get a little more refreshing sleep.

Research continues to produce findings that show the importance of circadian phases to all kinds of biological functions, including alertness, reaction time, memory, mood and other factors. One recent study found that highly trained swimmers were able to swim fastest in the late afternoon, not in the few hours before dawn. That might seem obvious, but then again, there are millions of Americans out on the highways in those same pre-dawn hours, trying to drive, when their brains are really saying, “Sleep!” That is an example of a circadian mismatch that results in far too many tragedies.

This article was written by National Sleep Foundation CEO Richard Gelula and first appeared in the July 24, 2007, edition of the National Sleep Foundation's e-newsletter NSF Alert..

Fatigue Management: Is Blue the New Green?

By **WILLIAM G. SIROSIS** and **DR. ACACIA AGUIRRE, MD, PhD**

Fatigue is a problem in the marine industry due to the extended tours of duty and demanding watchkeeping schedules. Biological clocks automatically switch the human brain to low levels of alertness at night. Thus, we are not well equipped to sustain optimal performance during nocturnal hours.

There are innovative technologies to help optimize crew alertness and performance levels. Research studies have found that, in addition to supporting vision, light has other non-visual effects, such as resetting our biological clock to the 24-hour day and improving alertness. Shiftwork researchers are evaluating the most effective intensity and wavelength to improve alertness and performance at night. Sunlight is a broad mix of colors, perceived by the human eye as white. At first, experiments were done using high intensity white bright light.

Research studies have proved that short wavelength blue or green light is more effective than white light, thus allowing the same alerting effects with lower intensity. For example, an ex-

posure to 5 lux of blue light for 40 minutes had similar effects as exposure to 5000 lux of white light during longer periods. Two or three properly timed 20-minute exposure periods to short wavelength light can improve alertness and performance during the night.

The U.S. Coast Guard has tested the effectiveness of low intensity green light to avoid accidents caused by fatigue, and has incorporated the use of timed green light exposure into their Crew Endurance Management System.

Recent studies have compared the effectiveness of blue light and green light to improve alertness. Volunteers exposed to blue light rated themselves less sleepy, had quicker reaction times and fewer lapses of attention than those exposed to green light. However, the authors of the study cautioned that further research is still needed, especially regarding safety with long-term exposure, since there is concern that blue light may cause damage to the retina.

People most sensitive to eye damage are those with pre-existing eye conditions, diabetes and other diseases that predis-

Physical Stressors

Diet, Exercise, Mood May Be Keys to “Eternal Youth”

By STEVE SPEARMAN
Technical Writer/Editor

Had Ponce de León had the benefit of modern science behind him, he might not have searched so long for the legendary Fountain of Youth. Instead, he would have done well to concentrate on eating right, exercising, and looking on the sunny side of life to forestall old age. That's because “normal” aging is largely a matter of some simple choices we make every day.

So claims Dr. Henry S. Lodge, co-author of *Younger Next Year* and a faculty member of the prestigious Columbia Medical School. In an article for the March 18, 2007 issue of the *New York Post's Parade* magazine, Dr. Lodge examines how our bodies age and discusses what we can do every day to slow down this process.

So what's the secret? First—countless infomercials notwithstanding—there is no magic pill. No surprise there. Second, there is no secret, not really. What's exciting here isn't a patented process, special diet, or newly

discovered wonder-drug. Instead, it's the news that simply by making the right decisions about our bodies—to exercise, to eat right, to be optimistic—we can all dramatically affect our health and well-being by putting the brakes on aging. It's a common-sense approach that all too few of us take.

Getting exercise may be the biggest factor. “The hard reality of our biology is that we are built to move,” writes Dr. Lodge. “Exercise is the master signaling system that tells our cells to grow instead of to fade. When we exercise, that process of growth spreads throughout every cell in our bodies.”

Most of the trillions of cells that comprise our bodies live for a relatively short time—a few weeks or a couple of months—before dying and being replaced by new cells. Our bodies are in a constant state of flux, moving from the old and dying to the new and vibrant at a rate of about 1% of our cells daily. As Dr. Lodge puts it, “Think of it as getting a whole new body every three months. It's not entirely accurate,

but it's pretty close.” The type of new body we end up with, however, depends on the choices we make each day during those three months. And getting plenty of exercise is one choice that improves the quality of the cells we produce. We decide through our actions (or lack thereof) whether those new cells are stronger or weaker, whether they grow or decay, according to Dr. Lodge. “(Our) cells don't care which choice (we) make. They just follow the directions (we) send. Exercise, and (our) cells get stronger; sit down, and they decay.”

While calling someone a machine is usually meant as flattery, it doesn't do the human body justice. Unlike machines—subject to the strict laws of entropy where use inevitably brings about wear and tear—our bodies have the capacity to grow stronger in response to physical demands. But proper diet and a positive outlook are needed to create the right kind of environment in which we can “rebuild ourselves” for the better.

News In Other Transportation Modes

Fatigue a Likely Factor in Fatal Comair Crash

(July 26, 2007) Nearly 11 months to the day that a plane crashed on takeoff, killing 49 of the 50 people on board, the National Transportation Safety Board announced that flight crew failure was to blame for the catastrophic event on Aug. 27, 2006, in Lexington, Ky.

According to an NTSB press release dated July 26, 2007, the Comair 5191 flight crew failed to use “available cues and aids to identify the airplane's location on the airport surface during taxi” and did not “cross-check and verify that the airplane was on the correct runway before takeoff.” In addition, a pre-flight conversation between the pilot and co-pilot may have led to “positional awareness” and played a role in the fatal crash at the Blue Grass Airport. The NTSB also cited the Federal Aviation Administration (FAA) for not requiring that all runway crossings be authorized only by specific air traffic control clearances.

“This accident was caused by poor human performance,” said NTSB Chairman Mark V. Rosenker. “Forty-nine lives could have been saved if the flight crew had been concentrating on the important task of operating the airplane in a safe manner.”

In addition, the Board reiterated that the FAA and the National Air Traffic Controllers Association work together to reduce the potential for controller fatigue by revising controller work-scheduling policies and practices. The controller on duty at the time of the fatal crash had slept for only two hours between his morning and overnight shifts on Aug. 26. The crash happened toward the end of his overnight shift.

This article was based on information that first appeared in the July 31, 2007, edition of the National Sleep Foundation's e-newsletter NSF Alert.

CEMS Spotlight

Rivera Joins Office of Human Element and Ship Design

Pik Kwan Rivera, an integral member of the research team that developed and implemented Crew Endurance Management programs, tools and practices for both U.S. Coast Guard units and commercial maritime operations at the USCG Research and Development Center (USCG R&DC) in Groton, CT, has now brought her skill set to Coast Guard Headquarters and the Office of Human Element and Ship Design.

In her more than eight years of working with the Coast Guard, Rivera has served in many capacities, including project manager, technical lead, and principle investigator for research conducted under both the USCG RD&C Crew Endurance Management and Command Center of the Future programs.

Prior to her arrival at the Coast Guard, Rivera worked in the U.S. Army Aeromedical Research Laboratory (USAARL) in Fort Rucker, AL, serving

as a Chemical and Biochemical Laboratory Technician and research assistant. Her work in the Army supported research conducted to evaluate the effects of the hormone melatonin on human performance.

Rivera received her bachelor's degree from the University of Connecticut in Storrs, CT. Her multi-disciplinary education background includes studies in the physical, biological, psychological and social sciences. Coupled with her training in systems analysis and human factors and certification as a Project Management Professional (PMP®), Rivera brings diverse experience and knowledge to her new role of addressing human systems integration, ergonomics and human factors issues impacting maritime safety.

Rivera has contributed to several publications on Crew Endurance Management, most notably *Enduring the Shipboard Stressor Complex: A Systems Ap-*

proach, published in the Aviation Space and Environmental Medicine Journal, and two publications for the Coast Guard, *Crew Endurance Management Practices: A Guide for Maritime Operations*, and the *USCG Guide for the Management of Endurance Risk Factors*.



Pik Kwan Rivera

Fighting Fatigue: The Alternative Watch System

System was developed from West German operation of single-person bridges

By CAPT. ROBERT SHEEN, FNI

Fatigue is one of the most significant causes of accidents at sea. Mariners can become fatigued through “traditional” means such as lack of sleep and insufficient or poor quality rest time between work periods. However, they also become fatigued through excessive work loads, monotonous tasking, excessive noise or vibration, and ingesting certain types of nutrients and chemicals. The question then becomes one of how to mitigate fatigue.

In the case of my company, in 1998, we decided to institute an Alternative Watch System on our five 32,500 DWT product tankers. This scheme was based on one that had been developed by the West German Ministry for Technology and Research, for the operation of single person bridges.

The Alternative Watch System comprises a series of two-hour and six-hour watches. Each person stands one two-hour watch and one six-hour watch each day (see the chart below).

See *ALTERNATIVE*, Page 5

THE ALTERNATIVE WATCH SYSTEM												
	2	4	6	8	10	12	14	16	18	20	22	24
Second mate	00-06				08-10							
Chief mate				06-08			12-18					
Third mate						10-12				18-24		

Continued from **Alternative**, Page 4

For example, on a 3 Mate ship, the Second Mate stands watch from 0001-0600 and again from 0800-1000, then is off, barring any other onboard operations or overtime work, until 0001 the next day. The Chief Mate stands from 0600 to 0800 and 1200 to 1800, and is off until 0600 the next day, while the Third Mate stands from 1000 to 1200 and 1800 to 2400 and is off until 1000 the following day.

This schedule allows onboard personnel to work four hours overtime each day, while fully complying with the requirements of the Standards of Training, Certification and Watchkeeping for Seafarers (STCW), and the American Oil Pollution Act of 1990.

Initially, there was some hesitation about standing these types of watches, especially from older officers. This was due, in large part, to the six-hour watch segment. However, once these individuals actually experienced the benefits of

the long, uninterrupted rest period, they quickly adapted to the new system.

The system has been entirely voluntary on the part of the ships' crews. We do not mandate that they work the Alternative Watch System; however, not one ship that has tried the new system has changed back to the traditional 4-on, 8-off system.

We have found that the vessel crews fully support the Alternative Watch System and that they report being better rested, have a more "normal" work experience, and feel that they have enough time off to accomplish their personal tasks without compromising their rest.

The Alternative Watch System has worked extraordinarily well, and has gone a long way to improving the quality of life onboard our vessels.

Capt. Robert Sheen is Vice President of Operations for Ocean Shipbuilding, Inc.

This article first appeared in the January 2007 edition of the National Sleep Foundation's e-newsletter NSF Alert.

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was assigned to the USCG Cutter RELIANCE out of New Castle, NH. In addition to serving as a Student Engineer, he filled the positions of Damage Control Assistant and Assistant Engineering Officer during his two-year tour.

LCDR Hawkins is looking forward to his new assignment at Coast Guard Headquarters in the District of Columbia. He has already begun to make note of areas where he believes his skills, knowledge, and experience will reap the greatest dividends.

"With seven years conducting marine investigations, I am intimately familiar with the role of human factors in marine casualties including the potential detrimental effects of fatigue," he said. "I am excited at the prospect of working with the maritime industry to secure solutions that will mitigate the dangers posed by fatigue and advancing the mission of marine safety and environmental protection."

The Alternative Watch System: A Critical Analysis

More time off is important, but so are other factors when combating fatigue

By **PIK KWAN RIVERA**

The Alternate Watch System developed by the West German Ministry for Technology and Research provides a number of features that may, under the right conditions, reduce crewmember fatigue. It is important to recognize, however, that implementing a schedule without managing other shipboard personal, organizational and environmental factors can actually sabotage the potential benefits of even the best designed work schedule. Employing the Alternate Watch System within the context of shipboard practices that manage the complex of stressors impacting the crewmember will ensure its effectiveness. This is the value that the Crew Endurance Management System program provides more reliably than other more traditional fatigue management and countermeasures initiatives.

A crucial point of misinformation that

prevails in the maritime industry is that a long period off equates to a long period of rest, or more specifically to a long period of uninterrupted sleep. Although this may appear to be the case, it is deceiving when organizations fail to make systemic changes in their operations to support the way crewmembers manage endemic risk factors that compromise their safety performance while they are on watch.

For instance, regarding the 14 hours off, one captain was quoted in an article about the schedule, "crewmembers were better able to take care of routine duties such as inspections, drills, and maintaining safety and lifesaving equipment. As ample time is now available to accomplish these tasks, the mates are less likely to overlook items that might lead to a chain of errors at a later date."

There is risk providing long periods off watch if the mariner is not indoctrin-

ated in endurance practices. The organization and its members must be enlightened about the synergistic effects of human physiology, established work policies/culture, management of work practices and human behavior on crewmember alertness and performance.

For instance, take the watch schedule of the second mate. A red flag should be automatically raised because this crewmember is expected to stand watch during the night when, physiologically, he is at his lowest period of alertness and performance in a 24-hour period. Rather than retiring after his 6-hour watch, into a quiet and dark environment to sleep for an uninterrupted 7-8 hours, he is expected to return to watch after a 2-hour period off. This situation and his early morning exposure to daylight maintain his biological rhythms in a daytime orienta-

Continued from **Analysis**, Page 5

tion.

Lacking the appropriate light management plan and environmental controls to facilitate his adaptation to the nighttime work schedule, his sleep at any time throughout his long period off will be disrupted and lack restorative value. Therefore, he will consistently experience low performance and sleepiness during the night, particularly while on watch. Over a short period of two to three days, this crewmember can expect to experience significant degradation of performance and compromised safety. Include in this scenario overtime work interference into his rest periods, personal desire for recreational activities, mismanagement of dietary requirements and meal timing as well as uncontrolled environmental factors in his sleeping environment (e.g., noise, motion, and lighting) and endurance degradation has risen exponentially.

In the case of the Chief Mate, his watch schedule appears to be that of a typical daytime work schedule. However, consideration of maritime operations would yield the following concerns. For instance, the placement of overtime work hours (as a result of such events as port calls, critical evolution, and training) can interfere or disrupt the sleep period of a nighttime sleeper if organizational policies or practices are not in place to prevent or minimize their exposure to these occur-

rences.

Furthermore, this crewmember may not realize that personal habits (i.e.: diet, recreation) and/or conditions (i.e.: sleep apnea) may be a source of disturbance to his quality of sleep. These and other factors such as environmental conditions in the berthing space and personal stress, while left unmanaged, will contribute to tax cognitive and physical resources of this crewmember. Without education and organizational support to control these endurance risk factors, crewmembers, even those who enjoy a stable daytime work schedule, can become a liability to shipboard safety, particularly because these crewmembers are the least likely to recognize when they are chronically fatigued.

Lastly, the third mate's watch schedule also requires consideration. Because this crewmember's off periods occur predominantly during the morning and afternoon hours, interruption of his/her sleep period are very likely to occur as a consequence of activities such as training and vessel maintenance. Without supporting organizational policies to manage the timing of these types of activities and of overtime work periods, this crewmember can expect to experience fragmented sleep and the resulting accumulation of sleep debt over the course of the voyage.

Additionally, this crewmember will require a light management plan that will

help him/her to "delay" his/her sleep onset and wake-up times to ensure that he/she is alert during the watch period. This again points to the notion of how important it is to create watch schedules that allow for 7-8 hours of uninterrupted sleep. It is even more important to ensure, however, that the 7-8 hours of sleep is not sabotaged by poor management of critical shipboard activities.

While the Alternate Watch System serves to meet the hours of service standards as reported in the following quote, "This scheme allows onboard personnel to work four hours overtime each day, while fully complying with the requirements of STCW and the American Oil Pollution Act of 1990," it also has the potential to promote crew rest. For the Alternate Watch System potential to be realized, however, it is necessary to embed it within processes and practices that control shipboard endurance risk factors. Otherwise, like many other watch schedules currently in use, the Alternate Watch System will promote chronic fatigue.

Pik Kwan Rivera works for the Office of Human Element and Ship Design Division at Coast Guard Headquarters in Washington, DC.

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pose them to retinal damage or those taking photosensitizing medications. Moreover, some studies comparing blue and green light have suggested that the alerting effect of blue light may persist during the subsequent sleep period, reducing sleep quality.

William G. Sirosis is a Senior Vice President and COO of Circadian Technologies, Inc. Dr. Acacia Aguirre is the, Medical Director of Circadian Technologies, Inc.

This story first appeared in the January 2007 edition of the National Sleep Foundation's e-newsletter NSF Alert!

Serotonin and Rotating Shifts

People who work the night shift often have a difficult time adjusting to sleeping during the day and being alert at night. These effects can be even worse for people who work rotating shifts, which include both day and night shifts in a given week.

Now a new study finds that rotating shift work is associated with low levels of serotonin, a neurotransmitter that plays an important role in sleep regulation. Researchers in Argentina studied 437 workers with a daytime schedule and 246 with rotating shifts at a factory in Buenos Aires. Based on medical examinations and responses to a questionnaire on health-related behavior and work schedules, the researchers determined that low serotonin levels were correlated with rotating shift work and that this correlation was independent of how long a person had the rotating shift schedule.

This article first appeared in the Aug. 7, 2007, edition of the National Sleep Foundation's e-newsletter NSF Alert..

Penn Maritime: CEMS Delivers Real Results

Maritime transportation leader installs sound-proof doors, exercise equipment on tugs

By **DAVE McCALLUM**

Technical Writer/Editor

There is always trepidation when trying out something new or different, especially when it goes against something you have been practicing for some time. That could have been said for towing vessel crews working for Penn Maritime when it came to implementing the Crew Endurance Management System (CEMS).

Just ask Don Hinson, the company's CEMS expert in charge of the Southern Division, which encompasses operations on the East Coast, Gulf Coast, and in California.

"Folks are always going to be a little skeptical, but it is always easier to swallow when it's voluntary and not mandatory," said Hinson, a Captain for 28 years, the last 20 with Penn Maritime. "But, the transition was a little easier [for Penn Mari-



time] because we were already doing a lot of things that involved CEMS."

Some of the areas Penn Maritime is addressing include improving crew sleeping environments, providing better opportunities for hydration, and making exercise equipment available so that crew members have the opportunity to keep themselves in top physical shape.

Given the size of most towing vessels and the location of sleeping quarters (usually adjacent to the machinery space and/or galley) on those vessels, it can be a difficult task to reduce the amount of noise crews hear when they are trying to

get the proper amount of uninterrupted



sleep (7-1/2 to 8 hours) recommended by sleep experts.

Penn Maritime was able to accomplish the task by installing sound-proof doors between the sleeping quarters and the galley in all 10 of the company's tugboats. This undertaking, however, did not come cheaply. According to Hinson, the cost was between \$2,800 and \$3,000 per door.

"Installing those sound-proof doors was the single biggest improvement the crews are always talking about," he said. "You want to do things for the crew to let them know you're listening to them and doing your best to take care of them."

Another beneficial change is having exercise equipment on every vessel. Be it a Bowflex machine, a multi-station gym, elliptical bicycles, stationary bicycles, or treadmills, proper exercise equipment can be a powerful incentive to help crew members exercise regularly and stay physically fit.

A second but no less important part of the fitness aspect is ensuring there is plenty of potable water on board each vessel. Having drinking water readily available has helped crew members cut down on their intake of caffeine. According to Hinson, there has been an approximately 60 percent decrease in the amount of soda consumption on the vessels.

"When you're thirsty and you see soda and water side by side, you're going to lean more toward the water," said Hinson. "The crews are going through 30 to 40 cases of water a month."

Although the crews haven't yet implemented the scheduling portion of CEMS, which is the last step in adopting the system, two tugboat crews (*Julie* and *Teresa*) are using the green light to help them get acclimated and allow them to get the proper amount of uninterrupted sleep they need each night.

"The crews in New York (two-watch system) aren't using (the green light) because they're shifting around and not on steady routes, but those down here (Gulf



Coast) on the three-watch system are using it a lot because of the longer routes they are on," he said. "They find the green light helps them the more that they use it."

In addition to overseeing CEMS efforts at Penn Maritime, Hinson has been talking up the program to other companies who are interested in it.

He said a company in New Orleans and another in New York want to get started in the near future.

"They wanted to know how to get started and how to train the coaches," he said. "I tell them about the light management, the environmental changes portion of the program and about educating their crews on proper rest, diet and hydration."

CEMS Training Update and Upcoming Sessions

Upcoming Coaches Training Classes

Kirby Corporation

Baton Rouge, LA

Sept. 6-7

**Contact Kelly Parker for
more details:**

Email: kelly.parker@kirbycorp.com

Phone: 713-435-1775

Upcoming Experts Training Classes

An Experts Class will be held in the Fall

**Please contact [LCDR Vivianne Louie](mailto:Vivianne.W.Louie@uscg.mil)
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Better Sleep Can Lead to Healthier Life

By **DAVE McCALLUM**

Technical Writer/Editor

Ask people why they don't get enough sleep and among the responses may be the old joke, "I don't have time to sleep now. I'll have plenty of time to sleep when I die."

There is irony in that statement, because both sleep and medical experts agree that inadequate sleep (less than 8 hours) may, over time, considerably shorten lifespan.

Getting the proper amount of sleep to ensure good health and a longer life is just as important as proper diet and regular exercise, according to David Dinges of the University of Pennsylvania's School of Medicine,

Sleep and health are connected by a common denominator—the hypothalamus, which helps to regulate hormone production throughout the body.

Ever noticed that you feel hungrier when you don't get enough sleep? That's because the body is producing more ghrelin, a hormone that promotes hunger, and less leptin, one that decreases hunger pangs.

The result of this two-fold effect is a craving for food—specifically high calorie carbohydrates—which leads to bigger waistlines and health issues such as diabetes and other diseases that, in turn, work to shorten lifespan.

"Chronic short sleep is the royal road to diabetes and obesity," said Karine Spiegel, a sleep researcher.

There you have it. One more reason to make sleep a top priority.

This article is based on information from an August 5, 2007, story in the Providence (RI) Journal.



The [Coast Guard CEMS Website](http://www.uscg.mil/hq/g-m/cems/index.htm) continues to be updated with additional CEMS information and resources.

Thoughts and suggestions are always welcome regarding content and information. Please forward these to:

HQS-PF-flidr-G-PSE@uscg.mil, or call us at 202-372-1358.