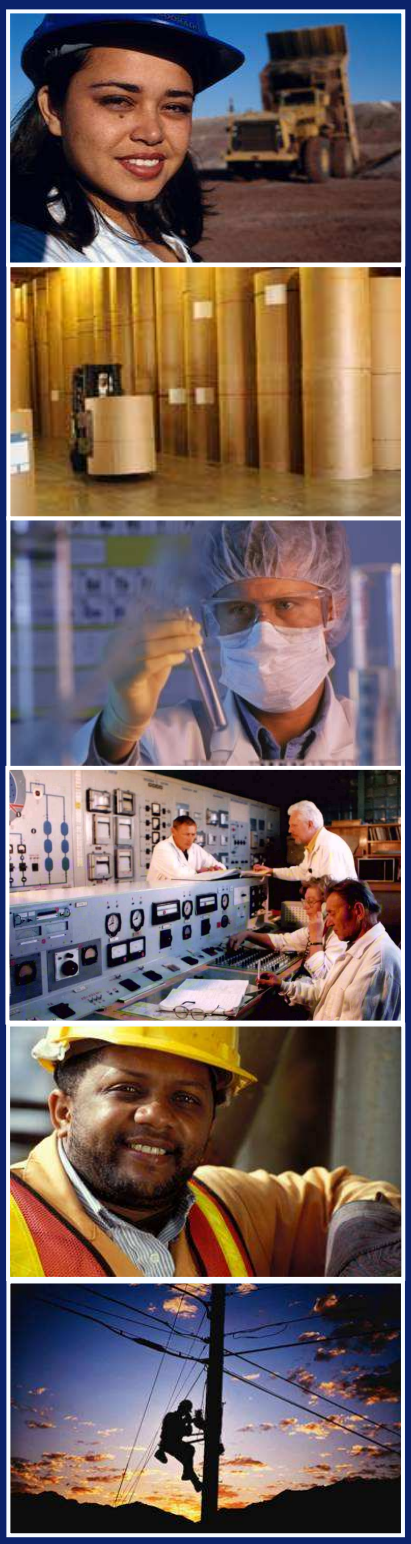
Managing a Shiftwork Lifestyle

A Workbook & Reference Guide for Shiftworkers



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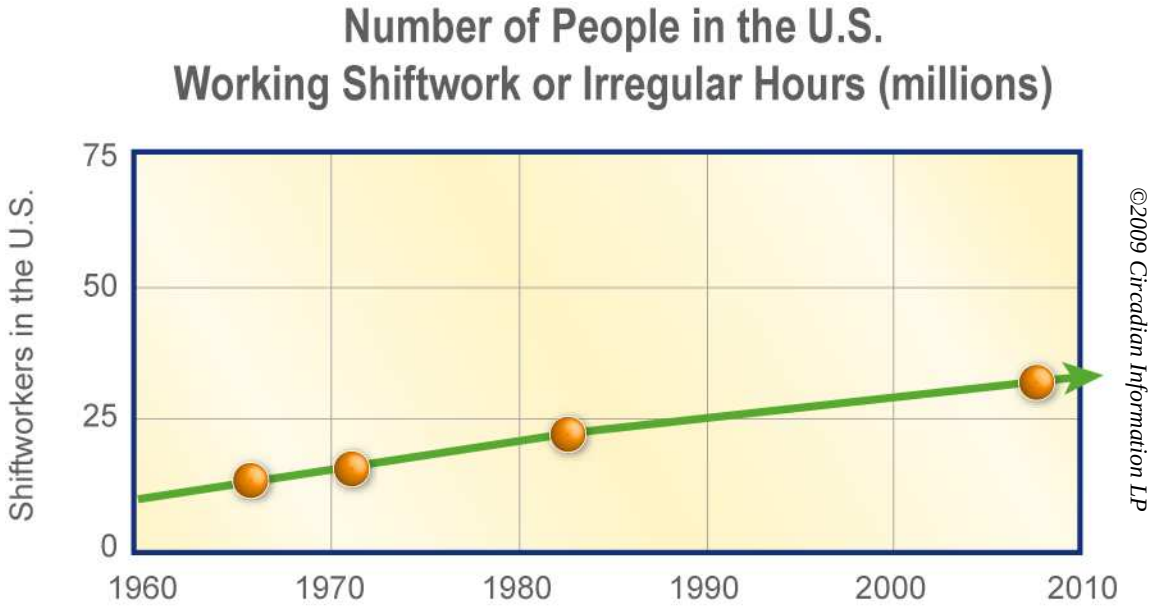
Introduction:
The Growth of Shiftwork

Nearly 30 million people are currently working shiftwork and irregular schedules in North America alone, and the growth trend of shiftwork is increasing (see chart below). Those who work rotating or irregular shifts have different challenges than straight day workers because shiftwork has an effect on sleep, alertness, health, and family and social life. To alleviate these problems takes a change in lifestyle, which is something that shiftworkers can control.

If shiftworkers recognize and understand the cause of these issues and take steps to cope with them, their alertness level, performance, physical health, and sense of well-being can be improved. These benefits should be apparent not only in the workplace, but in better use of free time and improved family and social life.

This book has been tailored to address the special challenges that shiftworkers face in their everyday lives. It would be impossible to condense all of the information available into a 4-hour training session. As a result, this book is designed to not only follow along with the presentation, but also to fill in with more detailed information on each of the subjects that can be reviewed at one's leisure. This book will also serve as a reference for solutions to problems you may encounter as a result of your shiftwork lifestyle.

If you are having severe difficulty coping with shiftwork, contact your HR or Safety & Health Department, and always consult your physician.



CHAPTER 1

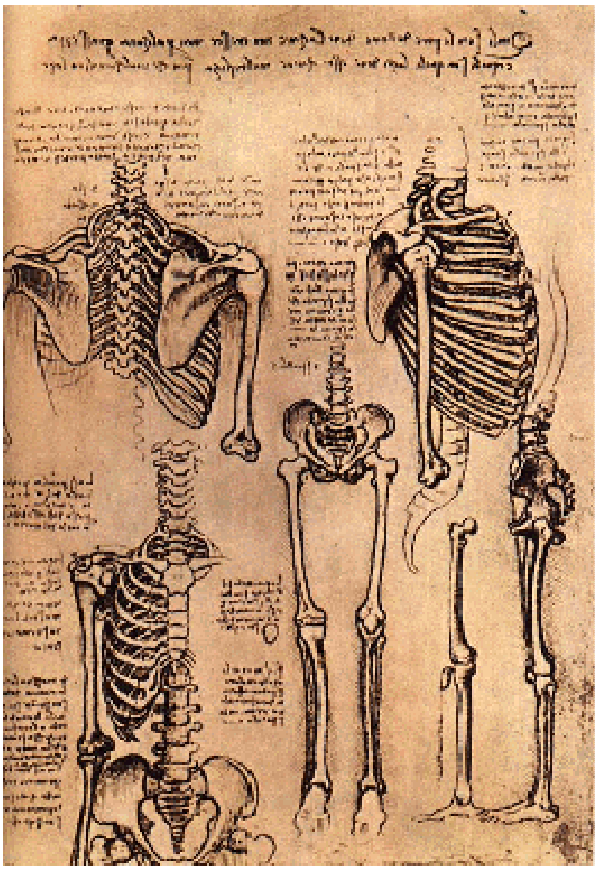
Your Biological Clock

"Looks like Charlie's biological clock needs new batteries..."

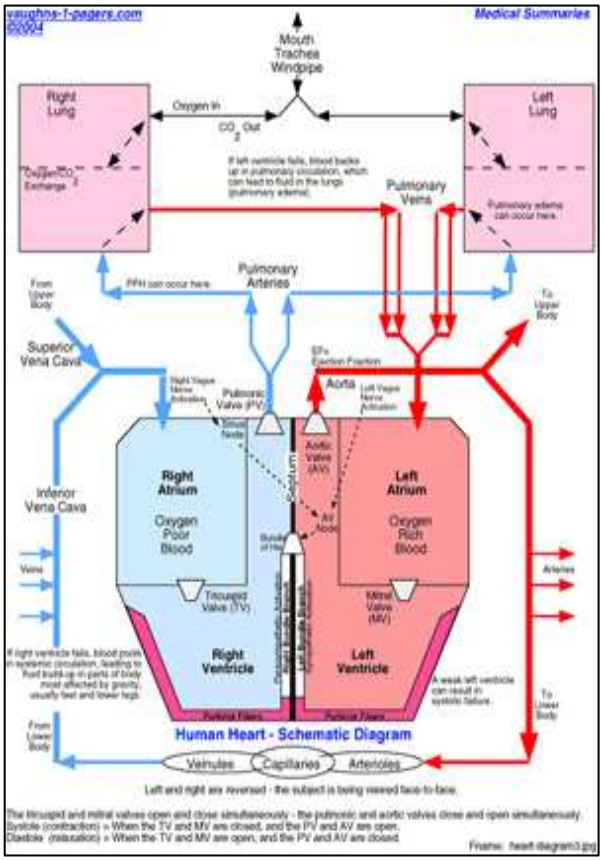
Design Specs

That's right - design specifications! You are the most sophisticated machine in the world, and yet we usually take better care of the equipment at work than we do our own bodies.

The human body is similar to a machine in that it has certain limitations to its performance. One of these limitations is that we are designed for peak operation during the day but not for peak performance at night. Our daily biological rhythms dictate that our body functions slow down at night, recharge while we sleep, and then get us up and running the next day.



Source: Leonardo da Vinci



Source: http://www.vaughns-1-pagers.com/medicine/heart-diagram.htm

Human Design Specs

Since the beginning of humankind, we have been active by day and sleeping at night. Perhaps because our poor night vision, poor sense of smell, and slower reflexes made us more vulnerable to the nighttime predators in the primitive world, we retreated to the safety of shelter and slept out of harm's way.

Thus our biological functions and energy levels came to operate on a cycle or rhythm of about 24 hours, what scientists call "circadian rhythms." We rose with the sun and we set with the sun. For most of human history, that was our daily routine. But in 1883 one man changed all that - Thomas Edison invented the light bulb and forever changed the way we live and work. We may have conquered the night, but we have not evolved our genetic code; therefore, our bodies are not able to adjust immediately to working nights.

Today, the demands of our modern economy require that many of us work around the clock, but our circadian rhythms continue to rise and fall as they have been since the beginning of time. This not only affects how we feel, but also how well we perform.

Humans were not designed for sustained peak performance at night

Then…

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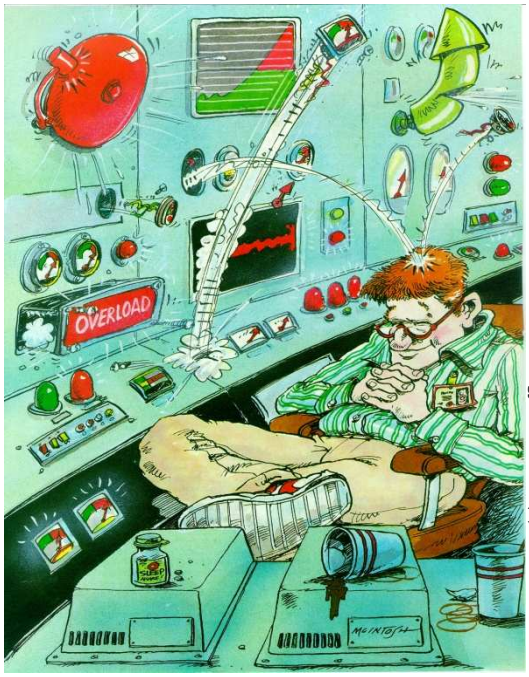
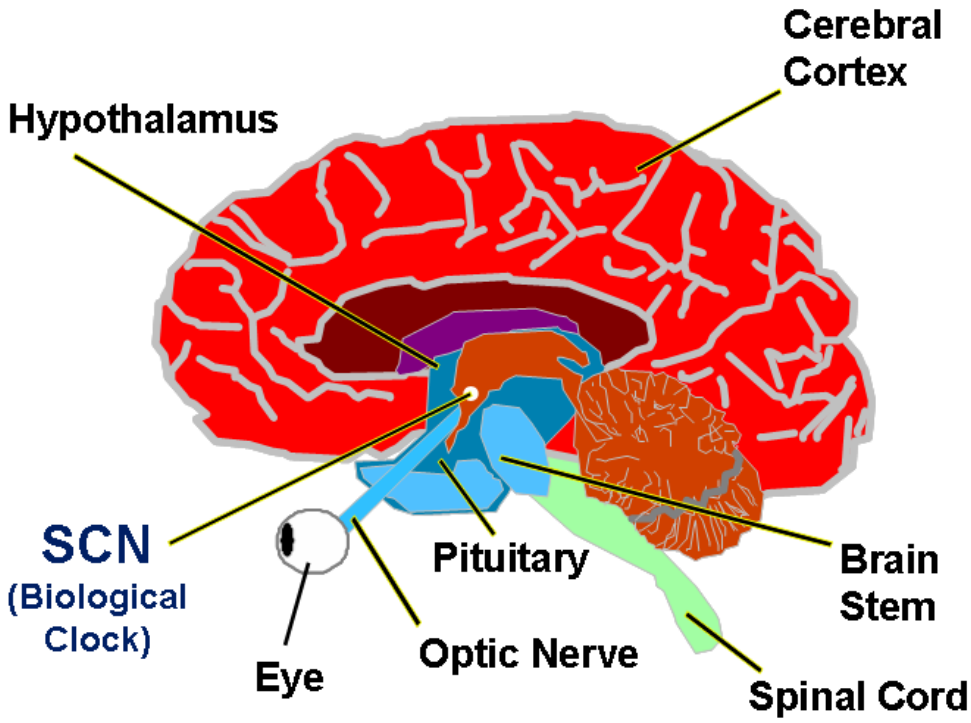
…and Now



Moore-Ede MC. Alert at the switch. Technology Review 96 (7): 52-59, 1993.

Our Biological Clock: The Suprachiasmatic Nucleus

Virtually every function in the human body follows a daily rhythm that includes sleep, digestion, hormone secretions, and alertness levels. A tiny cluster of cells in the brain (called the Suprachiasmatic Nucleus or SCN), located at the chasm where the two optic nerves cross, controls all these rhythms. The SCN is our biological clock. Basically, the biological clock is like a pacemaker. It activates and deactivates other areas in the brain to maintain our body rhythms and to keep our biology in perfect daily synchronization



Ultradian Rhythms: How They Affect Alertness & Sleep

The difference between circadian and ultradian rhythms is that while circadian rhythms follow patterns of approximately 24 hours, ultradian rhythms run in cycles lasting less than a day.

Many ultradian rhythms run in cycles of 90 to 100 minutes, with the clearest example being the 90-minute cycle that occurs during sleep. After falling asleep, we pass through the 5 stages of sleep in about 90 to 100 minutes.

Studies have found that ultradian cycles continue during wakefulness and are less prominent during sleep. Documented examples of ultradian rhythms in the 90- to 100-minute range include urine production, oxygen consumption, pain perception, sleepiness and performance on tests of reaction time and motor skills, according to the Encyclopedia of Sleep and Dreaming.

Being aware of your ultradian rhythms can help you adopt successful strategies for staying alert through the difficult overnight hours. Sleepiness tends to come and go in waves due to ultradian rhythms' effects. Once you learn to recognize the signs of an impending dip — sluggishness, difficulty concentrating, an inability to remember the last few minutes — you can take preemptive action, such as making a few trips up and down the stairs or having a snack.

In the chart below, the circadian rhythm for sleep pressure is shown by the thicker line, which shows greater sleep pressure between midnight and 6 a.m. as well as during the post-lunch dip. On the other hand, the ultradian rhythm for sleep pressure, represented by the thinner line, shows an increase in sleep pressure every 90-100 minutes.

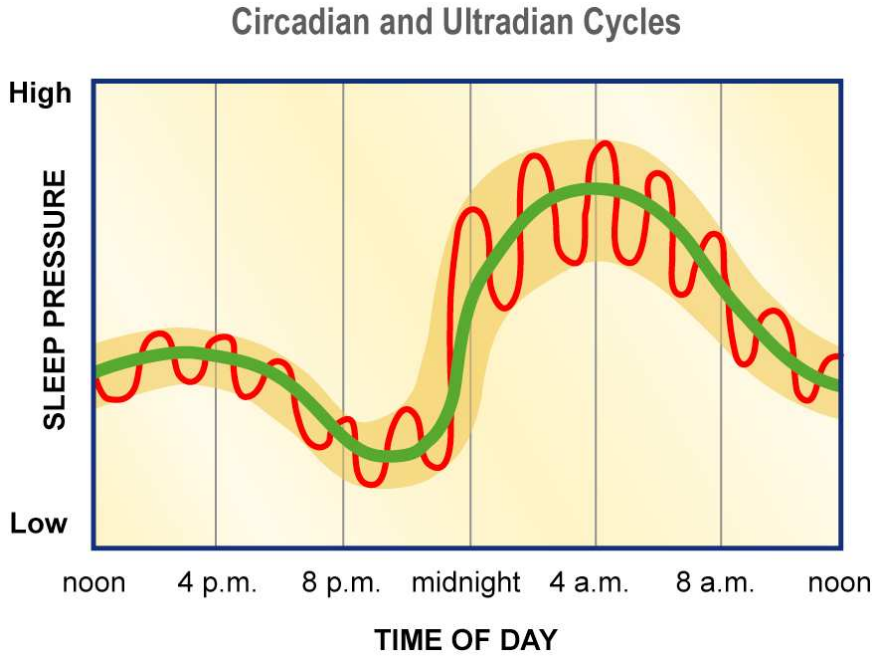
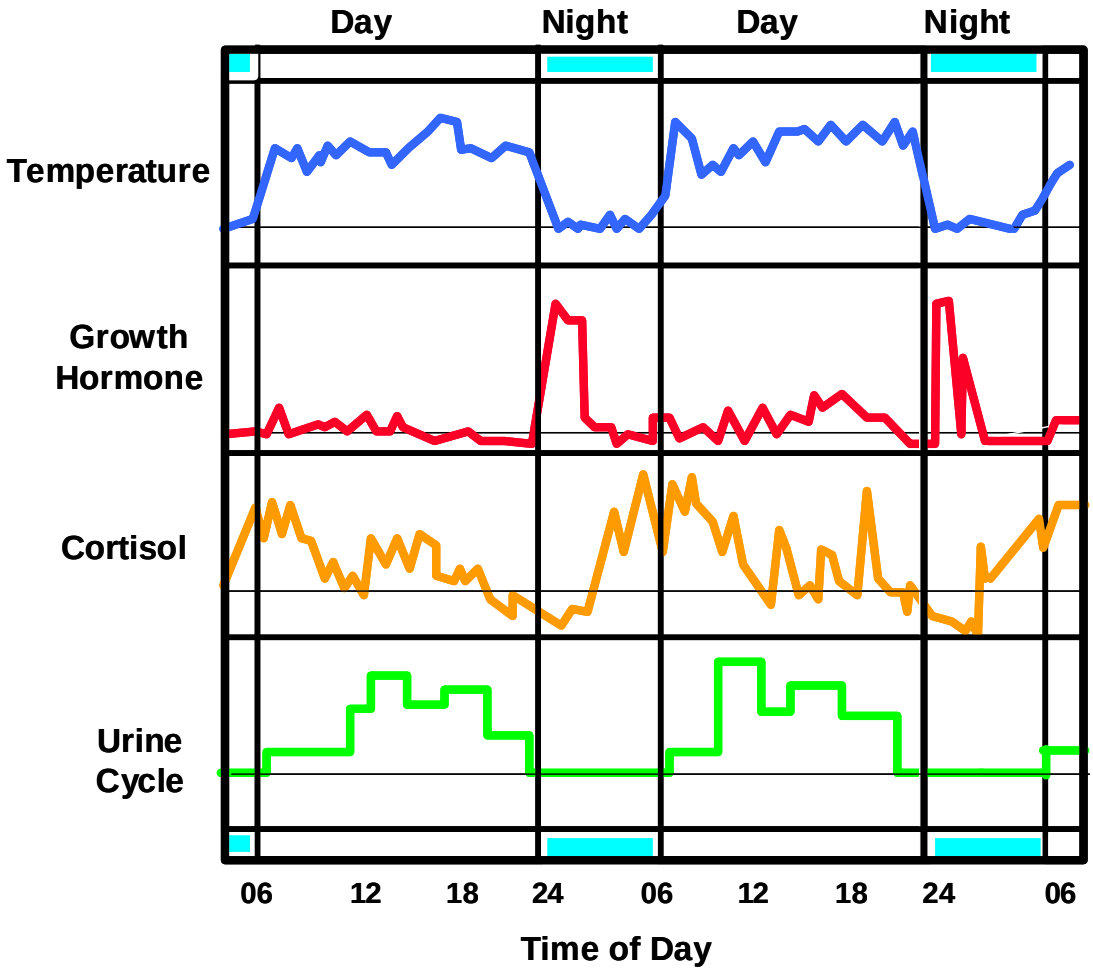


Chart Source: Lavie P. Ultradian rhythms:gates of sleep and wakefulness. Experimental brain research; 1985, suppl. 12, pg. 148-164.

Daily Rhythms

Our biological clocks have been programmed to operate on a cycle or rhythm of about 24 hours. Virtually every function in the human body follows a daily rhythm, including heart rate, blood pressure, blood concentration of hormones, breaths per minute, rate of salivation, sensitivity to pain, fatigue and alertness, how long it takes to fall asleep, anxiety and mood, physical strength and performance, reaction time, and even short-term and long-term memory.

This chart shows a few examples of our daily rhythms. Our core body temperature is fairly constant throughout the day, but takes a significant drop at night to help us sleep. The peak secretion of growth hormone (which helps repair the body) occurs during the early night. On the other hand, the peak secretion of the hormone cortisol occurs during the later part of the night, and this helps us to get ready to wake up and start our daily activities. Lastly, even our urine production and release has a daily cycle – during the day our kidneys are working at full capacity to flush the waste out of our system, while at night they are designed to slow down so you are not waking up throughout the night to go to the bathroom.

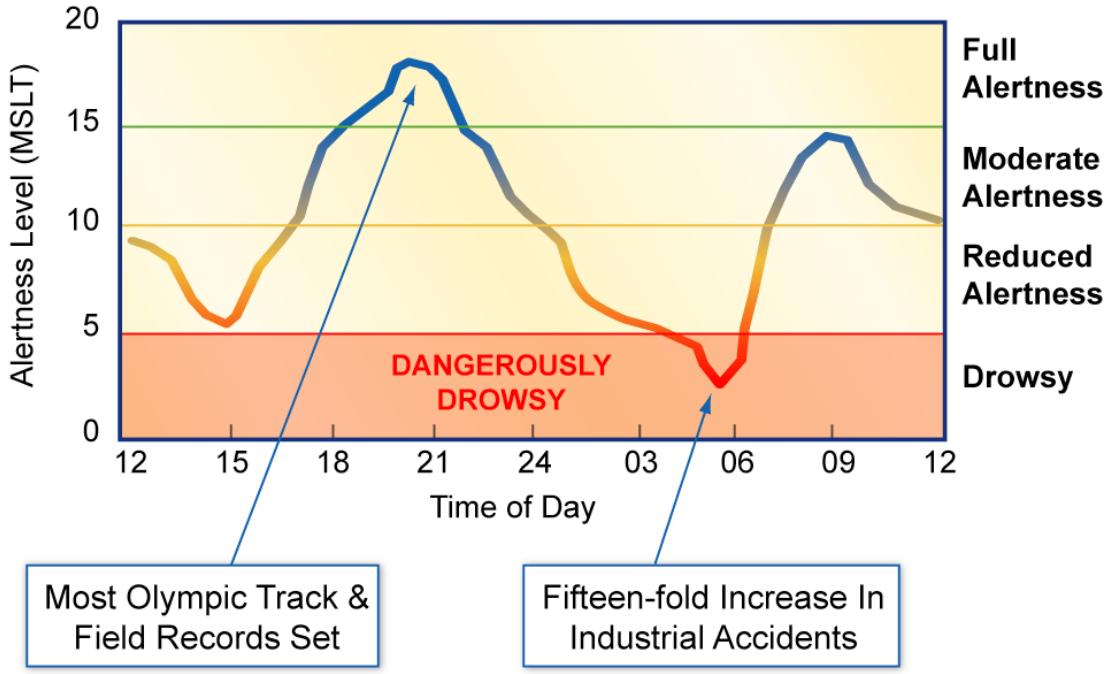


The Circadian Rhythm Of Alertness

Human alertness also has a circadian rhythm. Basically, our alertness is higher during the day and decreases during the night. As indicated on the chart below, we typically have two peaks and two valleys of alertness each day. One valley (or low point of alertness) occurs in the early morning between 3 – 6:00 a.m. when our alertness levels typically reach their lowest point. We then begin to feel the waves of sleepiness wash over our brains; our head becomes heavy; we lose our appetite; our reaction time slows down; and our memory becomes fuzzy. Maybe not coincidentally, this is also the time of lowest core body temperature and lowest blood pressure. It is also the time when industrial and transportation accidents are up to 15 times more likely!

The second low point occurs when we get drowsy after lunch, typically between 1 and 3 p.m., which is better known as the post-lunch dip. At work, depending on how automated one's process is, safety incidents and production mistakes often increase during this period of drowsiness.

On the other hand, peak alertness is usually around 6:00 - 8:00 p.m. in the evening. Not coincidently, this is the time that most Olympic records have been set. It is also the time of fewest motor vehicle accidents, and it is the time of fewest industrial accidents as well.



Performance And Circadian Rhythms

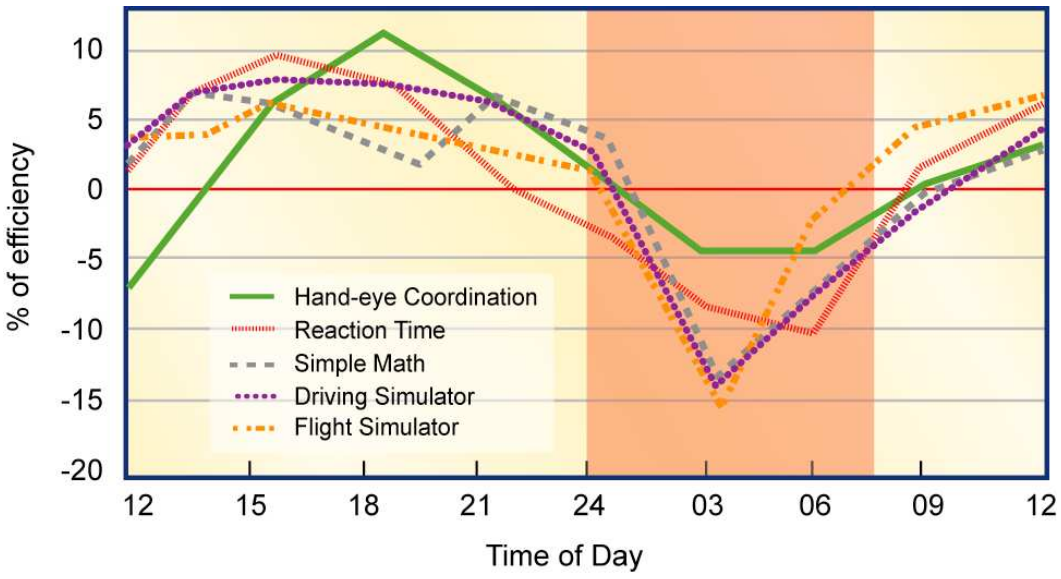
Human performance also shows daily fluctuations and they correlate to alertness levels. We are typically more efficient during the day, while performance decreases during the night.

As shown in the chart below, this pattern is true for most tasks, such as coordination & motor skills, mathematical tests, tasks involving short-term memory, and driving simulations. The scores on all of these tests were higher during the daytime hours (1500-2100), while the lowest scores occurred during the nighttime hours of 0100-0800.

Just as our alertness is typically higher between 1500-2100, so is our performance. An interesting study done on Monday Night Football shows the same correlation between performance and time of day.

Out of 63 “intercoastal” Monday night games from 1970 to 1994, the West Coast team won 64% of the time, according to a study at Stanford University. The West Coasters also beat the point spread 68% of the time. Study author Roger Smith suggests that because West Coast players’ biological clocks are still set to California time (on both coasts), they essentially play the game between 6 p.m. and 9:30 p.m. — hours of peak alertness and athletic performance. East Coasters, meanwhile, are playing from 9 p.m. to 12:30 a.m., the latter part of which may be associated with declines in performance.

A separate study by Leonard Kass at the University of Maine found similar problems for teams competing in different time zones. During March Madness, Kass discovered that higher-ranked basketball teams that had to travel cross country to play in the NCAA national basketball tournament were twice as likely to be upset in the first round game than those in their own time zones. “The kiss of death is shifting three time zones,” says Kass. “If higher-ranked teams shift across three time zones, they have a better than 50 percent chance of losing.”



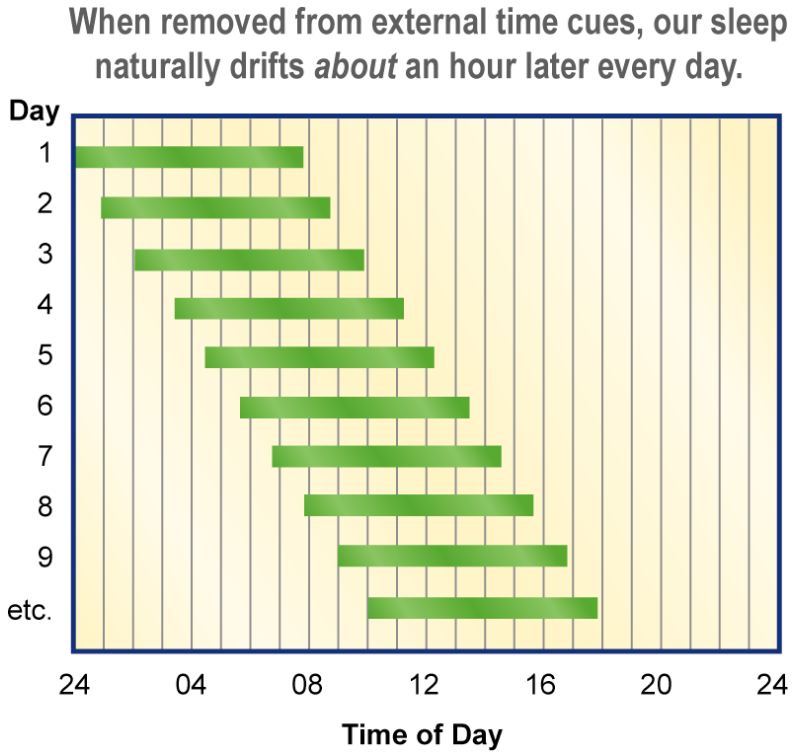
Why Is The Timing Of The Biological Clock Important?

Remarkably, our bodies' circadian rhythms actually run on a cycle slightly longer than 24 hours. If all time cues are removed, therefore, we would unknowingly go to bed about one hour later each day. That's why we typically find it easier to go to bed a little later than to get up a little earlier. Many people on straight day jobs who stay up later and sleep in later on the weekends often suffer the "Monday morning blues" because they have a hard time getting up earlier on Monday after letting their sleep patterns drift later on the weekends.

Even though our bodies naturally want to drift to a later time, time cues reset our biological clocks, thus keeping us "in-tune" with the world's 24-hour society.

The biological clock can adjust by an hour or two a day without much problem, but it simply cannot immediately adjust to an 8-hour or 12-hour change between shifts. In fact, circadian rhythms never fully adapt to the night shift because of sunlight's effect on the biological clock and because people tend to revert to a daytime schedule on days off.

As depicted in the chart on the below, in experiments where people live in isolation — away from clocks and sunlight — they progressively go to bed about one hour later each day.



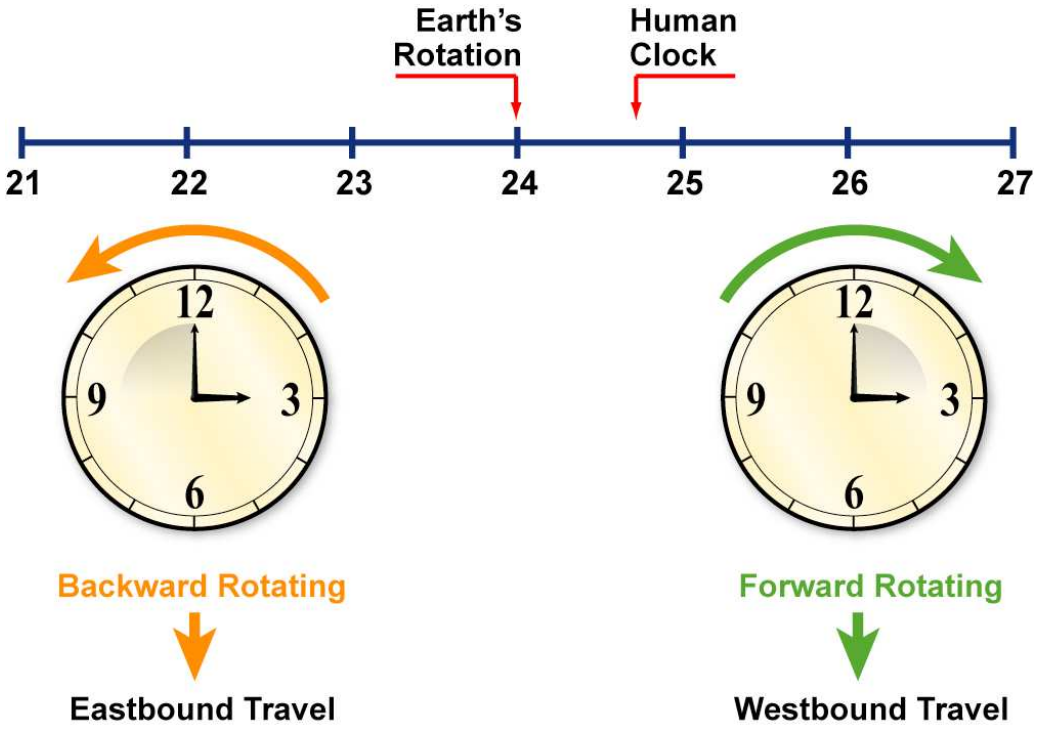
The Biological Clock And Shiftwork

The fact that the biological clock is designed to run on a cycle longer than 24 hours also helps explain the mysteries of jet lag. Many travelers notice that it is easier to adjust to the new time zone when traveling west than traveling east. By going west, we "gain" time and actually go to bed later according to our internal clocks. Therefore, since our internal clocks naturally want to drift later, it is easier to adjust to this time zone. However, when we travel east, we "lose" time and are going to bed earlier according to our internal clock, and this is more difficult to adjust to.

Likewise, the shiftworker on rotating shifts has all the symptoms of jet lag. If you work the day shift one week, the night shift the next week, followed by the evening shift for a week, you have done the equivalent of flying from Denver to Paris to Tokyo and back to Denver.

Because of this, many shiftworkers feel that a forward rotation is easier to adjust to than is a backward rotation. The body's natural tendency to drift forward is best accommodated by a rotation that moves forward as well, as is the case in a Day to Evening to Night rotation.

One of the results of a backward or rapidly rotating schedule is "Industrial Jet Lag," a constant state of fatigue that results when the body never has a chance to adjust to the changes.



Time Cues - “Zeitgebers”

Time cues also influence the human biological clock. The most effective cues are light and darkness. Other time cues are social interaction, timing of meals, clocks, and exercise or physical activity. These time cues are called “Zeitgebers” or time givers because they help to synchronize and reset our internal clock to the 24-hour day.

Changing the sleep-wake and work schedule disrupts our natural circadian rhythms and the biological clock needs to be reset to the new schedule. However, adapting to a new schedule can take several days, since our biological clock can only be shifted a few hours each day. This is why the first couple of night shifts are usually the most difficult.

Individual Differences

1. WHAT HAPPENS WHEN YOU AGE?

When you become older, your biological clock and other systems in your body change:

- Sleeping patterns tend to become more rigid (it becomes more difficult to change your bedtime/wake up time and try to sleep at different times)
- You become more of a "morning person"
- You often use naps to make up for lost sleep

On the other hand, you have become accustomed to your work schedule and you have established a lifestyle that suits you and helps you stay alert and healthy.

2. LARKS AND OWLS:

People differ as to when they prefer to go to bed at night and rise in the morning. This "circadian profile" is not a matter of personal preference but a genetically determined characteristic.

Morning Types (Larks):

- Prefer to go to bed before 9 p.m.-10 p.m.
- Prefer to wake up before 7 a.m.
- Are quite rigid in their sleep patterns (find it difficult to sleep at different times of the day)

Evening Types (Owls):

– Prefer to go to bed after midnight or 1 a.m.
– Prefer to wake up after 9 a.m.
– Find it easy to adjust to changes in their sleep patterns

Intermediate Types (Regular Robins):

– Prefer to go to bed between 10 p.m.-12 a.m.
– Prefer to wake up around 7-8 a.m.
– Can adapt to changes in sleep patterns

Most people are intermediate types, but about 10% of people are morning or evening types. Extreme types may have trouble adapting to their work schedule (morning types find it difficult to wok at night, evening types have difficulties when working early morning shifts).

Individual Circadian Profile

Are you really a morning or evening person? There are genetic differences in circadian rhythms between individual people that influence sleep-wake patterns, alertness at different times of the day or night, and adaptability to shift schedules. Please answer each question as honestly as possible by marking the number for the choice that best matches your individual preference. Add up all these numbers to determine your total score.

1.) Considering only your own "feeling best" rhythm, at what time would you get up if you were entirely free to plan your day?

5:00-6:30 a.m.	_____ (5)
6:30-7:45 a.m.	_____ (4)
7:45-9:45 a.m.	_____ (3)
9:45-11:00 a.m.	_____ (2)
11:00 a.m.-12:00 (noon)	_____ (1)

2.) Considering only your own "feeling best" rhythm, at what time would you go to bed if you were entirely free to plan your evening?

8:00-9:00 p.m.	_____ (5)
9:00-10:15 p.m.	_____ (4)
10:15 p.m.-12:30 a.m.	_____ (3)
12:30-1:45 a.m.	_____ (2)
1:45-3:00 a.m.	_____ (1)

3.) Assuming normal circumstance, how easy do you find getting up in the morning? (Check one.)

Not at all easy	_____ (1)
Slightly easy	_____ (2)
Fairly easy	_____ (3)
Very easy	_____ (4)

4.) How alert do you feel during the first half hour after having awakened in the morning? (Check one.)

Not at all alert	_____ (1)
Slightly alert	_____ (2)
Fairly alert	_____ (3)
Very alert	_____ (4)

5.) During the first half hour after having awakened in the morning, how tired do you feel? (Check one.)

Very tired	_____ (1)
Fairly tired	_____ (2)
Fairly refreshed	_____ (3)
Very refreshed	_____ (4)

6.) You have decided to engage in some physical exercise. A friend suggests that you work out twice a week for an hour and the best time for him is 7:00-8:00 a.m. Bearing in mind nothing else but your own "feeling best" rhythm, how do you think you would perform?

Would be in good form	_____ (4)
Would be in reasonable form	_____ (3)
Would find it difficult	_____ (2)
Would find it very difficult	_____ (1)

7.) At what time in the evening do you feel tired and, as a result, in need of sleep?

8:00-9:00 p.m.	_____ (5)
9:00-10:15 p.m.	_____ (4)
10:15 p.m.-12:30 a.m.	_____ (3)
12:30-1:45 a.m.	_____ (2)
1:45-3:00 a.m.	_____ (1)

8.) You wish to be at your peak performance for a test which you know is going to be mentally exhausting and lasting for two hours. You are entirely free to plan your day, and considering only your own "feeling best" rhythm, which ONE of the four testing times would you choose?

8:00-10:00 a.m.	_____ (4)
11:00 a.m.-1:00 p.m.	_____ (3)
3:00-5:00 p.m.	_____ (2)
7:00-9:00 p.m.	_____ (1)

9.) One hears about "morning" and "evening" types of people. Which ONE of these types do you consider yourself to be?

Definitely a morning type	_____ (4)
More a morning than an evening type	_____ (3)
More an evening than a morning type	_____ (2)
Definitely an evening type	_____ (1)

Adapted from: Horne JA, Ostberg O. A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. Int. J. Chronobiol. 4:97-110. 1976.

Individual Circadian Profile

10.) When would you prefer to rise (provided you have a full day's work – 8 hours) if you were totally free to arrange your time?

Before 6:30 a.m..	_____ (4)
6:30-7:30 a.m.	_____ (3)
7:30-8:30 a.m.	_____ (2)
8:30 a.m. or later	_____ (1)

11.) If you always had to rise at 6:00 a.m., what do you think it would be like?

Very difficult and unpleasant	_____ (1)
Rather difficult and unpleasant	_____ (2)
A little unpleasant but no great problem	_____ (3)
Easy and not unpleasant.	_____ (4)

12.) How long a time does it usually take before you "recover your senses" in the morning after rising from a night's sleep?

0-10 minutes	_____ (4)
11-20 minutes	_____ (3)
21-40 minutes	_____ (2)
More than 40 minutes	_____ (1)

13.) Please indicate to what extent you are a morning or evening active individual?

Pronounced morning active (morning alert and evening tired)	_____ (4)
To some extent, morning active	_____ (3)
To some extent, evening active	_____ (2)
Pronounced evening active (morning tired and evening alert)	_____ (1)

TOTAL SCORE: (Add all of the numbers you marked for each of the 13 questions above) _____

What Your Score Means	
22 or less	Strong Night Owl
23-29	Moderate Night Owl
30-36	No Strong Tendencies – Regular Robin
37-43	Moderate Morning Lark
44 or more	Strong Morning Lark

Adapted from: Horne JA, Ostberg O. A self-assessment questionnaire to determine morningness-eveningness in human circadian rhythms. Int. J. Chronobiol. 4:97-110. 1976.

NOTES:

CHAPTER 2

What Is Sleep?

Sunday afternoon at the Phillips' household: father and son take time out to recharge their batteries…

Why Is Sleep Important?

Good quality and quantity sleep allows us to perform at our optimum, both physically and mentally.

PHYSICALLY:

- Enables the body to significantly recuperate and restore energy
- Enables the body to repair itself
- Helps our immune system to work at its best

MENTALLY:

- Essential part in our mental well-being
- Sleep deprivation can lead to anxiety and depression
- Crucial to memory retention and the learning of new motor skills

KEEP IN MIND:

- Most shiftworkers experience some kind of difficulty with sleep
- The best way to stay alert, productive, and feeling good on the job is to get better sleep at home

Don't Skimp On Sleep!

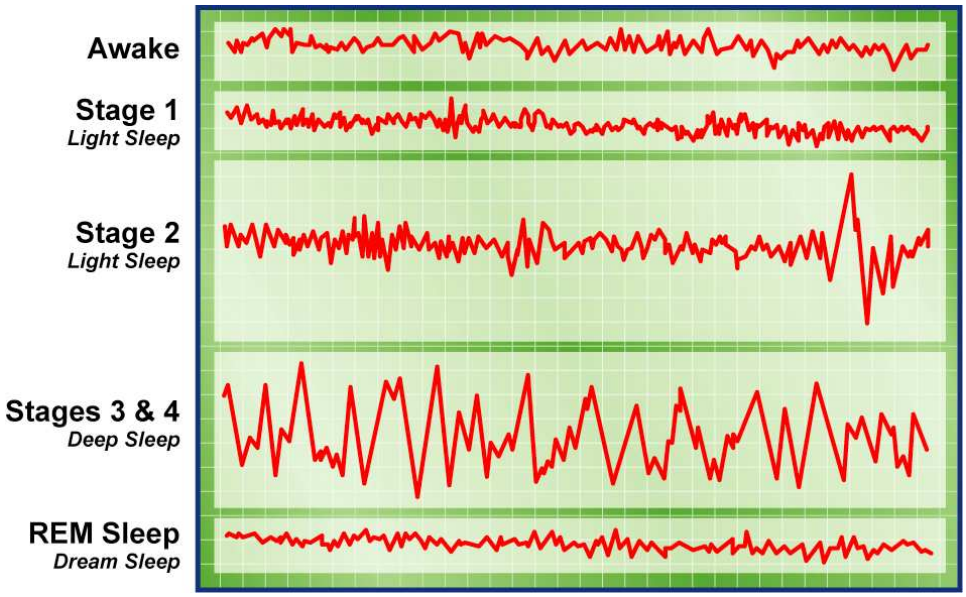
Normal Sleep Pattern

Researchers found that sleep is not just a shutting off of the brain. Instead, they found that a variety of brain wave activities repeat themselves over and over during a night of sleep. In fact, these brain wave activities run in cycles of about 90-100 minutes. As indicated on the chart below, sleep can be divided into five distinct stages: Stages 1 and 2 (light sleep), Stages 3 and 4 (deep sleep), and REM sleep (dreaming).

Stages 1 and 2 are considered "light sleep" because we can be easily awoken from these two stages. An example of Stage 1 sleep is when you are relaxed in a chair or in a bed with your eyes closed and are starting to fall asleep. If someone were to speak to you at this point, you could probably respond, and you might even argue that you weren't asleep at all. After a few minutes in Stage 1 sleep, we enter Stage 2, which is still light sleep, but you will notice in the chart below that brain waves are starting to slow down more in this stage of sleep.

After about 20 minutes of "light sleep," we enter the stages of "deep sleep," which are Stage 3 and Stage 4 sleep. These are the deep, physically restorative stages of sleep when the body carries out most of its repair work by sending out restorative hormones such as growth hormone. People awakened from Stage 3 or Stage 4 sleep are usually very sluggish and slow to react for up to half an hour.

The fifth stage of sleep is called REM sleep. After about 90 minutes of sleep, we return to the light stages of sleep and experience our first REM sleep episode. REM, which stands for "Rapid Eye Movement," is the phase of sleep in which we dream. Even though we are sleeping, the brain is very active during the REM stage. That is why it is easy to be awakened out of a dream, and why we feel quite alert when that happens. Notice on the chart that REM brain waves are very similar to the "Awake" brain waves.

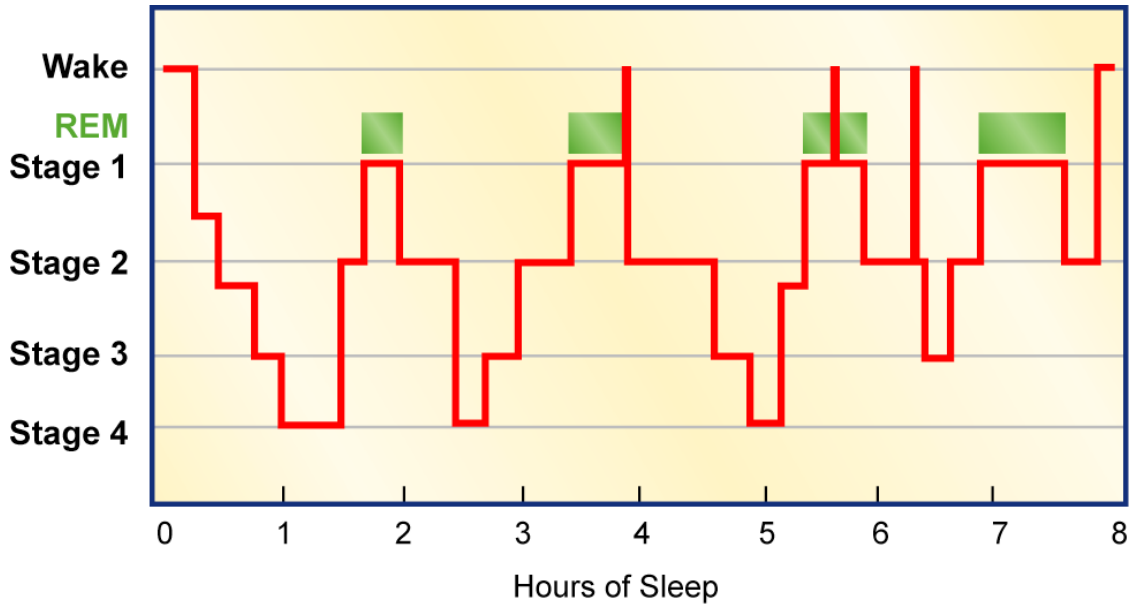


Normal Sleep Pattern

It is possible to map out the stages of sleep during a sleep episode and see that there is a clear structure to it. These patterns form what is called “sleep architecture.” In order for a person to feel fully rested and alert, this architecture must not be disrupted.

A complete sleep cycle, consisting of all 5 stages of sleep, lasts approximately 90-100 minutes. After we have completed the first sleep cycle, we go back to Stage 1 or 2 and start a new cycle. During a good night's sleep, we will complete 4-5 of these sleep cycles. We obtain most of the deep sleep (stages 3 and 4) at the beginning of the night, while REM episodes become longer during the later part of the night.

The chart below is the sleep architecture for a “normal” night of sleep where a person completes 4-5 sleep cycles over the course of a little more than 8 hours of sleep. This is what sleep experts would consider “good sleep.”



Key points from the chart above:

- Sleep architecture showing five 90-minute sleep cycles
- More deep sleep in the early part of the sleep
- More REM in the later part of the sleep episode

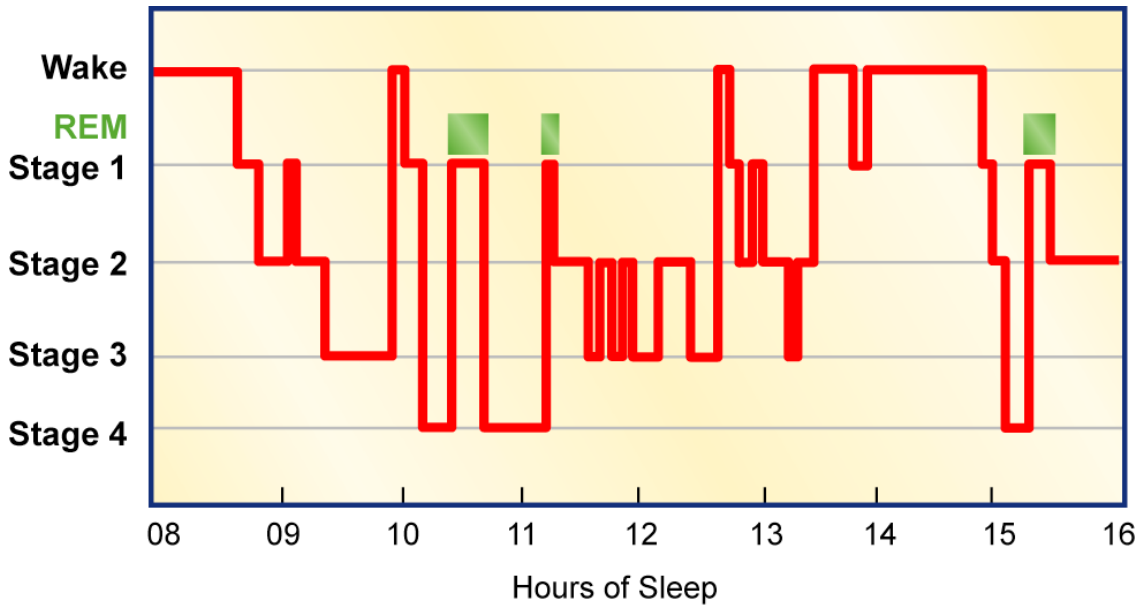
Daytime Sleep

As discussed earlier, we are not designed to sleep during the daytime, so daytime sleep is usually shorter and the quality not as good as nighttime sleep.

Usually it takes longer to fall asleep and we wake up more often during the day. In addition, daytime sleep usually contains less deep and restorative sleep stages and a greater proportion of light sleep. Reduction of time spent in these deep sleep stages means that you may still feel fatigued despite having slept for 5 or 6 or more hours.

The chart below shows the typical sleep architecture for someone who is trying to sleep during the daytime. Notice that there is less time spent in deep sleep than in the normal or "ideal" sleep architecture on the previous page. There is also more time spent in light sleep which, when combined with environmental cues such as light and noise, leads to more awakenings and a poorer quality of sleep.

However, despite the deficiencies of daytime sleep, it is still better to sleep in the day than to not sleep at all.



In this chart showing a daytime sleeping pattern, you'll notice the following problems:

- More frequent awakenings
- Less deep sleep
- Less REM sleep

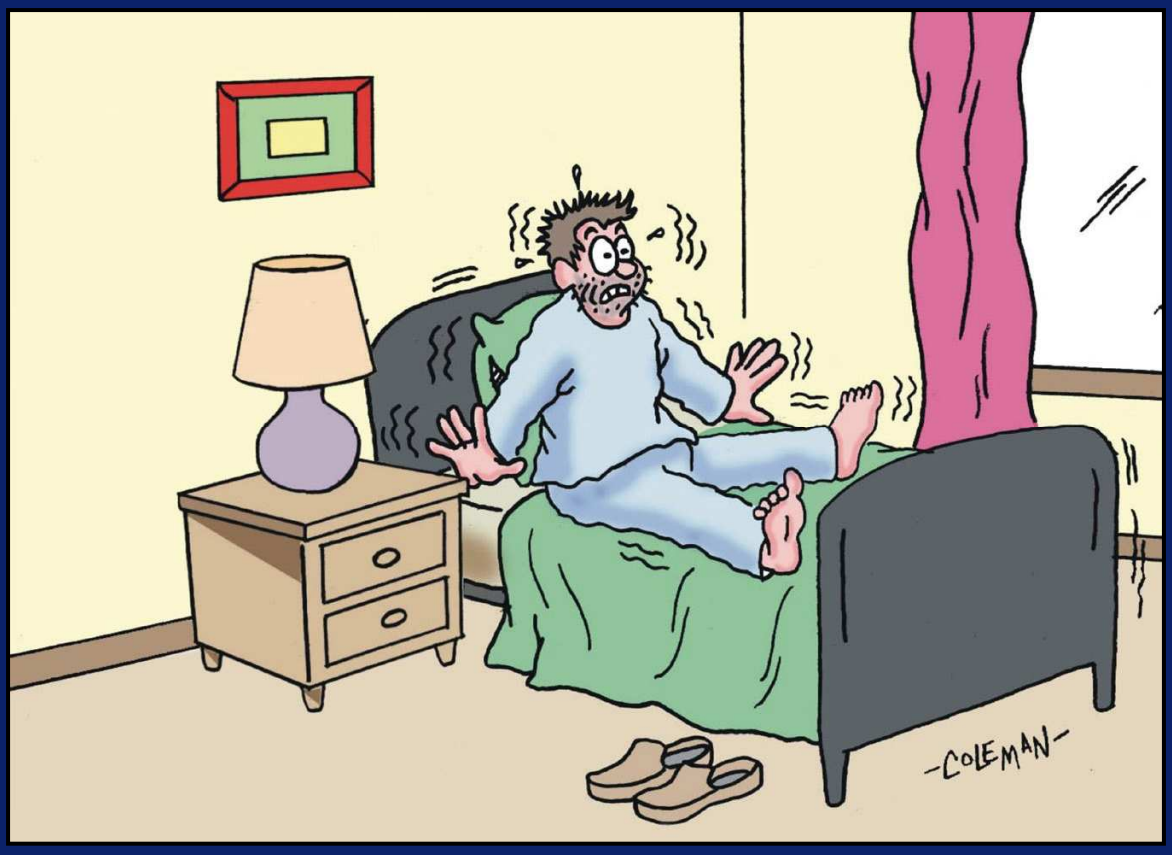
Why Is Daytime Sleep So Difficult?

There are several reasons why daytime sleep can be more difficult than nighttime sleep:

- Daytime sleep is affected by environmental factors: there is more light and noise in the daytime
- Daytime sleep is out of sync with our body's natural circadian rhythms
- Daytime sleep is out of sync with family and social schedules
- Changing your sleeping schedule often disrupts your circadian rhythms and causes insomnia

CHAPTER 3

Getting Better Sleep



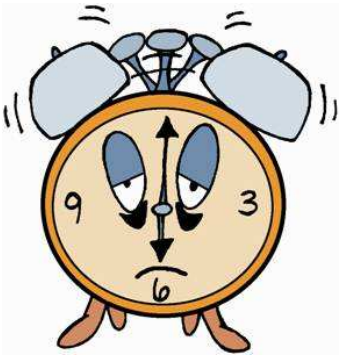
Wally found out the hard way that caffeine's effects are long lasting

How Much Do You Need?

- On average we need about 7-9 hours of sleep per night.
- However, there are differences among people, and sleep also changes at different times of life. For example, babies sleep in multiple episodes or naps, but adults sleep in one sleep block for about 6-9 hours, and senior citizens go back to napping again.

4 CATEGORIES OF SLEEP BEHAVIOR:

- **Long sleepers vs. short sleepers** - how much sleep we need is a genetically-determined characteristic. Long sleepers are people who need to sleep more than 9.5 hours to feel well, while short sleepers need less than 6 or 6.5 hours of sleep to feel well. The vast majority of us need 7-9 hours of sleep to feel well.
- **Rigid sleepers vs. flexible sleepers** - some people need to go to bed and wake up at the same time every day, while others can easily adjust their sleep patterns to accommodate change.
- **Larks vs. Owls** - morning people and evening people.
- **Nappers vs. non-nappers** - some people can make up for lost sleep with naps whereas others can't.



What Can Go Wrong!

For most people, the enemies of sleep are found in our lifestyle:

Too Busy

Too Stressed

Underexercised

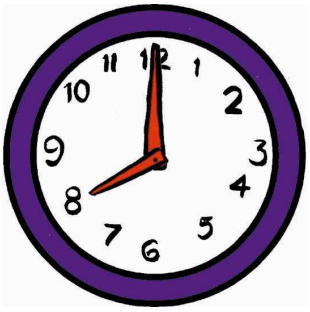
Overweight

Improving Your Sleep

FOUR AREAS TO MANAGE

Environment

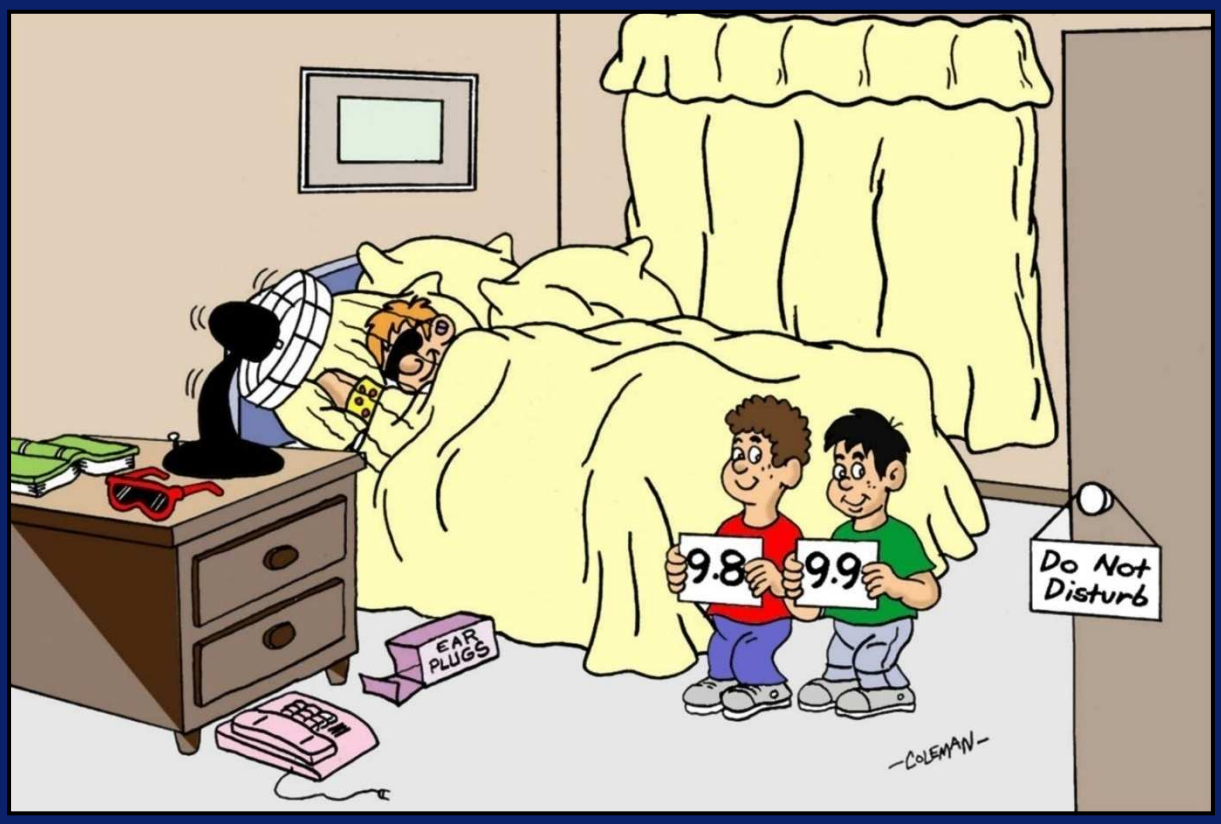
Lifestyle



Schedule

Sleep

Managing Your Sleep Environment



After six years of shiftwork, Bernard's daytime sleep routine was nearly perfect

The Effect Of Light On Sleep Quality

Even low levels of light can keep you awake or disrupt your sleep

For quality daytime sleep, make your bedroom as dark as possible:

- Use double-thick, heavy drapes
- Use a sleeping mask
- Put aluminum foil over windows
- Build a bedroom in your basement

Ambient Noise

Loud, intermittent or irritating noises make it difficult to sleep, while soft, soothing sounds or “white noise” will encourage sleepiness. White noise, which is a mixture of sound waves extending over a wide frequency range, is commonly generated by engines, computers and machinery. Depending on where you are, it can be a problem or solution. At work, white noise can lull you to sleep, especially if you’re struggling to stay alert during the overnight hours. But at home, white noise offers benefits because it masks outside noise that can interfere with sleep. Many shiftworkers use fans as white noise devices to drown out noise during the daytime.

Therefore, try to make your bedroom as quiet as possible by using the following:

- Fan or air filter
- White noise machine
- Earplugs
- Phone management – turn off the phone, turn on the answering machine in another room, etc.

Temperature And Ventilation

Keeping your bedroom at a comfortable temperature and well ventilated will help you get good sleep:

- Temperatures around 65-68° F are best for sleep
- Temperatures above 75 degrees and below 54 will disrupt sleep
- Use blankets to stay warm and induce sleep
- Use a fan to ensure good air flow

Bedding

Never underestimate the importance of a good mattress for getting quality sleep. Your mattress should be firm yet comfortable, supporting your body at all points. Always go mattress-shopping with your bed partner and lie down on as many models as possible to get an idea of what style and size mattress you want - queen or king sizes are recommended for couples. Mattresses should be replaced every 8 to 10 years. After all, your bed is the single most used piece of furniture in your house.

Good bedding includes:

- Comfortable mattress and pillow
- Clean sheets
- Comfortable blankets or covers

How Does Your Room Rate?

Use these guidelines to rate your room and how conducive it is to your getting and staying asleep. Respond to the following questions by circling the number that best matches the room in which you sleep, with 1 being poor up to 5 being excellent.

	Poor				Excellent
1. **Quiet:** My room is quiet, without loud or sudden noises.	1	2	3	4	5
2. **Dark:** I sleep in darkness using window shades, eye covers, sleeping in the basement, etc.	1	2	3	4	5
3. **Temperature:** My room is warm or cool enough to help me sleep.	1	2	3	4	5
4. **Comfortable Bed:** My bed is comfortable (mattress, blankets, pillows, etc.).	1	2	3	4	5
5. **Air Flow:** My room has adequate fresh air to help me sleep.	1	2	3	4	5
6. **Interruptions:** I am able to prevent interruptions of my sleep.	1	2	3	4	5

TOTAL SCORE: _____

How Does Your Room Rate?

How Does Your Room Rate?	
25-30	Well-designed
20-24	Good, but not great
Less than 20	Needs Work

Managing Your Lifestyle

"I've cut down to two cups per flight but I still can't seem to get to sleep in the morning

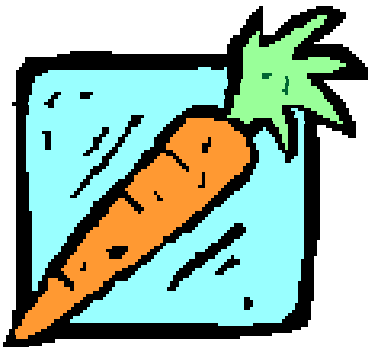
LIFESTYLE FACTORS THAT COULD CAUSE SLEEP DISRUPTION

Caffeine

Nicotine

Alcohol

Sleeping Pills



Diet

Caffeine: The Pros And Cons

THE PROS:

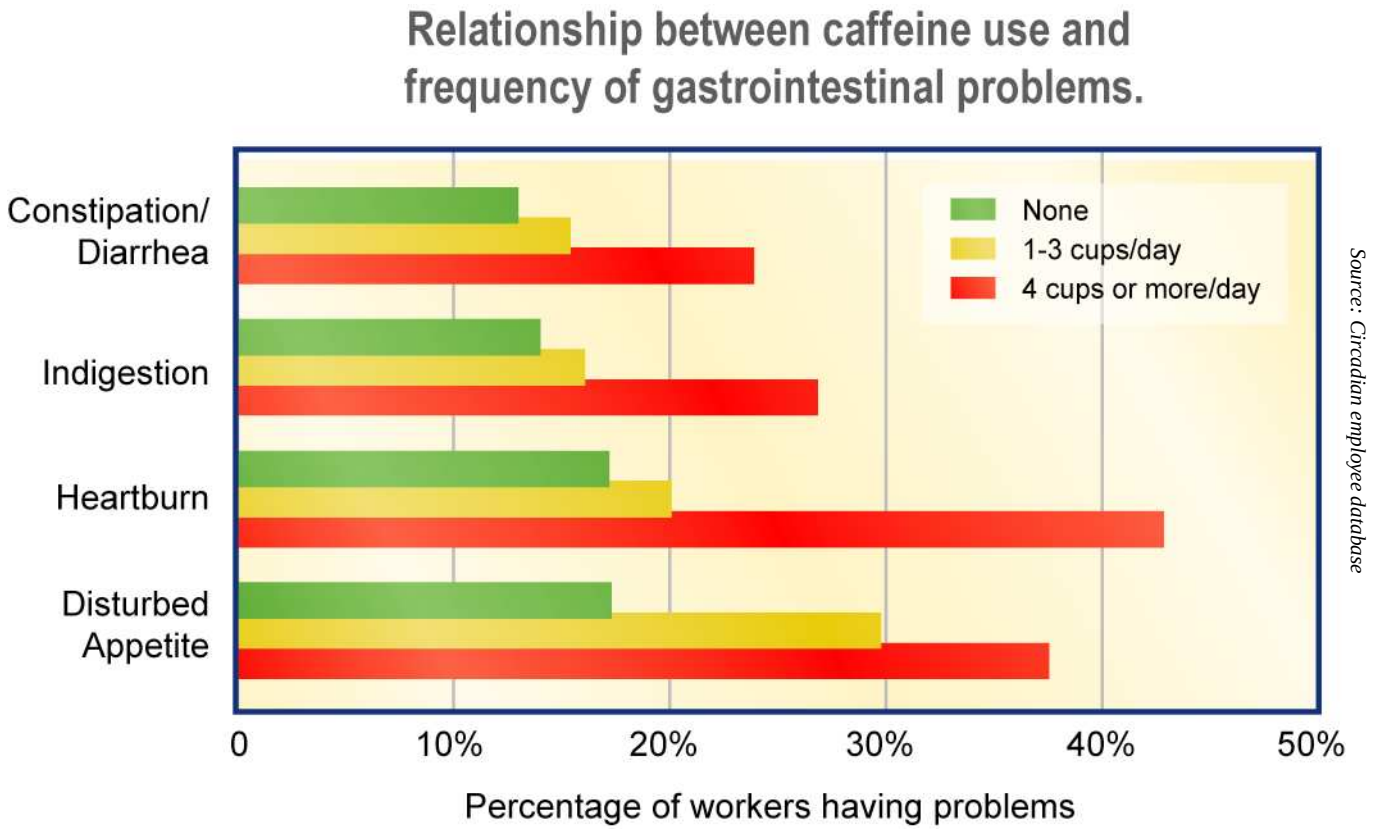
- Can increase alertness
- Can improve reaction time
- Can improve performance
- Can improve overall energy
- Works quickly (in about 30 minutes)
- The effects last for 3-5 hours in most people

THE CONS:

- Can cause gastrointestinal problems
- Stays in the body for several hours
- Caffeine is addictive; a dependence can develop
- Can disturb sleep and may worsen some sleep disorders
- High levels promote stress, anxiety and irritation
- Coffee is a mild diuretic (increases urine production)
- Cutting back quickly can cause withdrawal symptoms

Caffeine

High caffeine intake is associated with an increased prevalence of gastrointestinal problems. Thus compared to workers who do not drink caffeinated beverages, or drink in moderation, those consuming 4 or more caffeinated beverages per day are more likely to have disturbed appetite, heartburn, indigestion, and constipation/diarrhea.

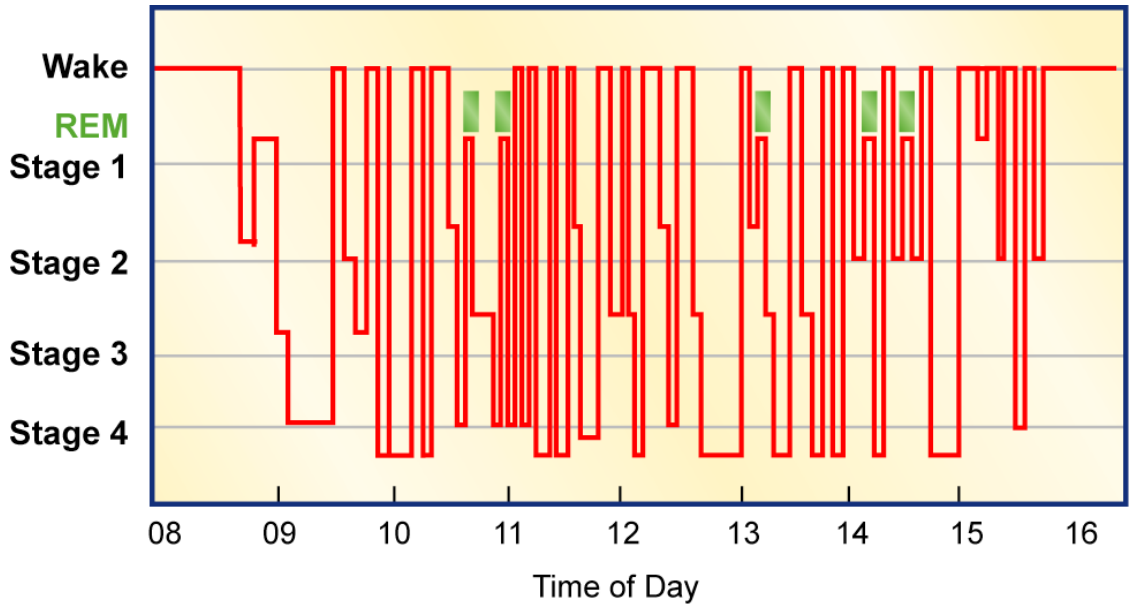


Source: Circadian employee database

Caffeine Can Affect Sleep Quality

Some people may be able to fall asleep after consuming caffeine, but that does not mean the quality of sleep will be very good. This chart shows the daytime sleeping pattern of an individual who consumes too much caffeine. You'll notice the following problems:

- Takes longer to fall asleep
- Less deep sleep (Stages 3+4)
- Less REM sleep
- More frequent awakenings



Caffeine Survey

In order to increase awareness of the dangers of excessive caffeine intake, it is useful to determine how much caffeine is consumed per day by using the following guide:

Note: the following are averages and may vary per serving.

CAFFEINE TYPE		X	NUMBER OF SERVINGS =	TOTAL CAFFEINE
1. Coffee and Tea (milligrams per 10 oz. cup)				
Drip coffee		260		
Percolated coffee		220		
Instant coffee		120		
Decaffeinated coffee		4		
Tea (weak brew)		80		
Tea (medium brew)		120		
Tea (strong brew)		160		
2. Soft drinks (milligrams per 12 oz. can)				
REGULAR:	Coca-Cola	34		
	Pepsi-Cola	38		
	Dr. Pepper	41		
	Mountain Dew	55		
	RC Cola	50		
	Jolt Cola	71		
	Red Bull (8.2 oz)	80		
	Nestea Ice Tea	26		
DIET:	Diet Coke	45		
	Diet Pepsi	36		
	Tab	47		
	Diet RC	47		
	Diet Dr. Pepper	37		
	Diet Mountain Dew	55		

Source: National Soft Drink Association

Caffeine Survey

CAFFEINE TYPE		X	NUMBER OF SERVINGS	=	TOTAL CAFFEINE
3. Over-the-Counter (milligrams per tablets/capsule)					
Pain Relievers:	Excedrin	65			
	Anacin	32			
	Aspirin (plain)	0			
	Midol	32			
Cold:	Dristan	16			
	Sinarest	30			
Stimulants:	No-Doz (regular strength)	100			
	Vivarin	200			
4. Chocolate (milligrams per 1 oz.)					
Baking Chocolate		35			
Dark chocolate bar		31			
Chocolate cake		14			
Chocolate candy bar (2 oz.)		12			
Cocoa beverage (6 oz.)		10			
Pudding pop (2 oz.)		4			
Brownie (with nuts)		6			
DAILY TOTAL					

Source: National Soft Drink Association

Caffeine Survey Results

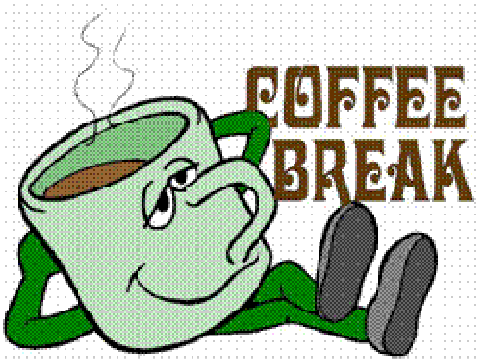
HOW DO YOU RATE?

Caffeine Amount	Status
0-250 mg	No Problem
251-500 mg	Moderate Intake
501-1,000 mg	High Intake
Over 1,000 mg	Very High—Reduce Intake

Note: Reaction to caffeine varies among individuals, depending on weight, food intake and habitual usage. The ranges above serve as a general guideline.

Using Caffeine Effectively

- **No Cumulative Effect** – you get the same alertness boost from 2-3 cups as you do from 20 cups
- "Use It, Don't Abuse It!" Use caffeine in moderation
- Time it – use it when it is needed most during shift
- Drink something else, like water, fruit juices, or decaf rather than drinking caffeinated beverages all shift long
- Avoid its use at least 3 - 4 hours before you plan to sleep
- Cut back slowly if you are a heavy caffeine drinker



Nicotine

Nicotine may be a stimulant that temporarily increases alertness, but the harmful effects of smoking far outweigh the alertness-enhancing benefits. Therefore nicotine is not an effective fatigue countermeasure because:

- Every boost you get from nicotine is followed by a letdown, making you feel tired and wanting another shot of nicotine
- Nicotine can disturb sleep when habit is strong
- Tobacco can cause serious health problems, such as cancer and cardiovascular problems
- Holding 1 pinch of smokeless tobacco in your mouth for 30 minutes delivers as much nicotine as 3-4 cigarettes.

Recommendation: stop or cut back your use of tobacco

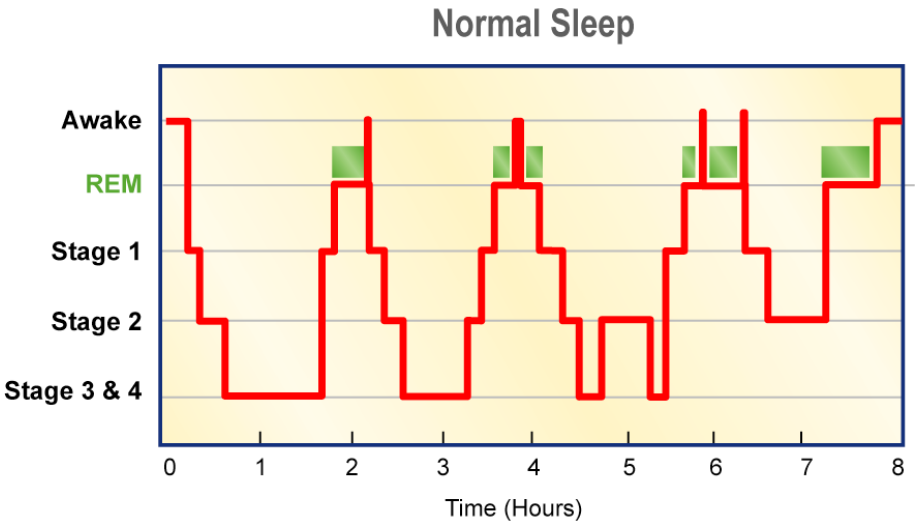
Alcohol Is Not An Effective Sleep Aid

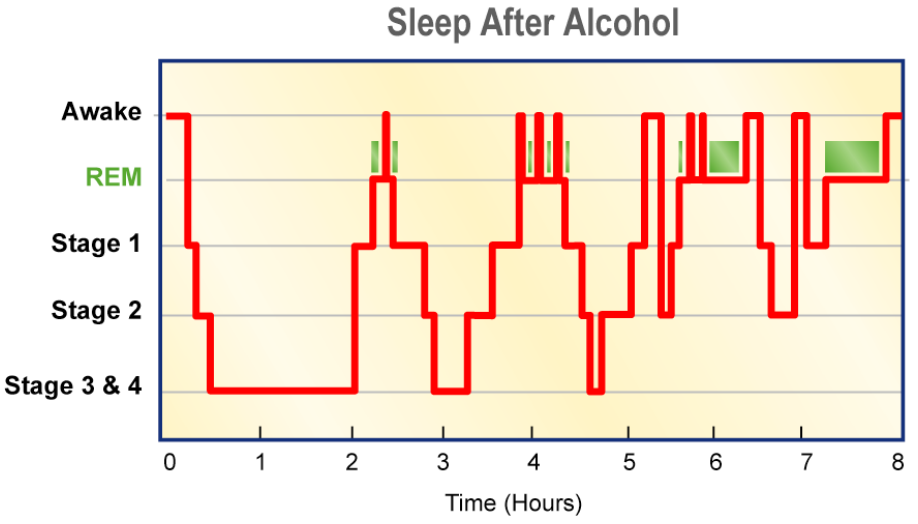
Alcohol is a depressant and may help you fall asleep, but it also….

- Reduces amount of REM sleep
- Increases the amount of light sleep and awakenings, making sleep less restful
- Acts as a diuretic, flushing fluids from the body and requiring you to wake up and use the bathroom
- May worsen some sleep disorders, including sleep apnea.

Why Alcohol Makes A Poor Sleep Aid

- Alcohol worsens the quality of your sleep
- You spend less time in REM sleep and have more frequent awakenings
- Try to avoid alcohol within 2-3 hours of when you go to sleep





Sleeping Pills

Sleeping pills may be useful for treating insomnia, but you should only use them for a short time.

They can create the following problems:

- A reduction in REM sleep
- “Hangovers”
- May worsen some sleep disorders
- Can lead to tolerance and dependence

If you are having serious and prolonged difficulties sleeping, then you should consult with your physician to explore ways to solve this problem.

Melatonin

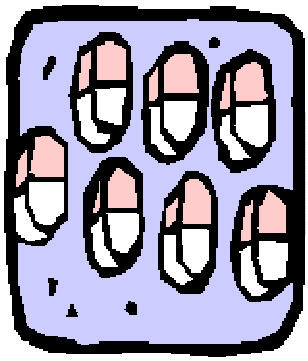
Melatonin is a natural hormone that may help you get to sleep. It is sold over the counter but you nevertheless need to be careful with it.

DANGERS

- Some short-term side effects have been reported such as grogginess, headaches, night terrors, and mild depression
- No long-term studies on possible long-term side effects
- Shifting the biological clock is challenging to do in a short period of time
- No guidelines for dosage for shiftworkers
- Unregulated production / danger of contamination

RECOMMENDATIONS

- Consult your physician before using
- Use a low dosage (.5 mg)
- Avoid prolonged use
- Do not drive or operate heavy machinery while under the influence of melatonin



Nighttime Sleep Aids

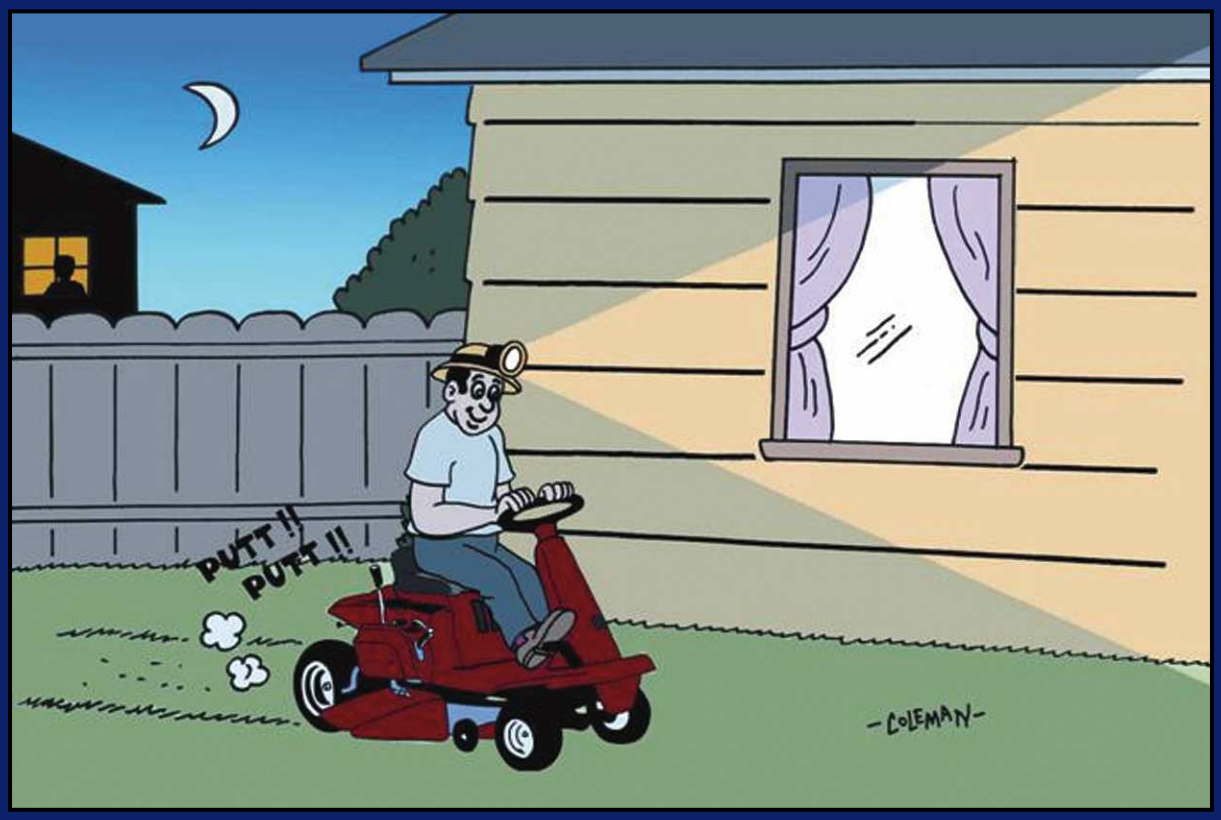
- There are many over-the-counter sleep aids. Some of them are specifically designated as sleep aids, and some are PM versions of other medications, such as pain relievers or cold medicines.
- As with prescription sleeping pills, over-the-counter medications should not be a long-term solution. If you have long-term sleep problems, talk to your doctor about it.
- Also, keep in mind that over-the-counter medications may make you sleepy if you have to get up before you planned, and that they may have other side effects.
- It is also very important not to take these medications with alcohol because this combination could aggravate some sleep disorders and also make you feel much more drowsy upon waking, especially if you have to wake up early.

Natural Sleep Aids

There are a number of natural substances that may help you sleep:

TEA	HERBS	AROMAS
Chamomile or **Passion Flower** These are decaffeinated Teas	**Valerian** or **Kava** Do not use Kava in large doses	**Lavender oil used through a diffuser**

Managing Your Schedule To Get Better Sleep



Although staying up late the night before helped Ted prepare for his first night shift, some of his neighbors failed to appreciate his strategy

Preparing For Your First Night Shift

To prepare for your first night shift:

- Start adjusting ahead of time at home on your days off before you start your block of night shifts:
  - Go to bed later at night (around 2:00 a.m.)
  - Rise later in the morning (around 10:00 a.m.)
  - This should give you plenty of daylight hours to be with family or get things done, and it also starts to shift your circadian rhythms towards a nighttime rhythm
- Take a nap before your night shift.

Between Consecutive Night Shifts

- Avoid sunlight before going to bed
- Eat a light breakfast before sleeping
- Go to sleep ASAP!
- Get at least 5 hours of sleep
- When you can't sleep any more, get up
- Nap before your night shift

Studies show a significant drop-off in alertness from 5 hours of sleep to only 4 hours or less:

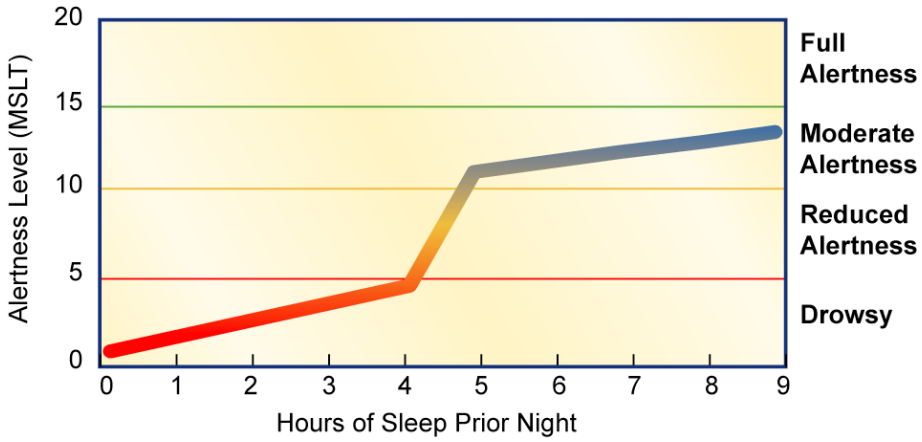


Chart Source: Moore-Ede, The Twenty-Four-Hour Society, Addison-Wesley, 1993.

Returning To A Daytime Schedule Method #1: A Nap After Work

- Nap for 2 - 3 hours after work
- Don’t sleep too long or else it will be difficult to sleep later that night
- Get exposure to bright light during the day
- Plan activities for the afternoon
- Try to go to bed around normal bedtime

Returning To A Daytime Schedule Method #2: Up All Day

- Try to stay awake most of the day and retire at a normal bedtime for a day-shift lifestyle
- Eat a protein-filled breakfast to provide energy for the day
- Try to get bright light during the day
- Avoid overly strenuous, sedentary, or potentially dangerous activities
- Do not drive and certainly do not plan long driving trips on this day!
- Expect some irritability
- Take a short nap if feeling overly tired in the afternoon
- Do not overexert yourself on this recovery day

"John, don't you think you should take a recovery day before you start painting the house?"

Managing Your Sleep

"Can I call you back?
I'm getting Harry to sleep."

Bedtime Routines

The body likes regularity. By doing things on a regular basis, our bodies become trained to perform a specific series of events. So if you keep to a certain routine whether you are trying to sleep at night or during the day, your body will acknowledge you are preparing to sleep. This may help you fall asleep easier, even during daytime. Try different combinations and see what works best for you.

- Develop a bedtime routine
- Same routine every time
- Follow even when preparing for daytime sleep
- Some activities that may be part of a regular “pre-sleep” routine are:
  - Watching TV
  - Reading
  - Meditating
  - Listening to relaxing music
  - Taking a hot bath or shower (92ºF- 97ºF)
  - Eating a light snack
  - Drinking a glass of warm milk

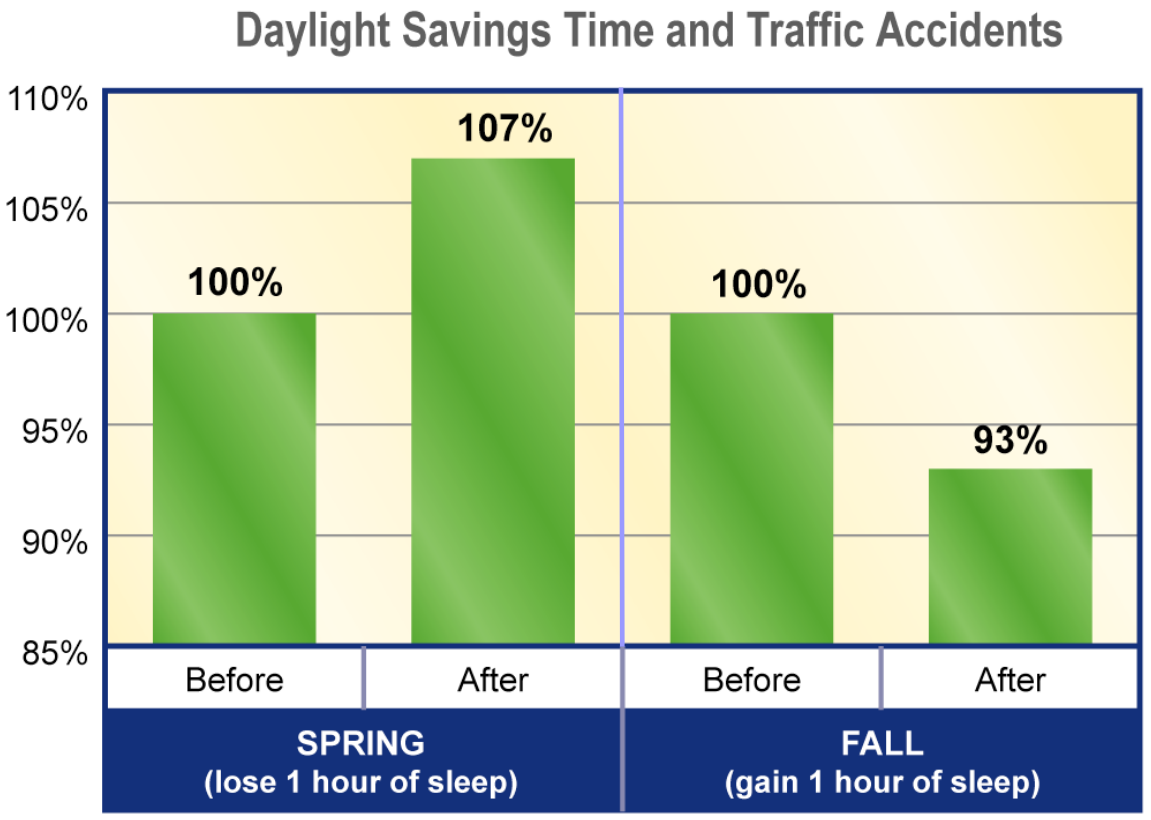
Dangers of Sleep Deprivation

- Sleep debt occurs when you get less hours of sleep than your body needs.
- A National Sleep Foundation Poll shows that Americans are sleeping less and less: from 2001 to 2005, the % of people sleeping 8 hours or more on weekdays decreased from 38% to 26%. During days off, the % of those sleeping less than 7 hours increased from 17% to 25%.
- The 2008 National Sleep Foundation Poll found that 33% of shiftworkers sleep less than 6 hours on workdays, compared to 15% of non-shiftworkers
- Sleep deprivation increases the risk of certain health problems:
  - Weakened immune system and increased susceptibility to infections
  - Cardiovascular disease (high blood pressure, etc)
  - Increased sensibility to pain and aggravation of chronic inflammatory diseases (such as asthma and rheumatoid arthritis)
  - Premature aging
  - Increased appetite (leading to weight gain)
  - Obesity and diabetes
  - Sleep deprivation increases the risk of depression, burnout, feeling irritable and making it difficult to get along with family and co-workers
  - Sleep deprivation increases the chances of having accidents
- Direct costs of accidents resulting from sleep debt:
  - $56 billion per year
  - 25,000 deaths
  - 250,000 disabling injuries

(Source: National Commission on Sleep Disorders)

Sleep Deprivation Affects Performance & Safety

One example of how sleep deprivation affects performance is during daylight savings time. A study done in Canada found that when we switch annually to daylight saving time in the spring, traffic accidents increase by 7 % the day after setting our clocks forward 1 hour and losing an hour of sleep. In the fall, when we set our clocks back an hour and gain an hour of sleep, there is a reduction in traffic accidents by about 7%.



Source: Wellness Options Publishing Inc

Adapted from: Radomski, MW and Coren, S. "Sleep debt and fatigue" Wellness Options Magazine: No9 Life Energy & Fatigue, November 2005.

How Large Is Your Sleep Debt?

To determine if you have a sleep debt, answer each question by checking either the "Yes" or "No" box.

	Yes	No
Do you usually need an alarm clock to wake you up?		
Do you usually hit the snooze button to get a few more minutes of sleep when the alarm goes off?		
Do you find getting out of bed is a struggle?		
Do you sometimes sleep through the alarm?		
Do you usually find that a single beer, glass of wine, or other alcoholic drink seems to have a noticeable affect on you?		
Do you sleep longer on days off than you normally do during the workweek?		
On vacations or holidays, do you sleep longer than you normally do on regular workweeks?		
Do you often feel like your "get up and go" has gotten up and gone?		
Do you find it more difficult to attend to details or routine chores than it used to be?		
Do you sometimes fall asleep when you had not intended to?		
Do you sometimes find yourself getting very sleepy while you are sitting and reading?		
Do you sometimes find yourself getting very sleepy or dozing off when you are watching tv?		
When you are a passenger in a car, bus, train, or airplane and the trip lasts over an hour without a break, do you find yourself dozing off?		
Do you usually feel extremely sleepy or doze off when you are sitting quietly at a public meeting, lecture, or theater?		
Do you usually feel extremely sleepy or doze off when you are sitting quietly after lunch without alcohol?		
Have you sometimes found yourself getting extremely sleepy with the urge to doze when you drive and are stopped for a few minutes in traffic?		
Do you drink more than 4 cups of coffee, tea , or soda (containing caffeine) during the day? (Remember to count refills; also count extra large take-out cups as two cups)		
YOUR TOTAL		

Adapted from: Radomski, MW and Coren, S. "Sleep debt and fatigue" Wellness Options Magazine: No9 Life Energy & Fatigue, November 2005.

How Large Is Your Sleep Debt?

Count the number of times you marked "Y**es"** and compare your score below:

Score	Status
4 or less	Adequate sleep
5 or 6	Most days adequate sleep. Some days a person's sleep account may be a bit short and this may mean that performance is less than 100 percent on certain activities.
7 or 8	Evidence of a sleep debt that may cause a noticeable reduction in work efficiency.
9-11	Definitely a large sleep debt. The person's work is likely to suffer from large, random errors; even small errors may be missed when work is reviewed a second time.
12-14	In addition to experiencing the same symptoms as those with scores of 9 to 11, the person's general quality of life suffers. Perhaps the person is less interested in things formerly found to be fascinating and is less inclined to spend time socializing. The person may also be a bit accident-prone and subject to temporary memory defects such as momentarily forgetting his or her address or phone number.
15 and above	Sleep debt is a major problem. Levels of sleepiness are in the range often found in people with clinical levels of sleep disturbance – for example, those with sleep apnea or severe insomnia. The person should increase the amount of sleep he or she gets and should seek professional help if this does not bring scores back below 7.

Adapted from: Radomski, MW and Coren, S. "Sleep debt and fatigue" Wellness Options Magazine: No9 Life Energy & Fatigue, November 2005.

Recovering From Sleep Deprivation

- Adequate sleep is not a luxury but rather a key component of a healthy lifestyle
- People cannot “adjust” to sleep deprivation – your body is genetically predisposed to the amount of sleep it requires
- Sleep debt needs to be paid back
- Sleep debt does not have to paid back hour for hour
- Randy Gardner set the world record for staying awake:
  - Stayed awake for 264 hours (11 days & 12 min)
  - Slept 14 hours and 40 minutes on 1st night of sleep
  - Slept 9 hours on the 2nd night
  - Then returned to his regular 7.5 - 8 hours of sleep each night.
- To recover from sleep debt, let yourself sleep as long as your body wants to. One or two consecutive full sleep blocks like this and you should be “recovered.”

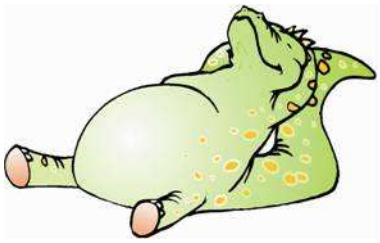
The Benefits Of Napping

THE BENEFITS OF NAPPING:

- 10- to 15-minute naps provide an alertness boost lasting up to several hours
- A 90-minute nap before staying awake all night increases alertness and performance by about 30%
- Reduces the risk of heart disease
- Reduces stress

FAMOUS NAPPERS:

- Albert Einstein
- Thomas Edison
- Winston Churchill
- Numerous professional athletes nap before games



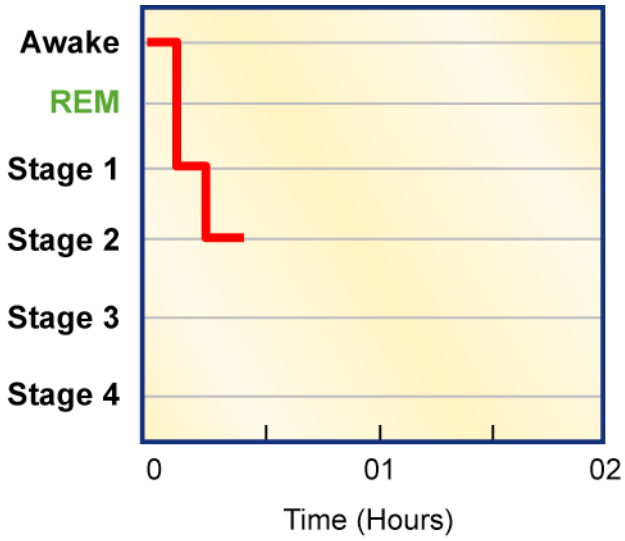
Napping Strategies

LENGTH OF NAP

Part of the key to a beneficial nap is the length of your nap. If you sleep too long, you may wake up from deep sleep and feel worse. Therefore try to time your nap so you wake up from light sleep (15-20 minutes) or REM sleep (about 90 minutes).

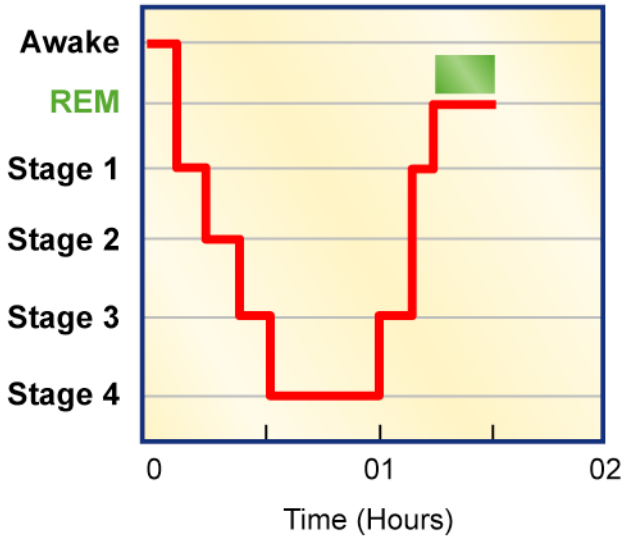
15-20 MINUTES:

- You wake up from light sleep (stage 2)
- Sleep inertia is minimal



90 MINUTES:

- One complete sleep cycle
- You get some deep sleep
- You wake up from REM sleep
- Sleep inertia is minimal



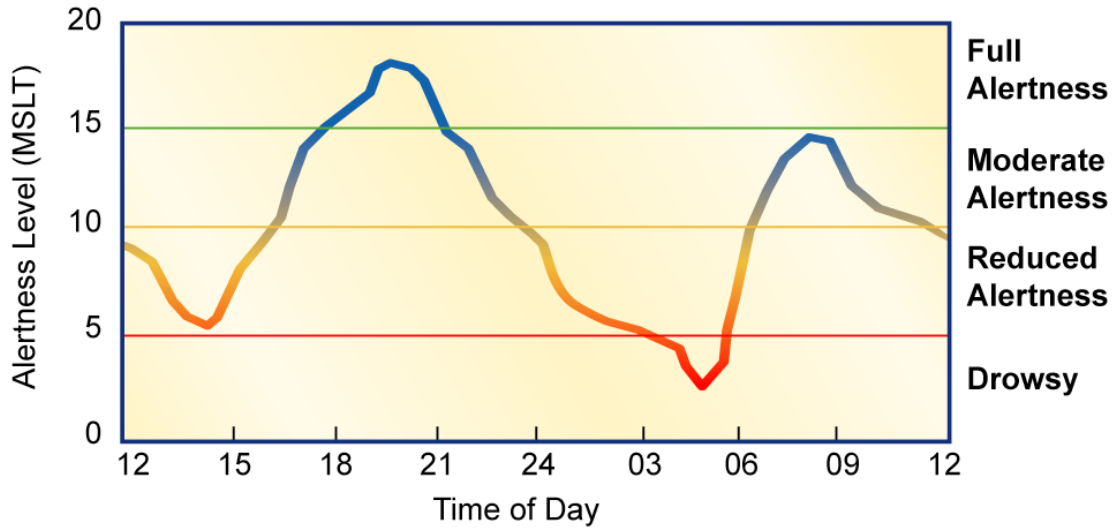
Napping Strategies

WHEN SHOULD I NAP?

The timing is a matter of understanding your body's natural cycles

- There are times when it is easier to fall asleep:
  - After lunch in the early afternoon
  - The period in the pre-dawn hours around 3-4 a.m.

- There are times when it is more difficult to nap:
  - Times when our alertness is at its highest level
  - In the morning around 9-10 a.m.
  - In the early evening around 6-8 p.m.



Sleep Disorders

- There are more than 80 different sleep disorders
- The main categories are:
  - Problems initiating and maintaining sleep, and disorders of excessive sleepiness (such as insomnia)
  - Parasomnias: episodic physical events that occur during sleep or become worse during sleep (such as sleepwalking)
  - Sleep disorders associated with mental, neurological or other medical problems (such as Parkinson, alcoholism, etc)
- National Sleep Foundation estimates that 30-40 million people have a sleep disorder.
- 95% of sleep disorders are undiagnosed *(Source: National Commission of Sleep Disorders Research)*

Sleep Disorders

A few of the more common sleep disorders:

INSOMNIA:

- Difficulty falling asleep, staying asleep, waking up too early, or having un restorative sleep

SLEEP APNEA:

- Stoppage of breathing while asleep.
- Causes very poor quality sleep and increased sleepiness during the daytime

NARCOLEPSY:

- Uncontrollable episodes of falling asleep.
- Causes excessive sleepiness

PERIODIC LIMB MOVEMENT DISORDER

- Frequent twitching of limbs during sleep
- May cause the person to wake up briefly
- More common among older people

RESTLESS LEGS SYNDROME

- Crawling or prickling sensations in the legs when sitting still or lying down for which the only relief is to move the legs or get up and walk around.
- Occurs mainly in the evening or at night

If you feel you may have a sleep disorder, visit your doctor right away!

Sleep Apnea

Obstructive sleep apnea is caused by a blockage of the airway, usually when the soft tissue in the rear of the throat collapses and closes during sleep. With each apnea event, the amount of oxygen in the blood decreases, and the brain briefly wakes up the person to resume breathing. Sleep is extremely fragmented and of poor quality. That results in increased sleepiness and fatigue.

RISK FACTORS:

- Being overweight, having a collar size 17 or greater
- High blood pressure
- Smokers
- Sleep deprivation can worsen the condition, as can alcohol and sleeping pills

MAIN SYMPTOMS:

- Habitual loud snoring
- Pauses in breathing while asleep followed by a snorting or gasping-for-air sound
- Excessive sleepiness
- Feeling tired all the time, even after sleeping long hours
- Feeling irritable, depressed, difficulty concentrating
- Habitual headaches after waking up

EFFECTS OF SLEEP APNEA:

- Increased risk of cardiovascular disease
- Increased risk of depression
- Twice as many traffic accidents per mile
- Three-fold risk of occupational accidents

Sleep Apnea Is Treatable:
Consult A Doctor Or Sleep Center

Personal Plan For Great Sleep

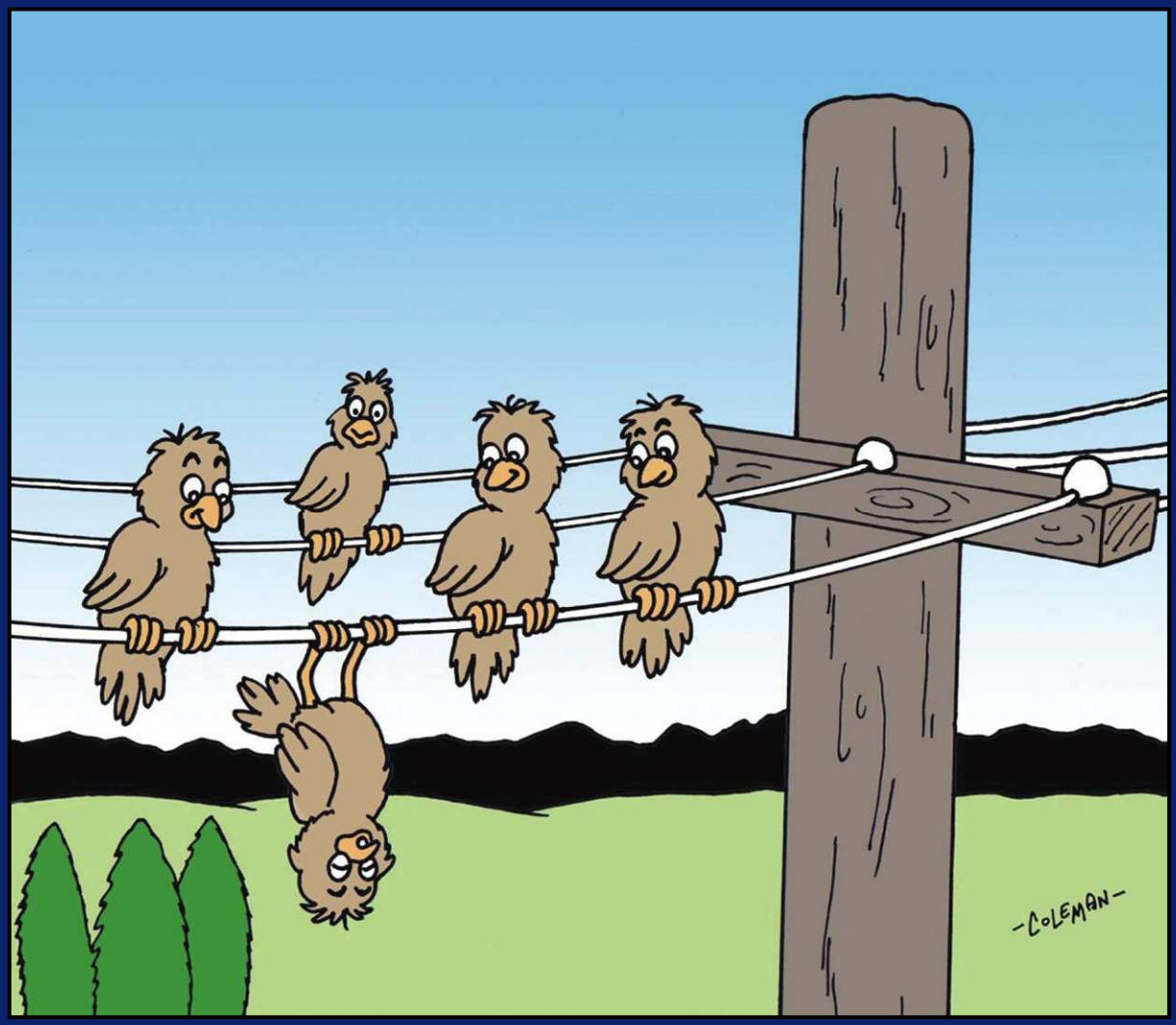
List at least 3 things that you can do to improve or enhance the quality and quantity of sleep, either during the day or night:

1

2

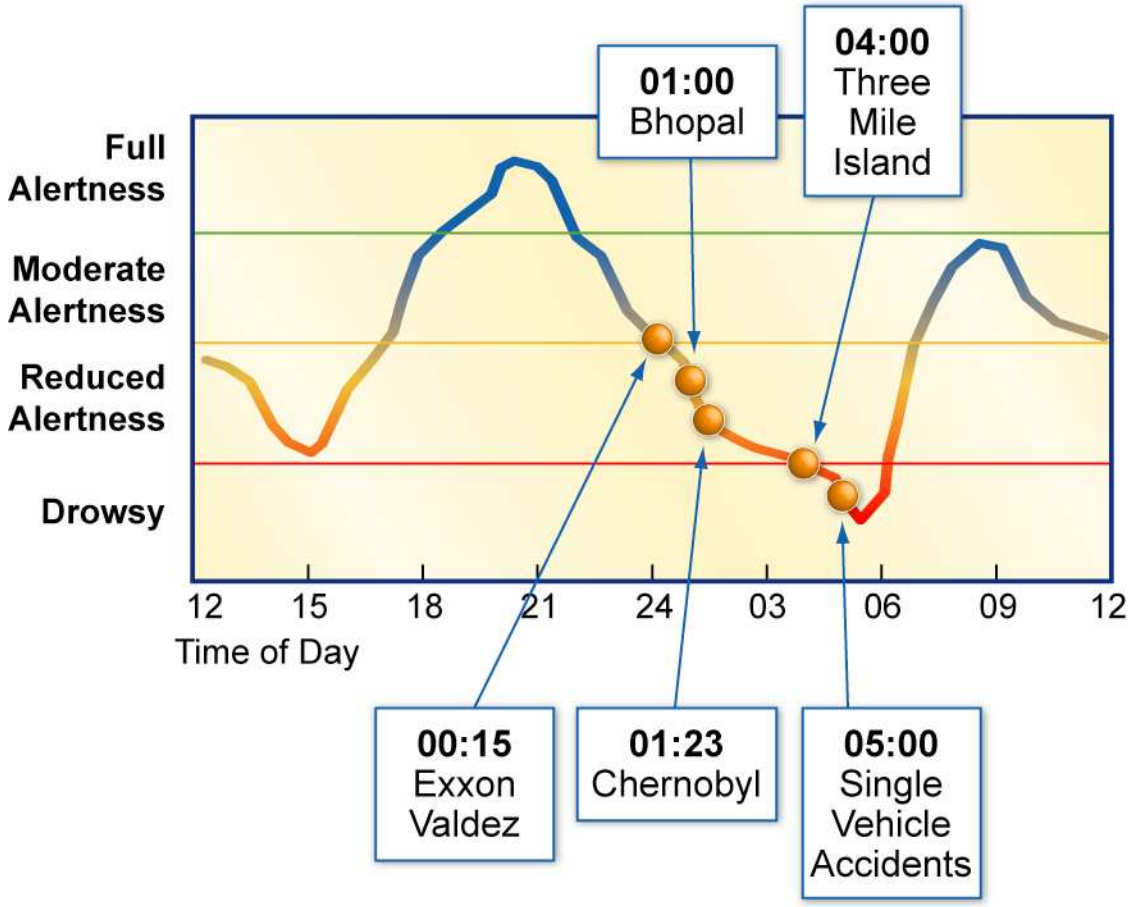
3

CHAPTER 4
Alertness and Safety



A microsleep can happen to anyone

Fatigue And Human Error



Major industrial accidents and single vehicle accidents occur most frequently at night.

What Is Fatigue?

- Fatigue is an impairment of mental and physical function with a cluster of debilitating symptoms, including:
  - Excessive sleepiness
  - Reduced physical and mental performance ability
  - Depressed mood and loss of motivation

- Fatigue can cause:
  - Increased human error / procedural deviations
  - Reduced ability to work safely
  - Miscommunication / misunderstanding
  - Inappropriate / slow response
  - Reduced morale
  - Increased health problems
  - Reduced operating efficiency
  - Reduced productivity / customer service quality
  - Impaired judgment

The direct costs of human fatigue are estimated at $70 billion dollars per year to the American economy and $300 billion dollars worldwide.

Source: Moore-Ede, The Twenty-Four-Hour Society, Addison-Wesley, 1993.

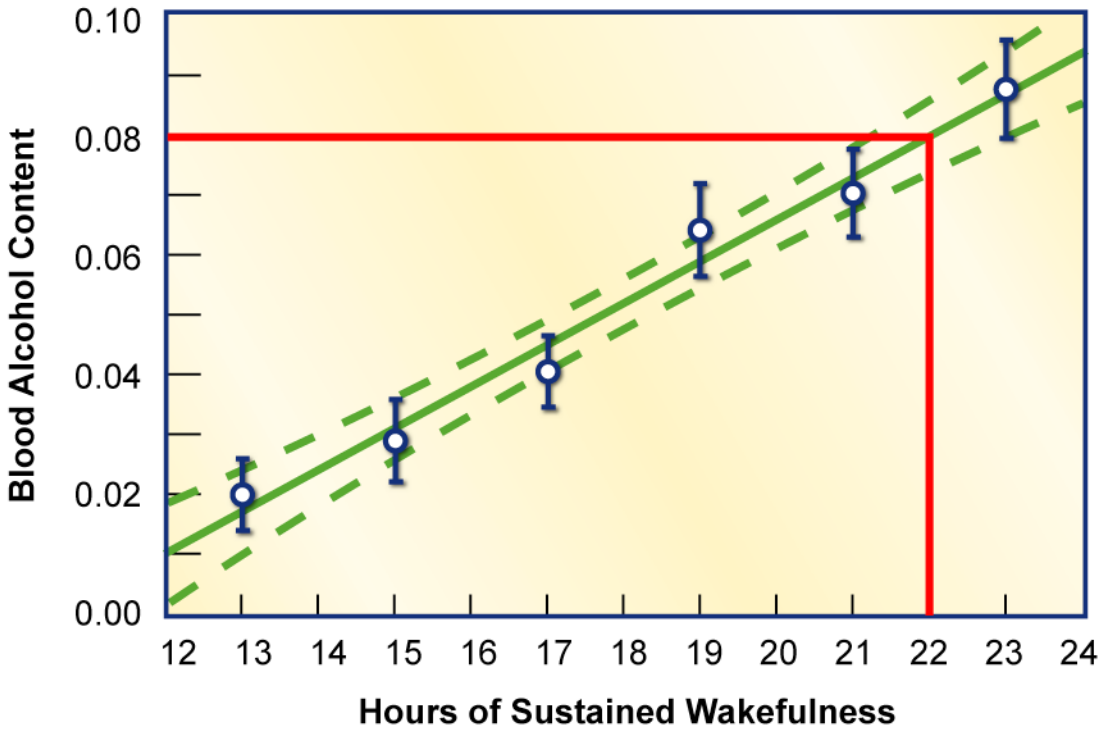
Fatigue Impairment vs. Alcohol Impairment

Prolonged wakefulness has a similar effect on alertness as alcohol use. Several scientific studies have measured the impact that consecutive hours of wakefulness has on alertness and compared it to different Blood Alcohol Concentrations (BAC). This research shows that being awake for 22 consecutive hours produces a similar impairment to a BAC of 0.08 - the legal limit in every state for driving.

Keep in mind that even less hours of sustained wakefulness can cause some degree of impairment (see chart below).

Working shifts, especially night shifts, makes it easier to accumulate a large number of consecutive hours without sleep and potentially cause a dangerous level of fatigue impairment. Therefore, it is important to monitor yourself to see how many hours you have gone, or potentially could go without sleep, and then make time to sleep in order to break the hours of sustained wakefulness.

Note: BAC is affected by a person's sex, age, weight, percentage of body fat, and how fast the person is drinking. For example, a 175-pound male would need to consume four-and-a-half 12-ounce beers in one hour to obtain a BAC of 0.08.



Replotted from: Dawson D. and Reid K. "Fatigue, alcohol and performance impairment" Nature 388, 235 (17 July 1997)

Signs Of Fatigue

To counteract fatigue, it is important to learn to recognize its warning signs. Along with the obvious signals – experiencing difficulty keeping one's eyes open and a feeling of sluggishness - more subtle indications include having difficulty concentrating, irritability, and an inability to remember the last five minutes. When you experience these symptoms, it's time to take a break. You might take a quick walk, have a cold drink, or eat a small snack.

The following are signs of fatigue:

PHYSICAL SIGNS:

- Red eyes
- Lack of energy
- Slower movements and poor coordination
- Slower than normal response time
- Excessive yawning
- Head nodding or nodding off
- Heavy eyelids, blinking, slow rolling eye movements
- Out-of-character facial expressions

COGNITIVE SIGNS:

- Distracted from task
- Poor concentration or lapses in attention
- Inability to complete task
- Short-term memory loss (do not remember what you were doing, forget instructions, etc)

EMOTIONAL SIGNS:

- Depression
- Irritability
- Lacking motivation to do task well, cutting corners
- Easily frustrated
- Become quiet and more withdrawn

When You Need To Be Prepared For Fatigue

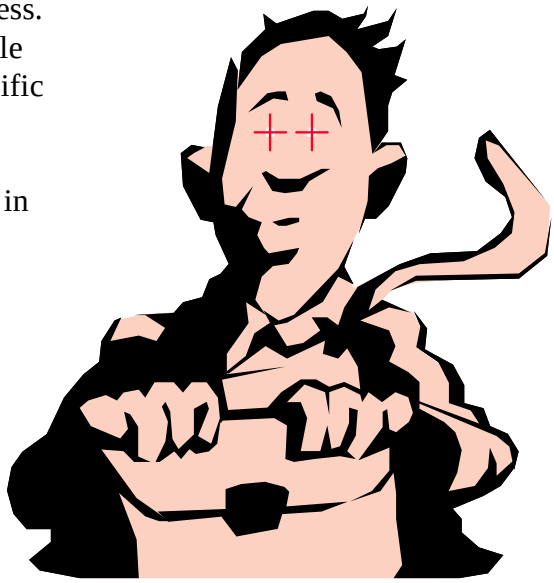
Fatigue can strike at anytime throughout the day or night. However, there are certain times when fatigue is usually higher and you should, therefore, be prepared. These times are:

- First & Second Night Shifts After Days Off
- Between 0100 and 0600
- First Few Hours of the Day Shift
- During the Post Lunch Dip
- Between Shift Turnover Times
- Driving Home After Your Shift

Automatic Behavior Syndrome (ABS)

When people are severely fatigued, they can experience what scientists call "Automatic Behavior Syndrome," which is a low level of alertness that often precedes nodding off. Automatic Behavior Syndrome (ABS) is one of the major causes of many fatigue-related accidents. It is characterized by the inability to react to changes and is also known as "Auto Pilot."

In this stage of reduced alertness, a person can spend up to 20 or 30 minutes or more still performing routine duties, but without active awareness. For example, if you experience automatic behavior syndrome while working on an assembly line, you might continue doing your specific task but ignore the fact that the product is missing several parts.



In other words, we are able to perform purely routine tasks while in this state, but there is a noticeable loss of perception and memory, accompanied with an inability to respond to changing conditions, signals, or communications.

Another example: how many times have you been driving down a familiar stretch of highway and suddenly realized that you missed your exit or have no recollection of the last few miles? This is one of the most common examples of an Automatic Behavior Syndrome episode. Keep in mind that not being able to make quick decisions while driving is very dangerous.

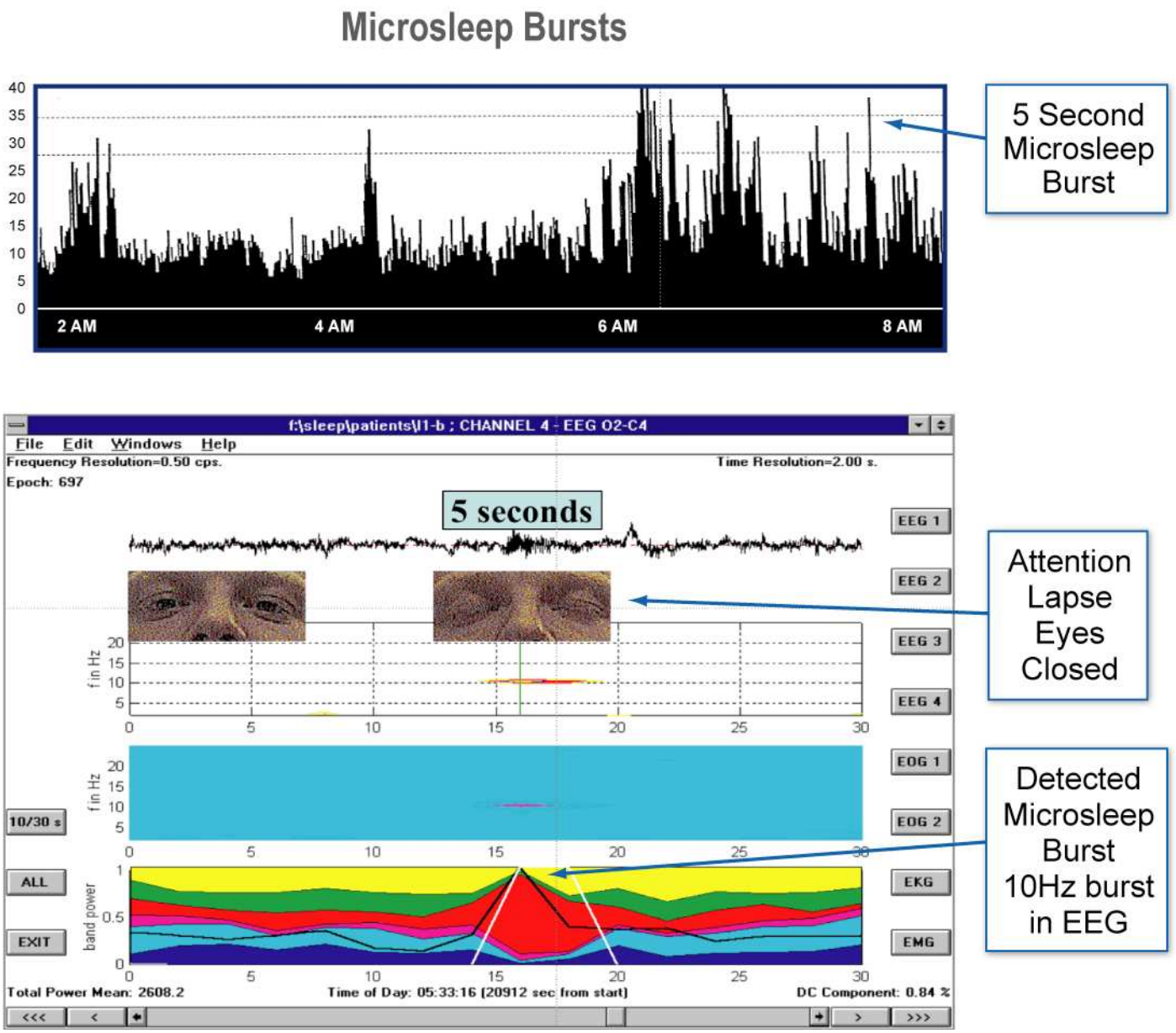
Symptoms of ABS include:

- "Autopilot"
- Blank Stare
- Inability to Respond to Changes
- Inability to Maintain Situational Awareness

Microsleep

- A brief, involuntary lapse into sleep that can last between 2-15 seconds.
- Often unaware that you have even had a microsleep.
- Characterized by heavy eyelids and a slow blink rate
- Causes an interruption of thought and behavior that can result in serious mistakes at work or on the road.
- Tends to occur more often at night and when a person is sleep deprived.

Microsleep



This chart shows a test subject having an actual microsleep episode – his eyes are closed, and the spike in the line at which the arrow points, shows his brain waves briefly falling in and out of microsleeps.

Managing Microsleep And ABS

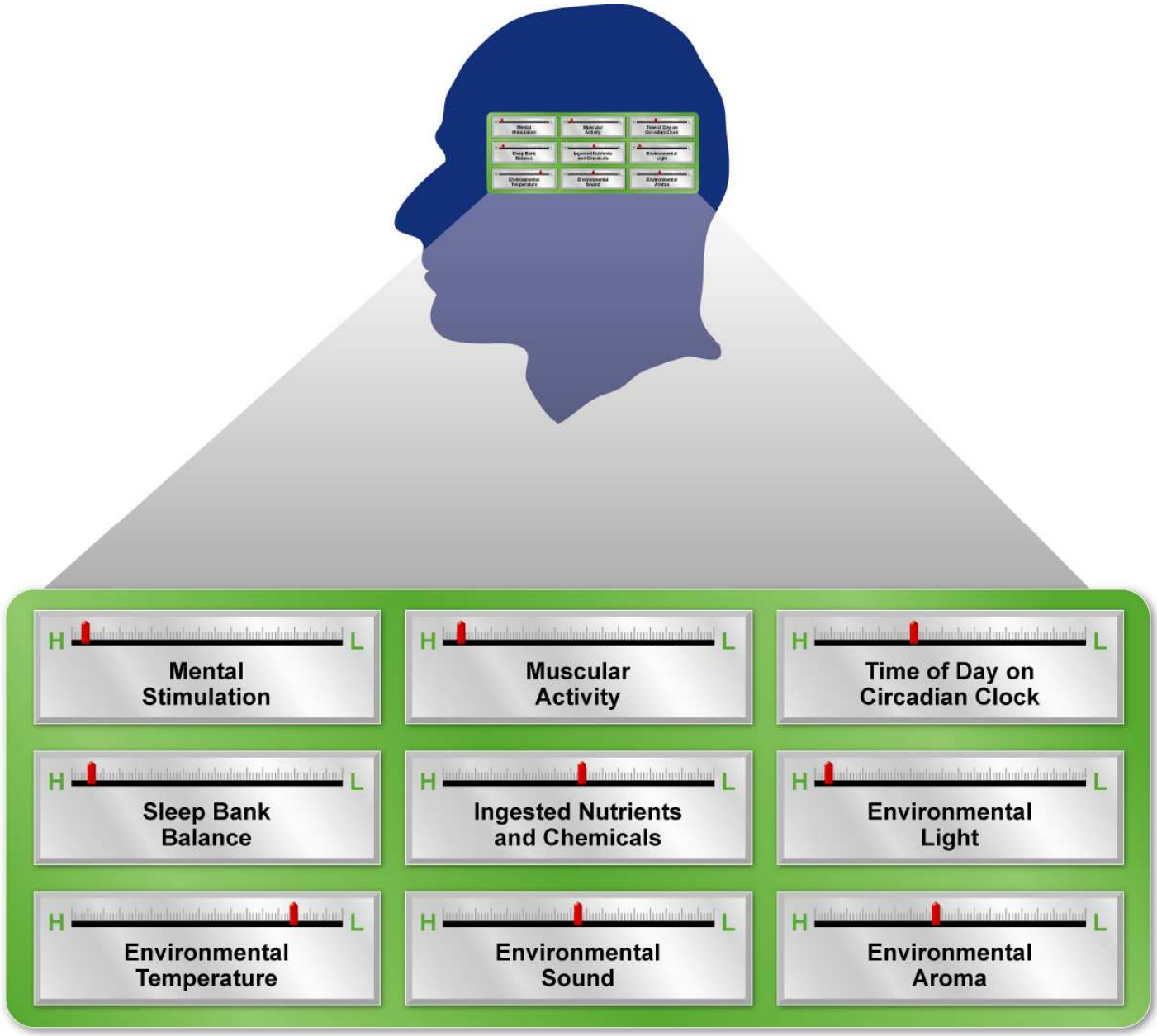
- Sleep is best antidote for lack of sleep
- Use short power naps to burn-off sleep deprivation/fatigue
- Use long preventative naps to prepare for night shifts
- Caffeine may not keep you safe
- If you drink coffee while seriously sleep deprived, you are still likely to suffer brief Microsleep episodes

CHAPTER 5

Staying Safe and Alert

"It's something I invented to keep me from dozing off unexpectedly."

The Nine Controls Of Human Alertness



Source: Moore-Ede, The Twenty-Four Hour Society, Addison-Wesley, 1993.

Keep in mind that not all 9 controls (or switches) are necessarily on or off at any given time. So if you feel yourself getting tired, see what you can "turn on."

The Nine Controls Of Human Alertness: Mental Stimulation

Nothing switches us faster from drowsiness to alertness than the awareness of imminent danger or a near accident. The emergency fight-or-flight response is activated by the nervous system and the brain is placed on full alert. The heart pounds, hair stands on end, and the skin turns cold and clammy.

Although less extreme than the response to danger, a stimulating job, task, or opportunity triggers a similar response in alertness. Watching the lottery balls fall into their slots is a boring activity unless you are holding a ticket and already 4 of your numbers have come up. The pupils dilate, the heart rate starts increasing, and the hopeful ticket holder becomes animated. The sympathetic nervous system is triggered by this as well as other situations such as an interesting challenge at work, an exciting idea, and anything else that is new, different, and/or interesting.

But if the job is boring or monotonous, alertness can easily fade. Continuously doing the "same old thing," the endless stretch of freeway, the night shift in a plant when everything is running smoothly all trigger the parasympathetic nervous system and the result can lead to drowsiness. Thus, when alertness is lost, danger looms for attentiveness and performance will also suffer.

The brain needs to be challenged to stay alert, so job tasks and activities need to be as stimulating as possible. Using word or mind games during difficult periods may be helpful. Talking with other co-workers may also help increase alertness. If you are having trouble staying alert while driving, keep your eyes moving and look for things that will stimulate your interest and maintain your awareness.

The Nine Controls Of Human Alertness: Physical Activity

Physical activity stimulates blood flow to the brain and extremities, helping you feel more refreshed and alert. Any type of muscular activity triggers the sympathetic nervous system and helps you to stay alert. You do not have to be running for miles or lifting weights, just taking a walk or stretching can stimulate your level of alertness. If you are performing a task where you can't move around much, try stretching in place or chewing gum. Even light physical activity can help boost your alertness. After vigorous activity, the effect on alertness can last for an hour or more.

Conversely, try to avoid exercise 3-4 hours before you plan to sleep as it may interfere with your ability to fall asleep.

In addition, research suggests that exercise offers a bonus for people who work at night. It shifts circadian rhythms leading to better mood and alertness on the job. For example, after a vigorous late evening aerobic-type workout, your low point in body temperature and alertness might move from 5 a.m. to 7 a.m.. Delaying circadian rhythms in this fashion puts you in a better position to be awake overnight and to sleep in the morning.

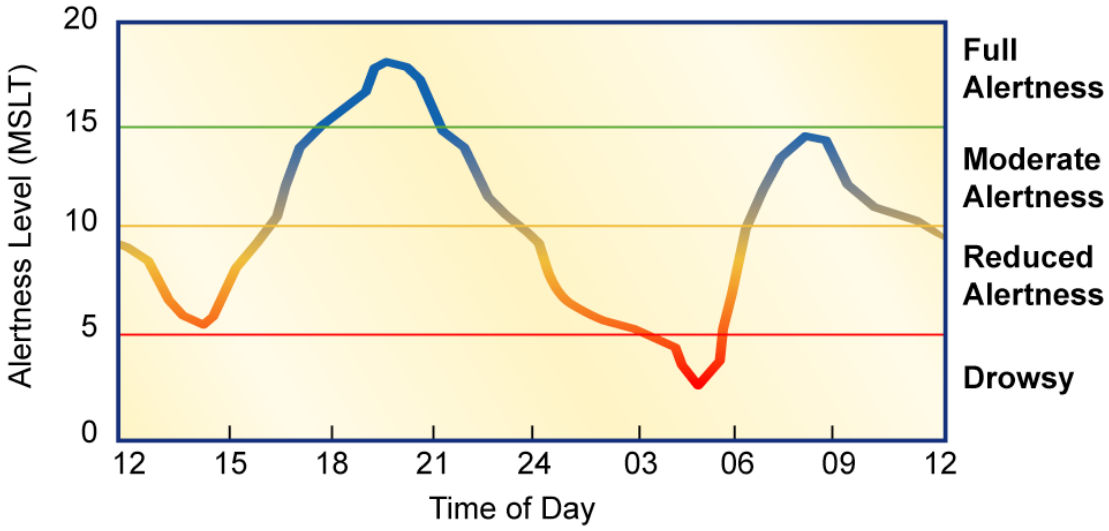
The Nine Controls Of Human Alertness: Time of Day

Time of day on the biological clock plays a strong role in your alertness. Due to circadian rhythms, we generally experience peak levels of alertness in the morning and early evening. Times of low alertness include the overnight hours (midnight to dawn) and the early afternoon (the "post-lunch dip").

A scientific study that monitored truck drivers in the US and Canada concluded that time of day was the strongest and most consistent factor influencing driver fatigue. Statistics about accident rates confirm the increased safety risk during night driving.

This "time of day effect" indicates the strong influence that circadian rhythms have on human alertness. Because circadian rhythms fluctuate during the day, when you work generally plays a larger role than how long you work in determining how fatigued you feel at any given moment. This is referred to as the "Time of Day Effect." For example, most people feel more tired after working an 8-hour shift from 11 p.m. to 7 a.m. than they would after working a 10-hour shift from 8 a.m. to 6 p.m.

Be aware of the time of day on your biological clock so you can anticipate low points of alertness and utilize effective countermeasures, such as caffeine, exercise, or a nap (if allowed).



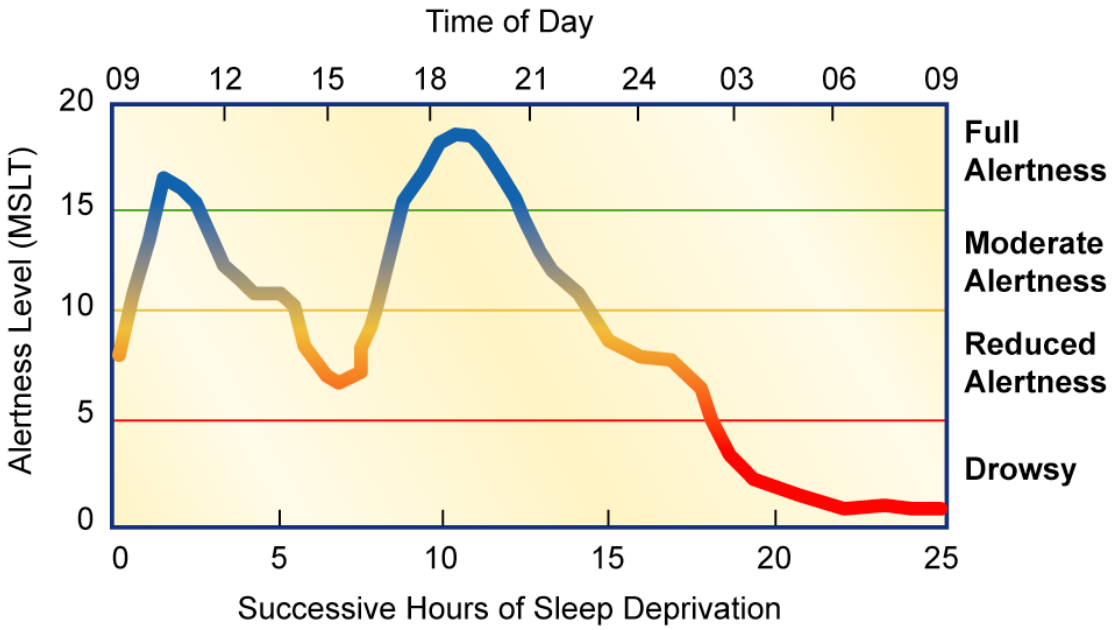
The Nine Controls Of Human Alertness: Sleep Bank Balance

Our alertness is also affected by how long it's been since we last slept or how much sleep we've gotten in the past few days. As we have all experienced, the longer we go without sleep, the more impaired our alertness becomes. This also holds true when we are sleep deprived for several days. Basically, in both cases you build up a "sleep debt" that leads to reduced alertness and poorer health.

How can you reduce your "sleep debt?" This can be accomplished by getting a good night's sleep or by taking brief naps at strategic intervals. Both act as a "deposit" in your sleep bank and lead to increased alertness.

Remember, if you nap at work, a short nap of 10-15 minutes provides more benefit than one of 40-60 minutes which can leave you drowsy and increase the likelihood of low performance for a while after you wake up. Research has shown that people can work for extended periods if they take short 15-20 minute naps every few hours. However, a person cannot nap for 20 minutes and function at a high alertness level for 8 or more hours without paying back their sleep debt.

So, monitor your sleep bank balance and make up for any sleep debt by taking naps and by letting yourself sleep in on days off to "catch up" on sleep and pay back that sleep debt.



The Nine Controls Of Human Alertness: Food and Stimulants

Alertness may also be altered by the chemicals and nutrients that we ingest.

For an alertness boost, there are some stimulants, such as caffeinated drinks, that can increase alertness quickly. Also keep in kind that a well-balanced diet will help with your overall energy. *(See Chapter 8 for a more in-depth look at nutrition)*

On the other hand, some substances will decrease alertness. One such substance is alcohol, which will increase sleepiness, especially if you are sleep deprived or if you are drinking in the early afternoon or at night when your alertness levels are naturally lower.

Furthermore, some prescription and over-the-counter drugs, such as cold and allergies remedies, contain substances that produce sleepiness. Check the labels and, if needed, switch to a non-drowsy formula.

The Nine Controls Of Human Alertness: Light

Light is the most powerful environmental signal. Not only is more than 85% of the information processed about our environment visual in nature, but light has direct biological effects on alertness levels and performance. Light stimulates the human brain and neuroendocrine system to modify or affect reproduction, metabolism, body temperature, activity, alertness, sleep/wakefulness, and many rhythmic daily and seasonal functions. Light regulates these many of these functions via a neural pathway to the suprachiasmatic nucleus (SCN), which functions as both an internal body clock and a central way station for light mediated effects on the brain.

The proper intensity, wavelength, and timing of light at night can result in increased alertness, increased vigilance, increased logical reasoning performance, increased subjective sense of alertness, and suppression of bouts of sleepiness.

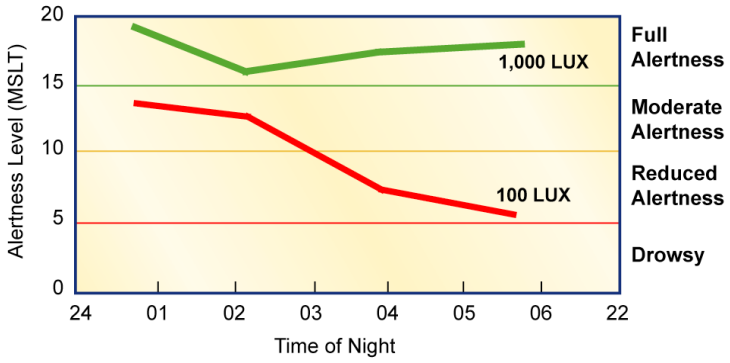
HOW MUCH IS NEEDED?

For maximal visual acuity, for photo-stimulation of the human brain, and for psychological mood elevation, we need 1,000 lux of surface illumination on the human eye. That's roughly 100 foot candles of light, but it must be provided at eye level - not in the ceiling or on the desktop, but rather what is measured at the employees' eyes. As a reference point, 1,000 lux is about the level of natural light at daybreak, which is about 2-5 times brighter than a well-lit interior office.

The good news is that if you can achieve 1,000 lux levels, it will put a "buzz" on your brain that is far better than caffeine and amphetamines. In the chart below, direct photo stimulation with 1,000 lux shows a substantial improvement in alertness during the night shift as compared to exposure to only 100 lux.

In laboratory studies conducted at the Institute for Circadian Physiology, people exposed to 1,000 lux during simulated night shifts were less likely to fall asleep on the job, and they also scored better on cognitive performance tests than workers exposed to less light. Therefore, if you feel tired on the day shift, take a break, go outside, and expose yourself to bright sunlight to help boost your alertness.

1,000 lux of illumination may sound like a lot, but in reality, it is quite small compared to natural outdoor lighting levels which range from over 100,000 lux on a bright sunny day in the summer to around 10,000 lux on a very dark, cloudy, rainy day. Unfortunately, most artificially illuminated work places only provide around 200-400 lux, which is too low for alertness stimulation.



Source: Study conducted at the Institute for Circadian Physiology by Campbell, SS & Dawson, D (1990)

The Nine Controls Of Human Alertness: Light

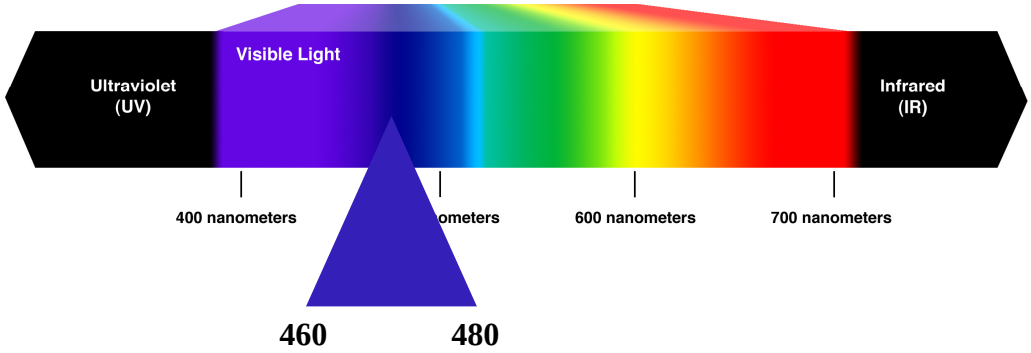
WHAT TYPE OF LIGHT SHOULD IT BE?

Providing brighter levels of light at night has both benefits and drawbacks:

BENEFITS	DRAWBACKS
● Increased alertness/reduced sleepiness	● Shift biological clock / disrupt sleep
● Increased vigilance	● Suppression of melatonin
● Improved cognitive performance	● Elevation of cortisol - stress hormone
● Reduced accidents and injuries	● Potential carcinogenic risk

New research from the University of Toronto shows how you can get the benefits of brighter light without the drawbacks. How can this be possible? The answer lies in the wavelength of the light.

The human visual spectrum extends from blue (380nm) to red (700nm) as shown in the chart below.



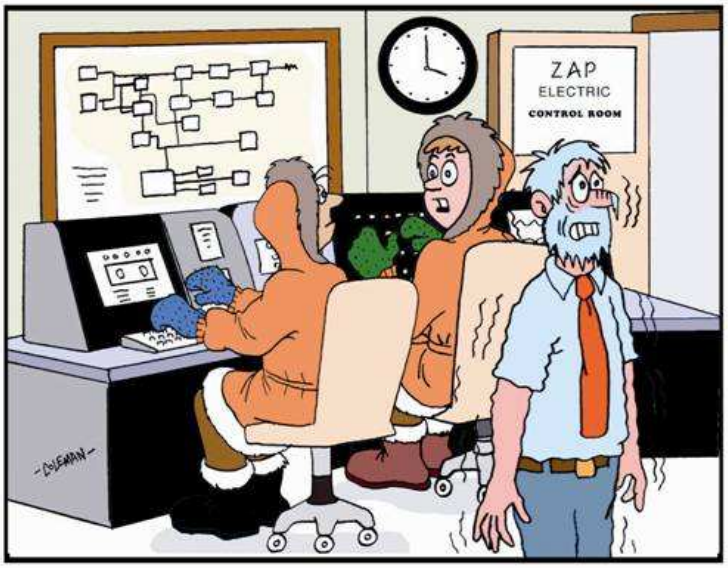
Using sharp cut-off filters, Prof. Bob Casper showed that light wavelengths longer than 480 nm are responsible for the beneficial alertness and performance effects, whereas the melatonin suppression and biological clock shifting effects are found in a narrow band of blue light between 460-480 nm.

Therefore, wearing light filtering glasses blocking wavelengths shorter than 480 nm makes it possible to get the beneficial effects of brighter light at night without its disadvantages.

The Nine Controls Of Human Alertness: Temperature

Environmental temperature can increase or decrease alertness. Basically cool, dry air (especially on your face) helps keep you alert, while heat and humidity make you drowsy. We all know that a cold shower wakes us up and that a warm bath tends to relax us. However, extreme cold can also make one very tired and a hot room will cause one to become sleepy. Therefore, it is important to monitor and control the temperature in your work environment.

- Cooler temperatures enhance alertness.
- Work environment temperature should be maintained slightly below 70 degrees Fahrenheit (i.e., 65-68 degrees F is ideal).
- Rather than raising the thermostat, which will promote sleep, bring extra layers of clothing that can be put on or taken off to optimize personal comfort.
- Work area temperature should not be increased at night to compensate for the circadian decrease in body temperature. Again, layered clothing is equally effective without inducing drowsiness.
- Try to keep temperature uniform throughout the work area.
- Temperature at floor level should not be significantly different from that at head level.
- Use fans to help circulate air to maintain consistent temperatures throughout the work area.
- Avoid blowing warm or cold air directly on worker-occupied areas.



"I agree – keeping it cool makes it easier to stay alert. But we do need to start warning the relief workers in advance."

The Nine Controls Of Human Alertness: Sound

Sound can invigorate us or send us to sleep. The rolling surf on the beach, the smooth rushing of a mountain stream can lull us to sleep – so effectively that these sounds are now electronically simulated in "white noise" machines that many people use in their bedrooms. Unfortunately, the same electronic white noise is produced in less desirable places, such as industrial control rooms, production areas, and even our cars and trucks, or by the equipment that people are meant to watch alertly through the night. Any type of consistent sound or "White noise" can lull us to sleep. As such, the regular hum or noise of computers or machinery can cause you to become drowsy.

Conversely, irregular or variable sounds, such as a radio, conversation, or a honking horn, stimulate alertness. Therefore, playing a radio over the plant speakers or talking to a co-worker can help break the monotonous sounds of the equipment and help improve your alertness.

Research shows that improvements can be made to alertness levels by increasing the amount of audio activity in a room, but only at certain levels. Sound is characterized by frequency and amplitude fluctuations, and any type of sound at high amplitude (volume) can be annoying and/or distracting. To that end, volume in excess of 65 db may be disturbing and reduce performance.

Music typically falls within the variable frequency and amplitude fluctuation range known as "pink noise." This sound range is stimulating to the brain, thereby reducing errors and improving response time. Music with a beat, talk-radio programs, and social conversation are particularly helpful in maintaining alertness during monotonous tasks such as driving or monitoring computers.

The Nine Controls Of Human Alertness: Aroma

A growing body of research shows that smell, the most acute of our senses, has a powerful influence on our bodies and minds. Various scents are believed to activate olfactory nerve cells in the nasal cavity, which then send impulses to the area of the brain associated with emotions and memory. In fact, Alan Hirsch, M.D., a neurologist and psychiatrist who directs the Smell & Taste Treatment and Research Foundation in Chicago, believes that "The quickest way to induce an emotional response is through smell."

The sense of smell's impact on alertness is just beginning to be studied. However, some studies already indicate that certain aromas such as peppermint and lemon actually do increase alertness, particularly during the early morning hours.

For example, the chart on the bottom shows the results for individuals monitored for rate of keypunch errors over thirty 8-hour working days. You will notice that the frequency of errors was significantly lower when they were exposed to the lemon scent

Likewise, a driving simulation study found that peppermint "had an alerting effect at the end of the night when the subjects were most sleepy." In this study, volunteers drove during the overnight hours on two different nights. One night, the drivers were exposed to a peppermint scent. On the second night, the drivers were only exposed to unscented air. The volunteers scored better on the driving simulator when they were exposed to the peppermint as opposed to the unscented air.

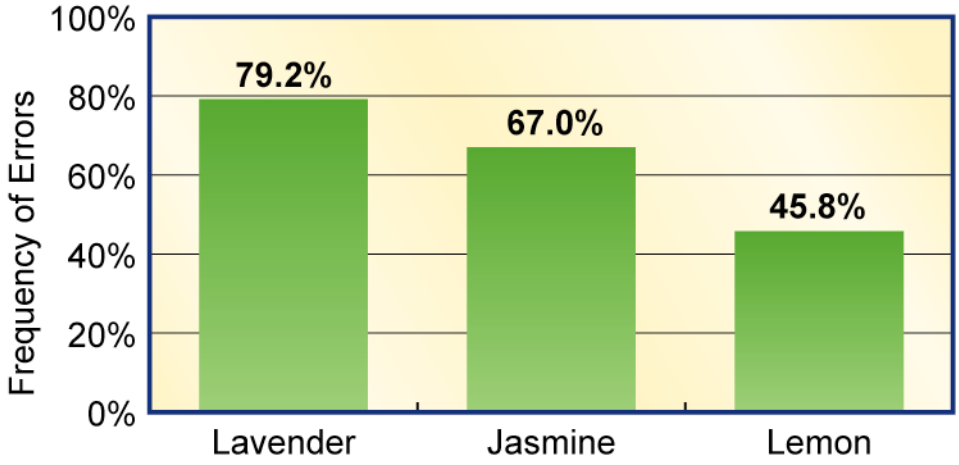
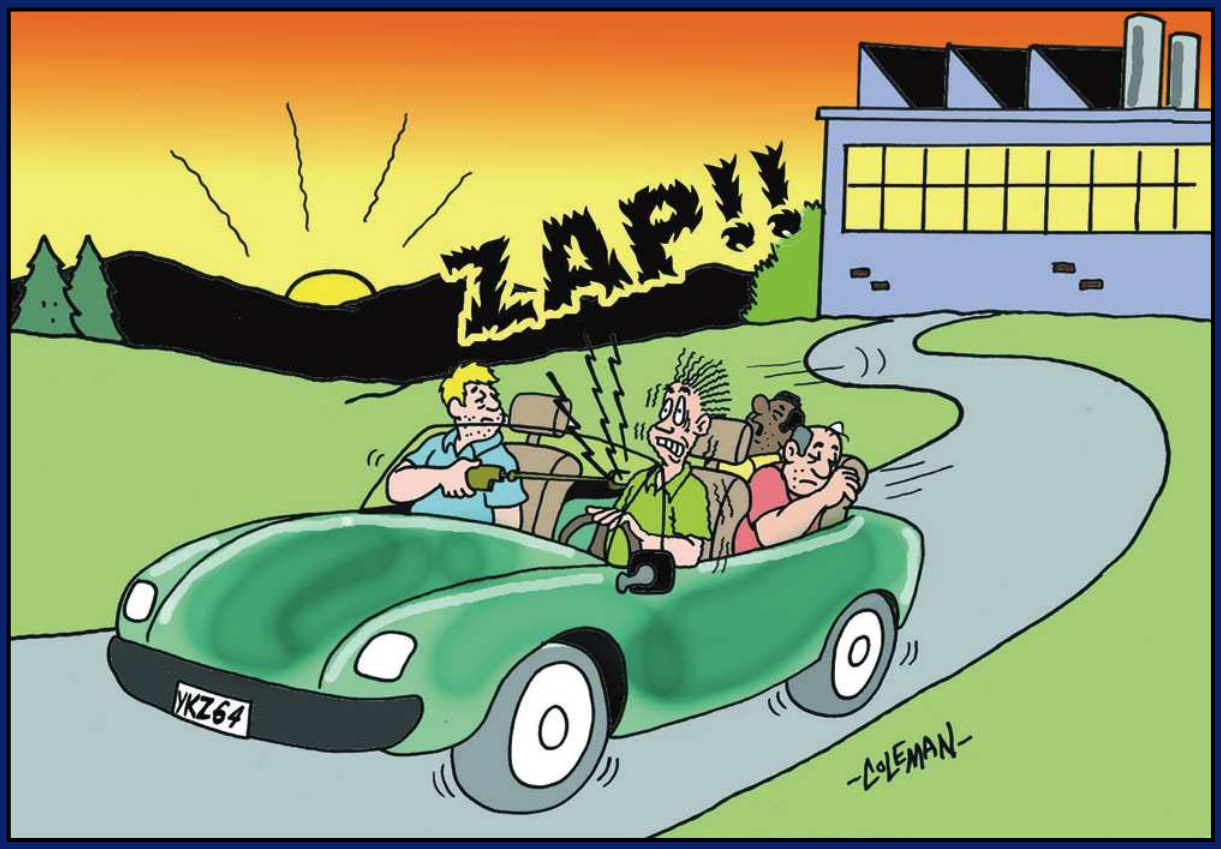


Chart Source: Howard, P.J., The Owner's Manual for the Brain: Everyday Applications from Mind-Brain Research, 2nd Ed, Bard Press, Atlanta, GA, 2000, p.713.

CHAPTER 6
Fatigue and Driving



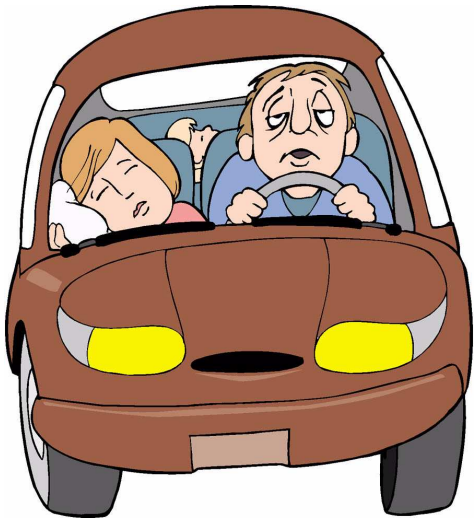
For the third day in a row, Dave got stuck being the "Designated Prodder."

Driver Fatigue

The National Highway Traffic Safety Administration estimates that:

- 100,000 vehicle crashes
- 71,000 injuries
- 1,500 fatalities
- $12,500,000,000 in related costs per year are attributed to:

Driver Fatigue



Driver Fatigue

According to a study by Dr. Czeisler at Harvard Medical School:

- Every day 80,000 people nod-off behind the wheel
- Half of them drift into another lane, or are awakened by the rumble strip
- Ten percent of them actually drive off the highway
- 1% of them have a motor vehicle crash associated with drowsiness or fatigue
- One out of five serious injuries from motor vehicle crashes are fatigue-related

Asleep At The Wheel

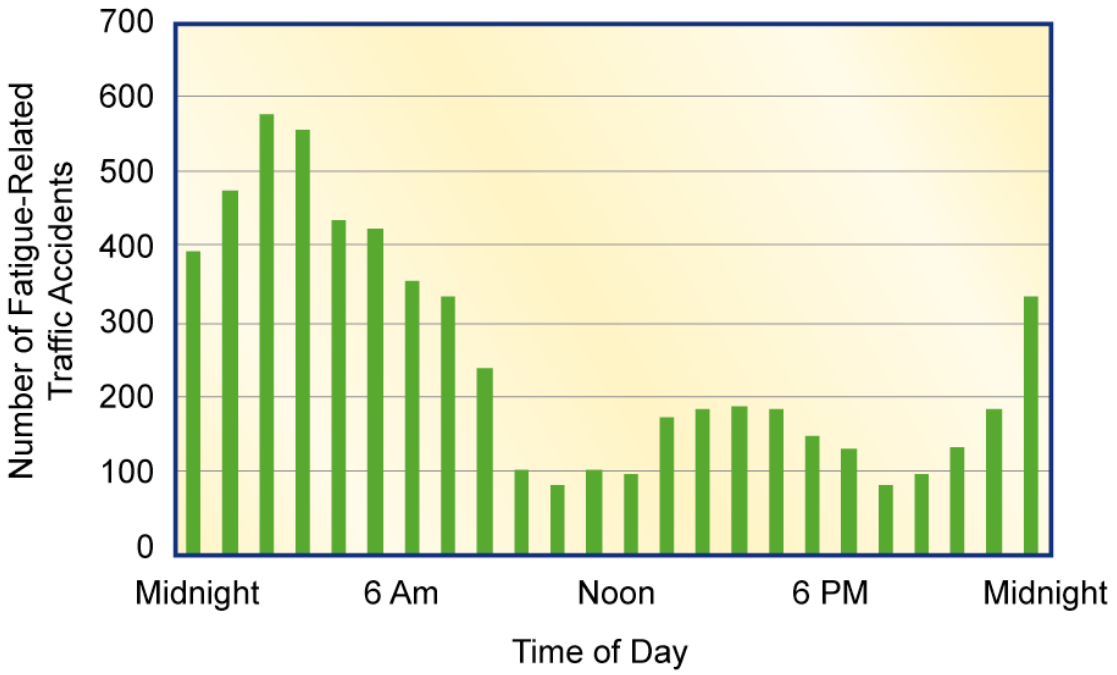
FATIGUE RELATED DRIVING ACCIDENTS:

- Six times greater for night workers
- Two times greater for rotating shiftworkers
- Other high-risk factors:
  - Getting less than 6 hours of sleep
  - Being awake more than 20 hours straight
  - Driving between midnight and 6:00 a.m.
  - Working more than one job

Source: AAA study, J. Stutts, UNC 1999

Drowsy Driver Accidents By Time Of Day

The graph below is based on the results of several international studies involving more than 6,000 traffic accidents. The graph reveals that most drowsy driver accidents take place during the early morning between midnight and 6 a.m., and another increase occurs in the mid-afternoon during the "post lunch dip" time period.



Source: Mitler MM et al. "Catastrophes, Sleep, and Public Policy: Consensus Report." Sleep 1988; 11:100-109

Drowsy Driving Awareness Quiz

Answer these questions “True” or “False.”

		TRUE	FALSE
1	I can tell when I am about ready to nod off.		
2	I’m a safe driver, so it doesn’t matter if I’m sleepy.		
3	A cup of coffee is all I need to wipe out the effects of sleep deprivation and stay alert during a long drive.		
4	Older people need less sleep.		

Drowsy Driving Awareness Quiz: Answers

1. **I can tell when I am about ready to nod off – FALSE**

   Studies show that most people who are drowsy do not know exactly when they are going to fall asleep. According to the AAA Foundation For Traffic Safety, in a study of drivers who fell asleep and crashed, half said they felt only somewhat sleepy or not sleepy at all just before the crash.

2. **I'm a safe driver, so it doesn't matter if I'm sleepy - FALSE**

   The safe driver is an alert driver. In 1989, Michael Doucette won the National Driver's Excellence contest, earning him the title of "America's Safest Driver." Just a few months later, Doucette fell asleep at the wheel and crashed into another car killing himself and the 19-year old driver of the other car.

3. **A cup of coffee is all I need to wipe out the effects of sleep deprivation and stay alert during a long drive – FALSE**

   Food or drinks containing caffeine can help you feel alert - but only for a short time. If you drink coffee while seriously sleep deprived, you are still likely to suffer brief microsleeps. At 60 miles an hour, a five-second microsleep will leave you 150 yards down the road when you wake up from it.

4. **Older people need less sleep – FALSE**

   Older people still require the same amount of sleep as they did in their younger days, but as we age, our sleep patterns do change, and older people tend to get less sleep in their main sleep block. The reason for this is that as we get older our bodies produce less melatonin, and melatonin not only helps us to fall asleep but also to stay asleep. So as you get older, it is important to make sure you are well rested before driving.

Drowsy Driving Danger Signs

There are eight drowsy driver "danger signs," according to the American Medical Association:

1. Eyes closing or going out of focus
2. Trouble keeping your head up
3. Yawning nonstop
4. Wandering, disconnected thoughts
5. Not remembering driving the last few minutes
6. Drifting between lanes, tailgating or missing traffic signs
7. Jerking the car back into the lane
8. Drifting off the road

If you experience any of these signs of fatigue during your drive home from work, pull off the road and find a safe place and take a nap.

Safety Tips For The Road

Commonly used fatigue countermeasures that may help boost alertness a little:

- Exercise
- Car pool
- Vary your route home
- Chew on ice, fruit, gum, sunflower seeds
- Keep the car cool (may only help a little)
- Listening to the radio

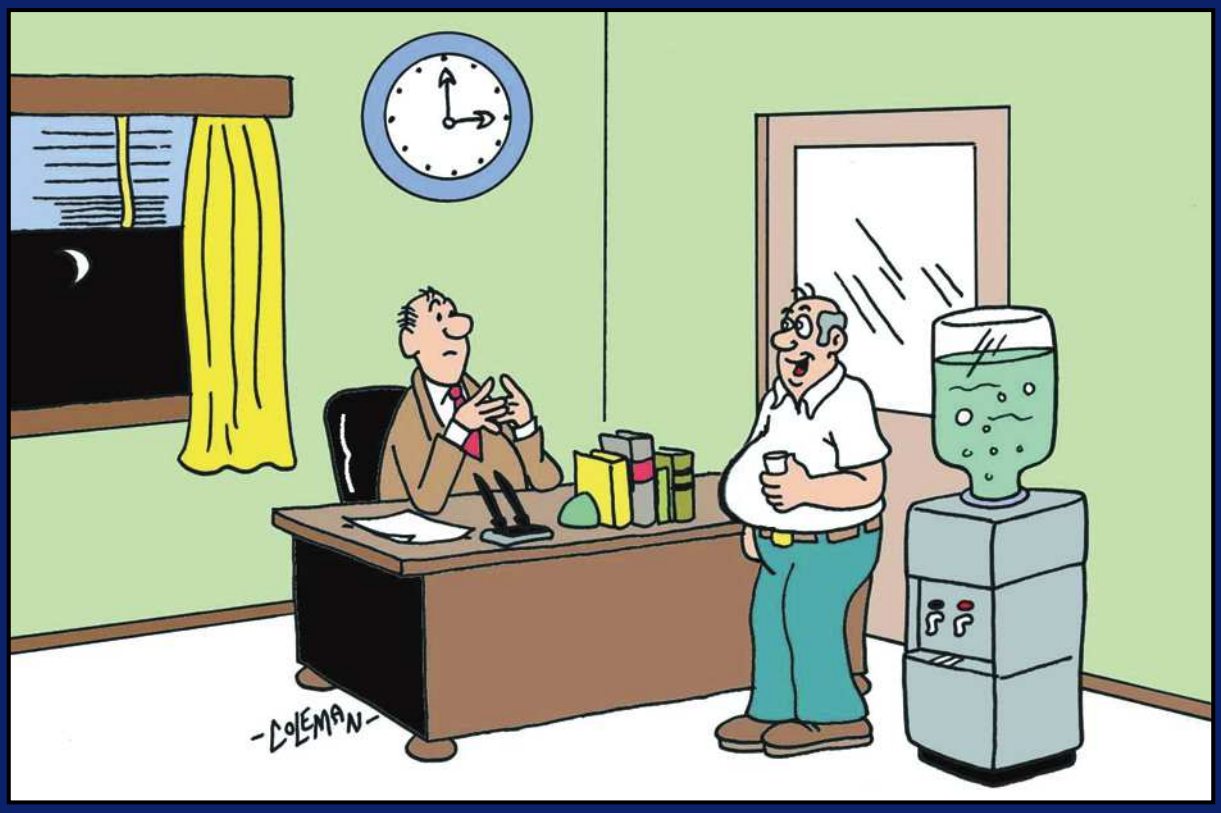
However, keep in mind that these countermeasures are only effective for a very short period of time and may not ensure that you get home safely every time.

The most effective fatigue countermeasures are:

- **Taking a nap**
- **Drinking coffee**

NOTES:

CHAPTER 7
Maintaining Health



"How did I get the nickname 'Slim'?
A co-worker gave it to me a few years back
before I started working nights."

Maintaining Good Health Requires:

EDUCATION

Start by seeing your doctor and determining what your problem areas are. Inform your doctor that you work shifts/nights, and discuss the potential risks of working non-conventional hours, especially regarding problems you may be particularly prone to suffer.

A PLAN OF ACTION

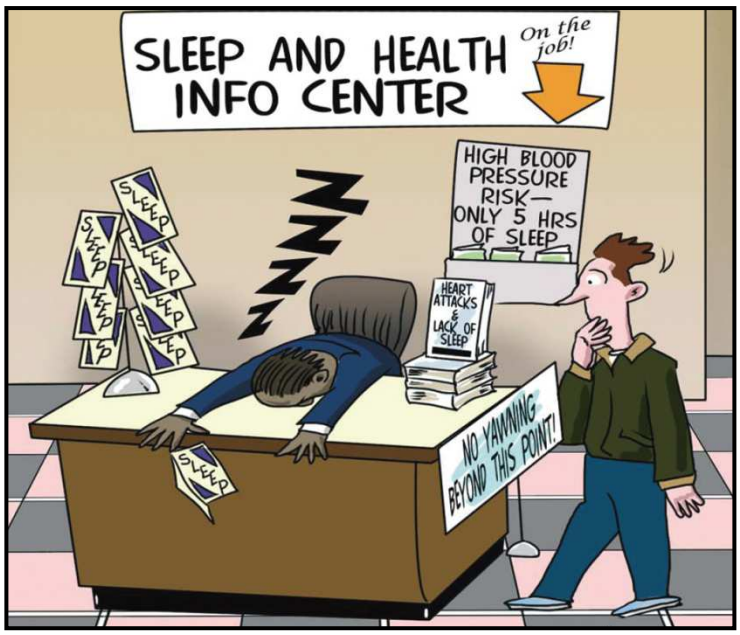
Develop a plan to deal with your specific problems, and put this plan in writing.

PERSONAL COMMITMENT

Make a personal commitment to improve your lifestyle for your benefit and for those around you and develop personal management skills to make your plan work. Unfortunately, for most people this is the most challenging part of the equation.

Common Health Problems In Shiftworkers: Sleep Disorders

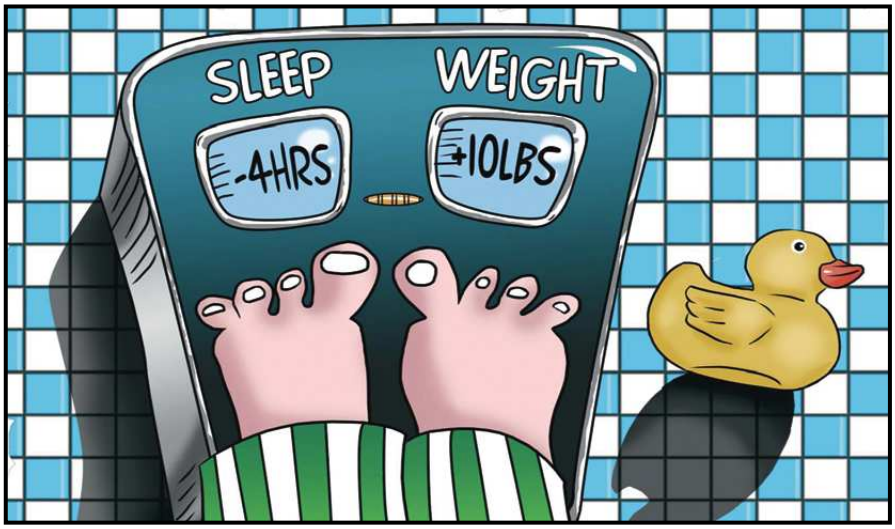
- The average night worker obtains about two hours less sleep a day than the average nine-to-fiver.
- Insomnia is more frequent among people working shifts: 61% of shiftworkers vs. 47% of general population. *(Source: National Sleep Foundation)*
- Excessive daytime sleepiness is more frequent among people working shifts: 30% of shiftworkers vs. 18% of general population. *(Source: National Sleep Foundation)*
- Some sleep disorders are more common among shiftworkers.



Common Health Problems In Shiftworkers: Metabolic Problems

Shiftworkers have a higher risk of:

- Being overweight/obese
- Insulin resistance or glucose intolerance (the body can't properly use insulin or blood sugar), which can lead to diabetes



Common Health Problems In Shiftworkers: Digestive Disorders

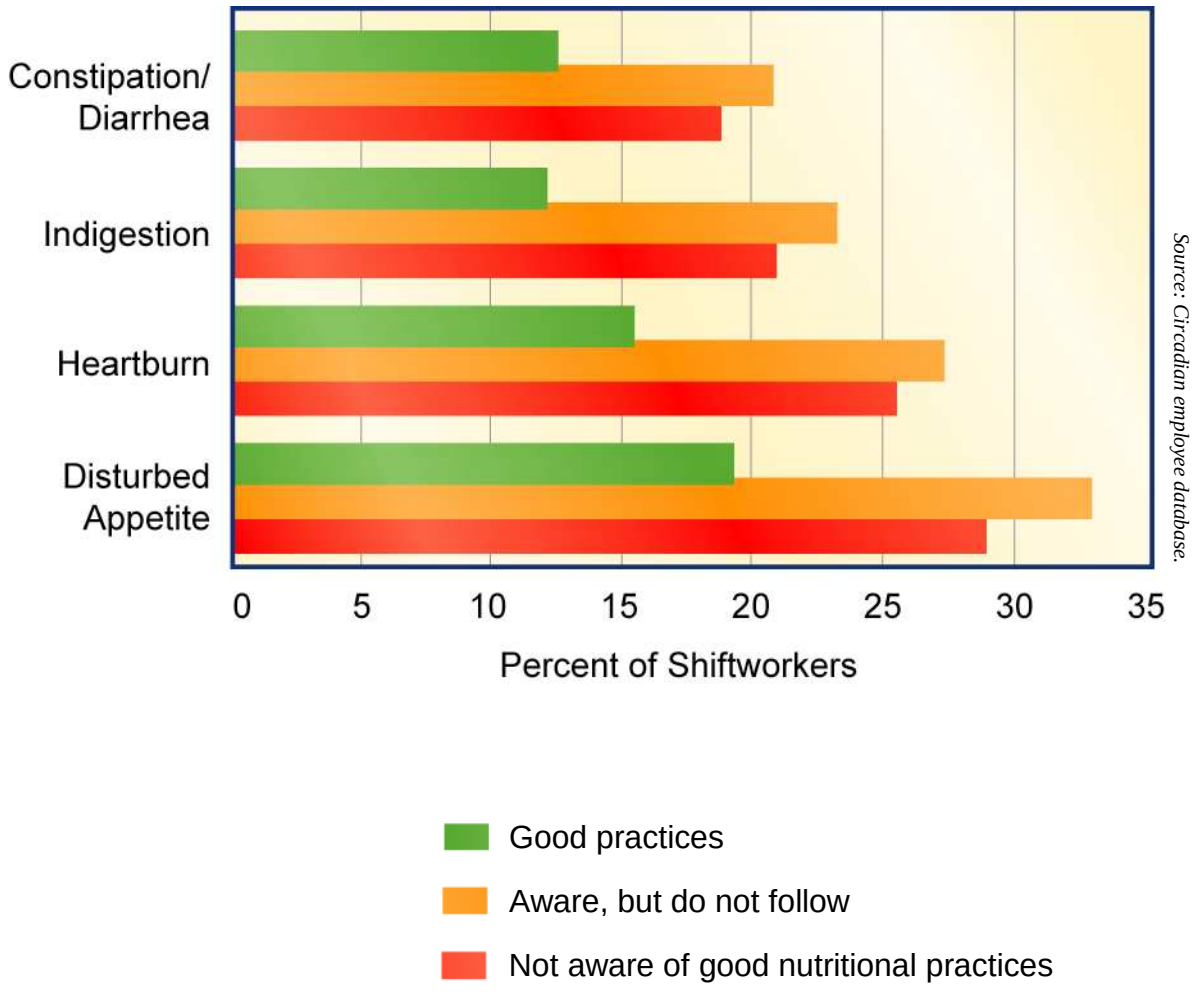
Shiftworkers have a higher rate of gastrointestinal disorders, including:

- Heartburn and Indigestion
- Ulcers
- Diarrhea and Constipation

Impact Of A Healthy Diet

A healthy diet is related to a lower frequency of gastrointestinal problems, such as disturbed appetite, heartburn, indigestion, and constipation or diarrhea.

Relationship between good nutritional practices and frequency of gastrointestinal disorders.



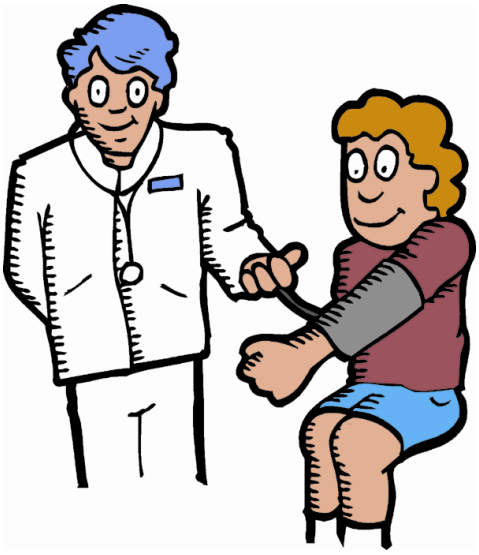
Source: Circadian employee database.

Common Health Problems In Shiftworkers: Heart Disease

- Shiftworkers have a higher rate of cardiovascular disease
- Things that have been proven to contribute to a disease are called risk factors
- Risk factors for heart disease and high blood pressure include:
  - Being overweight
  - High cholesterol
  - Lack of exercise
  - Smoking
  - Excessive alcohol consumption
  - Excessive stress
  - Family history

Dealing With Health Issues

- Meet with your doctor and evaluate health status
- Determine your personal risk areas
- Write down the areas of improvement
- Work on one or two areas at a time
- Don’t try to change everything at once



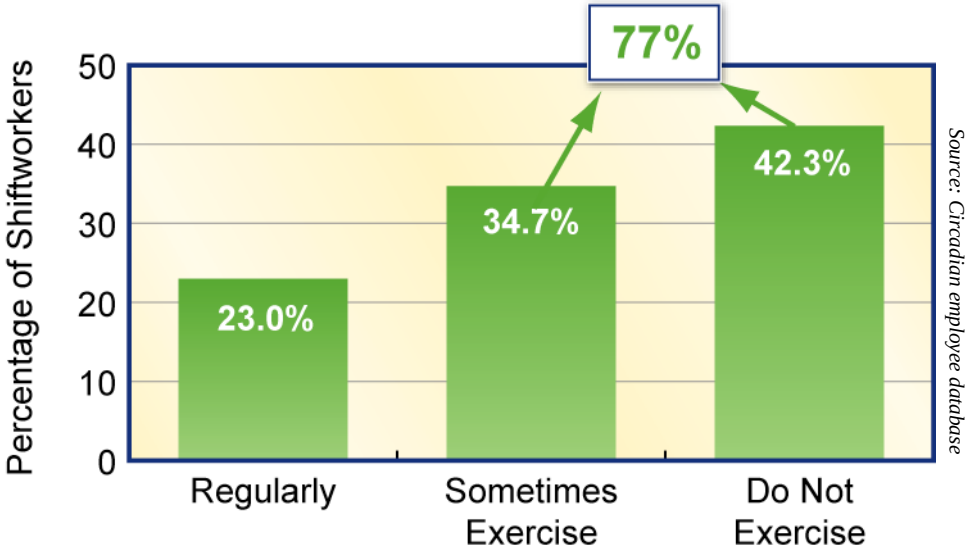
Benefits Of Exercise

- Increases physical fitness
- Increases energy levels and alertness
- Helps relieve stress
- Can improve sleep quality and quantity
- Can improve your memory
- Can add years to your life:
  - Each year 250,000 deaths in the US are attributed to the lack of regular physical activity according to the American Heart Association.
  - Walking 2 miles per day added years to the lives of people over age 60 compared to those who walked less than 2 miles per day.
  - Regardless of cholesterol level, men who are physically fit cut their risk of dying from heart disease by 50%.

Exercise Trends

- 54% of Americans do not exercise regularly.
- Shiftworkers exercise even less: 77% do not exercise regularly.

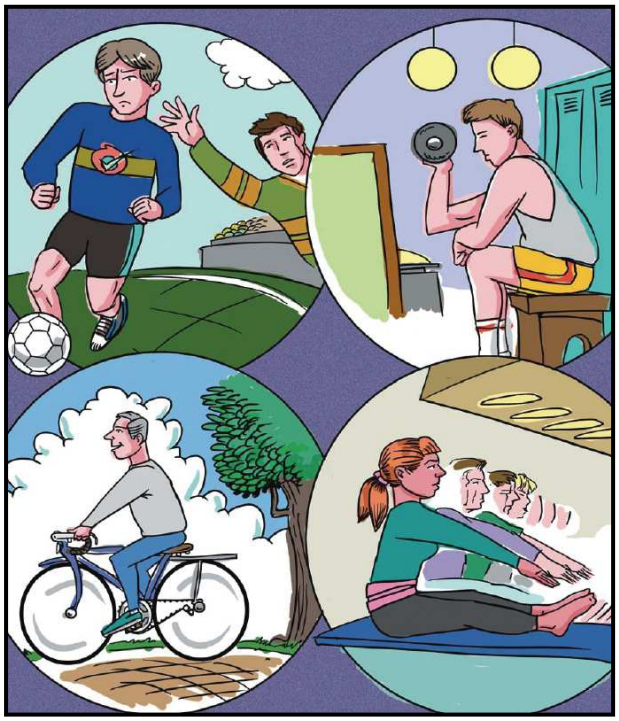
Exercise Practice Among Shiftworkers



Source: Circadian employee database

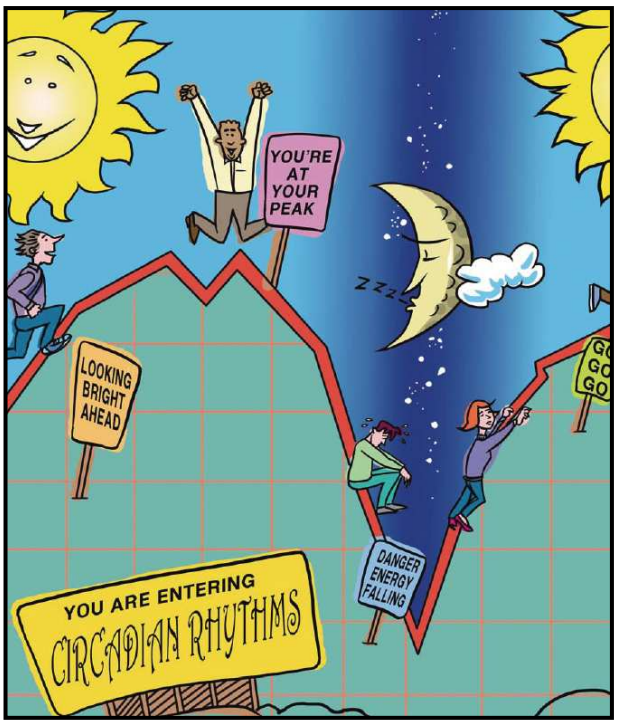
Sleep and Alertness Benefits Of Exercise

- Exercise helps you fall asleep faster
- Exercise helps you sleep longer
- Exercise improves sleep quality
- Exercise can shift circadian rhythms – making it easier to be awake and alert overnight and to sleep in the morning
- Exercise can be used to speed up the transition to “getting used to” working nights on a block of night shifts since physically fit people recover from shift changes quicker than non-exercisers



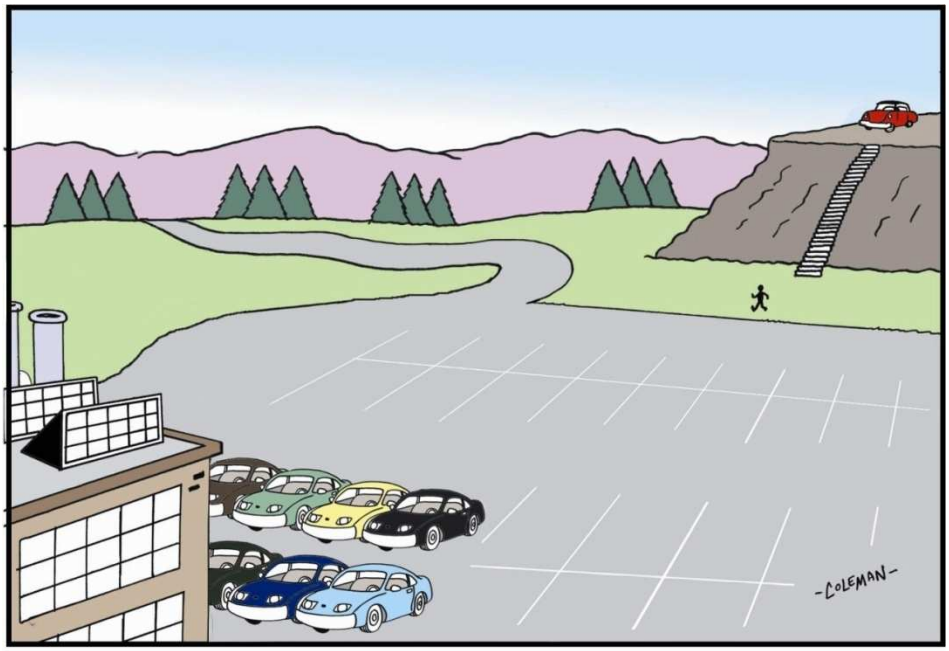
Exercise Tips

- Three 30-minute exercise sessions per week are recommended to maintain cardiovascular fitness
- Any exercise, even low level, will boost alertness by activating multiple body systems and releasing adrenaline, which stimulates the brain
- Exercising before the nightly low point of alertness can make you more alert on the night shift



Paths To Fitness

- Start slowly
- Do things you enjoy
- Do a mixture of activities
- Involve the people around you
- Don’t expect immediate results
- Sneak in fitness



BOB WAS DETERMINED TO INCORPORATE REGULAR EXERCISE INTO HIS LIFE.

Understanding Stress

- Stress is a reaction to circumstance
- The key is **HOW** we respond
- If we respond positively, stress may be seen as challenging and has a beneficial effect
- If we respond negatively, stress becomes threatening, exhausting and may ultimately damage your health or well-being

DEFINITIONS

1. "Stress" is commonly used to describe:

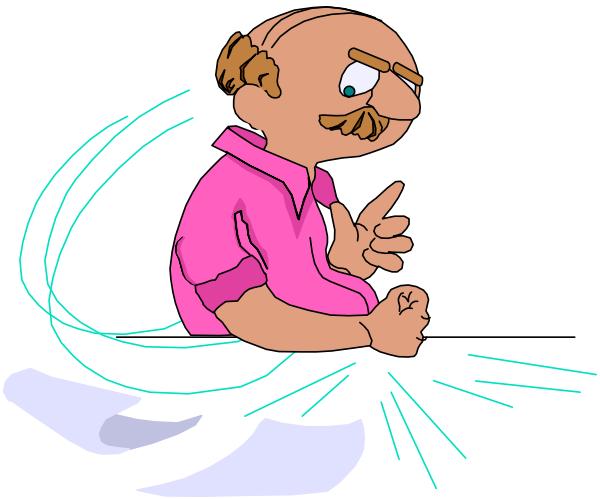
1. External exposures, pressures and demands
2. The outcomes and results or those pressures

2. "Stressor"

Pressures, challenges or demands that are known to have the potential to cause distress and health problems

3. "Distress"

Negative emotional, behavioral or bodily reactions to stressors



Stressors

- Found in every facet of our lives:
  - Family
  - Social
  - Financial
  - Physical (i.e., health)
  - Workplace

- Interactive and interdependent:
  - Coping mechanisms can be overwhelmed when dealing with multiple stressors at once
  - Individuals experiencing distress are often not good at identifying root cause

- Ability to manage stressors differs:
  - Social networks
  - Coping skills
  - Attitude

WHAT STRESSORS MAY EXIST AT WORK?

- Lack of control
- Time / deadline pressure
- Work overload
- Poor working relationships
- Excessive travel
- Lack of communication
- Organizational change
- Job insecurity

Types Of Stress

1. **Acute Stress** - an immediate reaction to some circumstance and of short duration
2. **Chronic Stress** - stress maintained during long periods of time. There are different types with different causes:
   - Internally Generated Stress - being anxious and worrying about uncontrollable circumstances
   - Environmental and Job Stress - when living or working environment creates stress
   - Fatigue and Overwork - when you are tired and unable to "reset" and energize your body

Effects Of Too Much Stress

- Irritability
- Fatigue
- Eating disorders
- Heart problems
- Deteriorating immune system
- Poor work performance
- Decreased interest in sex

Recognizing Signs And Symptoms Of Stress

SYMPTOMS OF ACUTE STRESS:

- Increased heartbeat
- Sweating
- Cool, clammy skin
- Cold hands and feet
- Feelings of nausea
- Rapid breathing
- Tense muscles
- Dry mouth
- A desire to urinate
- Diarrhea

SYMPTOMS OF CHRONIC STRESS:

- Change in appetite
- Back pain
- Digestive problems
- Headaches
- Sexual disorders
- Confusion
- Concentration problems
- Feeling overwhelmed
- Mood changes:
  - depression
  - frustration
  - hostility
  - impatience & irritability
  - restlessness & helplessness
- Being more lethargic
- Difficulty sleeping
- Relying more on medication, alcohol, and nicotine
- Change in habits
- Neglect of personal appearance

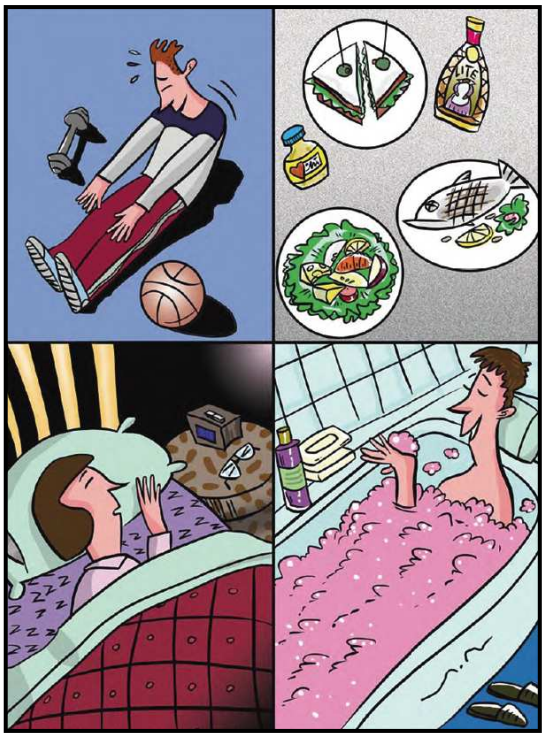
CHRONIC OR LONG-TERM STRESS LEADS TO:
Fatigue and exhaustion
Depression
Burn out
Breakdown
Detachment from relationships and interests

Stress Reduction Techniques

- Determine the cause of stress and eliminate it if possible
- Exercise
- Relax or meditate
- Slow down - break the rut of the “to-do’s”
- Leave time for fun, recreation, family and friends
- Avoid excessive amounts of toxins and stimulants
- Set goals and use positive thinking
- Improve financial planning and management
- Remove unnecessary clutter
- Improve air quality, lighting, noise, furniture, and ergonomics

Shiftwork And Health

- As a group, shiftworkers have more health problems than 9-5 workers
- Shiftworkers do not have to suffer from poor health - with good management, you can enjoy the same healthy life as your counterparts on day work
- Making appropriate changes in your lifestyle now can help improve your health in both the short- and the long-term
- You can remain in excellent health by:
  - Getting good sleep
  - Exercising regularly
  - Reducing stress
  - Eating properly



CHAPTER 8
Nutrition and Shiftwork

"No, I'm not sure your stomach problems were caused by the change in our shift schedule."

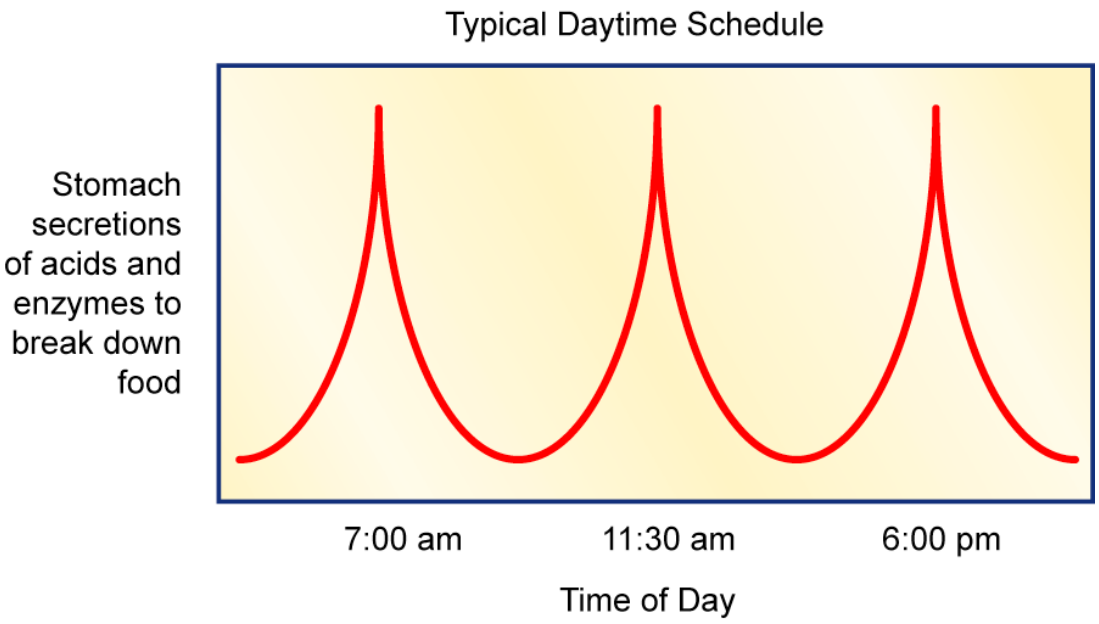
Shiftwork And Nutrition

Most of the digestive problems for shiftworkers can be summed up in one phrase:

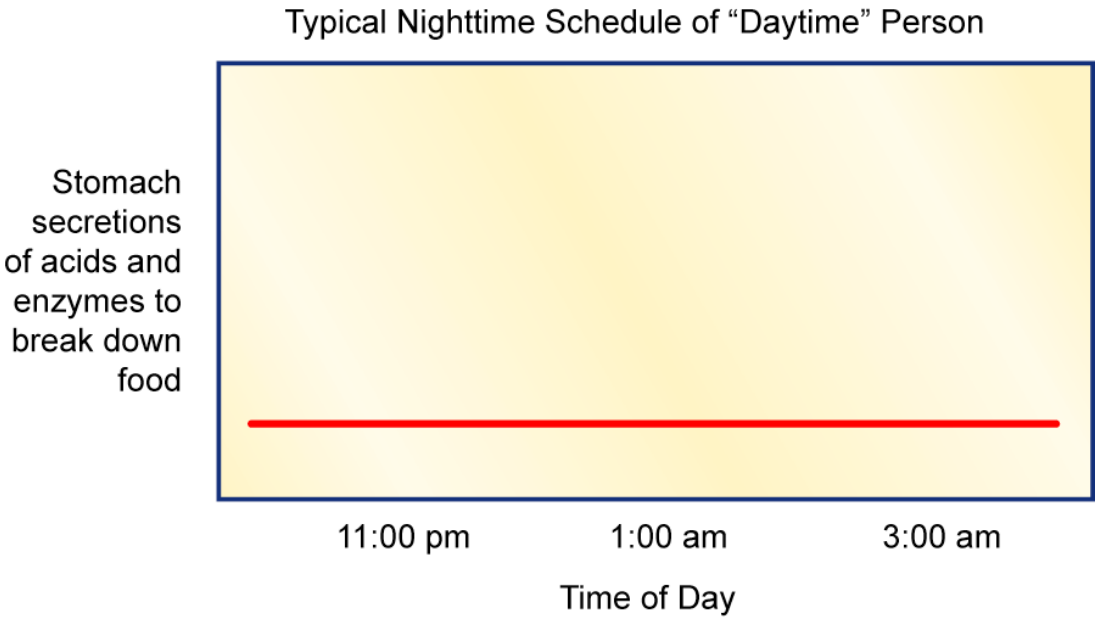
"Eating the wrong food at the wrong time"

Your Biological Clock And Your Stomach

Your stomach anticipates meal times during the day:



At night, your stomach does not expect to digest food:



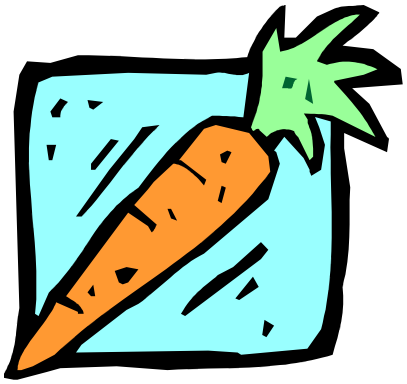
What Can You Eat At Night?

COMPLEX CARBOHYDRATES:

- Pasta, rice and potatoes
- Whole grain breads and breakfast cereals
- Fruit and vegetables

LOW FAT PROTEINS:

- Lean meats, skinless chicken, and fish
- Soybeans, tofu, and beans
- Low fat pizza



Foods To Avoid At Night

Fried Foods
Candy Bars
High Sugar Snacks
Pastries and Donuts
Potato and Corn Chips
Whole Milk Dairy Products
Fatty Meats and Most Red Meats

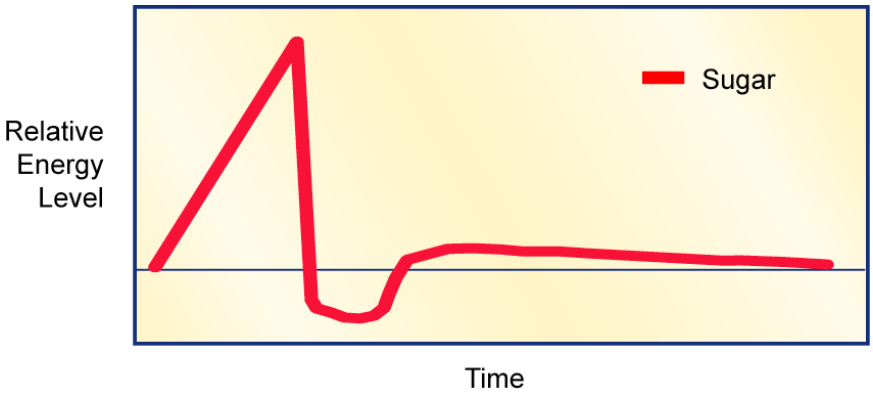
FOODS THAT COULD UPSET YOUR STOMACH

Acidic Juices (like Tomato Juice)
Excessive Coffee and Tea
High Fat Foods
Spicy Foods

The Effects Of Sugar

Despite the impression given in the advertising campaigns of chocolate bar manufacturers, downing a candy bar is not an effective way to boost your energy level. The human body metabolizes sugar rapidly, so eating candy or chocolate gives you a "high" that lasts only about 20 minutes before causing you to crash to a more fatigued state than when you started (as depicted in the chart below).

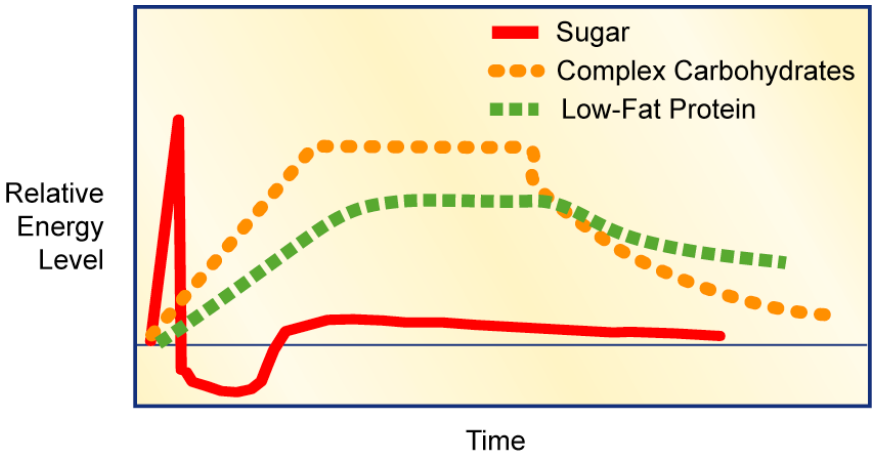
Energy Level After Eating A High-Sugar Snack



Sugar provides a quick energy boost but tails off quickly leaving you tired and needing more

Other drawbacks to a high-sugar diet include weight gain, dental problems, diabetes, and a link with heart disease when combined with obesity.

Therefore, keep your nighttime (and overall) sugar intake low to stay off the energy roller coaster and avoid weight gain, heart disease, and dental problems. Instead have healthy alternatives at hand in the form of complex carbohydrates and low-fat proteins for when you crave sugar since these will give you a longer energy boost (see chart below). Finally, pay close attention to food labels: the words "sucrose," "fructose," and "corn syrup," signify sugar.

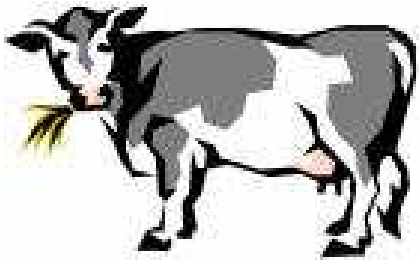


Complex carbohydrates and low-fat proteins provide a longer energy boost than sugar

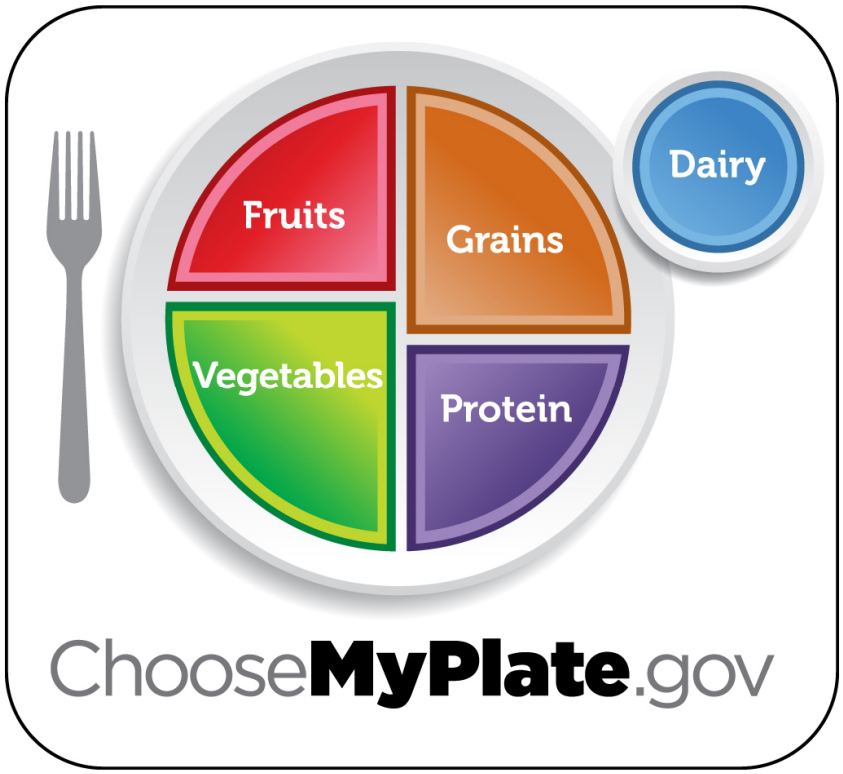
Strategy For Eating At Night

HEALTHIER FOODS	SMALLER PORTIONS	MORE OFTEN
Helps avoid weight gain & provides more energy	Makes digestion easier	Eating helps you stay awake and stabilizes your metabolism

"Graze" your way through the night shift.



The Food Plate



Take action on the Dietary Guidelines by making changes in these three areas:

Balancing Calories

- Enjoy your food, but eat less.
- Avoid oversized portions.

Foods to Increase

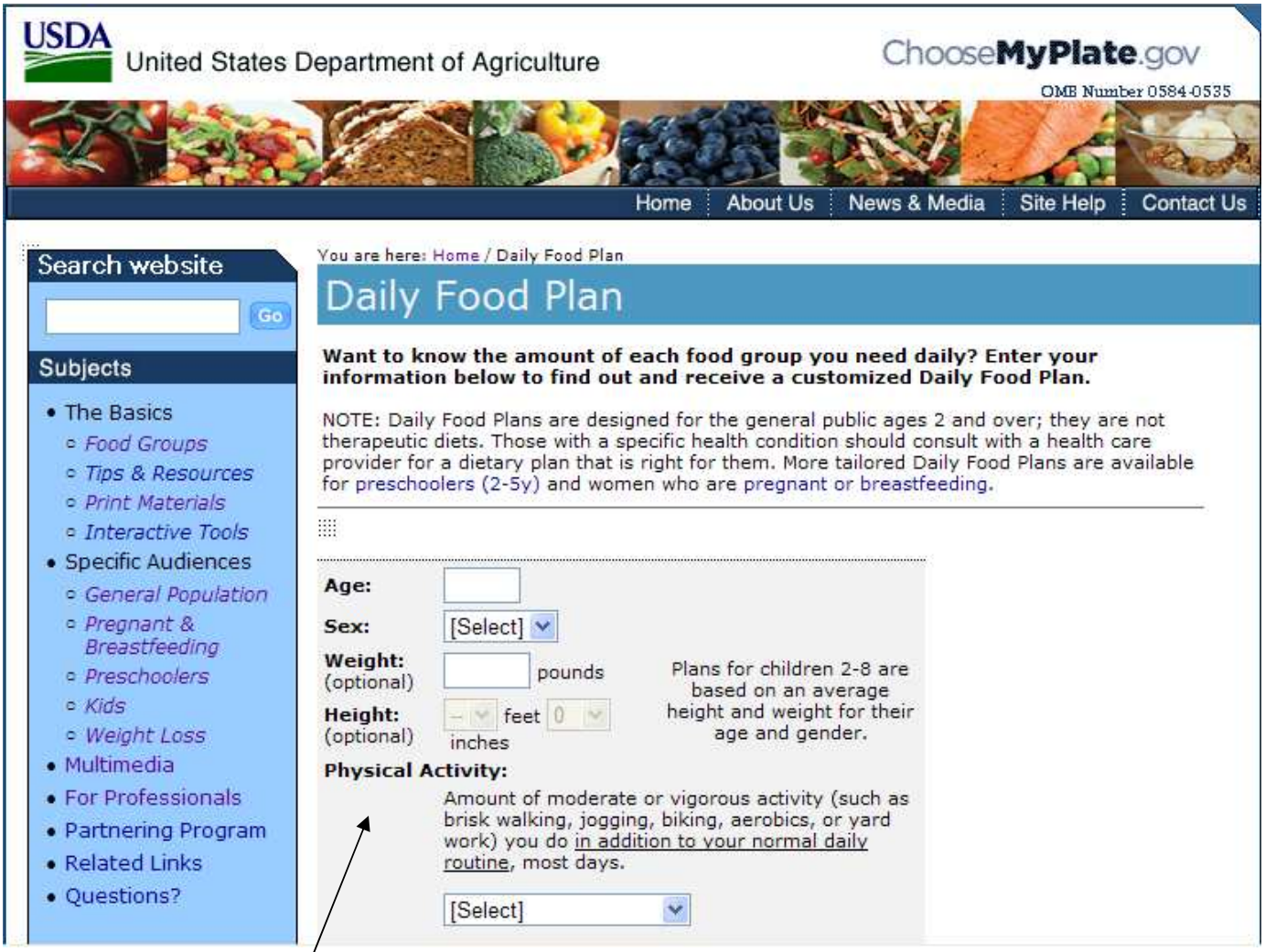
- Make half your plate fruits and vegetables.
- Make at least half your grains whole grains.
- Switch to fat-free or low-fat (1%) milk.

Foods to Reduce

- Compare sodium in foods like soup, bread, and frozen meals — and choose the foods with lower numbers.
- Drink water instead of sugary drinks.

The Interactive Food Plate

By logging onto ChooseMyPlate.gov, you can receive your personal Daily Food Plan by inserting your age, sex, and activity level into the "Get a Personalized Plan" section.



In order to calculate your own personal daily food plan, log onto http://www.choosemyplate.gov/myplate/index.aspx and enter your age, sex, and activity level.

The Interactive Food Plate

Below is a sample of the type of results you will receive after putting your information into the Daily Food Plan section on ChooseMyPlate.gov.

USDA United States Department of Agriculture

ChooseMyPlate.gov

OME Number 0584-0535

Home | About Us | News & Media | Site Help | Contact Us

Search website

Go

Subjects

- The Basics
  - *Food Groups*
  - *Tips & Resources*
  - *Print Materials*
  - *Interactive Tools*
- Specific Audiences
  - *General Population*
  - *Pregnant & Breastfeeding*
  - *Preschoolers*
  - *Kids*
  - *Weight Loss*
- Multimedia
- For Professionals
- Partnering Program
- Related Links
- Questions?

You are here: Home / Daily Food Plan

Daily Food Plan

Eat these amounts from each food group daily. This plan is a **2600** calorie food pattern. It is based on average needs for someone like you. (A **42** year old **male**, **5** feet **10** inches tall, **170** pounds, physically active **30 to 60 minutes** a day.) Your calorie needs may be more or less than the average, so check your weight regularly. If you see unwanted weight gain or loss, adjust the amount you are eating.

Grains[1]	9 ounces	tips
Vegetables[2]	3.5 cups	tips
Fruits	2 cups	tips
Dairy	3 cups	tips
Protein Foods	6.5 ounces	tips

Click the food groups above to learn more.

[1] Make Half Your Grains Whole

Aim for at least 4.5 ounces of whole grains a day.

[2] Vary Your Veggies

View, Print & Learn More:

- Click here to view and print a PDF version of **your results**.
- Click here to view and print a PDF of a helpful **Meal Tracking Worksheet**.
- For a more detailed assessment of your diet quality and physical activity go to the **The Tracker**.
- You can view/print the **My Daily Food Plan Results** and the **Food Tracking Worksheets** for any or all

Rate Your Plate

These 12 questions will give you a rough sketch of your typical eating habits. The number for each answer instantly pats you on the back for good eating habits (2), or alerts you to problems that you may want to try and fix (0 or 1). The quiz focuses on the main food groups and sweets. It doesn't attempt to cover everything in your diet, and it doesn't try to measure precisely how much of the key nutrients you eat. This just serves as an outline of your current diet.

Directions: Use the scale on the right to indicate your typical eating habit for each

Scale:
0 = Never
1 = Sometimes
2 = Most days

1. Do you consider nutrition when making food choices?	0	1	2
2. Do you avoid skipping meals?	0	1	2
3. Do you include 3 or more whole grains per day?	0	1	2
4. Do you eat at least 2 cups of vegetables daily?	0	1	2
5. Do you vary veggies with dark green and orange varieties?	0	1	2
6. Do you eat at least 2 cups of fruit daily?	0	1	2
7. Do you get 3 cups of low-fat or fat-free milk, yogurt or cheese daily?	0	1	2
8. Do you have 5-6 ounces of meat and beans per day?	0	1	2
9. Do you choose lean meats and poultry?	0	1	2
10. Do you vary protein with fish, beans and nuts?	0	1	2
11. Do you limit the amount of fat in your diet?	0	1	2
12. Do you limit sweets (cookies, cake, donuts, candy bars, etc.)?	0	1	2
YOUR TOTAL			

Adapted from the American Dietetic Association

How you rate:

19-24 Great – your diet appears to well-balanced and healthy

13-18 Good - A few easy changes will make your diet healthier

0 - 12 Needs work - try adding healthier choices to your diet. You may want to consult with a nutritionist for tips and advice

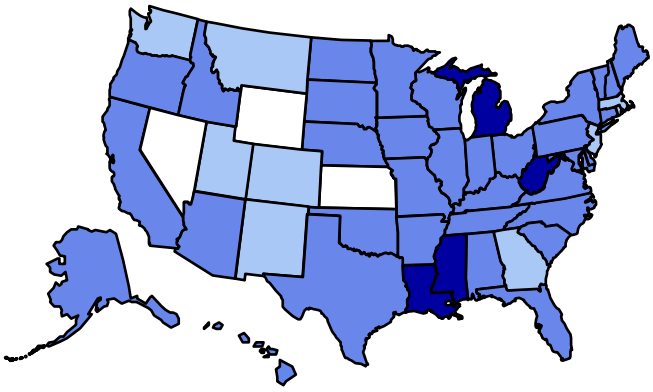
Note: these ratings only serve as general guidelines and should not be considered complete medical advice. It is always best to consult with your physician or a nutritionist who can do a more thorough evaluation of your nutritional needs, especially if you have any conditions which may require a special diet (diabetes, heart disease, pregnancy, etc.).

Truth and Consequences

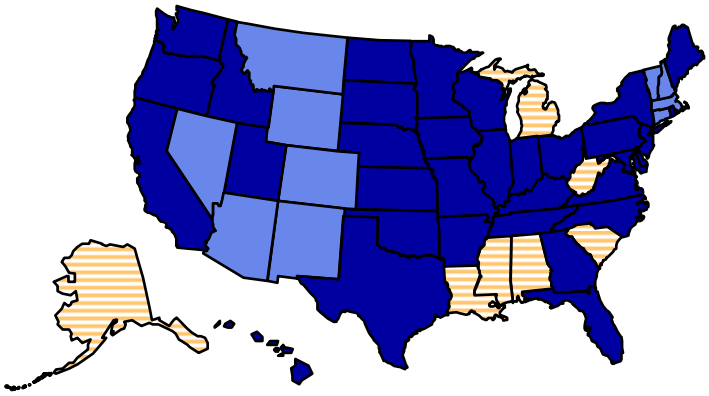
By Rob Davenport
KEC Health Advocate

Obesity Trends* Among U.S. Adults
BRFSS, 1991, 1998, 2007

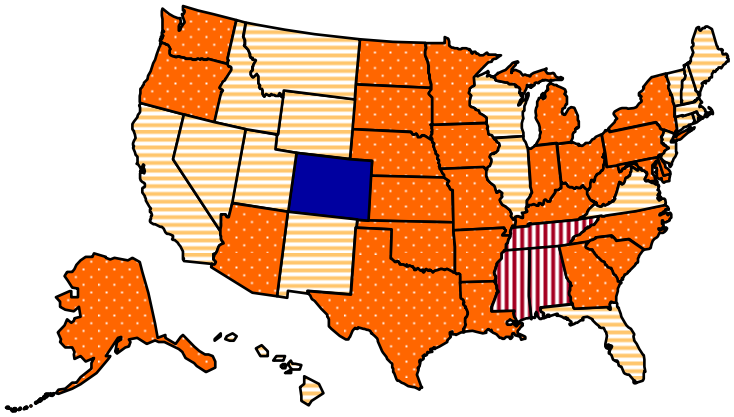
1991

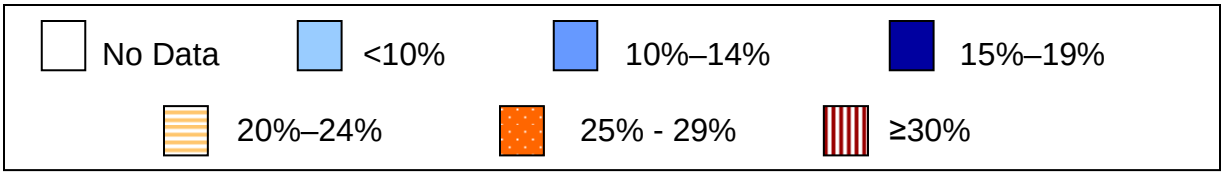


1998



2007





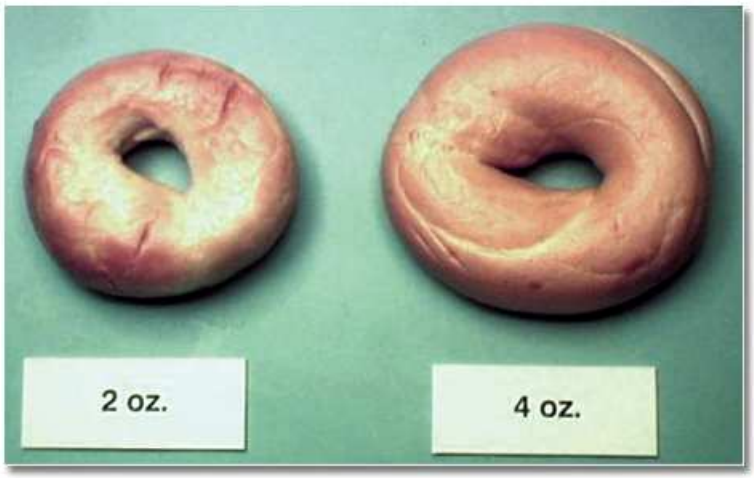
Source: Centers for Disease Control & Prevention

(*BMI ≥30 in adults)

What's Changed?

- Portion sizes:
  - Standard servings have increased over the years
  - Society puts importance on value - Super size me!
  - Increase in buffet style restaurants
- Food content:
  - Higher sugar content (high fructose corn syrup)
  - Greater reliance on hydrogenated oils for food preservation, texture and taste
- The average US adult is 25 pounds heavier than the average adult in 1960, and the trend is getting worse
- Two-thirds of American adults are overweight or obese according to the Center for Disease Control

Increased Portion Sizes



Picture source: Rob Davenport

What Can I Do?

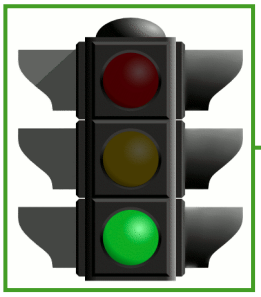
CONTROL PORTIONS:

- Read labels regularly
- Learn serving sizes & measure your servings
- Use sandwich baggies to control size

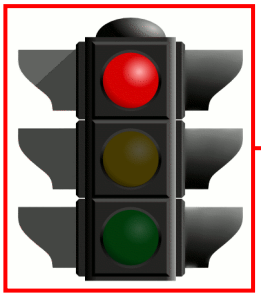
MAKE HEALTHIER FOOD CHOICES:

- Choose low calorie foods and snacks
- Lower fat and saturated fat intake
- Lower sugar intake
- Increase fiber intake

Breakfast Options

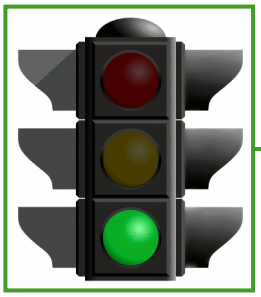


Hot and cold cereals with whole grains and high in fiber are great options that are filling and can help reduce cholesterol.

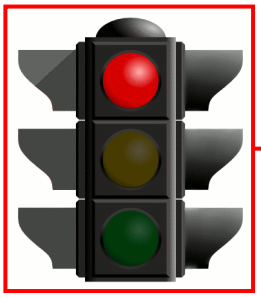


Donuts, muffins and other high calorie baked goods are low in fiber, high in fat and contribute to higher cholesterol levels.

Soda Options

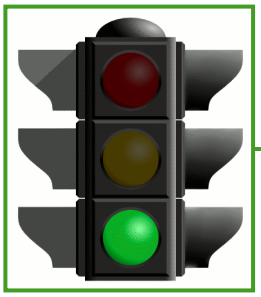


- Compared to regular pop diet pop has no calories and no sugar.
- 0 Cals, 0 g of sugar

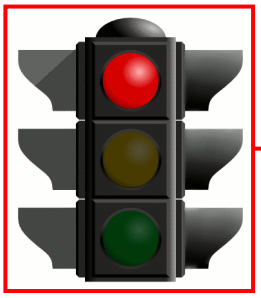


- 170 Cals, 42 g of sugar
- Change = 17.7 lb wt. loss/yr
- 4 regular sodas or one 44oz Big Gulp per day can add 71 lbs in one year!

Energy Drinks

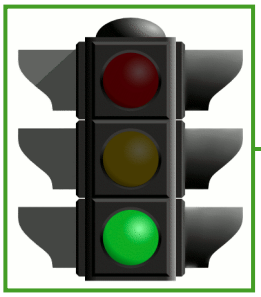


- "Sugar free" version
- 10 Calories/8oz serving

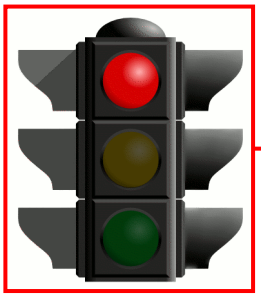


- Regular version
- 100 Calories/8oz serving
- Change = 9.4lb wt. loss/yr

Beverage Options

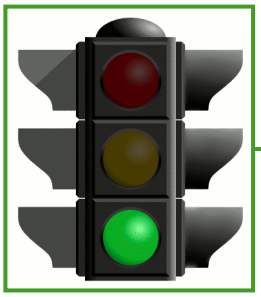


- Good taste & less calories
- 10 Calories per 8oz serving

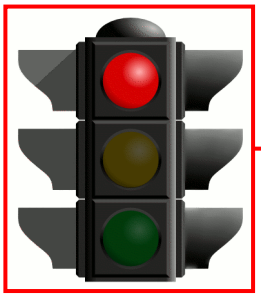


- Originally designed for exercise fluid replacement
- 50 Calories per 8oz serving
- Change = 4.2lb wt. loss/yr

Chip Options

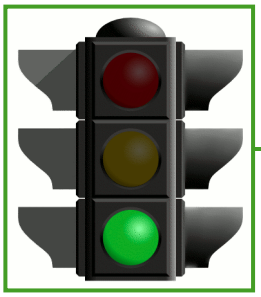


- Baked Lays chips has significantly less fat and calories than regular Lays.
- 170 Cals, 4g fat, 0 trans fat

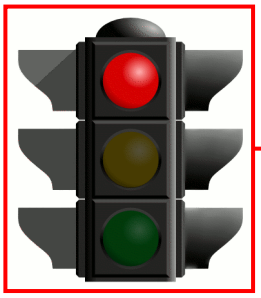


- Regular chip serving much higher in calories & fat.
- 195 Cals, 10g fat
- Change = 3 lb wt. loss/yr

Chip Options

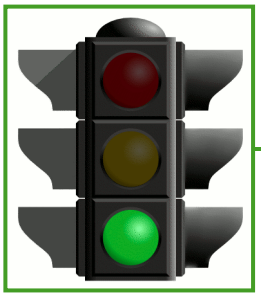


- Significantly reduced fat and calorie content.
- 70 Cals, 0g fat

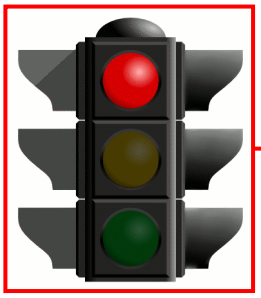


- Regular chip serving much higher in calories & fat.
- 150 Cals, 10g fat
- Change = 8.3lb wt. loss/yr

Snack Options

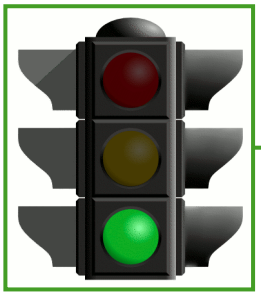


- All Bran bar is a good source of fiber and made of healthy whole grain carbs.
- 130 Cals, 5g fiber, 3g fat

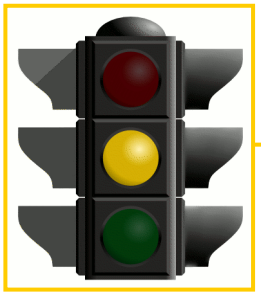


- Skippy bar has a higher sugar content and more fat!
- 170 Cals, 1g fiber, 10g fat
- Change = 4.2 lbs/yr

Snack Options



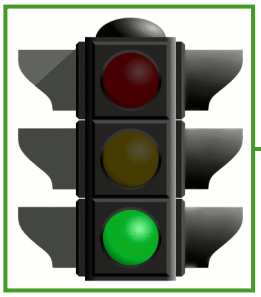
- Made with whole grains
- 100 Cals, 3g fiber



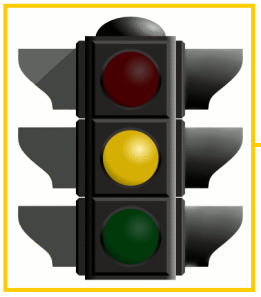
- Made with enriched flour
- 100 Cals, 1g fiber

Enriched flour removes the bran and the germ, which are the parts of the wheat plant that contain vitamins and minerals. Because of this, your body absorbs enriched wheat differently - instead of absorbing it at a slow, steady process through which you get steady bursts of energy, your body breaks down enriched flour too quickly, flooding the blood stream with too much sugar at once. Your body then has to work hard to absorb the excess and stores it as fat. This causes quick highs and lows in your blood-sugar level which can lead to type-two diabetes and obesity. In addition, enriched flour does not provide anywhere close to the amount of nutrients that whole grains do.

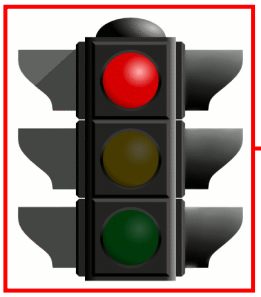
Dressing Options



- Fat Free – 2Tbsp
- 30 Calories, 0g fat

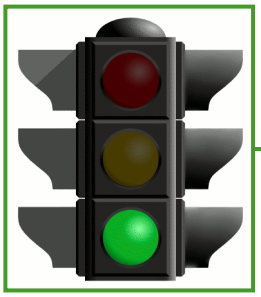


- Light – 2Tbsp
- 80 Calories, 7g fat



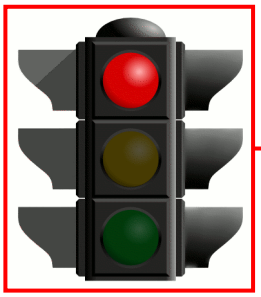
- Regular – 2Tbsp
- 140 Calories, 14g fat
- Change = 11.5 lbs/yr

Mayonnaise Options



- Fat Free – 1Tbsp
- 10 Calories, 0g fat

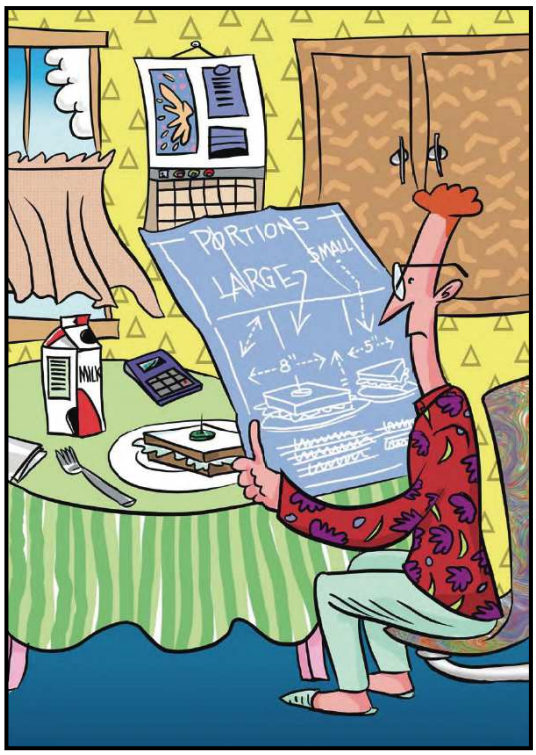
- Light – 1Tbsp
- 40 Calories, 3.5g fat



- Regular – 1Tbsp
- 100 Calories, 11g fat
- Change = 9.4 lbs/yr

What Does All This Mean?

- Small changes can impact your health:
  - Simply making 3 changes in you food choices from the options shown today can help you lose up to 30 pounds in a year due to a lower calorie intake
- Portions Count:
  - Without portion control, healthy food choices can still add weight to your body



The Nutrition Label

How to Read a Nutrition Facts Label

Macaroni & Cheese

Start Here →

Nutrition Facts

Serving Size 1 cup (228g)
Serving Per Container 2

Amount Per Serving

Calories 250 | Calories from Fat 110

	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

Limit these Nutrients

Get Enough of these Nutrients

Quick Guide to % DV

5% or less is Low

20% or more is High

Footnote

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

U.S. Food & Drug Administration
Center For Food Safety & Applied Nutrition June 2000

The Nutrition Label

Chicken Noodle Soup

Nutrition Facts

Serving Size 1/2 cup (120 ml) condensed soup
Servings Per Container about 2.5

Amount Per Serving			
Calories 60		Calories from Fat 15	
			% Daily Value*
Total Fat 1.5g			**2%**
Saturated Fat 0.5g			**3%**
Trans Fat 0g			
Cholesterol 15mg			
Sodium 890gm			**37%**
Total Carbohydrate 8g			**3%**
Dietary Fiber 1g			**4%**
Sugars 1g			
Protein 3g			
Vitamin A	4%	**Calcium**	0%
Vitamin C	0%	**Iron**	2%

Multiply everything by 2.5 since there are 2.5 servings per can

1 whole can of this soup (1.5 cups) =

- 150 calories
- 92.5% of daily requirements for sodium

U.S. Food & Drug Administration
Center For Food Safety & Applied Nutrition June 2000

The Nutrition Label

Whole Milk
Serving Size 8 fl oz (240mL)
Servings Per Container 2

Amount Per Serving	
Calories 150	Calories from Fat 70
	% Daily Value*
Total Fat 8g	12%
Saturated Fat 5g	25%
Cholesterol 35mg	12%
Sodium 125mg	5%
Total Carbohydrate 12g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 8g	
Vitamin A 6% •	Vitamin C 4%
Calcium 30% • Iron 0% •	Vitamin D 25%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Nonfat Milk
Serving Size 8 fl oz (240mL)
Servings Per Container 2

Amount Per Serving	
Calories 80	Calories from Fat 0
	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol less than 5mg	1%
Sodium 130mg	5%
Total Carbohydrate 12g	4%
Dietary Fiber 0g	0%
Sugars 11g	
Protein 8g	
Vitamin A 8% •	Vitamin C 4%
Calcium 30% • Iron 0% •	Vitamin D 25%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

The nonfat milk is the healthier choice because it has nearly half the calories (80 vs. 150) and significantly less fat (0 grams vs. 8 grams)

Keep in mind:
if you drink the whole carton of milk, then double the value of these amounts!

CHAPTER 9

Shiftwork and Family Life

"He works nights, but somehow they've managed to keep their Marriage quite active."

Who Does Shiftwork Affect?

- Relationships take work to maintain
- Divorce rates are up to 60% higher for shiftworkers
- Entire family is affected by a shift schedule
- Family's opinion of job affects employee's attitude on-the-job

Special Family Challenges

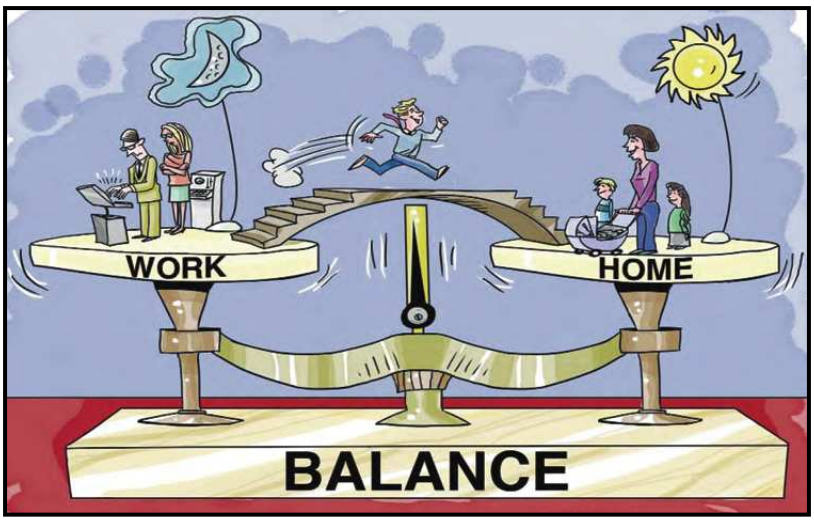
- Communication
- Problem solving
- Unrealistic expectations
- Planning ahead
- Child care
- Lonely nights

Why Communication Is Difficult

- Inability to have consistent and regular communication
- Communications are not as effective
- Irritability makes communication more difficult
- Preference to enjoy time together
- Expectations aren’t obvious
- Conflicts with traditional male and female roles
- Communication skills are not practiced
- Kids have trouble understanding your absence

Tips For Communication

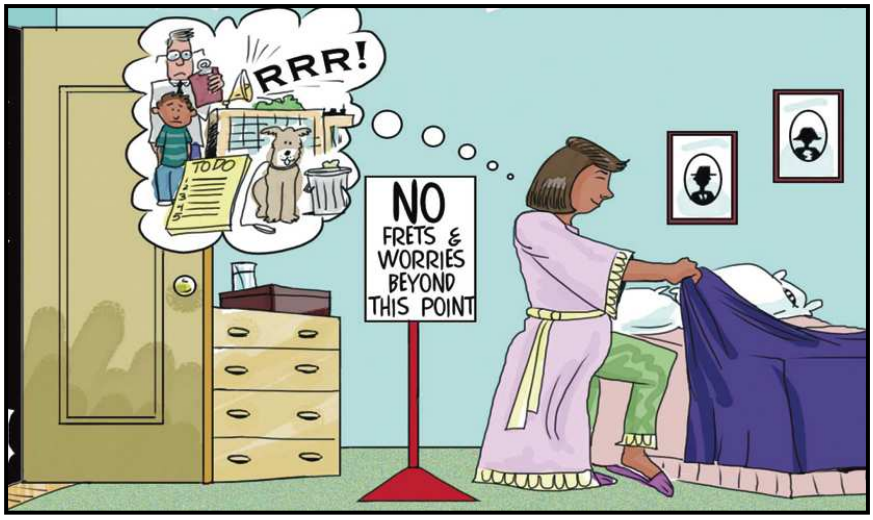
- Share expectations
- Be specific about your feelings
- Don’t suppress emotions
- Compromise on differences
- Be sure spouse, partner, family and friends understand your shiftwork schedule



Tips For Communication

Help your family understand the challenges of shiftwork:

- Daytime sleep
- Different meal times
- Not being available when the rest of the world is up and active
- Moodiness (especially around shift changes or with excessive overtime)
- Missing some family events and holidays



Tips For Communicating

COMMUNICATION IS A TWO STEP PROCESS:

1

LISTEN for feelings & for content

ACKNOWLEDGE

- Acknowledge feelings
- Acknowledge content

2

EXPRESS your ideas and feelings

ASK for clarification

Common Family And Social Problems: Shiftworker Survey

Many times problems are not addressed because one of the parties involved does not perceive that there is a problem. If the spouse, partner, or child fails to point out that something is troubling them, the problem can grow until the situation erupts suddenly and emotionally. It is important to share feelings so problems may be discussed and resolved before developing into seemingly unsolvable situations. The following survey may help identify whether or not a problem exists.

Directions: You will notice that there are two identical surveys – one is for you and the other is for your spouse. Fill them out separately, and when finished, compare your results with one another and discuss them openly.

Rate your situation:
0 = No problem
1 = Some problem
2 = Big problem

Difficulty planning ahead	0	1	2
Not enough "quality" time with the family	0	1	2
Shiftworker "irritable"	0	1	2
Spouse feels he/she is rearing children alone	0	1	2
Communication problems	0	1	2
Spouse lonely or nervous when shiftworker on night shift	0	1	2
Meal planning	0	1	2
Interference with household routines	0	1	2
Keeping kids quiet (for daytime sleep)	0	1	2
Family/friends don't understand the problems of shiftwork	0	1	2
Having enough time for romance	0	1	2
Having enough time for recreational activities	0	1	2
Being "too tired" all of the time	0	1	2
Matching your schedule with friends' schedules	0	1	2
YOUR TOTAL			

How you rate:

0 - 10 Things are going great

11 - 19 You might want to pick a couple of things to work on with your family

20 - 28 You need to find some better ways to deal with your family situations

Common Family And Social Problems: Spouse or Partner Survey

Directions: Rate how much difficulty you are having with the following areas based on the scale on the right.

Rate your situation:
0 = No problem
1 = Some problem
2 = Big problem

Difficulty planning ahead	0	1	2
Not enough "quality" time with the family	0	1	2
Shiftworker "irritable"	0	1	2
Spouse feels he/she is rearing children alone	0	1	2
Communication problems	0	1	2
Spouse lonely or nervous when shiftworker on night shift	0	1	2
Meal planning	0	1	2
Interference with household routines	0	1	2
Keeping kids quiet (for daytime sleep)	0	1	2
Family/friends don't understand the problems of shiftwork	0	1	2
Having enough time for romance	0	1	2
Having enough time for recreational activities	0	1	2
Being "too tired" all of the time	0	1	2
Matching your schedule with friends' schedules	0	1	2
YOUR TOTAL			

How you rate:

0 - 10 Things are going great

11 - 19 You might want to pick a couple of things to work on with your family

20 - 28 You need to find some better ways to deal with your family situations

Problem Solving Skills

METHOD:

1. State the problem
2. Brainstorm solutions
3. Evaluate and rate the solutions
4. Develop a plan of action
5. Make the ideas become actions

GUIDELINES:

- Don’t let the session become a shouting match
- Be receptive to all ideas
- Don’t try to force an idea without reviewing others’ ideas

Planning Ahead

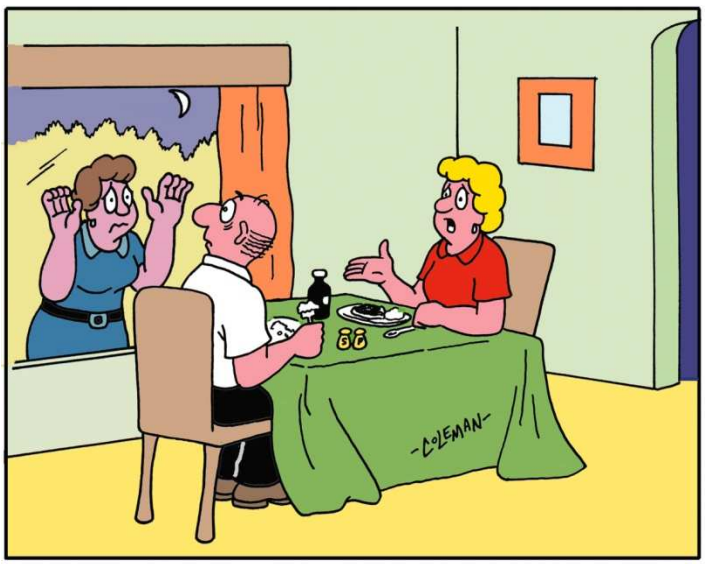
- Keep a schedule calendar
- Plan ahead as much as possible
- Inform family and friends of your schedule
- Identify RECOVERY DAYS when you need to catch up on sleep
- Make sure partner and children understand the need for recovery time
- Identify QUALITY DAYS that you will spend with your spouse and/or family
- Plan at least 2 or 3 quality days per month

Child Care Solutions

- Family and relatives
- Coordinate a child care network with other shifts
- Child Care Board - contact your HR representative for help in organizing a “child care board” in which parents can offer and request child care services.
- Share care with your partner - organize employment so one parent works days while the other works evenings.
- Contact Child Care Aware at 1-800-424-2246 or www.childcareaware.org

Helping Your Spouse Cope With Nighttime Isolation

- Call home during break
- Expand social circle
- Encourage hobbies
- Share experiences
- Keep a pet
- Establish a relaxing nighttime routine
- Install a home security system
- Create emergency list of contact numbers
- Avoid use of sleeping pills
- Try going onto the same schedule as the shiftworker



"THAT'S MRS. WILSON NEXT DOOR. SHE FEELS LEFT OUT BECAUSE HER HUSBAND WORKS NIGHTS..."

Working Nights Reader Survey: Maintaining Strong Relationships

Balancing family and work life is an ongoing challenge when you're a shiftworker. Each family develops its own strategies for finding time together and making the most of it.

To find out how shiftworkers handle this issue, Working Nights Newsletter asked more than 400 shiftworkers the question: "What strategies do you find most effective for maintaining strong relationships with your spouse and children?"

Here are some of the more notable responses — we hope you can apply a tip or two to your life:

CHILDREN:

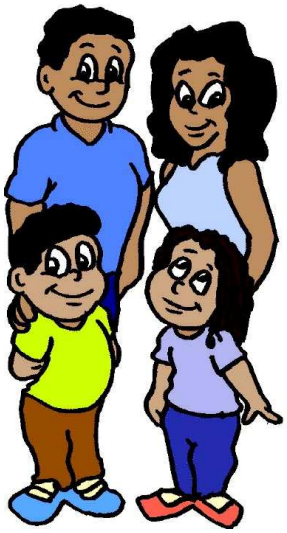
- "We include children in planning so they know what to expect."
- "On my days off, I make it a point to be home when my kids are home."
- "I try to attend my kids' functions, but if I can't, I make sure they understand why."
- "I sleep in the morning so I'm available for after-school and evening activities."
- "I let them know that if I have their cooperation in getting a good day's sleep, I will have more energy and motivation to do things with them."
- "I make sure I spend time each day reading to my children."
- "I take my grandchildren on all my days off and vacation days."

SPOUSE:

- "I take a daily walk with my wife - this gives us exercise and time to talk without interruptions."
- "My wife and I plan a special 'date' once a month."
- "I call home and talk with my husband about his day."

GENERAL:

- "Each month, I plan one day alone with my wife for dinner or dancing, one day alone with my kids, and one day as a family day (for games, movies, eating out, etc.)."
- "We take more frequent short vacations instead of fewer longer ones."
- "We have sit-down suppers with the entire family every day — whether I'm working 12-hour days or 12-hour nights. It's our communication time."
- "The key for me is not looking at life as a weekday vs. weekend thing. Going out on weekdays to clubs, restaurants, parks and shows proves to be just as satisfying, due to the limited crowds."

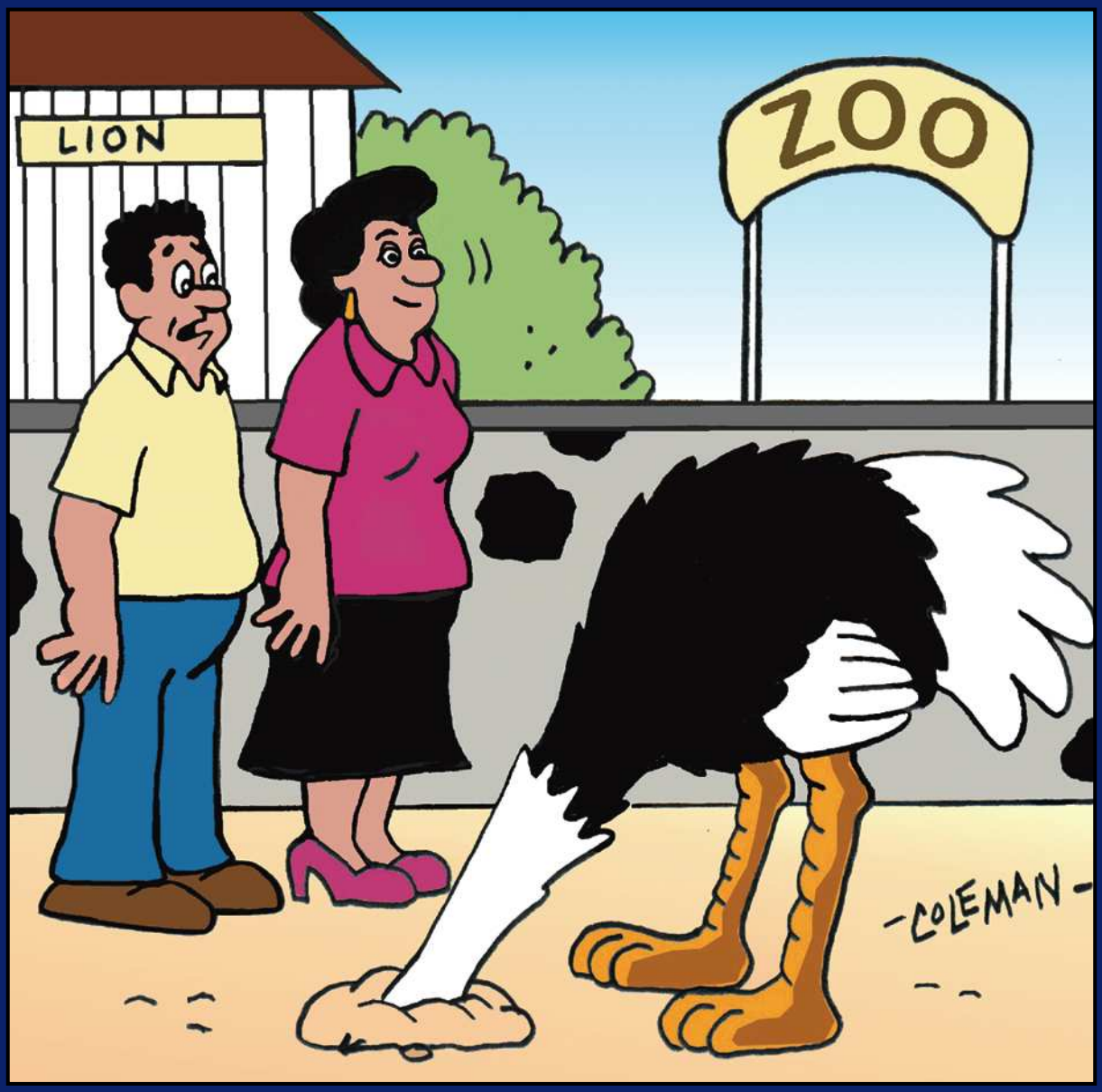


Other Shiftworker Tips

- Set a family schedule. In many cases, the family should go ahead with planned activities even if the shiftworker can't make it.
- Develop a small group of close friends who understand the life of a shiftworker and are willing to be flexible in the scheduling of social activities.
- Set aside a designated time each week to talk to your spouse or significant other.
- Deal with family or personal relationship problems before they get too big.
- Make a "date" with a spouse or child to share a special activity.
- Plan a Family Day at least once a month.
- Set up a family bulletin board where you can leave special notes and where the kids can leave schoolwork, pictures, or messages for you.
- Have a family member tape a favorite TV show and then watch the tapes together when you are home.
- Have the family videotape an activity that was missed because you had to work (i.e., birthday party, Little League game, etc.).
- Organize group activities with your co-workers
- Be specific about your shiftwork schedule with family and friends. You may be surprised that they will make themselves available when you are.

Appendices

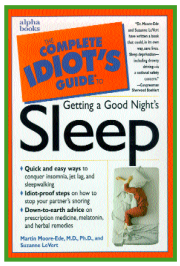
APPENDIX 1
Additional Resources



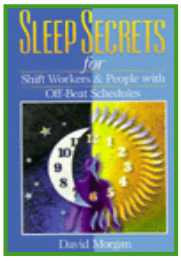
"Now there's a way to get daytime sleep."

Additional Resources

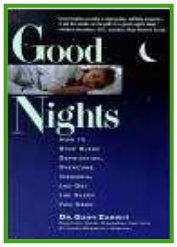
Problems related to sleep are the number one complaint of people who work at night. Several books serve as valuable resources if you're not getting your zzzz's:



The Complete Idiot's Guide to Getting a Good Night's Sleep by Dr. Martin Moore-Ede. Along with a chapter specifically for people who work night shifts, the book covers topics such as insomnia, sleeping pills, stress reduction, dreaming, snoring and sleep apnea. And unlike most sleep books, it also includes a series of quizzes that allow you to determine your specific "sleep personality." Then you can apply sleep strategies tailored to your situation. This book is available at amazon.com.



Sleep Secrets for Shift Workers and People with Off-Beat Schedules provides good advice on ways to establish a quiet, dark environment for daytime sleep as well as information on napping and stress reduction. Author David Morgan, who has worked irregular hours as a radar operator, deckhand and mine geologist, includes numerous real-world tips from shiftworkers. The book is available at amazon.com or barnesandnoble.com.

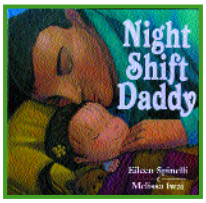


Good Nights covers topics such as sleep physiology, sleep disorders, treatments for insomnia, sleeping pills, and what to expect from a sleep doctor. Perhaps the most useful chapter is "Ten Tips for a Good Night" — most of which also applies to the challenge of sleeping during the daytime. Just about everything you would ever want to know about sleep is included in Dr. Gary Zammit's Good Nights (Andrews & McMeel or visit amazon.com).

All I Want is a Good Night's Sleep is not specifically targeted for night workers but does make a good resource if you're seeking information about sleep disorders. Chapters cover topics such as circadian rhythms, insomnia, sleep apnea, narcolepsy and aging. Author Dr. Sonia Ancoli-Israel is a psychologist and the director of the sleep disorders clinic at Veterans Affairs Medical Center in San Diego. Published by Mosby, and available at amazon.com.

Additional Resources

Working Nights Newsletter: the fast-reading monthly newsletter for people who work non-traditional hours. Whether you work an irregular, fixed or rotating schedule, you face unique challenges that impact your health, safety and quality of life. Working Nights is exclusively devoted to helping you minimize the drawbacks and maximize the benefits of working non-daytime hours. Provides authoritative tips and ideas on eating, sleep, exercise, stress management, work/family issues and more. You can download a free sample of Working Nights at http://www.circadian.com, select publications, then newsletters, Working Nights, and then click on the link for The Working Nights Newsletter. Scroll to the bottom of the page and there will be a link to view a sample.



Young children whose parents work nontraditional hours sometimes have difficulty understanding why Mommy or Daddy has to work when other parents are home.

Now there's a book just for them. **Night Shift Daddy,** a picture book written by Eileen Spinelli and published by Hyperion Books for Children, portrays a little girl who watches her father walk down the street to his night shift job, then tucks him into bed in the morning. The book is aimed at children ages 4 to 7.

Author Eileen Spinelli's own father worked nights as a welder at a shipyard when she was a little girl. She drew on her own experiences when writing "Night Shift Daddy" for the next generation of shiftworkers' children. Check your local library for "Night Shift Daddy," or buy it on the web at www.amazon.com or www.bn.com.

Resources On the Web: Sleep

1. **National Sleep Foundation**
   The National Sleep Foundation (NSF) is an independent nonprofit organization dedicated to improving public health and safety by achieving understanding of sleep and sleep disorders, and by supporting sleep-related education, research, and advocacy. Their website is full of sleep facts, information, and surveys. It can also help you find a sleep center near you. www.sleepfoundation.org

2. **American Sleep Apnea Association**
   The ASAA is a non-profit organization dedicated to reducing injury, disability, and death from sleep apnea and to enhancing the well-being of those affected by this common disorder. It offers information, education and the Sleep Apnea Forum, connecting people with information on sleep apnea.
   http://www.sleepapnea.org/

3. **The National Center for Complementary and Alternative Medicine (NCCAM)**
   Newsletter and information on sleep and sleep disorders:
   http://nccam.nih.gov/news/newsletter/2005_summer/sleep.htm

4. **Sleep.net**
   A message board where shiftworkers ask and answer each other's questions:
   http://www.sleepnet.com/shift/shiftinf.html

Resources On the Web: Health and Nutrition

1. **Healthier US**
   From obesity to diabetes to high blood pressure — this site contains facts and tips on staying healthy by being active and eating well. www.HealthierUS.gov

2. **American Heart Association**
   Tools and resources to help you lead a healthier life. This website has information on exercises, eating healthy, cholesterol, smoking, and more. http://www.americanheart.org

3. **Delicious Decisions (by the American Heart Association)**
   You can have it all: delicious food and better health! To find out just how much "delicious" and "nutritious" have in common, look through the Contents of this website. http://www.deliciousdecisions.org/ This site even has a Recipe Quick Find to locate dozens of tempting heart-healthy recipes.

4. **The New Food Pyramid**
   This new interactive food pyramid can help you make healthier food choices and incorporate exercise into your life. http://www.mypyramid.gov/

5. **Caffeine FAQ**
   This website contains everything you ever wanted to know about caffeine, from the amount of caffeine in soft drinks, coffee and chocolate to caffeine's chemical structure. A chart lists the caffeine content of just about every type of soft drink as well as the different varieties of coffee (instant, drip, percolated), tea, and "wake-up pills" such as Vivarin. http://coffeefaq.com/caffaq.html

6. **Centers for Disease Control and Prevention**
   Offers information on healthy living, conditions and diseases, and workplace safety and health. http://www.cdc.gov

7. **National Institutes of Health**
   Information on healthy lifestyles, wellness and lifestyle, men's and women's health, child and teen health and minority health. http://health.nih.gov

NOTES:

APPENDIX 2

Tips From Shiftworkers

Reader Survey Pinpoints Key Lifestyle Changes

To identify what changes have had a major effect on the lives of people who work at night, Working Nights asked more than 400 shiftworkers the question: "What was the single most important change you ever made that enabled you to cope better with the physical and social challenges of shiftwork?" Here are some of the more notable comments. We hope you can apply a tip or two to your life:

Sleep Strategies

- "Getting enough sleep is #1 — sleep comes before any and all social activities."
- "Turning the ringer off the phone."
- "I gradually prepare for night shifts by staying up later."
- "I take a half-hour nap an hour before I leave for night shifts."
- "Losing 40 pounds, which helped me sleep better."
- "Wearing earplugs helps tremendously, especially with two small children."
- "Sleeping in the basement during the day."
- "Using ceiling and box fans to drown out noises."
- "I use dark curtains and blinds that totally block out all light."
- "I realized that if someone needs to get a hold of me, he or she can leave a message on the machine and I'll deal with it when I get up."

Health

- "Exercising three times a week is the most important thing."
- "Taking up cycling helped bigtime."
- "Walking at least five times a week."
- "Quitting smoking."
- "I stopped drinking coffee."
- "Switching to decaf on evening and night shifts."
- "I quit drinking as much beer on my odd hours."
- "I watch what I eat so I don't get heartburn."

Family/Social Life

- "I plan activities with my family even if it is on weeknights."
- "Friendship with other shiftworkers."
- "I clear my social calendar when working nights and maintain a reasonable schedule while on days."
- "Learning to relax and enjoy life, especially on days off."
- "When I'm working nights, I don't do anything strenuous during the daytime."
- "Taking up golf — unlike team sports I can play by myself anytime and meet good-natured people."
- "Making an extra effort to volunteer in my community."

Tactics for Coping with Working Non-Traditional Hours

In another survey, Working Nights asked, “What was the single most important change you ever made that enabled you to cope better with the challenges of shiftwork?” Here are some of the responses - we hope you find some tactics you might not have thought of that can help you deal with a shiftwork lifestyle:

- “Bring home-cooked meals to work.”
- “Mentally accepting shiftwork as my new way of life.”
- “I don’t try to live both a night life and a day life by pretending I don’t need sleep.”
- “Exercise. Helps regulate sleep and feel more alert at work.”
- “Napping in my car before driving home, gets me home alive.”
- “Painted our bedroom dark colors and blacked out the windows.”
- “Moved master bedroom to the basement where it’s DARK!”
- “Drink 3 to 4 large glasses of water a shift. This forces me to go to the bathroom. The walks wake me up.”
- “Convincing my family that just because I was home in the daytime did not mean that I didn’t need to sleep.”
- “Treatment for sleep apnea.”
- “Maintaining a regular eating schedule — no matter which shift, breakfast is first meal upon waking up.”
- “Exercise during breaks.”
- “Communicated with my girlfriend about the mood swings we go through by being on nights.”
- “Wearing ear plugs to bed and using the air conditioner to drown out background noise.”
- “I don’t try to put a lot of things on my schedule while I am working 12-hour days or nights - I do things like appointments, shopping, cooking, and visiting on my days off.”
- “Pre-planning of family time and events outside of work.”
- “As a single mom, I used to put my children’s activities first. Now my rest and some relaxation shares priorities.”
- “Lay down for a nap for 1 hour before work. You wake up tired, but makes a big difference at night.”
- “Listening to my body. Don’t fight sleep - if you are sleepy, go to bed, no matter what time of day it is.”
- “Finding someone to communicate with - spending as much time with others as possible, instead of isolation.”
- “On long night shifts, stay moving around, don’t sit too long.”
- “Accept the fact that I won’t have a clean house and perfect lawn - give up unrealistic expectations and sleep more.”
- “Think of the positive points of each shift.”
- “Told my 2 older children to help more around the house, and rewarded them more.”
- “To get off nights, I stay up all day my first day off. It hurts, but it gets me back to day shift faster and easier in the long run.”
- “Some rotations are easy and go smooth, others, my body doesn’t adjust. I try to make the best of it and get as much rest as I can.”

Poll Results: Shiftworkers Share Coping Methods

We asked 100 shiftworkers this question: “What was the most important change you ever made that helped you cope better with shiftwork?”

Here are some of their responses, which you may be able to use toward making shiftwork easier for you:

- “Attitude - if you think it’s going to be a bad night at work, it will be.”
- “I sent a copy of my schedule to all my friends and family so they know what the best time to call is — this helps them plan events more around my schedule.”
- “Take power naps to relieve the sleep debt when it occurs.”
- “Letting people know sleep is important to my way of life.”
- “Regular exercise & less caffeine.”
- “Admit I was getting older and could not keep the same routine I could at 25 or 30. I started going to bed earlier and taking naps on my off days. It made a big difference in my attitude and job performance.”
- “Stay active with youth groups and family on days off and off shifts.”
- “Before starting night shift, I stay up late and sleep in. This makes my first night shift easier to handle.”
- “Getting my girlfriend to understand the strange hours shifters keep.”
- “Focus on the positive aspects of shiftwork, not the negative.”
- “Earplugs & a fan for white noise.”
- “I lined my bedroom windows with velcro, then sewed velcro into the edges of inexpensive black cloth. During nightshift periods, I install these “light blockers” on my windows, which makes my bedroom light-free.”
- “Getting rid of my guilt about sleeping during the day!”
- “Sleep in a separate bedroom, make that room sound- and light-proof.”
- “Getting enough rest. It was hard not to burn the candle at both ends.”

Survey Identifies Coping Strategies

What changes make a difference in a person's ability to handle working at night? Seeking real-world answers to this question, Working Nights surveyed about 250 shiftworkers. Here are some of the replies:

Sleep Environment

- "Buying a noise machine for white noise."
- "Wearing earplugs to block noise during day sleep."
- "Hanging heavy drapes over bedroom windows to block out the sun."
- "Unplugging my phone."
- "Darkening bedroom windows with a blanket."
- "If I have trouble getting to sleep, a few prayers relax me."
- "I keep a pager on my night stand so my immediate family can reach me when sleeping — this gives me peace of mind when I turn the phone ringers off."
- "Putting aluminum foil over windows."
- "Wearing sunglasses during my drive home."

Sleep Strategies

- "Developing and sticking with a consistent sleeping routine."
- "I sleep at least part of the day and stay up part of the night even on my days off."
- "Taking a nap about 90 minutes before work."
- "Making sure I have enough rest, especially prior to the first night back."
- "Going to bed as early as possible when working days."
- "Giving myself a recovery day after night shift — I used to think I didn't need it."
- "Teaching my family that daytime sleep is my night — not a nap! I say, 'Good night' to my kids at 9 a.m.; this reminds them what I'm doing."

Other Issues

- "Avoiding heavy meals after midnight on night shifts."
- "Limiting coffee intake after 6 p.m."
- "I made exercise a priority."
- "I have my big meal at 4 p.m. and then eat light overnight."
- "I stopped drinking alcohol during the work week."
- "Learning to go with the flow — use the advantages of shiftwork such as time off."
- "Cutting back on outside work."
- "Eating earlier in my shift when on nights."

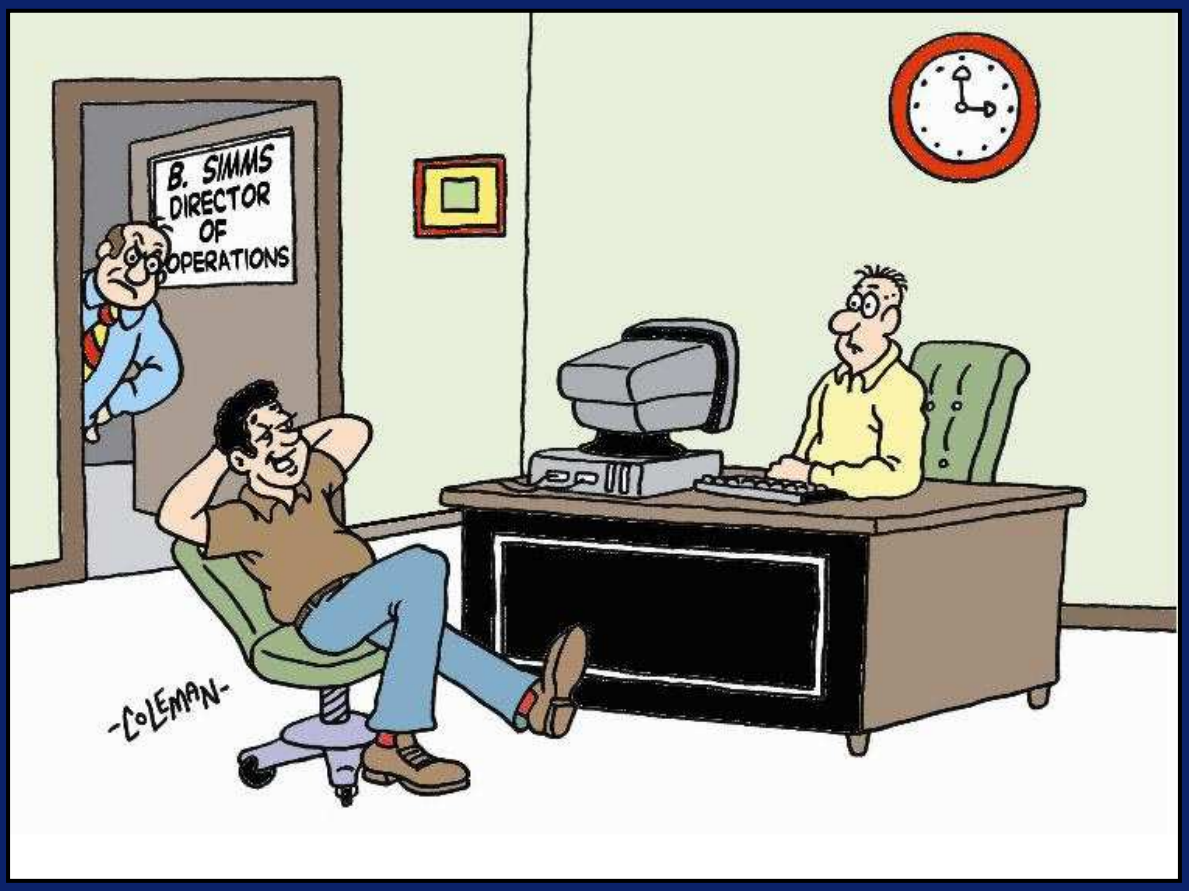
And One Funny One

- "At the end of my last night shift I pretend the last seven nights never happened."

NOTES:

APPENDIX 3

Sleep



"I think I figured out the perfect length for my naps – from the time I punch in until time to punch out."

The Benefits of a Power Nap

For a quick pick-me-up either at work (if you're allowed) or at home, a 10-minute power nap is the best way to rid yourself of those sleepy feelings that drag you down, research has found.

In an Australian study by Dr. Lack at Flinders University, 24 people took naps lasting either 5, 10, 20 or 30 minutes. The 10-minute nap produced immediate alertness improvements that lasted up to 155 minutes while a 5-minute nap had very limited results.

Longer naps—20 to 30 minutes—also improved alertness and performance and reduced fatigue, but their benefits were not seen until up to 35 minutes after a person woke from the nap. The delay is a result of "sleep inertia"—a period of disorientation, confusion, and sleepiness sometimes experienced after waking.

So if you're going to take a nap, 10- to 15-minute naps seem to give you the most bang for your buck. If you nap for 20 or 30 minutes, give yourself about half an hour to recover before you drive or perform other tasks that require concentration.

In a separate study, an afternoon nap increases productivity, reduces stress and prevents mental overload, says a study from Spain, where daily siestas are a centuries-old tradition.

A daytime snooze relaxes both mind and muscles and rejuvenates memory, says author Dr. Cesar Escalante. But, he cautions, more is not better — nap for no more than 10 to 40 minutes to avoid waking up groggy and disturbing normal sleep patterns.

Next, in a survey by the UK Sleep Council, 41% of people said they were most productive in the morning, while 38% hit their performance peak in the evening. That leaves a big gap in productivity — the afternoon, which coincides (not surprisingly) with a natural dip in circadian rhythms.

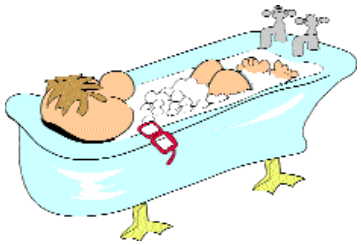
Author Dr. Chris Idzikowski concludes that "the traditional nine-to-five working day does not suit the majority." Letting workers follow their natural sleeping habits, he says, would benefit employers by expanding working hours and increasing productivity.

These studies support many others that have shown that short naps reduce fatigue and improve alertness and performance. However, other studies have found that 20- to 30-minute naps produced little or no sleep inertia.

Everyone reacts differently to different-length naps, so the important thing to remember is that if you wake up feeling groggy, give yourself a half-hour to burn off the sleep inertia before you start driving or working.

Sleep Tips from Research

Research Bulletin: A Hot Bath Can Improve Your Sleep



Every little trick helps when you're trying to get quality sleep in the daytime, whether it's installing heavy-duty curtains or teaching your kids not to disturb you.

Now, there's some evidence showing that another technique popular among shiftworkers — taking a hot bath — can improve your sleep.

To test the theory that raising one's body temperature enhances sleep quality, researchers at McLean Hospital in Belmont, MA, have been studying the benefits of hot baths.

Their first study found that insomniacs spent more time in Stage 3 and Stage 4 sleep — the deep "slow wave" sleep considered vital for waking up feeling well-rested — after taking a hot bath (105 degrees) than they did after taking a bath in warm water.

A second study took the concept further, comparing the effects of hot baths with Ambien, a commonly prescribed sleeping pill. Again, the baths led to more deep sleep, and they also worked as well or better than the pills in helping people fall and stay asleep.

So you may wish to add a hot bath to your post-night shift, pre-sleep routine. If your family thinks you're pampering yourself, tell them you're doing your own experiment with "passive body heating" — that's what researchers call hot baths.

Sleep Tip: Warm Your Hands and Feet

Here's some sleep research news, that can be useful in the coldest winter months: warming your hands and feet may help you fall asleep faster.

Dr. Wirz-Justice and her team, at the Centre for Chronobiology in Switzerland measured people's body and skin temperatures as they fell asleep. They found that the higher people's skin temperatures were in their feet and hands compared to their core body temperature, the faster they progressed toward deep sleep.

Precisely why this temperature difference promotes sleep isn't known. But regardless of the explanation, you might try seeing if wearing socks and mittens for a few nights — or sleeping with a hot-water bottle at your feet — helps you fall asleep.

Forbidden Zones and Sleep Gates

You've probably noticed that there are times when you can't seem to fall asleep no matter how tired you are. Yet at other times, you're asleep within minutes of your head hitting the pillow.

When you experience major difficulty falling asleep, you may be trying to sleep during what sleep researchers call the "forbidden zone" for sleep. And when you drift off quickly, there's a good chance you've gone to bed after a "sleep gate" has opened to a "sleep zone."

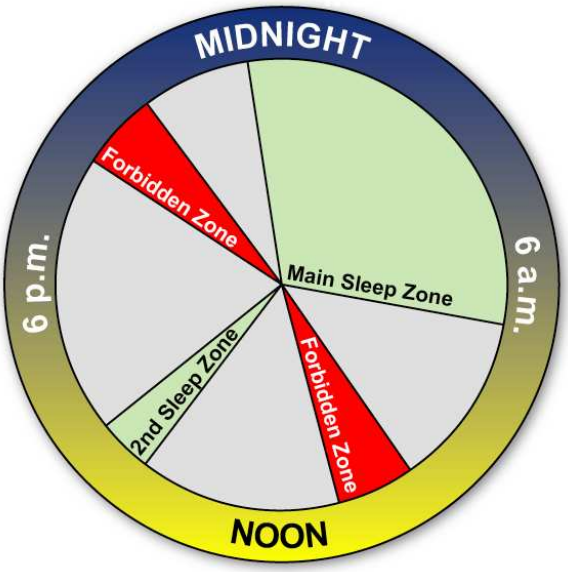
The chart below maps out forbidden zones and sleep zones during the 24-hour cycle. You can use awareness of these times to plan your own sleep strategy.

The "7-13" Experiment

Forbidden zones and sleep gates have a scientific basis. They were discovered in the 1980's by sleep researcher Peretz Lavie, from the Technion Institute in Haifa, after he conducted a sleep deprivation experiment.

First, volunteers were kept awake all night. Then, beginning at 7 a.m., they were asked to try to fall asleep within seven minutes. After the seven minutes were up, they were kept awake for the next 13 minutes, regardless of whether they had fallen asleep. This "7/13" pattern over 20 minutes was repeated for the next 24 hours.

The experiment revealed that despite the volunteers' severe sleep deprivation, their ability to fall asleep varied considerably around the clock. They fell asleep quickly during the late night and early morning, but found it extremely hard to fall asleep in the evening.



"Some could not fall asleep even once between 8 and 10 p.m.," according to Lavie. "But the moment the door was closed behind them at 10 o'clock, they fell asleep, and from that time on they fell asleep quickly every time."

Lavie named this 8 to 10 p.m. window in which sleep was nearly impossible "the forbidden zone." Once it passed, a sleep gate opened, defined as the sudden change from a high level of alertness to one of extreme sleepiness.

Subsequent research at Harvard University by Dr. Strogatz identified a secondary forbidden zone that occurs in the morning, from about 10 to 11 a.m. He also described a secondary sleep gate, which opens around 2:30 p.m.

Anchor Sleep

If you have trouble getting enough sleep and adapting to shift changes, you may benefit from the concept of "anchor sleep" — sleep taken during the same daily time frame.

Anchor sleep serves to keep your circadian rhythms on a 24-hour cycle. The alternative — sleeping at random times — can lead to insomnia, fatigue and mood swings.

People who work fixed shift schedules stand to benefit most from anchor sleep.

For workers on a fixed night shift, the most common block of time to establish anchor sleep is 8 a.m. to noon. Although family obligations and delays in getting home from work can prevent you from being in bed during this time frame, you should still be aware of the concept and try to use it to some degree.

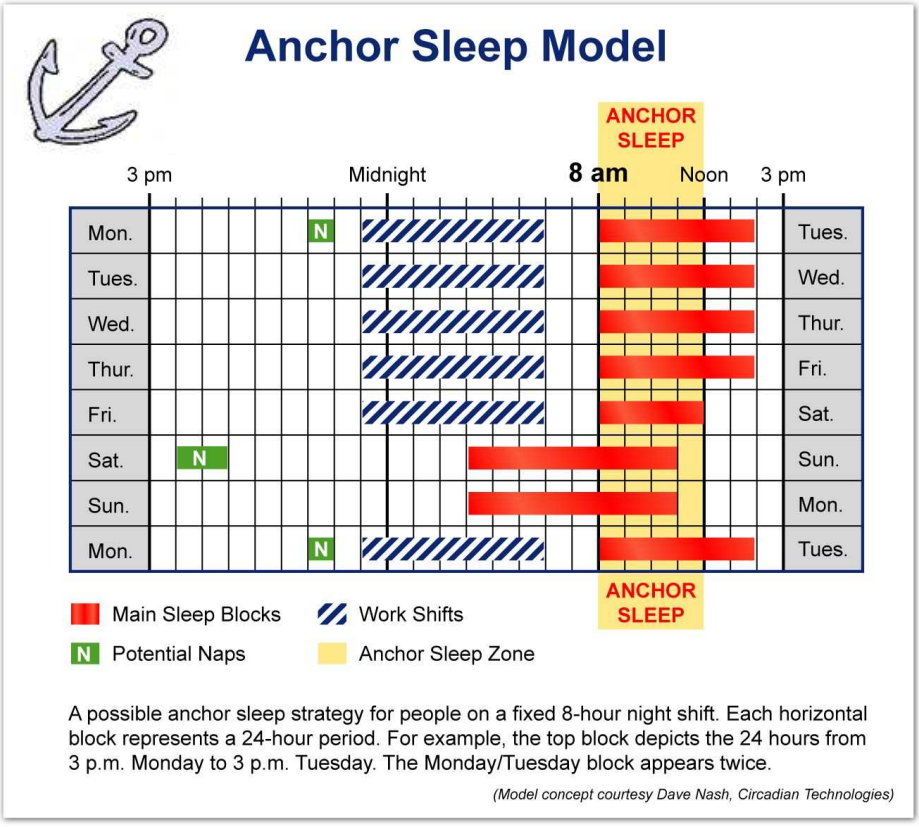
As an example, let's say you work from 11 p.m. to 7 a.m., Monday through Friday, with weekends off.

From Monday through Thursday, you could sleep from about 8 a.m. to 1 or 2 p.m. (even later if possible). After the Friday night shift, you could sleep from 8 a.m. to noon on Saturday morning, and then get up to spend the rest of the day with family or friends.

You might then stay up late on Saturday night (actually into Sunday morning), and sleep until 11 a.m. On Sunday night (actually Monday morning), you could again stay up late and sleep until 11 a.m. Over the weekend and on Monday, you might supplement your sleep with afternoon or evening naps.

By this method, you would be sleeping between 8 and 11 a.m. every day and between 8 a.m. and noon five of seven days (see chart on the right). The general principles of this strategy can be applied to any fixed night shift schedule, whether you work 8-, 10- or 12-hour shifts.

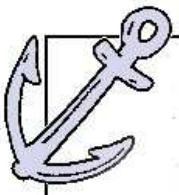
Whatever your schedule, it's a good idea to make a chart showing when you typically work and sleep. This should give you ideas on how changes in waking and sleeping times — coupled with strategic naps — can establish blocks of anchor sleep.



A possible anchor sleep strategy for people on a fixed 8-hour night shift. Each horizontal block represents a 24-hour period. For example, the top block depicts the 24 hours from 3 p.m. Monday to 3 p.m. Tuesday. The Monday/Tuesday block appears twice.

(Model concept courtesy Dave Nash, Circadian Technologies)

Anchor Sleep Chart



Anchor Sleep Chart

	3 pm			7 pm			Midnight						6 am						Noon			3 pm
Mon.																						Tues.
Tues.																						Wed.
Wed.																						Thur.
Thur.																						Fri.
Fri.																						Sat.
Sat.																						Sun.
Sun.																						Mon.

Fill in your anchor sleep strategy based on your work schedule. Using different colors for work, main sleep block, and potential naps, fill in the appropriate boxes that correspond to the exact time of each activity. Each vertical line represents one hour. An example is shown on the previous page.

Sleepiness Logs

Sleepiness logs are an effective way to determine when napping will be beneficial, as well as point out times when your alertness and performance will be lowest.

To fill the logs, simply check the appropriate time box when you begin to feel especially sleepy.

Nighttime Sleepiness Time Log

Check your log for any patterns that might exist while working the night shift. Many shiftworkers will notice that they are consistently sleepy somewhere between 1 a.m. and 6 a.m. Wherever you are typically sleepy are times when extreme caution must be used to avoid poor performance. These are times when alertness enhancing strategies should be used, whether it be exercising, consuming caffeine, or taking a nap (if allowed).

		TIME												
		7 am	8	9	10	11	12 am	1	2	3	4	5	6	7 am
N I G H T	Monday													
	Tuesday													
	Wednesday													
	Thursday													
	Friday													
	Saturday													
	Sunday													

Daytime Sleepiness Time Log

Again, simply check the appropriate time box when you begin to feel especially sleepy to check for any patterns that might exist during the day shift. Many shiftworkers will notice daytime sleepiness between 7 a.m. and 8 a.m. and also between 12 p.m. and 2 p.m. (the post-lunch dip). Whenever you are typically sleepy during the day is an excellent time to exercise, use caffeine effectively, get exposure to sunlight, or to take a recuperative nap to catch up on sleep (if allowed).

		TIME												
		7 am	8	9	10	11	12 am	1	2	3	4	5	6	7 am
D A Y	Monday													
	Tuesday													
	Wednesday													
	Thursday													
	Friday													
	Saturday													
	Sunday													

Bright Light, Sunglasses Ease Adjustment to Nights

A study by Korean researchers and also a series of studies by Dr. Charmane Eastman and her team in Chicago were performed in real-world shiftwork settings. Their results support two pieces of advice we often give night workers: Make your work area bright at night and wear sunglasses during your drive home.

In the study, nurses working 8-hour backward-rotating shifts were exposed to bright light for four hours each night over the course of four night shifts. A second group was exposed only to the normal light levels in the workplace. A third group got the extra-bright light at night and also wore very dark sunglasses during their one-hour commute home.

Compared to the other two groups, the bright-light-and-sunglasses group rated their own alertness higher during night shifts, slept nearly 100 minutes longer after each night shift, took less time to fall asleep, and woke up less often during sleep.

Scientists believe the nurses' improved alertness resulted from a shift (produced by the bright light) in their circadian rhythms.

APPENDIX 4

Fatigue and Sleep Deprivation

"This lack of sleep is getting to me…
not only did I forget my anniversary,
I forgot my wife's first name."

The Dangers of Automatic Behavior Syndrome

To find out the exact effects of monotonous nighttime tasks, a group of scientists undertook a unique experiment. They hooked a driver up to an electroencephalograph, which measures brain waves, and to a machine which measures how long eyes remain closed when they blink (a reliable measure of alertness), and sent him out on the Autobahn, one of the fastest roads in Europe where average speeds can exceed 90 mph.

Their findings were startling. Driving his specially equipped Citroen on the secondary roads leading to the highway, the duration of the driver's eye blinks and the EEG readings indicated steady alertness, exactly what the researchers expected. The interactive demands of stopping and starting and turning from one road to the next kept him alert and awake. However, as the driver began settling in to highway driving, his eyes stayed closed longer every time he blinked, indicating reduced alertness and growing fatigue.

After a time, the eye blinks stopped. Traveling down the fastest expressway in Europe at 80 to 90 mph, the driver's eyes were fixed in a blank stare with no blinking at all. But at the same time, the EEG showed brain waves that are characteristic of sleep, indicating that, while the driver's eyes were wide open, his brain was asleep. Not until 20 minutes later, did the eye blinks resume and sleep stop. From then on, the trip continued without incident, but it was very fortunate that the highway did not curve while the driver was on "automatic pilot."

While there is no way to measure how frequently this state of automatic behavior occurs among most drivers, nearly everyone who drives at night has felt the urge to give in to sleep at least once. Suddenly realizing one has missed one's exit or having no memory of the past ten miles are symptoms of this automatic behavior syndrome.

On straight, fast highways like the Autobahn in Germany and many interstates in the United States, the danger is greatest. And, this state of automatic behavior is not limited to automobile drivers. Any monotonous task, such as monitoring a highly automated control panel or flying an airplane, can lead to the same results. A worker can be sitting at the console with his eyes in a blank stare and his brain asleep. He will be able to perform purely automatic tasks, but will not respond appropriately to critical signals such as a red light, process control alarms, or emergency situations like those that occurred at Bhopal, Chernobyl, or Three Mile Island.

Your Accident Rate Soars at Night

Four recent study findings serve as strong reminders to make an extra effort to follow safety procedures during the overnight hours:

1. The risk of sustaining a serious injury is 43% higher on the night shift than on the day shift, according to a study of British factory workers on a rotating 8-hour schedule.
2. Nurses who work rotating shifts have twice the odds of a reported accident or error related to sleepiness as nurses who only work day and evening shifts, a study at a Boston hospital found.
3. Work-related fatalities are more than twice as likely to occur at night than would be expected based on the proportion of people at work at this time, according to an Australian study. The percentage of fatalities attributed to human error was especially high during the overnight hours.
4. An analysis of 75,000 workplace fatalities in the U.S. over 15 years finds the risk of death is three times as high between 11 p.m. and 7 a.m. as it is from 9 to 5. Fatal accidents are most likely to occur at 5 a.m., according to a study by Stanford University's Dr. Rebecca Coggins-Smith.

Ultradian Rhythms: How They Affect Alertness & Sleep

Circadian rhythms aren't the only type of biological rhythms that affect alertness. Ultradian rhythms also play a key role. The difference between circadian and ultradian rhythms is that while circadian rhythms follow patterns of approximately 24 hours, ultradian rhythms run in cycles lasting less than a day.

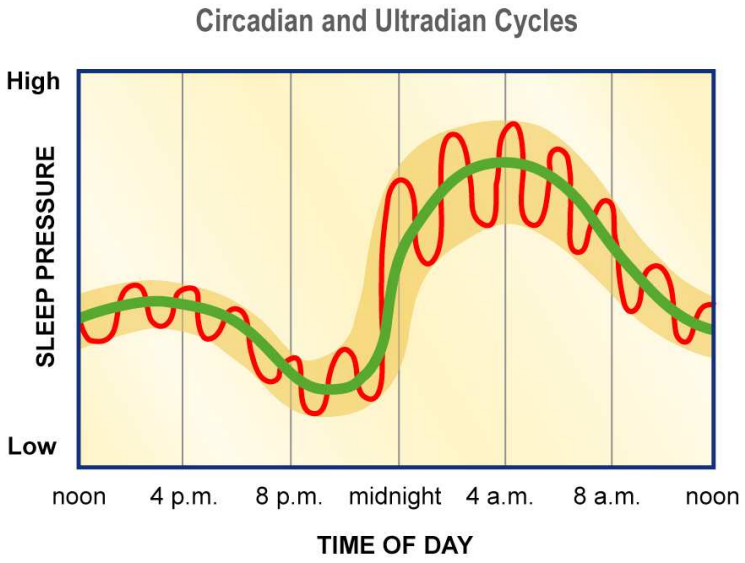
Most ultradian rhythms run in cycles of 90 to 100 minutes, with the clearest example being the 90-minute cycle that occurs during sleep.

Ultradian rhythms continue during wakefulness, but are less prominent than during sleep.

Documented examples of ultradian rhythms in the 90- to 100-minute range include urine production, oxygen consumption, pain perception, sleepiness and performance on tests of reaction time and motor skills, according to the Encyclopedia of Sleep and Dreaming.

The graphic below charts "sleep pressure" over a 24-hour period and illustrates how ultradian and circadian rhythms exist simultaneously. The thick line represents the standard circadian pattern: The drive to sleep is highest around 4 a.m. and also rises during the afternoon (2 to 4 p.m.). It's easiest to stay alert in the morning (9 to 11 a.m.) and evening (8 to 10 p.m.). The thin line shows the more frequent ultradian peaks and valleys, with sleepiness rising and falling in 90- to 100-minute cycles.

Being aware of ultradian rhythms can help you adopt successful strategies for staying alert through the difficult overnight hours. Sleepiness tends to come and go in waves due to ultradian rhythms' effects. Once you learn to recognize the signs of an impending dip — sluggishness, difficulty concentrating, an inability to remember the last few minutes — you can take preemptive action, such as making a few trips up and down the stairs or having a snack. And from a psychological perspective, it may be helpful to know that once you make it through a 20- to 30-minute dip, your alertness will naturally start to rise again.



Off the job, meanwhile, ultradian rhythms can help you get the most out of naps and sleep time. Through familiarity with ultradian cycles, you may find times when you're able to fall asleep within a few minutes of lying down. Failing this, you may find that if you can't fall asleep within 10 minutes, you're better off getting up and trying again in 30 to 45 minutes — when the next ultradian dip arrives.

Understanding the Effects of Sleep Deprivation

No matter how conscientious you are about getting enough sleep, on occasion you may still find yourself sleep deprived. In fact, on average, people who work night shifts sleep four hours less per week than day workers, according to research by Don Tepas of the University of Connecticut. And in a study of employees on fixed 8-hour shifts at four rubber and plastics plants, Tepas found that those on the night shift slept 6.8 hours on workdays, but compensated by sleeping 8.8 hours on days off. People on afternoon shifts, meanwhile, slept 7.7 hours on workdays and 8.5 hours on days off.

Have you ever thought about how sleep deprivation affects you? There are actually several different types, each with different effects. As someone who works at night, the type you're most likely to experience is "moderate, short-term" - in other words, getting by on four to six hours of sleep for several days in a row. Research has found that most people function near their normal level after one night (or day) of short sleep. Two or more nights of insufficient sleep typically leads to irritability and increased sleepiness - especially when you're on the job during the overnight hours. Work performance begins to suffer - particularly on complicated tasks - and people are at substantially higher risk of falling asleep on the job and while driving home. In addition, people are more likely to complain of minor health ailments such as headaches, stomach problems and sore joints.

Moderate, short-term sleep deprivation should be the only type you experience. Nevertheless, it's informative to look at what studies tell us about the effects of sleep deprivation that is more severe or lasts longer.

Moderate, long-term. Not much research exists on the effect of abbreviating sleep night after night for years on end. However, one study of 2,900 students at the San Diego Naval School of Health Sciences found that students who slept five to seven hours a day performed less effectively over the long-term than students who slept more than seven hours. As a group, short sleepers received fewer promotions, stayed in lower pay grades and had a higher attrition rate.

Complete, short-term. Military situations and weather emergencies sometimes require people to stay awake for 24 hours or more. Studies have found that after 48 hours or more without sleep, people have difficulty completing tasks demanding a high attention level and often experience mood swings, depression and increased feelings of tension.

Interestingly, performance is highly influenced by ups and downs in circadian rhythms. Even people deprived of sleep for more than 80 hours may be able to function during the morning and evening. But during the overnight hours, they often literally cannot stay awake, and may fall asleep while standing, sitting or even walking. A small percentage experience hallucinations.

Complete, long-term. Complete sleep deprivation is believed to be fatal. Studies done in the 19th century found that puppies deprived of sleep died after seven to 10 days, and research conducted in the 1980s found that rats die after two weeks without sleep.

Although a small percentage of the population can function well on four to six hours of sleep a day, the overwhelming majority needs seven or eight hours a day. When you do find yourself sleep-deprived, try to catch up with an extra-long block of sleep (eight to 10 hours) or a long nap. As this story illustrates, continued sleep deprivation can have a significant effect on your health and well-being.

Dangers of Sleep Deprivation

Battle Fatigue: Drowsiness in Combat

After a week under combat conditions, soldiers are so badly affected by fatigue and stress that they perform worse than when drunk, according to research performed at the U.S. Army Research Institute of Environmental Medicine and reported in *The Western Mail*.

With the need for 24-hour vigilance and readiness for action, soldiers in combat situations sleep whenever they can—and if they can't, they don't. News reports of the conflict in Iraq told of commanders who would order their troops to lie down and take a nap whenever their transport was required to stop for even a few minutes. The problem of fatigue is well known to the U.S. military, which spends millions researching fatigue countermeasures.

In the study, Navy Seals and Army Rangers took part in exercises designed to mimic combat conditions, and performance tests were carried out before and during active duty. During the course of their 73 hours on duty, both groups showed dramatic declines in cognitive tasks required for warfare. A task as simple as firing a weapon requires pattern recognition to sight a target, logical reasoning to decide if firing was appropriate, and short-term memory of the location of friendly forces—abilities that were all substantially impaired by fatigue. "Their performance was worse than if they were legally drunk," said researcher Harris Lieberman.

Fatigue impairs performance—whether you're a soldier, a trucker or a hotel clerk. Research has shown that being awake 24 hours produces mental impairment equivalent to a blood-alcohol content of 0.10—legally drunk. The most dangerous time for a night worker is the early-morning commute home—at which point, if you didn't nap the previous afternoon, you've been awake for about 24 hours. Be aware of this danger zone and take appropriate steps to reduce fatigue: take a nap, stop for coffee, or have someone else drive.

Dangers of Sleep Deprivation

Is Some Sleep Better than None?

Surviving on just four or six hours of sleep per day may be just as bad as not sleeping at all, according a new study conducted at the University of Pennsylvania. In the study, 48 people were divided into four groups. Over 14 days, the first group was restricted to four hours' sleep per night; the second group, six hours; and the third group was allowed to sleep for eight hours. The fourth group was kept completely awake for three straight nights.

Not surprisingly, the groups that were restricted to six, four or zero hours of sleep showed significant declines in alertness and mental performance. The fewer hours of sleep people got, the more their performance suffered.

What is surprising is that, after two weeks, the mental performance of people who slept six hours every night was equivalent to the performance of someone who'd had two nights of total sleep deprivation. In addition, subjects whose sleep was restricted were generally not aware of how much their performance had suffered—which may explain why we generally think it's no big deal to cheat ourselves of sleep.

This study illustrates the importance of not letting your sleep debt build up. Be conscious of how much you've slept over the previous few days. If you've been averaging just five or six hours a day, it's time to clear your schedule and darken your bedroom to ensure you get a full eight hours of sleep for at least a day or two, or start taking "power naps" whenever you get a chance.

Learning Suffers Without Enough Sleep

6-Hour Minimum

A study conducted at Harvard Medical School found that without a minimum of six hours of sleep most people fare poorly at learning new information.

Researchers trained students to spot visual targets on a computer screen and press a button once they were certain they had seen one. After some practice, the students averaged 75 milliseconds per target.

Over the next few days, some students were limited to less than six hours of sleep per night, while others got a full night's sleep. When they took the test again, those who got less than six hours of sleep failed to improve their performance. Students who got six to eight hours of sleep cut their response time to an average of 62 milliseconds.

The researchers theorize that the improvement in speed and accuracy is somehow consolidated during sleep. Getting two hours of Rapid Eye Movement (REM) sleep — a higher proportion of which typically comes toward the end of one's sleep block — appears critical.

During REM (when people dream), the brain seems to re-enact the training and solidify newly made connections throughout its memory circuits. Without REM sleep, new skills and factual information does not get properly encoded into the brain.

So the message is that you should always strive to get a minimum of six hours of sleep every 24 hours. If you can't get it in one block, then supplement your main sleep block with a nap.

Untapped Reserves - One Region Of The Brain Powers Up Without Enough Sleep

A different study performed at University of California at San Diego found that short-term sleep deprivation stimulates a normally inactive part of the brain. In effect, your brain may temporarily "work harder" to compensate for one night of short sleep. (This phenomenon is less likely to occur after two or three nights without sufficient sleep.)

Volunteers took a word memory test after 35 hours without sleep. As they tried to recall a list of words they had been shown, researchers used an MRI device to monitor blood flow in their brains.

The researchers were focusing on the part of the brain called the cerebral cortex, which they expected to become progressively less active the longer a person went without sleep.

What they found was that even though activity actually increased in the cerebral cortex (which plays a key role in short-term memory), activity slowed in a part of the cerebral cortex known as the temporal lobes (which allow a person to speak and understand speech).

One part of the cortex, the parietal lobe, was inactive when people were well-rested but came to life the sleepier they became.

The surprised researchers concluded: "The brain may be able to compensate for the effects of sleep deprivation while maintaining at least partially intact performance."

Side Effects of Sleep Debt

Sleep Debt's Effects Mimic Aging

Here's an attention-getting study result for people who routinely try to get by on less than four hours of sleep: Carrying such a sleep debt affects your body in ways similar to the aging process.

Less than one week of major sleep debt "is associated with striking alterations in metabolic and endocrine functions [that] mimic some of the hallmarks of aging," according to study author Dr. Eve Van Cauter of the University of Chicago.

One key finding was that levels of the hormone cortisol rose much higher in the afternoon and then decreased at a rate six times slower than normal in the evening. Excess cortisol could result in memory problems, Van Cauter said.

In addition, the body's ability to clear glucose was nearly 40% slower than normal in the sleep-debt condition. Inability to clear glucose is a risk factor for obesity and hypertension.

So unless you wish to grow old before your time, make sure you get enough sleep per day (seven to nine is ideal for most people). If you only sleep four or five hours after a night shift, try to squeeze in a supplemental nap before your shift.

Short Sleep Raises Your Nodding-Off Risk

You're probably well aware that your ability to work — and even stay awake — declines the longer you go without sleep. But what about if you get some sleep every day, but it's less than your body needs?

A recent study offers important data on how gradually accumulating a "sleep debt" hampers your ability to function effectively. The study, conducted at the University of Pennsylvania, examined people's alertness levels during two weeks in which three groups of volunteers got to spend four, six or eight hours a day in bed (always waking at 7:30 a.m.). Each day they took tests measuring reaction time and math skills and rated their sleepiness and mood.

The study found that five straight days of getting less than six hours of sleep resulted in performance levels equivalent to going one night without any sleep, and that 13 nights of less than four hours of sleep equaled two nights without sleep.

The study also tracked "uncontrolled sleep attacks" — falling asleep unintentionally. Although none of the subjects who got eight hours of sleep experienced such episodes, after six days 23% of the six-hour subjects did and 46% of the four-hour subjects did.

The results are a convincing argument that the common belief that people can somehow adjust to sleep deprivation is false. "There was no objective evidence that subjects were 'adapting' to the restricted sleep," author David Dinges reported.

5 Hours of Sleep Isn't Enough to Keep You at Your Best

Even moderate sleep deprivation can have a significant effect on your ability to do your job, a study suggests.

In a study conducted at Penn State, 16 people were limited to an average of five hours of sleep per night for one week. Each day, they took a 20-minute battery of performance and mood tests at 10 a.m., 4 p.m., and 10 p.m. Performance tests measured alertness lapses, reaction time, memory and math skills.

The volunteers also rated areas such as their energy level, happiness, stress, sleep quality, and mental and physical exhaustion. In addition, each night they listed any illness, pain, worry or significant problem they experienced that day.

The study produced three notable findings. First, moderate sleep deprivation had a "two-stage" effect on human performance. Performance dropped after the second night of shortened sleep, stabilized at this reduced level for four or five days — and then plummeted again.

Next, after the third night of moderate sleep deprivation, complaints of physical ailments such as headaches, stomach problems and sore joints shot way up.

And finally, two full nights of "recovery sleep" — sleeping about eight hours — were needed to return volunteers to their normal performance and mood levels.

The study offers three lessons:

Sleep is vital to performance. You're likely to have performance problems at work and to suffer minor health problems if you habitually sleep only five hours per day. Most people need seven or eight hours of sleep to function well.

Sleep loss takes its toll quickly. The study suggests that most people can function fairly well after one day of shortened sleep. But they are likely to experience performance problems after the second or third day of insufficient sleep.

Recovery days are essential. Catching up on your sleep is important. If you have major problems sleeping in the daytime — thus adding to your "sleep debt" after each day of abbreviated sleep — you may need two days of long sleep on your days off to get back to full functioning.

Sleep Debt Dangers: Heart Disease, Workplace Accidents

According to several studies, chronic sleep deprivation might lead to a heart attack or workplace accident:

Sleep, Work & Heart Disease

Women who said they got 5 or fewer hours of sleep per night were 45 percent more likely to have a heart attack as women who averaged 8 hours of sleep, according to a recent study. The heart attack risk declined for every extra hour of sleep the women got (up to 8 hours). The risk remained even when other risk factors, such as smoking and body mass index, were factored out.

And in a Japanese study, men who frequently slept less than 5 hours per night were twice as likely to have a heart attack as men who slept more. The same increased risk was found for men who worked an average of 61 hours a week or more, compared with men who worked less.

Previous studies have shown that short-term sleep deprivation can raise blood pressure, increase levels of the stress hormone cortisol, lower glucose tolerance, and lead to variations in heart rate — all precursors of heart disease.

Sleep & Workplace Accidents

Disturbed sleep leads to an increased risk of fatal accidents at work, according to an analysis of a health database that includes nearly 50,000 people.

In the study, individuals who answered Yes to the question “Have you had difficulty sleeping during the last two weeks?” were 76 percent more likely to suffer a fatal accident at work than those who answered No.

Non-daytime work (defined as rotating shiftwork, night or evening work) and male gender were also found to contribute to an increased risk for a fatal occupational accident. Researchers obtained their results by matching data from the Swedish Living Conditions Survey with the nation’s official cause-of-death registers.

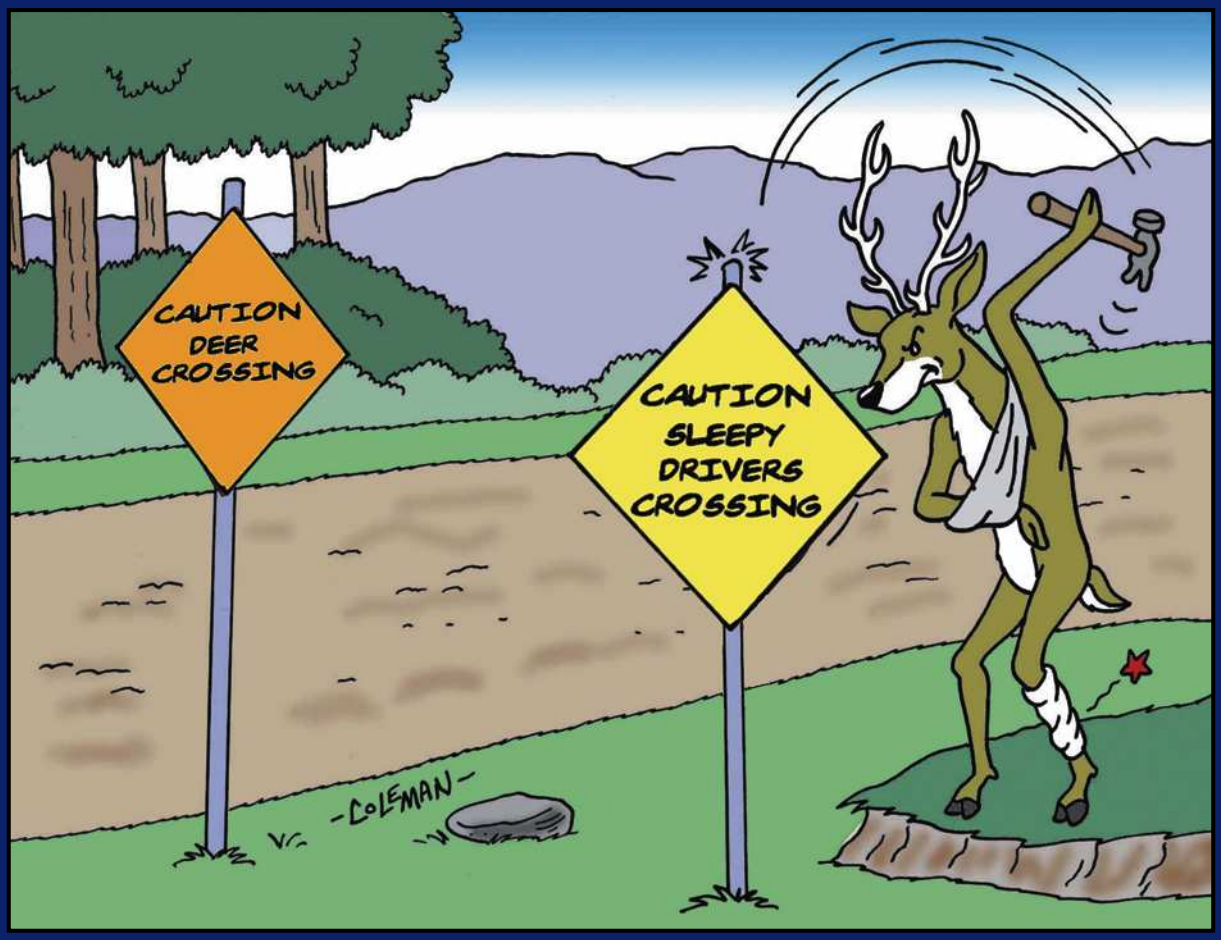
“People should start thinking of adequate sleep not as a luxury but more as a component of a healthy lifestyle,” Dr. Najib Ayas, author of one of the heart disease studies, told the Associated Press.

So be sure to darken your bedroom and eliminate noise as best you can for daytime sleep. You’ll not only feel better-rested and more alert, you’ll be improving your health and safety in the long run. And if you snore loudly, or if you’ve been told you stop breathing while you’re asleep, you might have a sleep disorder — see your doctor as soon as possible for testing.

NOTES:

APPENDIX 5

Drowsy Driving



The Dangers of Drowsy Driving

What's the most dangerous part of your workday? Many sleep experts believe it's your early morning drive home from work as fatigue plays a significant role in driver safety. Being tired and/or sleep deprived puts you at a high-risk to fall into Automatic Behavior Syndrome or Microsleep, both of which can lead to accidents.

As a shiftworker, you face a serious risk of falling asleep at the wheel. Studies have found that the auto accident rate increases during the early morning hours and that shiftworkers are at a higher risk of falling asleep at the wheel than daytime workers.

In fact, several recent studies show that sleepiness and alcohol have very similar affects on your ability to drive. Just like alcohol, drowsiness leads to slowed reaction time, decreased awareness and impaired judgment. The risks and consequences of alcohol and fatigue are equally high when you get behind the wheel.

Most people realize how dangerous drinking alcohol and driving can be, but few know that driving drowsy can be just as dangerous as driving drunk. Two separate studies, one done by the Oklahoma Turnpike Authority and the other by the California Division of Highways, suggest that 50% of all the fatal accidents on highways are caused by drivers who are fatigued or who fell asleep.

Fatigue-related accidents are particularly associated with single-vehicle accidents and are more common at night. A 1995 study by the National Traffic Safety Board (NTSB) showed that fatigue was the probable cause of 58% of single-vehicle truck accidents and that 74% of the accidents at night were fatigue-related.

Unfortunately, fatigue-related accidents result in higher driver mortality and more severe injuries. Since the person is asleep or in "Automatic Behavior Syndrome," there is usually very little, if any, breaking or steering adjustments.

One of the biggest problems with fatigue-related accidents is that most drivers are not aware of the degree of impairment produced by fatigue or are not able to recognize the early symptoms of fatigue.

A survey by the National Sleep Foundation found that 41% of shiftworkers have fallen asleep at the wheel at least once compared to 28% of daytime workers.

That statistic is easily explained by looking at three risk factors that make your commute home potentially hazardous:

1. **Sleep deprivation.** Night workers typically get less sleep than day workers do. So it's quite possible you're sleep-deprived — a big risk factor for nodding off at the wheel.
2. **Time spent awake.** The number of continuous hours that you've been awake when you begin to drive makes a difference. For example, if you sleep until 1 p.m. and get off work at 7 a.m., you're driving home after being up for 18 hours. That's nearly twice as long as a daytime worker who wakes at 7 a.m. and drives home at 5 p.m.
3. **The circadian factor**. Fluctuations in the body's circadian rhythms make it particularly hard to stay alert between 2 and 6 a.m. Even at 7 or 8 a.m., your alertness level may still be lower than it is at other times of the day.

Nighttime Auto Accident Risk

Three studies illustrate the danger of driving while drowsy and in the early morning.

Fatigue Fatalities

A study that examined more than 50,000 accidents found the risk for an accident caused by sleepiness to be seven times higher at 4 a.m. than in the late morning, and by 6 a.m. the risk was still three times higher. Not until 8 a.m. did the risk decrease to near zero.

Fatigue-related accidents were more often fatal: the driver died in 11.4% of sleep-related accidents, compared with 5.6% of accidents not related to sleepiness.

Riskiest Hours

A Swedish study of more than 10,000 non-alcohol-related accidents found that single vehicle accidents (often caused by fatigued drivers who fall asleep at the wheel) accounted for 60% of all accidents between 4 and 6 a.m. The risk of a single vehicle accident resulting in injury or death peaked at 4 a.m., when risk was 12 times higher than at 11 a.m., and remained high during all hours from midnight to 6 a.m.

Nurses Nodding Off

A study of 45 intensive care nurses who worked rotating shifts or permanent night shifts highlights the serious risk of falling asleep at the wheel. Of the 45 nurses, 43 said they had had a near-accident or accident on the morning drive home during the last year.

In focus group interviews by a researcher at Case Western Reserve University in Cleveland, the nurses reported numerous drowsy driving incidents such as falling asleep at the wheel, nodding off at traffic lights, running off the road into a ditch, and missing a freeway turnoff. One nurse collided with a mailbox and another was hospitalized after getting into a multi-vehicle accident.

Apart from letting an alert person drive or checking into a hotel, getting enough sleep is the number one thing you can do to reduce your chances of getting into an accident on the way home. Taking a nap before you drive home also is effective — just give yourself 10 to 15 minutes to shake off any grogginess you may feel upon waking.

Secrets To A Safe Commute

Here are some tips on what works — and what doesn't — for staying awake behind the wheel.

Rest up. Your safe drive home begins well before you start your car after a night shift. To avoid attention lapses on the road, you need to get enough sleep (most people require seven or eight hours a day to function well). Keep in mind the effects of sleep debt — if you slept eight hours yesterday, but only five hours the two preceding days, you're likely to still be feeling the effects of drowsiness that can reduce your ability to drive safely.

Keep in mind the accident risk. Even if you're normally a careful driver, realize that you can fall asleep at the wheel if you are fatigued. When you get into your car, be conscious of the three risk factors discussed above. For example, if you only got three hours of sleep yesterday and you didn't have time to take an afternoon nap, be aware that that you're at higher risk than usual.

Nap. Taking a nap before you drive home is the number one thing you can do to reduce your accident risk (apart from letting someone else drive or checking into a hotel). A nap directly addresses your problem — you're sleepy, so a dose of sleep is the best medicine. A 20-minute nap should make you feel refreshed and capable of driving safely. If you're concerned about sleeping too long, pack a battery-powered travel alarm clock in your glove compartment and set it when you begin your nap.

Be careful with caffeine. Caffeine does make you feel more awake, but it can also make it harder to sleep once you get home. It may be useful if you just can't stay awake any other way, but it's not a good idea to rely on caffeine to get you home safely after work.

Carpool. Having someone to talk to keeps your mind engaged and reduces the likelihood that you'll fall asleep at the wheel. Of course, this only works as long as your passenger is awake!

Two Ineffective Countermeasures. Don't rely on ineffective measures to keep you from nodding off at the wheel on your commute home after a night shift. A study of drowsy drivers found that two popular tactics — playing the radio and turning on the air conditioning — hardly reduced driving errors at all. The improvements were minor compared to the significant performance boost napping and caffeine each offered in earlier comparable studies.

APPENDIX 6

Health

The Benefits of Exercise

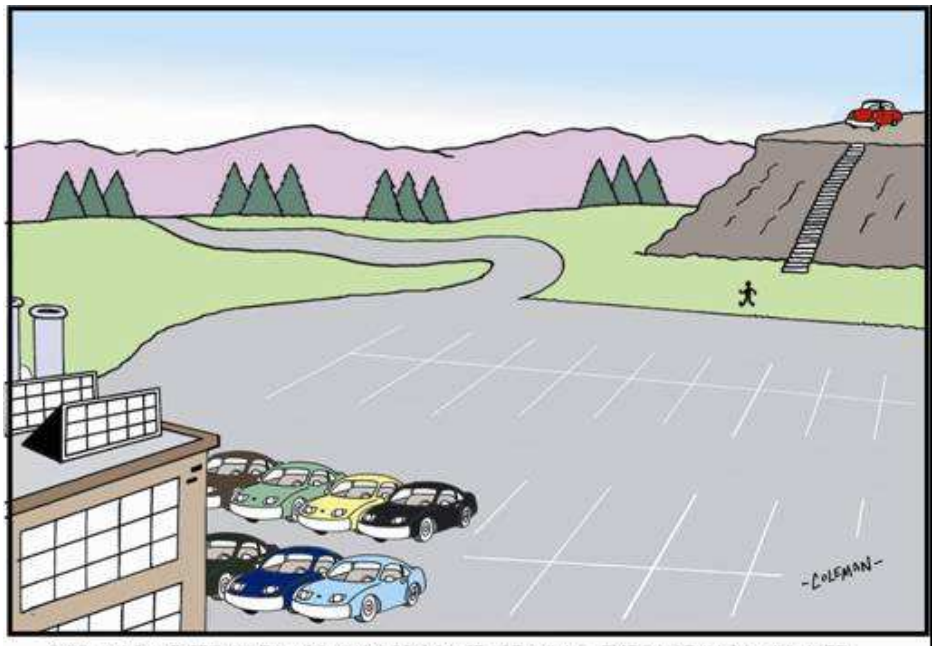
Physical exercise is key to maintaining a healthy body and mind, but exercising can be difficult, especially if you work the night shift. Of more than 10,000 shiftworkers asked about their exercise habits by Circadian, 77% reported not exercising regularly. The most common reason was a "lack of time." Another common reason is a failure to exercise because they do not know "when" to exercise during their night shift.

Studies by Finnish shiftwork researcher Mikko Harma have confirmed that exercise benefits shiftworkers. For example, he found that nurses who exercised two or more times per week felt much less fatigue on the night shift, slept longer, and experienced fewer muscle and back problems.

Exercise adds years to your life —even more than quitting smoking, according to a study of more than 6,000 men. Men who were in the worst physical shape had a risk of early mortality four times higher than the most fit men. Exercise reduces several risk factors for heart disease, which is the leading cause of death in the U.S. In the study, regular exercise helped prolong life even in men who already had heart disease. In addition, The American Heart Association estimates that each year about 250,000 deaths in the United States are related to the lack of regular physical activity.

Everyone knows exercise is good for you. The hard part is finding the time and motivation to do it regularly. Remember, you don't have to be a professional athlete to earn exercise's benefits. Most of the advantages come from temporarily elevating your heart rate for 20 to 30 minutes several times week. Brisk walking, jogging, bicycling, swimming and aerobics all accomplish this.

In fact for older workers, merely walking two miles per day may add years to the lives for people over age 60, according to a study of 700 Hawaiian men. Over a 12-year period, 43% of men who walked less than a mile a day died compared to just 22% of men who walked at least two miles a day.



BOB WAS DETERMINED TO INCORPORATE REGULAR EXERCISE INTO HIS LIFE.

Exercise Shown to Improve Sleep

A study at Stanford University offers some good news for older night workers who have trouble sleeping: you can fall asleep faster and stay asleep longer if you exercise regularly.

There's no need to start running marathons or pumping iron — the sleep benefits result from moderate exercise such as aerobics, walking or riding a stationary bicycle.

In the study, previously inactive people over age 50 completed a 16-week exercise program that included four, 40- to 60-minute workouts each week. Before the program, the exercisers took an average of 28.4 minutes to fall asleep; afterward they dozed off after 14.6 minutes. Sleep length increased from 6 hours to 6.8 hours.

Interestingly, it took a while for the exercise's sleep-inducing effects to kick in. After eight weeks, there was no major improvement in sleep. This implies that people need to make a long-term commitment to regular exercise to earn its benefits.

An Active Engineer

Although the study participants were not night workers, there's no reason to believe that inactive shiftworkers who started exercising regularly would not experience similar benefits.

Andy Mehall, a 65-year-old engineer at Conrail who routinely works during the overnight hours, is convinced his exercise regimen is a key reason he sleeps well and doesn't suffer from on-the-job fatigue.

"It doesn't matter what time I go to bed — within 10 minutes I'm gone, and I get eight hours of sleep," Mehall told Working Nights. "I wake up feeling fresh, and I can go for 24 hours if I have to."

The Stanford study is just the latest piece of good news about exercise. In fact, a willingness to exercise is an important factor in how well a person adapts to night work

This isn't just common sense. Mikko Harma, a researcher who studies shiftwork in Finland, has found that physically fit people recover from shift changes quicker than non-exercisers.

One of his studies looked at 150 nurses who jogged, walked or swam two to six times a week for four months. Compared to a group of nurses who didn't exercise, the active nurses slept longer after work and experienced "a remarkable decrease in general fatigue and sleepiness" on the job, Harma said. The improvement in alertness was especially strong on the night shift. Along with the improvement in alertness, the nurses who exercised had fewer muscle and back problems.

Finally, exercise's positive effect on your heart is well documented. Since people who work at night have an increased risk for cardiovascular problems, it's clear that exercising regularly is one of the best things you can do for yourself — both personally and professionally.

Sleep Benefits of Exercise

Imagine if there were a magic potion you could drink that made it easier to cope with working at night.

Regular doses of this concoction would help you stay alert on the job. Once home, you'd fall asleep faster and stay asleep longer. Overall, you would be less irritable around co-workers and family and friends.

Although no such magic potion exists, there is something that provides all these benefits: regular exercise. Most of us already know that exercise provides numerous physical and mental benefits to our well-being: it improves physical fitness, energy, and self-esteem, as well as reduces stress. However, did you know that exercising regularly can improve your sleep several different ways? In fact, studies how that there are actually 4 areas of sleep that exercise can have a positive affect on:

Exercise helps you fall asleep faster. In one study, regular exercise cut the time it took to fall asleep in half — from 28 minutes to 14. The study looked at a group of sedentary people who completed a 16-week program of moderate exercise.

Exercise helps you sleep longer. The same study found exercise added an average of more than 45 minutes to participants' main sleep block.

Exercise improves sleep quality. To wake up feeling refreshed, you need to spend a good proportion of your time in bed in deep sleep. A study found that people who completed an aerobic training course experienced a one-third increase in Stages 3 and 4 sleep (deep sleep).

All three of these sleep benefits accrue only when you finish exercising at least three or four hours before bedtime. Exercising too close to bedtime actually makes it harder to get to sleep.

Exercise can shift circadian rhythms. The benefits above apply to everyone — non-shiftworkers included. But some recent research suggests that exercise offers a bonus for people who work at night: It shifts circadian rhythms, indirectly leading to better mood and alertness on the job.

Ups and downs in circadian rhythms — body functions such as body temperature, heart rate and blood pressure — make it hard to stay alert during the overnight hours and to sleep after the sun rises. Basically, your circadian rhythms follow a 24-hour pattern that "programs" you to be sleepy at night and to be awake in the morning.

Recent research has found that exercise significantly shifts circadian rhythms. For example, your low point in body temperature might move from 5 a.m. to 10 a.m.

Delaying circadian rhythms in this fashion puts you in a better position to be awake overnight and to sleep in the morning. It's easier to stay alert during the toughest hours. And once you get home, you should have less trouble falling and staying asleep.

If you have the option of squeezing in a vigorous 10- to 15-minute workout at work and wish to delay your circadian rhythms, researchers recommend exercising before the nightly low point. Since this is typically around 5 a.m., anytime between midnight and 3 a.m. is ideal.

So make exercise a regular feature of your life — it's the next best thing to a magic potion for night workers.

Moderate Exercise Lowers Heart Risk & Aids Weight Loss

For those of us who'd like to exercise to reduce the risk of heart disease, but don't have time to go to the gym three days a week, a ray of hope has arrived.

A study shows walking only an hour a week can reduce the risk of coronary heart disease by 50%.

Scientists at Harvard University tracked the physical activity and health of nearly 40,000 female health professionals ages 45 and older.

Women who walked as little as one hour a week had about half the risk of heart disease faced by women who got no physical activity. The risk reduction was equivalent to the reduction achieved by losing weight or giving up smoking.

"So long as you walk at least an hour a week, it doesn't matter how fast or how slow you walk," said researcher I-Min Lee, whose study appeared in the Journal of the American Medical Association. "Even a little bit can be helpful."

Lee's Harvard colleague, Dr. JoAnn Manson, emphasized that while more exercise is better (three hours a week is recommended for good heart health), an hour a week is a more achievable short-term goal, especially for those who don't currently exercise.

Scientist Tests Alertness Effect of Changing Position

Here's a quick riddle from a new scientific study: If a drowsy person who is moments away from falling asleep in bed gets up and does three knee bends in 15 seconds and then lies down again, how long will it be before he falls asleep?

The answer, according to researcher Michael Bonnet of Wright State University in Dayton, Ohio, is two minutes and 12 seconds. To see how a position change affects alertness, Bonnet tested several brief exercises on volunteers just as they entered the lightest sleep stage (Stage 1).

Knee bends placed first, followed by 106 seconds after standing up, 58 seconds after sitting up, and 43 seconds after merely being told "you're doing fine."

So it seems that good old-fashioned "moving around" can temporarily ward off an alertness lapse. More vigorous exercise over a longer time span would likely have a longer-lasting effect.

Moderate Exercise Beneficial

For those looking to counter the weight gain that's common among shiftworkers: modest exercises such as walking, biking, and even climbing stairs during TV commercials can contribute to weight loss when performed consistently, according to a Dutch study.

In the study, published in the journal *Nature*, author Klaas Westerterp measured the activity levels and energy expenditure of 30 non-obese men and women ages 22 to 32. He found that the best way to boost metabolic rates — which contributes to weight loss — is through moderate exercise coupled with shorter stints of inactivity throughout the day.

Though experts caution there's no replacement for watching food intake and engaging in more intense exercise, most agree any exercise is better than none for helping reduce the risk of heart disease and diabetes.

The Exercise Balance

COMPLETE FITNESS INCLUDES 3 AREAS:

1. Cardiovascular fitness involves aerobic activities that basically exercise your heart and lungs. The American College of Sports Medicine recommends 20-60 minutes of aerobic activity, 3-5 times per week, using 60-90% of your maximum heart rate.

2. Strength training is important for carrying out everyday activities, as well as preventing injuries and osteoporosis (deterioration of bones). It is recommended to work all major muscle groups 2-3 times per week. It is also very important to give your muscles a rest between workouts. Therefore, you should never work the same muscle groups on consecutive days.

3. Flexibility is also important in the prevention of injuries since stretching reduces muscle tension and joint stress, increases range of motion, promotes circulation, and can correct muscular imbalances. Stretching can also make you feel more relaxed by relieving built-up body tension. Reebok University Master Trainer Gin Miller recommends stretching 2-5 times per week for 15-18 seconds per stretch. Furthermore, stretching should not be stressful and should never hurt. Only stretch to the point of mild tension. Also, many doctors and trainers believe that the best time to stretch is when the body is warm, such as after a light aerobic warm-up or at the end of your workout as a “cool down” activity.

Before beginning any type of exercise program, the first thing you should do is to consult your physician, especially if you have any type of medical history. Once you have your doctor’s approval, the next step is to determine what will work best for you and your schedule. Think about what type of activities you enjoy doing, who you would like to do them with (if anyone), when you can consistently participate in these activities, and what your budget is. From there, you can tailor a plan to fit your needs.

Keep some of these tips in mind while you are getting started:

- Start slowly - start small and build gradually
- Set realistic goals - don’t expect immediate results
- Add variety - to alleviate boredom
- Do things you enjoy
- Seek convenience - make it as easy as possible to stick to your routine
- Find a support group - find a workout buddy so you can help push and motivate one another
- Involve the people around you – exercise with family and/or friends so you can spend time with them as well as getting exercise
- Sneak in fitness – walk up the stairs instead of using an elevator; park in the back of the parking lot and walk to the store rather than trying to find a parking spot right in front of the entrance, etc.

Incorporating Exercise Into Your Life

In addition to enhancing physical fitness, regular exercise improves several of the maladies shiftworkers commonly experience. Exercise reduces the risk of heart disease, speeds weight loss and can make it easier to fall asleep and stay asleep. And exercising at work is a great way to improve alertness, especially on the night shift.

With so many benefits, the real question is "why not exercise?" Here are two popular excuses and ways you can defeat them:

1. **"I don't have time."** It may surprise you to learn that even brief periods of activity, such as a brisk 20-minute walk, can improve heart health and promote weight loss.
2. **"I can never stick with an exercise routine."** "Regular exercise" need not necessarily follow a strict schedule of four weekly gym visits with a personal trainer (though there's nothing wrong with that). If you don't currently exercise, it's best to start with small, manageable activities you know you can handle — such as a one-mile afternoon jog twice a week. Once you're doing those regularly, you can add (slowly) additional miles, minutes or activities.

Here are some tips to help you incorporate exercise into your life:

A little exercise is better than none. Experts recommend workouts of 30 minutes or more for optimum heart health and fitness. But that doesn't mean that if you don't have 30 minutes, you shouldn't work out at all. Workouts as short as 10 minutes, performed consistently, can bring benefits.

Have a sleep/exercise plan. If you like to catch extra winks with periodic cat naps, you need to put some thought into where to fit in exercise. In general, you don't want to exercise immediately after eating (which might cause indigestion) or before napping (because you might be too wired from working out).

Here's an example for someone working 8-hour night shifts: Sleep from 8:30 a.m. to the early afternoon, eat lunch, relax a bit or run errands, exercise around 4 or 5 p.m., eat dinner at 7 or 8, and nap just before returning to work.

Save major workouts for days off. If you work 12-hour shifts, there may not be enough hours in the day to squeeze in a full workout — especially if you have a long commute. You may be better off with light work-outs on workdays — such as a quick jog or 15 minutes on the treadmill — and heavier workouts on days off.

Work out at work. Depending on your job, you may be able to exercise at work. You might use your longest break of the night for a brisk walk around your worksite, a round of push-ups and sit-ups, or a few minutes lifting weights — some people keep a small set of hand weights at work. Along with the health benefits, many shiftworkers say nighttime workouts help them stay alert for the rest of their shift.

Don't Sweat Before Sleep. Experts advise against exercising within 2-3 hours of bedtime, on the theory that the physical activity "gears up" body and mind and makes it more difficult to sleep. But some shiftworkers say a good, tiring workout makes it easier to drop off to sleep. Experiment to find what works best for you.

Handling Shiftwork When You Have Diabetes

With proper attention to sleep, diet and blood sugar level, many diabetics are able to work at night without problems. Doctors recommend these guidelines:

1. **Shift your meals to a nighttime schedule.** When working night shifts, eat one meal upon waking in the afternoon, a second sometime before midnight, and a third before going to sleep in the morning. Snack as needed during the overnight hours to lower the likelihood of hypoglycemia (low blood sugar).
2. **If you take insulin,** do not keep your insulin doses and meals on a "day" schedule while working at night. This will increase your risk for hypoglycemia on the job, due to your being more active at night without eating more to compensate.
3. **Make sure your physician knows your shift schedule.** He or she can help plan your meal schedule, exercise plan, and insulin or medication doses, and suggest snacks for the night shift, according to what hours you work.
4. **Good on-the-job snacks for diabetics** incorporate a fast-acting carbohydrate (such as bread) with a slower-digesting substance (such as protein or fat). Good examples include peanut butter crackers, cheese crackers, half of a tuna sandwich, or a bagel with a glass of milk.
5. Though it's not always possible, it's best to **keep the same sleep/wake schedule** every day to ensure a consistent meal pattern and to avoid disruptions in metabolism. Try to ease your way into shift changes by staying up late and sleeping late for several days before your first night shift.
6. Stress causes the release of hormones that lead to increased levels of glucose in the blood. This can result in unpredictable fluctuations in blood sugar, making control more difficult. Diabetic shiftworkers stand to benefit from **learning stress management techniques.**
7. **Test your blood sugar regularly.** This can help you get to know your own daily patterns of ups and downs in blood sugar, and warn you when your blood sugar is becoming too high or low.
8. **Always carry a source of fast-acting carbohydrate with you** to treat low blood sugar quickly.

Diabetes Facts

About 1 in 18 Americans suffers from diabetes. Diabetics have difficulty either producing or using insulin, a hormone necessary to process sugar (glucose) for energy.

Symptoms of diabetes include increased thirst, extreme tiredness, blurred vision, weight loss, and going to the bathroom frequently — especially at night. Risk factors include being overweight, lack of exercise, family history of diabetes, and older age (45+).

There are two main types: Type I (aka "insulin-dependent" or "juvenile-onset") and Type II (aka "adult-onset").

Type I, usually diagnosed in childhood, is the more serious type and requires the greatest amount of care.

Most Type I diabetics treat their condition by injecting insulin at mealtimes, in addition to monitoring the amount of sugar they consume.

Type II diabetes is far more common, accounting for 90% to 95% of diabetes cases in the United States. It can develop at any stage in a person's life. Some Type II diabetics inject insulin, but many can control their diabetes by watching their diet. Some take medications other than insulin.

In addition to good blood sugar control, diabetics need daily medication (such as insulin), regular visits to the doctor, good nutrition, and exercise to stay healthy.

Sleep Deprivation May Increase Diabetes Risk, Study Finds

In addition to impairing alertness and performance both on and off the job, getting too little sleep may increase your chances of developing diabetes, according to a study.

"When you chronically get inadequate sleep, you are not merely developing a sleep debt, but also disrupting other body functions," said researcher Bryce Mander.

The study found that chronic sleep deprivation decreased the body's sensitivity to insulin, a hormone necessary for processing glucose, or sugar, into energy.

Decreased insulin sensitivity is considered a "pre-diabetic situation" that increases a person's risk of developing the full-blown disease.

In the study, researchers at the University of Chicago studied healthy, non-obese adults ages 23 to 42. Half of the subjects averaged eight hours of sleep a night. The other half were "chronic short sleepers" who got less than five and a half hours of sleep per night.

On the final day of the study, researchers gave all subjects an intravenous glucose tolerance test. Insulin sensitivity was 40 percent lower among chronic short sleepers.

A potential, though uncommon, danger for diabetics on the job is hypoglycemia — a condition where one's blood sugar drops considerably below normal levels. In severe cases, diabetics may experience shaking, sweating, dizziness, disorientation, double vision, or a combination of symptoms.

A study found that regular exercise and healthy diet were very effective at preventing Type II diabetes.

Some workers say that before being diagnosed with diabetes, they mistook the tiredness caused by fluctuating blood sugar for sleepiness resulting from their shift schedule.

For more information, contact the American Diabetes Association at 703-549-1500 or visit its website at www.diabetes.org.

Link Between Sleep Mood, Behavior, and Performance

Lack of sleep doesn't just make you tired: it also makes you impatient, stressed, irritable and even depressed. That's the finding of the National Sleep Foundation's 2002 Sleep in America poll, which studied people's moods in relation to how many hours they typically slept.

Those who got fewer than six hours of sleep on work days were more likely to report negative feelings than those getting 8 hours of sleep, including: fatigue (32% vs. 15%), stress (32% vs. 16%), sadness (14% vs. 7%) and anger (11% vs. 4%).

Poll respondents said that when they did not get enough sleep, they were more likely to make mistakes, eat more than usual, have difficulty getting along with others, and get impatient or aggravated with common annoyances such as waiting in line or in traffic.

People who reported often feeling sleepy during the day were more likely to describe themselves as dissatisfied with life (21% vs. 7%) and angry (12% vs. 4%) compared to those who rarely or never felt sleepy during the day. People who seldom experienced insomnia described themselves more often as full of energy, relaxed and happy.

Don't Worry, Be Happy

We've all had one of those nights (or days) when we felt so anxious about something that we barely slept a wink.

So what about those people who seem happy and content all the time? They probably drift off to sleep every day without a care in the world, right? That's exactly right, says one new study—people who have fewer worries also tend to have fewer sleep problems.

Researchers gave 135 men and women two tests, one to assess sleep disturbances, and one to assess sense of humor (yes, there actually is a scientific test that measures your sense of humor). The results were significant: those who laughed more slept better. Specifically, people who "produced humor" more—for example, being funny or telling jokes, rather than appreciating other people's humor—were the ones with the fewest sleep problems.

So don't be afraid to laugh a little and not take life too seriously.

So, doesn't everyone already know sleep deprivation can put you in a bad mood? Yes, they do know — but they deprive themselves of sleep anyway. Most poll respondents agreed that inadequate sleep can impair their work performance (93%), increase their risk for injuries (91%), lead to health problems (90%), and make it difficult to make decisions (62%) and get along with others (85%).

As you know, working at night can leave you sleep-deprived, which in turn may cause you to be irritable around your family. This is so common that many people who work irregular hours refer to it as "Grumpy Bear Syndrome."

When you feel irritable, make sure your family understands that it's because you're tired, not because you're angry at them. This is especially important if you have young children.

The bottom line is to make time for sleep: it could change your whole outlook on life.

Why Night Work Can Put You in a Bad Mood

A new study suggests that your work schedule, and how it influences the timing of when you sleep, can have a strong effect on your mood. Specifically, the study offers evidence that misalignment between your biological clock and your work schedule – in other words, working when your circadian rhythms are "programming" you to be asleep – can contribute to poor mood and irritability.

These findings will come as little surprise to shiftworkers who suffer from so-called "Grumpy Bear Syndrome" – feeling grouchy due to shiftwork – as well as those who have observed that they feel better on the third and fourth consecutive night shifts than on the first and second. This latter phenomenon is due to your circadian rhythms getting more adjusted to a pattern of being awake at night and asleep in the daytime.

Thirty-hour Days

The study's author, Dr. Diane Boivin of Brigham and Women's Hospital in Boston, used an ingenious research technique to show that people's moods tend to fluctuate with corresponding ups and downs in circadian rhythms.

Boivin used the results of two earlier studies in which volunteers lived in laboratories for a month and kept artificially long sleep-wake cycles – 30 hours or 28 hours instead of the usual 24. These extremely long days led to sleep-wake cycles becoming totally separated from circadian rhythms, which continued on cycles of about 25 hours.

While this was happening, the volunteers rated their moods on a scale of happiness and sadness whenever they were awake.

Because the volunteers were awake at varying times in relation to the cycles of their circadian rhythms, the experiment allowed researchers to look for trends in when the subjects were most and least happy.

The key finding was that volunteers tended to rate their moods worse during lows in circadian rhythms, such as when body temperature was declining or at its low point. This is important for shiftworkers because unlike people on a 9-to-5 schedule – who sleep through the overnight period when they're likely to be in a poor mood – you face being awake and on the job.

What You Can Do

So, what does this study mean to you, and what can you do about it?

For starters, it may be reassuring to learn that there's a scientific explanation for why you may sometimes feel irritable. Now you have proof that it's not you – it's that you're working when your circadian rhythms are at their low point.

Beyond reassurance, the study underscores the importance of not fully reverting to a daytime sleep-wake schedule on days off if you work a fixed night schedule.

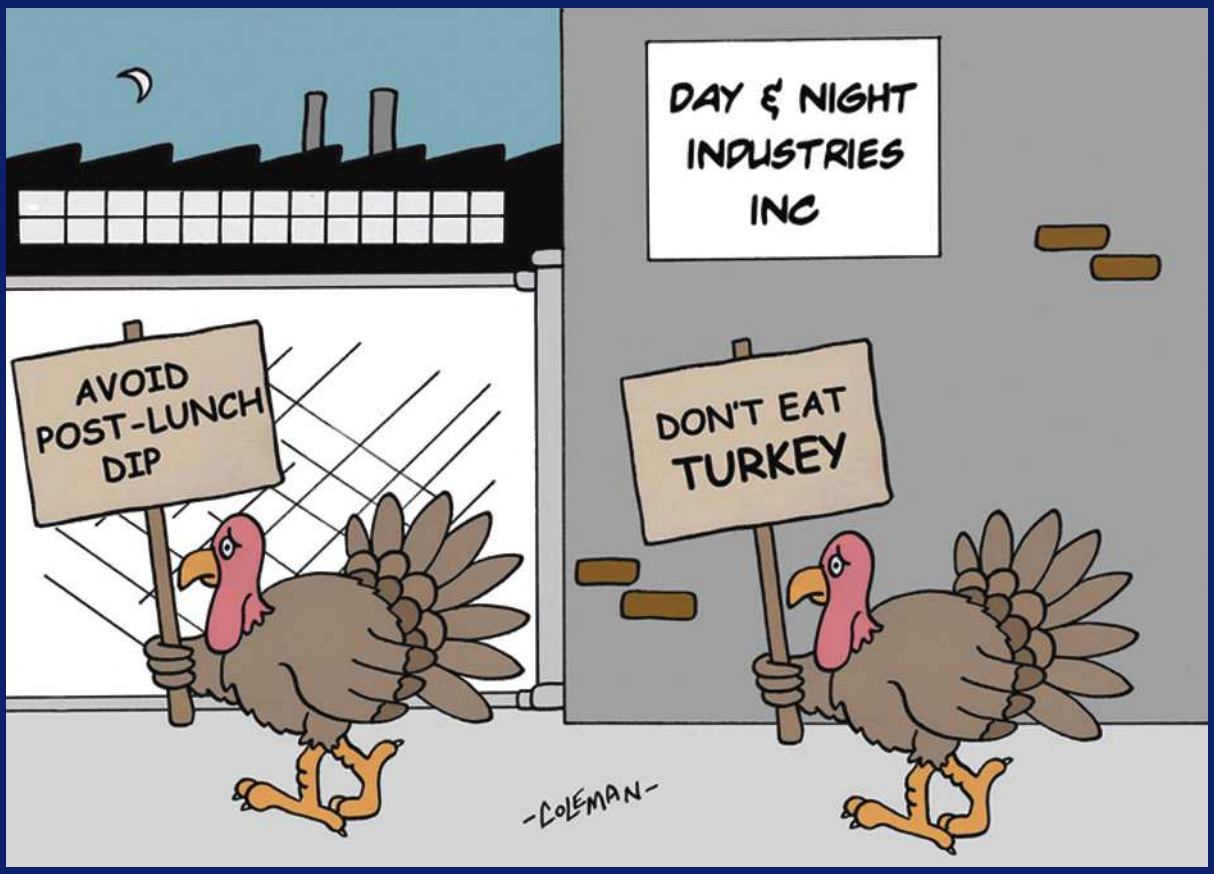
Although it's natural to want to quickly switch to daytime living so you can get the most out of your free time, you may feel better if you adopt a compromise strategy of staying up late and sleeping late on off days.

By doing this, you reduce the amount of time you spend awake when your circadian rhythms may put you in a bad mood. And it will also be easier to get readjusted to the night shift when it's time to return to work.

NOTES:

APPENDIX 7

Nutrition



How to Avoid Putting on Excess Pounds

Maintaining a healthy weight is a challenge everyone faces, but it can be even more problematic when you work at night and are hard-pressed to find a healthy meal or an open gym during your waking hours.

Research reflects this difficulty. A new Columbia University study of night workers at a hospital found they'd gained an average of 9.5 pounds since starting shiftwork; most reported increasing their food intake and exercising less.

In addition, a study of 400 Dutch shiftworkers found that men put on an average of about 13 pounds during their first five years of shiftwork, and women added about eight pounds.

This can have significant consequences. Excess weight increases a person's risk of health problems such as hypertension and diabetes. And a 1998 Penn State study found that overweight people have more trouble than normal-weight people getting quality sleep, already a challenge for shiftworkers.

Despite the statistics, it's quite possible to maintain a healthy weight as a shiftworker. Here are some ways you can keep yourself healthy and at the weight you want.

Monitor your daily food intake. Are you eating the same foods now that you did before you started working shifts? While you need not count every calorie, a balanced diet, low in saturated fat and including grains, vegetables and protein, will allow you to maintain good overall health and control weight gain.

Eat light before day sleep. When you eat in the morning after work before going to sleep, stick to low-fat, healthy foods. A bowl of cereal or a small serving of pasta with chicken are good examples.

"While you're asleep, your body does not actively burn calories like it does while you're awake," says Dr. Marci Gluck, who has done research on shiftwork and weight gain at the New York Obesity Research Center. "Eating light before going to bed in the morning can help night workers keep the pounds off."

Bring meals and snacks from home. With many workplace cafeterias shutting down at night, the food available to night workers tends to be limited. What's available to you is not necessarily what's healthy for you. Bringing your own food gives you control over your overnight food options.

Snack smart. Low-fat, natural foods make the best snacks for those trying to maintain a healthy weight. Packing some pretzels, crackers, an apple or a bag of carrots can help you save money and avoid the high-sugar, high-fat snacks sold in most vending machines. While an occasional candy bar won't kill you, limiting yourself to one a night at most will minimize the empty calories you consume.

Also keep in mind that although candy bars provide a quick energy boost, this high lasts only about 20 to 30 minutes, after which your energy crashes back down to a level that is actually lower than it was before you ate the candy. Energy bars, at health food stores and many gyms, are a better option. Some brands are high in sugar, so check labels before settling on a particular brand.

How to Avoid Putting on Excess Pounds
(Continued)

Keep a regular eating schedule. Strive to maintain as regular an eating schedule as possible. Regardless of your work (and sleep) schedule, try to eat breakfast between 6 a.m. and 10 a.m. and lunch and dinner before 10 p.m.

Between 10 p.m. and 6 a.m., it's advisable to stick to light and healthy snacks because the stomach doesn't digest food well during the overnight hours. Adhering to a regular three-meal schedule helps avoid the tendency to grab quick but fattening meals whenever hunger strikes.

Stay active. Night work offers good opportunities for morning or afternoon workouts, which help you burn calories and lose fat while preserving muscle. During the daytime, you have access to gyms and running and biking trails when they are less crowded.

Chew gum. Instead of reaching for a snack, reach for a piece of sugar-free gum. The nice things about gum are that you can chew it all night long without ingesting calories (provided you choose sugar-free gum), and some studies suggest chewing gum actually boosts people's alertness levels.

Eating Right On The Night Shift

On the night shift, eat snacks instead of meals. Some people find eating a full meal late at night causes indigestion or drowsiness (that "blood rushing to your stomach" feeling), neither of which you want to experience at work. If that's true for you, try eating your normal-sized dinner before work and sticking to light snacks throughout the night.

The best night-shift snacks are the ones that are the least fatty, spicy or greasy, as discussed above. Try to find snacks that you can eat in small portions — such as fruit, pretzels, crackers, granola bars, or mixed nuts — then snack on them when you feel hungry. Unfortunately, the no-fat, no-grease guideline rules out most vending machine items, so it's best to bring snacks from home.

Identify "problem foods." After working nights for a while, you'll probably discover which foods make your stomach feel normal and which ones make it feel as if an earthquake is hitting down there.

Problem foods — and the "problem hours" during which they bother you — are different for everyone. For example, some shiftworkers find that eating oranges or grapefruit around 4 a.m. lead to heartburn, whereas citrus fruits don't bother them at other times. Likewise, some people only eat, on night shift, the same foods they would feel comfortable eating for breakfast — cereal, oatmeal and yogurt work great, but heavy foods like burgers and chips are out.

Watch your coffee consumption. Too much coffee can lead to stomach irritation. Two or three cups in a single night don't usually cause problems, but if you're drinking more than four, cutting back may reduce stomach discomfort. Water is a great substitute for coffee — it both aids digestion and helps you avoid dehydration, which can cause you to feel fatigued.

Eat on a regular schedule. It's easiest on your stomach to eat at the same times every day. That may sound like an unrealistic fantasy if you work rotating shifts, but in fact, some people do well continuing to eat breakfast in the morning, lunch around noon, and dinner in the evening, even when they're on the night shift. If you do that, and you're still hungry during night shifts, it's fine to eat light snacks also (as described above).

Eating Right On The Night Shift

What do you eat on the night shift?

Do you choose your nighttime sustenance carefully and pack healthy snacks? Do you grab leftovers from last night's dinner at home? Or do you eat whatever the vending machine guys delivered that day?

Choosing your nighttime meals and snacks carefully can make the difference between feeling alert and energetic, or spending your breaks in the bathroom with a bottle of Tums. It's a fact that night workers experience more digestive problems — such as heartburn, diarrhea, constipation and abdominal pain — than day workers.

Here are some points to consider when choosing what foods to eat on the night shift:

You're not alone. Though some shiftworkers can eat a pizza or cheeseburger at midnight just like they would at noon, most experience some discomfort. That's because during the overnight hours, your body slows its production of digestive hormones and gastric juices in the stomach and intestines, making it harder to digest food.

Avoid fatty, greasy and spicy foods. High-fat foods are harder to digest in general, but especially on the night shift. So it's wise to save fried foods, pastries, potato chips, red meat, pizza, and whole-milk dairy products for the day shift. (Of course, minimizing your intake of these foods on all shifts will help you battle other common problems, such as heart disease and excess weight.)

Spicy or acidic foods can cause problems at night because of their potential to upset your stomach. You may feel better if you avoid garlic, onions, peppers, strong spices (such as cayenne pepper or paprika) and certain juices, such as orange, grapefruit or tomato juice.

It may be boring, but bland food is best for the night shift. Some examples: soup, potatoes, rice, pasta, chicken, fish, tofu, casseroles, and low-fat dairy products such as yogurt, milk and cheese.

Heart Health Tips

Marlene Lesson, nutrition director at Structure House (a residential weight management facility in Durham, N.C.), recommends the following guidelines for choosing foods that will help achieve weight loss, keep cholesterol levels low, and improve heart and overall health:

- Eat only 6 ounces of lean meat, fish and poultry per day if your LDLs are normal. Eat only 5 ounces per day if LDLs are high.
- Eat at least 2 servings of fish per week for optimum heart health. Fish, particularly salmon, contains omega-3 fatty acids, which protect your heart by lowering triglycerides and have an anti-clotting effect.
- Eat only 4 egg yolks per week if your LDLs are normal. Eat only 2 per week if LDLs are high.
- Choose polyunsaturated and monounsaturated fats (such as soft margarine, canola and olive oils) rather than saturated fats.
- Eat water-soluble fibers such as oat bran and dried beans.
- Eat low-fat dairy products. Drink skim or reduced-fat milk, eat low-fat or non-fat yogurt. Limit cheese (no more than three grams of fat per serving) to one ounce per day.
- Eat 3-5 servings of vegetables and 2-4 servings of fruits each day.

Easy on the Cheese, Please

A typical American in 2001 consumes 30 pounds of cheese a year (up from 11 in 1970), and you can save your arteries by choosing lower-fat cheeses, according to a report by the Center for Science in the Public Interest (CSPI), a nonprofit health-advocacy group based in Washington, D.C.

Though cheese has its nutritional benefits, such as calcium and protein, it's also the number-one source of artery-clogging saturated fat in Americans' diets, CSPI says. A single ounce of full-fat cheese can contain 100% of your daily recommended allowance of saturated fat.

While it's a good idea to limit your intake of high-fat cheeses, you needn't give up cheese altogether. Some tips:

1. In the supermarket, look for part-skim or low-fat cheese varieties, which often taste just as good as the full-fat kinds.
2. When ordering pizza, ask for half the normal amount of cheese and avoid crusts stuffed with cheese.
3. Use grated parmesan or romano cheeses, which pack a high amount of flavor into a small serving.
4. Occasionally order your Quarter Pounder without cheese.

Heart Health:
Eat More Fruits & Vegetables

Very simple modifications to your diet can help you offset the slight increased risk of heart disease that you face as a shiftworker, according to new research.

One More Apple a Day

Eating just 50 grams (1.6 ounces) more fruit or vegetables a day may help protect you from heart disease, according to a study. (50 grams is the equivalent of only a couple of broccoli florets or a quarter of a medium-sized banana.)

After studying nearly 20,000 people between ages 45 and 79, scientists at England's Cambridge University found that those with the highest vitamin C intakes had the lowest heart death rates. Just a 50-gram increase in fruit or vegetable intake lowered the death risk by 20%, regardless of age, blood pressure, or whether a person smoked.

"Small and feasible changes in diet could have a large effect" on people's health, said study author Kay-Tee Shaw. This study adds to previous research affirming vitamin C's cardio-protective properties.

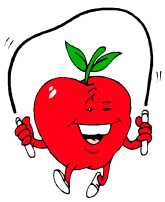
So load up on fresh fruit such as oranges, kiwi, grapefruit and strawberries, and vegetables such as broccoli, cauliflower, bell peppers and cabbage, which are all excellent sources of vitamin C. Research has yet to confirm whether vitamin C supplements provide the same benefits as fresh fruits and veggies.

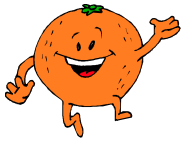
Benefits of Fruit & Vegetables

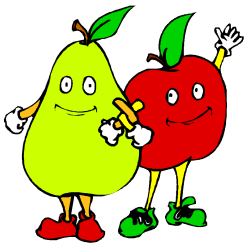
Let's compare apples to no apples. People who eat more fruits and vegetables—including fresh, canned, frozen, cooked, raw, and juice—have a lower risk for both strokes and heart attacks, a study shows.

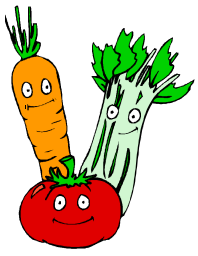
In the study, which surveyed 9,608 American adults over ten years, people who ate fruits and vegetables three or more times per day had a 42% lowered risk of dying of a stroke, and a 27% lower risk of dying of a heart attack, compared with people who ate their veggies one time per day or less.

One has to wonder whether people who eat more fruits and vegetables tend to follow healthier diets in general—and whether that healthier diet, not the fruit itself, might explain their lower risk. However, other research points to a lower risk for cancer among people who eat more fruits and veggies, and that lowered risk is thought to be due to the antioxidants in those foods. No matter which way you slice it, those who eat more fruits and vegetables tend to live longer lives.









Fiber & Fish: Two Pathways to a Healthy Heart

Trends appear to change with the wind; however, two in particular — a high-fiber diet and regular fish consumption — look like they're here to stay.

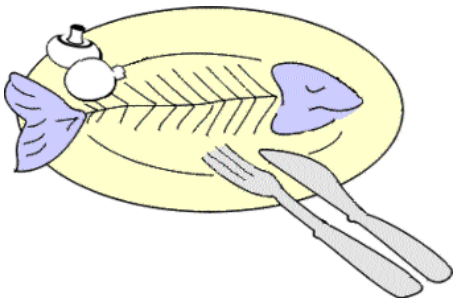
An established body of research has found these two diet strategies offer long-term health benefits. On fiber, for example, one study found that men who ate at least 25 grams of fiber a day had 36% fewer fatal and nonfatal heart attacks over a six-year period compared to those who consumed half that amount.

These results have particular relevance for shiftworkers, who are at a greater risk for heart disease than people who only work days. On top of its cardiovascular benefits, a high-fiber diet also is a good way to reduce gastrointestinal problems (such as indigestion and ulcers), which people who work nights often suffer.

Fiber-rich foods include cereals, potatoes, carrots, broccoli, cauliflower, peas and beans, apples, bananas, nuts and citrus fruits.

Eating fish at least twice a week also benefits your heart. Numerous studies have had positive findings, including a recent one concluding that people who eat seven ounces or more of fish a week are significantly less likely than those who rarely eat fish to suffer fatal heart attacks.

So how about making baked salmon, mashed potatoes and green beans one of today's meals?



Ways to Make Comfort Foods Healthier

Stressed Out? What are your "comfort foods"—the grub you yearn for in times of stress? Is it pizza? Macaroni and cheese? Fried chicken? Mashed potatoes and gravy? Maybe cake or chocolate cookies?

People turn to these and other "comfort foods" when they're stressed out. For example, a survey conducted two months after the terrorist attacks of September 11, 2001, found that almost 20 percent of Americans found themselves eating more comfort foods. "When we are anxious or fearful, we fall back to foods we associate with times of lower stress—that is, with childhood," says Dr. John Foreyt of Houston's Baylor College of Medicine.

Unfortunately, the foods that make us feel the best tend to be among the worst for our health. Comfort foods tend to be hearty, filling, and fattening. And now, health experts are concerned that Americans will "comfort" themselves into weight gain and poor health.

Experts at the American Institute for Cancer Research have prepared a brochure called "Comfort Foods," which covers ways to cook the food you love so that it doesn't pack on the cholesterol and pounds you hate. The brochure includes recipes for better-for-you beef stew, chili, meatloaf, spaghetti, chocolate chip cookies, and many others.

To order a free copy of "Comfort Foods," or to read it online, visit www.aicr.org. You may also request a copy by calling the AICR at 1-800-843-8114, x65.

Nutrition Q & A

1. I don't always work the same shift. When I change shifts, I'm confused about when I should or should not eat.

When you change the usual time of your meals, your stomach does not immediately adapt and anticipate food. This is why you do not feel hungry at these new changing meal times. Only after several days of eating at specific times will you begin to feel sensations of hunger, so try to eat bland, easily-digestible foods until then. Your body naturally anticipates food and secretes gastric juices before you eat. Therefore, whenever your shiftwork hours change, it's important to revise your meal time schedule and follow this plan consistently. Haphazard meal times will prolong the adjustment period and confuse your appetite and digestive secretion patterns.

The one exception to this overall plan is that many shiftworkers report being hungry right after they wakeup, regardless of what shift they work. If this is what happens to you, feel free to have a nutritious snack or light meal after you wake up, but do not increase the total amount of food that you eat each day.

2. Twinkies, fruit pies, and candy bars are the primary foods in our vending machines. I usually eat these for a quick snack or when I'm tired. I've heard these are not good. Why not?

These foods supply quick energy by introducing sugar into the blood. However, this energy burst is short-lived (i.e. 10 to 20 minutes), and since blood-sugar levels fall quickly, you will feel fatigued again. You will then desire more of these types of food and keep repeating the cycle while piling sugar and calories into your system. These foods are referred to as "empty calories" because they contribute nothing except sugar or fat to the diet. Furthermore, this kind of fat is usually saturated or hydrogenated, which is linked with heart disease. An excessive consumption of these empty calories tends to reduce the intake of health-protecting foods, largely by taking away one's appetite for them. Chocolate-based snacks also contain caffeine, which will keep you awake if you eat them too late in the shift. To provide longer-lasting energy sources, better choices for snacks would be complex carbohydrates like crackers/cheese, fruit, vegetables, and low-fat sandwiches. Lastly, high-sugar diets also tend to contribute to obesity and a greater incidence of dental cavities.

3. Should I be taking vitamins? Don't I need vitamin supplements with an erratic schedule like mine? Or to give me extra energy?

If you are eating a well-balanced diet from the Food Pyramid most of the time, it is not necessary to take additional vitamin or mineral supplements (the exceptions to this are people on weight reduction diets of 1,000 or less calories per day, pregnant women, and women of menstruating age who do not routinely eat foods high in iron). Vitamins do not give you food energy and vitamin-mineral pills contain only a small part of the nutrients in food that play an important part in our nutritional well-being. However, although vitamin supplements are no substitute for a healthy diet, they may help out particularly in times of stress or fatigue.

If you have concerns or questions, always ask your physician for specific advice.

Nutrition Q & A

4. What foods that are easy-to-digest would you recommend to eat when working nights?

1. Select foods that are high in **complex carbohydrates** for long-term energy:
   - All fresh fruits and vegetables, and 100% fruit juices
   - All cooked fruits and vegetables (without added fats or spices)
   - Whole grain breads, cereals, crackers, rolls, graham crackers
   - Potatoes, enriched rice, barley, noodles, macaroni, and other pastas (whole grain pasta is best)

2. Select **low-fat protein** sources:
   - All lean, tender meats
   - Skinless chicken or turkey
   - Fish, shellfish (baked, broiled, or canned in water)
   - Soybeans, tofu, legumes, small amounts of mild, low-fat cheese
   - Pizza with low-fat cheese, without fatty toppings

3. **Caffeine-free beverages:**
   - Caffeine-free sodas
   - Postum or other coffee alternatives
   - Low-fat and skim milk
   - Decaffeinated coffee or tea
   - Fruit drinks, juices
   - Herbal teas (except Matte and Morning Thunder)

4. **Microwave** - if a microwave is available in your facility, the following may guide you in selecting nutritious snacks and meals:
   - Hot sandwiches (chicken, lean roast beef)
   - Home dinner leftovers (baked chicken, pasta, casseroles)
   - Baked potato
   - Frozen fresh vegetables
   - Frozen low-calorie dinners (avoid if on sodium restriction)

5. Choose carefully from the **vending machine:**
   - Fruits
   - Popcorn
   - Fruit juices (beware of high sugar content)
   - Raisins
   - Fig bars
   - Low-fat yogurt
   - Pretzels
   - Low-fat milk
   - Ginger snaps

6. **Other foods** you can bring from home:
   - Fruit-nut mix (nuts, raisins, dates)
   - Cold sandwiches with mustard
   - Dried fruit
   - Angel food cake
   - Low-fat cottage cheese, fruit bowl
   - Cereal and low-fat milk
   - Tabouli, hummus, or pita bread
   - Crackers with small amounts of jam, peanut butter, cheese

Nutrition Q & A

5. What foods should I avoid on the night shift?

1. Avoid these foods and substances which are gastric irritants or promote gastric secretion:
   - Tomato juice, tomato sauce
   - Alcohol (beer, wine, liquor)
   - Strongly flavored seasonings: horseradish, BBQ sauce, black pepper, onions, garlic, chili powder, cayenne, tabasco sauce
   - Caffeine-containing substances: coffee, tea, colas, certain fruit-flavored sodas, cocoa, chocolate, and certain pain medications
2. Avoid foods high in fat:
   - Fatty cuts of meat such as ribs, corned beef, bologna, salami, pepperoni, bacon, hot dogs, sausage
   - Chicken skin, fried foods, gravies, creamy sauces
   - Whole milk dairy products, cream, large amounts of butter, margarine, mayonnaise, cheese, ice cream, chocolate candy
   - Donuts, pastries, pies, cupcakes
   - French fries, onion rings, potato chips, corn chips egg rolls, fried rice, sweet and sour dishes, pizza with high-fat cheese or toppings, meatball subs

6. I hear a lot lately about cholesterol and saturated fat. Why are these important and what foods should I eat or avoid eating?

Cholesterol is a fat-like substance found in your body and also in some of the foods we eat. In your blood, cholesterol is bound to two different types of proteins, known as low-density lipoproteins (LDL) and high-density lipoproteins (HDL).

LDL cholesterol is know as “bad” cholesterol because it is related to increased risk of cardiovascular diseases including strokes and heart attacks. You want to keep your “bad” cholesterol level as low as possible and it can be partly controlled by diet. To do this, you want to limit the amounts of fats and oils which you consume altogether and to cut down as much as possible on saturated fats. Saturated fat is characteristically hard at room temperature and raises blood cholesterol levels more than other fats. It is found mostly in animal fats and tropical oils (palm, coconut, etc.).

On the other hand, polyunsaturated fats in small quantities can help out. They all become liquid at room temperature and help lower the level of bad cholesterol by helping the body get rid of excessive newly formed cholesterol. Polyunsaturated fats are products such as sunflower oil, safflower oil, olive oil, and canola oil. Soluble fiber can also help to lower both your total level of cholesterol and especially that of bad cholesterol. (Soluble fiber will be discussed in the next question).

HDL cholesterol is known as “good” cholesterol because it actually promotes good health and higher levels are actually better. Your HDL level is mostly inherited, but it can be helped by exercising. Alcohol in small amounts is also helpful. (Heavy drinking is not good for you).

Nutrition Q & A

6. I hear a lot lately about cholesterol and saturated fat. Why are these important and what foods should I eat or avoid eating? ***(continued)***

Healthy Alternatives:

- Egg whites, egg substitute
- 2-4 fish meals per week
- 1-2 lean meat meals per week
- Meatless pasta meals
- Beans and rice dishes
- 2-3 skinless chicken or turkey meals per week
- Tub margarine (sparingly)
- Safflower and other polyunsaturated oils
- Skim or low-fat milk
- Sorbet, popsicles, frozen yogurt, non-fat frozen desserts
- Homemade cookies and muffins (with oil not vegetable shortening) and commercial non-fat pastries

Foods to Limit:

- Egg yolks
- Organ meats (liver)
- Red meats (beef, veal, lamb, ham)
- Fried chicken with skin
- Butter
- Vegetable shortening (Crisco)
- Coconut oil, cocoa butter, palm oil (tropical oils)
- Whole milk, cheese, and yogurt
- Ice cream
- Commercial pastries, pies, cookies, cakes (unless they are non-fat)

7. High fiber diets are supposed to be good for you. Why is this so, and what foods contain a lot of fiber?

Fiber is another important component of your diet because it helps prevent constipation, decreases elevated blood sugars, may lower blood cholesterol, and may reduce the risk of colon cancer. Experts recommend having 20-35 grams of dietary fiber each day in your diet. There are two kinds of fiber which make up total dietary fiber: insoluble fiber and soluble fiber.

Insoluble fiber has been commonly known as “roughage” or “bulk,” and it is made up of the part of the plants and animals you eat that the body cannot digest. A diet high in insoluble fiber may be used in cases of constipation and diverticulosis, and to decrease transit time. A high insoluble fiber diet is a normal diet with increased amounts of foods rich in plant fiber. Insoluble fiber can be found in fruits, vegetables (especially leafy ones), whole grains and brans, and nuts.

Soluble fiber lowers your total cholesterol level, especially the level of your LDL (bad) cholesterol. Soluble fiber can be found in citrus fruits (such as oranges and grapefruits) and other fruits containing pectin (such as apples). It can also be found in oats, barley, legumes (such as lima beans, peas, lentils, kidney beans, and chick peas), nuts, and processed foods containing gums such as guar gum and carboxyl methyl cellulose (look for these names in the list of ingredients). Foods containing these gums include some salad dressings, frozen desserts, pudding, and non-fat baked goods.

Nutrition Q & A

8. What should I eat if I suffer from diarrhea?

There are many causes of diarrhea. Some of the major causes include overeating, eating high-fat or difficult-to-digest foods, nervous irritability, and caffeine consumption. One or all of the following may help relieve diarrhea:

- Eat only until comfortably satisfied, not until "stuffed"
- Eat smaller, more frequent meals
- Avoid spicy or high-fat foods
- Make eating time as pleasant as possible: sit down to eat vs. standing; chew food thoroughly
- Evaluate your caffeine intake; caffeine consumption in as little as 1 to 2 cups of coffee per day may cause diarrhea in some people. In these doses, caffeine increases intestinal secretion which may account for the diarrhea

Warning: if suffering from diarrhea, it is essential to replace fluid losses by drinking 6-8 cups of water per day in order to avoid dehydration. Note: sports drinks like Gatorade contain large amounts of sugar and may actually worsen diarrhea.

9. What should I eat if I suffer from constipation?

- **Increase soluble fiber** content of diet: fresh fruits, vegetables, whole grains (including whole grain bread and oatmeal), nuts, and bran (use in moderation)
- **Increase fluids** - increase caffeine-free beverages, especially water, drinking 6-8 glasses per day.
- **Increase activity** - plan into your schedule regular exercise or a few short, brisk walks during the day/night

Two important points should be noted prior to beginning a diet high in soluble fiber:

1. Adequate fluid (6-8 cups per day) should accompany the high-fiber diet to prevent dehydration
2. Foods high in insoluble fiber should be added gradually after talking to your doctor

Nutrition Q & A

10. What is the importance of water? How much should I drink?

Water, although often forgotten, is an essential nutrient. Water plays a function in digestion, absorption, circulation, and excretion. It also plays a major role in the maintenance of body temperature and helps lubricate joints, as well as many other metabolic functions. Along with a high fiber diet, water also aids in the treatment of constipation. Water is the largest single component of the body as two-third of our total body weight is water.

We receive water from drinking fluids and from foods that we eat. Six to eight cups of water per day will meet our requirements. Keep in mind that thirst is usually an inadequate guide to water intake. Special attention to water needs should be given to those individuals with excessive diarrhea, athletes, and to all persons working in hot environments.

11. What can I do to make my meal times feel more pleasant and satisfying?

Extra efforts can be made to enhance meal enjoyment, such as:

- Prepare for the meal or snack and place it on a plate rather than grabbing and eating items directly from the refrigerator.
- Plan meals and shopping so you can have foods you really enjoy and foods which will keep you healthy. Cooking something you really like and then eating it is a great psychological boost, as well as being more healthful.
- If you do not have time to cook every day (and who does?), try cooking things in big batches. You can either eat what remains during the following week, or you can freeze the remainder and have healthy microwaveable meals when you're too busy to cook.
- Sit down for all meals and snacks instead of eating while standing, rushed and on the run, or while working.
- Chew food thoroughly and eat slowly. Avoid gulping beverages with each bite.
- Schedule a specific, routine time to be with family and friends even if it is not meal time.
- When possible, sit with family and friends and sip a beverage or eat a light snack to enjoy the social atmosphere of a meal.

Healthy Choices

The following are recommended healthy choices:

Vegetables:

- Dark-green, leafy vegetables (spinach, romaine lettuce)
- Yellow vegetables (carrots, sweet potatoes)
- Starchy vegetables (potatoes, corn, peas)
- Legumes (navy, pinto, kidney beans, as well as chickpeas)
- Others (lettuce, tomatoes, onions, green beans, broccoli, red & green peppers)

Fruit Group:

- Apples, apricots, avocados, bananas, blueberries, cantaloupes, cherries, grapefruit, grapes, kiwi, lemons, mangoes, nectarines, oranges, peaches, pears, pineapples, raspberries, strawberries, tangerines, and watermelon
- Eat whole fruits more than fruit juices (whole fruits have more fiber than juices)
- Citrus fruits, melons, and berries are high in vitamin C
- Only drink fruit juice that contains 100% fruit juice - all the others contain little fruit juice and lots of added sugars
- Limit canned fruits with “heavy syrup added” since it is loaded with calories and sugar

Bread Group:

- Select whole-grain breads and cereals (whole-wheat, multi-grain, rye, millet, oat bran, oat, and cracked-wheat)
- Choose breads with at least 2 grams of fiber per slice and cereals with at least 2 grams of fiber per serving
- Choose foods that are made with little fat or sugars (bread, english muffins, rice, and pasta)
- Limit baked goods made from flour (cakes, cookies, croissants, and pastries) since they are high in fat and sugars
- Limit the fat and sugars you add as spreads, seasonings or toppings (margarine, butter, cream or cheese sauces on pasta, etc.)
- Be careful that your cereal is not loaded with too much sugar or salt. Check the “Total Carbohydrates” against the “Sugars” on the nutrition label to make sure that sugar is not the main ingredient
- Pasta is a great source of complex carbohydrates (spaghetti, elbow macaroni, ziti, rigatoni, penne, fusilli, orzo, shells, bow ties, and lasagna noodles)
- Rice is another good source of complex carbohydrates. Brown rice is the most nutritious followed by polished white rice, while instant white rice has the fewest nutrients

Healthy Choices *(Continued)*

Milk Group:

- Skim milk or 1% low-fat milk
- Non-fat or low-fat yogurt (plain or flavoured)
- Low-fat or dry-curd cottage cheese
- Reduced-fat sour cream
- Non-fat or low-fat frozen yogurt
- Buttermilk
- Non-fat or low-fat cheese
- Reduced-fat cream cheese
- Non-fat or low-fat ice cream

Meat Group:

- Choose lean meats and poultry without the skin
- Broil, roast, or boil instead of frying
- Limit nuts and seeds since they are high in fat
- Trim away all the fat you can see
- Limit egg yolks

Lean Meat Choices Include:

- **Beef**: round, loin, sirloin, chuck, rump, flank, tenderloin, T-bone, porterhouse, cubed steak, and ground beef (extra lean)
- **Pork**: tenderloin, center loin, loin chops, rib chops, boiled ham, pork roast, and Canadian bacon
- **Veal**: all cuts except ground
- **Lamb**: leg, loin, chops, and roast
- **Poultry**: skinless chicken breast, turkey breast (white meat without the skin), cornish game hen (no skin), ground chicken or turkey breast (look for no skin added), duck and pheasant (both with no skin)
- **Fish**: most are low-fat, although marinated or canned in oil will be higher and may contain lots of sodium. Your leanest choices are cod, haddock, flounder, monkfish, sea bass, perch, whiting, tuna, halibut, mullet, red snapper, swordfish, shark, abalone, clams, mussels, oysters, scallops, squid, crab, crayfish, lobster, shrimp. Fattier fish include: salmon, albacore tuna, mackerel, bluefish, herring, shad, eel, catfish, and pompano.

Note: Meats are graded by the USDA according to their fat content and texture. Here is a quick guide to this grading scale:

GRADE	EQUALS
Prime	Highest in Fat
Choice	Moderately Fatty
Select	Leanest

Healthy Choices *(Continued)*

Condiments:

Just because you have a healthy diet does not mean that you can not use low-fat condiments to add some flavor to your meals. Some of these condiments may be high in sodium, so if you are salt-sensitive, pay attention to how often you use these and how much sodium you are consuming.

LOW-FAT CONDIMENTS	
Ketchup	Mustard
Jams, Fruit Preserves, Low-sugar Spreads	Soy Sauce - low-sodium
Teriyaki Sauce - low-sodium	Balsamic Vinegar
Cider Vinegar	Lemon Juice
Worcestershire Sauce	Cocktail Sauce
Tomato Chutney	Salsa

Cooking Oils and Spreads:

The following lists are healthy suggestions for oils and other spreads to use while preparing or eating food:

COOKING OILS	
Monosaturated	**Polyunsaturated**
Olive Oil	Safflower Oil
Canola Oil	Sunflower Oil
Rapeseed Oil	Corn Oil
Peanut Oil	Soybean Oil

OTHER SPREADS
Nonstick Cooking Sprays
Reduced-fat mayonnaise
Low-fat Dips
Soft-tum Margarines or Spreads
Butter Substitutes
Fat-free Spreads
Fat-free Salad Dressings
Low-fat Salad Dressing (3 grams or less per 2 tablespoons)

Night Shift "Menu" 1

SAMPLE MENU 1

"Breakfast" 10:00 p.m.	• Bowl of cereal with low-fat milk • Bagel or toast with jam • Fruit • Fruit juice
"Lunch" 3:00 a.m.	• Tuna fish on whole wheat bread • Carrot sticks • Low-fat cheese and crackers • Banana • Lemonade
"Dinner" 8:00 a.m.	• Turkey breast • Baked potato • Broccoli • Non-fat or low-fat frozen yogurt
Snacks	• Pretzels or baked corn chips and salsa • Bowl of cereal or fruit

Night Shift "Menu" 2

SAMPLE MENU 2

"Breakfast" 10:00 p.m.	• Spaghetti with tomato/vegetable sauce • Whole-wheat roll • Iced tea • Low-fat cookies or frozen yogurt
"Lunch" 3:00 a.m.	• Chicken breast sandwich (lettuce, tomato, low-fat mayo) • Celery sticks • Pretzels • Cranberry juice
"Dinner" 8:00 a.m.	• Cereal with low-fat milk • Bagel or toast with jam • Apple • Orange juice
Snacks	• Toasted bread with melted low-fat cheese • Low-fat cookies with low-fat milk

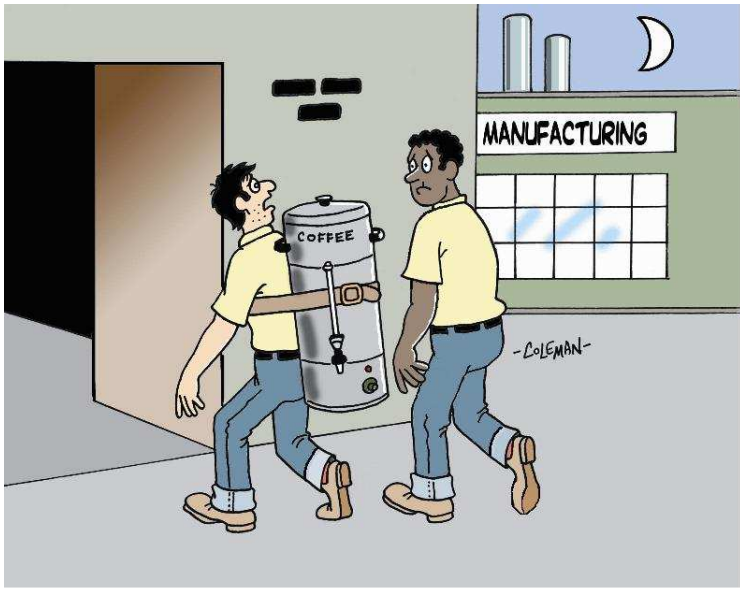
Caffeine Study: You May Not Need as Much as You Think

A new study finds that the amount of caffeine in less than one-quarter of a cup of coffee produces close to the same effect on people's mental performance as the amount in a full cup of coffee.

The study measured the effects of 0, 12.5, 25, 50 and 100 milligrams (mg) of caffeine on mental performance and mood in a group of 23 male and female subjects. (A typical cup of coffee contains 100 mg of caffeine.)

After consuming caffeine, subjects took two performance tests, one that measured simple reaction time and another that required more complex mental processing. Reaction time improved significantly even with the lowest caffeine dose (12.5 mg). All caffeine doses produced nearly equal improvement on the more complex task, despite the fact that the highest dose (100 mg) was 8 times higher than the lowest dose.

So the next time you want an alertness boost on the night shift, try pouring yourself half a cup of coffee instead of a whole one — it may just provide the improvement you're looking for without making sleep difficult in the morning.



"Without my coffee, I'd never make it through the night."

Tea Offers Alertness & Health Benefits

Health benefits associated with drinking tea regularly:

- Reduced cancer rates
- Lower the risk for both heart attacks and strokes.
- Tea helps lower cholesterol levels, which coffee can actually elevate.
- Less caffeine than coffee

Types of Tea

1. Black Tea - regular tea such as Lipton, or most iced tea.
2. Green Tea - highest amount of cancer-preventing antioxidants.
3. Oolong Tea - made from partially processed tea leaves and has slightly more caffeine than green tea.
4. Rooibos (or red tea) - a caffeine-free herbal tea from S. Africa.
5. “Herbal tea” - does not provide the antioxidant benefits of black and green tea.

CAFFEINE PER 10-OZ CUPS OF TEA & COFFEE*	
Drip Coffee	120-360 mg
Instant Coffee	60-240 mg
Black tea	42-180 mg
Percolated coffee	40-170 mg
Oolong tea	20-90 mg
Green Tea	13-30 mg
Decaffeinated coffee	4-10 mg
Decaffeinated tea	6 mg or less

** Caffeine content varies depending on strength of brewing*

Caffeine Amounts

Brand	12 oz. serving
7-Up	0
A&W Crème Soda	29
A&W Root Beer	0
Ale-8-One	67
AMP Energy Drink (8.4 oz.)	75
Barq's Root Beer	22
Canada Dry Cola	30
Canada Dry Diet Cola	1.2
Cherry Coca-Cola	34
Cherry RC Cola	43.2
Coca-Cola classic	34
Code Red Mt. Dew	55
Cool from Nestea	16
Cool from Nestea Peach Frrreezer	6
Cool from Nestea Raspbrrry Cooler	6
Diet A&W Crème Soda	22
Diet Ale-8	44
Diet Barq's Root Beer	0
Diet Cherry Coca-Cola	34
Diet Code Red Mt. Dew	53
Diet Coke	45
Diet Coke with lemon	45
Diet Cool from Nestea	11
Diet Dr Pepper	41
Diet Inca Kola	37
Diet Mello Yello	51
Diet Mountain Dew	55
Diet Mr. Pibb	40
Diet Pepsi-Cola	36
Diet Rite Cola	0
Diet Ruby Red Squirt	39
Diet Sun Drop	69
Diet Sunkist Orange Soda	42
Diet Wild Cherry Pepsi	36
dn.L	54
Dr. Nehi	42

Brand	12 oz. serving
Dr. Pepper	41
Fresca	0
IBC Cherry Cola	23
Inca Kola	37
Jolt	71
Kick (Royal Crown)	57.6
KMX Blue (8.4 oz.)	38
KMX Orange (8.4 oz.)	38
Lipton Brisk, All Varieties	9
Mad River-Lemon Green Tea	36
Mad River-Mountain Berry	9
Mad River-Oolong Tea with Honey	45
Mad River-Orange Carrot Medley	36
Mad River-Red Tea	36
Mello Yello	51
Mello Yello Cherry	51
Mello Yello Melon	51
Mistic-Diet Lemon Tea	18
Mistic-Lemon Tea	18
Mistic-Peach Tea	18
Mountain Dew	55
Mr. Pibb	40
Mug Root Beer	0
Nehi Wild Red Soda	50.1
Nestea Diet lemon	16
Nestea Earl Grey	50
Nestea lemon sweet	16
Nestea peach	16
Nestea raspberry	16
Nestea sweet	26
Nestea unsweetened	26
Pepsi Light	34
Pepsi One	55
Pepsi-Cola	38
Pibb Xtra	40
Planet Java -Caramocha (9.5 oz.)	65

Brand	12 oz. serving
Planet Java-Javadelic (9.5 oz)	65
Planet Java-Tremble (9.5 oz)	129
RC Cola	50
RC Edge	70.2
Red Bull (8.2 oz.)	80
Red Flash	40
Royal Crown Cola	43.2
Ruby Red Squirt	39
Shasta Cola	42
Sierra Mist	0
Slice	0
Snapple-Decaffeinated Lemon Tea	4.5
Snapple-Diet Lemon Tea	31.5
Snapple-Diet Peach Tea	31.5
Snapple-Diet Raspberry Tea	31.5
Snapple-Diet Sun Tea	7.5
Snapple-Ginseng Tea	7.5
Snapple-Green Tea with Lemon	24
Snapple-Lemon Tea	31.5
Snapple-Lemonade Iced Tea	13.5
Snapple-Lightning (Black Tea)	21
Snapple-Mint Tea	31.5
Snapple-Moon (Green Tea)	18
Snapple-Peach Tea	31.5
Snapple-Raspberry Tea	31.5
Snapple-Sun Tea	7.5
Snapple-Sweet Tea	12
Sprite	0
Sun Drop Cherry	64
Sun Drop Regular	63
Sundrop Orange	0
Sunkist Orange Soda	41
Surge	51
TAB	47
Tahitian Treat	Less than 1
Vanilla Coke	34
Wild Cherry Pepsi	38

Source: National Soft Drink Association

APPENDIX 8

Family and Social Life

Better planning might have made Shiftworker Appreciation Day more enjoyable for the night crew

Tips for Parents Who Work at Night

Shiftwork schedule can affect your relationships with your children, who may have trouble accepting that you need to work when most parents are at home. These tips can help you maintain strong relationships with your kids.

#1: Make daily contact. It isn't always possible, but make your best effort to spend at least some time with your kids every day. You might try to have at least one meal together every day, whether it be breakfast, lunch or dinner, during whatever hours you're home that day.

#2: Phone home. While daily personal contact is ideal, it doesn't always work out. Between your sleep and work schedule, time spent commuting and your kids' busy slate of after-school activities, some days the closest you get to your children is discovering the trail of mud they track through the back door. On days when you don't see your kids face to face, call home in the evening to see how their day went.

#3: Set up a bulletin board. Another excellent way to stay in touch is to set up a family bulletin board in your kitchen or hallway. You can leave encouraging notes for your kids and they can leave messages or graded schoolwork for you.

#4: Plan special events. When you're in the middle of a stretch where you don't get to spend much quality time with your kids, it's helpful to have something fun to look forward to. Make sure to include your children in planning as much as possible so they know what to expect and get to do things they enjoy.

#5: Share schedule info. Make sure your kids understand how your schedule works, and keep them abreast of day-to-day changes such as training, overtime and shift trades. If your schedule is about to change, hold a family meeting to talk about how the change will affect your lives and activities.

#6: Teach your children well. As soon as your kids are old enough to understand, start teaching them that if they respect your need to sleep in the daytime, you'll have more energy to play with them after you wake up. As they get older, always make sure they understand not to take it personally when the demands of your job force you to miss one of their functions.

#7: Find a rhythm. It's often easier said than done, but you may be able to come up with a routine that allows you to get the sleep you need and spend quality time with your kids. If they're in school, try to get as much sleep as possible in the morning and afternoon before they get home.

#8: Celebrate birthdays creatively. Depending on how old your kids are and how many you have, it may be worthwhile to arrange a shift trade with a co-worker so you can be there to celebrate your son's or daughter's birthday. If this isn't feasible, have a cake on your first day off after the birthday. (Young kids tend to enjoy this arrangement, because in their eyes it allows them to celebrate their birthday twice.)

#9: Involve your kids. Take them to see your workplace. Introduce them to your co-workers' kids of similar age. The more they understand how your job works, the more supportive and understanding they can be of your schedule as they get older.

Strong communication is the key to all relationships, including those between parents and children. To make the most of the time you spend together, make an effort to engage your kids in conversations in which each of you shares thoughts and ideas about what's going on in your lives — and don't forget to listen.

Maintaining Family Relationships

For a shiftworker, maintaining relationships with your spouse and children takes more work than it would for someone on a 9-to-5 schedule. You may not see your family as often. When you do, sometimes you've missed several events in the days since you saw them last. Family support is important — many veteran shiftworkers say the support of their family made all the difference in a successful shiftwork career. And as much as they love you, it's easy for spouses and kids to resent the fact that you have to work when most people are home, such as on the weekends. "It's easy for a shiftworker's family to feel that things are never 'normal,' where everyone is on the same schedule — and that's stressful to them," says Susan Zafarlotfi, who works with shiftworkers as clinical director of the Institute for Sleep and Wake Disorders at Hackensack University Medical Center in New Jersey.

Here is how you can do your part to keep family relationships strong:

Communicate often. Since you don't see your family as often as a day worker does, stay in touch at whatever hour — and in whatever way — that you can. If you're on evening shift, call home on your break to ask your spouse and kids how their day went. On night shift, you might drop your husband or wife an e-mail to read the next morning at work.

Stay involved by arranging a time — perhaps once a week — to sit down with your family and catch up on what's going on in each other's lives. Write down your schedule on a calendar so they can easily see what day and shift you're working.

Know your capabilities. When it comes to spending time together, keep your family's (and your own) expectations realistic. For example, going shopping with your wife Friday morning after working the night shift on Thanksgiving is probably a bad idea — you'll make a less-than-ideal shopping companion if you're walking around like a zombie from lack of sleep. "Don't try to be a martyr and sacrifice sleep," Zafarlotfi says. "Fatigue will catch up with you and give your temper a short fuse, and then the time you do spend with your family won't be quality."

Plan ahead. Planning is crucial for shiftworkers, even for daily activities, says Zafarlotfi. For example, if you're working Friday night and want to spend time with your kids on Saturday, plan to stay up with them for two or three hours, then sleep for the next eight. Scheduling special events for future dates gives you and your family something to look forward to.

Set up a bulletin board. Even if it's the family fridge, a bulletin board can serve as a central place to provide each other with information and updates on family matters. You can leave chore lists for your kids or notes for your spouse. Kids can post graded homework, report cards or their artwork.

Help them understand. The more your family understands the demands of your job, the more supportive and less resentful they can be. There are several ways you can help in this area. Some shiftworkers say that giving their families a tour of their workplace helped their spouses and kids become more supportive of the irregular work schedule. It's fun for families — especially kids — to see the equipment and machines used at work and watch you and your co-workers on the job. You can explain how the processes work and why they need people to run them 24 hours a day.

On a related note, it can be helpful to introduce your family to co-workers' families. Getting to know other families can help your spouse and kids realize they're not the only ones who have to adjust some parts of life around a shiftwork schedule. This may be particularly helpful if your spouse did not grow up with a shiftworker in his or her own family and is not used to dealing with "strange" work schedules.

Tips for Keeping a Marriage on Course

When you're on the job on a Tuesday evening or a Saturday night, you may feel like you married your work schedule instead of your spouse. But while work may prevent you from seeing your wife or husband during "normal" hours, it need not prevent you from having a healthy marriage. It's certainly not easy, but veteran shiftworkers say it is possible to keep a relationship running smoothly when you work nontraditional hours.

"With my 12-hour shift, we get a lot of time off — of course it's not always at the same time my wife is off from her 9-to-5 job," says Bill McIntosh of BP Solvay Polyethylene in Deer Park, Texas. "But we make sure to see each other when we can — I like to take her to lunch when she's working and I'm off."

Some work schedules, such as those that use 10- or 12-hour shifts, include regular breaks of three or more days. With advance planning, you can use these breaks to your advantage. "My schedule gives me an eight-day break every month," says Frank Castillo, who works rotating 12s at Phelps Dodge in Tyrone, N.M. "We often use the long break to go on out-of-town trips."

Here are more ideas to help you juggle the often competing demands of night work and marriage:

Address problems head-on. When you work at night, it's easy to ignore minor annoyances at home. But trivial matters — getting your car's oil changed or fixing a broken window — can quickly grow into major annoyances if you incorrectly assume your partner will take care of them. Keeping the lines of communication open, and even meeting at a designated time each week to update each other on events in your lives, can help you address issues before they become problems.

Share schedule information. Make sure your spouse knows your work schedule and is kept informed of changes and overtime. Castillo writes his daily work hours on a calendar he keeps on the refrigerator. "My wife and I leave each other notes on the calendar in case we miss each other because of our different schedules," he says. "Because it's in such a visible place, each of us is sure to see it when we're home."

Phone home. Make it a habit to call home at least once a night at an appointed time. Such a routine is reassuring to your spouse. When you're on the evening shift, it's a good idea to call after your kids are already in bed.

Allow time for recovery days. A spouse's expectations that you will do things together on off days can be a major source of stress. If you work between four and seven straight night shifts, plan for at least one full day of recovery during which your body can readjust to a daytime schedule. Plan major events or family outings for days when you're likely to be rested and in a good mood.

Take advantage of free daytime hours. If distance permits, even something as small as meeting for lunch during your spouse's lunch hour can give you a little time together. If your spouse's schedule allows him or her some free time during the day, even better; seize the opportunity to go places while others are at work.

Tips for Keeping a Marriage on Course
(Continued)

Get to know other night workers. Making an effort to develop friendships with other people who work nights can pay big dividends. Your spouse will have someone to talk with who shares the same challenges, and you may be able to work out child care arrangements together.

Share experiences. Even when your free time and your spouse's occur on opposite ends of the day, the sense that you are sharing the same experiences can be gratifying. Try reading a book or seeing a movie that your partner enjoyed recently. Or collaborate on a home improvement project that you can take turns working on.

Of course, all of these tips are made better by good communication between partners. Keeping your spouse in the loop will make it easier for him or her to appreciate and accept the unusual demands of your job.

Plan "dates." If you are having trouble finding quality time, plan a date and do something special. Even if you decide to do something low key like going to a movie or eating out, setting a date in advance reduces the chance of a scheduling conflict and gives the two of you something to look forward to.

7 Tips for Holidays

Christmas, Hanukkah, New Year's … for most people, the holiday season is a mix of joy and family fun on one hand and stress and exhaustion on the other. Although this time of year can be stressful for anybody, as a shiftworker you face additional pressure because you may have to work on holidays. This can cause resentment among spouses and children who wish you could share in every holiday activity.

Here are some ideas that can help you minimize family problems and make things go smoothly during the holiday season:

1. Emphasize communication. Between work and family obligations, the holiday season often seems to go by in a blur. You need to put extra effort into making sure you tell family members promptly about changes to your regular work schedule. Spouses, meanwhile, should be sure to double-check that their partners will be available (and rested) for special events.

2. Make plans early. By requesting time off well in advance, you increase the likelihood that your supervisor can work out a schedule that accommodates your needs.

3. Change dinner to lunch or brunch. Many families eat the holiday meal in the late morning or early afternoon on Thanksgiving, Christmas or Hanukkah. Shiftworkers on the night shift can have an enjoyable, relaxed meal with their families, sleep for a while and then go to work. "If I have to work a holiday night, my family gets together earlier that day," says Clayton Weaver, a painter with Kenton County Airport Board in Cincinnati, Ohio. "Since working 9 p.m. to 7 a.m. leaves me free in the daytime, sometimes it's just a matter of moving what time I sleep." Just be careful not to overeat — doing so can make you feel sluggish and sleepy later on at work.

4. "Move" the holiday. It may take some getting used to, but there's no reason a holiday can't be celebrated a few days early or late. If you can't make your family's holiday get-together because you must work, you might celebrate the holiday again with your immediate family on a day when you're available. Children often enjoy this because they get to celebrate the holiday twice instead of once. You might even try hosting a "post-holiday" party in early January. Friends are less likely to have other commitments, and they'll be more relaxed because holiday shopping, baking, planning and traveling are finally over with.

5. Videotape the holiday. A portable video camera can be an effective tool for coping with the holiday season. If you have young children, you might tape a message to be played before the kids go to sleep. Spouses or other family members can tape segments of the holiday celebration, which everyone can watch together the next day.

6. Plan group activities. A good way to enjoy the holiday season is to involve yourself more in the activities leading up to the holiday. Since it's not always possible for everyone to get together for a holiday dinner, plan activities in the days before the holiday that the whole family can participate in. Examples include cooking, decorating, shopping, and going to the movies. Having days free allows greater opportunity for these activities.

7. Build up your sleep bank. Nothing sours a holiday celebration like being cranky and exhausted from lack of sleep. Making sleep a priority will make this season more pleasant for both you and your family. In this regard, naps can be a big help. If you normally sleep right after a night shift and have to work on Christmas Eve, make sure to squeeze in a nap before work. Doing so will allow you to spend more quality time with your family on Christmas Day. "If I'm working the night before, I sometimes show up late at my family's holiday get-together," says Kevin Williams, a packer at Westwood Squibb in Buffalo, N.Y. "I'd rather get some sleep in first so that while I'm there I'm enjoying the celebration."

Strategies for Single Shiftworkers

Meeting other singles (and finding time for dates) is one of the challenges single shiftworkers face. You might be heading to work at the hour your friends want to go out. And night work can make it hard to find the energy to go out when you do get time off.

The key is finding ways to take advantage of both your schedule and your interests. For single parents, free daytime hours may allow involvement in children's school activities, through which you can meet other parents. Volunteer work enables you to help your community while meeting like-minded people, and organizations are often in need of volunteers with free daytime hours. Pursuing hobbies can bring you together with people who share common interests.

When many of your friends work a different schedule than you do, extra effort is often necessary to work out when to get together and stay updated on events in each other's lives. Phone calls and e-mail help friends on different schedules stay in touch.

Other ideas for maintaining a satisfying social life:

Socialize with co-workers. If you get along well with your co-workers, you might set up one day a week (or month) when you go out together for drinks or a movie. This is a way to get to know co-workers better and it also gives you a chance to introduce your other friends to your co-workers and to meet their friends.

Take classes. Daytime classes on topics that interest you can be a great way to meet people who share both your schedule and your interests.

Play non-team sports. It can be a good way to meet people, but tennis, golf, bowling, or hunting may work out better than basketball, softball or volleyball leagues, especially if you work rotating shifts that might cause you to miss a lot of team practices.

Join a health club. Most health clubs have a pretty low-key atmosphere during the day, which can make it easier to meet people. And the people you meet are likely to have social schedules similar to yours.

Plan ahead. If there's an upcoming event that means a lot to you, arrange well ahead of time to get the night off, even a few months ahead. The further in advance you notify your supervisor, the more likely coverage can be worked out.

Be creative. If you are dating someone with a similar schedule, use your imagination to plan fun dates that 9-to-5 workers could never do. At 11 a.m. on a Monday morning, catch a movie that opened over the weekend. Or go hiking in the woods on a Wednesday afternoon.

NOTES:

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