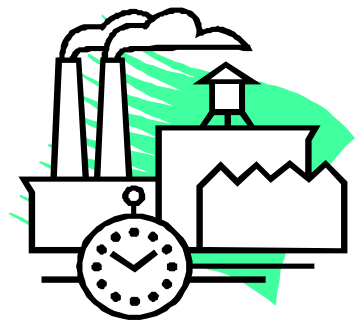


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THE HUMAN ASPECTS OF SHIFT WORK

By SeaBright Insurance Loss Control

Around the clock work schedules have existed for many centuries. Shift work has been with us since ancient Rome, when workers toiled all night to transport goods into the city. When the Great Wall of China was built to protect that country from invasion by the Huns, work continued around the clock for decades. If a worker collapsed from toiling day and night, he was more than likely walled up inside, and the work continued. Health and fatigue were of no concern to those crew leaders.



Today, we consider ourselves more civilized. And yet, compared to other safety concerns, research data is still limited regarding the impact that shift work may have on the safety and health of the American worker. Even the Occupational Safety & Health Administration (OSHA) has no regulations in place. For many, “shift work” simply means the manufacturing process is operating 24 hours per day to maintain production demands. We seldom appreciate the fact that shift workers keep modern society running around the clock, “like clockwork”. Long after the 9-to-5 crews go home, night workers toil in such diverse industries as transportation services, entertainment, fast food, hospital care, police and fire protection, shipbuilding and construction. Sometimes, we take them for granted without considering the physical and psychological effects that may be taking place due to their particular hours of work.

The Advantages Of Shift Work

Some people prefer working at night. There is generally less supervision and the commute is often lighter. A reduced workload and solitude may create a more relaxed atmosphere. The pay may be better. The right shift work schedule can provide more free time to be with one’s family and to pursue hobbies and sports activities. But studies have also shown that people often work the night shift for one main reason—to remain employed—rather than as a personal choice.

Tampering With the Internal Clock

As an evolutionary process, the human body has developed as a diurnal (daytime) species that sleeps at night and stays awake during the day. Any deviation from this pattern requires a *complete resetting* of the biological clock, sometimes called the circadian pacemaker. (“Circa” means about and “dian” means day.) Functions such as waking, sleeping, hunger, body temperature, hormone secretion and blood pressure are regulated by this internal clock on a 24-hour basis. By working at night, we are challenging this basic human physiology. We may be asking too much of the human body.

It's easy for a person to think, "I can handle this, I'm in control," but the power of the biological clock is hard to overcome, because it is a very complex system. At each hour of normal sleep, our bodies go through critical stages and research shows when these stages do not take place, the individual can suffer physically and psychologically. Shift workers are about twice as likely to complain of health problems as are day workers in every industry. They suffer more stomach ulcers, heartburn, constipation and other digestive problems. They're also more likely to complain of chest pain, wheezing, nervousness, colds and fatigue. Evidence also suggests that shift work may increase a woman's risk of infertility, miscarriage and premature delivery. If only we could "control" our biological clock, these problems wouldn't occur. But the biological clock is deeply imbedded in our genes. Some studies show that even after years on the night shift, the internal temperature and hormone cycles of nurses remained oriented toward a day shift.

Some people however, adjust to night work more easily than others. This is just one of the interesting differences between people. We all know that some people are "Larks" and others are "Owls." The former reach their energy peak early in the morning; the latter do their best work late at night. Matching "Owls" with night work is a good strategy, but is not always possible.

On the other hand, research shows that the older we get, the more inflexible our internal circadian rhythms become, and the more difficult it is to adjust to night work. Near the age of 50, many shift workers find they can no longer cope with irregular work schedules—even if they were able to adjust previously. As aging "baby boomers" now compose a large part of the workforce, we face a predictable group of older workers who will have medical problems related to shift work, and a shortage of younger people who can take their place. Smart managers should analyze workforce demographics every five years or so, when setting shift schedules.

The Basic Problem – Sleep Deprivation

The number one health-and-safety complaint associated with shift work is poor sleep. After they've worked all night, workers typically have trouble sleeping during the day, because of noisy surroundings and because their internal body clocks keep reminding them, "It's time to get up!" All shift workers suffer at some time from the effects of trying to stay up at night and sleep in the daytime. Studies show that about 60% to 70% of rotating shift workers do not get enough beneficial, quality sleep during the day. Irritability, digestive problems, lack of concentration, fatigue, personality conflicts with co-workers, and diminished job performance all collide when coping mechanisms fail over time. This in turn leads to diminished job performance and a greater risk of work-related accidents.

Sleep researchers say it is no coincidence that the major accidents at Three Mile Island in Pennsylvania, Bhopal in India, Chernobyl in the Soviet Union, and the Alaskan Exxon Valdez oil spill all occurred between midnight and 4 a.m. NASA physicians have implicated both simple fatigue and the time of day in a series of accidents, some of which involved shuttle launches. In one study, between 50% and 70% of shift workers reported that sleepiness diminishes job performance in their plant. Between 40 to 55 percent said they had observed accidents, near misses or poor safety practices during shift work. This situation presents a clear danger to the worker, co-workers and the public.

Family, Social And Psychological Problems

Shift work is sometimes accepted because it will help two-income families share the responsibilities of childcare. But if sleep time for the night worker is not protected, family relationships often suffer. Family members may expect more of the shift worker who is home during the day and "not doing anything." Despite good intentions, shift workers often have higher rates of divorce and drug and alcohol problems than the rest of the employee population. They simply do not appreciate how disturbance of their "biological clock" can affect their attitude, moods, coping mechanisms and how they relate to other people.

Some Shift Work Schedules Are Better Than Others

Permanent night shift workers are not as affected as those who have rotating shift schedules, because the former can pretty much normalize their waking, sleeping and eating patterns. Those who are on rotating shifts, however, are never able to

get their biological clock in sync. Just as their bodies are adjusting to a new sleeping and eating pattern, their schedule changes again. Vacation days, sick days and holidays all undermine the rotating shift workers' normal living pattern. The consequences of this erratic pattern include physical disorders, nervous problems and poor psychomotor performance that can lead to serious accidents.

A variety of shift schedules are used today. Some use 8-hour, but most follow 12-hour shifts. Major factors are how fast shift rotations take place, the direction of rotation, how many days off lapse between work periods, and how many weeks it takes to complete a full rotation. Family members and the worker may enjoy the long schedule breaks, but there are safety concerns about returning to a night shift after several days off. Other factors that impact the smooth consistency of these schedules are the periodic need for extra overtime work due to production demands, and the need for a relief worker when a regular crewmember is ill.

Resetting the Body's Clock

An innovative technique that uses bright lights to reset the human body clock offers promise. One study had men work under very bright lights, then go home to sleep during the day in totally darkened rooms. Within three days the men had adjusted to the night schedule. This seems possible because the body's circadian rhythm is believed to be controlled by a link between the retinas of the eye to an area of the brain that controls many body functions. However, manipulating light intensity to control sleep patterns is still experimental.

Use of the "Sleep Hormone"

Drugs may also be used to combat shift-work problems and is being researched. Melatonin is a sleep-producing hormone that is released by the tiny organ inside the brain known as the pineal gland. Non-prescription melatonin is sometimes used for jet-lag symptoms, helping to regulate the body's sleep-wake rhythms. It may also help shift workers temporarily adjust to a new shift work sleep pattern. Still, until the drug's efficacy and safety are proven, its usefulness remains uncertain.

Steps To Reduce Company & Human Problems:

But there are things a company can do. There should be no need for government intervention to pass laws that will protect the health of their shift workers. Simple steps can be taken, at relatively little cost, to make life more bearable for them. Some of the most important research has come from experiments with astronauts, who have needed to function under abnormal living, working and sleeping conditions. Aviation training and NASA astronaut alertness practices have produced techniques that can teach employees how to prevent "microsleep" (driving and nodding off), eat for alertness, exercise for performance, and therefore work more safely.

Step 1: Education

The first step is to educate your shift workers and their families on the importance of adopting a regular sleeping and eating schedule and to form good nutritional habits. Most will be unaware of how important adjusting their lifestyle to shift work will be. Regular patterns of eating and sleeping can reduce digestive problems, fatigue and diminished job performance. Through safety meetings, videos or brochures, employees should learn that a good sleeping environment includes:

- 1) Sleeping in a darkened and cool room;
- 2) Eliminating noise by turning off the telephone, establishing home rules and using ear plugs or muffs;
- 3) Establishing a routine that prepares the person for sleep such as taking a warm bath, reading, or watching television.
- 4) Avoiding caffeine and alcohol. The caffeine drink used to keep a worker awake during his shift will have the same affect when he tries to go to bed after work. The same goes for alcohol. Alcohol is a depressant, and social drinking after work will eventually inhibit the sleep the worker desperately needs to keep functioning at peak performance.

- 5) Also consider counseling shift workers on how family communications can break down under the stresses of shift work, and have counseling resources available. It is additionally important for family members to receive education in how to support, rather than frustrate the shift worker with demands he or she cannot fulfill without impacting their sleep time.

The Importance Of Nutrition

Nutrition is a subject that few people understand in this “fast food” society. A full stomach doesn’t necessarily provide good fuel for good body performance. Whether trying to stay alert during a work shift, or trying to stay awake while driving long hours across country, people need to understand how protein and carbohydrates affect the body. If you want to stay awake, eat protein—meat, fish, poultry, eggs or cheese. On the other hand, carbohydrates—bread, pastry, pasta, desserts and candy will eventually induce sleep. If you don’t believe this, remember how hard it is to stay awake during an afternoon meeting when you’ve eaten a lunch that consisted of bread, pasta and sugary drinks or desserts. This is simple body chemistry—believe it!

Step 2: Overhaul Outmoded Shift Schedules

The next step is to revamp outmoded schedules, allowing adequate blocks of time between shift changes. To help the body adjust to the change, adjust shifts bi-weekly rather than once a week. The body needs a couple of weeks to adjust to a new work, sleep and eating schedule. Clockwise shift rotations are the easiest on the human body. Days, swing, then graveyard shifts work far better than moving from graveyard to swing, and then to days. This has to do with the strange fact that although we function on a 24-hour clock, the body functions on a 25-hour clock. Clockwise rotation is easier for the body to handle. Establishing or revising shift schedules should involve careful analysis. Experts advise the involvement of both employees and management during the planning process, including unions when appropriate.

Step 3: Establish Company Policies and Procedures

Finally, company policies and procedures should be established to help employees adjust to shift work. Depending upon the size and type of your facility, some of these strategies will work while others may not be appropriate. Many are worth trying, at least on a temporary experimental basis:

- 1) If you have a cafeteria, consider staying open at night to serve the same nutritional fare given to day workers. Have the vending machines refilled in the late afternoon so that evening shift workers have a selection of fresh and nutritious snacks, instead of carbohydrate “junk food” which will induce sleepiness.
- 2) Look at the feasibility of having some employees in your Personnel Department begin work earlier or stay later so they are available to answer shift employees’ questions regarding pay, benefits and other personnel matters.
- 3) During meal and break times, you might rebroadcast regularly scheduled television and radio programs to stimulate employees, keep them awake and ease their social isolation. Fitness classes can be made available during these times too. Some employees will appreciate this. Exercise re-energizes the mental and physical being and helps promote sleep when it is bedtime.
- 4) Assure that your off-shift employees are receiving the same training in equipment use, maintenance and safety as your day shift workers. Sometimes putting a day shift supervisor on nights or weekend, for a limited time, helps to educate management regarding the needs of shift workers.
- 5) Very often a major stressor for shift workers is dealing with childcare issues, especially if a spouse also works odd hours or a child becomes ill. If this is a critical issue for many of your shift employees, consider a “night care” and “weekend care” facility on your premises or research other childcare options for your shift employees. Remember, if an employee’s personal life is running smoothly, he/she is more likely to give the job his/her full attention while at work.

Step Four, Utilize Experienced Consultants

In recent years, we find that a growing number of specialists are helping to determine which shift work schedules are most effective. Take advantage of these resources. They have learned, through working with a variety of industries, which strategies are most productive for different types of operations. There are several “models” of shift work to be considered. You can benefit by considering the advice of experienced consultants, rather than doing your own time-consuming research into the various models of shift work scheduling. These consultants will deal with profit issues, training programs and workforce satisfaction as well as with labor relations. A place to start is with an Internet search for “Shift Work.” The next step will be acquiring testimonials from companies that have used these consultants.

Conclusion:

All the ideas offered on this subject may not apply to your operation, but many can be helpful. It is important to note how many serious accidents have occurred during the wee hours when manual dexterity, mental arithmetic, reaction time and cognitive reason may have deteriorated. The consequences are serious for your company in the form of greater liability, impaired human health, lower productivity and reduced bottom line profit. Keep all of your workers satisfied and safe. Talk to them and find out what they need. You will be rewarded with a happier, healthier, safer and more productive work force.

Selected Internet Resources on Shift Work:

www.schedule-masters.com

www.shift-work.com

www.circadian.com

www.sleepfoundation.org

www.dol.gov/dol/topic/workhours/nightwork.htm