

LAW ENFORCEMENT MANAGEMENT INSTITUTE

SHIFT WORK: A HEALTH HAZARD

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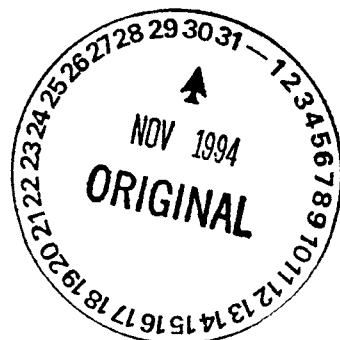
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SHIFT WORK: A HEALTH HAZARD

I. INTRODUCTION

Today's law enforcement officer faces many dangers which are inherent to the job. Officers face recognizable dangers such as physical assaults, verbal threats, and possible injury from traffic accidents. But one danger that the law enforcement officer may face, and give little thought to, is shift work.

Over 20 million Americans work non traditional hours, often referred to as shift work. (Liskowsky 1992, 3047) Usually a person working irregular hours or rotating shifts is considered a shift worker. Persons who are assigned to work day time hours on a regular basis are often said to be working "normal hours", and as a rule do not experience the problems a "shift worker" encounters.

Disruptions in sleep occur in at least three quarters of the people who experience a major time shift. (Bennett, Goldfinger and Johnson 1987, 168) In law enforcement, particularly for those assigned to street duty or patrol functions, disruptions in eating, sleeping, and exercising habits are a regular occurrence. These type of problems can eventually lead to the development of increased stress, illnesses, and do harm to the body.

An estimated 70 billion dollars is lost by industry due to sleep related accidents, inefficiency, errors, and

health problems. (Brody 1994, 78) Studies show that workers on the night shift have only half their alertness as they would have had if they were working during the day. Law enforcement personnel assigned to shift work may run a higher risk of errors and accidents than those working the day shift.

Not only does shift work impact the agency or the employer, but also the individual's personal and family life is affected. Many times an officer is assigned to hours which directly interfere with the family or the officer's own personal interests. An occasionally missed event may not cause much grief, but repeated occurrences (because of shift work) will take it's toll.

Shift work is a necessity which law enforcement will have to deal with until there is no longer a need for law enforcement services. The purpose behind this research is to bring to light problems associated with shift work and to gain a better understanding on how to avoid some of the problems it creates.

II. DESCRIPTION OF SHIFT WORK

Depending on the rank, assignment, or seniority level, an officer may draw a permanent day shift assignment. These day shift positions allow the officer to lead what is considered a "normal life". Working the day shift permits the officer to develop normal sleeping, eating, and

exercising habits. Additionally, the officer is able to spend time with their family or socialize on a more regular basis.

However, permanent day assignments are the exception rather than the rule in law enforcement. The majority of officers in this field spend their time working rotating shift assignments or irregular hours. To make matters worse, the majority of agencies who use rotating shifts to staff the night hours normally rotate their personnel in a counter clockwise direction from shift to shift. With rotating or irregular hours, officers will usually also have different days off on a continuous basis.

Shift work practices used by today's law enforcement agencies were developed during a time when crime was at it's low point. Many shift practices that were developed and maintained decades ago, are still in practice. One 300 year tradition, which is still practiced in a Scandinavian Country, is having the police officer work a different shift every day. (Kohl 1994, 61) Schedules such as these are used by law enforcement agencies in order to provide 24 hour police protection. But while doing so, agencies are exposing their greatest resource, their personnel, to a vast array of health disorders and safety concerns.

III. PROBLEMS OF SHIFT WORK

Health disorders are an area of concern which faces law enforcement officers working shift work. A good majority of people who work shift work often experience one or more physiological and or psychological disorders. These disorders may include, but are not limited to:

- * Sleep disorders
- * Disruptions of biological rhythms
- * Gastrointestinal disorders
- * Increased stress levels
- * Increased use of drugs or alcohol
- * Affects of preexisting conditions
- * Eating disorders
- * Lack of physical exercise
- * Increased risk of illness

Sleep Disorders

Some 100 million Americans are seriously sleep deprived and have created a potential hazard to themselves and others. (Brody 1994, 64) Increased work days, television viewing, sports activities, and the general desire to live as much of the day maybe to blame for the majority of the public's sleep deprivation. This may not be the case for the people on shift work who are forced to adjust sleep patterns around their employment, causing them to develop sleep disorders and health problems.

Insomnia is one sleep disorder experienced by many law

enforcement officers on shift work. Insomnia is a term which refers to a poorly understood situation in which people habitually have difficulty falling asleep and staying asleep when its time to go to bed. (Bennett, Goldfinger and Johnson 1987, 338) High levels of anxiety are one component of insomnia. This component is not exclusive to the officer working shift work, but may be more common and magnified. The officer working the night shift is exposed to more traumatic experiences than would his day time counterpart. The unpleasant thoughts from the night's activities begin to come to mind while attempting to fall asleep. The second component of insomnia is thought to be responses which have been learned and related to bed time. An officer working rotating shifts, having had trouble sleeping during the day time in the past, anticipates this problem. This is a prime example which many officers experience.

Insomnia, the inability to fall asleep, is not the only sleep disorder many officers face while working shift work. Frequent awakenings during sleep is another problem. All too often, after falling asleep, the day sleeper is awakened. External noises such as lawn mowers, truck traffic, children playing, and day time "door bell ringers" are examples of the disturbances the day sleeper battles with. The day sleeper is now faced with higher levels of noise and an increase in light, causing sleep problems.

Disruption of Biological Rhythms

A person's biological rhythms are often disrupted by working shift work. Biological rhythms are changes in various physiological and behavioral functions that repeat at regular intervals, ranging from minutes to months. (Liskowsky 1992, 3047) One such biological rhythm which is directly affected by shift work is the "circadian rhythm". The circadian rhythm is an internal clock which governs the sleep process of an individual. Normally, a person's circadian rhythm advances forward as time goes on day by day. The circadian rhythm is easily disrupted on people who are working when they should normally be sleeping.

The circadian rhythm is generated by the internal clock within the brain. The rhythm of this internal clock is synchronized to the environment, most importantly the light and dark cycle. (Liskowsky 1992, 3047) The circadian rhythm attempts to dictate when a person sleeps. Officers who are placed on night duty after completing a day assignment will usually experience problems staying awake. This occurs because their biological clock is telling them it's time to sleep.

A laboratory study was conducted by researchers at Deaconess Hospital in St. Louis, Missouri, into the circadian rhythm. (Dotto 1990, 227) Using the Multiple Sleep Latency Test to measure the sleepiness of subjects, the researchers found that the subjects were profoundly

sleepy between the hours of 2:00 a.m. and 7:00 a.m. when faced with a simulated night shift schedule. This sleepiness was prevalent mainly on the first two or three days after starting the night shift, no matter how much sleep the test subjects got before the shift, they continued to experience sleepiness.

Not only do shift workers experience problems staying awake during the night, but they also have problems going to sleep during the day. A variation of this problem is being able to go to sleep, however waking up frequently during the sleep period. As a result, often times officers working the night hours (sleeping during the day) get approximately two to three hours less sleep than those who work the day shift and sleep throughout night.

An opposing force to the circadian rhythm which also regulates sleep is the "homeostatic". This cycle puts pressure on us to sleep after being awake for 16 hours, normally around 10:00 p.m. to 11:00 p.m. The circadian rhythm in contrast, causes the body to become sleepy based on cycles of daylight and darkness. Usually, a normal functioning circadian rhythm would have us drowsy during the middle of the afternoon and sleepest at 4:00 a.m. to 5:00 a.m.

A study conducted by Dr. Charles A. Czeisler, a neuroendocrinologist with Brigham and Women's Hospital in Boston, Massachusetts, studied the interaction of the

circadian and homeostatic systems. Dr. Czeiler found that the homeostatic drive causes sleep in the evening hours, but would cause us to awaken in a few hours into the sleep. The circadian rhythm takes over to permit sleep the remainder of the night. One way to maintain a long period of sleep is to actually go to bed 5 to 7 hours before the circadian peak in sleep. (Brody 1994, 79) This is the reason why shift workers have problems sleeping. Shift workers who try to sleep during the morning often wake up after a few hours of sleep and then have problems going back to sleep. Not only are shift workers experiencing rhythm disturbances, but also the accumulated sleep deficit further impairs their general well being.

Many health problems can be traced to the rigidity of the circadian process. (Borbeley 1984, 187) The sudden change in working hours, such as going from one shift to another, causes the sleep cycle to change immediately. Additionally, the body's metabolic and hormonal rhythms change. Intestinal enzyme secretions and gastric acidity in the circadian cycle become disturbed and contribute to gastrointestinal disorders, to include general gastric discomfort and peptic ulcer disease.

Heartburn

Heartburn is one disorder many officers working shift work experience on a regular basis. Heartburn is a burning discomfort felt in the chest. This can often alarm a

person into thinking that he or she maybe having a heart attack. The immediate cause is the acidity of the material refluxed into the lower end of the esophagus. The gastric acid which is hydrochloric acid directly irritates the surface layers of the protective lining. (Janowitz 1992, 43) When saliva is swallowed, the acid is diluted and neutralized, becoming less irritating. But if the esophagus muscles do not work in a coordinated fashion, they can not remove the acid from the esophagus.

Since fluids do not flow up hill, one can understand why you may not have heartburn during your working hours. But when you lay down to sleep, the stomach contents can easily run into the esophagus, especially if the stomach is full. An officer working nights is a prime target. The majority of night workers eat only a few hours before going to sleep at the end of their shift, as compared to the officer on the day shift who normally has several more hours of activity (after eating) before going to bed.

Gastrointestinal Disorders

Peptic ulcer diseases are another problem shift workers tend to experience more so than their counter parts who work straight "day" jobs. Food is transported to the stomach via the esophagus. Once in the stomach, digestive enzymes known as pepsins break down food. Acids begin to fill the stomach as well. At times, problems develop and the acids begin to digest the stomach's lining. A

combination of acid and enzymes is needed together to cause the damage. The combination of these chemicals often times will result in circular surface damage measuring approximately one inch in diameter called a "peptic ulcer". (Janowitz 1992, 69)

The body has several internal defenses to combat the combination of enzymes and acids. But there are several factors which undermine these defenses. Consumption of coffee and tea are an everyday occurrence which tends to disrupt the stomach's defenses. Although a regular in most people's lives, officers who work shift work tend to rely on these beverages to help them stay awake and keep warm at night.

Caffeine, found in tea and coffee, induces acid secretions into the stomach and exaggerate heartburn. Coffee is also known to block the prostaglandin production, thus weakening the cytoprotection and perhaps leading to ulcers. (Hoffman 1990, 57)

Diarrhea is another problem the officer working shift work experiences. Diarrhea is a frequent symptom of food allergies or food intolerance. Sometimes associated with lactose intolerance, diarrhea can also be triggered by consumption of fatty foods. Officers who work shift work are often exposed to this condition. Few restaurants, other than those known as "greasy spoons", are open during the late hours of the night.

Eating Disorders

In general, officers are said to have poor diets, often limited in time to eat, fast food is a staple. Officers working shift work are not only limited in time, but are also limited to selection as well. All too often, the only places open during the late night hours are usually known for their availability of high fat and high calorie, fast food. Officers who work shift work tend to eat meals associated with "day" schedules. The officer working graveyards will at times eat a meal which he or she might be accustomed to eating during the day time hours. In sharp contrast, many officers working shift work survive on "junk food". Many times officers on the run will grab candy or chips from a nearby vending machine and then wash them down with sodas. The officer considers this a meal on the run.

Officers who work shift work tend to eat in irregular patterns, if they eat at all. Commonly known as rhythm eating, officers tend to indulge in periodic food intakes followed by periods of low or no food intakes. This practice is observed in shift workers who do not have time to eat (usually in the evening hours) or do not have the availability of a place to eat, which is often the case for officers working the early morning hours of the shift. The officer who works the day shift does not as a rule run into this same problem.

Increase in Illness

Illnesses are suspected to increase in shift workers as compared to day personnel. Frequently, officers are moved from one shift to another. This causes the officer to lose sleep and cause his or her body to adjust. The body's internal workings are thrown off, as a result creating a strain on the officer's system. Medical research has been hard pressed to show the relationship of sleep and how it affects disease or human health. But recently, researchers have found that the body's immune system is somehow repaired or bolstered during sleep. This process has a role in regulating sleep. (Blakeslee 1993)

Experiments conducted by sleep researchers found that sleep deprived test subjects had an increase in immune functions. This increase appeared to treat sleep deprivation as an invading organism. The immune system rhythmically releases chemicals during sleep, which may be related to the contraction of the small intestine. This raises the possibility that the intestine promotes sleep by way of the brain in order that the body's organs can carry out housekeeping functions. (Blakeslee 1993)

Dr. James Kruger, a physiologist at the University of Tennessee at Memphis, has conducted research into sleep and cytokines. Cytokines are the messenger chemicals in the immune system which are connected with the white blood cells. These combined substances combat infection. It is

believed that cytokines, like interleokine - 1 (IL-1) may induce sleep to various regions of the brain, at different times, this is believed to explain why there are variations of sleep from light dozing to deep sleep. (Blakeslee 1993)

"There is a long held belief, based on very little evidence, that going without sleep will make you sick" states Dr. David Dinges, a psychiatrist at the University of Pennsylvania. Studies show that sleep deprived test subjects have a reduction of T and B cells which combat infection. A British medical journal recently published a study from the Royal Edinburgh Hospital in Scotland, in which researchers found that the same process that renewed our normal cells during sleep also promotes accelerated healing. (Cooper 1989, 69)

As if the risk of colds and other ailments were not enough, female officers have additional health problems to worry about when working shift work. A survey was conducted with female officers on the Cincinnati Police Department, with one area addressing shift work. The female officers reported unpleasant changes in sleeping and eating habits, as well as attitudes. (Daum and Johns 1994, 46) Another study conducted by researchers looking at night workers, found that females working shift work experienced problems with menstrual cycles and may run an increased risk of miscarriages and premature births. (Liskowsky 1992, 3047) It is important to note that it is

unclear if these risks are a result of the circadian rhythm being disrupted, or the psychological and physiological stress associated with shift work or other factors.

Affects on Heart and Kidneys

Scientists have proven that people who work the night shift have a higher incidence of heart disease than those who work during the day. (Fishetti 1992, 32) People whose schedules are disrupted are more prone to heart attacks than permanent day workers. Functions such as blood pressure and heart rates are affected by exposure to shift work.

With a decrease in light exposure, scientists believe that the cholesterol level goes up. When the cholesterol level raises, the chances of arteries clogging also raises. The lack of light disrupts the circadian rhythm which accounts for the bodily changes. A study of shift workers was conducted in Northern France where it was found that these workers experienced a rise in triglyceride levels (fatty acids) independent of dietary intakes. (Ramon, Nuttens, et.al. 1992, 348)

Kidneys are also directly affected by constant changes in work schedules. Kidneys produce less urine at night than they do during the day time. In fact, production of urine varies throughout the day as well: subjects given water to drink at different times will produce urine at 10:00 a.m. at twice the rate they do at 3:00 p.m. The

concentrations of various chemicals such as potassium, calcium, and sodium fluctuates during the 24 period. (Dotto 1990, 47)

Increased Stress Levels

If a person were asked what type of job could be considered "stressful", being a law enforcement officer would rank within the top five suggestions. Things such as exposure to danger, traumatic events, and the physical activity involved could be the reasoning behind this thought. But very little consideration is given to the non dramatic causes of stress officers face routinely. Two such stressors are boredom and shift work, sometimes synonymous with each other.

Shift work is an aspect of the job which very little attention is ever given, yet is one of the most likely areas to create stress. Usually attacking the weakest part of the body, stress can impair the respiratory system, gastrointestinal track, and immune system. Even if a person has never been treated for heart disease or high blood pressure, they too may be a candidate for a stress related catastrophe. (Eliot 1994, 2)

Stress refers to demands or activities that stretch our ability to respond comfortably and describe the feelings of distress or negative tension that occurs because of such demands.

Signs of stress are familiar and troubling:

- | | |
|-------------------|-------------------|
| * Anger | * Muscle tension |
| * Anxiety | * Ulcers |
| * Sleeplessness | * Chronic fatigue |
| * Irritable bowel | * Headaches |

But the more dangerous are the reactions you can't feel: the body's out pouring of chemicals, the rise in blood pressure, the rise in heart rate, and the preparation for "fight or flight". (Eliot and Breo 1984, 23)

The body responds to emotional stress as it does physical stress. Heart and other organs in a person's body increase activity in the event of having to attack or run away. Pressures of today's world cause our bodies to react as they have for centuries when dealing with physical stress. As a result, we end up pumping high energy chemicals for low energy needs. This energy is turned inwards creating burnout, physically and mentally. The demands made on your physical and mental resources, known as stressors, may involve major changes in your life. Constant rotation of working hours is but one stressful event many officers face on a regular basis.

Affects on Preexisting Medical Conditions

Shift work not only causes and increase in health problems in some officers, but also may aggravate preexisting conditions. Given that the symptoms of some disorders such as diabetes, depression, and asthma give

evidence of significant circadian fluctuation, it has been proposed that the stressors associated with shift work might exaggerate these preexisting conditions. (Liskowsky 1992, 3047) Officers who experience high blood pressure increase the likelihood of becoming more firmly fixed and harder to treat with the increased stress shift work may bring. Shift work may complicate medical treatments for disorders as well.

Lack of Physical Exercise

Lack of physical exercise is still another problem officers on shift work experience. Many people find it easy to plan an exercise program. However actually starting a routine and sticking with it is another matter. This affects any person starting up a program, but the problem becomes magnified for officers who work shift work. Officers working constant rotating shifts often discontinue any exercise program because of the daily, weekly, or monthly alterations of exercise schedules to coincide with work schedules. It is unclear the effect this has on sleep. But research has shown that people who are physically fit do sleep better than those people who are less fit. Although the requirements for being a police officer suggests they be in shape, changes in work hours sometimes make regular exercise programs a luxury.

Use of Drugs to Control Sleep

Problems falling asleep, staying awake, and other areas relating to shift work may at times cause officers to look at various stimulants to help them cope or override the problems. Increased usage of alcohol and other drugs, such as tranquilizers and caffeine, are noticeable.

Sleeping pills are often prescribe as a means of inducing sleep. Over 4.3 percent of the American population use prescription sleep aides with an even larger number using over the counter aides. (Graham and Wallace 1990, 58) Such sleeping aides like bensodiazepines are popular and assist in sleep, however the effectiveness diminishes after several weeks of use. Sleeping pills also have a tendency to alter a person's sleeping patterns. Often a person is assisted in sleep, but the quality of sleep is not the same. Sleeping pills also have side effects including day time clumsiness and confusion, as well as some impairment of the mental facilities on the day after use. (Graham and Wallace 1990, 58) Continued use of sleeping pills will cause a psychological dependency. Drug dependant insomniacs convince themselves that they can not sleep without their sleeping pills, however research shows that this person's sleeping patterns are no different from the person not taking the medication.

Alcohol is often used by officers who work shift assignments to help induce sleep. Alcohol is a substance

which affects body and brain functions as well as mood. Alcohol is a depressant, yet can act as a stimulant. Effects from alcohol can lead to headaches and shallow sleep. Alcohol will also cause the user to experience fragmented sleep with frequent awakenings. (Kohl 1994, 62) Research shows that shift workers tend to use alcohol more than the average worker, which is ironic given the reason for it's use is to fall asleep.

A staple officers who work shift work often times rely on is "caffeine" which is a drug, but a legal drug. Caffeine can disturb sleep in people who don't believe they are affected much by its use. Caffeine can not only be found in coffee and tea, but also in chocolate and many carbonated beverages. Once caffeine is introduced into the body, it sometimes takes the entire day for the caffeine to leave the body.

Coffee triggers the release of adrenaline. In moderate doses, it gives one the feeling of being able to cope. It also assists in helping the officer on the night shift stay awake. Studies show that even relatively low doses of caffeine in mice can aggravate stress. (Eliot and Breo 1984, 201) The same holds for humans as well. Millions of Americans who consume large amounts of coffee have been found to have problems with headaches, ulcers, and insomnia.

Smoking and coffee often go hand in hand. Numerous times, officers found to be taking a "coffee break", are also found to be taking a cigarette break. When a person smokes, he or she is doubling, tripling, and even quadrupling the adrenaline in their circulation. This causes the body to be filled with adrenaline - deprived stress chemicals. In times of crisis, a persons physical response may be exaggerated because the body is already starting from a higher baseline arousal point.

IV. ACCIDENTS AND SHIFT WORK

Individual officer's health are just one concern when discussing shift work. Job performance, or lack of, and job related accidents are another. Poor job performance does not only compromise the safety of the individual officer, but also the safety of the public as well.

In a recent published study in the American Journal of Public Health, researchers reported that nurses who were on rotating shifts make more on the job errors and faced an increased risk of personal injury. (RN 1993, 16) The study, conducted by the Harvard Medical School, found that nurses who work rotating shifts made twice the medication errors as nurses not working rotating shifts.

Additional studies looking into shift work found that many night and shift personnel regularly fall asleep driving trucks, operating machinery, and working in nuclear

plants. In 1987, a nuclear reactor was shut down by the Nuclear Regulatory Commission because its workers were falling asleep. (Brody 1994, 64) It is not coincidence that the accidents in Bhopal, India, Chernobyl, Ukraine, and Three Mile Island in the United States, were attributed to errors by operators between the hours of midnight and 6:00 a. m. (Kohl 1994, 62)

Based on evidence gathered from traffic accidents, sleepiness is believed to account for more than 200,000 car accidents and 10,000 deaths in North America annually. (Brody 1994, 78) Sleepiness induced inefficiency, errors, accidents, and health problems cost industry an estimated 70 billion dollars.

In Philadelphia, PA., where shift changes occurred weekly, 80 percent of the officers working nights reported falling asleep. (Kohl 1994, 61) In addition, officers reported an increased number of incidents involving actual or near miss auto accidents due to sleepiness. A survey of 50 patrol officers in the El Paso, Texas police department revealed that drowsiness and sleepiness while working the night hours caused an increase in clerical errors as well.

V. IMPACT ON THE FAMILY

Industry and the public may pay the price for officers experiencing problems as a result of shift work. But what about the officers' families? The family has to deal with

the stress each and every day of not knowing if their loved one will return from work the same way they left earlier that day. The problems become compounded when the officer works a different work schedule routinely.

Shift work creates a burden in the families' routine and limits the time that officers have contact with their spouse and children. Every day plans and conversations begin to evolve around the officers' work rather than the officers' personal life. In the survey of the El Paso police officers, 72 percent of the officers listed scheduling family events around their shifts were a major problem. Comments commonly heard in families where the officer works shift work are:

"Quiet, daddy (or mommy) is sleeping."

"We can't go tonight, I have to work."

"Sorry sweetheart, I'd love to go but I can't get the night off."

Children have to learn that when mom or dad is working shift work, their behavior and routine must also change. Families soon find it necessary to coexist with the officer's schedule, or lastly, find a life without the constant adjustments.

Like the family, the officer involved in shift work has to change his or her style of living. Officers new to shift work experience many problems when first starting out. They not only have to experience the changes their

bodies are put through, but also they have to adjust to everyday life around their schedules.

Officers who were once accustomed to socializing on a regular basis now find that while friends are out on the town for an evening, the officer is working. Once the officer ends the shift, coming from evenings or graveyards, he or she finds out that now they are available to socialize but friends are now sleeping or working.

Out of the 50 El Paso police officers responding to the survey, 60 percent listed the inability to socialize normally as a problem. After awhile, the officer slowly starts losing touch with friends that he or she once associated with. Missing out on family events fast becomes a problem with shift work too.

VI. CORRECTIVE ACTIONS FOR SHIFT WORK

We have examined the many negative aspects directly or indirectly associated with shift work. Officers working shift work normally do not have a say in whether they work shift work or not. Therefore, given the nature of law enforcement there will always be shift work.

Since shift work will be around for an indefinite period of time, there are several ways to help with easing this burden. Health problems from headaches to diarrhea, insomnia to fatigue, and other shift work disorders can not be totally eliminated. But there are several actions which

can be taken to minimized the negative effects.

One step which can help ease shift work difficulties is by altering the shift's work. Often times, agencies in the law enforcement field change the employees hours on a weekly or monthly basis. Weekly rotations do not give the body time to adapt to the scheduled changes. Monthly rotation permits the body to adjust. However once the body has adjusted, then it is time to change shifts. By lengthening the time an officer spends on a shift, the easier it becomes on the body. It is recommend that shifts should remain the same for a period of no less than three weeks. (Graham and Wallace 1990, 60) To help further, officers who work rotating shifts should be rotated in a clockwise direction: days to evenings, evenings to graveyards, and graveyards to days. This direction of rotation makes it easier for the natural circadian rhythm of the body to continue to move forward as compared to counter clockwise rotation of the shift.

There are also several steps the individual officer can take to ease the problems associated with shift work. Many of these steps simply require an individual to break or alter old habits associated with shift work. Such changes which the officer should consider are:

- * Nicotine and caffeine should be reduced or eliminated during the working hours or at least several hours before going to bed.
- * Allow yourself one hour to unwind before bed.

- * Avoid eating heavy meals, especially before going to bed.
- * Exercise regularly. This will help relieve stress and will promote good health.
- * Avoid the use of stimulants or depressants to aid in falling asleep. If help is needed to fall asleep, try drinking a glass of warm milk.
- * In the event sleep is disrupted and falling back to sleep is a problem, try napping later in the day prior to going to work.

Physical activity and regular exercise have numerous health benefits, but perhaps the greatest and most far reaching is the improvement to cardiovascular health. There is a relationship between exercise and the incidence of fatal and non fatal heart disease. Regular exercise will help prevent heart disease and those who exercise regularly stand a better chance of surviving cardiovascular diseases.

A study of 16,936 male Harvard alumni between the ages of 35 and 74 showed that the most sedentary alumni were 25 percent more likely to have a heart attack than the most active group. Among the very active participants, those who regularly participated in vigorous sports were 38 percent less likely to have heart disease than those who reported themselves as being "active", but did not play in rigorous games. Men who expended less than 2,000 calories per week in exercise were at 64 percent greater risk of heart disease than those who exercised more. Heart disease

among the alumni would have been reduced by 23 percent if all had exercised away more than 2,000 calories per week. (Graham and Wallace 1990, 86)

The connection between regular exercise and reduced blood pressure has been of interest to experts. Hypertension, high blood pressure, is known to be a significant risk factor in heart disease. Active people record lower blood pressure, and participation in a regular aerobic exercise program may lower blood pressure, regardless of a person's weight.

Exercise should be in every officer's life. The officer should choose an activity that will increase heart rate, but within medical guidelines. As officers may not "have the time" to exercise, the officer should choose a program which offers a high intensity work out during a short duration. An officer following a schedule of three times per week will produce the desired health benefits. Exercise will impact the officer's overall health level by reducing stress, decreasing the chances of cardiovascular diseases, and increasing the officer's confidence.

Police officers have to deal with stressful situations on a daily basis. It is the way that the officer manages these events which determines whether or not they become victims of stress. Different personality types handle problems with varying degrees of success or failure.

Fortunately, there are many possible ways of dealing

with stress. Some methods are everyday coping mechanisms that many people use without even thinking twice about. Not every method will apply to every officer or every event, but by using various techniques to relieve stress, the officer will be able to lead a healthier life.

One way to help relieve stress is by relaxation. This can be done by simply reading a book, listening to soft music, soaking in a hot bath. The officer can learn to control the level of his or her tension by changing the way the thoughts run through the mind. Relaxation is an easy way to deal with stress.

Establishing good social contacts is also important. Although it may be hard when working irregular hours, contact with other people is important. Talking about everyday problems can be helpful in the reduction of stress.

In order to achieve total muscular relaxation, it is important to pay attention to the diaphragm. Deep breathing exercises have a calming effect on the body. Rapid, shallow breathing often causes dizziness and a feeling of anxiety due to an imbalance in the oxygen and waste gases in the bloodstream. A few deep breaths from time to time throughout the day and prior to going to sleep, will be an effective way of stopping tension from building up.

Good nutrition is important to the shift worker. A balance of major nutrients as well as the appropriate number of calories is a must for good health. A well nourished officer is generally healthier and better equipped to meet the physical and emotional challenges that police work brings. This includes the many tedious hours of no activity many people on shift work must face. A well balanced diet may also help offset the effects of stress, reduce fatigue, and increase resistance to illness.

Variety is the key to healthy eating. The functioning of our bodies depend on the right foods. A combination of proteins, carbohydrates, fats, vitamins, minerals and fibers are essential in good diets. Water makes up 60 percent of a person's total body weight. Most adults require at least two quarts of water per day to maintain the body's water level in order to replace daily water loose related to urine and sweat.

A officer's sleep environment is as important as well. Shift worker's should avoid sleeping in a hot setting. And contrary to the theory that one sleeps better in the cold, several studies have shown that sleeping in a cold room maybe more disruptive than heat. (Dotto 1990, 89) Extreme temperatures, whether hot or cold, will cause an increase in wake time and a decrease in the ability to sleep.

If falling asleep is not a problem, but sleeping during the day is, then consider napping later on.

Recommendations from sleep researchers is that once you wake up, try staying awake for awhile rather than laying in bed. Later in the day, try laying down and taking a nap. Officers working shift work should try to continue a sleep routine to help adjust the circadian rotation period. Not only should the officer go to bed the same time daily, but also the officer should try waking up the same time daily.

A shift worker's sleep routine should continue even on his or her days off. By continuing a good sleep schedule, the circadian rhythm is not severely disrupted on a repeated basis.

VII. CONCLUSION

Law enforcement officers are at risk; not only because of the violence encountered on the job, but also because of the effects of working rotating shifts. Law enforcement officers consciously realize the potential dangers of the job when they have their new badge pinned on for the first time. However, the unhealthy effects of shift work are never fully realized until several years later or until the first signs of shift work comes to surface. Shift work will always remain in law enforcement, just like the hand gun.

Rotating shifts create hazards to the employee, the employer, and the family. Officers working shift work start experiencing problems with sleeping, eating, and coping with stress. Supervisors notice an increase in

employee errors such as accidents and clerical errors due to rotation of working hours and the sleep problems it creates. Family life changes with each rotation of the shift. Hellos and good byes are exchanged as one party arrives home and the other party is leaving for work. Truly, shift work has a major impact with not only the individual employee, but also with work and home. There are several measures to help combat the hazards of shift work. The law enforcement officer needs to maintain a healthy diet, and limit the intake of caffeine even when working the late hours or graveyards. An exercise program should be followed by the officer or even be included in the officer's work day. Exercise relieves stress and build up the body's defenses. Law enforcement agencies need to have a shift rotation in a clockwise rotation pattern and have the officers work the shift for at least a minimum of three weeks as to allow for the circadian rhythm to adjust. Once the solutions are implemented into the officers daily life style, the hazards of shift work will decrease.

Law enforcement agencies need to take a proactive approach to the problems of working shift work. They should educate the employees on the affects of shift work and how to recognize and reduce them. Agencies should also closely examine the current schedules and rotations of shifts. After all, agencies should look out for their number one resource, their personnel.

BIBLIOGRAPHY

ARTICLES

Blakeslee, Sandra. "Mystery of Sleep Yields as Studies Reveal Immune Tie." New York Times, 3 August 1993, Late Ed., Sec C. Science Desk, 1.

Brody, Jane E. "America's Falling Asleep." New York Times Magazine, 24 April 1994, Sec. 6.

Daum, James M., and Cindy M. Johns. "Police Work from a Woman's Perspective." The Police Chief, September 1994, 46-49.

Fischetti, Mark. "Working the Heart Disease Shift." Omni, August 1992, 32.

Gutfield, Greg. "The New Science of Rays and Rhythms." Prevention, February 1993, 66-79.

Hershenson, Roberta. "New Rules Pose Conflicts for Interns." New York Times, 14 February 1993, Late Ed., Sec. 13WC, 1.

Jackson, Susan E. and Christina Maslach. "Burned Out Cops and Their Families." Psychology Today, May 1979, 59-62.

Kohl, Martin. "Modifying Police Shifts Increase Police Efficiency." Law and Order, March 1994, 58, 61-62.

Liskowsky, David R. "Biological Rhythms and Shift Work." Journal of the American Medical Association, 2 December 1992, 3047.

Lombardi, Kate Stone. "Clinic Lends a Hand in Rocking the Cradle." New York Times, 14 February 1993, Late Ed., Sec. 13WC, 12.

Noble, Barbara Presley. "At Work; Dissecting the 90's Workplace." New York Times, 13 September 1993, Late Ed., Sec. 3, Financial Desk, 21.

BOOKS

Bennett, William I., Stephen E. Goldfinger, and G. Timothy Johnson. Your Good Health. Cambridge, Mass.: Harvard University Press, 1987.

- Borbeley, Alexander. Secrets of Sleep. New York: Basic Books Inc., 1986.
- Coates, Thomas J. and Carl E. Thoresen. How to Sleep Better. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1977.
- Cooper, Robert K. The Performance Edge: New Strategies. Boston: Houghton Mifflin, 1991.
- Dotto, Lydia. Losing Sleep: How Your Sleeping Habits Affect Your Life. New York: Morrow 1990.
- Eliot, Robert S. From Stress to Strength. New York: Doubleday Dell Publishing Group Inc., 1993.
- Eliot, Robert S. and Dennis Breo. Is it Worth Dying For. New York: Doubleday Dell Publishing Group Inc., 1984.
- Edelson, Edward. Sleep. New York: Chelsea House 1992.
- Graham, Jean Ann and Louise Wallace. The Complete Mind and Body Book. New York: Simon and Schuster, 1990.
- Hartman, Ernest. The Sleep Book: Understanding and Preventing Sleep Problems in People Over 50. Glenview, Illinois: Scott, Foresman and Co., Lifelong Learning Division, 1987.
- Hoffman, Ronald L. Seven Weeks to a Settled Stomach. New York: Simon and Schuster, 1990.
- Janowitz, Henry D. Indigestion. New York: Oxford University Press, 1992.
- Neufeld, Richard W. J. Advances in the Investigation of Psychological Stress. New York: John Wiley and Sons Inc., 1988.
- Podell, Richard N. Doctor, Why Am I So Tired? New York: Pharos Books, 1987.

OTHER

Survey dealing with shift work from within the El Paso, Texas Police Department.