

IMPROVING SHIFT SCHEDULE AND WORK-HOUR POLICIES AND PRACTICES TO INCREASE POLICE OFFICER PERFORMANCE, HEALTH, AND SAFETY

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Fatigue among police patrol officers arising from departmental policies and practices may degrade individuals' abilities and hence the performance of organizations. Few U.S. police departments have established comprehensive shift, work-hour, and fatigue management policies despite the well-understood, long-standing, and profound influences that round-the-clock schedules have on worker health, safety, performance, job satisfaction, and family life. After reviewing the sources, costs, and impacts of fatigue as well as recent research into the prevalence of fatigue among police, the authors discuss policies and practices that police executives, managers, and supervisors can employ to minimize officer fatigue.

Police work often swings unpredictably from monotonous routine and numbing boredom to dynamic, fact-starved, and confusing situations that make extreme physical, mental, and emotional demands on officers.

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Physically weary, cognitively impaired patrol officers can find it difficult to cope effectively with this sometimes overchallenging mix, a situation that clearly can be problematic for the officers, their departments, and their communities (Vila, 1998). Recent research reveals that some officers within many—perhaps most—police agencies are highly fatigued at work, yet few U.S. police agencies exert much control over the factors that cause officer fatigue.

Fatigue is a mental and/or physical state resulting from insufficient good-quality sleep or from prolonged or intense physical, emotional, or mental effort that tends to decrease alertness, impair performance potential, worsen mood, and interfere with decision making. Thus, we can expect excess fatigue to adversely affect police officers' performance, health, and safety; their relations with the public; and the quality of their discretionary decisions. Fatigue among police long has been a problem. Furthermore, as distinguished sleep researcher William C. Dement noted recently, policing is

the one profession in which we would want all practitioners to have adequate and healthful sleep to perform their duties at peak alertness levels. Not only is fatigue associated with individual misery, but it can also lead to counterproductive behavior. It is well known that impulsiveness, aggression, irritability and angry outbursts are associated with sleep deprivation. (quoted in Vila, 2000, p. xiv)

The major administratively controllable culprits responsible for police fatigue are biologically insensitive shift rotation schemes, excessive mandatory or elective overtime assignments, frequent off-duty court appearances, and the use of extra and double shifts to cope with personnel shortages. Of course, officers' personal choices, obligations, and activities also can cause fatigue, but even these can be influenced by proper training about the importance of managing fatigue and alertness. Over time, the effects of one or more of these work-based or personal fatigue factors can become especially problematic because chronic exposure tends to magnify fatigue's effects. Chronically fatigued people tend to develop maladaptations¹ that spill over into leisure time and in turn make recuperation even more difficult (Moore-Ede, 1993).

Fatigue relentlessly exacts its human, community, and economic tolls. Ironically for the police, two recent research studies revealed that just 17 to 19 hours of sustained wakefulness—the kind of sleep loss routinely experienced by officers in many departments—impaired participants' performance as much as having a 0.05% blood alcohol content (BAC). Extending wakefulness to 24 hours produced impairment equivalent to a 0.10% BAC.

Both of the studies tested hand-eye coordination, and the more recent study also tested cognitive performance, motor speed, task accuracy, and alertness (Dawson & Reid, 1997; Williamson & Feyer, 2000). Reaction time on some of the tests in the more extensive study was 50% worse in the sleep-deprived condition than in the alcohol condition (Williamson & Feyer, 2000). As a matter of public safety, it seems appropriate to ask whether fatigue-impaired officers should tackle the tough job of policing, particularly because they may at times be as impaired as the drunken drivers they arrest.

Fortunately, police executives and managers can minimize officer fatigue by developing appropriate shift scheduling and work-hour policies and by educating officers about sound sleep habits and the importance of coming to work alert and well rested. This article discusses how appropriate shift scheduling and work-hour policies can be used in conjunction with fatigue and alertness management programs to minimize officer fatigue. First, however, we will briefly review the sources, costs, and consequences of fatigue for police, as well as indications of its prevalence.

SOURCES, COSTS, AND CONSEQUENCES OF FATIGUE

Police officers long have had to deal with fatigue arising not merely from shift work but also from lengthy and sometimes erratic work hours and other aspects of working conditions.² From its inception, modern policing was a 24-hour service provided seven days a week. As a result, 19th-century police in the large cities often bunked at their precinct stations to provide a reserve force for emergencies or to fill staffing shortages. Like most workers of that era, it was not uncommon for officers to work 12 hours a day, 6 to 7 days a week.

Shift work is an important source of fatigue for police and other workers because their natural circadian³ rhythms enhance alertness during daylight hours and encourage sleep at night. Highest alertness for most people occurs during the morning and in the late afternoon/early evening hours when energy levels are elevated, eyes focus more easily, and physical abilities and coordination peak. When circadian rhythms dip as evening wears on, waves of sleepiness wash over us; appetites diminish, recollection dulls, reaction times slow, and we fall asleep (see Dement & Vaughn, 1999; Monk & Folkard, 1992). As a consequence, officers on night shifts struggle to stay awake when their bodies want to sleep and then later try to fall asleep at home when they naturally are primed to be most alert. Even those who

conscientiously strive to adapt to a night-shift schedule and minimize schedule disruption still tend to get poorer quality sleep during daylight hours because their internal clocks are receiving conflicting time cues from the environment (Rosekind et al., 1996a).

As the public safety impacts of worker fatigue became increasingly clear over the past century, the U.S. federal government moved to control the work hours of selected occupational groups such as train engineers, truckers, commercial pilots, and, more recently, nuclear power plant operators—but not the police (Vila, 2000). One major difference between the police and the other workers is that they are a public-service-oriented workforce. The federal government previously has focused on the private, for-profit sector and thereby has largely overlooked the work-hour related fatigue problems involved with government's most public, sensitive, and routinely controversial service provider—the police.

But this does not explain why police have themselves ignored the insidious effects of fatigue that spring from shift work, workday, and work-hour arrangements. One likely reason is that policing's quasi-military beginnings and continued structure present a disincentive to complain (or to entertain complaints) about long hours. In addition, hiring, training, and paying benefits for new employees is expensive, so many departments use large overtime authorizations to fund extra officers who fill vacancies and staff extra functions. Reliance on overtime can be seductive for chronically understaffed departments (see Vila 1996). On a personal level, shift-differential pay and overtime⁴ work can provide strong motivation for officers to work considerably more than the typical 40-hour week (e.g., see Vila, 2000).

Conservative estimates put the costs of sleep deprivation and fatigue at more than \$100 billion annually (National Sleep Foundation, 1999), and it has been a major factor in catastrophes such as the massive radiation leaks at the Three Mile Island and Chernobyl nuclear power plants and the Exxon Valdez oil spill. It also contributed to faulty decision making, leading up to the space shuttle Challenger disaster (Mittler, Dinges, & Dement, 1994). Fatigue plays a role in air and ground transportation deaths and property losses, too. The National Highway Traffic Safety Administration estimates that falling asleep at the wheel causes one third of all long-haul trucking accident deaths and may be the primary cause in as many 100,000 motor vehicle accidents annually that result in more than 70,000 injuries and 1,500 deaths (Knippling & Wang, 1995; National Transportation Safety Board, 1990, 1995). In short, fatigue can be a killer.

Long-term consequences of chronic fatigue include increased stress levels and diminished ability to cope with the sorts of complex and threatening situations that police officers often are called on to handle. Chronic fatigue also can interfere with the kinds of familial and social relations that connect us to our communities and provide the perspective necessary to make sound decisions. Perhaps equally important, fatigue can degrade the millions of mundane contacts between police and the public—such as calls for information and advice, resolving simple disagreements, responding to passing comments during a meal break, or routine traffic stops—that are the basis of much public opinion about the police. Fatigue’s impact here may be akin to repeated micro-traumas that gradually erode police-community relations. A short-tempered, rude, or dismissive police officer provides a handy excuse for negatively stereotyping the officer, his or her department, and the profession.

The crucial public safety and service roles played by police officers do not make them immune to fatigue’s effects. Indeed, officers know better than most of us that an arrest made late in the evening, coupled with pulling a double shift or reporting to morning court for testifying, robs them of sleep and dulls them. Fatigue cannot simply be “toughed out.” The National Aeronautic and Space Administration’s (NASA’s) Fatigue Countermeasures Program advised Congress in 1999 that fatigue cannot “be willed away or overcome through motivation or discipline”; rather, it is

rooted in physiological mechanisms related to sleep, sleep loss and circadian rhythms. These mechanisms are at work in . . . [people] who need to remain vigilant despite long duty days . . . and working at night when the body is programmed for sleep.⁵

It seems obvious that police managers should develop policies and programs that help improve officer health, safety, performance, and interactions with their communities.

PREVALENCE OF FATIGUE IN POLICE AGENCIES

Scientific evidence presented elsewhere in detail (Vila, Kenney, Morrison, and Reuland, 1999) is further summarized below, but first let us emphasize that almost all of the hundreds of officers, supervisors, and managers that the authors have conversed with during the past 9 years report personal experiences with fatigue and exhaustion. Our personal experiences as police officers reveal similar circumstances. Although data collected to date

suggest that nonsupervisory patrol officers in large urban departments tend to average between 15 and 40 hours of overtime work per month (Vila, 2000; Vila & Kenney, in press; Vila & Taiji, 1999), some officers average 80 or more hours of overtime per month and 1,000 or more hours per year. This is an enormous amount given that the typical 40-hour, 50-week schedule results in 2,000 hours per year. We also have found extreme examples such as four officers in two different departments who recently averaged more than 3,000 hours of job-related overtime or moonlighting per year, and 16 Massachusetts state troopers who averaged more than 80 total work hours a week over a 12-month period (Armstrong, 1996; Cassidy & Armstrong, 1999; Grad & Schoch, 1995).

Beginning in 1996, Vila et al. (1999) probed the prevalence and possible consequences of excess work-hour-related fatigue among patrol officers by collecting data for a 4- to 6-month period at four police departments. Several different types of data were collected to triangulate the problem and increase the validity of results.

Daily administrative data were collected on hours worked and regularity of days off as well as sick and vacation days taken. Work policies and procedures also were examined. And, where possible, the researchers examined reports of accidents, injuries, misconduct, and citizen complaints. To obtain an objective measure of fatigue at the start of each work day, the FIT™ Workplace Safety Screener (www.pmifit.com), a computerized tabletop device that looks somewhat like a division of motor vehicles vision tester, was used. The FIT™ measures a person's fatigue-related impairment by comparing four eye-performance measures with their usual performance. The measures are pupil diameter, amplitude of pupil constriction and delay in pupil response to a flash of light, and the velocity with which the eye tracks a moving light. In total, Vila et al. (1999) collected and analyzed data from 379 officers and evaluated nearly 60,000 workdays.

Subjective information about the impact of fatigue on officers and the causes of officer fatigue was obtained from interviews and focus groups involving officers and their spouses as well as surveys. The surveys (see Vila, 2000, Appendix B) asked officers about their sleep quality, their attitudes about their own fatigue levels and those of their peers, how much of the fatigue they experienced could be attributed to various occupational sources, and how fatigue affected their health, safety, job performance, and family life. Taken together, data from these sources provided some of the first solid information about the effects of fatigue on patrol officers' work performance, physical and emotional well-being, and personal lives.

SUMMARY OF POLICE EXECUTIVE RESEARCH FORUM/NATIONAL INSTITUTE OF JUSTICE STUDY FINDINGS

Forty-one percent of the 298 officers who took the Pittsburgh Sleep Quality Index (PSQI)—a well-validated questionnaire used to diagnose sleep disorders—scored at levels that would lead clinicians to recommend that they seek medical attention (see Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). On average, officers' PSQI scores were twice as high—indicating poorer quality sleep—than the average for the general public. Although research has established that most people need a minimum of 7, and preferably 8, hours of good-quality sleep each day, only 17% of the officers reported averaging 8 or more hours of sleep daily, and 53% of them reported averaging 6.5 or fewer hours of sleep each day. This compares with 38% of the general population who reported sleeping 8 or more hours nightly and 31% who reported receiving less than 7 hours of sleep per night in the National Sleep Foundation's 2001 Sleep America Poll. Thus, compared with the general population, less than half as many police get enough sleep and almost twice as many get far too little sleep.

Out of 5,274 workdays in which officers in the four departments successfully completed the pupil-reaction tests using the FIT™ Workplace Safety Screener, officers were found to be highly impaired on 329 occasions (6.2%). These officers' impairment was roughly equivalent to a BAC of 0.10% ($p < .001$). And nearly 1 in 5 (19%) of the FIT™ tests taken by officers showed impairment at a level roughly equivalent to a 0.05% BAC. According to the scientists who developed the FIT™ machine, this failure rate is 6 times higher than is usually found among shift workers at heavy-industry plants and twice as high as the worst failure rates ever reported among any work group (see Vila, 2000).

Fourteen percent of the officers surveyed reported that they were *always* or *usually* tired at the beginning of their work shifts. During the previous month, 18% either had *somewhat of a problem* or a *big problem* being enthusiastic enough to carry out their job assignments. Similarly, 16% reported having trouble staying awake while driving, eating meals, or engaging in a social activity more than once a week.

Regarding the source of overtime and thus potentially also of fatigue, officers reported 35% being attributable to off-duty court appearances; 11% to extra shift assignments to fill in for someone who was sick, on vacation, disabled, and so on; 20% to late arrests or report writing; and 9% to special events such as crowd control, missing children, or parades.

Self-reported and objectively measured fatigue relationships among the officers varied by shift, with evening-shift officers being the least likely to report fatigue while being the most likely to have tested impaired using the FIT™ machine. The most likely explanation for this inconsistency is that evening-shift officers typically arrive for duty when their body rhythms are at or near peak alertness levels; this tends to cause people to underestimate their level of fatigue impairment.

Workday length and shift arrangements also appeared to make a difference. Officers who worked compressed shifts involving fewer but longer workdays per week tended to be somewhat less fatigued than those working traditional 5-day, 8-hour shifts. Although this suggests that compressed work schedules might be associated with less fatigue, this test involved too few departments for this particular result to be conclusive.

Older, more experienced officers generally were more fatigued in those departments with weaker collective bargaining units. Because stronger collective bargaining often is associated with greater reliance on seniority to distribute privileges, the key difference may be whether older officers—who tend to tolerate night-shift work less well and take longer to recover from sleep disruption—are able to select their own shift and thus migrate to shifts that they tolerate better.

Officers who self-reported more fatigue and poorer quality sleep at the beginning of the study also tended to fail the FIT™ test more often throughout the study period. Officers who experienced the least amount of overtime work, shift irregularity, and/or work-related sleep disruption also tended to self-report less fatigue.

There were too few accidents or on-the-job injuries during the roughly 59,000 police workdays studied to test for a statistically significant link between fatigue and work-related accidents or injuries. Still, half of the officers who took pupilometry tests within 2 days of being injured or involved in an accident tested impaired, 3 with a 95% probability of serious impairment and 1 with a 99% probability of serious impairment. This compares with the typical FIT™ failure rate for officers involved in the study of 19% at the 95% level and 6.2% at the 99% level. Furthermore, 22.7% of the accident-injury officers had deviated from their regular schedule at the time of the incident, whereas officers experiencing neither accidents nor injuries deviated from their regular schedules only 13.4% of the time (see Vila et al., 1999). Moreover, the relationship between fatigue and workplace accidents and injuries has been well documented for more than a century.

Paralleling Vila et al.'s (1999) general findings is a recent internal study conducted by the Albuquerque Police Department, an agency that is taking fatigue issues very seriously. In the study, a large proportion of Albuquerque's officers reported substantial problems with fatigue (Cochrane, 1999). In 2000, Albuquerque also found that 33% of accidents involving patrol vehicles that were ruled preventable occurred between midnight and 6 a.m. and another 19% occurred between 1:30 and 3:00 p.m. And most of the afternoon accidents involved officers from evening or midnight shifts who were headed to court (G. Cochrane, personal communication, November 2, 2000).

To summarize the evidence presented thus far, excess fatigue has detrimental effects on human performance, mood, health, and safety, and these effects are unavoidable. Because police officers obviously are human and they often are fatigued, it follows that it is important to manage fatigue and alertness.

MANAGING FATIGUE

Police executives and the jurisdictions for which they work have a clear and compelling interest in ensuring that officers are not overly fatigued on the job and that they are sufficiently alert to perform their duties properly. Regardless of whether officer fatigue stems from job-related factors or from outside the job—for example, from family and social activities, moonlighting, personal habits, or physical fitness—management should do all it can to ensure that officers are fit for duty when they report to work and throughout their work shifts because overly fatigued officers are more likely to put themselves, their fellow officers, and their communities at risk (see Vila & Kenney, in press; Vila, Kenney, & Morrison, 2001). An agency that fails to take reasonable precautions to manage the risks associated with fatigue may therefore incur substantial civil liability for avoidable accidents, injuries, or misconduct. It also may face more staffing shortages—which can, in turn, require more overtime—because officers who are chronically fatigued are more vulnerable to a host of physical ailments and stress-related disorders.

There is a great deal that police executives, managers, and supervisors can do to minimize job-related fatigue. In particular, sources of fatigue can be effectively addressed by managers who

- develop and implement sound policies about excess work hours, shift scheduling, and shift length;

- educate subordinates about fatigue and involve them in alertness assurance programs;⁶ and
- encourage officers to report for work well rested and alert.

We discuss several potential lines of action for managers to pursue.

WORK HOURS

Managing work hours is critical for fatigue control because the number of hours an officer works in a day, week, month, or year can contribute a great deal to how fatigued or alert he or she is. Two of the studies cited previously suggest that as little as 17 to 19 hours of sustained wakefulness can impair performance as much as having a 0.05% BAC and that being awake for 24 consecutive hours may produce impairment equivalent to a 0.10% BAC (Dawson & Reid, 1997; Williamson & Feyer, 2000). Repeatedly working excessive amounts of time is likely to lead to chronic fatigue and its attendant problems. Thus, one of the key issues that departments need to address is how much work officers are allowed to do in a given period of time. And, to be meaningful, work-hour policies must include regular shift length, overtime, and moonlighting. It does no good to cap overtime at, for example, 15 hours per week, then allow officers to work an additional 25 hours per week at a second job while also attending school 3 nights a week. Of course, work-hour policies need to include provisions for emergency situations in which longer work hours are unavoidable to protect the public safety. Even during protracted emergencies, however, officer performance, health, and safety could be improved by calling people in for a nap when circumstances permit.

But capping work hours can make it difficult to meet a department's obligations. Aside from taking the obvious step of working to ensure that staffing levels match demand for services, many departments could substantially reduce overtime by minimizing off-duty court appearances. The courts' historical monopoly of the docket, prosecution and defense delays, and case rescheduling ignore the impact that these more typically 8-to-5 members of the justice system have on police working a 24/7 schedule. In many jurisdictions, officers spend hours waiting around court to be called to testify, although they rarely are called to the stand—a common estimate by officers is that they testify fewer than 5 out of every 100 days that they spend sitting around the courthouse. Some departments deal with this problem by giving officers electronic pagers so they can be notified when they truly are needed to testify. Other common arrangements include maximizing on-

duty court time, situating court-based coordinators at precinct stations, increasing access to notification programs via remote computer terminal, or even providing sleeping quarters for off-duty officers who are waiting to testify (Vila, 1996; see also Boorstein, 1986; Duggan, 1993; Harriston, 1993).

SHIFT LENGTH

Shift lengths fall into two basic groups: 8-hour shifts worked 5 days a week and compressed shifts in which approximately 40 hours are worked in fewer than 5 days (e.g., four 10-hour or three 12-hour shifts). Although there is no clear consensus among sleep and fatigue researchers about which type of shift is preferable, most administrators seem to prefer either 8- or 12-hour shifts because they divide evenly into a 24-hour day. Most of the officers we have discussed shift issues with around the country during the past 6 years appear to favor compressed shifts, primarily because they can reduce total weekly commuting and provide more consecutive days off for recreation and family activities as well as for recuperation. Fewer, longer shifts reduce the number of commuting days and enable officers to live farther from the large urban centers in which many of them work. This added distance can help them avoid perceived work-related threats to their families and afford better housing. Compressed shifts also have been used to attract qualified recruits—and to lure experienced officers from departments with less desirable shift arrangements.⁷

Some police executives doubt that the real and perceived advantages associated with compressed shifts outweigh their drawbacks: For one thing, on the face of it, the 12-hour workday seems more likely to leave officers more fatigued by shift's end, especially during the third or fourth consecutive 12-hour shift. Longer shifts also tend to magnify the impact of any overtime. For officers who have only 12 hours to eat, sleep, see their families, and commute, even an extra hour or 2 spent on arrest reports or waiting to testify in court can make it impossible to get enough sleep.

SHIFT ROTATION, DIRECTION, AND PATTERN

There are three general shift rotation options: nonrotating, "forward" (with the clock), and "backward" (against the clock). Not rotating remains the best scheme, because almost any change in our daily sleep routines tends to increase fatigue over the short run by running afoul of circadian

rhythms. For a variety of reasons, however, many managers find it necessary to change shift assignments periodically. Among the shift change or rotation options, backward shift rotation is the hardest to adapt to biologically because the body's circadian rhythm interval is slightly predisposed to rotating forward, that is, from day to evening shifts (Dement & Vaughn, 1999). It therefore takes about 8 days to adjust to a change from an evening to a midnight shift but about 12 days to adjust to a change from days to midnights (Monk & Folkard, 1992).

Forward rotation schemes can be slower (i.e., monthly, quarterly, annually) or faster—where employees spend 1 or 2 days on each consecutive shift between their days off. The rationale behind fast rotation is to share the misery of shift work while preventing officers' bodies from attempting to adapt to nondaytime shift work. One advantage of fast rotation is that employees can socialize normally on their days off and thereby avoid the common problem of night-shift workers who get little recuperation on days off because they return to daytime schedules. The main disadvantage is that employees often are very tired while working night shifts unless they conscientiously work at paying back the "sleep debt" they accrue on days when they do not get sufficient good-quality sleep whenever they have the chance. Otherwise, these shift workers are more vulnerable to problems such as shift maladaptation syndrome.

In general, longer shift rotation intervals tend to have fewer negative biological effects—at least for officers who are reasonably well-suited to their current shift and who practice good sleep hygiene. However, staying on a shift longer obviously is not better for those who are ill-suited for it, who never allow themselves to adapt properly, or who make little effort to get sufficient recuperative sleep. Researchers disagree about the ideal rotational scheme, but one thing seems certain: It is almost impossible for the body to manage weekly shift rotation because it takes about that long to adapt to an 8-hour schedule change (Monk & Folkard, 1992; O'Neill & Cushing, 1991).

PERSONNEL ASSIGNMENT

Another important shift-work issue has to do with how people are assigned to various shifts. From a fatigue-reduction standpoint, it would be ideal to let employees work the shift they choose simply because some people are biologically more well-suited than others to working nights; "night owls" can tolerate evening and midnight shifts better than those who

naturally rise early each day (so-called morning larks). And this means that night owls are less susceptible—but not invulnerable—to fatigue-inducing factors associated with night shifts. In addition, how well an officer can tolerate sleep disruption and recover from sleep debt is a function of age, physical and emotional health and fitness, diet, and innate ability to adapt to changes in sleep and wake cycles. But biology is not the only—or even the primary—reason for giving employees a say about which shift they are assigned.

Employee involvement in scheduling and shift assignment decisions also is critical because an officer's attitude and overall level of emotional stress affect his or her ability to deal with fatigue. The number of hours officers work and the time of day they are assigned to work affect almost every aspect of their personal, social, family, and professional lives. Officers who are excluded from decisions about shift work and scheduling become powerless in some of the most important dimensions of their lives. Powerlessness corrodes their self-image and increases stress. Stress reduces their ability to deal with fatigue, which in turn tends to diminish their job performance and ability to deal with stress. Thus, excluding officers from scheduling and shift assignment decisions can trigger a vicious cycle that causes more fatigue and job stress.

Although organizational imperatives require managers to distribute human experience, talent, and problems across the day, it still makes good sense to accommodate individual preferences to the extent possible. Department policies that take individual differences and preferences into account when scheduling work will help reduce fatigue and its negative side effects.

OFFICER EDUCATION

Shift-work and fatigue education enables managers to address sources of fatigue that arise outside the job as well as those arising from the job itself. Officers should be educated about the hazards of failing to cope with fatigue and encouraged to think about alertness as an important aspect of being fit for duty. Officers need to be taught how to minimize fatigue's impact on their professional performance and personal lives, just as they are taught firearms safety, arrest techniques, and field tactics. At a minimum, they need to learn to think of fatigue as a critical safety issue. As Figure 1 shows, on average, as many officers are killed each year by accidents as by gun-fights, family disturbances, arrest situations, ambushes, and traffic stops.

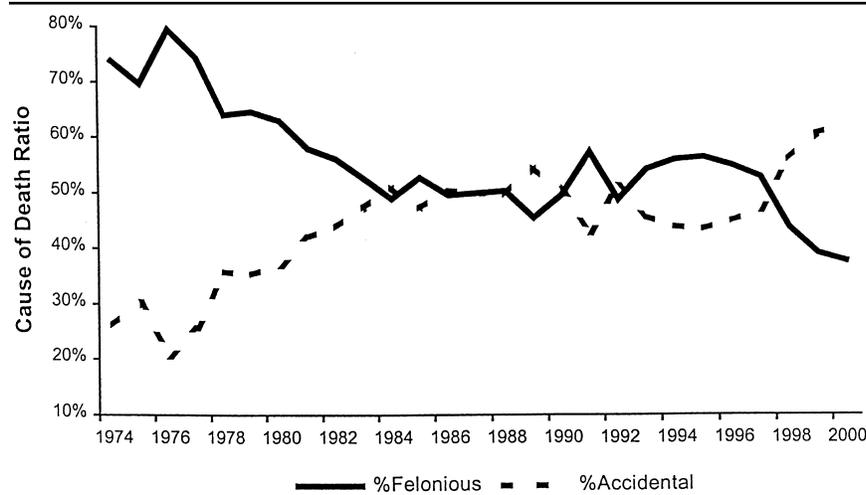


FIGURE 1: Felonious Versus Accidental Deaths of Police Officers in the United States, 1974-2000

DEVELOPING FATIGUE OR ALERTNESS MANAGEMENT PLANS

One of the best ways for managers to pursue the policy goals discussed above is to develop a comprehensive fatigue or alertness management plan. Effective plans can be built around either fatigue or alertness management themes: Which theme is chosen will depend on the external political environment, as well as the agency's managerial style and internal culture. Essentially, fatigue management highlights potential hazards whereas alertness management puts more emphasis on enhancing officer performance. Mark Rosekind, president and chief scientist of Alertness Solutions and former manager of NASA's fatigue countermeasures program (Rosekind et al., 1996a, 1996b), found that elite groups such as astronauts, pilots, and military special operations troops who always are looking for a performance "edge" tend to respond better to the latter approach. Whichever approach a department takes to managing fatigue and alertness, the overall goal should be to create an organizational culture that recognizes that sleep deprivation, disruption, and fatigue set the stage for accidents, errors in judgment, and employee health problems.

Another important benefit of developing and implementing a sound fatigue or alertness management plan is that it helps inoculate an agency

against legal liability by showing that management is concerned about these issues and has done its best to ensure that its officers are not impaired by fatigue. Liability protection measures are important because police probably are more susceptible to liability litigation than any other group of workers (Barrineau, 1987) and because fatigue is being raised more and more frequently in civil suits regarding industrial and traffic accidents. Los Angeles, for example, recently settled for \$19 million in a suit brought by the family of a woman who was severely injured by a city employee who fell asleep while driving an overloaded 4-ton city maintenance truck, veered across several lanes of traffic, crashed into a center divider, and then crushed her car (McGreevy, 2000). Similarly, in November 1999, a rookie Cincinnati officer on his way home from work fell asleep at the wheel one block from his home and drove off the road and onto a sidewalk where he hit and killed a jogger (DiFilippo, 1999, Winston, 1999). That lawsuit still is pending. In June of the same year, a Margate, Florida, officer who was exhausted from lack of sleep ran a red light and crashed her patrol car into a Broward County Sheriff's van, seriously injuring the deputy who was driving. The city settled his claim for \$100,000 (Milarsky, 2000). In August 1999, a Muskegon, Michigan, police officer who had been working nearly 24 hours straight was critically injured after he crashed his cruiser into a tree while initiating a pursuit of a fleeing motorist (Medendorp, 1999). Imagine the liability if he had hit a car loaded with children.

In general, employers in cases such as these are being held responsible for the actions of overly fatigued employees under the theory that an employer has a duty to intervene if an employee has worked so many hours without rest that their impairment constitutes an unreasonable and foreseeable risk to others (Coburn, 1996; Moore-Ede, 1995). Now that research has established that many officers work foolishly long hours, a substantial proportion of them are seriously impaired by fatigue, and roughly half of them are likely to have sleep disorders, managers are obligated to address fatigue issues to the best of their ability.

Developing a fatigue and alertness management program is a challenging endeavor. Each department and community tends to be unique in terms of current practices and collective bargaining agreements, staffing levels and officer demographics, the timing and magnitude of service demands, geography, and the extent to which they—and their officers—have become dependent on overtime. This means that the particulars of which fatigue or alertness issues are emphasized, what policies are developed, and how they are implemented will vary somewhat from community to community.

. However, all will tend to target the following objectives for managers and supervisors and employee practices (adapted from Vila, 2000, Appendix D).

WHAT MANAGERS AND SUPERVISORS CAN DO

- Encourage employees to treat sleep like a safety and performance issue—it is!
- Involve employees in scheduling and work-hour decisions whenever possible.
- Schedule appropriately to meet organizational obligations while minimizing shift-work disruption.
- Minimize shift changes and maximize work-hour regularity.
- Never use weekly shift rotation, and always rotate shifts forward.
- Ensure adequate staffing.
- Develop an overtime policy that minimizes mandatory overtime and discourages excessive work hours.
- Develop policies that promote a physically and emotionally healthy lifestyle among employees.
- Provide clinical support for shift workers suffering from sleep disorders.
- Provide a bright, stimulating night-work environment wherever possible.
- Provide shift workers with opportunities to eat healthful food.
- Educate employees about the importance of the fatigue and alertness issues and practices listed below.

WHAT EMPLOYEES CAN DO

- Practice good sleep habits and make getting enough quality sleep a high priority for yourself and your family/household.
- Use naps as a stopgap measure to help catch up when you have not gotten enough sleep.
- Do your best to adapt to a shift and stay adapted; do not keep different hours on days off.
- Try to pick a shift that matches your biology.
- Be aware of the hazards of fatigue impairment on and off the job.
- Watch your diet by avoiding junk foods and fatty foods, favoring complex carbohydrates, lean meats, low-fat dairy products, and fruits and vegetables.
- Drink lots of water and limit caffeine and alcohol consumption.

THE MANAGEMENT PLAN

Achieving these objectives requires careful planning. As with any other planning activity, sound fatigue and alertness management plans are more likely to be developed if managers take the following steps in sequence:

- Assemble a planning team that includes key stakeholders such as managers, supervisors, and perhaps even collective bargaining representatives and clerical personnel.

- Conduct a needs assessment that reviews shift work, scheduling, and work-hour policies and practices as well as fatigue training and education. The assessment also should identify the extent of fatigue-related problems and their likely causes by reviewing records, administering surveys, taking objective measurements using devices such as the FIT™ Workplace Safety Screener, and/or hiring a team of specialists to evaluate fatigue-related problems and offer recommendations.
- Brainstorm alternative courses of action that might be taken to manage fatigue without taking cost into consideration.
- Analyze probable costs and benefits associated with various alternatives and decide which are likely to work best over the long run given realistic estimates of fiscal and human resources.
- Draft fatigue/alertness management plans and circulate them widely for comment and review. Revise and repeat the review process until a workable plan is developed.
- Implement the plan, being sure to set clear goals and objectives and remembering to keep it flexible enough to handle unanticipated problems.
- Monitor and revise the plan as needed using the planning team or a similar group as a permanent employee/manager task force that will be responsible for monitoring progress toward goals and identifying problems and opportunities.

SUMMARY AND CONCLUSIONS

Police fatigue is a widespread problem that can seriously degrade officers' performance, health, and safety. Evidence from many different sources points to high levels of fatigue among patrol officers in the United States—and there is no contrary evidence. No harm is likely to come from any of the suggestions made in this article and, based on what we know with good confidence about the effects of sleep loss and disruption on people, much good can be done. Police professionals and researchers need to work together to minimize the threat that fatigue poses to our communities and to our officers—just as we have developed standards and procedures for other complex problems like vehicle pursuits, the use of deadly force, and domestic violence.

Many of the changes required to manage police fatigue will be difficult. For example, we will have to acknowledge that, contrary to the macho culture that pervades policing, officers cannot overcome the effects of fatigue and sleep deprivation through motivation, discipline, or force of will. Managing fatigue and alertness also will mean making hard choices about staffing police agencies. At the same time, when departments across the United States are expanding their role in the community and struggling to counter terrorist threats, economic pressures and demographics are making it increasingly difficult to recruit qualified officers. Agencies that attempt to constrain overtime in the face of expanding demands for service and a

contracting labor force will have to use their officers more efficiently and make the job more attractive. But the pay-off for managing these challenges successfully will be safer, healthier, and more competent officers and, as a consequence, safer and healthier communities.

NOTES

1. According to Moore-Ede (1993), over the near term, the suite of problems covered under the umbrella of shift maladaptation syndrome can lead to insomnia, excessive sleepiness at work, and mood disorders. It also can increase the probability of errors, accidents, and family or social problems and lead to an increased tendency to make errors. After 5 or more years, chronic sleep disorders, cardiovascular disease (see Franke & Anderson, 1994; Franke, Collins, & Hinz, 1998), and gastrointestinal disease can arise. In addition, employees often become absent from the job more frequently and disciplinary problems increase, as do marital problems.

2. For insights on 19th-century police working conditions, see Astor (1971), Costello (1972), Flinn and Wilkie (1887/1971), Lane (1967), Richardson (1970), Roe (1890/1976), Savage (1986), Schneider (1980), Sprogle (1887/1971), and Walling (1972).

3. *Circadian* is Latin for a time period of "about a day" in length.

4. The term *overtime* describes on-duty hours beyond those regularly scheduled each day, week, or month.

5. Quoted from www.afo.arc.nasa.gov/zteam/.

6. A wealth of useful information about fatigue and alertness management can be found at the following Web sites:

- National Sleep Foundation, www.sleepfoundation.org
- Sleepnet's links to more than 200 other sites, www.sleepnet.com
- American Sleep Disorders Association, www.asda.org
- Sleep Medicine Home, www.users.cloud9.net/~thorpy?
- Dr. William C. Dement's The Sleep Well, www.stanford.edu/~dement/
- Alertness Solutions, www.alertness-solutions.com

7. See Melekian (1999) for a thoughtful discussion on this and related matters.

REFERENCES

- Armstrong, D. (1996, September 3). Troopers' extra hours spur worry overtime, details on pike pile up despite regulations. *Boston Globe*, p. A1.
- Astor, G. (1971). *The New York cops: An informal history*. New York: Scribner.
- Barrineau, H. E. (1987). *Civil liability in criminal justice*. Cincinnati, OH: Anderson.
- Boorstein, R. (1986, November 5). Port agency police overtime up 25 percent. *New York Times*, p. B3L.

- Buysse, D. J., Reynolds, C. F. III, Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: A new instrument for psychiatric practice and research. *Psychiatry Research*, 28, 193-213.
- Cassidy, T., & Armstrong, D. (1999, September 12). State police overtime soaring. *Boston Globe*, p. B1.
- Coburn, E. (1996, July 29). Managing the costs of worker fatigue. *Risk Management News*, pp. 3-4.
- Cochrane, G. (1999). The effects of sleep deprivation on APD officers: Executive summary. Internal report, Albuquerque Police Department.
- Costello, A. E. (1972). *Our police protectors: A history of the New York Police Department*. Gloucester, MA: Peter Smith.
- Dawson, D., & Reid, K. (1997). Fatigue, alcohol and performance impairment. *Nature*, 388, 235.
- Dement, W. C., & Vaughan, C. (1999). *The promise of sleep: A pioneer in sleep medicine explores the vital connection between health, happiness, and a good night's sleep*. New York: Delcorte.
- DiFilippo, D. (1999, November 26). Cop charged in jogger's death. *Cincinnati Enquirer*, p. A1.
- Duggan, P. (1993, April 5). D.C. losing in overtime: Officers wait to testify—at \$30 an hour. *Washington Post*, p. A1.
- Flinn, J. J., & Wilkie, J. E. (1971). *History of the Chicago police*. New York: Arno. (Original work published 1887)
- Franke, W. D., & Anderson, D. F. (1994). Relationship between physical activity and risk factors for cardiovascular disease among law enforcement officers. *Journal of Occupational Medicine*, 36, 1127-1132.
- Franke, W. D., Collins, S. A., & Hinz, P. N. (1998). Cardiovascular disease morbidity in an Iowa law enforcement cohort, compared with the general Iowa population. *Journal of Occupational and Environmental Medicine*, 40, 441-444.
- Grad, S., & Schoch, D. (1995, September 9). Cities' top 25 lists show employees generously paid. *Los Angeles Times*, p. B1.
- Harriston, K. (1993, March 2). Kelly calls for clampdown on police: Those who abuse overtime should expect harsher penalty, she says. *Washington Post*, p. B3.
- Knipling, R. R., & Wang, J. S. (1995, October). *Revised estimates of the U.S. drowsy drive crash problem size based on the general estimates system case reviews*. Paper presented at the 39th annual proceedings of the Association for the Advancement of Automotive Medicine, Chicago.
- Lane, R. (1967). *Policing the city: Boston 1822-1885*. Cambridge, MA: Harvard University Press.
- McGreevy, P. (2000, January 12). Crash victim to receive \$19 million. *Los Angeles Times, Valley Edition*, pp. B1, B4.
- Medendorp, L. (1999, August 23). "Tired" Heights officer hurt in accident during pursuit. *Muskegon Chronicle*, p. 1A.
- Melekian, B. K. (1999, August/September). Alternative work schedules and the twelve-hour shift. *Subject to Debate*, pp. 1-3.
- Milarsky, J. (2000, June 8). Margate to pay \$100,000 to settle suit against police officer. *South Florida Sun-Sentinel*. Retrieved from <http://www.sun-sentinel.com>

- Mitler, M. M., Dinges, D. F., & Dement, W. C. (1994). Sleep medicine, public policy, and public health. In M. H. Kryger, T. Roth, & W. C. Dement (Eds.), *Principles and practice of sleep medicine* (2nd ed.). Philadelphia: W. B. Saunders.
- Monk, T. H., & Folkard, S. (1992). *Making shift work tolerable*. London: Taylor & Francis.
- Moore-Ede, M. (1993). *The 24-hour society: Understanding human limits in a world that never stops*. Reading, MA: Addison-Wesley.
- Moore-Ede, M. (1995, January). When things go bump in the night. *ABA Journal*, pp. 56-60.
- National Aeronautic and Space Administration. (1999). Hearing on pilot fatigue before the aviation subcommittee of the Committee on Transportation and Infrastructure, U.S. House of Representatives. Retrieved from www.afo.arc.nasa.gov/zteam/
- National Sleep Foundation. (1999). 1999 Omnibus Sleep in America poll. Retrieved from www.sleepfoundation.org/publications/1999poll.html#1
- National Sleep Foundation. (2001). 2001 Sleep in America poll. Retrieved from <http://www.sleepfoundation.org/publications/2001poll.html#3>
- National Transportation Safety Board. (1990). *Fatigue, alcohol, other drugs and medical factors in fatal-to-the-driver heavy truck crashes* (Vol. 2). Washington, DC: Author.
- National Transportation Safety Board. (1995). *Factors that affect fatigue in heavy truck accidents*. Washington, DC: Author.
- O'Neill, J. L., & Cushing, M. A. (1991). *The impact of shift work on police officers*. Washington, DC: Police Executive Research Forum.
- Richardson, J. F. (1970). *The New York police: Colonial times to 1901*. Fair Lawn, NJ: Oxford University Press.
- Roe, G. M. (1976). *Our police: A history of the Cincinnati police force, from the earliest period until the present day*. New York: AMS. (Original work published 1890)
- Rosekind, M. R., Gander, P. H., Gregory, K. B., Smith, R. M., Miller, D. L., Oyung, R., et al. (1996a). Managing fatigue in operational settings 1: Physiological considerations and countermeasures. *Behavioral Medicine*, 21, 157-164.
- Rosekind, M. R., Gander, P. H., Gregory, K. B., Smith, R. M., Miller, D. L., Oyung, R., et al. (1996b). Managing fatigue in operational settings 2: An integrated approach. *Behavioral Medicine*, 21, 157-164.
- Savage, E. H. (1865). *A chronological history of the Boston watch and police from 1631 to 1865, together with the recollections of a Boston police officer or Boston by daylight and gaslamp*. Boston: Author.
- Schneider, J. C. (1980). *Detroit and the problem of order, 1830-1880*. Lincoln: University of Nebraska Press.
- Sprogle, H. O. (1971). *The Philadelphia police, past and present*. New York: Arno. (Original work published 1887)
- Vila, B. (1996). Tired cops: Probable connections between fatigue and the performance, health, and safety of patrol officers. *American Journal of Police*, 15(2), 51-92.
- Vila, B. (1998). We can't keep ignoring police fatigue. *Subject to Debate*, 11(3), 1-3.
- Vila, B. (2000). *Tired cops: The importance of managing police fatigue*. Washington, DC: Police Executive Research Forum.
- Vila, B., & Kenney, D. J. (in press). Tired cops: The prevalence and potential consequences of police fatigue. *National Institute of Justice Journal*.
- Vila, B., Kenney, D. J., & Morrison, G. B. (2001, April). The importance of managing police fatigue. *Police Chief*, pp. 188-193.

- Vila, B., Kenney, D. J., Morrison, G. B., & Reuland, M. (1999). *Evaluating the effects of fatigue on police patrol officers: Final report*. Washington, DC: Police Executive Research Forum.
- Vila, B., & Taiji, E. Y. (1999). Police work-hours, fatigue, and officer performance. In D. J. Kenney & R. McNamara (Eds.), *Police and policing* (2nd ed.). Westport, CT: Praeger.
- Walling, G. W. (1972). *Recollections of a New York chief of police*. Gloucester, MA: Peter Smith.
- Williamson, A. M., & Feyer, A.-M. (2000). Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occupational and Environmental Medicine*, 57, 649-655.
- Winston, E. (1999, December 3). Witness: Officer was asleep at the wheel. *Cincinnati Enquirer*. Retrieved from <http://www.enquirer.com/today>

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