

Shiftwork Lifestyle Training:
Employee and Employer Benefits



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Introduction

Shiftworkers face significantly greater challenges than their day-working counterparts. Family and social life can suffer, especially for those who work in the evening, at night or on the weekend. Health can also be adversely affected if not properly managed. Shiftwork has been associated with an increased risk of cardiovascular disease, gastrointestinal disorders, obesity, diabetes, insomnia and obstructive sleep apnea. Sleep quality and quantity is often lower for those working at night, or on shifts starting early in the morning.

These issues not only directly affect the employee, but the employer also incurs extra costs as a result of increased absenteeism, turnover, medical care, safety incidents and production errors.

The good news is that all of these challenges can be effectively managed. However this requires specialized training. The techniques that an employee can use to help mitigate shiftwork problems are not obvious, and unlike other skills, cannot be simply “picked up on the job.”

This white paper examines the proportion of shiftwork operations implementing shiftwork lifestyle training, and the benefits derived by employees and employers when these training programs are implemented.



How widespread is Shiftwork Lifestyle Training?

The results of Circadian Shiftwork Practices Survey 2016 of 224 shiftwork operations found that 40% of shiftwork operations provided lifestyle training for their shiftworkers. This is very encouraging, since it represents a significant improvement compared to the results from Shiftwork Practices 2007, where only 22% of respondents reported providing lifestyle training to employees. This is noteworthy, because as we will discuss in this White Paper, CIRCADIAN's research has found that facilities that offer training report higher turnover levels, poorer morale, and more severe fatigue problems than facilities that offer training.



Figure 1 Shiftwork lifestyle training from 2016 survey

Figure 1 shows that in 2016 only 8% of shiftworking facilities involve the families of the shiftworker in the lifestyle training involving families can be a very effective tool, as it provides them with an understanding of the employee's need for sleep, proper nutrition, and how best to organize household chores and family activities around a shiftworker's schedule. Shiftwork affects the entire family, not just the shift worker, therefore involving the family not only helps to provide support and re-enforcement in the home, but also maximizes the training's long term value.



Elements of a Successful Shiftwork Training Program

There are several essential elements to ensure a program's success [3]. The starting point should be a comprehensive evaluation of the needs of the target employee population. Many programs choose the issues to be addressed based on general epidemiological data, instead of identifying the needs of the specific employee population. If employees do not perceive the interventions as relevant to them, the participation rate will be quite low, and the efficiency of the program will be substantially reduced. A second key element is to ensure employee ownership of the program. The planning and implementation should actively involve management, union representatives (if applicable), and employees. Finally, programs should be implemented at both the employee and the organizational level.

Attracting a large proportion of employees as well as reducing the number of drop-outs is key for the success of the program. Moreover, it is fundamental that the program reaches individuals at high risk. Several studies have shown that employees who have high-risk behaviors, such as smoking, sedentary lifestyles, hypertension, and high cholesterol levels, are less likely to participate. Those who do participate are more likely to be younger, well-educated, female, non-smokers and white-collar workers.

A study in a manufacturing company [4] found that factory workers were less likely to engage in healthy lifestyle behaviors than (management, engineers, and clerical workers). Blue-collar workers have greater health risks in terms of blood pressure, weight, and smoking habits. Moreover, they are less likely to participate in health promotion programs. The study also showed that blue-collar and white-collar employees view the workplace health climate differently. The biggest difference in perception is in supervisor support. White-collar employees feel more support from their supervisors and also from their coworkers. In addition, they also reported a stronger employer health orientation. It is unclear whether these differences are due to different levels of support among groups or to the support not being communicated as effectively to the blue-collar group. In any case, these findings have practical relevance, because if blue-collar workers are skeptical about employer commitment to the health programs, they will be less likely to participate.

Ensuring that workers perceive the interventions as relevant to them is also a key factor for the success of the program. [5] evaluated the impact of combining smoking cessation programs with work safety programs (a program informing workers how to protect themselves from exposure to toxic chemicals and



hazards). In the work sites that implemented the combined program, twice as many smokers quit after 18 months, compared to workplaces that had implemented only the smoking cessation program.

Employee Benefits Case Study

The impact and value of lifestyle education and training for shiftworkers has long been a subject for discussion. Recently, a joint study by CIRCADIAN and a major surface mining company found a positive impact on a group of heavy equipment operators who were provided training on “Managing A Shiftwork Lifestyle” at one of their mine sites. This impact was not just limited to improvements in sleep, but also demonstrated benefits in overall health indicators due to improved timing and content of meals.

The “Managing a Shiftwork Lifestyle” program was specifically designed to assist shiftworkers in coping with the special issues associated with working long, irregular, or night and evening shifts. It contains the elements for successful training programs found by Harden et al. in their study. The training sessions consisted of small group workshops conducted by an expert trainer, and included participation of spouses or partners. The content included practical information on how to get better sleep, tips for using naps effectively, special considerations for a safe and healthy shiftworker diet, managing fatigue and alertness levels, and balancing work and home life.

The study began with the collection of sleep/wake/work data from operators at the mine, who volunteered to fill out sleep/wake logs for a 28-day shift cycle. These operators, plus an additional employees who did not collect sleep/wake/work data, completed a diagnostic survey about their sleep habits, diet, family/home life, fatigue, alertness, health and safety to establish a pre-implementation baseline. After this initial data collection, the operators and their spouses/partners attended the “Managing A Shiftwork Lifestyle” training workshop.

The course was not designed to be prescriptive, but rather to provide factual information on the solutions to the special challenges of shiftwork. Approximately six weeks following the training session, the original operators filled out an additional month of sleep/wake/work logs and completed a post-implementation survey. The pre- and post-implementation data were then compared to determine the net impact of the training.



Key Employee Findings

The survey was comprised of a series of scientifically validated instruments, such as sleepiness index, gastrointestinal index, and sleep disorders risk. It also assessed the sleep obtained and the employees attitudes about their shift schedule.

The post-implementation improvement in the gastrointestinal index was quite dramatic, dropping from a score of 17.9 to 13.6, versus a U.S. norm of 12.7. Heartburn, indigestion and other forms of gastrointestinal problems are frequent complaints for shiftworkers, so the significant downward trend from pre- to post-implementation results for this company indicated an important benefit of training. This correlated well with other results from the survey that indicated a high percentage of operators became more aware of good nutrition practices and were incorporating healthy eating habits into their lifestyle. The reduction in the gastrointestinal score potentially represented a significant reduction in medical costs for the company.

Excessive use of caffeine, which was defined as drinking more than four 10 oz. servings in a 24-hour period, decreased from 24% of employees to 16% during days off. Even more impressive was the decrease in excessive consumption during the night shifts, from 32% to only 8% of participants drinking 4 or more cups of coffee.

One of the more notable results from the sleep/wake/work logs was a significant increase in average daily sleep length. In the pre-implementation data, the overall average sleep length was 7 hours 33 minutes. This included sleep on days off, as well as days at work. Following the MSL training, the overall average sleep length increased by 16 minutes to 7 hours 49 minutes.

Even more compelling was that the amount of daytime sleep obtained (when working night shifts) increased a full hour to 5.8 hours, as compared to the 4.8 hours obtained prior to the training (a 21% increase) as illustrated in Figure 2. This additional daytime sleep when working night shifts can be attributed to a better understanding of sleep and sleep management techniques.

This is further reflected by the fact that 67% of those surveyed reported getting more than 5 hours of daytime sleep when working night shifts, compared to only 45% prior to the training. This again illustrated

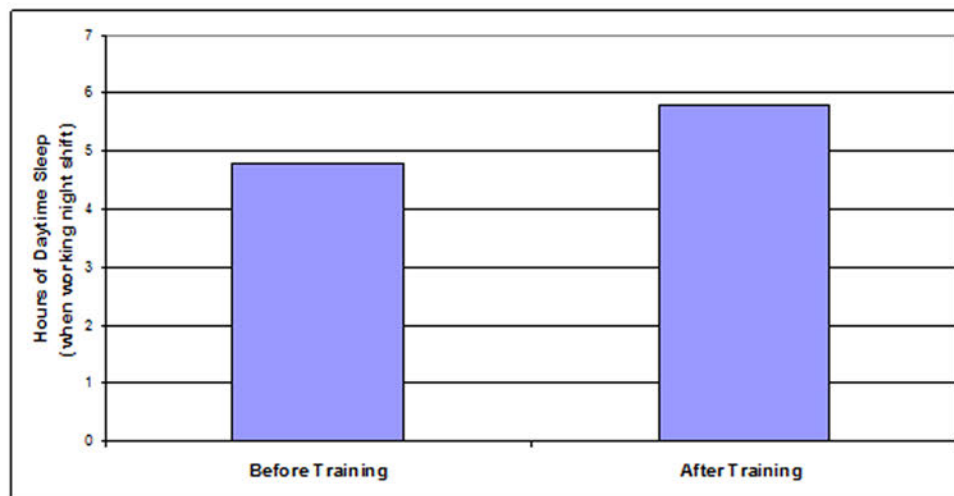


Figure 2. Average duration of daytime sleep obtained (when working night shifts) prior to shiftwork lifestyle training and after the training program.

a better understanding of sleep and commitment to improve one's sleep quantity and quality. This is also confirmed by the fact that prior to training, 82% had stayed awake for more than 18 hours at some point in the previous week, while after the training only 67% had done so. More than half (54%) indicated making changes in their sleeping environment to further enhance their ability to get to sleep and stay asleep, especially during the daylight hours when they were working the night shifts.

The average sleepiness index, as determined by the Epworth Sleepiness scale, was reduced from 9.2 to 8.9 following the training. This corroborated the improved quality and quantity of sleep resulting from the training workshops. Improved sleep and reduced fatigue directly correlates with improved alertness, safety and performance.

Although there was no schedule change associated with the training, there were also some significant differences between the pre- and post-implementation data with regard to the employees' perception of the schedule. For example, before the training, 41% found it "very" or "often" difficult to fulfill domestic responsibilities; after the training, only 23% felt that way. This can be attributed to a generally better overall management of work and family balance following the training. Similarly, 46% reported difficulty finding adequate time for entertainment and recreational activities prior to the training, compared to only 23% after the training.

It is also striking that in the post-implementation survey, 77% felt that their overall health would improve with a different schedule, as compared to 59% in the pre-implementation survey. This could be the result of better understanding of how their own personal circadian rhythms are impacted by their current schedule, coupled with the knowledge of how different schedule configurations might be easier for them to work.



Employee Conclusions and Recommendations

The positive impact of the training was readily apparent in the post-implementation data analysis. Both the employee survey and the sleep/wake/work log analysis confirmed marked improvements resulting from the shiftwork lifestyle training. These results underscore the need to provide training and education for 24/7 workforce employees on how to better manage the special issues and challenges they face. At the very least, there is a compelling case to provide training on “Managing a Shiftwork Lifestyle” for every new shiftworker as part of a company orientation program for new hires.

Although training alone is not sufficient for a comprehensive fatigue risk management system, the results of this study indicate that it can serve as a core element for a strong plan. Combined with scheduling improvements, more supportive policies and procedures, and strategic informational support publications, lifestyle training can provide a substantial return on- investment for 24/7 operations, while improving the health, safety and quality of life of their employees.

In the final analysis, the program was very well received by both managers and operators. Employee’s feedback was that they felt better and were more alert. Operations Managers stated that, “Overall, the program was a very positive breakthrough”. The company is working now to develop a plan to provide the training across all of their operational sites.

Employer Benefits

Given the results of this training study, it would also be expected that employer costs would decrease as a result of employee lifestyle training. While data is not yet available from the case study site, results from CIRCADIAN’s Shiftwork Practices 2016 Survey indicate that these employee benefits occur.

Shiftwork Practices 2016 presented data collected from 224 shiftwork operations. It is used to benchmark key performance indicators and identify important trends and best practices that are defining success in the 24/7 economy. With regards to training, the survey reveals that facilities that provided training to shiftworkers also exhibited lower levels of turnover. It is noteworthy that providing training to shiftworkers and their families is much more efficient than providing training to shiftworkers exclusively (Figure 3).

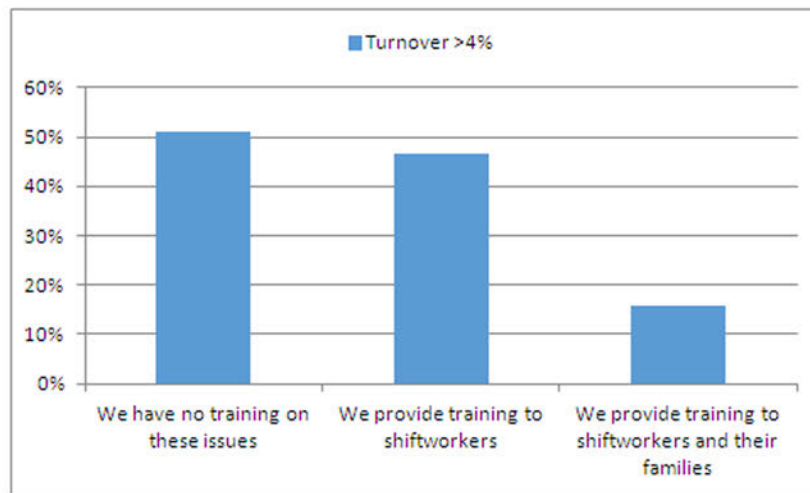


Figure 3. Variation in turnover by shiftwork lifestyle training offered at facility.

Furthermore, when survey respondents were asked to estimate their cost of replacing an employee (including any recruiting costs), the cost was substantial. While the costs reported varied significantly by industry, the potential savings by lowering turnover rates as a result of shiftwork training is significant in all industries.

Figure 4 shows which industries are more likely to provide shiftwork lifestyle training to their employees. Pipelines Transportation and Natural Gas Distribution are the industries most likely to offer training, both to shiftworkers and to their families. Data from the Shiftwork Practices 2016 survey demonstrates that those industries have some of the lowest absenteeism and turnover rates and fatigue-related safety concerns.

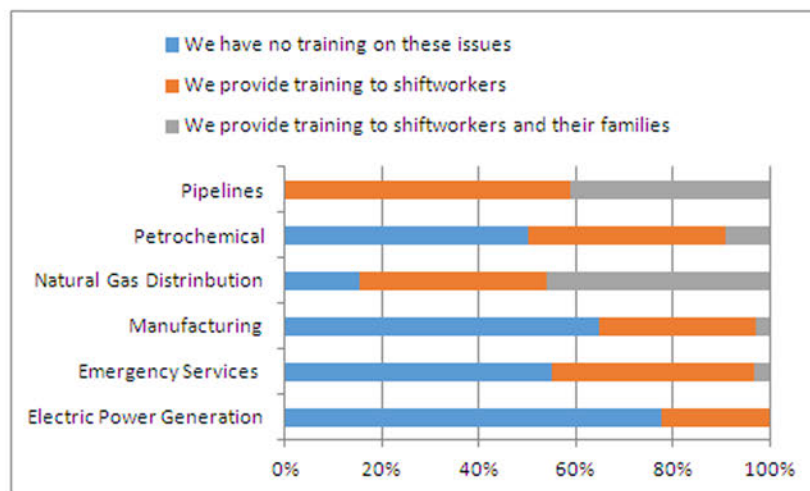


Figure 4. Shiftwork Training Offered by Industry



Other results from the Shiftwork Practices 2016 survey show that facilities that provide training have lower rates of moderate/severe fatigue and stress and better morale (Figure 5). As noted above, providing training to shiftworkers and their families produces significantly better outcomes than providing training only to shiftworkers. Clearly, other savings may also be possible, such as decreased health care costs, safety incident costs and workers' compensation costs, and increased productivity.

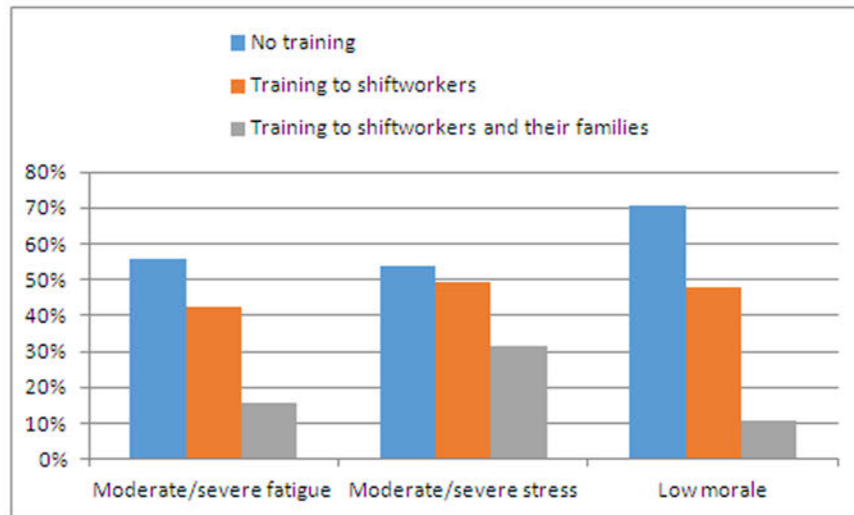


Figure 5. Shiftwork lifestyle training and the percent of facilities reporting moderate /severe fatigue stress and low morale issues.





Final Conclusions and Recommendations

The results of both employer and employee analyses clearly indicate that shiftworker lifestyle training provides measurable benefits for both the company, its employees, and their families. In addition to improved alertness levels, health, and quality of life, such training can also reduce accidents, decrease legal liability, and reduce overall operating costs. As productivity in the U.S. continues to increase, companies must ensure that they stay competitive by minimizing operating costs, such as absenteeism, turnover, and human error related incidents. Training that will help employees better cope with their rigorous shiftwork lifestyle, combined with other support programs such as bio compatible shift scheduling and staffing optimization, provide a new and largely untapped avenue of opportunity for making breakthrough reductions in operating costs.

Harden et al. (1999) concluded that in order to be successful, health promotion programs should have the following:

- Visible support and involvement from management
- Involvement of employees in all steps (planning, implementation, activities)
- A focus on well-defined and modifiable risk factors, which constitute a priority for the specific employee group
- Interventions that are customized to the characteristics and needs of the employees

In association with health promotion interventions, workers should receive training that involves information and skills development. The training should be adequate to the needs of the specific population. In the case of workers in extended hours operations, information about healthy lifestyles should show how to cope with the workers' specific work schedule. For example, rather than simply receiving information about good sleep hygiene practices, workers should be able to understand how to schedule their sleep to obtain the best possible sleep when working different shifts, different strategies on how to prepare for the first night shift, and how to nap wisely.



Research supports the relationship between lifestyle behaviors and health care costs. There are strong data suggesting that high levels of stress, obesity, and multiple risk factors are associated with increased health care costs and illness-related absenteeism. A recent review [1] evaluated the financial impact of health promotion programs and concluded that health promotion interventions appear to provide positive financial returns, mainly for health care costs and absenteeism reduction.

Before starting a training program, it is important to decide exactly what are the objectives and what is the best method to deliver the training. For example, [6] suggests that training programs for workers take into account the following principles:

- The recommendations should be relevant to the specific groups and work systems.
- The recommendations should be practical and socially acceptable to the employees.
- The number of recommendations should be limited, so that employees can remember and use them.
- The training programs require a high level of motivation and a significant investment in time.
- Educational programs should not be a substitute for needed improvements in work conditions.
- Training programs may be a valuable supplement to improvements in work scheduling practices.
- It is important to evaluate the actual impact of the program.





When setting the objectives of the program, it is useful to evaluate the employees' motivation and readiness to change. This assists in determining which information to provide and how most effectively to help employees reach their goals. Before starting a training program, it is important to decide exactly what are the objectives and what is the best method to deliver the training.

When setting goals, it is important to differentiate between information and education. Information can be defined as the communication of knowledge and facts. A training program that simply provides information to employees is not sufficient, since not all employees need the same amount of information, and may not be equally ready to assimilate and use it. On the other hand, education can be defined as instruction or training, whereby information is developed, learned, and used.

Concerning the method of delivering the training, multiple options are available, including presentations to groups of employees, mailed information, posters, newsletters and pamphlets distributed in the workplace, and e-mail. Presentations may require the highest time investment from employees and may be costly to employers. However, presentations have benefits that cannot be achieved through other systems. Moreover, sharing concerns and experiences in the group helps in understanding and applying the information. Considering the impact of extended hours operations on family life, CIRCADIAN strongly recommends involving spouses and sometimes children in the training sessions when possible. Training sessions can be scheduled as part of regular on-the-job training activities or as a special company event at a meeting facility.

A key factor for ensuring the success of training programs is reinforcement of the information provided. Posters in the workplace, newsletters, pamphlets, company websites, and e-mail can be used for this purpose.



For more information about CIRCADIAN's Managing A Shiftwork Lifestyle training and our support publications, please call CIRCADIAN at 1-800-284-5001 or email a specialist at info@circadian.com.



References

1. Aldana SG. Financial impact of health promotion programs: a comprehensive review of the literature. *Am. J. Health Promot.* 15 (5), 296-320. 2001.
2. Circadian Technologies, Inc. Shiftwork Practices Survey 2007. Stoneham, MA, CTI. 2007. www.circadian.com.
3. Harden A, Peersman G, Oliver S, Mauthner M, Oakley A. A systematic review of the effectiveness of health promotion interventions in the workplace. *Occup. Med.* 48 (8), 540-548. 1999.
4. Morris WR, Conrad KM, Marcantonio RJ, Marks BA. Do blue-collar workers perceive the worksite climate differently than white-collar workers? *Am. J. Health Promot.* 13 (6), 319-324. 1999.
5. Sorensen G, Stoddard A, Ockene JK, Hunt MK, Youngstrom R. Worker participation in an integrated health promotion/health protection program: results from the WellWorks Project. *Health Edu. Quar.* 23, 191-203. 1996.
6. Tepas, DI. Educational programmes for shiftworkers, their families, and prospective shiftworkers. *Ergonomics* 36 (1-3), 199-209. 1993.





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Working from offices in North America, Europe, Australia and Asia, CIRCADIAN experts ensure that over half the Fortune 500, and other leading international companies, improve their competitiveness in the global 24/7 economy. CIRCADIAN's core expertise is the staffing, scheduling, training and risk management of their most vital asset – the 24/7 workforce.

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