

## SHIFTWORK LIFESTYLE TRAINING: EMPLOYEE AND EMPLOYER BENEFITS

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### Introduction

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Extended hours employees (shiftworkers) face considerable challenges compared to their day-working counterparts. Family and social life can suffer, especially for those who work in the evening or on weekends. Health can also be affected if not properly managed. Shiftwork has been associated with an increased risk of cardiovascular disease, gastrointestinal disorders, obesity, diabetes, and obstructive sleep apnea. Sleep quality and quantity is often lower for those working at night, or starting early in the morning.

These issues clearly affect the employee, but the employer also incurs extra costs as a result of increased absenteeism, turnover, medical care, safety incidents and production errors. While all of these challenges can be effectively managed, the techniques that an employee can use to help mitigate shiftwork problems are not obvious, and unlike other skills, cannot be “picked up on the job.” Unfortunately, as illustrated in Table 1, a recent survey found that the vast majority of shiftwork facilities reported that they offer no form of lifestyle training for their shiftworkers<sup>1</sup>. Equally, only one in 20 facilities involve the families of the shiftworker in any training that they do provide. 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. Indeed, shiftwork affects the entire family, not just the shiftworker. Involving the family not only helps to provide support and re-enforcement in the home, but also maximizes the training's long-term value.

**Table 1. Shiftwork lifestyle training.**

Type of Shiftwork Lifestyle Training	% of Facilities (2003)
No training	77.7%
Training for shiftworkers	17.6%
Training for shiftworkers and their families	4.7%

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<sup>1</sup> Circadian's *Shiftwork Practices 2004* survey

## Employee Benefits

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The impact and value of lifestyle education and training for extended hours employees 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 the mine sites. This impact was not just limited to areas of sleep, but also demonstrated improvement in overall health indicators due to improved timing and content of food.

The “Managing a Shiftwork Lifestyle” program was designed to assist extended hours employees in coping with the special issues associated with working long, irregular, or night and evening shifts. 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/activity data from 19 operators at the mine, who volunteered to fill out sleep/wake logs for a 28-day shift cycle. These operators, plus an additional three who did not collect sleep/wake/activity 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 then 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, 14 of the original operators filled out an additional month of sleep/wake logs and 13 of the original group completed a post-implementation survey. The pre- and post-implementation data were then compared to determine the net impact of the training.

## Discussion of Key Employee Findings

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Although there was no schedule change associated with the training, there were 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 often 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.

Included in the survey were a series of scientifically validated instruments, such as relative fatigue index, gastrointestinal index, and sleep disorder potential. 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 was favorable. This correlates well with other results from the survey that indicate a high percentage of operators were more aware of good nutrition and were incorporating healthy eating habits into their lifestyle. The reduction in gastrointestinal score potentially represents a significant reduction in medical costs for the company.

Excessive use of caffeine, which is generally defined as drinking more than four 12 oz. servings in a 24-hour period, decreased from 24% of employees to 16% during off-duty hours. 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/activity 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 average sleep length increased by 16 minutes to 7 hours 49 minutes. Even more compelling is that the amount of sleep obtained during the daylight hours (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). This additional daytime sleep when working night shifts is 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 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 fatigue 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.

## **Employee Conclusions and Recommendations**

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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 extended hours 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 extended hours employee as part of a company orientation program for new hires.

Although training alone is not sufficient for a comprehensive fatigue management program, 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 companies with extended hours operators, while improving the health, safety and quality of life of their employees.

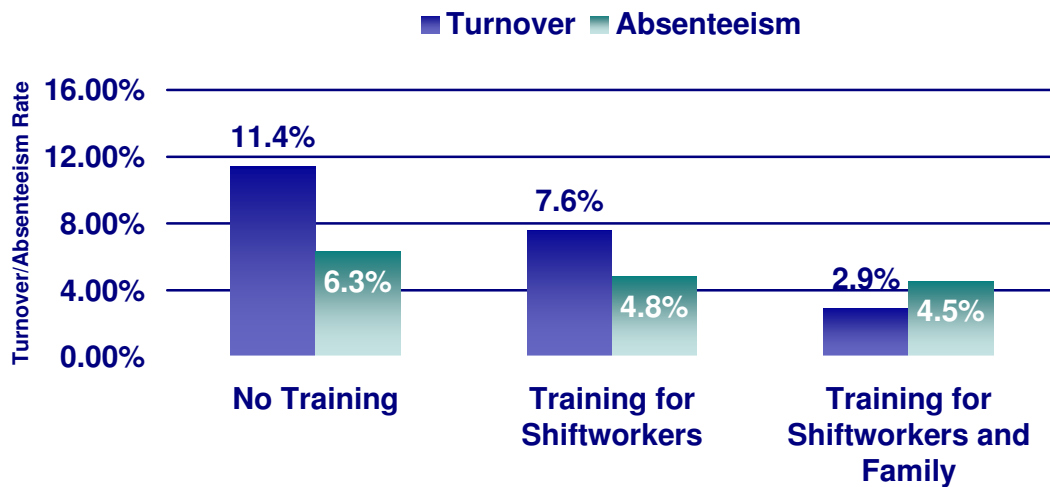
In the final analysis, the program was very well received by both managers and operators. Employee’s feedback was that they felt better and were more alert. Operations Managers stated that, “Overall, the program was a very positive breakthrough”. The company is working now to develop a plan to provide 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 test site, results from Circadian's *Shiftwork Practices 2004* indicate that this is the case. This survey of 550 managers of extended hours operations addressed questions concerning absenteeism, turnover and the level of shiftwork training provided to employees.

Facilities that provided training to shiftworkers also exhibited lower levels of turnover and absenteeism, as illustrated in Figure 1. These companies had significantly lower costs as a result of the lower turnover (7.6% vs. 11.4%) which amounts to annual cost savings of \$952 per worker. These facilities also had reduced absenteeism (4.8% vs. 6.3%), saving an additional \$940 per shiftworker per year. Thus, total savings of \$1,892 per employee per year were suggested by this extensive survey.<sup>2</sup>

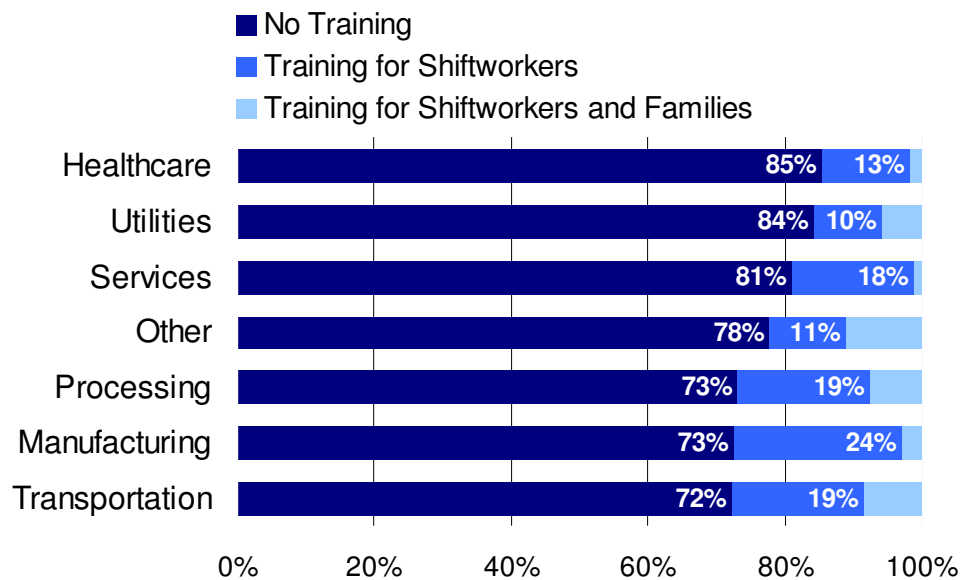
**Figure 1. Variation in absenteeism and turnover by shiftwork lifestyle training offered at facility.**



<sup>2</sup> Absenteeism costs are calculated from the additional pay that a replacement worker receives when an employee is absent (presumed to be at an overtime rate). Turnover costs are calculated from the average cost of recruiting, hiring, and training a new employee, as reported by managers of extended hours operations.

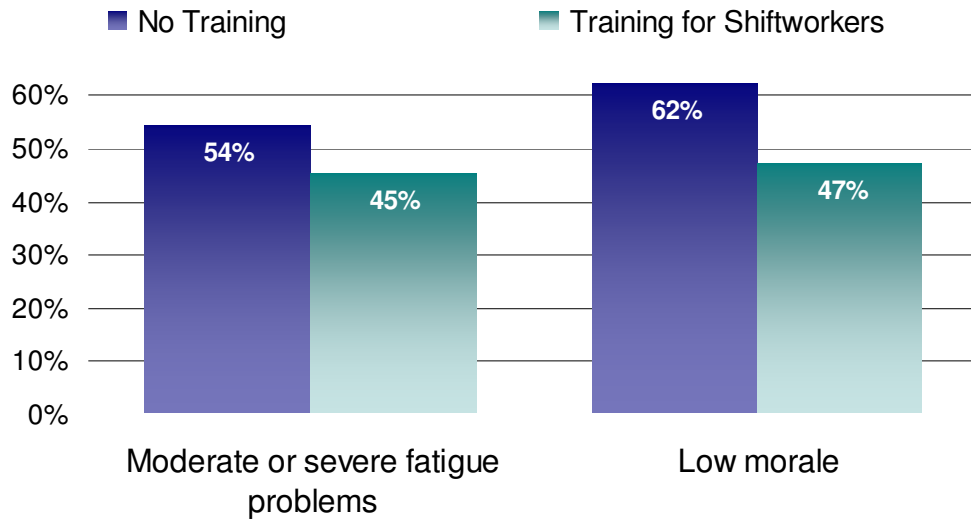
Figure 2 shows which industries are more likely to provide shiftwork lifestyle training to their employees. The health care industry offers the least amount of shiftworker training, yet other data from the *Shiftwork Practices 2004* survey demonstrates that health care has among the highest work hours, turnover, and fatigue-related safety concerns of any extended hours industry. Although transportation provides the highest amount of training overall, it is striking to note that two in three transportation employees receive no training on managing sleep and recognizing the signs of fatigue.

**Figure 2. Shiftwork training offered by industry.**



Other results from the *Shiftwork Practices 2004* survey show that 54% of facilities that provide no training have severe or moderate fatigue issues, compared to 45% of those with training, as illustrated in Figure 3. Morale also suffers: 38% of facilities with no training have good or excellent morale, compared to 53% of facilities with shiftworker training, and 82% of facilities with training for shiftworkers *and* their families. Clearly, other savings may also be possible, such as decreased health care costs, safety incident costs and workers' compensation costs, and increased productivity.

**Figure 3. Shiftwork lifestyle training and the percent of facilities reporting fatigue and morale issues.**



## Overall Conclusions

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.

For more information about training, please call Circadian Technologies, Inc. at 1-800-CTI-5001 or email a specialist at [info@circadian.com](mailto:info@circadian.com)