

Sleep Deprivation:

A Wake-up Call for Business



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Employees are not getting adequate sleep and both employers and employees across every industry are paying the price. The consequences range from lost productivity and higher healthcare costs to serious, even deadly, accidents. As notable examples, the Exxon Valdez oil spill, the Space Shuttle Challenger disaster and many of the recent bus crashes have all been blamed on sleep deprivation.^{1,2,3}

The High Costs of Sleep Loss

While these disasters capture the headlines, the fact is that all businesses are affected by sleep loss, sleepiness and fatigue. Employers have sleep-deprived and fatigued employees negotiating sensitive contracts, producing products, managing money and driving trucks. If their decision-making abilities and/or response times are addled by fatigue, the result can be serious human and financial loss that figure in the billions.⁴

In fact, in terms of health-related lost productivity, researchers place the estimated cost to business due to fatigued workers at more than \$136 billion per year.⁵

The costs will likely climb as the incidence of sleep deprivation is expected to grow, making workplace sleep management strategies a critical imperative. This white paper will detail the scope and toll of the issue and emphasizes the importance of putting in place workplace policies and programs now that help employees get adequate sleep to perform at their best and lower costs.

Eye-opening Statistics

The number of workers who get inadequate sleep is astonishing. At present, it is estimated that nearly 30 percent of workers get six or less hours of sleep a night.⁶ Yet, for optimum functioning, the recommended amount is generally seven to nine hours.⁴

In worker surveys, well over half of the employees reported having problems with poor sleep—a major cause of daytime sleepiness. In a 2008 National Sleep Foundation (NSF) poll, about two-thirds (65 percent) of American workers said they had a sleep problem at least a few nights a week within the past month. Forty-four percent reported having sleep problems every night or almost every night.⁷

As a result of daytime sleepiness, about three in ten employees in the NSF poll reported becoming very sleepy at work or having actually fallen asleep on the job.⁷

A growing problem

Sleep deprivation in the general population and among workers is an increasing, and some experts say, an alarming problem. The research reveals that, overall, Americans are getting far less sleep today than they did just two decades ago.⁸ And more than 80 percent of Human Resources leaders polled say that sleep deprivation among workers is worse than in previous years.⁹

And experts say the problem is likely to worsen, given factors such as the increase in underlying health conditions such as obesity and stress, longer work hours and the around-the-clock technological connection to work and social networking.⁴ This has prompted experts to warn employers not to wait to implement sleep management strategies.

“Very simply, proper sleep is a biological need that cannot be ignored by employers or employees,” says Ilene M. Rosen, M.D. Associate Professor of Clinical Medicine, Department of Medicine, Division of Sleep Medicine, University of Pennsylvania School of Medicine. If it is inadequate, everyone suffers. “Too many people are trying to beat the system, but you can’t beat the system.”¹⁰

Research Findings

The National Sleep Foundation’s 2008 *Sleep in America* poll found that:⁷

- Nearly thirty percent of employees said they have fallen asleep or become very sleepy at work because of a sleep problem.
- Twelve percent of workers said they were late to work in the past month because of sleepiness or a sleep problem.
- Four percent of workers said they left work early; and two percent said they didn’t go to work in the past month because they were too sleepy or because of a sleep problem.

What Is Behind Sleep Loss?

The reasons for sleep loss and excessive sleepiness are vast and varied. The most notable causes include: underlying medical conditions such as chronic pain or depression; sleep disorders such as insomnia and sleep apnea; international travel; medication side effects; drug and alcohol use; stress relating to job security; multiple jobs; competing work/life responsibilities; and an increased demand on current employees because of downsizing.⁴

Working extended hours is a notable cause. In one 2010 NSF poll, 22 to 26 percent of workers reported that their current work schedule does not allow them to get enough sleep.¹²

Another contributing factor is performing work outside of the typical workday. Surveys show that Americans spend nearly 4.5 hours a week doing additional work from home on top of a 9.5-hour average workday.⁷

“Longer workdays and more access to colleagues and the workplace through the Internet and other technology appear to be causing Americans to get less sleep,” remarked the then-acting NSF Chief Executive Officer, Darrel Droblich, of the survey results.⁷

Corporate sleep policies should be developed just as they already have been for behaviors like smoking...” remarked Charles A. Czeisler, the Baldino Professor of Sleep Medicine at Harvard Medical School in a Harvard Business Review article.¹¹

Sleep disorders are a leading cause of sleep deprivation

When people are not getting adequate sleep, the fault is very often a sleep disorder. In fact, an estimated 50 to 70 million Americans have some type of chronic sleep-related disorder, according to a report from the Institute of Medicine.¹ Although there are more than 90 such conditions,⁴ the most common are sleep-related breathing disorders, particularly obstructive sleep apnea, chronic insomnia, and restless legs syndrome.^{4,7} (see “Glossary” on page 17)

Reportedly, a sizable number of people with sleep disorders are either not diagnosed or untreated.¹ For example, in the 2008 NSF Poll, of the employees surveyed, about one in ten said a doctor told them they have sleep apnea, a condition involving brief interruptions of breathing during sleep. Yet, only half were being treated for the condition.^{15,7}

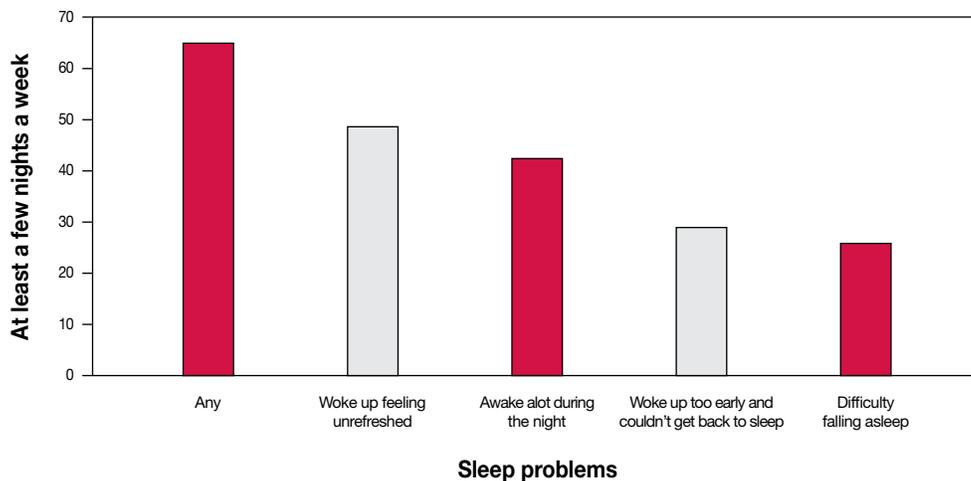
Industries Most Affected

Sleep deprivation is particularly prevalent in certain occupations, including the healthcare professions. In one survey of U.S. emergency medical technicians conducted by researchers at the Medical College of Wisconsin, 70 percent of the technicians had at least one sleep problem.¹³ In other findings, about 40 percent of employees in management positions, 37 percent of transportation/warehousing employees, and 35 percent of manufacturing employees slept six or less hours a day. The latter two are likely related to the high propensity of shift work in these industries.⁶

Regarding shift workers, in one reported study, up to 82 percent of shift workers reported finding it difficult to stay alert and perform their job safely. Sixty-four percent say they are “very drowsy” at work and make mistakes. Alarmingly, 16 percent reported having accidents or “near misses” several times a week.¹⁴

Overall, on a general, individual basis, people who are most likely to be fatigued are women, those under age 50, white workers and those in higher, decision-making positions.⁵

Frequency of Sleep Problems of Survey Respondents in a Given Month



Source: National Sleep Foundation, 2008.⁷

The Far-reaching Consequences

Employees who lack sufficient sleep are often sick, unproductive and absent. They have poor short-term memory and poor performance on new tasks, and are at greater risk for mood disorders and delayed response time.^{16, 17, 18, 19, 20} The consequences of sleep deprivation fall in to the following categories:

Health problems

People with severe insomnia, for instance, take more medications, undergo more tests, and are hospitalized twice as often over a 12-month period than those without insomnia.²¹ They also have a higher risk for future psychiatric conditions including anxiety disorders, depression and alcohol abuse.²²

Moreover, sleep deficits in general are linked to an increased risk of cardiovascular disease, stroke, obesity and hypertension.¹ These chronic conditions are a major factor in soaring healthcare costs for U.S. companies, accounting for 70 to 80 percent of their overall healthcare costs.²³

The link between sleep loss and weight gain is particularly troublesome.^{24, 25} Sleep loss alters the balance between appetite and satiety hormones, increasing hunger and requiring more food to make you feel full.^{26, 27, 28} Indeed, the reduction in sleep time that has occurred over the past 20 years may be a contributing factor to our current epidemic of obesity, researchers suggest.^{28, 29, 30}

The effects of sleep loss on work performance are costing U.S. employers tens of billions of dollars a year in lost productivity. It's time for American workers and employers to make sleep a priority.”¹²

Darrel Droblich, Nation Sleep Foundation, 2008

Less productive, more prone to mistakes

Employees who lack proper sleep simply do not perform up to par, the research shows. In a survey of workers conducted by CVS Caremark during a 2-week period, the prevalence of fatigue was close to 40 percent. A little more than 65 percent of these fatigued workers reported health-related Lost Production Time (LPT) compared to 26.4 percent of the workers without fatigue. Nearly 10 percent of the workers reported they lost an average of about four hours of productivity per week because of difficulty with concentration and that it took longer to do their job.⁵

Regarding the link between insomnia and productivity, a Canadian study estimated that employees with insomnia lost an estimated 28 days a year of work productivity because of their sleepiness.³¹

Insomnia can also cause serious mistakes. Researchers from the Centers for Disease Control and Prevention found that 15 percent of employees with severe insomnia said they had made errors at work over the previous month that could have resulted in serious consequences, as compared to just 6 percent of workers who got enough sleep.²¹



Higher presenteeism and absenteeism

In one national survey of more than 7,400 employees, 23 percent reported insomnia, found to be significantly associated with lost work performance due to presenteeism (present at work, but unproductive).³²

Those with severe insomnia had a higher rate of absenteeism, missing work twice as often as good sleepers.²¹

A French study of 369 insomniacs and 369 “good sleepers” reported that half of employees with insomnia missed work over a two-year period compared to a third of days missed by those who slept well.³³

Other research shows that workers with obstructive sleep apnea, in particular, and the excessive daytime sleepiness that often accompanies it, were 18 percent more likely to miss a full day of work compared to 9 percent of employees without sleep apnea.³⁴

Increased work-related accidents

Highly fatigued workers are 70 percent more likely to be involved in accidents in general than workers who are not as tired and nearly twice as likely to die in a work-related accident.^{5, 35}

As for specific predictive factors related to fatal work-related accidents, a prospective study concluded that employees who had problems sleeping the two weeks before their accident were nearly twice as likely to have a fatal accident than those who had no problems sleeping.³⁶

Driving risks

Inadequate sleep can contribute to slow response times, which is particularly dangerous behind the wheel.¹⁹

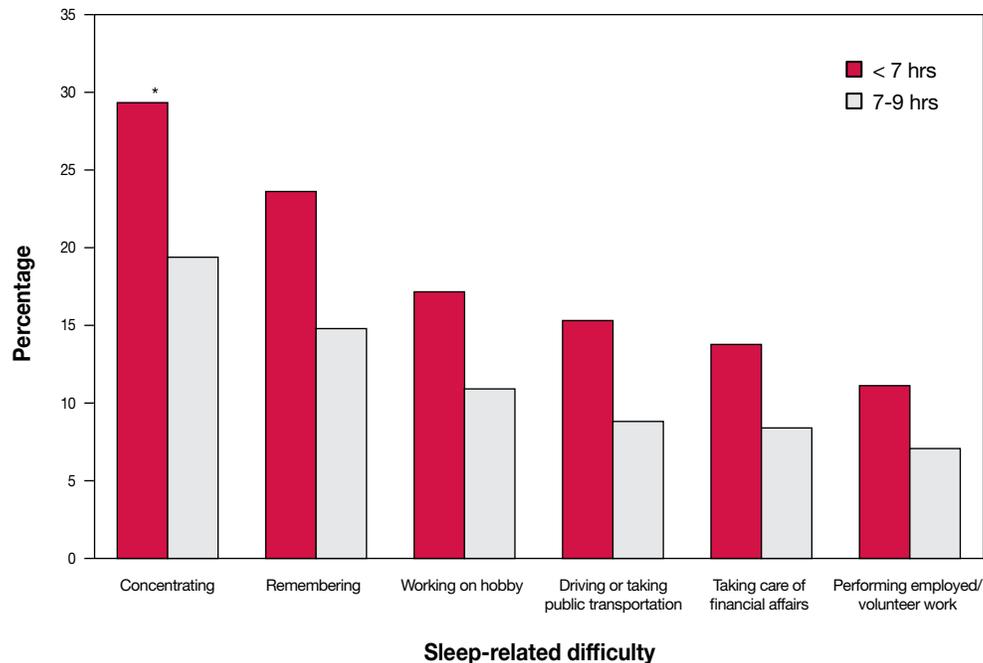
In the workplace, approximately 12 percent of workers report that their fatigue affects their ability to drive. “Drowsy driving is not just a hazard that affects the transportation industry, but all employees who commute,” says Natalie P. Hartenbaum, M.D., MPH, President and Chief Medical Officer, OccuMedix, Inc., an occupational health and safety consulting firm.⁴

A chronic lack of sleep can have the same impact on driving as being legally drunk.^{37, 38}

Work modifications

University of California researchers found that employees with sleep apnea and excessive daytime sleepiness were not only at higher risk of absenteeism, falling asleep on the job, and performing ineffectively than workers without these conditions, they were much more likely to miss a promotion, have a change in job schedule or duties, to change jobs and to take a pay cut in the past five years.³⁴

Age-adjusted Prevalence of Adults ≥ 20 Years Reporting Sleep-related Difficulties Carrying Out Selected Activities



Source: National Health and Nutrition Examination Survey, United States, 2005-2008.

*95% confidence interval. (reliability of the estimate)

The Critical Effects on the Bottom Line

The costs of health-related lost productivity are striking. As reported in the *Journal of Occupational Environmental Medicine*, researchers studying fatigued workers estimate the cost to employers is \$136.4 billion per year in health-related lost productivity—\$101 billion more than the lost productivity costs for non-fatigued workers.⁵

Insomnia plays a major role in impacting the bottom line. The Canadian study cited previously found that the indirect costs of untreated insomnia to employers averaged more than \$4,388 per person a year, mostly related to absenteeism, lost productivity and accidents.³¹

Clearly, workers with insomnia are more expensive than those who get proper sleep. Researchers at the Institute for Health and Productivity Studies, Cornell University, Washington, D.C., analyzed claims from nearly 139,000 individuals younger than 65 who were covered by self-insured, employer-sponsored health insurance plans. The researchers found that medical and indirect costs were about \$1,253 higher for those with insomnia than for those without insomnia. Indirect costs included costs related to absenteeism and the use of short-term disability programs.³⁹

The association of sleep loss to obesity could have staggering consequences for businesses, as shown by a report released in 2010 by Duke University. The data showed that the costs due to obesity-related health problems among full-time workers relating to absenteeism, work productivity and medical costs, totaled more than 73 billion dollars a year.⁴⁰

Legal issues related to sleepy employees

Fatigued employees increase employer liability if the employee is injured as a result of fatigue, particularly work-related fatigue.⁴¹ A 1993 landmark case involved a pipefitter foreman, who worked 36 hours straight, drove home, fell asleep at the wheel and struck a telephone pole. The courts ruled that the employee's company was at fault and, as a result, employers became liable for incidents relating to employee fatigue.^{41, 42}

Employers should note that employees who have sleep-related disorders may need to be accommodated under the Americans with Disabilities Act. When evaluating employees with sleep-related disorders, the U.S. Department of Labor's Office of Disability Employment Policy recommends that employers consider a series of questions. The questions include what limitations is the employee experiencing, how it affects their job performance; what accommodations are available and if it would be useful to evaluate the effectiveness of the accommodations.⁴³

Signs of Excessive Sleepiness

Mental

- Lapses in attention
- Difficulty remembering tasks being performed
- Failing to communicate important information
- Failing to anticipate events or actions
- Accidentally doing the wrong thing

Physical

- Yawning
- Heavy eyelids
- Eye rubbing
- Head dropping
- Microsleeps

Emotional

- More quiet or withdrawn than usual
- Lacking energy
- Lacking motivation
- Irritability

Source: Hartenbaum, NP. Sleep Deprivation: A Wake-up Call for Business. Presented June 22, 2011, Health Advocate, Inc.

A Shared Solution

Ensuring proper sleep does not only fall to the employer. Both employees and employers are responsible for using strategies that promote adequate sleep. While it is up to the employee to control individual factors such as an excess of late-night activities, employers can implement many low-cost ways to help reduce or prevent sleepiness in the workplace. The place to start is with educating employees about the importance of adequate sleep. Here are a few key strategies to consider:

Employer Strategies

Disseminate information. Holding seminars and providing information through newsletters, flyers and the company intranet should emphasize the effects caused by sleep deficit, how to recognize sleep-related disorders and should provide “sleep hygiene” tips such as regular exercise that promote a good night’s sleep.⁴⁴

Incorporate sleep hygiene in wellness programs. If available, wellness coaches can help employees make the appropriate behavior changes to improve sleep.⁴

Offer a Health Risk Assessment (HRA). This questionnaire should include a section on sleep habits. An HRA can help employees become aware of the health effects of poor sleep, potentially motivating them to make healthy changes. The aggregate data can help companies discover the scope of the problem in their workplace.⁴

Consider napping accommodations. Many companies offer on-the-job napping as a way to improve productivity. In a survey by Circadian Technologies, up to half of healthcare organizations, for example, allowed napping on the job, as did 42 percent of manufacturing companies.^{45, 46} And, in a NSF survey, 16 percent of employers permit napping during the day.⁴⁷

In other findings involving more than 530 employers, 7 percent of the large employers and 5 percent of the medium-size employers offered on-site napping rooms.⁴⁵

Implementing a Nap Policy

- Set aside a quiet, dark space with a comfortable couch, pillows and blanket.
- Include an alarm clock or other timer.
- Make sure employees let others know where they are so they can be reached in an emergency.
- Stagger break/nap times and have employees sign up for the nap room.

Ensure proper timing of napping. Many experts say that a 20-minute nap limit has been shown to be most effective.⁴ Napping longer than that can result in sleep inertia, which is defined as a feeling of grogginess and disorientation resulting from awakening from a deep sleep.⁴

Restructure workloads and schedules. Here are a few recommendations:

- Schedule longer or more frequent breaks, with back-up coworker coverage.
- Provide a flexible start time or end time, or offer a part-time schedule.
- Allow work at home. Telecommuting is particularly helpful to lower the stress of commuting or caregiving, for example, and has been shown to result in greater savings from increased worker productivity.⁴⁸

Manage circadian rhythm disorders. Alterations in individual circadian rhythms that can lead to severe fatigue occur with irregular schedules such as when shift workers must sleep during the day and work at night.⁴ The following strategies can help adjust circadian rhythm disruptions so the worker's sleep/wake cycle runs in concert with their altered schedule, which helps to reduce sleepiness:^{45, 49}

- Reduce the number of night shifts worked in a row.
- Avoid double shifts and excessive overtime.
- Maintain a regular schedule rather than frequently rotating shifts.
- Keep the workplace brightly lighted to promote alertness.
- For better sleep, educate workers about light and noise blockers, avoiding stimulants before sleeping, and using alcohol after work.⁴⁹
- Educate supervisors about symptoms and how to intervene.⁴⁹
- Consider routinely screening employees for obstructive sleep apnea and other sleep-related disorders. Many sleep centers offer employee screening programs. Studies find that treatment can improve productivity.⁵⁰
- Encourage regular physical activity before and during the work shift, to keep workers alert and to also improve their quality of sleep.⁵¹

Employee Responsibility

It is up to each employee to control the personal factors that contribute to their sleep loss. Employee communications can remind them to check their medications for sleepiness as a side effect, for instance, or talk to their doctor if arthritis, back pain or other conditions are keeping them awake.

They should also be reminded to follow these good sleep hygiene rules, recommended by the National Sleep Foundation:⁷

- Avoid stimulants such as caffeinated drinks, nicotine and alcohol in the evening.
- Engage in regular, more vigorous exercise during the day, and low-intensity exercise such as yoga later in the evening to stimulate melatonin, the “sleep hormone.”
- Eat large meals earlier in the evening and not close to bedtime.
- Get regular exposure to natural light during the day to maintain normal circadian rhythm activity.
- Create a quiet, dark, restful sleep environment.

Sample Success Stories

While there are not yet definitive “best practices” to help reduce sleep deprivation in the workplace, here are a few examples of organizations that have addressed the promotion of adequate sleep among employees:

- U.S. HealthWorks, a Valencia, California-based company that helps control work-related injury costs, partnered with Sleep HealthCenters which offers sleep management programs to the HealthWork’s employer clients as well as for its own 10,000 employees.⁵²
- Napping spa Yelo in midtown Manhattan contracts with large local employers to offer employees time in Yelo’s off-site nap rooms.⁵³
- The Harvard Medical School publication, *Get Sleep*, noted that Summa Health System, a major health care delivery system based in Ohio, reduced shift hours for their medical residents from the mandated limit of 24 hours to 16 hours. Officials reported that “residents are clearly more rested and perform better, which reduces medical errors and increases patient safety and resident satisfaction.”⁵⁴



Return on Investment

A small but growing number of studies suggest that treating sleep-related disorders such as sleep apnea, for example, may help improve productivity and lower costs.⁵⁰

And for commercial motor vehicle drivers with sleep apnea, effective treatment lowers healthcare costs and disability rates, according to a study reported in the May 2010 issue of the *Journal of Occupational and Environmental Medicine*.⁵⁵

Research presented in 2011 by the College of Nursing at the University of Central Florida in Orlando revealed important findings. The research showed that a large Florida corporation would have saved \$136 million in lost productivity over 10 years if it had screened high-risk employees (primarily overweight, middle-aged men) for sleep problems and provided treatment. The savings represents net savings—after medical costs are covered.⁵⁶

Another study found that treatment significantly reduced the number of doctor visits for individuals, in general. The research found that in the 5 years after diagnosis and treatment of obstructive sleep apnea, physician visits, healthcare costs and days absent were all reduced.⁵⁷

Conclusion

The issue of sleepy employees is one that is not going away. If anything, it will likely get worse, given increasing globalization that requires people to work across time zones; employees tethered to their work 24/7 by cell phones, computers and other technology; leaner workforces requiring a heavier workload and longer hours; and just the overall increasing pace of modern life.⁴

Now is the time for employers to identify opportunities to improve the quality and quantity of sleep that their employees receive. This is achieved through education, training, screening and even by changing the very culture of their company.

“Companies can no longer condone a company culture that demands and rewards long hours and requires that employees bring work home,” says Natalie P. Hartenbaum, M.D., MPH of OccuMedix, Inc. “Without making concrete changes and instituting strategies that promote adequate sleep, workers cannot perform at their best and companies risk losing millions of dollars in productivity, medical and legal costs.”

Glossary

Chronic insomnia. The accepted definition is trouble falling asleep or staying asleep that occurs nearly every night for a month or more, according to Ilene Rosen, M.D.¹⁰

Obstructive sleep apnea. A breathing disorder in which a person stops breathing during the night, perhaps hundreds of times. Sleep apnea is usually accompanied by snoring, disturbed sleep and daytime sleepiness.⁵⁸

Restless legs syndrome. Neurological disorder marked by throbbing, pulling, creeping or other unpleasant sensations in the legs and an uncontrollable, sometimes overwhelming, need to move them.⁵⁹

Circadian rhythm disorders. Disorders that are related to the timing of sleep within a 24-hour day. Some of these disorders are influenced by the timing of the sleep period that is under the individual's control (e.g., shift work). Others in this group are disorders of neurological mechanisms (e.g., irregular sleep-wake pattern).⁶⁰

Microsleeps. An involuntary bout of sleep brought on by sleep deprivation that lasts for a few seconds.³

Sleep hygiene. The healthy habits, environmental factors and practices that can help promote restful sleep. These include timing of sleep and eating, avoiding caffeine and other stimulants, and keeping the bedroom dark and quiet.⁷

Sleep disorders. Involves any difficulties related to sleeping including difficulty falling or staying asleep, falling asleep at inappropriate times, excessive total sleep time, or abnormal behaviors associated with sleep.⁶⁰

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Sleep Deprivation: A Wake-up Call for Business

This is a two-part publication, providing a White Paper and a Checklist.

Health Advocate™, Inc., the nation's leading independent healthcare advocacy and assistance company, has published this White Paper to provide research about important issues relating to employee sleep loss that impact the workplace and how employers can meet the challenges. The paper offers comprehensive research about the scope, causes and costs of sleep deprivation, and its role in absences, lost productivity, accidents and illness. The companion "Sleep Deprivation: Checklist for Workplace Strategies" provides a range of specific strategies for employers to help employees get adequate sleep to perform at their best and lower costs.

Additional White Papers

The following previously published Health Advocate White Papers are available for free on our website at: HealthAdvocate.com/webinars_seminars.aspx. There is a companion Checklist that accompanies each White Paper.



Workplace Wellness

More companies recognize that having unhealthy employees has become a critical burden and that wellness programs can provide an effective solution to rising healthcare costs. Instituting wellness programs that help employees adopt healthier behaviors can be an important way to decrease illness, absenteeism, turnover, medical claims, to increase productivity and create a healthier bottom line.



Stress in the Workplace

Job stress is a leading source of stress for Americans, costing businesses \$200-\$300 billion a year in terms of lost productivity, disability, absenteeism and presenteeism, where employees are present but function below par. Workplace strategies that help employees develop resiliency are becoming a critical component of wellness programs to help lower costs.



Obesity in America

Obesity, an alarmingly increasing phenomenon in the U.S., is a major factor in a host of chronic—and costly—conditions from diabetes to heart disease that are correspondingly increasing. Workplace strategies that help promote weight loss can significantly lower risk factors, injuries, absenteeism and, ultimately, healthcare costs.



Caregiving

About one in three employees care for a loved one who is elderly, sick or has special needs. The cost to businesses associated with absences, turnover, replacement, lost productivity, and stress-related illness can reach as high as \$33 billion a year. Employer-based strategies that support caregiving responsibilities can reduce the negative health effects, improve productivity and save costs.

About Health Advocate

Health Advocate™, Inc., the nation's leading independent healthcare advocacy and assistance company, serves 25+ million Americans through more than 8,200 client relationships, including many of the nation's largest companies, helping members personally navigate healthcare and insurance-related issues, saving time and money. The company offers a spectrum of add-on time- and money-saving solutions designed for both employers and employees. Founded in 2001 and headquartered in suburban Philadelphia, Health Advocate has been recognized, for the fifth consecutive year, as one of America's fastest growing private companies by *Inc. 500*, named one of the fastest growing companies in North America on Deloitte's 2011 Technology Fast 500™, 2011 Enterprise Awards' Life Sciences Company of the Year in the Greater Philadelphia Region, 2011 Entrepreneur of the Year in the Greater Philadelphia Region by Ernst & Young, won the 2011 *Workforce Management* magazine Worldwide Optimas Award for Service and the 2011 *InformationWeek* Innovation Award, and is rated one of the Top 20 Best Places to Work by *Philadelphia* magazine.

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 HA-B-1104022-6WP

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