

## FEATURE

# How Sleep Impacts Performance – And What Companies Can Do

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June 8, 2016

*Talent Management Magazine*



Companies today are increasingly committed to helping employees quit smoking, lose weight, become more fit and improve sleep and rest. Lack of sleep and fatigue contribute to both performance deficits and bottom-line costs for companies.

For example, a review of 182 major accident investigations by the National Transportation Safety Board between years 2001 to 2012 found that [20 percent of participants](#) identified fatigue as a probable cause, a contributing factor or single finding. [Research](#) from Harvard University has estimated that, for the average U.S. worker, insomnia results in the loss of approximately 11.3 days of productivity each year, representing a total loss nationally of about \$63.2 billion.

Organizations such as health care company Johnson & Johnson offer employees a digital wellness coaching program to address insomnia, and human capital management firm Ceridian provides sleep coaches as part of its employee assistance programs in hopes of improving the potentially dangerous impact of sleep loss on performance and safety.

Others companies, such as Google, Zappos, Capital One Labs, Ben & Jerrys and PwC, provide napping pods and dedicated rooms for employees to catch up on sleep while on the job.

## How Much Sleep Do You Get?

On average, how much sleep do you typically get on work nights?

- a) Less than 4 hours
- b) 4 to 6 hours
- c) 6 to 8 hours
- d) More than 8 hours

Across an 85-year lifespan an individual may sleep nearly [250,000 hours or more](#) than 10,000 full days. Yet, many of us in the “always on” world of work report being chronically fatigued and sleep deprived despite our circadian rhythm and pressure to get adequate rest and sleep.

Harvard's sleep medicine expert, Charles Czeisler, has stated that over the past five decades, the average amount of sleep we get on work nights has decreased by an hour and a half, from 8.5 hours to a little less than seven. A [2014 analysis](#) of sleep by the Centers for Disease Control and Prevention of 444,306 adults in all 50 U.S. states found that more than one-third reported getting less than seven total hours per day.

Even our own research at Envisia Learning Inc. using a validated health risk appraisal shows significant sleep impairment in working adults.

In a random sample of 1,326 working adults, we found that 35.7 percent reported “often” or “always” receiving less sleep than required because of staying up too late or getting up too early. Almost 22 percent reported being tired during the day due to poor quality sleep. Finally, slightly more than 8 percent reported missing an entire night or large proportion of sleep because of work or play activities in a month.

Moreover, a [2011 sleep study](#) by researchers from University of California San Diego reported results over a four-year period, which included 459 women. Of the group, a total of 358 women participated in follow-ups and a total of 86 individuals had passed away. Women’s sleep patterns were monitored each week using wrist-mounted activity monitors worn at night. Women who had slept longer (more than 7.5 hours) or shorter hours (less than 6.5 hours) were significantly more likely to have died during the study compared to women who had slept a moderate length.

Although it is not completely clear why short and long sleepers might have impaired health, some hints come from research involving 525 middle-aged people participating in the 2011 Morehouse-Emory Partnership to Eliminate Cardiovascular Health Disparities [study](#). Participants who reported six or fewer hours of sleep had significantly elevated levels of three important inflammatory markers, fibrinogen, IL-6 and C-reactive protein which are all risk indicators for coronary heart disease and stroke.

## Lack of Sleep Decreases Your Performance

Studies from Timothy Roehrs from the Henry Ford Hospital Sleep Disorders and Research Center have conclusively shown that the less sleep we get, the worse we perform on psychomotor vigilance tasks, recall tests and our ability to concentrate.

Research from Ann Williamson and colleagues from the University of New Wales, Australia, have shown that only two hours less sleep than you normally need is enough to impair your memory and mood as if you've been drinking two to three alcoholic beverages. What's more, getting four hours or less is equivalent, in terms of performance, to being legally drunk in most U.S. states (.10 blood alcohol concentration).

Research by David Dinges, a noted sleep expert and head of the Sleep and Chronobiology Laboratory at the University of Pennsylvania, found that the sleep deprivation and poor performance are intertwined. Using a PVT as a performance measure, he found that those who had a full eight hours of sleep hardly had any attention lapses and little or no cognitive declines over a 14-day study.

However, participants who slept for only four or six hours a night had results that declined steadily with almost each passing day despite subjective reports of being alert and able to concentrate effectively.

### **Lack of Sleep Make you Less Socially, Emotionally Competent**

Research from Matthew Walker and colleagues at UC Berkeley using MRI technology helps explain exactly why sleep-deprived employees are often seen as moody, impatient and irritable. In the [2007 study](#), half of the 26 participants were kept awake for 35 hours straight and the other half were allowed a normal night's sleep. All of the subjects were hooked up to an MRI and shown a number of images while the researchers monitored what happened in their brains as each image were shown.

The sleep-deprived subjects showed significant activity in the amygdala — the section of the brain that puts the body on alert to protect itself and influences memory and emotions — as well as slowed activity in the ventrolateral prefrontal cortex, which influences logical reasoning and willpower. On the other hand, subjects who got a full night of sleep showed normal brain activity. It appears that the ability to manage emotions and curb self-control is significantly compromised directly due to sleep loss.

Two other studies, also at UC Berkeley, support the notion that lack of sleep can contribute to making you less emotionally intelligent. In the first, researchers took 37 healthy participants and randomly assigned into a sleep control or sleep deprivation group where they were asked to recognize the intensity of human facial emotions, an important aspect of emotional intelligence.

Participants who were sleep deprived had significant blunting in the recognition of angry and happy affective emotions, and these differences were most pronounced in female participants. The good news was that the deficit in ability to accurately discern the correct identification of emotional expressions by others was completely restored following one night of recovery sleep.

In the [second study](#) by Andrea Goldstein-Piekarski and colleagues, 18 healthy young adults viewed 70 facial expressions that ranged from friendly to threatening, once after a full night of sleep and once after 24 hours of being awake. Researchers scanned participants' brains using functional magnetic imagery (fMRI) and also measured their heart rate variability.

Brain scans confirmed that the sleep-deprived participants were unable to accurately distinguish between friendly and threatening faces. The inability to recognize and react to emotional expressions of others is important in an important facet of emotional and social competence that appears to be highly related to quality and quantity of sleep we get each night.

### **Lack of Sleep May Create Bossholes**

Several studies, including one of our own, suggest that lack of sleep can bring out the worst in bosses converting “lovable stars” to competent jerks.” Gallup’s 2015 “State Of The American Manager: Analytics and Advice For Leaders” suggested that only 1 of 10 managers have the right “stuff” to lead effectively, so any evidence that sleep contributes to bad boss behavior is not going to be good news.

A study by Jane Gaultney, professor of psychology at the University of North Carolina, explored weekend to weekday sleep differences in 379 business leaders. She found that leaders who had the biggest change in weekend to weeknight sleep quantity received significantly lower evaluations on their leadership effectiveness from colleagues and peers. [Another study](#) by Christopher Barnes, associate professor at the University of Washington and colleagues, found that daily sleep quality — but not quantity — directly influenced the leader’s self-control and those who were sleep deprived were rated as significantly more abusive and toxic in interpersonal interactions.

Our own research about 100 senior leaders found that lack of sleep was significantly correlated with lower scores on a validated measure of emotional intelligence. The sleep-deprived leaders were seen by peers and colleagues as demonstrating significantly less empathy, warmth and interpersonal effectiveness relative to leaders reporting little or no sleep loss over a three-month period.

### **Implications for Companies**

Especially for organizations, it is challenging to directly influence employees’ sleep behaviors since this activity primarily occurs outside work hours and is not easily affected by work interventions. But the cost of lack of sleep is too important for companies to ignore given the direct negative effects it has on safety, accidents, performance, employee engagement and health.

Companies today should consider some of the suggestions below to enhance employee well-being and help employees cope with today’s wired and “always on” mode contributing to lack of sleep and serious fatigue deficits on the job. Each of these may have a tremendous return on investment in both in terms of financial and performance outcomes.

- Provide all employees with sleep/fatigue education/information programs
- Review policies and practices around scheduling to minimize sleepiness and fatigue
- Review and implement organizational strategies to reduce and manage fatigue among employees, like non-punitive programs for employees to self-report being tired and/or decline work assignments due to fatigue
- Review and revise travel policies to encourage flexibility in schedules to maximize sleep and alertness, like start times for meetings and “red eye” flights
- Support and provide employee stress management, mindfulness training, yoga and meditation programs for employees; all have been found effective in addressing insomnia
- Review vacation and sick leave policies to minimize job burnout, work pressure and enhance detachment from work
- Offer quiet spaces and napping rooms for employees to catch up on sleep during their time at the office
- Include questions on employee engagement surveys that measure employee fatigue, stress and psychological well-being
- Increase supervisory training related to workplace safety orientation, attitudes and practices
- Offer training programs to leaders to increase knowledge related to human fatigue, sleep and circadian rhythms and actions to counteract the effects of fatigue
- Encourage employees to use company sponsored health and wellness and employee assistance programs to address work-life integration, sleep and fatigue issues

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*<http://www.talentmgt.com/2016/06/08/how-sleep-affects-performance-and-what-companies-can-do/>*

# Sleep Schedules Influence Job Performance

Sleep expert Mark Rosekind highlights what companies can do to help workers' performance.

**Q&A with sleep expert and Administrator of the National Highway Traffic Safety Administration, Mark Rosekind:**



**Nowack:** The National Sleep Foundation, along with scientists from multiple disciplines, in November 2015 announced a consensus on the threshold for when motorists are definitely too tired to drive. It has been estimated that at least 1 million car crashes annually are due to fatigue and drowsy driving. NSF polls indicate that 60% percent of Americans have driven drowsy in the last year and 37 percent report nodding off at the wheel. Irregular schedules can be associated with up to a 50 percent increase in on-the-job injuries and accidents and sleep-deprived individuals are more likely to be injured and involved in motor vehicle crashes.

What is the association between sleep deprivation, drowsiness and performance on the job?

**Rosekind:** NHTSA has expanded our concept of impaired driving to include: drunk, drugged, distracted and now the fourth D, drowsy. [Our own research](#) found that around 850 fatalities, or 2.6 percent of all fatal crashes, were attributable to drowsy driving in 2014. However, given the many difficulties identifying drowsy driving, clearly this figure underestimates the problem. Therefore, to combat drowsy driving, NHTSA has launched a National Drowsy Driving Initiative to obtain better measurement of the problem, identify effective countermeasures, develop a national educational campaign, address the issue in EMS/first responders, and explore effective policies.

**Nowack:** Can you expand on how you consider drowsy driving a fourth 'D' of impaired driving?

**Rosekind:** Any factor that can impair human performance could increase driving risk. Perhaps the most established factor is alcohol while drugged driving related to legal and illegal drug use is a growing concern. Distraction, especially related to texting and talking on the phone, has been a significant impaired driving issue since smartphones have become so widespread. Everyone needs to be awake to drive and therefore, sleep and alertness are fundamental to safe driving. Sleep loss and sleepiness can also worsen the effects of alcohol, drugs and distraction.

**Nowack:** Your research on counterfatigue strategies while at NASA Ames confirmed that we are biologically wired to need a mid-afternoon siesta and how alert an individual "feels" does not

reflect reality. What do you think about "napping" as a strategy to counter fatigue and drowsiness?

**Rosekind:** While at NASA, we conducted a unique [real-world study](#) that provided commercial airline pilots a planned nap opportunity in flight to determine the effects of a 40-minute nap on performance and alertness. The study found that on average pilots fell asleep in about six minutes and slept for about 26 minutes. These 26-minute naps enhanced objective performance by 34 percent and increased physiological alertness by 54 percent, with effects lasting around three to four hours. Clearly, when suffering the effects of sleep loss one effective strategy is to get sleep, even small amounts.

**Nowack:** On the topic of napping, what general guidelines do you suggest for effective napping?

**Rosekind:** NASA and other research suggest that naps can be optimized by following these six guidelines:

- The ideal time for a nap is during the lull in the circadian cycle – around 3 p.m. to 5 p.m.
- For a short nap, sleep up to 40 minutes
- For a longer nap, sleep about two hours
- Avoid a long nap too close to planned bedtime
- Allow 10-15 minutes “wake-up” after nap
- Consider sleep aids: eye mask, ear plugs

**Nowack:** The National Institute for Occupational Safety and Health has recommendations for designing shift work schedules that draw from sleep and circadian science that could potentially be applied to industries outside of transportation and medicine. What evidence based suggestions do you have for organizations to address these concerns?

**Rosekind:** There are many possible ways for companies to institute policies designed to enhance alertness and presenteeism as a result of sleep deficits and fatigue. For example, companies can examine shift length, time off between shifts and control of time zone changes over consecutive workdays. Greater education to employees about the risk of sleep loss, fatigue and wellness/health promotion programs designed to enhance healthy habits conducive to sleep as well as diagnose possible sleep disorders are a few actions that can have some tremendous bottom-line results on productivity and directly impact safety on the job.



*Mark Rosekind is the administrator for the United States federal agency responsible for highway traffic safety, the National Highway Traffic Safety Administration (NHTSA)*

<http://www.talentmgt.com/2016/06/08/sleep-schedules-influence-job-performance/>