

Behind the Wheel at Work



Behind the Wheel at Work is a quarterly eNewsletter bringing you the latest news from the NIOSH Center for Motor Vehicle Safety.

Volume 1 Number 3 June 2016

Road safety and sleep

Safety. Since our priority is motor vehicle safety at work, we're excited to release this issue of *Behind the Wheel at Work* during [National Safety Month](#) [↗](#).

We're also excited to announce that we will co-host a road safety Twitter chat with the National Safety Council on June 28. Follow us on [Twitter](#) @NIOSH_MVSAFETY for updates.

Sleep. We asked, you answered. Thanks to your feedback on [Volume 1 Number 2](#) of the newsletter, our Readers' Choice topic this month is fatigued and drowsy driving.

What motor vehicle safety topics pique your interest? Keep sharing your ideas. Send them to kur4@cdc.gov.

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<https://t.co/QujFiF3pSr>

[Follow CDC on Twitter](#)

NIOSH and NSC co-host #DriveSafe4Life Twitter chat on June 28

NIOSH and the National Safety Council are co-hosting a road safety **Twitter chat on June 28 from 1-2 p.m. ET**. The chat is part of National Safety Month, the annual June observance focused on reducing leading causes of injury and death at work, on the roads, and in homes and communities. Tweet using the [#DriveSafe4Life](#) hashtag to join the conversation, and follow [@NIOSH_MVSAFETY](#) and [@NSCsafety](#) for road safety tips during the chat.

We relaunched our website!



Behind the Wheel at Work is a way to connect you to researchers and subject matter experts who work with the CMVS. That being said, we see our website as the main place for work-related motor vehicle safety resources.

Now that we've relaunched our site, you should find an improved user experience. Learn more about our [strategic work](#), download our [distracted driving animated GIF](#) to share on social media, or visit the [Motor Vehicle Safety at Work directory](#) to get an overview of what we have to offer.

Safety tip for employers!

Authorize workers to stop driving if they are too tired to continue.

The difference between fatigued and drowsy driving



Fatigue is a known contributor to roadway crashes among commercial motor vehicle drivers, others who drive for work, and the general public. Not surprisingly, the issue of fatigued driving is a growing safety concern for government agencies, businesses, and safety advocates. **However, in media reports and safety materials, we often see the terms “drowsy driving” and “fatigued driving” used interchangeably. But do they really mean the same thing?**

- “Drowsiness” generally refers to the result of sleep restriction, disturbed sleep, or poor quality sleep. It may also result from medication side effects. According to a study by the AAA Foundation for Traffic Safety, people who sleep 6 to 7 hours a night are twice as likely to be involved in a sleep-related crash as those sleeping 8 hours or more. People sleeping less than 5 hours increase their risk four to five times.
- “Fatigue,” on the other hand, is a broader concept that has been defined in many different ways. While drowsiness can be a component of fatigue, fatigue can also result from a range of other sources such as stress, physical demands, or health conditions. These can have a combined or cumulative effect, with long-lasting consequences. All these sources affect the same region in the brain that is responsible for cognitive functions such as concentration, hand-eye coordination, and decision-making – skills that are needed for safe driving.

Fatigue can affect anyone, and it can be difficult to predict. Whether cognitive impairments stem from lack of sleep, sleep disruptions, or other sources, it's critical from a safety perspective to recognize when your driving skills may be compromised, and to take appropriate precautions.

Here are some strategies for reducing fatigue behind the wheel:

- Improve sleep habits to obtain adequate, quality sleep (see NIOSH's [“Quick sleep tips for truck drivers”](#)).
- Take frequent breaks during your journey to break up the monotony of driving.
- Reduce or eliminate distractions such as mobile phones. As we become more fatigued, our ability to sustain concentration is compromised.
- Adopt a healthy lifestyle (e.g., diet and exercise).
- Reduce the need for driving by doing work by phone or video-conferencing, choosing safer modes of transportation such as air or rail, or combining trips and loads.

Using a seat belt: It's good for business



CMVS partner the Network of Employers for Traffic Safety (NETS) recently launched the [2Seconds2Click™ campaign](#) [↗](#) site to help employers save lives by promoting seat belt use on and off the job. Developed in collaboration with The Coca-Cola Company and supported by the National Highway Traffic Safety Administration, the site includes materials for the 6-week employee engagement campaign designed to educate workers on the importance of wearing a seat belt on every trip.

[Not wearing a seat belt has a \\$4.9 billion direct effect on employer crash costs.](#) [↗](#) This includes crashes off the job involving employees and their dependents, in addition to on-the-job crashes.

It only takes about two seconds to buckle up. For workers, that small amount of time can make a big difference when it comes to reducing chances of injury or death in a crash. It may also mean the difference in how costly the crash is for employers.

“2Seconds2Click™ is a low-cost campaign, requiring very little management time, and the benefits from preventing an injury — or worse — are immeasurable,” said Jack Hanley, NETS’ Executive Director. “We encourage employers to take advantage of this easy-to-use toolkit that has been shown to produce results.”

[For an employer, an on-the-job fatal crash is 10x more costly on average than a non-fatal injury, which is 10x more costly on average than a property-damage-only crash. Costs per employee injured in a crash on the job average \\$48,000 unrestrained, far exceeding the \\$25,000 cost if restrained.](#) [↗](#)

As part of your workplace motor vehicle safety program, require the use of seat belts at all times by all drivers and passengers.

Explore these NIOSH resources for occupation-specific seat belt safety information:

- [Vital Signs: Trucker safety: Using a seat belt matters](#)
- [Video for oil and gas extraction workers: Take pride in your job: Seat belts](#)
- [NIOSH research improves equipment design to protect firefighters](#)

Focus on NIOSH CMVS researchers

Meet Imelda Wong, PhD



How would you describe your work at NIOSH?

I am an occupational hygienist and epidemiologist who recently started working with NIOSH as an ORISE Fellow.

My specific research interests are shift work, working time, sleep, and fatigue as it pertains to worker health. My work includes projects such as developing a fatigue management training tool and identifying risk factors for motor vehicle crashes among long-haul truck drivers. I’m also interested in studying the risk of commuting-related crashes.

What is the relationship between nonstandard work schedules, fatigue, and motor vehicle crashes?

Working nonstandard shifts can lead to changes in sleep behaviors which can affect concentration, reaction time, or decision-making abilities. Restricting sleep to less than 6 hours per day for up to two weeks has the same effect on cognitive impairment as 48 hours of total sleep loss. These effects may also have a long-term impact. Working nonstandard shifts accelerates brain aging, and even after quitting nonstandard schedules, it may take years to regain normal cognitive functioning.

The cognitive impairment and sleep disruption linked to nonstandard schedules have implications for motor vehicle crash risk. North American surveys report that about 60% of respondents have admitted to driving while fatigued or drowsy, and 30% have fallen asleep while driving.

Commuting poses a special crash risk, particularly among those working nonstandard schedules. The routine nature of commuting may make workers less vigilant and attentive to the task of driving, particularly if they are fatigued. Evidence shows that shift work and

extended working hours are associated with risky driving behaviors (e.g., drifting across lanes, nodding off while driving, or “near-misses”). Over the past two decades, more people have been working nonstandard schedules, and the number of people driving to and from work has almost doubled. We also spend more time in our cars and drive longer distances. While these changes suggest that the risk of fatigue-related crashes during commuting may be increasing, in fact, little is known about incidence or trends.

While overnight shifts are often associated with fatigue, the effect of *early morning* shifts on crash risk is often overlooked. Getting up early cuts into deep stages of sleep, and the anticipation of waking up early may affect sleep quality. Whether it occurs during work hours or commuting, fatigued driving is a danger to workers themselves and to other road users.

With increased awareness of the risks of fatigued driving and nonstandard work schedules, what issues and trends do you expect will get more attention in the near future?

Use of in-vehicle telematics – for non-commercial drivers. Some luxury vehicles have fatigue sensors based on eyelid closures which alert drivers when they might be nodding off behind the wheel.

Heightened awareness that fatigued driving is a pressing issue for both worker safety and public safety is leading to **improvements and new ideas for managing fatigue from both employer and employee perspectives**. A good example is online fatigue management training such as the [NIOSH training for nurses on shift work and long work hours](#).

I hope to see more **discussion about the risk for commuting motor vehicle crashes**. While some countries have recognized this as a work-related hazard, we haven’t really approached it in the same light in North America. Long or difficult commutes can compromise safety at and outside of work.

NIOSH study results connect truck drivers’ sleep patterns to driving performance



Approximately 2.6 million workers are employed as drivers of large trucks in the United States. Each year, about 4,000 people die in crashes involving large trucks and buses – truck drivers and passengers, as well as other road users. Fatigued or drowsy driving is widely recognized as a contributor to fatal crashes involving large trucks. Stress associated with working as a truck

driver (e.g., irregular schedules, long work hours, and economic pressures) may put these drivers at risk for insufficient sleep and/or irregular sleep behaviors or patterns.

A study done by NIOSH in collaboration with the Virginia Tech Transportation Institute examined sleep patterns of 96 commercial truck drivers during their non-work periods and evaluated the influence of these sleep patterns on subsequent truck-driving performance during work periods. Driving performance was measured by *safety-critical events* (SCEs), which include crashes, near-crashes, crash-relevant conflicts, and unintentional lane deviations.

The statistical analysis grouped each work shift into one of four distinct sleep patterns:

1. **Moderate sleep averaging 6.7 hours:** In general, sleep started in the middle of the non-work period and lasted approximately half of the non-work period.
2. **Short sleep averaging 5.8 hours:** Sleep started at the beginning of the non-work period and lasted on average for 44% of the non-work period.
3. **Long sleep averaging 8.1 hours:** In general, sleep occupied two-thirds of the non-work period.
4. **Long sleep averaging 9.3 hours:** Sleep occupied almost the entire non-work period, 93% on average.

Across all four sleep patterns, higher SCE risk was found among drivers who were male, had fewer years of truck-driving experience, or had higher body mass index (BMI). Pattern 2 shifts, which were characterized by shorter sleep time early in a non-work period, were associated with an increased rate of SCEs compared to Patterns 3 and 4, which had longer sleep periods. Pattern 2 shifts were also considerably less likely to have sleep during the time period between 1 and 5 a.m. compared to Patterns 1, 3, and 4.

Study results show the importance of drivers' receiving adequate sleep the night prior to their driving and underscore the importance of providing drivers with sufficient sleep opportunities. The results of this study suggest that longer sleep duration has a measurable safety benefit by reducing SCE risk in the following shift.

Findings from this study highlight the importance of driver training and fatigue prevention among truck drivers. Prevention strategies include educating drivers on the safety benefits of adequate sleep, getting sleep between 1 and 5 a.m., and arranging sleep late in the non-working period if possible. More sleep tips are available in NIOSH's [Quick Sleep Tips for Truck Drivers](#).

Publication: Chen GX, Fang YJ, Guo F, Hanowski RJ. [The influence of daily sleep patterns of commercial truck drivers on driving performance](#). *Accident Analysis and Prevention* 2016; 91: 55–63.

Seat belt use among adult workers in 21 U.S. states



Do your workers wear seat belts? CDC recently reported estimates of [seat belt use among adult workers in 21 U.S. states](#). Although the analysis did not specifically address seat belt use on the job, respondents did provide information about their occupation at the time of the interview. **This analysis provides the first estimates of seat belt use among a wide variety of occupational groups.**

Overall, the percentage of individuals who reported they did **not** always use a seat belt was higher in states with secondary belt laws (i.e., where drivers can be ticketed for not using a seat belt only if stopped for another offense) compared with states with primary belt laws (i.e., where drivers can be ticketed solely for not using a seat belt).

For every occupational group, the percentage of individuals who reported they did not always use a seat belt was higher in states with secondary seat belt laws. But, there was considerable variation among occupational groups in both primary- and secondary-law states. In primary-law states, the percentage of individuals who reported they did not always use a seat belt ranged from 5.4% in business and financial occupations to 18.0% in construction and extraction occupations. In secondary-law states, the range was 8.1% in the life, physical, and social sciences occupations to 55.5% in farming, forestry, and fishing occupations.

How can you keep workers safe on the road? Employers should establish comprehensive motor vehicle safety programs that require seat belt use at all times for all vehicle occupants (i.e., drivers and passengers) and reinforce seat belt safety in training meetings. Workers should use seat belts on every trip – no matter how short – and make sure passengers buckle up, too.

Did you know...

We co-hosted an occupational research in motor vehicle safety webinar a few months ago with the Society for Advancement of Violence and Injury Research (SAVIR). The webinar features national and international research in occupational road safety, including:

- Organizational-level approaches to influencing driver behaviors and performance
- Naturalistic driving intervention study to reduce risky driving behaviors among truck drivers
- Use of statewide data to examine occupational motor vehicle injuries

[Catch up on our webinar](#), and let us know of any topics that interest you!

Please send your comments and suggestions to us at kur4@cdc.gov.

In the news

[National Safety Month](#)

[NIOSH fact sheet: Older drivers in the workplace](#) [↗](#)

[NIOSH fact sheet aimed at keeping older workers safe behind the wheel](#) [↗](#)

[New NIOSH resource helps older workers navigate safe driving](#) [↗](#)

[Industry group focuses on road safety](#) [↗](#)

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