



Drowsy Driving

Drowsy Driving Statistics

Annually, drowsy driving accounts for approximately 328,000 crashes, 109,000 injuries, and 6400 fatalities. It is estimated that 7.6% of all fatal crashes from 2017-2021 involved a drowsy driver.

Sleep Deprivation vs. Fatigue

Fatigue is a term that generally refers to the subjective feeling of being tired, either physically or mentally, which can result from physical exertion, mental effort, or from sleep loss. In comparison, sleep deprivation is the condition of not having enough sleep to function properly.

There are two types of sleep deprivation—acute and chronic. Acute sleep deprivation refers to no sleep or inadequate sleep over a short period of time (usually 1 to 2 days). Chronic sleep deprivation refers to regularly getting insufficient sleep for optimal performance where the sleep loss adds up over time as does the performance decrements associated with lack of adequate sleep.

Effects of Sleep Deprivation

The effects of sleep deprivation include the following:

- Falling asleep while driving
- Microsleeps
- Increased reaction time
- Degraded attention and vigilance
- Increased distractibility and confusion
- Decreased motivation
- Increased probability of driving performance errors

In general, sleep deprivation results in lapsing, cognitive slowing, and vigilance decrease. In addition, sleep deprivation impairs decision-making and judgment, degrades people's ability to follow procedures, and reduces people's ability to integrate important information. With respect to mood, sleep-deprived people may experience irritability, forgetfulness, and aversion to effort. In other words, sleep deprivation not only affects a person's alertness, it also affects critical cognitive processes required to drive a vehicle. For this reason, accidents caused by sleep deprivation are likely not the result of decreased alertness alone.

The effects of sleep deprivation on driving performance and crash risk have been well established in the scientific literature and include increased lane deviations and departures as well as increased crash risk. As an example, a study of driver performance after one night of sleep restriction (e.g., 4 hours of sleep) followed by acute sleep deprivation of up to 48 hours showed the dangerous results of sleep deprivation on driver performance. The number of crashes increased immediately following one night of sleep restriction (i.e., only 4 hours of sleep). Performance after 24 hours of sleep deprivation showed large numbers of crashes and lane excursions.

Several studies have also compared the effects of sleep deprivation to the effects of alcohol consumption on psychomotor performance. The results of these studies indicate that sleep deprivation causes psychomotor impairment at levels that are equivalent to those caused by alcohol consumed up to and above the legal limit (e.g., 0.1% BAC).

Causes of Drowsy Driving

The causes of drowsy driving include:

- Time of Day
- Irregularly scheduled shifts
- Overnight and extended shifts
- Early wake times
- Drug or medication use
- Medical conditions

Drowsy driving research has found that time of day is the single most important factor contributing to fatigue and reduced alertness when driving and is the single best predictor of crashes. In fact, drowsiness episodes are 8 times more likely between midnight and 6am than during other times of the day. One study found that drivers are 20 times more likely to fall asleep while driving at 6am than at 10am. Additional sleep-related factors that may contribute to fatigue include how much total sleep a driver has gotten, what time the sleep occurred, and the quality of the sleep. In addition, environmental conditions (e.g., darkness, monotonous driving environment), underlying medical conditions (e.g., sleep apnea) and drug use (e.g., methamphetamine, drugs that cause drowsiness) may also contribute to fatigue.

Human Factors Investigations of Drowsy Driving

Human Factors investigations of drowsy driving crashes consider the underlying scientific causes of sleep deprivation and fatigue to answer two main questions:

- Was the driver fatigued or sleep-deprived at the time of the crash?
- Was fatigue or sleep deprivation a cause of the crash?

A human factors analysis includes evaluating the driver's sleep/wake history, circadian factors, and health factors to determine the extent of sleep loss/deprivation as well as evaluating the driver's actions to determine whether a driver was exhibiting the known effects of fatigue or sleep deprivation at the time of the collision.

If your case involves drowsy driving, contact Dr. Nancy Grugle to discuss how fatigue or sleep deprivation may have played a role in the collision.

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