

Fatigue Basics

How significant is fatigue as a road safety issue?

Road safety authorities in ON (and throughout North America) agree fatigue is a leading cause of motor vehicle incidents (MVI) – right up there with distractions, speed and impairment. The Canadian Council of Motor Transport Administrators reports that 20% of fatal collisions involve driver fatigue.



The Canadian Trucking Association reports that 30 to 40% of crashes in the heavy truck industry in North America are related to fatigue. A 2007 survey found that about 60% of Canadian drivers admitted that they occasionally drove while fatigued and 15% of respondents admitted that they had fallen asleep while driving during the past year (Vanlaar et al, 2008).

What is fatigue?

When it comes to driving, two types of fatigue matter – physical fatigue and mental fatigue. Both reduce a driver’s capability to perform essential driving-related duties.



Physical fatigue is the result of physically demanding duties. A full day of roofing or framing, lifting heavy boxes, or strenuous field activities can leave your muscles exhausted, and unable to respond as quickly or as effectively as they did when you started the day. In terms of driving, physical fatigue translates to longer reaction times and inaccurate or incorrect responses.

Mental fatigue is the greater concern for most of us. It is the physiological state or condition that decreases mental performance capabilities and impairs cognitive abilities. Mental fatigue reduces driver alertness, focus, attentiveness and decision-making ability in ways that reduce their ability to perform key driving functions.



What are the primary contributors to fatigue?

Acute and Cumulative Sleep Loss

Everyone’s sleep needs are unique, but for optimal performance 90% of us require 7.5 to 8.5 hours of sleep every night. Acute sleep loss occurs when an individual gets less than the necessary number of hours of sleep within a 24-hour period. Cumulative sleep loss occurs over several days. For example, if you lose one hour of sleep each night, after five days you have accumulated a sleep debt of five hours. Recovery from sleep debt does not require hour-for-hour pay back – two consecutive nights of good rest will often reduce accumulated sleep debt to zero.

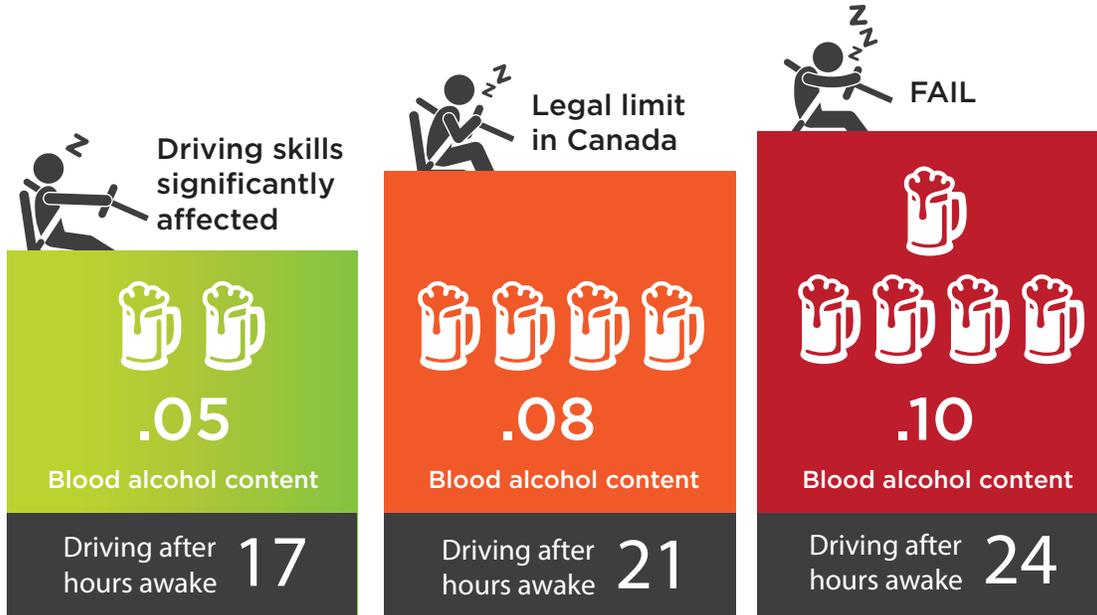


Continuous Hours of Wakefulness

It’s not only the length of your working day that matters; it’s how long you are awake. Studies indicate that 16 to 18 hours of continuous wakefulness is associated with significantly reduced performance and alertness.

Disruption of Circadian Rhythms

Our bodies are hard-wired to respond to environmental stimuli, especially light and dark. Circadian rhythm refers to the cycles (about 24 hours) of our internal clock which controls the timing of physiological processes such as body temperature, blood pressure, hormone release, digestion, and immune response. We function best with traditional patterns of daytime wakefulness and night time sleep. Lifestyles and work that run contrary to that cycle (e.g. evening and night work shifts) confuse one’s “built-in” circadian rhythm, resulting in accumulated fatigue and over-taxed human performance.



Estimates based in average-size male: 82kg

Sleep Disorders

Sleep disorders - sleep apnea, insomnia, night terrors, and others - greatly reduce sleep quality. Eight hours of tossing and turning, dozing and waking does not equal eight hours of sleep. Intermittent sleep prevents you from entering the most essential sleep elements - stage 3 and 4 non-REM sleep.



Medications

Some prescription medications (such as heart, blood pressure and asthma drugs) and over-the-counter medicines (such as pain relievers, cold decongestants, antihistamines and diet pills) contain caffeine or other stimulants that interrupt normal sleep patterns.



Stress and Workload

An 8-hour day that starts with a long commute and is filled with a demanding boss, complex problems, difficult customers, hard decisions, challenging patients or lost shipments is tiring enough. By the time you're driving home, any delays caused by a traffic incident can leave you frustrated, stressed-out and exhausted - and certainly in less-than-prime condition to diligently complete your driving responsibilities. How you cope with that stress before you head to bed will determine how good of a rest you get that night.

