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# Health and fatigue

March 2015

An introduction programme for drivers of heavy motor vehicles

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# FATIGUE – THE HIDDEN KILLER

There is no single definition of fatigue.

Fatigue is invisible and there is no single symptom. It is for this reason that driver fatigue is often called 'the hidden killer'.

Fatigue is believed to be a contributing factor in approximately 12 percent of all motor vehicle crashes.

For all drivers, fatigue often results in loss of alertness, drowsy driving or falling asleep at the wheel. These factors often show up first as poor judgement, slower reaction time and decreased driving skills. Ignoring these factors could result in your death or the death of another driver.

It is an established fact that in a fatigued driver the deterioration in driving skill occurs well before the driver falls asleep at the wheel.

When driving fatigued your judgement will be severely impaired. Fatigue affects anyone and is particularly dangerous because one of the major symptoms of fatigue is a reduced ability to judge your own level of tiredness.

## The causes of fatigue

Any of four main factors can influence the onset of fatigue:

1. Body clock factors:
  - working when you would normally be asleep
  - sleeping when you would normally be awake.
2. Sleep factors:
  - getting less than the normal amount of sleep
  - getting poor sleep.
3. Work factors:
  - working very long or extended hours
  - no time to recover from work.
4. Health factors:
  - medical sleep problems
  - general health and lifestyle issues.

## Impact of work time on fatigue

Common transport industry work practices include:

- working long hours
- prolonged night work
- working irregular hours
- little or poor sleep and early starting times.

In practice, many truck drivers work 12 or more hours per day, of which at least 60 percent is usually spent driving. A working week of 70 hours is common practice for many drivers. These long hours of work often result in fatigue and increase the crash risk. In addition, these work practices may disrupt eating and sleeping routines and affect a driver's body rhythms or body clock cycle, leading to sleep debt. Once this level of fatigue is reached, the only solution is sufficient, good-quality sleep.

**Important:** The maximum number of hours that a driver can work in any cumulative work day is 13 hours. A driver must have at least 10 hours continuous rest between cumulative work days (as well as the standard half hour breaks every five-and-a-half-hours). The number of hours that a driver can work in any cumulative work period is 70 hours (before a minimum 24 hour rest break must be taken).

## How to recognise fatigue

The common indicators of fatigue include:

- not feeling refreshed after sleep
- a greater tendency to fall asleep while at work
- more frequent naps during leisure hours
- feelings of being weary or sleepiness
- extended sleep during days off
- increased errors and loss of concentration at work.

Research has shown that the more fatigued a person becomes, the more likely they are to experience lapses of attention or wandering thoughts.

## Effects of fatigue

Driver fatigue covers things like the loss of alertness, feeling drowsy and distracted while driving or even falling asleep at the wheel.

### Loss of alertness

This means that you:

1. cannot respond quickly and safely to an emergency and may miss spotting dangers
2. may be less efficient at controlling your vehicle, for example changing gears, staying in your lane and maintaining steady speed.

### Drowsy driving

Drowsiness means feeling sleepy, but not actually being asleep.

If you feel drowsy you may actually drift in and out of sleep without knowing it. Drivers have been studied when drowsy and found to be asleep for many seconds without being aware of it. This accounts for some quite common 'ran-off-the-road' crashes.

### Crashes after falling asleep at the wheel

These are typically very severe single-vehicle crashes where there has been no attempt by the driver to control the vehicle and where the driver was clearly completely unaware of events before the crash.

It is not often that drivers will report they were asleep, but usually the evidence tells a different story.

### Poor memory

Being fatigued will affect your short-term memory. For example, you may suddenly become aware you have travelled 200 km without knowing it.

### Bad moods

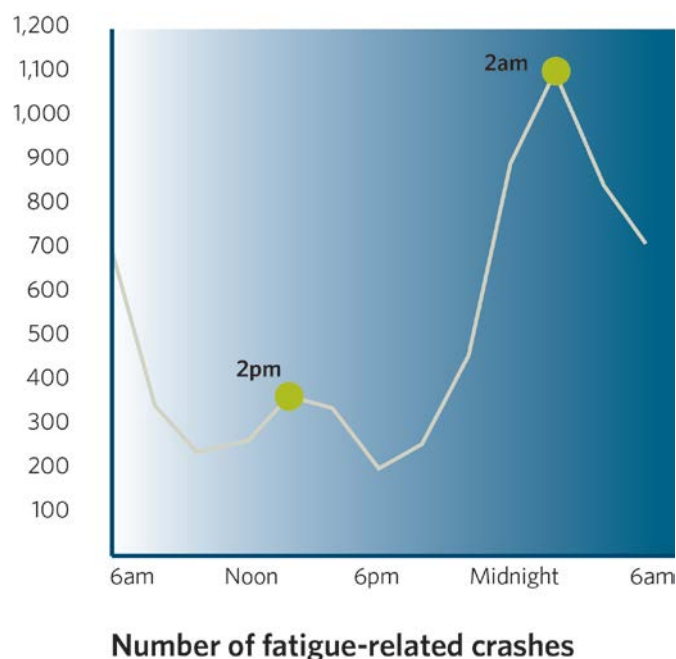
Being very fatigued can make you irritable and not very good company at work or at home. You are likely to overreact to things going on around you.

## Body clock and sleep factors

Your body clock runs on a natural biological cycle of around 24 hours. This is called the circadian rhythm (circadian means 'about a day'). We'll refer to it as your body clock. We all have a body clock. Your body clock synchronises your body rhythms. When the rhythms are out of 'synch' you get effects such as jet lag or feeling tired when you should be awake and wide awake when you should be asleep.

Human beings are designed to work in the daytime and sleep at night. Our internal body rhythms cause regular variations in individual body and mental functions during each 24-hour period. For instance, our body temperature, heart rate, blood pressure, breathing rate and adrenaline production

normally rise during the day and fall at night. These rhythms influence job performance and quality of sleep. Most of the body's basic functions show maximum activity by day and minimum activity by night. The body rhythms affect the behaviour, alertness, reaction times and mental capacity of people to varying degrees. Crash risk increases when the driver is driving at times when he or she would normally be asleep. There is also an increased crash risk during the mid-afternoon 'siesta hours'.



Although fatigue-related crashes can happen at any time, they tend to peak in the early morning, when we should be asleep, and in the early afternoon, soon after the midday meal.

Your body clock programmes you to sleep at night and to stay awake during the day. Your body temperature drops during the night and you get sleepy; then it rises during the day to help you feel alert.

At night your digestive system slows (because you are less likely to be eating) and your hormone production rises to repair your body. The hormone melatonin is the important one – it helps set your biological clock. Your body clock is controlled partly by light and dark and partly by what you do.

If you normally work from 9 to 5, some of the things that happen to you as a result of your body clock are:

- The morning light tells your body clock to make you more alert.
- During the morning your body clock keeps you alert.
- After lunch (siesta time) your body clock will turn your alertness down for a couple of hours.
- Your body clock will make you most alert in the late morning and early evening.
- Darkness in the evening tells your body clock to turn your alertness down again so you can get ready to sleep.
- After midnight your body clock will turn your body temperature and alertness right down so that you are switched off between 1 am and 6 am. At this time all your body functions are at their lowest level.

Research about body clocks has all pointed to the following:

- Without external time, your body clock tells you when to sleep, when to be active and when to have a nap.
- Without sunlight or clocks to guide you, your body will follow roughly a 24-hour cycle.
- People who have to work at night often have trouble adjusting their body clocks to meet the work regime. No matter how much sleep you get beforehand, you'll often feel sleepy during the 1 am to 6 am period.

## The need for sleep

We all have an irresistible need to sleep, and the urge to sleep is greatest during the night and early morning when most of us would normally be sleeping. However, people differ in the amount of sleep they need and their tolerance levels if they don't get enough sleep. Most sleep experts suggest that six hours sleep a night is the minimum but closer to eight is desirable. Less than this and the crash risk increases. Poor sleep, such as sleeping in a moving vehicle or a small amount of sleep over several days, leads to sleep debt. Sleep debt causes an irresistible urge to sleep, increasing the probability of falling asleep at the wheel and crashing.

Readily available mild stimulants, such as coffee, may reduce the likelihood of falling asleep when drowsy, but they don't reduce the need for sleep. Sleep which is delayed by stimulants or drugs (legal or otherwise) will need to be made up later.

The most beneficial sleep a person can have is a good night's sleep taken in a single continuous period. The restorative effects are less if the sleep is split between day and night time.

Some people experience excessive sleepiness during the day, despite apparently adequate periods of sleep. This suggests the presence of a sleep related disorder that requires medical attention.

### **Once fatigue has set in the only answer is sleep.**

Drivers working long hours, or working night shifts, have an average of one to four hours less sleep than permanent day workers. They tend to take more naps during leisure hours and sleep deficit builds up over several nights of work with poor or little sleep. Therefore, people working at night are generally more tired than people working during the day.

When driving, your body will tell you when you are sleepy, so if you experience any of the warning signs they must not be ignored. Studies have shown that people have a limited ability to predict the onset of sleep and, by continuing to drive when they are sleepy, place themselves and others at a great risk of a serious crash.

Indicators of lack of sleep include:

- a drowsy relaxed feeling
- blurred vision
- difficulty keeping your eyes open
- head nodding
- excessive yawning
- repeatedly drifting out of your lane.

## Sleep quality

Getting the right kind of sleep is just as important as getting enough sleep. In this case, both quality and quantity do count.

Getting eight hours of uninterrupted quality sleep allows your body to repair itself both mentally and physically; getting less than that or getting eight hours in separate periods is not as effective.

As you sleep your body cycles through several stages of sleep from light to deep. When your sleep is uninterrupted your body has the chance to go through the different cycles, giving you the maximum effectiveness. If, however, you break the sleep pattern, you lose some of the effectiveness of going through the various cycles.

It is too late to manage your fatigue after you have fallen asleep at the wheel!

## Work factors

Studies have shown that many truck drivers do not get sufficient quality sleep to avoid the onset of fatigue. The reality is that lack of quality sleep is the number one factor leading to driver fatigue. In many cases the lack of quality sleep is a direct result of poorly-planned work schedules; schedules that do not permit a driver to get the quality sleep that they require. Many drivers believe that just because they are not working then they are recovering lost sleep times regardless of whether they are actually asleep or not.

The hours a driver can legally work, be it driving or non-driving, are controlled by law. These controls are not new and have been in place for many years. But just because you are complying with the law in respect of working time does not mean that you are safe to drive; activities outside of work have just as much influence on your body, and thus your fatigue, as those that occur as a result of your job.

Prior to starting work, if you feel that you are too tired or sufficiently unwell to drive safely and could pose a hazard on the road to yourself and/or other road users, then you have a moral responsibility to inform your dispatcher. They have a legal responsibility to listen and take appropriate action.

### **You must get off the road immediately if:**

- you find yourself weaving in your lane or drifting across the marker lines into other lanes
- your eyes start to play tricks on you, for example, a motorway off-ramp looks like your lane or a road sign looks like a person standing on the side of the road
- you lose mental focus and become unable to concentrate on one thing for more than a few seconds
- your eyelids become heavy and may occasionally close by themselves
- your head falls toward your chest
- you doze off.



## Your health

### Stress

Definite links have also been made between stress and fatigue. Fatigue is a major problem for truck drivers, and because of this you need to take steps to control your stress as a factor of controlling the onset of fatigue.

#### What is stress?

There are many definitions of stress and many theories about what causes it, but workplace stress can be defined as the result of the interaction between a person and their work environment. For the person, it is the awareness of not being able to cope with the demands of their work environment, with an associated negative emotional response.

In relation to driving, stress can be interpreted as the inability to cope with the many demands placed on a driver undertaking the complex task of driving. One commonly talked about example is 'road rage'.

#### How do you identify stress?

There are a number of tests to determine if you are prone to stress or have a low stress tolerance. These tests can include accident risk management profiling, which is used as an employment tool by many of today's transport operators. However, personal stress can be identified by answering these questions:

- Do you have difficulty sleeping?
- Are you prone to fatigue?
- Do you always feel weary?
- Are you intolerant of others?
- Are you distrustful or suspicious of others?
- Are you withdrawn?
- Do you lack motivation?
- Do you always feel that in any situation the worst possible thing will always happen?

If you answer yes to these questions, then you may be suffering from stress.

If you are experiencing stress, and it is affecting your job or out of work activities, this is called stress overload and you must take action to control the causes of the stress. It is strongly suggested that you see your doctor before stress takes control of your life and perhaps ruins it, or someone else's life.

### Road rage

Drivers will often show that they are under stress by aggressive driving, often culminating in road rage.

Aggressive driving consists of practices exhibited by high-risk drivers who use the anonymity of a vehicle to take out their frustrations on others. For them, frustration levels are high, and their level of concern for other road users is low.

Aggressive drivers don't bother stopping at Stop signs and red lights. They speed, tailgate, weave in and out of traffic, pass on the left, make improper and unsafe lane changes, make hand and facial gestures, scream, blow their horn, and flash their lights. They drive at speeds far in excess of what is safe, which causes them to follow too closely, change lanes frequently and abruptly without notice (ie, they don't use signals). They pass on the shoulder or unpaved portions of the roadway and stare at and/or threaten (verbally or through gestures) other motorists who are thoughtless enough to be in front of them.

## General health

Driving any motor vehicle requires:

- constant attention
- good judgement
- appropriate responsiveness, and
- reasonable physical capability.

All of these rely on a driver maintaining good physical and psychological health.

Commercial vehicle driving brings with it additional demands due to the:

- nature of the vehicle itself, eg size or load
- distance travelled
- responsibility to passengers
- nature of goods carried, eg dangerous goods
- working hours and delivery schedules.

The extent to which medical conditions contribute to vehicle crashes is difficult to assess, however, certain medical conditions and health circumstances do have the potential to cause serious impairment. There is also recognition that lifestyle behaviours can impact on health and driving performance, particularly in relation to driver fatigue.

A driver's health can therefore affect public safety and the environment, as well as their own safety.

## What health problems can affect fitness to drive?

Common examples of health problems that might affect fitness to drive are described below.

### Vision problems

Good vision, including the ability to see clearly, and with adequate fields of vision, is vital for safe driving. Drivers need to be able to detect other vehicles and pedestrians, as well as any hazards on the road.

### Heart disease

Heart and blood vessel disease is a risk because of possible loss of consciousness or collapse at the wheel.

### Diabetes

The main risk for drivers with diabetes is a loss of consciousness due to lack of control of their condition. Effects on other organs, such as the eyes and heart, may also affect driving ability in the long term.

### Epilepsy

If untreated, epilepsy can result in loss of awareness, loss of consciousness and loss of control of the body. These effects are not compatible with safe driving.

### Blackouts and fainting

Blackouts and fainting will clearly affect a driver's ability to control a vehicle.

### Psychiatric disorders

Mental illness can result in significant changes to a driver's behaviour. If untreated, this can increase the risk of a crash by affecting concentration, decision-making and various other important aspects of the driving task.

### Age-related decline

Getting older does not necessarily mean that driving will be affected, however drivers should be aware of changes such as reduced vision and hearing, reduced reaction times and limited movement.

### Sleep disorders

Sleep loss is often caused by disorders that disrupt the quality and quantity of sleep a person gets. Some disorders have been found to increase the rate of crashes by as much as seven-fold.

There are 84 recognised sleeping disorders, the most common of which is sleep apnoea.

Sleep apnoea affects approximately five percent of the middle-aged population. In sleep apnoea, the sleeper's throat relaxes so deeply that they stop breathing. The sleeper gasps, wakes up enough to start breathing normally and then goes back to sleep without being aware of any problem. This process repeats itself as many as 600 times a night, leaving the apnoea sufferer extremely sleepy during the day.

The most common risk factors for sleep apnoea are being overweight, male and middle-aged. Sleep apnoea is usually accompanied by snoring (although snoring can be caused by other things).

Sleep apnoea can be successfully treated. If you think you might have it, see your doctor immediately.

## Exercise

Physical activity protects against disease and promotes health. Studies show that a lack of physical activity and low levels of physical fitness contribute substantially to major chronic diseases. It is a major worry that 75 percent of the population is either sedentary or exercise insufficiently to obtain any appreciable health benefit.

Exercise helps bowel health and reduces constipation. It improves our breathing, so we get more oxygen and helps us have better cholesterol levels.

While walking (20 to 30 minutes continuously, four days per week) is recognised as one of the best forms of exercise, cycling, swimming and regular physical activity such as gardening all help our bodies work much better.

It can also be beneficial to learn relaxation techniques that can be used in the cab of your truck, such as neck roll exercises.

## Diet

Your general good health and your resistance to stress can be enhanced by having a good all-round diet that is rich in wholegrain foods, vegetables and fruit, and by avoiding the excessive use of alcohol, caffeine and tobacco.

## Water

Remember, as you eat you also need more fluid. Around 6–8 glasses of water a day is ideal for most people.

Fresh, pure water is absolutely essential to good health. Water promotes good bowel health and aids kidney, lung and brain function. Oxygen cannot be absorbed into our lungs unless the air sacs are moist. Water absorbs and releases heat very slowly, thus being well hydrated (drinking plenty of water) helps us cope with fluctuations in temperature. Water serves as a lubricant and is necessary for most of the chemical reactions in our body.

Without enough water we will be subject to disorders such as dry skin, constipation, poor memory, bladder infections and kidney stones, to name only a few. The caffeine in coffee, tea and cola drinks, and the alcohol in beer and wine, cause fluid loss and cannot be counted as good sources of water intake. We can drink these in moderation but we need the water as well.

## Ways to reduce fatigue

### Don't try to beat your body clock

Whether you have adequate sleep or not, you will have high points when you feel alert and low points when you feel drowsy or want to sleep. Lack of sleep just makes these feelings worse. You will feel most sleepy between 1 am and 6 am, and between 1 pm and 4 pm. If your schedule is particularly demanding, or you have fallen behind schedule, you may not be able to get a good night's sleep and you will feel like a nap in the afternoon. If this happens, listen to your body clock and schedule breaks for rest or naps.

The likelihood of falling asleep when the body clock is set to its 'sleep' function is very much higher than at other times in the day.

### Don't mess around with your body clock

Try and stick to a regular sleep and waking routine on every day of the week, so that sleep, meals and activity are always at the same time. This includes during time off as this will improve your sleep quality and your alertness when you are awake.

### Get rid of your sleep debt as soon as possible

Losing two hours of sleep each day for four days will make you nearly as fatigued as losing a whole night of sleep. Plan your time off so you have enough sleep to cancel the debt. Avoid being tempted to go to parties and engagements if they will eat into the time when you should be repaying the sleep debt. Discuss with your family and friends why sleep is so important for you.

### Plan your trip

Most driving schedules will hinge on pick-up and delivery times and dates. It's up to you and your dispatcher to plan the details of your trip to include time for sleep, food and rest, including extra time for naps, should you need them.

### Recognise and act on your signs of sleepiness

Once fatigue has set in, the only effective counter-measure is sleep. Don't wait till sleep happens before you find out that you were too fatigued to drive safely!

If you pull over to nap in your cab, find out how sleepy you are by noting how long it takes to fall asleep. If sleep occurs within five minutes, then it was time to pull over. If it takes you 20 minutes to fall asleep, maybe you did not need to do so just yet.

### Work out how much sleep you really need

Work out how much sleep you really need by recording how much you sleep when you are on holiday. Try keeping a diary to see how much less sleep you have had while at work and calculate whether you are repaying your sleep debt away from work. If not, you are a hazard on the road and need to do something about it.

## Manage your fatigue at home

Use your time off work to recover from sleep debt, not to incur more. This means setting up conditions at home so that you get as much sleep as you need. Work out how to reduce noise, light and disturbances, and to develop a regular sleep pattern.

## Develop your techniques for staying alert in the cab

Even if we have adequate sleep, the monotony of a trip can make you less alert.

If the vehicle is hot and the route is monotonous, anyone will lose attention. But the driver who has had insufficient sleep will be lulled into sleep.

You should develop some mental games and habits to help keep your mind alert.

## Take advantage of opportunities to nap

Taking a nap is not a sign of inability to cope with fatigue or being a poor driver; it is good fatigue management practice. When any opportunity to nap and rest occurs, take it.

## Eat sensibly and at regular times

You don't have to be overweight to be a driver!

Eating high-calorie and fatty foods can make you sleepy even if you have had enough sleep.

Drink plenty of water and eat sufficient light and healthy food to keep you going.

## Exercise

Exercise will keep you fit, keep your weight down and improve blood flow where you need it. Driving involves long periods of inactivity, so take advantage of stops to get some exercise, such as a short walk.

## Stimulants

If you feel like taking stimulants, perhaps this indicates that you need more rest and sleep, or that your schedules and rosters are too demanding. Use stimulants only when you need them and beware of strong stimulants. Caffeine in coffee and cola based drinks can be good mild stimulant, but is no replacement for sufficient sleep.

Stimulants are not the answer to fatigue. Do not use them at a time when their effect will interfere with your next sleep. Remember, amphetamines and other stimulants only delay sleep, and when they wear off you will be doubly tired.

## Look after your health

Regular health checks are important. You need to be sure you do not have a sleep disorder or other medical condition that could affect your ability to drive safely.

## Final tips

### Avoiding fatigue

- Plan your trip ahead of time so as to allow time for breaks.
- Drive your vehicle smoothly; cut down on rough driving, hard turns and sudden, harsh, braking.
- Avoid excessive caffeine – it may pick you up for a while but it will leave you even more tired than before.
- If you wear glasses, make sure they are suitable for your eyesight, and in sunny weather wear sunglasses.
- Keep your windscreen clean.
- Eat healthy meals.
- Get plenty of sleep.
- Adjust your out-of-work activities to allow you to have adequate rest before commencing work.
- If you have trouble sleeping, seek medical advice.

### Get quality sleep

- Make sure the temperature in the room is comfortable; not too hot or cold.
- Don't exercise immediately before going to bed – you are likely to still be on a 'high' and will have difficulty getting to sleep.
- Avoid heavy meals, caffeine and alcohol immediately before going to sleep.

The ability to effectively manage the factors that contribute to fatigue is one of the most important skills for a truck driver in today's high-pressure work environment.