



# DRUGS AND DRIVING

# Drugs and Driving

## Prevalence of drug driving

Motor vehicle accidents are a major cause of death internationally. In Australia they account for one fifth of accidental deaths. Alcohol and other drugs have been shown to play a major role in many of these. Unfortunately, driving under the influence of alcohol and/or other drugs is common in Australia. Approximately one in ten Australians report having been involved in drink driving in the past year, and one in twenty five report drug driving.

Approximately one quarter of fatal road accidents in Australia are caused by alcohol, compared to one in ten by other drugs. However, this appears to be changing. Recent research shows that the number of drink drivers killed in motor vehicles in Australia has decreased over recent years, while those killed under the influence of drugs has risen.

Cannabis is the most common drug detected among drivers involved in motor vehicle accidents and those suspected of impaired driving. This is not surprising, as cannabis is the most widely used illicit drug in Australia. Other drugs commonly detected among drivers are benzodiazepines (i.e. sleeping pills such as Valium), cocaine, amphetamines and opioids (i.e. drugs such as heroin, codeine and methadone). Multiple drugs are also often detected, as is alcohol used with one or more drugs.

## Characteristics of drug drivers

While there are a range of people found to be involved in drug driving, drug drivers are most likely to be young males. The link between young people and driving risk is the same for drug driving. Research has found young drivers are more likely to drive after taking drugs than older drivers. This is not surprising, as young people are also more likely to use drugs. However, this pattern does not fit for all drugs, as older drivers are more likely to drive after having used benzodiazepines, possibly due to the higher rates of benzodiazepine use among older people.

Males are more likely to be illicit drug users, and are more likely to engage in risk-taking behaviour. It makes sense, then, that most studies have found male drivers more likely to be positive for drugs than female drivers. However, drug driving among females does appear to have been increasing in recent years.

# Do drugs impair driving performance?

While those drivers involved in accidents often test positive for alcohol and/or other drugs, this does not mean that their driving was impaired at the time of the accident. Researchers have looked at this using laboratory studies, driving simulator studies, closed-circuit or on-road driving studies and field or 'real-world' studies. While there is no doubt that alcohol decreases driving performance and increases the risk of motor vehicle accident, the link between other drugs and driving performance is not as strong.

## Alcohol

There is no doubt that alcohol reduces driving performance, and increases the risk of motor vehicle accidents:

- 0 Laboratory studies have shown that alcohol affects a range of skills necessary for driving, such as:
  - concentration
  - co-ordination
  - attention
  - reaction time
- 0 Simulator and driving studies have shown that certain driving skills are reduced after drinking alcohol, such as:
  - brake reaction time
  - collision frequency
  - speed control
  - indicator use
  - steering
  - lane control
- 0 Studies of actual motor vehicle accidents have shown that alcohol increases accident-involvement, and more importantly, greatly increases the risk of responsibility for the accident. For example, at a blood alcohol concentration of 0.1% the chance that the accident-involved driver was responsible for the accident is approximately 90%.

**The more alcohol a person drinks, the worse their driving performance becomes. In addition, using alcohol has been shown to increase the risk of being involved in an accident and being responsible for one.**

## Cannabis

The link between cannabis and driving impairment is less clear than that between alcohol and driving performance. While some studies show that cannabis can affect certain driving skills, there is little evidence to show that the drug affects actual driving performance.

**0** Laboratory studies have shown that using the main psychoactive ingredient of cannabis, delta-9-tetra-hydrocannabinol (THC) can affect a range of skills necessary for driving, such as:

- attention
- reaction-time
- short-term memory
- hand-eye coordination
- alertness
- time and distance perception
- decision making
- concentration

**0** Simulator and driving studies have shown that a range of driving skills may be affected after cannabis use, such as:

- steering
- reaction time
- headway control (working out the distance between your vehicle and the vehicle in front)
- speed control
- lane position
- car following

**0** Studies of cannabis and accident-involvement are mixed, with some studies finding THC-positive drivers more likely to be involved in accidents than THC-free drivers, while other studies have found no difference between the groups.

It has been suggested that cannabis-affected drivers are able to compensate for the effects of the drug by driving more slowly or avoiding risky driving manoeuvres. While this may decrease some of the accident risk, there is still a safety issue in regards to unexpected occurrences on the road, with drivers having a slower reaction time and problems with decision making.

**Cannabis affects your ability to react and pay attention on the road. There has been some debate as to whether the driver can compensate for the effects of the drug (e.g. by driving more slowly), but there is still a safety issue due to unexpected occurrences on the road.**

## **Stimulants (amphetamines, ecstasy and cocaine)**

There is very little information on the effect of stimulants on driving performance.

**0** Laboratory studies have shown that small amounts of amphetamines have few negative effects on performance, and in some cases, have been found to improve performance (though usually only in tired subjects performing simple tasks). However, ecstasy (MDMA) does appear to affect such areas as attention, memory and perception. The evidence is mixed regarding cocaine, with some studies finding the drug decreases performance, others finding cocaine increases performance, and some finding no effect of cocaine on performance at all.

**0** There are very few simulator and driving studies in this area. However, recent research using a driving simulator showed evidence of a form of "tunnel vision" after using amphetamine, in which the driver focussed on only one thing, and ignored their peripheral vision.

One area that needs examination is the effect on driving performance caused by fatigue after stimulant use. This issue is of particular concern for long distance heavy vehicle drivers, a group believed to regularly use stimulants. This is also an issue for nightclub and dance party patrons who are travelling home after a night out. We also need more information on the link between increased confidence and risk-taking after stimulant use, and whether this increases the possibility of an accident.

**There is little research on the link between stimulant use and driving performance and what has been done is inconsistent. Issues that need to be examined more closely are the possibility of fatigue after using stimulants and increased confidence and risk-taking after taking this type of drug.**

## Opioids (heroin, methadone)

As with stimulants, there is very little information on opioids and driving performance.

- 0 Laboratory studies have shown mixed findings regarding opioids and performance. However, methadone has been shown to reduce a range of skills necessary for driving, such as reaction time, concentration and vision among non-opioid users, but not among opioid-dependent users (possibly due to the building up of a tolerance to the drug). However, opioid-dependent users have been found to still experience other effects from opioids such as drowsiness.
- 0 Simulator and driving studies have found no evidence of significant impairment in driving performance. However, it is important to realize that these studies have been conducted on patients who are using these drugs for opioid dependence or pain relief.

The mixed results regarding opioids and driving performance are believed to be due to a range of factors such as the amount of drug used, the type of opioid administered, how the drug was used and tolerance.

**There is little research on the link between opioid use and driving performance and what has been done is inconsistent. More work needs to be done to examine illicit opioid use, and the use of increased amounts of the drug.**

## Benzodiazepines

Many prescription drugs affect driving skills. The most commonly studied group of prescription drugs in relation to driving impairment are benzodiazepines. Benzodiazepines (or 'benzos') are sometimes called minor tranquilizers, pills or sleepers and include drugs such as Valium, Serepax and Normison. Like alcohol, heroin and cannabis, benzos are 'downers'. They affect the central nervous system by slowing down the body physically, mentally and emotionally.

**0** Laboratory studies have found benzodiazepines reduce skills necessary for driving, such as:

- visual and speed perception
- concentration
- coordination
- reaction time
- memory

**0** Simulator and driving studies have found that driving after using benzodiazepines affect a range of driving skills, including:

- emergency decision making
- lane position
- steering
- braking
- speed control
- attention
- reaction time

As with other drugs, there are mixed findings on the link between benzodiazepines and driving performance. It is believed that this is due to factors such as the type of benzodiazepine used and tolerance to the drug.

**The more benzodiazepines a person uses, the worse their driving performance becomes. Some benzodiazepines will cause greater problems, as will the driver's tolerance to the particular drug.**

## Other prescription drugs

A number of other prescription drugs have been found to impair driving ability, such as antidepressants, allergy medicines, blood sugar medicines, blood pressure medicines, motion sickness medication, antibiotics, anti-seizure medications, anti-nausea medicines, sedatives, cough syrups, decongestants, and more. Such drugs are labelled, with information regarding safe usage of the medication, including the effect on driving skills.

## Multiple drugs

Drivers positive for multiple drugs or drugs in combination with alcohol are at greater risk than drivers positive for one drug or alcohol alone.

- 0 Laboratory studies show greater effects on skills necessary for driving when alcohol is used with other drugs, compared to alcohol alone. There is also some evidence of greater risks when multiple drugs (apart from alcohol) are used in combination.
- 0 Simulator and driving studies show increased impairment when alcohol is combined with other drugs, most commonly cannabis or benzodiazepines.
- 0 Field studies clearly demonstrate that using drugs and alcohol in combination, or mixing drugs together place drivers at a far greater risk of accident, than one drug alone.

## Summary

Overall, it is clear that alcohol significantly impairs driving performance and increases the risk of an accident. There is also evidence that cannabis and some prescription drugs (such as benzodiazepines) impair performance and increase accident risk. However, there is a limited amount of evidence on the effect of opioids and stimulants on driving performance.

Results from laboratory, simulator and driving studies are limited as they can only study the effects of low levels of a drug, due to issues around giving study subjects large doses of drugs. It is difficult to relate these to the real-world situation, as a range of other factors come into play with actual driving, such as compensatory driving (taking drug use into account and driving more carefully), and external variables such as weather conditions and other drivers. Unfortunately, there are few, large-scale field studies, which would shed more light on the issue of drug use and motor vehicle risk.

**However, it can still be assumed that any drug used at a high dose is likely to increase accident risk. Further, multiple drugs, and alcohol in combination with drugs present a great risk to road safety.**

# Drug and alcohol testing in relation to driving

While alcohol remains the major focus of government bodies in regards to driver impairment, drug driving is gaining increasing attention. While random breath testing is a simple and effective procedure for detecting drink drivers, the detection of drug drivers presents more of a problem. While there are a range of drug testing procedures, not all are suitable for roadside drug testing. Some of the major types of drug testing procedures are described below:

## Urine analysis

Urine testing is the most commonly used method of detection. While the period the drug can be detected varies, urine samples generally contain the highest concentration of drugs and drug metabolites within six hours of using the drug, and are mostly eliminated from urine within 48 to 72 hours of use. One of the major problems with urine testing is the possibility of the urine sample being tampered with, either using other substances to adulterate the sample, or substituting one sample for another. There are a range of on-site urine testing kits available, which are similar to laboratory-based urine analysis, although they are generally more expensive.

## Blood analysis

Blood is not generally used for drug testing as its analysis is costly, and blood sampling is much more invasive than other methods. Blood analysis detects only those drugs recently used by an individual as most drugs are rapidly eliminated from blood, by the body's metabolism and by excretion into urine. The typical detection period is 1 to 48 hours. An advantage of blood analysis is that it can provide information on an individual's level of intoxication.

## Saliva analysis

Saliva analysis is a rapidly developing technology. It is a simple, non-invasive method, and a number of on-site devices are commercially available. The drug concentration found in saliva when compared to the concentrations found in blood are very similar, which means that saliva testing, like blood analysis can be used to show effect and impairment. However, the correlation between the amount of drug used and the concentration of the drug found in the saliva varies between individuals, meaning that two people may have used the same amount of a drug, but have significantly different concentrations of that drug in their saliva.



While most drugs disappear from saliva within 12 to 24 hours of use, some studies have found evidence that chronic drug use can extend this time. As with urine testing, there is some risk of sample adulteration. Supervision is required when the sample is being taken, as substances eaten, drunk or smoked in the ten to thirty minutes prior to sampling can affect test results.

## **Hair analysis**

Hair analysis is becoming an increasingly popular drug detection technique. Drugs move into the hair follicles from the capillaries and via secretions from the various glands that coat the hair. Hair analysis has a wide detection period, with drugs able to be identified in hair samples months after use. However, it cannot detect drug use within the past seven days, due to the slow growth rate of hair. Hair analysis has a number of limitations, for example, it cannot be used to show the level of drug use. Also, drugs in the environment can be absorbed in hair, and it is currently impossible to determine whether the drug has been used passively or not. A range of other factors can affect the concentrations of drugs in the hair, such as hair hygiene, cosmetic hair treatments, and differences in hair structure. To date there are no commercially available on-site hair testing kits available.

## **Sweat analysis**

There have also been recent developments in sweat patch technology, however more research is needed in this area. It appears that sweat analysis may be useful in monitoring continuous drug use over one to two weeks. Sweat analysis is relatively inexpensive, is non-invasive, and is quite resistant to tampering. However, there is a possibility of environmental contamination, as the patch is worn for approximately 30 minutes.

## **What does this mean for roadside drug testing?**

While there are a number of drug testing procedures available, not all of them are suitable for roadside testing. Hair analysis can detect drugs that have been used several months prior to testing and cannot detect recent drug use. Similarly, sweat analysis is not a good method for identifying recent drug use, as it can detect drugs used one to two weeks earlier. Blood and urine analysis are also unsuitable methods, as their sampling is intrusive and the cost of using these tests in a roadside situation would be too high. Saliva analysis appears to be the best method available as it detects recent drug use (typically within 12 to 24

hours), and is simple, non-invasive and cost-effective. Further, the results can be used to assess drug-related impairment.

Although roadside drug screening is an important development in the policing of drug driving, there are a number of issues relating to its use. At present, roadside drug testing devices are expensive, their reliability is not as good as that for breath testing, and positive results need to be confirmed by standard laboratory testing off-site. Also, it is not yet possible to determine the level at which to set the legal limit for driving with drugs other than alcohol, due to various factors such as variability of absorption, tolerance and drug purity. For this reason, in jurisdictions in which roadside drug testing is currently taking place, there is typically a “zero-tolerance” approach to drug driving, with any amount of a drug in the system considered illegal.

There is a great need for further research into the effects of drugs on driving performance, in order to determine which drugs significantly impair driving impairment, and consequently, which drugs should be targeted in roadside drug testing. As stated, drug driving is an increasingly common phenomenon, which has the potential of significantly increasing the number of people injured or killed on Australian roads.

## **Frequently asked questions**

### **Is drug driving illegal?**

All states and territories in Australia have laws that make it illegal to drive when under the influence of drugs. Most jurisdictions require driving impairment to be established. That is, being under the influence of a drug to the extent of being incapable of exercising proper control of the vehicle. In addition, every jurisdiction has laws which allow for the testing of drivers for illicit drugs, although how this is done varies in each state and territory.

### **What are the penalties for drug driving?**

The penalties for drug driving vary in each state and territory. Typically drivers can be charged with drug driving under road safety or transport legislation, for which the charge is for being in control of a vehicle while being under the influence of or positive for drugs, and offences under the criminal act, such as dangerous driving causing bodily harm, if the driver was to injure someone while driving under the influence of a drug.

## **Are the penalties the same for drug driving and drink driving?**

There are some small differences between the laws for drug driving and drink driving, but overall, the laws and penalties are similar for both. As with drug driving, drink driving is illegal in all states and territories of Australia, with only a slight variation in the laws according to the particular jurisdiction. Also similar to drug driving, drink drivers can be charged with criminal offences, as well as offences under road transport legislation.

## **If I have been using drugs, how do I know if I am safe to drive?**

Unfortunately, there is no easy answer to this question. As opposed to drink driving, with which people can roughly estimate their BAC according to the number of standard drinks consumed per hour, there are no such formulas for drug driving. It is important to remember that even these are only guidelines, there are no 'rules' when it comes to drinking and driving safely.

## **Cannabis makes me a better driver - I am more cautious and drive more slowly. So, why is it illegal?**

While it has been reported that people often take precautions when driving after using cannabis (such as driving more slowly), the problem lies in reaction time and altered perception. When people use cannabis, their time and distance perception is affected, their coordination is reduced, and the time it takes for them to react is much longer. Therefore, if a cannabis-affected driver is in a high-risk or unexpected situation, they will be less able to make an accurate judgement of the situation, and may take longer to react, placing them at a much greater risk of accident.

## **Can stimulant drugs like speed improve your driving skills?**

While 'speed' or methamphetamine can improve concentration when used in small doses by someone who is tired, it causes a significant risk to road safety when used in larger amounts. Large doses of methamphetamine can increase confidence and risk-taking behaviour, which may lead a driver to take risks that they would not normally take, or to drive outside of their ability. Also, stimulant drugs can mask the effects of fatigue, which is a common factor in accidents.

## **Can the police do roadside tests for drugs like they do with alcohol?**

Yes, police can do roadside screens for drugs, although they do not use the random breath testing procedure used for alcohol. Instead, the most common method used in roadside drug screening is saliva testing, which detects drugs used in the past 12 to 24 hours. At present, roadside drug screening is being tested in various states in Australia, but it is not yet a national initiative.

## **How long does it take for a drug to get out of your system?**

This varies depending on a range of factors, such as metabolism, body fat content, exercise and hydration, and obviously the type of drug used, how much of the drug was used, how it was administered, and the frequency of administration. Basically, the more often you use a drug, and the greater the amount used, the longer it will stay in your body.

## **How long after using a drug can it be detected by roadside saliva testing?**

Saliva testing provides an accurate measure of how much of a drug is in a person's bloodstream, as water-soluble substances diffuse directly from the bloodstream into saliva. Therefore, saliva tests should only detect drugs that are still present in your bloodstream. This time varies from drug to drug, but typically the detection period is up to 48 hours after use. However, not all drugs are water-soluble. THC, the active component of cannabis, is fat-soluble - it is absorbed directly into the cells in the lining of your mouth. THC should only be detectable in saliva tests for approximately four hours after use, however this may be longer for regular users of the drug. It has been suggested that dependent or heavy drug users may test positive for drugs even if they have not used the drug in the few hours before the screen.

## **What drugs can be detected by drug screens?**

Different tests are able to detect different drugs, and some tests are better at detecting particular drugs than others. Saliva testing has been shown to be an accurate method for detecting cocaine, heroin, methadone and amphetamines. While saliva testing is able to detect cannabis, the accuracy of detection is less than for other drugs.

## Are drug tests reliable?

Drug screens, such as saliva screening, give a good indication that a drug is present in the body. However, they do not have 100% accuracy, they sometimes may fail to detect a drug that is present (known as a false negative), or may detect a drug that is not present (a false positive). Also, different types of drug tests generally use different cut-off levels (the amount of drug needed to be present in order to be detected). Positive drug screens are usually confirmed via laboratory-based drugs tests, which have much greater reliability, but are too expensive, time-consuming and invasive to be used as roadside screens.

## Does driving on prescription drugs affect your ability?

Prescription drugs and over-the-counter medications can affect your driving ability, such as decreasing concentration, causing drowsiness, reducing reaction time and affecting your perception. Medications are required to have printed warnings about side effects, including driving risks. You should always read the label, and also ask the pharmacist or doctor about possible side effects of the drug. Prescription and over-the-counter medications can be particularly impairing if used in large quantities or if they are mixed with other medications, alcohol or illicit drugs.

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