DRIVING UNDER THE INFLUENCE OF PRESCRIBED MEDICINAL DRUGS (DUID)

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ABSTRACT

Driving is a complex skill. Ability to drive safely can be affected by changes in physical, emotional and mental conditions. People take medications for a variety of reasons including allergies, cold, depression, diabetes, heart and cholesterol conditions, high blood pressure, muscle spasms, pain, Parkinson’s disease and schizophrenia. Medicines include prescribed medications, over the counter medications (OTC) and herbal supplements. These can affect driving by causing reduced ability to judge distance and speed, distorted perception of time, place and space, reduced coordination and concentration, hyperactivity, aggressiveness, paranoid psychosis, hallucinations, blurred vision, convulsions, dizziness and fainting, fatigue, memory loss, nausea, tremors, unpredictable moods/behaviors, unconsciousness and muscle weakness.

Medications known to impact driving include tranquilizers, narcotic pain pills, sleep medicines, some antidepressants, cough medicines, antihistamines and decongestants. These may lead to drug impaired driving (DUID). They can be just as dangerous for motorists as alcohol and illicit drugs and can trigger a DUI.

Often people take more than one medication at a time. The combination of different medications can cause problems for some people. This is especially true for older adults because they take more medications than any other age group. Due to changes in the body as people age, older adults are more prone to medication related problems. The more medications one takes, the greater the risk that medicines will affect ability to drive safely.

Most people can drive safely, if they are taking medications. It depends on the effect those medications, both prescription and OTC, have on driving. In some cases one may not be aware of the effects. But, in many instances, the doctor can help to minimize the negative impact of medications on driving in several ways. Before driving while taking prescription medicine, all labels and instructions must be read to determine side effects and their relationship to driving. Combinations of medicines can magnify their effects beyond the individual warnings.

The aim of this paper is to understand the problem's magnitude of DUID in Jordan, to educate people about the possible dangers of prescribed drugs on driving and the health care advices drivers should follow to avoid these dangers. Implementation of drug evaluation and classification programs, designed to train police officers would be fruitful.

Key words: DUID, OTC, Prescribed Medicines, Benzodiazepines, Opiates, Cannabis,
1. INTRODUCTION

Driving is a complex information processing task and is one of the most challenging activities people engage in on a daily basis. Road traffic crashes are a common cause of death all over the world. Among the numerous risk factors are speeds, talking on cell phones, road infrastructure, and alcohol, illegal and medicinal drugs both prescribed and over the counter drugs (OTC).

Driving under the influence (DUI) of alcohol or illicit drugs affect mood, cognition, judgment, reaction times, reflexes, and motor skills as they act on the brain and the central nervous system (CNS) and thus they negatively affect driving skills.

Health professionals and researchers internationally agree that the consequences associated to driving under the influence of medicinal drugs (DUID) are much the same as those associated with driving under the influence of alcohol or illicit drugs. When talking specifically about drugged driving, we need to recognize that it is often the result of prescription and OTC medications. These drugs, therefore, can have potentially harmful effects on traffic safety and can directly or indirectly potentially impair driving ability and lead to traffic crashes. DUID costs large amounts of money as well as time, embarrassment, possible injury, and even death. Besides that, it affects not just the person making the decision to drive impaired, but people in the car, other drivers, and the entire society.

Many of those who use psychoactive medication are outpatients and likely to drive a vehicle. The medicinal drugs thus negatively affect driving skills through their effect on

1- **Coordination:** they affect nerves/muscles, steering, braking, accelerating, manipulation of vehicle.

2- **Reaction time:** they cause insufficient response and reaction.

3- **Judgment:** that includes cognitive effects, risk reduction, avoidance of potential hazards, anticipation, risk-taking behavior, inattention, decreased fear, exhilaration, loss of control.

4- **Tracking:** they affect staying in lane, maintaining distance.

5- **Attention:** they make it divided, not focused. High demand for information processing is severely affected.

6- **Perception:** 90% of information processed by our brain while driving is visual. Glare resistance and recovery, dark and light adaptation, dynamic visual acuity all are negatively impacted by drug use (1,2,3).

Table 1 shows the possible side effects of many drug classes.
### Table 1 Some Drug Classes and their Possible Side Effects (1)

<table>
<thead>
<tr>
<th>Drug classes</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-Diabetic Drugs</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>Blurred vision</td>
</tr>
<tr>
<td>Narcotic analgesics</td>
<td>Sedation</td>
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<tr>
<td>Anti-hypertensive drugs</td>
<td>Hypotension</td>
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<tr>
<td>Sedative/Hypnotics</td>
<td>Sedation</td>
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<tr>
<td>Antidepressants</td>
<td>Sedation, dizziness</td>
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<tr>
<td>Allergy drugs</td>
<td>Sedation, dizziness</td>
</tr>
<tr>
<td>Antiarrhythmics</td>
<td>Fainting (syncope)</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>Ataxia, dizziness, sedation</td>
</tr>
<tr>
<td>Skeletal Muscle Relaxants</td>
<td>Dizziness, sedation</td>
</tr>
</tbody>
</table>

The most common drugs that may impair driving due to their effects on CNS are:

#### 1.1 Opioids

Some of the opioids share with alcohol and cannabis an acute intoxicating effect, although the sedative effect is more pronounced. Acute administration of heroin causes euphoria in many users, although other opioids such as methadone do not have this effect in tolerant individuals. The extent of euphoria is also affected by route of administration. As is found with cannabis, some naive users report unpleasant feelings with opiate use, specifically nausea and dysphoria. All opioids are CNS depressants and as such can reduce level of consciousness and cause sleep (4).

#### 1.2 Stimulants

Stimulant drugs, such as caffeine, amphetamines and cocaine, may increase alertness, but this does not mean they improve driving skills. The tired driver who drinks coffee to stay awake on the road should be aware that the stimulant effect can wear off suddenly and that the only remedy for fatigue is to pull off the road and sleep. The use of amphetamines can interfere with concentration, impair vision, and increase the driver's tendencies to take risks. Amphetamines do not seem to affect driving skills when taken at medical doses, but they do make some people overconfident, which can lead to risky driving. Higher doses of amphetamines often make people hostile and aggressive. People who use cocaine are also likely to feel confident about their driving ability. Cocaine use affects vision, causing blurring, glare and hallucinations. People who use cocaine may also hear sounds that aren’t there, such as bells ringing, or smell scents that aren’t there, such as smoke or gas, which distract them from their driving(4,5).

#### 1.3 Sedatives and Tranquilizers

The use of sedatives such as benzodiazepines produces drowsiness, a lack of coordination, altered perceptions, memory impairment, poor control of speech, and slower reaction time. Effects on driving include poor tracking, difficulty in maintaining lane position, and neglecting roadside instructions. Taking sedating antidepressant even 10 hours before driving is equal to driving drunk(2,3). Benzodiazepines can cause greater driving impairment than a blood alcohol
concentration of 0.1 which is above the legal limit of 0.08 in USA (6). Tranquilizers, sedatives, and sleeping pills slow down the CNS causing drowsiness and diminished reaction time and impairing ability to concentrate (4,5).

1.4 Hallucinogens

The effects of hallucinogenic drugs, such as LSD, ecstasy, mescaline and psilocybin, distort perception and mood. Driving while under the influence of any of these drugs is extremely dangerous.

1.5 Cannabis

Cannabis slows reaction times, causes weaving, creates difficulty maintaining a constant speed, and predisposes to distraction (7,8, 9,10).

1.6 Cold medications, Pain Relievers, Antihistamines and others

When people take cold medications or a pill, for example, to ease their headache, they often forget that the medication has effects on their cognitive and motor abilities. It doesn't usually cross their minds that they are taking a drug and will be impaired. Even if they read the warning, it's common to assume that it only applies a few certain people and that "do not operate heavy machinery" means farm equipment or tractors, forgetting that cars should be included as well. Also, many drugs carry warnings about drowsiness or dizziness that people ignore. However, this is a serious problem that leads to thousands of automobile crashes each year. The danger of getting behind the wheel when a driver is too tired to drive can be fatal (11). Antihistamines, which block allergic reactions, slow down reaction time and impair coordination (11). The OTC decongestants can cause drowsiness, anxiety, and dizziness. Drowsy driving is responsible for an estimated 100,000 traffic crashes and about 1,500 deaths every year, according to the National Highway Traffic Safety Administration (NHTSA). (12). Common prescription drugs (including medications to treat allergies, pain, diabetes, high blood pressure, cholesterol, ulcers, depression, anxiety disorders, and insomnia) can cause drowsiness, affect vision and other skills that can be serious hazards on the road (11). Other OTC drugs such as cold and cough medicines, antihistamines, drugs to prevent nausea or motion sickness, pain relievers, decongestants, and diuretics can cause drowsiness or dizziness that can impair a driver's skills and reflexes(11). Some drugs may make you feel alert and confident in your driving. In reality of the situation may be quite different. Drugs can fool you into believing you are in control of your driving when you are, in fact, impaired. (2,12).

1.7 Gastrointestinal drugs

Drugs such as esomeprazole, lansoprazole, pantoprazole and ranitidine block gastric acid secretion. These drugs are also having some CNS side effects because of their dopaminergic blocking action. The medications of this class vary in level of potency and carry the general caution label of “use caution when driving as this medication may cause some drowsiness or dizziness.”
In fact, many prescription drugs come with warnings against the operation of machinery, including motor vehicles, for a specified period of time after use. When prescription drugs are taken without medical supervision (i.e., when abused), impaired driving and other harmful reactions can also result.

Several factors have recently contributed to the severity of prescription drug abuse, including drastic increases in the number of prescriptions written, greater social acceptance of using medications, and aggressive marketing by pharmaceutical companies. The matter becomes even worse upon combination of drugs administration together or taking them with alcohol (12,13,14,15,16,17,18). These factors together have helped create the broad “environmental availability” of prescription drugs and lead to impaired driving.

There is a pressing need, therefore, to understand the association between medicinal drugs and the risk of road traffic crashes and also to have a more accurate picture of the fraction of road traffic crashes that are attributable to the use of prescribed medicines. The effects of specific drug differ depending on how they are used, singly or in combination, the amount consumed, the age of the user, and other factors. Drivers older than 50 years of age are more likely to use medications and thus more likely to cause traffic crashes.

2. METHODOLOGY

Drug analysis is performed to confirm an acute drug effect in drugged driving. Analysis is carried out after testing a sample of blood, urine or saliva or after hair testing. Sample collection is carried out using dedicated collection devices.

2.1 Blood Testing

A blood test is most likely to be used to determine whether the driver is under the influence of a drug (DUID) at any given time. It is the most invasive form of testing and must be conducted in a medical laboratory. This is the most expensive type of test, but it is also the most accurate.

2.2 Urine Testing

Urine is the most widely used specimen for drug testing, as it is produced in large quantities, is easy to collect, and offers a wide window of detection. A urine test is relatively inexpensive and can detect relatively recent use as well as long-term exposure to the drug.

2.3 Saliva Testing

Saliva tests are becoming more popular for detecting illicit drug use, since they are relatively non-invasive and are less expensive than hair or blood testing. This method is easy to administer to testing subjects and the samples are forwarded to a laboratory for analysis. Saliva normally contains the parent drug substance rather than drug metabolites such as are present in urine. Collection of saliva is generally considered less invasive than either blood or urine, and could be an excellent matrix to tie recent drug use with behavioral impairment.
2.4 Hair Testing

A hair sample test involves taking a small sample of hair from the head of the individual being tested. This method is more expensive than conducting a urine test. A person is more likely to test positive on a hair test than one using a urine sample. While the technology for assaying hair for drugs of abuse has progressed somewhat over the last 15 years, there remain many unresolved issues: for example, it is still unclear how drugs actually enter the hair. Because hair only grows at a rate of about one-half inch per month, it is not suitable for the detection of recent use. Therefore, it is highly unlikely that hair could serve as a viable specimen in DUID testing.

2.5 Assays

In 1980, Thin Layer Chromatography (TLC) and Gas Chromatography (GC) were the state of the art and the most commonly used screening procedures. In 2002, most laboratories use immunoassay screening technology with GC/MS confirmation. Immunoassays are sensitive, selective, rapid and large numbers of samples can be processed simultaneously. GC/MS techniques are used to separate drugs, specifically identify with the drug’s “fingerprint,” and quantify the amount of the drug in the specimen. Over the last 20 years the cost of using these technologies have become affordable, and most laboratories now have the equipment, the assays and the expertise to identify the most commonly used drugs.

Immunoassays are effective tools for identifying presumptively positive samples in targeted analysis for major drugs of abuse, but positive results require confirmation by more selective and sensitive techniques. The analytical methods used for confirmation tests as well as non targeted drugs of abuse testing are generally based on GC or liquid chromatography coupled to single-stage or tandem mass spectrometry. These techniques are highly sensitive and selective allowing unambiguous compound identification.

2.6 DUID Laws

Internationally, drunk driving (DUI) laws are well implemented but cases involving drug impaired driving (DUID) are more problematic. According to the Governors Highway Safety Association of USA, only 19 states have strict per se laws that prohibit the presence of any amount of a prohibited substance while driving. There is some controversy with "per se" DUID laws in that a driver with any detectable quantity of controlled substances may not in fact be impaired and the detectable quantity in blood may be only the remnants of drug use in days or weeks past. Such a standard for drugs is very difficult, as many of them, such as cannabis, have no stable amount that can be labeled as “intoxicated”. According to the US Department of Transportation, toxicologists have failed to agree on a specific level of drugs in the blood that could be designated as evidence of impairment.

3. RESULTS

Blood tests for drugs other than alcohol are inconsistently performed. Prescription medications are also difficult to study because of the fact that many people use multiple psychotropic medications. Cannabis is the most-studied drug. After alcohol, tetrahydrocannabinol (THC), the active ingredient in cannabis, is the substance most commonly found in the blood of impaired drivers, fatally injured drivers, and motor vehicle crash victims. Studies in several localities have
found that approximately 4 to 14 percent of drivers who sustained injury or died in traffic accidents tested positive for THC (14).

Evidence suggests that acute cannabis use approximately doubles the risk of crashing (15,16,17). A study of over 3,000 fatally injured drivers in Australia showed that when THC was present in the blood of the driver, he or she was much more likely to be at fault for the accident. Additionally, the higher the THC concentration, the more likely the driver was to be culp (15, 16, 17). Considerable evidence from both real and simulated driving studies indicates that cannabis can negatively affect a driver’s attentiveness, perception of time and speed, and ability to draw on information obtained from past experiences. Research shows that impairment increases significantly when cannabis use is combined with alcohol (17, 18).

For stimulants (cocaine, amphetamines), some studies suggest an increase crash risk, but evidence is limited. (8, 9). Benzodiazepines appear to increase crash risk by 40% to 60%. (10, 11).

In a 2003 study of seriously injured drivers admitted to a Maryland shock trauma center, drugs other than alcohol were present in more than half of the cases. These included cannabis (26.9 percent), cocaine (11.6 percent), benzodiazepines (11.2 percent), and opiates and other prescription drugs (10.2 percent). A quarter of the cases involved both alcohol and other drugs (19).

University of Iowa researchers who tested allergy sufferers in a driving stimulator found that the antihistamine diphenhydramine (found in many allergy and cold medications) significantly impaired a driver’s ability to follow, steer, and maintain the correct lane. The study showed that diphenhydramine has more significant impact on driving performance than alcohol does. Researchers said that of the 39 million Americans who suffer from hay fever and allergies, only 4.8 million take prescription medications. The remainder either goes without treatment or take over-the-counter medications. These medications may be effective, but they often come with warnings stating drowsiness may occur and to use caution when driving a motor vehicle or operating machinery (20, 21).

First generation antihistamines, all of which have sedation, somnolence, impair learning and reduce work efficiency. These drugs have been repeatedly shown to diminish cognitive, psychomotor and driving performance in healthy volunteers. Sedation the most common adverse effect of these agents occurs in 10% to 25% of users (22, 23).

Many prescription drugs including opioid pain relievers and benzodiazepenes prescribed for anxiety or sleep disorders come with warnings against the operation of machinery including motor vehicles for a specified period of time after use. When prescription drugs are abused (taken without medical supervision), impaired driving and other harmful reactions become much more likely.

Administration of more than one drug simultaneously augment the effect on driving and lead to serious effects. This is especially true for older adults because they take more medications than any other age group. Unfortunately, many drivers take drugs together with alcohol, resulting in
greater impairment (15, 16, 17). A few studies examine multiple medication use. However, there is a dearth of research on the effects of combinations of specific medications or even combinations of drug classes on driving ability per se. However, in one recent and comprehensive pharmacy database analysis of multiple medication use (24), higher percentages of crash-involved drivers were prescribed two or more prescriptions than non crash-involved drivers. When sedatives are combined with alcohol or other CNS depressants, synergistic effects may be produced, which may be fatal. Alcohol increases the absorption of benzodiazepines, slows their break down in the liver and can cause cardiovascular and respiratory depression. People who take stimulants sometimes take tranquilizers to offset agitation and sleepiness. Amphetamines should never be taken with a class of antidepressants known as MAO inhibitors, because of potential hypertensive crisis (24). Amphetamine users sometimes use marijuana and depressant drugs in order to avoid the adverse side effects of the "crash," therefore creating multiple drug effects. Additive effects are noted when cocaine is combined with over-the-counter products, such as diet pills or antihistamines (24). Cocaine taken with psychotropic drugs, especially antidepressants, can be extremely detrimental. A person who has extremely high blood pressure and uses cocaine may suffer from a stroke or heart attack. Some users combine cocaine with alcohol and sedatives to cushion the "crash" or feeling of depression and agitation that sometimes occurs as the effects of cocaine wear off. Further research indicates that additive and antagonistic effects can be produced when cocaine is mixed with alcohol. If cocaine is used in high doses, as in the case of overdose, alcohol will probably have an additive effect on the symptoms that eventually contribute to death (24). Being relatively devoid of sedation and CNS impairment, second and third generation antihistamines are less likely to impair driving then first generation antihistamines. It can be stated, therefore, that new generation antihistamines are safe in driving. Although there are also differences within the antihistamines drug generations (25).

In a study it was found that driver taking anticholinergic/antispasmodic had a 20% increased like hood of crashing compared with driver not taking these medicines (26).

The effect of zolpidem was identified for impaired driving. Subjects who received zolpidem with other drugs and/or alcohol; symptoms reported were generally those of CNS depression. Symptom slow movements and reactions, slow and slurred speech, poor coordination, lack of balance, flaccid muscles tone, and horizontal and vertical gaze nystagmus. Subjects who received only zolpidem also showed signs of impairment which included slow and slurred speech, slow reflexes, and disorientation, lack of balance and coordination, and “blacking out”. It is reasonable to conclude that because of its specific activity as sleep inducer, blood concentration consistent with therapeutic doses of zolpidem have the potential to affect driving in a negative way, and that concentration above the normal therapeutic range would further impair a person’s level of consciousness and driving ability (27).
4. DISCUSSION

Driving a vehicle (including cars, trucks, boats and off-road vehicles) is one of the most complex divided-attention tasks we do on a daily basis; paying attention to what's ahead of us, what's behind us, what's going on around us, our rate of speed, road conditions, and what's playing on the radio. The medications we take can interfere with how we process all that information. Until recently most people had never heard the term "DUID" which stands for driving under the Influence of drugs. As you can surmise, a DUID is an ordinary DUI except that the intoxicating agent is some drug other than alcohol or another drug in combination with alcohol.

Medicinal drugs include prescribed medications (Rx), over the counter medications (OTC) and herbal supplements. Many over the counter and prescription medications can potentially impair driving. People take medications for a variety of reasons including allergies, anxiety, cold, depression, diabetes, heart and cholesterol conditions, high blood pressure, muscle spasms, pain, Parkinson's disease and schizophrenia. Table 2 shows examples of medical conditions that may impair driving. Medications known to affect driving skills include anxiolytics, barbiturates, stimulants, narcotic analgesics, anti-allergics, anti-diabetics, antidepressants, tranquillizers, antihypertensives, motion sickness medication, antiulcers, antibiotics, anticonvulsants, anti-nausea medicines, sedatives, cough syrups, alcohol-containing medicines, caffeine-containing medicines and decongestants. Cannabis, amphetamine and opiates which are illegal for recreational use can be used legally for medical purposes.

Table 2 Examples of Medical Conditions that may impair Driving

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Effects</th>
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<tbody>
<tr>
<td>Diabetes</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Stiffness</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>Seizures</td>
</tr>
<tr>
<td>Depression</td>
<td>Inattentiveness</td>
</tr>
<tr>
<td>Insomnia</td>
<td>Daytime sleepiness</td>
</tr>
<tr>
<td>Arrhythmias</td>
<td>Fainting</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>Stroke, MI</td>
</tr>
<tr>
<td>Alzheimer’s</td>
<td>Confusion</td>
</tr>
<tr>
<td>Parkinsonism</td>
<td>Stiffness, dementia</td>
</tr>
</tbody>
</table>

Medicinal drugs impair our bodies in a variety of ways. They may blur our vision; make us tired or too excited; alter depth perception; make us see or hear things that may not be there; raise or lower blood pressure; react too quickly, too slowly, or not at all. They cause problems with concentrating on the task at hand. These problems can result from taking any type of drug: illegal, prescription or over the counter. When our brain function is altered, our muscle and nerve function changes (1, 24).

Although alcohol is by far the most prevalent and well documented psychoactive substance affecting drivers, concerns have been mounting about increasing reports of road deaths linked to illicit or medicinal drugs. It is a reality that drugs, even those prescribed by a physician, can
impair perception, judgment, motor skills and memory critical for safe and responsible driving. The effects of specific drugs differ depending on how they act in the brain, but all impair faculties necessary for the safe operation of a vehicle. These faculties include motor skills, balance and coordination, perception, attention, reaction time, and judgment. Even small amounts of some drugs can have a measurable effect on driving ability.

According to the National Highway Traffic Safety Administration’s (NHTSA) and National Roadside Survey (NRS), more than 16% of weekend, nighttime drivers tested positive for illegal, prescription, or OTC medications (11% tested positive for illegal drugs). In 2009, 18% of fatally injured drivers tested positive for at least one drug, illegal, prescription and/or over the counter (20,23).

According to the World Health Organization, nearly 1.3 million people are killed on the world's roads each year. Up to 50 million people are injured, and many remain disabled for life. Ninety per cent of casualties from road deaths occur in developing countries. The situation is projected to escalate especially as more developing countries record significant increases in car use (24).

It is hard to measure the exact contribution of drug intoxication to driving accidents, because blood tests for drugs other than alcohol are inconsistently performed, and many drivers who cause accidents are found to have both drugs and alcohol in their system or more than one drug making it hard to determine which substance had the greater effect.

Further research is urgently needed to better understand the crash risk associated with prescription medications. Further research work is also needed to explore the drug level and the effect on driving of combination of drugs on driving especially in people over 50 years as they usually use a combination of drugs for certain ailments.

Table 3 shows the most frequently appearing drug combinations in the group of crash-involved drivers age 50 and older.

Despite a drug’s potentially lethal effects when driving, drugged driving laws have not kept up with alcohol-related driving legislation because of the limitations of technology for determining specific levels of impairment based on levels of the drugs in the system. Detection of alcohol, through technology has developed a very effective means of measuring the blood alcohol content (BAC) and level of impairment. Detection of BAC is relatively simple and concentrations greater than 0.08 percent have been shown to impair driving performance. Thus, 0.08 percent is the legal limit. For drugs, other than alcohol, no such agreed upon standard like the BAC has been reliably demonstrated. Determining current drug levels can be difficult, since some drugs linger in the body for a period of days or weeks after initial use.
Table 3 Drug Combinations in the group of crash-involved drivers

<table>
<thead>
<tr>
<th>Drug A</th>
<th>Drug B</th>
<th>Drug C</th>
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<tbody>
<tr>
<td>Skeletal Muscle Relaxants</td>
<td>NSAIDs</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
<td>NSAIDs</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
<td>Skeletal Muscle Relaxants</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
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<td>NSAIDs</td>
</tr>
<tr>
<td>Narcotics</td>
<td>Antibiotics.</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
<td>NSAIDs</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
<td>Antilulcers</td>
<td>-</td>
</tr>
<tr>
<td>Narcotics</td>
<td>Anxiolytics</td>
<td>Antibiotics</td>
</tr>
<tr>
<td>Narcotics</td>
<td>SSRI</td>
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</tbody>
</table>

While there have been countless campaigns warning people of the dangers of driving after drinking, few campaigns to date directly deal with driving after drug use. It is a crime under the criminal code of Canada and the consequences are serious. One may lose his license, have his vehicle impounded, need to pay an administrative monetary penalty, need to attend an education or treatment program, be fined upon conviction, be required to install an ignition interlock device in his vehicle and spend time in jail. Ontario is a leader in combating impaired driving through some of the toughest laws and programs in North America.

Several American states and European countries now have "per se" DUID laws that presume a driver is impaired if they are found to have any detectable quantity of controlled substances in their body while operating an automobile and that the driver has no doctor's prescription for the substance. This is similar to the "per se" DUI/DWI laws that presume a driver is impaired when their blood alcohol content is above 0.08%. There is some controversy with "per se" DUID laws in that a driver with any detectable quantity of controlled substances may not in fact be impaired and the detectable quantity in blood or sweat may be only the remnants of drug use in days or weeks past. Drivers who are taking legally prescribed medication will be required to closely follow their doctor's and drug manufacturer's guidance when taking the medication. If the driver is found to be carrying more than the set levels in their system, outside of the set guidelines, they will be guilty of an offence under the new rules.

5. CONCLUSIONS AND RECOMMENDATIONS

There are conspicuous lacks of data on all the prescription and OTC medications to corroborate their influence on driving performance. A few studies also examine multiple medications use and their effect on driving which makes the situation even worse. There is a pressing need to develop standard screening methodologies for drug-testing labs to use in detecting the presence
of drugs in the biological fluids of drivers. Several recommendations must be taken into consideration regarding drivers and the use of medicinal drugs, among which are

1- It is important that physicians must advise their patients of the potentially impairing effects of medicinal drugs particularly in relation to drowsiness and sedation and the implications of these effects on driving skills such as reaction time, attention and vigilance.

2- It is important that physicians must have an extensive history of all the patient’s medication. This includes prescribed, OTC medications and illicit drugs. Particular attention should be given where drugs are taken together as the effects may be synergistic or one drug may alter the pharmacokinetics of the other drug resulting in an increase in blood levels. The physician may change the drug to another safer drug or may add an exercise or nutrition program to lessen the need for medication. The physician must advise the driver to avoid driving if he is not sure how a drug will affect him, take medications only at prescribed levels and dosages, not drive when he feels ill, tired or disoriented and never combine medication and alcohol while driving.

3- The driver must consult with his doctor or pharmacist about medications that may impair driving and must closely follow doctor's and drug manufacturer's guidance. In case of an emergency, the driver must carry a list of all medications he is taking, including names and dosages.

4- It is illegal to operate a motor vehicle if there is any detectable level of a prohibited drug or its metabolites, in the driver's blood. However, drug-impaired drivers are difficult for police to detect and enforcement of current drug driving laws is difficult. Law enforcement plays a critical role in reducing drugged driving and there is a need to increase training for law enforcement officials on how to recognize signs and symptoms of drugs other than alcohol.

5- As important as data collection and law enforcement training is the need to create public awareness and to educate people on the dangers of driving while under the influence of drugs (DUID). Therefore, enhancing prevention of drugged driving by education communities and professionals seems fruitful.

6- Implementation of drug evaluation and classification programs, designed to train police officers as drug recognition experts must be stressed on. Officers must learn to detect characteristics in a person's behavior and appearance that may be associated with drug intoxication. If the officer suspects drug intoxication, a blood, urine or hair sample is submitted to a laboratory for confirmation.
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