Fortox 2017

TAKING ACTION TO DECREASE ROAD FATALITIES AND INJURIES

Bled, Slovenia, May 28-30, 2017

PROGRAMME AND ABSTRACTS

The joint FORTOX/ICADTS meeting: FORTOX 2017

Programme and Abstract Book

Edited by Majda Zorec Karlovšek, Association Fortox
www.fortox.si

Scientific Programme Committee

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PROGRAMME

Agenda

Sunday, 28 May

13.00-19.00	REGISTRATION – Welcome desk (Foyer)
13.00-19.00	EXHIBITION SET UP (Foyer)
13.00-16.00	ICADTS Executive Board meeting (Libertas room)
14.00-22.00	PRE-CONFERENCE VISITS AND WELCOME RECEPTION (at 18.30, Bled Castle)

Monday, 29 May

08.00-19.00	REGISTRATION – Welcome desk (Foyer)
08.00-18.00	EXHIBITION (Foyer)
09.00-09.30	**WELCOME (Jupiter room)**

Introduction: Majda Zorec Karlovšek, President, Association FORTOX

Welcome messages:

Janez Fajfar, Mayor, Municipality of Bled

Kathryn Stewart, President, International Council on Alcohol, Drugs and Traffic Safety

Prof. Santo Davide Ferrara, *President,* International Academy of Legal Medicine
Vesna Marinko, **Slovenian Traffic Safety Agency**
Vesna Kerstin Petrič, Ministry for Health, Slovenia
Robert Vehovar, Republic of Slovenia, Ministry of the Interior, Police, General Police Directorate
Robert Štaba, Vicepresident, FEVR (European Federation of Road Traffic Victims | Fédération Européenne des Victimes de la Route), and President of Safe Journey Institute (Zavod Varna pot)
David Razboršek, Director, VOZIM Institute (Zavod Vozim), Leader of the project "I still drive – but I cannot walk" (Še vedno vozim-vendar ne hodim)

09.30-10.40	**SESSION 1 – TAKING ACTION TO DECREASE ROAD FATALITIES AND INJURIES**

Chair: Kathryn Stewart, Majda Zorec Karlovšek

1-01

Taking action in impaired driving worldwide: Where we have been, where we are going, and the role of ICADTS
Kathryn Stewart
ICADTS, Prevention Research Center, USA

1-02

A Paradigm Shift to a Safe System; Lessons from the Netherlands
Wendy Weijermars
SWOV, Netherlands

1-03	**Improving Road Safety in the Western Balkan ("WB6") countries – Connectivity Agenda** *Liljana Çela* South East Europe Transport Observatory (SEETO), Republic of Serbia
1-04	**Effective measures to reduce alcohol – related harm: Alcohol policy in Slovenia.** *Vesna Kerstin Petrič, Nataša Blažko* Ministry for Health, Slovenia
10.40-11.00	Break
11.00-12.30	<mark>**SESSION 1 – TAKING ACTION TO DECREASE ROAD FATALITIES AND INJURIES**</mark> Chair: **Evelyn Vingilis**
1-05	**Tech, Policy and Research Innovations that Launched the Interlock Age** *Paul Marques* PIRE, USA
1-06	**Drink driving – why we so often fail to learn from best practice and experience** *Matej Košir and Sanela Talić* Institute for Research and Development "Utrip", Slovenia
1-07	**Alcohol and driving: Numbers, trends, attitudes, and new technologies** *Majda Zorec Karlovšek* Association FORTOX, Ljubljana, Slovenia
1-08	**Alcohol interlocks and drink driving rehabilitation in the European Union** *Sjoerd Houwing* SWOV, The Hague, Netherlands
12.30-13.30	Lunch
13.30-15.00	**How to start interlock programmes?** Chair: *Sjoerd Houwing, Paul Marques* **WORKSHOP – based on »Best practice and guidelines for EU Member States**
15.00-15.15	Break
15.15-16.30	<mark>**SESSION 2 – ALCOHOL, DRUGS AND DRIVING - EPIDEMIOLOGICAL RESEARCH**</mark> Chair: **Gordon Smith**
2-01	**Survey of alcohol and drug use among drivers in the Arctic county of Finnmark (Norway)** *Ragnhild Elen Gjulem Jamt, Hallvard Gjerde, Stig Tore Bogstrand* Department of Forensic Sciences, Oslo University Hospital, Oslo, Norway
2-02	**Psychoactive drugs prescription in DUIA population: An emerging public health and traffic safety concern** *Elettra Carini, Carmela Centola, Manuel Papi, Adriano Tagliabracci, Raffaele Giorgetti* Section of Legal Medicine, Università Politecnica delle Marche, Ancona, Italy

2-03	**Prevalence of drug and polydrug abuse in drunk drivers. Possible implications in the driving license regranting system**
	Snenghi R[1], Pelletti G[1], Frigo AC[2], Nalesso A[1], Favretto D[1], Montisci M[1], Ferrara SD[1]
	[1]Legal Medicine and Toxicology, University-Hospital of Padova, Italy; [2]Biostatistics, Epidemiology and Public Health Unit, University of Padova, Italy

2-04	**Incidence of alcohol and drugs use among drivers injured in road accidents in Campania (Italy) during 2009-2016 years.**
	Anna Carfora, Paola Cassandro, Anna Cucciardi, Luisa Russello, Raffaella Petrella, Renata Borriello
	Forensic Toxicology Unit- Experimental Medicine Department University of Campania "L. Vanvitelli«, Italy

2-05	**Incidence of alcohol and drug use among pedestrians and cyclists fatally injured in road accidents in Slovenia**
	Ticijana Prijon[1], Tomaž Čakš[1], Branko Ermenc[2]
	[1]Health Insurance Institute of Slovenia
	[2]Institute of Forensic medicine, Medical Faculty, University of Ljubljana Slovenia

| **16.30-16.45** | Break |

| **16.45-18.00** | <mark>**SESSION 3: DETECTION OF PSYCHOACTIVE DRUGS**</mark> |
| | Chair: **Jeremy Davey, Kerry Armstrong** |

3-01	**Australian roadside drug testing: Moving to a next generational response**
	Jeremy Davey and *Kerry Armstrong*
	Centre for Accident Research and Road Safety- Queensland University of Technology, Australia

3-02	**Can the use of Dräger DrugTest 5000 correctly identify drug drivers? Evaluation in a naturalistic setting in Norway**
	Hallvard Gjerde[1], Håvard Furuhaugen[1], Grethe Brennhovd Clausen[2]
	[1]Department of Forensic Sciences, Oslo University Hospital, Norway; [2]Norwegian Mobile Police Service, Stavern, Norway

3-03	**Evaluation of some abuse drugs in Patients of an Emergency Hospital**
	R.A.Adeldayem; R.A.Mandour
	Toxicology Unit, Emergency Hospital, Mansoura University, Egypt

3-04	**Technique of receiving antibodies to synthetic cannabinoids «spices» and some antidepressants for development of diagnostic test system**
	Fazliddin Jalilov[1], Lola Pulatova[2], Shohista Tashmukhamedov[3]
	[1]Tashkent Pharmaceutical Institute, Tashkent ,Uzbekistan
	[2]Higher military customs institute, Tashkent, Uzbekistan
	[3]National University of Uzbekistan, Tashkent, Uzbekistan

3-05	**Application of the Thermodesorption surface – ionization spectroscopy method in Amitriptyline analysis**
	Fazliddin Jalilov[1], Mansur Tojiev[1], Lola Pulatova[2], Feruza Jalilova[1]
	[1]Tashkent Pharmaceutical Institute, Tashkent,Uzbekistan
	[2]Higher military customs institute, Tashkent, Uzbekistan

Break 5 min

SESSION 4: TRAFFIC SAFETY: EDUCATION
Chair: **Mary Sheehan**

4-01 **Risky Driving Videos on YouTube: Should We Be Concerned about this Social Medium?**
Evelyn Vingilis[1], Larissa Vingilis-Jaremko[2], Zümrüt Yıldırım-Yenier[1], Christine Wickens[3], Jane Seeley[1], Judy Fleiter[4], Daniel H. Grushka[1]
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[3]Social and Epidemiological Research, Centre for Addiction and Mental Health, 33 Russell Street, Toronto, Canada M5S 2S1
[4]Centre for Accident Research and Road Safety-Queensland, Queensland University of Technology, Kelvin Grove, Queensland 4059, Australia

4-02 **Street Racing Videos and their Popularity - A YouTube Content Analysis**

Jane *Seeley*[1], Christine *Wickens*[3], Larissa *Vingilis-Jaremko*[2], Judy *Fleiter*[4], Zümrüt *Yildirim-Yenier*[1], Daniel *Grushka*[1], Evelyn *Vingilis*[1]

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19.00-22.00 GALA DINNER

Tuesday, 30 May

08.00-15.00 **REGISTRATION** – Welcome desk (Foyer)
08.00-15.00 **EXHIBITION** (Foyer)

08.30-10.40 SESSION 5 – NON-ALCOHOL DRUGS AND DRIVING
Chair:**Jan Ramaekers**

5-01 **Drugs and driving: Trends and challenges**
Richard Compton, National Highway Traffic Safety Administration, USA

6-01 **Introduction and background of a Dutch collaboration to assess long term effects of medicinal drugs (classified ICADTS class III) on driver performance**

Joris C Verster[1,2,3]*, Aurora J.A.E. van de Loo*[1,2]*, Nick N.J.J.M. van der Sluiszen*[4]*, Annemiek Vermeeren*[4]*, Karel A. Brookhuis*[5]*, Janet Veldstra*[5]*, Joke H. van Dijken*[5]*, Johannes G. Ramaekers*[4]

[1] Division Pharmacology, Utrecht University, Utrecht, The Netherlands;
[2] Institute for Risk Assessment Sciences, Utrecht University, Utrecht, The Netherlands;
[3] Centre for Human Psychopharmacology, Swinburne University, Melbourne, Australia;
[4] Faculty of Psychology and Neuroscience, Division Psychopharmacology, Maastricht University, The Netherlands;
[5] Faculty of Behavioural and Social sciences, Division Psychology, University of Groningen, The Netherlands

6-02 **Long-term effects of antidepressant and benzodiazepine usage on actual driving and neurocognitive performance**

Nick N.J.J.M. van der Sluiszen[1]*, Annemiek Vermeeren*[1]*, Joris C. Verster*[2]*, Aurora J.A.E. van de Loo*[2]*, Karel A. Brookhuis*[3]*, Janet Veldstra*[3]* , Joke H. van Dijken*[3]* and Johannes G. Ramaekers*[1]

[1] Faculty of Psychology and Neuroscience, Division Psychopharmacology, Maastricht University, The Netherlands;
[2] Faculty of Pharmaceutical Sciences, Division Pharmacology, University Utrecht, The Netherlands
3 Faculty of Behavioural and Social sciences, Division Psychology, University of Groningen, The Netherlands

6-03 **Long term effects of antidepressants and benzodiazepines on simulated driving performance.**

J.H. van Dijken, J.L. Veldstra, K.A. Brookhuis, D. de Waard
University of Groningen, the Netherlands

6-04 **Polypharmacy of ICADTS III drugs and long-term effects on driving**

Vinckenbosch F, van der Sluiszen N, Veldstra J, van Dijken J, Verster JC, van de Loo A, Vermeeren A, Brookhuis K, Ramaekers JG

Maastricht University, The Netherlands

Break 5 min

6-05 **Effect of chronic opioid therapy on actual driving performance in non-cancer pain patients**

Schumacher, M. B., Jongen, S., Knoche, A., Petzke, F., Vuurman, E. F., Vollrath, M., & Ramaekers J.G.

University Maastricht, Federal Highway Research Institute, Universitaetsmedizin Goettingen, Technische Universitaet Braunschweig

6-06 **Therapeutic and recreational use of Codeine, Tramadol, Zolpidem and Ketamine in drivers**

Favretto Donata, Visentin Sindi, Bennici Silvia Eugenia, Vogliardi Susanna, Stocchero Giulia, Montisci Massimo, Snenghi Rossella, Ferrara Santo Davide

Legal Medicine and Toxicology, Department of Cardiological, Thoracic and Vascular Sciences, School of Medicine, University Hospital of Padova, Padova, Italy.

10.40-11.00	Break

11.00-13.10 <mark>**SESSION 7 – CANNABIS AND DRIVING**</mark>
Chair: **Hallvard Gjerde**

7-01

Cannabis and tolerance: acute drug impairment as a function of cannabis use history.
Ramaekers Jan

Faculty of Psychology and Neuroscience, Division Psychopharmacology, Maastricht University, The Netherlands

7-02

Determination of legislative limits for tetrahydrocannabinol in Norway
Vigdis Vindenes
Oslo University Hospital, Section of Drug Abuse Research, Norway

7-03

The Journey To Legalize Cannabis in Canada
Danielle Y.R. Comeau; Felix J.E. Comeau; Denise Connerty
Alcohol Countermeasure Systems Corp., Toronto, Canada

7-04

Relationship between medical cannabis, alcohol use and traffic accidents
Dušan Nolimal[1,2]
[1]NIJZ - National institute for Public Health, Ljubljana
[2]ICANNA - International Institute for Cannabinoids, Ljubljana

7-05

Epidemiological studies on risk for crash involvement after cannabis use
Hallvard Gjerde[1] and Jørg Mørland[2]
[1]Department of Forensic Sciences, Oslo University Hospital, Norway;
[2]Norwegian Institute of Public Health, Oslo, Norway

Discussion

Closing remarks: Kathryn Stewart

13.10-14.10 Lunch

Wednesday, 31 May

8.00-22.00 Post-conference visit (Sevnica)

Fortox 2017
TAKING ACTION TO DECREASE ROAD FATALITIES AND INJURIES
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ABSTRACTS

SESSION 1 – TAKING ACTION TO DECREASE ROAD FATALITIES AND INJURIES

1-01

Taking action in impaired driving worldwide: Where we have been, where we are going, and the role of ICADTS

Kathryn Stewart
ICADTS, Prevention Research Center, USA

BACKGROUND/INTRODUCTION: A great deal of progress has been made in reducing drinking and driving crashes in high income countries around the world. Important scientific and policy milestones have contributed to this progress. Drug impaired driving is less well understood and remains a challenge for researchers and policy makers. Unfortunately, the impaired driving situation in low and middle income countries has not improved in the same way as in high income countries and in some cases has gotten worse.
OBJECTIVE: This paper traces some of the history of the impaired driving field in Europe, Australia, and North America and examines trends in alcohol impaired driving, with additional information about drug impaired driving. The situation in these countries is compared to what we know about some low and middle income countries. The role that the International Council on Alcohol, Drugs and Traffic Safety (ICADTS) can play in bringing about future advances is discussed.
METHODS: Available data from selected high income countries were collected and comparisons made from country to country. Data from several low and middle income countries were also examined, though the quantity and quality of these data were much lower than in high income countries.
RESULTS: Progress has been made in alcohol impaired driving across many high income countries. Drug impaired driving has increased in some cases, though the impact on traffic safety is not entirely understood. There are insufficient data on most low income countries to track progress definitively. Low income countries face many challenges related to resources, public attitudes, laws and policies.
CONCLUSION/DISCUSSION: While a great deal of progress has been made in high income countries, deaths and injuries due to impaired driving continue to occur. Many aspects of drug impaired driving still need to be addressed systematically, though this issue will always be challenging. Low and middle income countries face significant challenges with respect to tracking alcohol and drug impaired driving as well as in taking steps to prevent crashes. ICADTS can play a role in transferring knowledge and fostering progress.

KEYWORDS: impaired driving, prevention, trends
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A Paradigm Shift to a Safe System; Lessons from the Netherlands
Wendy Weijermars
SWOV, Netherlands

At their meeting in Valetta on 29 March 2017, the transport ministers of the EU Member States reconfirmed their commitment to improve road safety. Road safety can be significantly improved by adopting a Safe System's approach to road safety. According to the OECD report '*Zero Road Deaths and Serious Injuries; Leading a Paradigm Shift to a Safe System'*, adopting the Safe System starts with accepting the ethical imperative that no human should be killed or seriously injured in a road crash. Once we accept this ethical imperative, we can no longer blame the victim or the driver, but we have to change the system. Core elements of a Safe traffic System are safe speeds, safe roads and road sides, safe vehicles, safe road users and an effective post-crash response.
In a Safe traffic System, all road users should be sober. The use of alcohol and drugs in traffic can be prevented by a combination of measures, including alcohol interlocks that prevent alcohol impaired drivers to start their car, enforcement and public information campaigns.

The Netherlands was one of the pioneer countries that adopted a Safe System approach to road safety, called Sustainable Safety. The actual implementation started in 1998, with the Start-up programme Sustainable Safety. An evaluation of Sustainable Safety in 2009 has shown that a lot of measures that fit in the Sustainable Safety vision have been realized in the period 1998-2007 and that these measures were cost-effective. The benefit-cost ratio of all measures together was estimated to be around 3.6. However, there are challenges ahead of us. Not all recommended measures are fully implemented yet and Sustainable Safety appeared to be less effective for serious road injuries. At the moment we are updating our Sustainable Safety vision, taking into account developments like an ageing population and technological developments.
I will present the highlights of the OECD report '*Zero Road Deaths and Serious Injuries; Leading a Paradigm Shift to a Safe System',* and I will explain how to deal with impaired driving in the light of a Safe System's approach. Moreover, I will illustrate the paradigm shift to and implementation of a Safe System as well as its effects and future challenges based on experiences from the Netherlands

Improving Road Safety in the Western Balkan ("WB6") countries – Connectivity Agenda
Liljana Çela
South East Europe Transport Observatory (SEETO), Republic of Serbia

The South East Europe Transport Observatory (SEETO) is a regional organisation in the transport sector, which provides a platform for the development of the SEETO Comprehensive Network and coordination of the regional transport policy in line with the Memorandum of Understanding (MoU) signed by Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro, Serbia and Kosovo as well as the European Commission in 2004.
The Memorandum of Understanding (MoU) establishing SEETO aims to facilitate and accelerate the development of the agreed multi-modal regional transport network

(SEETO Comprehensive Network) and to enhance the implementation of policies that facilitate such development. Both infrastructure investment measures and soft measures, including administrative and regulatory procedures, are within the scope of the MoU. The connectivity agenda has been fueled by political leadership given by the Berlin process and the reinforced cooperation of the Western Balkan 6. This has been combined with substantial technical efforts by the countries supported by SEETO and the Energy Community Secretariat. This has allowed the Western Balkan countries to make significant progress on the connectivity agenda since the first Summit, Berlin 2014.

The Western Balkan countries have agreed to a priority list of 'soft measures' in transport, which have been prepared by the SEETO in cooperation with the Transport Ministers. The Western Balkan countries will ensure that they are all fully implemented before each yearly Summit.

Connectivity Reform Measures (CRM) for transport are divided into two types of measures: regional and national where road safety is part of reginal measures. The Western Balkans summit in July 2016 in Paris adopted a Connectivity Reform Measures Management Plan (CRMMP) for 2016/2017. Among these connectivity reform measures on the regional level, there are 4 measures related to road safety, namely:

1. Adoption of Road Safety Inspection (RSI) guidelines and curriculum and delivering of trainings
2. Prepare three-year RSI plan for the core and comprehensive network and pilot RSIs on high accident sections
3. Carry road safety audits as per the Directive 2008/96/EC on all projects on the core and comprehensive road network
4. Establish a national system for continuous road crash data collection (by 2018)

SEETO and with support from the World Bank, has delivered the 1st measure. Under this measure, Road Safety Inspection Guidelines have been developed along with its training curriculum and one training session to 21 road safety expert of the SEETO region has been delivered in June 2016, in Belgrade.

SEETO road safety policy is in line with the EU policy on road safety guided by two main strategic documents: the Transport White Paper and the Policy orientations on road safety 2011-2020. The White Paper sets out the general long-term vision of coming close to zero road deaths, and announces a strategic target of halving the number of annual road deaths from 2010 to 2020. The Policy orientations define in more detail the policy framework and the work planned to be carried out in order to achieve this ambitious strategic target.

SEETO contributes to road safety in its Regional Participants by various outputs of a Road Safety Working Group (RSWG) established in 2009 and meets twice a year. Examples of such outputs are guidelines, curricula and training for Road Safety Audit and Inspection, as well as providing regular analysis based on the performance indicators in the region. There are plans to deliver new outputs in the coming year, including this study.

The UN adopted on September 25 the Sustainable Development Goals (SDGs- 13 of them) including a Health Goal (number 3) which includes a road safety target (3.6) that calls to half the number of global deaths and serious injuries from road traffic crashes by 2020 compared to 2010, which is the same as the EU target.

The number of road fatalities in SEETO decreases each year and has reach an average rate of 7.4 killed per 100, 0000 population in 2014. If SEETO region meets the EU and the SDG goal, then the rate of road traffic fatalities should reach an average of less than 4.5 fatality per 100,000 population in 2020. The data on serious injury is not reliable to report on, however both the EU and the SDG targets also call for a 50% reduction in serious injuries by 2020.

Several studies and EU Technical Assistance are undertaken in last 10 years with the main objective reduction of fatalities and serious injuries in the region. SEETO as a transport observatory is monitoring the progress done from each regional participant (country) in all above mentioned connectivity reform measures using questionnaires for

gathering the information from different transport authorities like: Ministries of Transport, Road Authorities etc. Several meetings are organized in the region with different institutional structures of SEETO like: Working groups, National Coordinator and with the highest-level Steering Committee, to discuss the latest progress and bring to a common table all 6 regional participants and exchange the best practices example. Another method that helps in collecting the information are regional visits that SEETO staff is doing to the Transport authorities and the Delegation of EU in each country. All the methods mentioned are resulting successful in enhancing the collaboration between SEETO, WB6 countries and European Commission and giving an outcome scored with positive result for the region.

All the studies, actions, meetings and deliverables that are produced in years from SEETO are requiring the political blessing and support in order to be implemented and bring the practical result that our citizens can benefit. Given that, SEETO is making use of its own higher instance, Annual Meeting of Ministers (AMM) and brings a set of conclusions in their round table which are actions to be implemented by SEETO Regional Participants in the forthcoming year. However, there is still room to work on all the CRM including here road safety as a priority reflected in the last SEETO AMM held in December 2016 in Brussels. Saying that, and the latest development on Road Safety Conference and Valletta declaration that was extended to the Western Balkan 6 countries as well, SEETO is working on drafting a WB6 declaration in road safety. The declaration is expected to be delivered from SEETO and be on the agenda of Trieste Summit under Connectivity Agenda meeting of the high levels of WB6 and EC.

Improving regional cooperation and coming up with regional actions in all measures as well as in road safety, exchanging of best practice examples in the region and out of it is one of SEETO main work to advance stronger regional connectivity for shared prosperity.

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Effective measures to reduce alcohol – related harm: Alcohol policy in Slovenia.
Vesna Kerstin Petrič, Nataša Blažko
Ministry for Health, Slovenia
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Tech, Policy and Research Innovations that Launched the Interlock Age.
Paul Marques
PIRE, USA

This report summarizes some of the key events leading to modern interlock devices, the interlock programs, the policies, and the research directions that followed.

The road safety motives for searching out new technologies to improve detection and control of alcohol impaired operators is just as one might imagine. Through the 1960s and 70s evidence accumulated that drivers previously arrested for alcohol impairment were 4 times more likely to be in fatal crashes than those with no prior convictions. But what could be done? How could alcohol offenders be controlled? Jail and suspending driver licenses helped somewhat but these were not the solution we needed. Jail is expensive and burdensome for states, individuals and for families. License suspension only works if it prevents driving, which it often does not, especially with the drinkers who most threaten

public safety. In the USA, by 1983, 42% of driver deaths involved an alcohol BAC >.10%; over 70% of nighttime fatal crashes included a driver with a BAC>.10%.

After World War II, performance testing, such as reaction time, and other approaches were developed to determine airplane pilots' readiness to fly. Flight and driver simulator studies were directed at driver fitness, fatigue and intoxication. This approach to evaluating operator performance was a start, but classification of impaired vs not impaired required a choice between too many false positives or too many false negatives. There was no perfect middle. Accuracy could be improved with baseline capabilities measurement, but that was impractical for the driving public.

In 1969, Robert Voas wrote a government report titled: Cars that Drunks Can't Drive. By 1970, Borg Warner Corp developed the first alcohol interlock based on use of a BAC set-point. However, the device was easily bypassed and it could not perform adequately in the highly variable ambient air temperatures and varying road elevations. But, a decade later several trends converged that led to the beginnings of modern interlocks. These included faster and cheaper microprocessors, electrochemical alcohol sensors such as the non-specific Taguchi semiconductor, and new per se laws that defined impairment by BAC level rather than having to demonstration actual motor impairment. This was a big deal. The semiconductor interlocks still had problems with calibration drift, were affected by elevation change, and were not specific to alcohol. But they were much better than nothing.

The first commercially viable ignition interlock products arrived in the mid-1980s. These used newer faster computer chips, solid-state alcohol detection technology, and technology that allowed for measurement of a controllable deep lung breath sample. A Guardian Interlock device was sold by Cincinnati Microwave based on development work by Donald Collier. The name, Guardian Interlock, has been leased to several interlock providers over the years since then. The original device inspired the imagination of other business ventures and soon several competitor devices appeared. Soon circumvention prevention features such as hum tones, temperature sensors to rejected filtered air, and running retest requirements, defeated many of the bypass techniques. In the interval 1985-90, pilot programs in several California counties showed mixed success, but momentum was building. By1990, a province wide program began in Alberta, Canada gave a lift to the new interlock programs. Other US states such as Michigan also wrote an early standard. It was the next stage of development, once there was an interlock, the next problem was how to use them, certify them, and later, study them.

These early adopters provided the initial thinking about how to write certification guidelines for interlock devices. Acting independently of the state road authorities, several USA criminal courts began using interlocks as a sanction despite the states having little understanding of how to determine which devices were acceptable. The courts had no experience with interlocks. Initially the manufacturers wrote the guidelines for the courts and the states. No one thought that was a workable plan for very long. The states needed to develop their own guidelines for both the devices and for the programs. In 1989, the US DOT, National Highway Traffic Safety Administration (NHTSA) got involved and awarded a contract to NPSRI (later part of PIRE) to develop the first certification guidelines to help states interested in interlock programs and devices. The contract led to a Voas and Marques (1991) NHTSA report on Interlock Support Services, and to the 1992 the Federal Register report titled "Model Specifications for Breath Alcohol Ignition Interlock Devices". The "Model Specs" was the first generation of US recommendations to States on how to evaluate the adequacy of products that were claiming to be alcohol interlock devices. The requirements for certification and accuracy testing were intentionally very weak (i.e., 80% accuracy), reflecting the state of the technology at the time. An early 1990 era Australian national standard was initially very strict and slowed adoption of interlocks there. The European Union, through CENELEC, launched a 4-nation pilot program, and by 2005 the EU standard, allowing only accurate fuel-cell devices, was near adoption and national programs began in earnest. Prior to the EU standard, however, Sweden had already begun its own interlock programs.

In 1999, the first two comprehensive evaluations of the interlock devices appeared in major research journals. Voas et al. (1999) in Addiction, and Beck et al., (1999) in American

Journal of Public Health. The Voas study was a 5-year province wide evaluation of the Alberta program which showed significantly reduced DWI rearrest while the interlock was installed. However, the interlock benefit was confined to the interlock period and showed no carry over after the interlock was removed. There was no reason it should have (interlocks are not behavior change therapy), but many people were disappointed. The Beck study was a random assignment study of interlock and non-interlock DWI offenders based on a selected subset of alcohol offenders approved by the Maryland Medical Review Board. Despite differing sample formation methods, both studies found substantially similar results: interlocks reduce repeat DWI while installed, but not beyond. Interlocks, are not therapy, they are interlocks. But there was more to learn from the interlock data file.

Also in Addiction, as part of the Alberta evaluation, Marques et al., (1999) reported the first of several studies demonstrating a relationship between failed interlock BAC tests and future, post-interlock recidivism. The more failed BAC tests, the more likely offenders were to be re-convicted of DWI. In the years that followed, a great many interlock laws were written (often inappropriately) to make use of the interlock breath test record as a marker of progress. Studies reliably found that, in the aggregate, drivers reveal their likelihood of success on the interlock program early. But, the aggregate was not good enough. There still was a need to know the predictive likelihood of a specific individual driver continuing to be an alcohol safety risk. That risk profiling needed an individual focus. Interlocks are a vehicle sanction. More precise assessment of alcohol risk tied to the individual had to await the development (and availability) of direct alcohol biomarkers that reflected consumption during the prior weeks and months (Marques et al., 2013; Marques et al., 2014).

KEYWORDS interlock history, development, prediction
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Drink and driving – why we so often fail to learn from best practice and experience

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In Europe, approximately 25% of all traffic accident fatalities are alcohol-related. Governments and other responsible authorities have carried out a number of more or less effective and (also) ineffective measures to prevent drink driving. Some policies and measures are proven to be successful (e.g. more frequent random BAC tests for all drivers, zero tolerance for novice and professional drivers, lower BAC levels in general, alcolocks for repeat offenders, structured and long-term campaigns and educational programmes etc.), but are still not fully included in many legislations and are not consistently implemented in practice. Despite the fact that drivers today are aware of the tragic and financial consequences they can bring to themselves and others while driving drunk, and that the public opinion with regard to drink driving largely changed (most Europeans nowadays openly oppose to drink driving), drunk drivers are still responsible for about a quarter of all fatal accidents in Europe. Therefore, new, better and more effective measures are urgently needed. The author will present an extensive existing scientific evidence from many studies and research in a structured way and present many good examples from practice as well (e.g. evidence-based interventions). Presentation will be based on the document (guidelines and recommendations) which was recently published by author (Košir) and co-author (Talić) in Slovenia and co-sponsored by the Slovenian Traffic Safety Agency. Link to the document: https://goo.gl/cU4zWg.

KEYWORDS: drink driving, prevention, guidelines
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Alcohol and driving: Numbers, trends, attitudes, and new technologies
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The number of traffic accidents, and injured in traffic has been decreasing during the last fifty years worldwide. In Slovenia, the country with 2M inhabitants the number of road deaths has decreased from about 800 in seventies to 130 in the year 2016. A huge progress was done due the safer cars, better infrastructure, sit belt use etc. A significant number of road deaths and injuries occur due to impairments in driver health and wellbeing.
Driving under the influence of alcohol is one of the principal factors contributing to road accidents, particularly those with severe or deathly consequences. Despite the decrease of number of traffic accidents, road deaths and road injuries; the involvement of alcohol in traffic accidents remains high. The measured percentages of alcohol related traffic accidents in Slovenia over the last fifteen years are in average 10% in all traffic accidents, 20% in traffic accidents with severe injuries, and 30% in traffic accidents with deadly injured persons.
Drink-driving is only a part of wider challenge of alcohol in society. The introduction of new technologies i.e. alcohol interlocks and interlock rehabilitation programmes, together with preventative work and education directed to the whole population enlarges the possibilities of a faster progress in reducing traffic deaths and injuries.
KEYWORDS: drink driving, attitudes, new technologies
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Alcohol interlocks and drink driving rehabilitation in the European Union
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In many European countries there is still a small group of hard core drink driving offenders that do not seem to be influenced by traditional countermeasures. This group accounts for 10% of all drink driving offenders, but are involved in two thirds of all alcohol-involved crashes. The introduction of an alcohol interlock programme seems to be an effective measure, as an alternative to 'traditional' measures such as fines and driving licence suspension. Belgium, Denmark, Finland, France, The Netherlands, Poland and Sweden have already introduced alcohol interlock programmes for drink driving offenders. Furthermore, Austria has announced that it will introduce mandatory alcohol interlocks in 2017 after two successful trials in 2012 and 2013. Based on the good experiences in these countries, as well as some of the pitfalls that have emerged, this report offers a set of practical guidelines to support authorities that want to introduce an alcohol interlock programme. The guidelines concern seven key areas, including good, proactive communication between all stakeholders which is seen as crucial to success. The guidelines are summarised as follows.
LEGISLATION: I. Alcohol interlock legislation needs to be wellgrounded and clearly described in the legal system so that it can't be disputed on legal grounds. As part of the legal foundation, special emphasis should be given to the relative position of the alcohol interlock programme when compared to other sanctions and measures. **II.** Before introduction of the legislation, information should be provided to all stakeholders concerning the contents and the purpose of the legislation and a public awareness plan should be created that sufficiently informs all drivers of the content of the new legislation and the implications for offenders. **III.** To maximise the effect on road safety, alcohol interlock

programmes for drink driving offenders should be compulsory and placed under administrative law. In case major practical or legal issues are foreseen, alcohol interlock programmes should be placed under criminal law

TECHNICAL AND PROCEDURAL ASPECTS: I. Countries that want to introduce alcohol interlock programs should, as a minimum, ensure that the interlock devices selected meet the CENELEC standards. Additional performance and data protection specifications are also necessary since the CENELEC specifications are only applicable for the interlock device and the service application, communicating with the alcohol interlock and sending out the event data recordings to a register. **II.** Involvement in the CENELEC working groups is recommended to keep track of the latest technical issues and solutions. For example, issues concerning the connection between the alcohol interlock device and the electronic systems of new vehicles, including electric vehicles. **III.** The role of a service provider depends on the design of the programme and the requirements posed by the national authorities that are responsible for the programme. In many programmes the service provider will be interacting with participants, press, national authorities, and other stakeholders. Therefore, when writing requirements for alcohol interlock programmes, authorities should not only focus on the technical details of the devices, but also on the total package of services that alcohol interlock suppliers can provide. IV. Many countries have a driver licence administration that is responsible for issuing driver licences and that has experience with the organisation of large-scale administrative procedures. These organisations should therefore be involved in the early stages of discussions on introducing an alcohol interlock programme.

REHABILITATION: I. An alcohol interlock programme should not be limited to just the installation of the interlock device itself but rather designed as a coordinated set of activities designed to minimise the possibility that programme participants drive after drinking. **II.** Rehabilitation measures should be tailored to the situation and background of the offender. A medical / psychological assessment before the start of the programme is recommended, as well as continuous monitoring during the programme. The frequency of registered attempts to start the car after drinking serves as an indication that the desired behavioural intentions are not yet present and of the risk of recidivism. **III.** The requirements of the programme should be flexible, e.g. by including a reduction of suspension periods based on the compliance of the participants (e.g. no fail tests during a certain period or continued participation in educational measures). On the other hand, if there are too many fail tests or the driver is caught for driving under the influence while driving in another vehicle, the duration of the programme should be increased. **IV.** Removing offenders from the alcohol interlock programme should only be done under severe circumstances, since recidivism rates of the alcohol interlock programme are lower than alternatives such as permanent or temporary driving bans. V. Not only the length of the programme, but also the types of rehabilitation measures should be targeted to the needs of individual users. There are a variety of measures that address the underlying causes of drink driving. For an optimal approach we recommend to get health care and behavioural professionals involved, since the alcohol interlock device itself only changes its user's behaviour while it is installed in the vehicle. A structural change of behaviour can only be achieved with a more comprehensive treatment intervention. Evidence suggests, that psychological and therapeutic approaches with educative elements are the most promising ones (for an overview see: Boets, Meesmann, Klipp et al., 2008).

ENFORCEMENT: I. Strong enforcement is a key requirement of successful alcohol interlock programmes for drink driving offenders. Firstly, the number of participants strongly depends on the number of offenders caught by the police. The participation rate also depends on the level of enforcement and the perceived chance of offenders being checked for alcohol or for their driving licence. If the chance of a driving licence check is low, offenders may be persuaded to choose driving without a driving licence instead of participating in an alcohol interlock programme. **II.** The enforcement of compliance can be done by regularly, e.g. every two months, checking the alcohol interlock device system for fraud and/or attempts of fraud, and simultaneously downloading and analysing the data

from the alcohol interlock device's data recorder. **III.** A clear code on the driving licence for participants of the alcohol interlock programme makes it easier for police officers to detect misuse while checking the driving licence. The harmonised code in Europe is now represented by the number 69, making it easier for police to enforce the requirements across EU borders.

COSTS: I. The costs to the offender of participating in an alcohol interlock programme should be kept at a reasonable level so as not to exclude BAC offenders from the lower income groups from participating in the programme. **II.** Decreasing the costs by changing or dropping content from the programme can have a negative influence on the road safety benefits and should therefore be done with care. **III.** In the United States of America and in Australia many alcohol interlock programmes offer discounts for people in financial hardship. **IV.** An alcohol interlock programme with good rehabilitation measures will also decrease public health costs and judicial costs generated by participants. Interdisciplinary working groups can provide expert knowledge and experience, and could increase engagement among stakeholders. **V.** It would be beneficial for the participation rates if the additional costs of a rehabilitation measure as part of the alcohol interlock programme are shared by those authorities that benefit from the measures, such as the Ministry of Transport, the Ministry of Justice and the Ministry of Health.

PILOTING AND EVALUATION: By conducting a pilot prior to the programme and an evaluation during the programme a lot of practical information can be gathered on practical, technical and procedural issues. Shortcomings of the programme regarding content and procedures can be discussed among the stakeholders and improved. II. The evaluation period should not only look at short term effects, but also the long term impact. Therefore, we would recommend using an evaluation period of at least five years with at least two evaluation moments, e.g. after 2 and 5 years.

COMMUNICATION: I. Good communication lines should be established and then maintained between stakeholders from the design phase of the programme onwards. **II.** All stakeholders and participants should get easy access to information on the background, content and procedures of the programme.

KEYWORDS: drink driving, dlcohol interlocks, European Union
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2-01

Survey of alcohol and drug use among drivers in the Arctic county of Finnmark (Norway)

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BACKGROUND: Previous roadside surveys conducted in Europe have shown that the prevalence of driving under the influence (DUI) varies a lot between countries, with the highest prevalence in southern Europe. In Norway, a low legal blood alcohol concentration limit, strong law enforcement and severe punishment for DUI have contributed to a low prevalence of DUI of alcohol. Legislative blood concentration limits have also been implemented for a number of illicit drugs and psychoactive medicines.

The prevalence of psychoactive substances is much higher among drivers involved in road traffic crashes (RTC) than among random drivers in normal traffic. If a driver is involved in a traffic accident in Norway, the driver might be subject to blood sampling regardless of whether or not the police suspects DUI. This is done in order to collect evidence that will further be used to determine the circumstances of the crash including responsibility.

In Finnmark, a sparsely populated county in the northernmost part of Norway, the relative number of arrests for DUI is higher than in other parts of the country. The reason for the high number may either be a higher incidence of DUI or a more efficient detection of DUI by the police compared to the rest of Norway.

OBJECTIVE: To compare the prevalence of alcohol and drug use between drivers involved in road traffic crashes and drivers in normal road traffic in Finnmark.

METHODS: Blood samples from drivers involved in RTC were collected shortly after the crash using 5 ml Vacutainer tubes containing sodium fluoride and heparin and sent for analysis to the Department of Forensic Sciences (part of Oslo University Hospital since January 2017). All blood samples from RTC involved drivers submitted by the police for toxicological testing from January 2000 to December 2015 were included in this study. Anonymous information regarding age, gender and time of accident were collected from the requisition forms submitted by the police together with the blood samples. All blood samples were screened for alcohol using an enzymatic method and quantified using gas-chromatography. An immunological method and/or high-performance liquid chromatography were used for screening for medicinal and illicit drugs, and quantification was performed using GC-MS or LC-MS.

Oral fluid samples were collected from random drivers in a roadside survey in collaboration with local police. Drivers were selected using a multistage cluster sampling procedure (selection of roads, time intervals, and drivers within each interval). Age, gender, nationality, time and geographical site were recorded. Samples of oral fluid were collected using the Quantisal device. The samples were analyzed for alcohol with an enzymatic method and for illicit drugs and medicinal drugs using UHPLC-MS/MS. The sample collection started period was from September 2014 to October 2015.

RESULTS: During the 16 years study period, 638 blood samples from drivers involved in RTC in Finnmark were submitted by the Norwegian police for the analysis of alcohol, medicinal and illicit drugs. The total prevalence of psychoactive substances was 83.5 %. Alcohol above the legal limit of 0.2 g/L was found in 70.5 % of the samples. The most prevalent illicit drug among the drivers involved in RTC was THC (9.4%) and the most prevalent medicinal drug was diazepam (7.4%). The total prevalence of psychoactive substances and the prevalence of alcohol were significantly higher among drivers under the age of 40 (total prevalence: p=0.006, prevalence of alcohol: p=0.048). In the roadside survey, 3028 samples were collected. The participation rate was 94%. In total, 3.6% of the

samples were positive for alcohol or drugs. Alcohol above 0.2 g/L was found in 0.3%. The most prevalent drugs illicit drug was THC (1.2%) and the most prevalent medicinal drug was zopiclone (1.0%). The prevalence of illicit drugs was significantly higher among drivers under the age of 40 (p=0.03) and among men (p=0.002).

CONCLUSION: The results shows that the prevalence of alcohol and drugs in samples of oral fluid from random drivers in the northernmost part of Norway was similar to the findings in previous Norwegian roadside surveys, which covered geographical regions further south. The prevalence of alcohol and drugs RTC involved drivers was high. THC was the most frequently found illicit substance in the two groups.

KEYWORDS: DUI, RTC, alcohol, drugs
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Psychoactive drugs prescription in DUIA population: An emerging public health and traffic safety concern

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BACKGROUND/INTRODUCTION:
Driving Under the Influence (DUI) of Psychoactive Drugs Prescription (PDPs) has been associated to an increased risk of Motor Vehicle Collision (MVC). Even within the same class of drugs, specific medication uses induce different levels of risk. A further factor to be considered is that the effects of PDPs on driving ability are not as apparent as the effects of alcohol. Since these substances can be consumed by subjects convicted for DUI of Alcohol (DUIA), a combined effect on psychomotor performance and accident-proneness is arguable. Many PDPs are known to cause impairment and have additive/synergic or antagonist effects when co-ingested with alcohol. Therefore, it is important to understand the extent of their role as risk factors for MVC in the specific DUIA population. To our knowledge, most of the studies focus on the use of illicit drugs and alcohol while driving, whereas the use of non-illicit drugs is commonly overlooked. Similarly, the knowledge on the implication of PDPs in a more generic accident-proneness i.e. activities related to work, domestic or sport environment, is very limited.

OBJECTIVE: Evaluate the role of PDPs as risk factors for traffic and general accident-proneness in Driving Under the Influence of Alcohol population.

METHODS: A sample of 5003 subjects (92% males, 8% females) aged 18 to 79 years, convicted for DUIA and seeking restoration of their driving license, was examined at the Legal Medicine Section of the Università Politecnica delle Marche, Ancona, Italy, between April 2005 and December 2015. Besides demographic data, other information of clinical interest was collected. For instance, the number of DUIA license suspensions, previous domestic and work accidents, sport injuries, traffic crashes, and current use of PDPs were compiled. Blood samples were analysed for quantitative determination of the main biological markers for alcohol abuse. To analyse data, statistical descriptive analysis and logistic regression was applied.

RESULTS: About 8% of DUIA population was in treatment with one or more PDPs. The main medications used were anxiolytics (45.8%), antidepressants (29.56%), hypnotics (15.41%), antiepileptics (15.09%), neuroleptics (15.09%), and antihistamines (8.49%). Most of the DUIA using PDPs were male, aged 18-49.
About 50% of DUIA in treatment with PDPs had at least one traffic crash.
More than 20% (21.40%) of subjects using PDPs had both workplace and generic accidents. Antiepileptics (OR = 2.740) and anxiolytics (OR = 1.976), as well as the number of relapses, age and Alkaline Phosphatase (ALP) values increased the risk of MVC and

generic accident-proneness. More than 31% of convicted subjects were repeat offenders. Antidepressants use emerged as an important risk factor for driving license suspension relapse (OR = 1.968).

CONCLUSION/DISCUSSION: The present study shows that almost half of DUIA population in treatment with PDPs is involved in at least one MVC. This observation reveals that the use of PDPs in DUIA is an underestimated problem. Furthermore, generic accident-proneness is increased by PDPs, in particular by antiepileptics and antidepressants. Therefore, DUIA offenders in treatment with PDPs should be considered as issues when it comes to traffic safety and public health. According to the literature, not all PDPs lead to similar risks. The increase of overall accident-proneness could be explained by combined effects of alcohol and PDPs or by an overall impaired physical condition. Many other factors may play an important role in the results obtained. Among them, dose, half-life, time of administration, carry-over effects, and tolerance for the drug; as well as subject gender, age, and underlying medical conditions. Due to the complexity of the matter as well as the involvement of numerous variables, particular attention is required when addressing the subject. In particular, general practitioners should provide adequate information and consider safer drug alternatives, when possible. Furthermore, the anamnestic examination of DUIA offenders seeking restoration of their driving license should be evaluated carefully. Finally, the role of antidepressants as enhancers of recidivism risk should be considered more accurately.

KEYWORDS: Driving Under Influence (DUI), Medications, Alcohol, Motor Vehicle Collision (MVC)
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Prevalence of Drug and Polydrug abuse in drunk drivers. Possible implications in the driving license regranting system

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INTRODUCTION: The phenomenon of the associated intake of alcohol and illicit drugs has not been systematically considered in the medico-legal assessment for license reissuing in cases of suspension of the driving license for DUI of alcohol.
The aim of the study is to estimate the prevalence and characteristics of drug and polydrug users among drunk drivers during the regranting process, in order to assess the inclusion of toxicology tests on hair and urine in the systematic methodology of the regranting procedure in this category of subjects.
MATERIALS AND METHODS: The experimental study was performed on 2160 drunk drivers examined at the Department of Legal Medicine and Toxicology of the University of Padova, in the period between October 2013 and October 2015 and assessing: anagraphical data (sex, age); Blood/Breath Alcohol Concentration (BAC/BrAC) found by traffic police or the refusal to perform such a test; the number of episodes of drunk driving (recidivism); category of driving license (standard or professional); the positivity for one or more illicit drugs in hair or urine samples confirmed by LC/MS and GC/MS analytical methods. The chi-square test (or Fischer's exact test, where appropriate) and Cochran-Armitage Trend Test were used for the analysis of the difference of proportions.
RESULTS: The main results were as follows.
• 11.3% of subjects resulted positive for at least one drug in hair or urine samples and

6,8% of subjects showed polydrug abuse.
• 8,4% resulted positive for at least 1 drug in hair samples.
• 2,9% resulted positive for at least 1 drug in urine.
• Drivers with a history of multiple episodes of drunk driving showed a correlation with drugs/polydrug abuse.
• The statistical analysis did not show significant differences and/or trends between gender/age/category of driving license and positivity for illicit drugs.
• A combination of cocaine and alcohol was the most common pattern of consumption in polydrug users (44% of the subjects that resulted positive for illicit drugs).
• An increasing trend of polydrug abuse was found in the ages between 25 and 35 years.

DISCUSSION: The results show that the category of drug and polydrug users among drunk drivers must be subjected to toxicological as well as alcohological monitoring in the regranting procedure of the driving license. The prevalence of the phenomenon appears to be independent of the BAC/BrAC detected and higher in drivers with a history of multiple episodes of drunk driving. Sex and age do not seem related to positivity for a substance, but a significant increasing trend for the abuse of more than one substance in the age group between 26 and 35 years has been detected. However, drug and polydrug abuse appear to be transversal phenomena of the reference population, unpredictable ex ante from the analysis of the parameters assessed by driving authority.

The procedure of regranting of the license for drunk drivers is one of the most important means for the control and prevention of impaired driving, and can be used for a preventive and rehabilitative purpose, considering the motivational value of a driving license. As known, in the majority of countries, the tools of prevention aimed at reducing road accidents related to alcohol use are organized on two levels:

1) first level: random test on drivers (breath test and/or analysis of blood or oral fluid samples) performed by traffic police with suspension of the driving license (if BAC/BrAC > 0,5 g/L in Italy);

2) second level: regranting of driving license after the conclusion of the period of suspension.

The absence of a toxicological analysis in hair and urine in the second phase of the assessment, could compromise the preventive efficacy not only of the regranting system itself, but also of the random test performed on drivers by traffic police (first level), limiting the first phase to a "repressive juridical act", without the aim of prevention.

The study proves that the increasing phenomenon of polydrug abuse, especially in the category of drunk drivers, should be taken into consideration as a major issue in the re-issuing phase, also in drunk drivers, through a full toxicological ascertainment. The implementation of this procedure could improve knowledge of the dimensions of the issue, providing a powerful means for the reduction of the phenomenon of driving under the influence of alcohol and substances of abuse.

KEYWORDS: Drug and Polydrug Abuse, Drunk Drivers, Driving License Regranting System
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Incidence of alcohol and drugs use among drivers injured in road accidents in Campania (Italy) during 2009-2016 years.

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INTRODUCTION: Driving a motor vehicle under the influence of alcohol or illicit drugs is worldwide considered an elevated risk for the traffic safety. Based on the most recent data

published by ISTAT (2016), in Italy there were 173.892 road accidents with personal injury during 2015. In Campania region (Italy) (5,869,965 inhabitants) ISTAT calculated, during three years 2013- 2015, on average 4-6 deaths and 20 injured drivers for 100000 inhabitants. In Italy, several epidemiological studies have been carried out accomplishing toxicological tests on the road, ensuring anonymity to drivers. However such studies were applied in restricted geographical areas and for a limited period of observation. Moreover, in Italy studies regarding the toxicological findings among drivers hospitalized after a crash are still insufficient and not homogeneous both in the sampling and in the analytical approach.

AIM: Objectives of this study were: a) to assess trends in alcohol, illicit drugs or pharmaceuticals intake by drivers involved in road crashes and admitted to emergency departments of 16 hospitals in the Campania Region, from 2009 to 2016. These 16 hospitals represent the National Health Service for the population of four out of five provinces of the Campania region; b) to propose changes to the current protocols for the assessment of driving disability and provide data for the development of additional preventive policies with regional relevance.

METHODS: In order to demonstrate the violation of the Road Safety Law, toxicological analyses were requested by the police on biological fluids taken from 1.797 hospitalized drivers. Confirmation analyses were performed only for biological samples resulted positives at immunochemical screenings applied by the hospital laboratories. According to the consensus expressed by patients for blood and/or urine sampling, the analyses were performed on: i) n. 780 blood samples referred to 609 cases of suspect driving under the influence of alcohol (DUI) and to 171 cases of suspected recent use of alcohol associated with illicit drugs (DUID); ii) n. 1017 urine collected from DUID cases, when the sampling of blood was denied by drivers.

A GC/HS-FID methodology was used to test blood alcohol concentration (BAC).

After L/L or SPE extraction of biological specimens in specific conditions for alkaline, neutral and acid substances, a systematic toxicological analysis (STA) was performed using validated methods for amphetamine and analogous, cocaine, opiate, benzodiazepines (BDZ), methadone, barbiturate, buprenorphine and cannabis metabolites by GC/MS or LC-MS/MS.

RESULTS: To study trends in the use of alcohol and drugs, the results obtained during 2009-2011, 2012-2014, and 2015-2016 were compared. The BAC greater than 0.5 g/L (legal limit in Italy) was proved in 91,5 % of drivers apprehend for DUI, as showed in Table I.

Table I - Frequency of Blood Alcohol Concentration (BAC) detected in drivers suspected of driving under influence (DUI) in Campania region (Years 2009/2016).

BAC (g/L)	2009/2011 (n. 110 drivers)	2012/2014 (n. 231 drivers)	2015/2016 (n. 268 drivers)
LLOQ < 0.02	0	0	4
0.02 - 0.5	10	17	21
0.5-0.8	19	16	25
0.8-1.5	37	65	87
>1.5	44	133	131

The highest incidence of crashes (DUI cases) involved drivers with BAC> 1.5 g/L and represents, almost the 51% of the cases. When alcohol was in association with illicit drugs (n. 171 cases) road accidents occurred with a lower BAC, prevalently involving both drivers with BAC in the range 0.8-1.5 g/L than those with BAC > 1.5 g/L. In the blood of DUID cases, the intake of more than one illicit drug was mainly detected (29%) and the correlation between BAC level and drugs detected is discussed. Cocaine and THC alone were confirmed for almost 27% of drivers whereas Opiate, BDZ and Methadone were revealed in less than 5%.

When only the urine were collected (n. 1017 DUID cases), drugs identified are synthesized in TableII.

Table II - Frequency of substances detected in drivers suspected of driving under influence of drugs (DUID) in Campania region (Years 2009/2016).

Drugs in Urine	*2009/11 (n. 250 drivers)*	*2012/14 (n. 374 drivers)*	*2015/16 (n. 393 drivers)*
Polydrug	88	60	84
THCCOOH	56	101	145
Cocaine	22	54	44
BDZ	8	20	32
Opiates	19	21	10
Methadone	9	10	7
Buprenorphine	3	1	--
Barbiturates	3	4	--
Amphetamines	--	--	3
Total positive cases	*208*	*271*	*325*
Negative cases	*42*	*103*	*68*

Among positive urine (n. 804), the THCCOOH was the most frequently identified compound alone or in combination with other drugs, with an increasing trend in the three periods. Polydrug use was detected in the 29% of drivers. Cocaine alone was detected only in the 15% of the cases, but in the accidents due to polydrug intake it was the drug mainly highlighted in association with THCCOOH and other drugs. Interestingly the incidence of BDZ, as only pharmaceutical substance taken, is constantly increasing, whereas it is falling in poly user drivers.

DISCUSSION AND CONCLUSION: In Italy, due to the Road Traffic Laws establish the zero limit for illicit drugs and none therapeutic level for pharmaceuticals, the discovery of any drug in the blood of drivers is considered a severe criminal offence. Nevertheless the blood sampling is not mandatory and the consensus must be required by drivers for the urine or blood sampling. The limits for driving following alcohol consumption with correlated sanctions is graded: despite the legal limit for BAC is 0,5 g/L, only for novice and professional drivers (taxi, bus, trucks) the zero limit in the blood is requested. A BAC in the range of 0.5-0.8 g/L determines an administrative sanction and the BAC > 0.8 g/L is considered a criminal offence with increasing severe sanctions. Even though the deterrence power of sanctions, the results of this study describe, in drivers suspected of DUI, an high incidence of cases with BAC > 1.5 g/L but when drivers were suspected of DUID, the accidents occurred at lowest concentrations. In addition, results obtained by the urine and blood positive of DUID cases show a sharp increasing in the use of cannabis, cocaine and BDZ and a decreasing trend for the polydrug intake. This survey, considering both the data collection period (8 years) and the geographical area covered, could assume an useful meaning in order to evaluate the efficacy of the current protocols applied for the assessment of the driving disability in injured drivers. In fact, the 16 hospitals that requested confirmation analyses (by GC/FID, GC/MS or LC-MS/MS) admit the cases of accident occurred in 4 out of 5 provinces of the Campania region. The study demonstrates that the intake of psychoactive drugs and alcohol should be checked in all the road accidents. Moreover, the blood sampling and a forensic analytical approach should be mandatory to demonstrate a violation of the Road Traffic Law. In fact, among 1797 injured drivers, suspected for DUI or DUID, basing on the immunological tests performed at the hospitals, after confirmation analyses negative results were obtained in 261 cases (14,5%) (n. 48 blood and n. 213 urine). Therefore, only a confirmed positive result, for alcohol or drug use, should assume a judicial meaning to demonstrate a criminal offence.

Moreover for the implement of the preventive policies on the road safety in Campania, the toxicological confirmation analyses should be extended to all five regional provinces.

Incidence of alcohol and drug use among pedestrians and cyclists fatally injured in road accidents in Slovenia

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INTRODUCTION: In Slovenia, as well as in other developed countries, road accidents are the leading cause of death among young people due to injuries, and second leading cause of hospital treatment due to trauma.Pedestrians and cyclists are the most vulnerable traffic participants,especially if thay are under the influence of alcohol/drug in the time of the road accident.The drivers who are under the influence of alcohol or other psychoactive substances, pose 11-times higher risk for causing traffic accidents, and 4-times higher risk for fatal injuries as the sober drives in trafficaccidents of the same severity. Less known are the data on the effects of alcohol, drugs and other psychoactive substances on the mortality of pedestrians and cyclists in road accidents. In our article we wish to define the influence of alcohol and psychotropic substances on the mortality rate of pedestrians and cyclist in road traffic.

SUBJECTS AND METHODS: From the ten-year retrospective review of police and autopsy reports we have collected the data on all deceased pedestrians and cyclist in road traffic who have been examined at the Institute of Forensic Medicine of the Faculty of Medicine, University of Ljubljana. We have divided the deceased pedestrians and cyclist into two groups, based on the concentration of blood alcohol and other psychoactive substances, which were proved by the toxicological tests: GROUP I (alcohol/ drug positive) and GROUP II (alcohol/drug negative). Alcohol/drug positive were all the subjects with measured blood alcohol concentration higher than 0.5 g/kg and/or had positive results for toxicological blood test for drugs and other psychoactive substances. We defined differences in sex, age, cause of death and survival time after the road accident.

RESULTS: The study included 149 subjects (deceased pedestrians and cyclists), 60 of them (40%) were alcohol positive and 89 (60%) were alcohol negative, and two subjects (1.3%) tested positive for drugs at the same time. The percentage of other deceased traffic participants (bikers, drivers, car and truck passengers), who were under the influence of alcohol in the time of death, was significantly lower (29%), also the average concentration of blood alcohol was lower with other participants (1,782 g/kg), while the percentage of drug positive was slightly higher (2.9%). The average concentration of alcohol in the alcohol/drug positive group was 2.196 g/kg of blood (from 0.65 to 3.97), average alcohol concentration in the alcohol/drug negative group was 0.12 g/kg of blood (from 0,00 to 0.43). GROUP I consisted of 57 men (95%) and 3 women (5%), the average age was 46.7 years (17 to 86 years), and GORUP II consisted of 39 men (44%) and 50 women (56%), the average age was 62.9 years (from 12 to 89 years). The most common cause of death in both groups was craniocerebral trauma, GROUP I with 22 cases (36%), and GROUP II with 40 cases (45%). In GROUP I we have found concurrent – competing causes of death in 18 cases (30%), while the number of such cases in GROUP II was only 9 (10%). The leading causes of death in GROUP I were cervical spine injuries - 6 cases (10%), chest trauma (lung, heart, aorta lacerations) - 6 cases (10%) and abdominal trauma (ruptured spleen, liver) - 4 cases (14%). In GROUP II the leading causes of death were injuries of cervical spine - 31 cases (35%), chest trauma (lung, heart, aorta lacerations) - 3 cases (3%) and abdominal trauma (ruptured

spleen, liver) - 6 cases (7%). In the alcohol/drugs positive group as many as 56 (94%) of pedestrians and cyclist died within six hours following the injury: 42 at the scene of the accident, 3 during transport and 4 after being admitted to a hospital. In the alcohol/drug negative group 64 (72%) of pedestrians and cyclist died within first six hours following the injury: 40 at the scene of the accident, 5 during transport and 19 after being admitted to a hospital.

DISCUSSION: There is a typical sequence of injuries in pedestrians and cyclists after a vehicle collision, the so-called injury triad: direct impact of a vehicle against the body, another impact to the body against the hood of the car and/or windshield, a fall of the person against the ground. Our research has revealed that alcohol/drugs positive pedestrians and cyclists have a greater number of severe or serious injuries, especially of the head, cervical spine, heart and aorta, liver, and spleen, in comparison with sober victims where the injuries of head and cervical spine are most common. The frequency of road accidents involving pedestrians and cyclists ranges only from 2% to 5%, and the percentage of deceased pedestrians and cyclist in road traffic varies from 13% to 26%. Especially vulnerable are if they under the influence of alcohol/drug. Data from the literature shows that as many as 41% of deaths among pedestrians and cyclists in road accidents are the result of intoxication of one and/or both participants; in 12% the intoxication of the driver and in 36% the intoxication of the pedestrian or cyclist. The highest mortality is recorded in pedestrians and cyclists with high concentration of blood alcohol and other psychoactive substances. On Slovenian roads 250 people died in the years 2015 and 2016, 65 of whom were pedestrians and cyclists (25% of all traffic-related deaths). During that period the police conducted 616,672 breathalyzer tests, 22,517 (37%) of which were positive, and 2307 (0.4%) of people responsible for traffic accidents had over 1.1 alcohol in g/kg of blood. The police also ordered 2426 expert blood alcohol tests, 1021 (42%) of which were positive, and 299 (12%) people refused the expert test. The police also ordered 1640 expert blood drug tests, 380 (23%) of which were positive, and 523 (32%) people refused the expert test. These data show that a large number of traffic participants is under the influence of alcohol and/or other psychotropic substances, unfortunately there is no data on how many of them were pedestrians and cyclists.

CONCLUSIONS: Pedestrians and cyclists are the most vulnerable traffic participants with highest mortality rate. Most vulnerable are the alcohol/drugs positive pedestrians and cyclists, since as much as 40% of deceased pedestrians and cyclists in the road traffic were under the influence of alcohol or drugs. Alcohol/drug positive deceased pedestrians and cyclists are usually younger men, who also have shorter survival time after the road accident, mainly due to severe and serious injuries. Our research also revealed that percentage of alcohol/drug positive pedestrians and cyclists who died in road traffic is significantly higher than percentage in alcohol/drug positive in other victims of road accidents. Considering the fact that alcohol is the greatest risk factor for deaths of pedestrians and cyclists in traffic, increased and more targeted control of degree of intoxication could significantly reduce the number of traffic-related deaths.

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3-01

Australian roadside drug testing: Moving to a next generational response

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BACKGROUND/INTRODUCTION: Drug driving is a problematic issue for many countries around the world. As a result, many governments have implemented legislation allowing for roadside specific roadside enforcement programs in an attempt to address this road safety concern. In Australia, drug driving enforcement takes a zero-tolerance approach via "per-se" legislation. That is, the mere presence of tetrahydrocannabinol (THC), methamphetamine (MA), and/or 3,4 methylenedioxy-methamphetamine (MDMA) in an oral fluid sample will result in sanctions. This roadside testing practice has been progressive implemented across all eight state and territory policing jurisdictions since 2004. Currently, there are around 500,000 roadside oral fluid drug tests conducted annually across the country.
OBJECTIVE: Australia has established itself as the leading country interdicting into drug driving via roadside oral fluid testing. As a result of the lessons learned following a decade of roadside oral fluid drug testing practice, there is now a maturity and willingness among all Australian jurisdictions to combine this experience with research and theory to move to the next generation of approaches to target and manage drug drivers.
METHOD/RESULTS: This presentation will outline the historical constructs that led to current roadside testing practices. This will be followed by a presentation of roadside drug test data from the state of Queensland for the period 1 December 2007 to 31 December 2014. Coronial reports for fatalities involving a drug-impaired driver will also be discussed. Conclusion/discussion: The presentation will conclude with an overview of research and theory that will inform future directions and discussion of second-generation policy for evidentiary roadside oral fluid testing.

KEYWORDS: roadside drug testing, oral fluid testing, policing
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3-02

Can the use of Dräger DrugTest 5000 correctly identify drug drivers? Evaluation in a naturalistic setting in Norway

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BACKGROUND: Reliable on-site testing devices for illicit and medicinal drugs would be an important tool for the police for detecting drug-impaired drivers. The Norwegian Mobile Police Service (NMPS) started using Dräger DrugTest 5000 (DT5000) in 2015 as an on-site drug screening instrument.
OBJECTIVE: The aim of this study was to compare the results of analysis of oral fluid using DT5000 with drug findings in blood samples taken from drivers suspected for driving under the influence of drugs (DUID).
METHODS: When the NMPS apprehended a possible DUID offender, an oral fluid sample was analysed with DT5000. The driver was then brought to a medical doctor for collection of a blood sample as well as an oral fluid sample using the Intercept sampling device. Blood

and oral fluid samples were sent to the forensic toxicology laboratory in Oslo for analysis of psychoactive medicinal drugs and illicit drugs using UHPLC-MS/MS. Drug findings above the legal limits introduced in Norway in 2012 were regarded as positive. In addition, codeine concentrations in blood above 100 ng/mL were regarded as positive. The study was performed from November 2015 to March 2016, and all NMPS districts were included. All data was handled anonymously.

RESULTS: A total of 369 drivers suspected for DUID were included in the study. The median time from analysis using DT5000 and blood sampling was 50 min. The proportions of false positives results in oral fluid analysed with DT5000 compared to findings in blood samples were for cannabis 14%, amphetamine 23%, methamphetamine 38%, cocaine 87%, opiates 66% and benzodiazepines 36%. The proportions of false negatives were for cannabis 13%, amphetamine 5%, methamphetamine 6%, cocaine 0%, opiates 0%, and benzodiazepines 19%. Among drivers who had drug concentrations above the legal limits in blood, the proportion who was positive using DT5000 was 82% for THC, 90% for amphetamine, 76% for methamphetamine, 100% for cocaine, 100% for opiates, and 37% for benzodiazepines. In cases with false positive DT5000 results, traces of drugs were often found in oral fluid in spite of the fact that the concentration in blood was below the legal limit. This was particularly evident for cocaine.

DISCUSSION AND CONCLUSION: The DT5000 did not absolutely correctly identify DUID offenders due to fairly large proportions of false positive or false negative results compared to drug concentrations in blood. False positives were often due to the fact that the drug was present in oral fluid above the cut-off concentrations of DT5000, but below the legal limit in blood. This was partly caused by the fact that the concentration in OF does not accurately reflect the concentration in blood, and the fairly long time between analysis of DT5000 and blood sampling may cause significant changes in the concentrations of some drugs in blood. However, the police found that the DT5000 was a valuable tool in identifying possible DUID offenders when other indications were present, such as observed unsafe or irregular driving, tips to the police, or driver known by the police for previous drug offences. One police district reported that the number of detected DUID offenders was doubled in after introducing DT5000.

KEYWORDS: on-site drug testing; Dräger DrugTest 5000
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Evaluation of some abuse drugs in Patients of an Emergency Hospital
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BACKGROUND: Drugs have played a major role in defining the sub cultural and counter cultural influences in society. The pervasive availability of psychotropic chemicals can cause a direct physiological and psychological change in the body.The present work is aimed to use laboratory based analyses to determine the prevalence and use pattern of some substances of abuse among a group of acute overdosed patients.

MATERIALS AND METHODS: The study was conducted on patients (n=390) with acute poisoning by some drugs of abuse (Cannabis, benzodiazepines, barbiturates, opiates and ethanol).The patients were from Dakahlia governorate and surrounding governorates. They were admitted to poison unit, emergency hospital, Mansoura University in the period between November 2009 and April 2014. In this study all patients were subjected for detection of drugs of abuse in urine by EMIT system and Gas Chromatography / Mass Spectrometry (GC/MS) for confirmation of the obtained results.

RESULTS: The study showed that approximately 75% of patients were encountered in the age group 20–40 years. Cannabis was the first abused drug (37.69%) followed by opioids (27.18%). Female patients were likely to abuse benzodiazepines (57.14%). The study revealed that the percentages of positive urine samples by EMIT were; (27.18%, 14.87%, 11.54% 9.74% and 1.79%), for cannabis, opiates, benzodiazepines, barbiturates and ethanol, respectively and by GC/MS were; 16.15%, 10.25%, 8.97% and 8.46% for cannabis, benzodiazepines, barbiturates and opiates, respectively.
CONCLUSION: Presence of these drugs has a serious effect on man health (mental and physical functioning), consequently his environment.

KEYWORDS: Drugs, EMIT, GC/MS
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Technique of receiving antibodies to synthetic kannabinoids «spices» and some antidepressants for development of diagnostic test system

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INTRODUCTION: It is known that development of the IFA sensitive methods it is connected with need of receiving highly specific antibodies. Receiving such antibodies, especially to low-molecular substances, is complicated by the fact that gaptens, not immunogenes and in itself don't induce an antibody education. Anti-gene determinants of such substances (the sites of a surface of an anti-gene connected by an antibody), consist of a small number of the amino-acid and carbohydrate remains. To transfer small molecules to an immunogene state, they need covalent be attached to a macromolecular matrix. At the same time, the importance, has a right choice of the carrier. Accession of low-molecular substances to the carrier provides a possibility of receiving specific antibodies. For prevention of nonspecific reactions and increase in sensitivity of an immunochemical method, especially concerning low-molecular substances, special attention is paid on a caption of antibodies, serological activity and extent of cleaning.
The main requirements for antisera when designing immunochemical method is their high specificity, the presence of antibodies to a particular antigen or hapten. Low molecular weight compounds can not be an inducer of antibody synthesis without macromolecular matrices. In this regard, one of the greatest challenges is to obtain high titer serum antibodies to haptens. It was found that in the preparation of the corresponding macromolecular carrier conjugate, hapten will have immunogenic properties.
In this paper, the synthesis of the conjugates to low molecular weight substances as a vehicle, we used BSA. It is known that too small and too large amount of the hapten molecules are attached to a carrier immunogenic properties deteriorates. In this regard, for the preparation of conjugates of synthetic cannabinoids "spice" albumin and antidepressants, in studies presented conjugate synthesis was performed using glutaraldehyde.
ACTION: To determine the optimal conditions for the production of antibodies to synthetic cannabinoids "spice" and some antidepressants using immunomodulatory agents.
METHODS: In this work, as synthetic cannabinoids "spice" have been selected antigen contact group AB-CHMINACA and antidepressants (carbamazepine, depression, sertraline) and specific antibodies generated by immunization of experimental animals. In the experimental group of laboratory animals by their appearance and condition did not differ from normal individuals.
In the first series of out bred mice body weight 18 - 22 g intraperitoneally introduced a low molecular weight complex means of AK in the volume of 0.5 ml. A day to stimulate antibody

production to the facility AK them further intraperitoneally within 3 h days with a camel kidneys extract (EPB) at a dose of 1.0 mg / kg.

In the second series to mice have entered low-molecular complex means the EXPERT of 0,5 ml inside. In 24 hours him in addition inside within 3 days entered EPB in a dose of 1,0 mg/kg.

In the third series to mice have entered low-molecular complex means of AR of 0,5 ml inside. In 24 hours him in addition inside within 3 days entered EPB in a dose of 1,0 mg/kg.

In the fourth series to mice have entered low-molecular complex means of FA of 0,5 ml inside. In 24 hours him in addition inside within 3 days entered EPB in a dose of 1,0 mg/kg.

Within 10 days mice instead of water were given the electroactivated water solution a catholyte. This solution was prepared in the Espero-1 electrobioactivator. Oxidation-reduction potential of solution has made in the range from 400-mV to 800-mV; pH the solutions prepared on physiological solution from 7,0 to 10,0 mattered.

For the 10th days at mouses, immunizied with low-molecular complex means and in addition receiving an immunomodulator extract of a kidney of a camel and a catholyte, hammered and in serum of blood defined a caption of antibodies to the studied low-molecular means.

RESULTS: At assessment of results of 4 series of immunological researches it is established that at additional introduction of immunoreactive means of an animal origin (EPV) and the electroactivated water solution (catholyte), essential increase in development of specific antibodies to low-molecular means of joint stock company, the EXPERT, by AR and FA in comparison with control values is noted. This tendency was noted in all series of experiences. Cleaning of the received antibodies carried out by means of an affine chromatography.

CONCLUSION: By means of an animal origin – extract of a kidney of a camel and the electroactivated water solution (catholyte) it is possible to increase development of specific antibodies to low-molecular anti-genes. In comparative aspect, quantitative increase in antibodies, perhaps, happens due to activation of the intracellular processes controlling synthesis of antibodies in plasmatic cages or due to increase in a pool of plasmatic cages, specific antibodies to a concrete anti-gene.

KEYWORDS: synthetic cannabinoids, electroactivated, antibodies, antidepressants, immunochemical method

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Application of the Thermodesorption surface – ionization spectroscopy method in Amitriptyline analysis

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INTRODUCTION: Nowadays antidepressants have acquired extraordinary actuality in chemical-toxicological researches and forensic chemical examination. The reason for it is frequent incidents of acute and chronic poisoning (intoxication) by the representatives of this medicinal agents group. Pharmacological, pharmacokinetic and other conducted experiments showed that the representatives of this group including amitriptyline have besides a main pharmacotherapeutic action some negative side effects which led to fatal end.The aim of this research is an elaboration of thermodesorptional surface-ionization spectroscopy methods for amitriptyline analysis.

METHODS: The following analysis methods were developed to detect the amitriptyline by thermodesorption surface-ionization spectroscopy (TDSIS) method: emitter - oxidized molybdenum, containing iridium; the voltage of emitter - 405 V; the temperature of emitter -

390-420 °C; the evaporation temperature - 20-505 °C; air flow rate - 50 l/h (the voltage of compressor - 12 V) ; the volume of test sample taken for analysis – 1.0 μl; the analysis (test) time - 3 minutes; writing down of the spectrum is conducted by means of a computer program. Standard solutions of amitriptyline were prepared in order to conduct an experiment. For this purpose 0.001 g of Amitriptyline (accurately weighed) was put into the 10 ml measure flask and amitriptyline was dissolved in a small volume of 95% ethyl alcohol. Then the solution was diluted with 95% ethyl alcohol to the mark. A standard working solution (1.0 μg/ml) was prepared from this solution. 1 μl of the obtained amitriptyline solution was injected into the cylindrical space of vapour-forming tape of apparatus "Iskovich-1" and thermodesorption surface-ionization spectra were obtained.

RESULTS: Specific peak for amitriptyline appeared at temperature ~95±15°C and ~180±10 °C. Also calibration curve for determination of the quantity of amitriptyline isolated from biological material was drawn. In this case linear-dynamic range of determination was 0.3-30 ng/sample. Detection limit – 0.1 ng. Developed methods were tested (approved) in the analysis of amitriptyline isolated from the biological material. In this case positive results were obtained.

CONCLUSIONS: Methods of amitriptyline analysis were elaborated which was isolated from the biological material. For this purpose TDSIS method was used. It was established that alcohol solutions of Amitriptyline form the peak at the temperature ~95±15°C and ~180±10 °C. It was shown an opportunity of TDSIS method using in the quantitative analysis of Amitriptyline, isolated from biological materia

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4-01

Risky Driving Videos on YouTube: Should We Be Concerned about this Social Medium?

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BACKGROUND: YouTube displays millions of videos of extreme risky driving behaviours. The top 20 highly subscribed automotive YouTube websites are mostly on high performance vehicles, high speed and often show risky driving. Among the top 10 featured YouTube videos based on the search words of street racing, only one is on a race track; the other nine show videos of street racing on public roads, often on expressways among other traffic.
OBJECTIVE: The purpose of this presentation is to present what we know about YouTube videos and risky driving.
METHODS: A systematic search was performed using specialized database sources with the following search words YouTube AND driving, YouTube AND speeding, YouTube AND street racing.
RESULTS: No published social media research was found on the content of risky driving videos or on the effects of these videos on viewers. However, research has shown effects of mass media on risky driving cognitions, attitudes and behaviour. Yet, the technology of YouTube makes this social medium unique from other mass media in its strong encouragement of social engagement and participation from its audience.
CONCLUSIONS: Monthly about 1,000,000,000 people are reported to view YouTube videos. Young males are the heaviest users, overall viewing more YouTube videos and watching them longer than females and other age groups. Young males are also the riskiest drivers, with more per capita violations and injuries and fatalities than other ages. This presentation will review what we do and do not know about the social medium of YouTube and risky driving, present psychological theories that could support YouTube's potential effects on driving behaviour and provide two examples of risky driving behaviours ("sidewalk skiing" and "ghost riding the whip") suggestive of varying levels of modelling behaviour in subsequent YouTube videos.

KEYWORDS: YouTube, street racing, content analysis
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4-02

Street Racing Videos and their Popularity - A YouTube Content Analysis

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BACKGROUND: Every month about 1,000,000,000 individuals view YouTube videos (ebizMBA Guide, 2015) and young men are the heaviest users, overall streaming more YouTube videos and watching them longer than women and other age groups (Nielson, 2011). The youngest millennials watch more digital video than TV. They are constantly connected - they are glued to their smartphones, texting, taking photos, and posting photos/videos. (Nielson 2014)

This group is also the most dangerous group in traffic, engaging in more per capita violations and experiencing more per capita injuries and fatalities (e.g., Reason et al., 1990; Parker et al., 1995; Transport Canada, 2008, 2015). YouTube contains many channels portraying risky driving. No one has examined just what videos are most popular and their content.

OBJECTIVE: To document and analyze the content of a sample of YouTube street racing videos, including high risk driving activities, consequences, comments, likes/dislikes and to assess content in relation to views.

METHODS: A sample of YouTube videos with the highest view count were identified using the search term "street racing" on a given day. Identifying characteristics such as their URLs, user names, upload date, and number of subscribers, likes and dislikes and comments were recorded. Using a sample of the videos, a coding matrix was developed and tested for inter-rater reliability. A quantitative content analysis was conducted in which a template analysis style was used to code and analyze the data.

RESULTS: Our strategy of searching for videos using the term "street racing" and filtering by view count yielded 186,000 videos. A sample of 25 most viewed videos were selected.

Almost all the videos were in the Cars & Vehicles category, but the Entertainment videos had higher counts. View counts ranged from 1,650,405 up to 9,045,488; 11 videos were produced by Users whose Channels contained more than 200 videos with at least 35,000 subscribers.

Video characteristics coded include whether the video is a compilation or just one scenario; descriptors of the drivers, bystanders, and focus vehicles; the terrain and road conditions; type of video; driving activities; consequences/outcomes; video effects; comments and emotions. Independent coding has been completed. This presentation will summarize the results of the analysis in terms of the higher order themes identified in the videos for driving activities, consequences and outcomes.

DISCUSSION: YouTube shows millions on videos of high risk driving. Yet, no research has been published on this topic. This is the first known study to examine the content of top ranking YouTube videos of the risky driving activity of street racing.

KEYWORDS: YouTube, street racing, content analysis
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SESSION 5: NON-ALCOHOL DRUGS AND DRIVING

5-01
Drugs and driving: Trends and challenges
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SESSION 6: MEDICINAL DRUGS: RECREATIONAL, THERAPEUTIC AND LONG-TERM THERAPEUTIC USE

6-01
Introduction and background of a Dutch collaboration to assess long term effects of medicinal drugs (classified ICADTS class III) on driver performance

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More than 10% of the Dutch population is treated with benzodiazepine hypnotics or anxiolytics, and about 41% of them reports using these drugs on a daily basis. Li is reasonable to assume that the majority of these patients also drive a car.
The Dutch regulations regarding fitness to drive a car when treated with medicines that have the potential to compromise traffic safety are laid down in the Regeling Eisen Geschiktheid 2000 (REG2000). These regulations refer to the classification of The International Council on Alcohol, Drugs and Traffic Safety (ICADTS). Medicines are allocated to one of three groups, namely Category I (Presumed to be safe or unlikely to produce an effect; i.e. comparable to a blood alcohol concentration (BAC)<0.05%), Category II (Likely to produce minor or moderate adverse effects; i.e. comparable to a BAC of 0.05% - 0.08%), and Category III (Likely to produce severe effects or presumed to be potentially dangerous; i.e. comparable to a BAC>0.08%). This classification is however largely based on double-blind clinical trials that were performed in healthy volunteers who used the treatment only for short time (i.e., acute or sub-chronic effects). Drivers who use Category III medications are considered unfit for driving. However, in real life, patients may use these medicines for long time. It is unknown to what extent tolerance develops to the impairing effects of these medicine, and if, and when, driving may become safe after chronic use of these drugs. Therefore the aim of the current study was to examine the effects of chronic use of anxiolytics, antidepressants, and hypnotic drugs, which are currently classified as ICADTS Category III on driving ability.
The study was conducted by the Dutch Universities of Utrecht, Groningen, and Maastricht, and consisted of two parts. To determine whether driving was impaired after long-term medicine use, results on a series of neuropsychological tests assessing skills and abilities related to driving, driving simulator tests, and the on-the road driving test in actual traffic (Part 2 of the study) were compared the effects observed after administering alcohol to achieve a blood alcohol concentration (BAC) of 0.05%, i.e. the legal limit for driving in The Netherlands

(Part 1 of the study). If the impairment observed after long-term use of ICADTS Category III medication was worse than the effect of alcohol BAC 0.05% it was regarded a clinically relevant impairment. The presentations in the current symposium will summarize the findings of this multi-center project.

Long-term effects of antidepressant and benzodiazepine usage on actual driving and neurocognitive performance

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BACKGROUND: In the Netherlands, the ICADTS classification system is used to assess fitness to drive when taking potentially impairing medicinal drugs. Driving is prohibited when a medicinal drug is classified as category III (i.e. do not drive). However, the ICADTS classification system is mainly based on double-blind research with healthy participants assessing the acute or subchronic effects of medicinal drugs. Information regarding the effects of long-term medicinal drug use on driving performance is, however, lacking.
OBJECTIVE: Assessing driving performance in patients receiving long-term category III medicinal drug treatment.
METHODS: A multicentre study in the Netherlands was conducted to examine the effect of long-term category III antidepressant, anxiolytic or hypnotic use on driving performance. Patients prescribed with medicinal drugs for at least 6 months were matched with healthy controls, based on age, gender, and driving experience. Each patient group consisted out of two subgroups based on duration of treatment, either between 6 months and 3 years, or, longer than 3 years. Performance measures included: a neurocognitive test battery (e.g. attention, reaction speed, executive functioning, risk perception) and a standardized on-the-road highway driving test. In total, 147 participants completed the study (Anxiolytics, N=12; Antidepressants, N=38; Hypnotics, N=32; Healthy controls, N = 65). Analyses of performance measures were two-folded. First, a between-group comparison (patient vs. control) was made to assess statistical significant differences in performance. Second, non-inferiority analyses were used to evaluate the clinical relevance of group differences in relation to a non-inferiority limit obtained at a Blood Alcohol Concentration (BAC) of 0.5mg/mL, the legal limit for driving under the influence in the Netherlands.
RESULTS: For the standardized on-the-road highway driving test, analysis showed significant performance impairment between patients treated with hypnotics and healthy controls. Non-significant differences were found for patients treated with anxiolytics or antidepressants. Non-inferiority analysis revealed that for anxiolytics and hypnotics, the upper limit of the 95% confidence interval (CI) of the mean difference exceeded the BAC 0.5mg/mL criteria, indicating clinically relevant impairment. Subsequent subgroup analysis for antidepressant and hypnotic users based on duration of treatment revealed that, for both groups, patients treated for a period shorter than 3 years showed statistical and clinically relevant impairment. These effects were absent in patients treated for longer than 3 years. For the neurocognitive test battery, analysis showed a non-significant difference between

patient groups and healthy controls on most performance measures. Due to large inter-individual differences, the upper limit of the 95% CI of the mean difference exceeded the BAC 0.5mg/mL criteria, thus indicating clinically relevant impairment.

DISCUSSION: Outcomes are used to develop and update regulatory policies with regard to long-term medicinal drug use in the Netherlands. Based on the obtained results, it is proposed to classify long-term (>3 years) use of antidepressants and hypnotics as category II (i.e. be careful).

KEYWORDS: Driving performance, Long-term treatment, Antidepressants, Benzodiazepines
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Long term effects of antidepressants and benzodiazepines on simulated driving performance.

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The International Council on Alcohol, Drugs and Traffic Safety (ICADTS) classifies the impairing properties of medicinal drugs into one of three categories, I = presumed safe, II = moderate adverse effects and III = (potentially) dangerous. The Dutch Law concerning the validity of the driving license is based on this classification. Consequently, the driving license of patients that use medicinal drugs from category III, is declared invalid. However, on the one hand this classification is based on short studies of drug use in healthy subjects, either in on-the-road studies or in laboratory tests. On the other hand, chronic (>3yrs) drug users (patients) may develop a tolerance for the impairing effects of Category III drugs. The present study had two objectives, evaluating fitness to drive of chronic users by comparing the performance of drug users with the performance of healthy persons under the influence of the legal limit of alcohol (0.5‰) in traffic, and comparing the results from on-the-road studies and laboratory tests with results from tests in a driving simulator. Results of patients in the driving simulator were comparable with the results of the on-the-road task. Patients who had been using antidepressants or benzodiazepines chronically showed comparable or even less performance decline compared to healthy persons who were under the influence of 0.5‰ alcohol. In contrast, short term users (<3yrs) of antidepressants or benzodiazepines showed an increased decline in performance compared to healthy persons under the influence of 0.5‰ alcohol. This suggests that the

KEYWORDS: ICADTS Category-III, driving, simulator
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Polypharmacy of ICADTS III drugs and long-term effects on driving

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ICADTS III medications are CNS drugs that are classified as severely impairing to driving performance. Examples of ICADTSIII medications are benzodiazepines and sedating antidepressants. ICADTS category III medications are often used in combination with each other and with other CNS drugs. The combined use of category III medications might carry an added risk due to additive or synergistic drug interactions. To explore this idea, driving performance of 17 participants who used at least 2 category III medications for a minimum of 6 months was compared to that of single category III drug users (N=82) and controls (N=65), who did not use CNS medications. Driving performance was assessed using an on-the-road driving test, a driving simulator and a neuropsychological test battery. Change scores in performance were compared to an alcohol criterion value (equivalence to BAC 0.5 mg/ml) to determine clinical relevance. The multi category III users did not show any significant differences in psychomotor functioning or on-the-road driving as compared to both single category III users and control participants. However, confidence intervals around differences from controls were very wide and included zero as well the alcohol reference criterion. This suggests considerable variance between individual drivers using multiple drugs of which some demonstrated impairments and others did not. Limitations of this investigation will be addressed and the potential role of co-medications, other than category III drugs will also be considered. Post-hoc consideration of the diversity of medication profiles of all participants invokes some questions about the approach of a heterogeneous clinical sample.

KEYWORDS: Polypharmacy ICADTSIII Driving
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Effect of chronic opioid therapy on actual driving performance in non-cancer pain patients

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BACKGROUND: Chronic non-cancer pain (CNCP) is a major health problem. Patients are increasingly treated with chronic opioid therapy (COT). Several laboratory studies have demonstrated that long-term use of opioids does not generally lead to impairment of driving related skills. However, there is still a lack of studies examining the effects of COT in CNCP patients on on-the-road driving performance in actual traffic.
OBJECTIVE: The present study assessed the effects of COT on road-tracking and car-following performance in CNCP patients.
METHODS: Performance of 20 CNCP patients treated with long-term stable doses of opioid analgesics was compared to 19 healthy controls in two standardized on-the-road driving tests in normal traffic. Performance of controls with a blood alcohol concentration (BAC) of 0.5 g/L was used as a reference to define clinically relevant changes in driving performance.
RESULTS: The Standard Deviation of Lateral Position (SDLP) was 2.57 cm greater in CNCP patients with COT compared to sober controls. This difference failed to reach statistical significance in a superiority test. Equivalence testing indicated that the 95% CI around the mean SDLP change was equivalent to the mean SDLP change seen in controls with a BAC of 0.5 g/L and did not include zero. When corrected for age differences between groups the 95% CI widened to include both the alcohol reference criterion and zero. No difference was found in car-following performance between patients and controls.

CONCLUSIONS: Driving performance of CNCP patients with COT did not significantly differ from that of controls due to large inter-individual variations. Hence in clinical practice, determination of fitness to drive of CNCP patients who receive opioid treatment should be based on an individual assessment.

KEYWORDS: Chronic pain; opioids; on-the-road driving tests
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Therapeutic and recreational use of Codeine, Tramadol, Zolpidem and Ketamine in drivers

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INTRODUCTION: Codeine, Tramadol, Zolpidem and Ketamine are psychoactive drugs that can be used for medical and recreational purposes (abuse/misuse).
Due to deficient international homogeneous guidelines with regard to the toxicological analysis performed in the context of the reissuing of driving licenses after a driving under the influence (DUI) offence, different protocols are applied in the national context, where these substances are not always detected. Given the potential effects of the aforementioned substances in impairing driving performance, it is important to monitor their use in drivers.
OBJECTIVE: This study aims at providing the prevalence and characteristics of those drivers using Codeine, Tramadol, Zolpidem and Ketamine, distinguishing between recreational and therapeutic uses, in order to offer preliminary evidence in support of the introduction of these analytes in all toxicological protocols.
MATERIALS AND METHODS: The study, performed on 2.305 subjects who underwent medico-legal ascertainment for the renewal/reissuing of the driving license (period 01.08.2013 - 29.02.2016), in the Department of Legal Medicine and Toxicology of the University of Padova, included the collection of the following data: age, sex, documentation of medical use, dangerous drinking habits, and results of the toxicological analysis performed on hair samples (LC/HRMS; GC/MS), including the detection of Amphetamines, Cannabinoids, Cocaine, Opiates (comprising Codeine), Opiate Substitutes, Tramadol, Zolpidem and Ketamine.
RESULTS: Data regarding frequencies, sex and mean age of positive drivers, are reported in the table below, divided on the basis of the target substances

	POSITIVE NUMBER (%)	SEX M/F (% MALES)	AGE MEAN ± SD
CODEINE	60 (2.61%)	55/5 (91.7%)	38,7±11,1
TRAMADOL	74 (3.21%)	70/4 (94.6%)	38,8±10,4
ZOLPIDEM	17(0.73%)	12/5 (70.6%)	39,7±10,6
KETAMINE	59 (2.56%)	57/2 (94.9%)	28,7±7,15

Medical documentation was available in the following percentage of cases: 50% Codeine, 65% Zolpidem, 17% Tramadol, 0% Ketamine. In cases without medical prescription, 71% of Zolpidem and 77% of Tramadol positive subjects were associated with alcohol abuse. Codeine, in the group with medical prescription, was found isolated or associated with other prescribed drugs.

DISCUSSION: The results demonstrate that Codeine, Tramadol, Zolpidem and Ketamine are used by more than 9% of drivers, and in frequent association with other drugs of abuse.

The absence of verified medical prescriptions, indicating the recreational use of the target substances, implies that Ketamine positivity is exclusively a consequence of abuse, more frequent in the younger population.

The prescription of Codeine was never associated with the positivity to other substances of abuse.

The high prevalence of alcohol abuse in Zolpidem and Tramadol positive subjects without prescription suggests the importance of monitoring these substances in drivers.

In conclusion, the results of this study demonstrate the importance to extensively introduce Codeine, Tramadol, Zolpidem and Ketamine in analytical-toxicological protocols for drivers requesting the reissuing of the driving license.

KEYWORDS: Codeine, Tramadol, Zolpidem, Ketamine, Drivers
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7-01
Determination of legislative limits for tetrahydrocannabinol in Norway
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BACKGROUND/INTRODUCTION: Norway introduced legislative limits for driving under the influence of drugs (DUID) February 1st, 2012, regulated in the Norwegian Road Traffic Act. Per se limits corresponding to blood alcohol concentrations (BACs) of 0.02% have been established for 28 drugs. Limits for graded sanctions, representing drug concentrations in blood, corresponding to impairment comparable to BACs of 0.05% and 0.12%, have established for 22 of these drugs, including tetrahydrocannabinol (THC). THC has been among the three most frequently detected drugs in blood samples from drivers apprehended by the police in Norway for a decade. In a road-side study among Norwegian drivers, THC was detected in 0.7% of oral fluid samples.
Legal limits have been introduced to cause a harmonization of the legislation for alcohol and non-alcohol drugs.
OBJECTIVE: Presentation of the legislative limits in Norway for DUID-cases, focusing on THC.
METHODS: The scientific evidence for suggesting legislative limits for THC will be presented, and the experience with this legislation will be discussed.
RESULTS: The per se limit for THC is 1.3 ng/ml (0.004µM), and the limits for graded sanctions corresponding to 0.05 and 0.12% are 3 and 9 ng/ml (0.010 and 0.030 µM), respectively.
THC was the most frequently detected drug of abuse found in blood samples from DUID cases in 2016, only alcohol was detected in a higher number of cases. Almost 10% of the THC concentrations detected were higher than the 0.12% limits, and around 50% were between the 0.02 and the 0.05% limits.
The number of expert witness statements has been reduced with more than 1/3 after introducing legal limits for DUID-cases. A 20% increase in the number of apprehended drivers has been seen in the same period.
There are no systematic studies that have investigated how the new legislation has influenced court sentences in the traffic cases, but the impression is that these cases have been processed as intended by the Norwegian courts.
CONCLUSIONS/DISCUSSION: Per se limits corresponding to BACs of 0.02% have been established for 28 drugs, and limits for graded sanctions comparable to BACs of 0.05% and 0.12% have been established for 22 of these drugs, including THC. Such limits enable the court to meter out sanctions based solely on the measured drug concentrations, thus reducing the need for expert witness statements, similar to the proceedings already present for alcohol. Before these law amendments were set in motion, an expert witness statement was required in every case detecting psychotropic drugs, other than alcohol, to assess the degree of impairment; taking into account concentrations of the drugs detected, results of the clinical test of impairment, as well as medical information of relevance to the case.
Legal limits have been introduced successfully in Norway, causing a harmonization of the legislation for alcohol and non-alcohol drugs.

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KEYWORDS: Driving under the influence, THC, legistlative limits
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The Journey To Legalize Cannabis in Canada

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Drawing on current research and available technology, as well as best practices from around the world, Canada's goal of reducing traffic fatalities from drug impaired driving will include effective legislation with enforcement based on proven methods of detection with increased use of standard field sobriety tests (SFST), and increased public education and awareness of the effects of Cannabis on driving.

Canada has taken a proactive approach by forming a federal Task Force on Cannabis Legalization and Regulation, that submitted a final report (A Framework for the Legalization and Regulation of Cannabis in Canada) to the Government of Canada on November 30, 2016. Canada will become a world leader in its combined approach to the legalization of Cannabis and directed enforcement of drug impaired driving. Policy, procedure, public awareness and legislation are all areas being targeted in Canada's approach to Cannabis, and will form the basis for the provincial regulations that will put this strategic plan into place. Driving under the influence of drugs, or "Drugged Driving", has become a growing concern for road traffic safety both in Canada and globally. Canada has a long history of effective legislation related to alcohol impaired driving, and is turning this experience towards newly revised impaired driving laws, which enables roadside oral screening for drugs. Oral Fluid screeners are of particular interest as they are less invasive than blood screening, highly reliable, as demonstrated in multiple studies, and accurate at detecting recent drug use. Just as public perception surrounding drinking and driving saw a large shift when its laws were first enforced, we anticipate a similar shift with regard to views on Cannabis use and driving. Far from being a benign substance, Cannabis is proving to be a cause of traffic fatalities in areas that have legalized its use, especially when combined with the effects of alcohol. Canada aims to reduce these fatalities through a multi-tiered approach to safety.

KEYWORDS: Cannabis, Drug-testing, Road Safety
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Relationship between medical cannabis, alcohol use and traffic accidents

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The legalization of cannabis for medical use is the subject of debate all over the world. In recent years, a number of countries have introduced specific laws and programs to allow the patients to use cannabis in various forms to treat the symptoms of specific disabling diseases, however little is known about the impacts of medical cannabis control policies on road safety.

Driving while impaired by any psychoactive substance, including cannabis, is risky. Laboratory studies have shown that cannabis use impairs driving-related functions such as, reaction time, distance perception, and hand-eye coordination. However, neither simulator nor driving-course studies provide consistent evidence that these impairments to driving-related functions lead to an increased risk of accidents. Cannabis can affect people differently, making it challenging to develop consistent and fair safety guidelines. Also, epidemiological studies have been inconclusive regarding whether cannabis use causes an increased risk of accidents. In contrast, unanimity exists that alcohol impairs driving-related functions and increases accident risk.

Moreover, simulator and driving-course studies revealed firm evidence that alcohol use leads to an increased risk of accidents. Even at low doses, drivers under the influence of alcohol tend to underestimate the degree to which they are impaired and take more risks. Furthermore, the risk from driving under the influence of both alcohol and cannabis is greater than the risk of driving under the influence of either alone.

Despite intense public interest, medical cannabis regulations have received little attention from researchers, policy makers and traffic safety practitioners. This presentation draws information from variety of studies to explore the impact of legalizing medical cannabis, including the probable negative relationship between medical cannabis laws and alcohol related traffic fatalities. The information on negative relationship between the legalization of medical cannabis and traffic fatalities involving alcohol supports the hypothesis that cannabis and alcohol may be substitutes.

The impact of medical cannabis policies on alcohol use is complex and likely depends on the specific aspects of policy implementation. In the context of possible adverse effects and associated cost of the drug control policies, this information should encourage further research focusing on resolving many contradictions posed by previous studies and could influence policy decisions on cannabis laws and how they are implemented.

KEYWORDS: Medical cannabis, alcohol use, traffic accidents
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Epidemiological studies on risk for crash involvement after cannabis use

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BACKGROUND: Experimental studies have documented that use of cannabis may affect psychomotor and cognitive functions that are needed to drive safely. However, most epidemiological studies on cannabis use and involvement in road traffic crashes (RTCs) found only minor or no risk increase.

OBJECTIVE: To assess the criteria used for defining cannabis exposure in epidemiological studies on the association between cannabis use and RTC involvement, and to discuss the implications on assessment of crash risk.

METHODS: Review of published studies where cannabis exposure was defined as concentrations of THC or THC-COOH above defined cut-offs in biological samples.

RESULTS: Of the 15 case-control studies reviewed, 7 were based completely or partly on analysis of urine samples, 5 on analysis of blood from cases and OF from controls, 2 on

only blood samples, and one on only oral fluid samples from cases and controls. Equal or equivalent definitions of cannabis exposure were used in 3 of the studies based on blood and oral fluid. Cannabis exposure was defined as THC concentrations above 0.3-1 ng/mL in blood for 6 studies and unknown in one study. Data using cut-off concentrations of 2 and 5 ng/mL in blood were also presented in one study. When using 5 ng/mL, the odds ratio (OR) was 14.3.

Of the 14 culpability studies reviewed, 6 based the data completely or partly on analysis of urine samples. Of the 8 studies based on analysis of blood samples, the cut-off concentrations ranged 0.2-1 ng/mL in 6 studies and not presented in 3 studies. Four studies also used cut-off concentrations of 2, 3, or 5 ng/mL. Using a cut-off of 5 ng/mL, the median OR was 2.1.

DISCUSSION: The majority of the studies used definitions of cannabis exposure that included drivers who had used cannabis during the last day or days/weeks. Those studies investigated the OR for involvement in RTC among drivers who were cannabis users, not only those who drove under the influence of cannabis. Only five studies used definitions of cannabis exposure that only included drivers who were likely to be intoxicated by cannabis due to cannabis smoking during the last few hours (THC > 5 ng/mL). The odds ratio for involvement in RTC among drivers with THC concentrations above 5 ng/mL ranged 1-14 with an overall median of 2.1. The quality of those studies was not always good due to selection bias or poor statistical power.

The use of different definitions of cannabis exposure among cases and controls is a serious design error. Results from those studies are unreliable and do not reflect the actual risk, and should not be included in meta-analyses of crash risk.

CONCLUSION: The studies show that cannabis users had higher risk for RTC involvement. Few studies investigated the association between acute cannabis intoxication and RTC involvement. More studies of good quality are needed for better estimations of the actual crash risk.

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