WELCOME

Dear Colleagues,

On behalf of the local organising and scientific committee I would like to welcome you to Melbourne Australia for the third National Cannabis Conference.

The topic areas have been chosen to respond to the developing evidence-base on issues such as cannabis and mental health. The emerging areas to be featured will include cannabinoids and medicinal cannabis related issues, cannabis and the brain, cannabis and driving, intervention approaches among Aboriginal and Torres Strait Islander communities, school based approaches to preventing and reducing cannabis use and synthetic cannabinoids. The conference will include perspectives from health, education, youth services and criminal justice sectors.

I would like to thank Turning Point, Australian Indigenous HealthInfoNet, Allen & Unwin and the Dalgarno Institute for their support of the conference. I would also like to thank Margaret Eagers from MERS Events for managing the conference.

I hope you enjoy the meeting!

Prof Jan Copeland
Convenor and Chair, Conference Committee

COMMITTEES

Local Organising Committee
Jan Copeland
Amanda McDonald
Margaret Eagers

Scientific Committee
Nadia Solowij
Peter Gates
Wendy Swift
Murat Yucel

Exhibitors

Turning Point TREATMENT · RESEARCH · EDUCATION

Australian Indigenous Alcohol and Other Drugs Knowledge Centre

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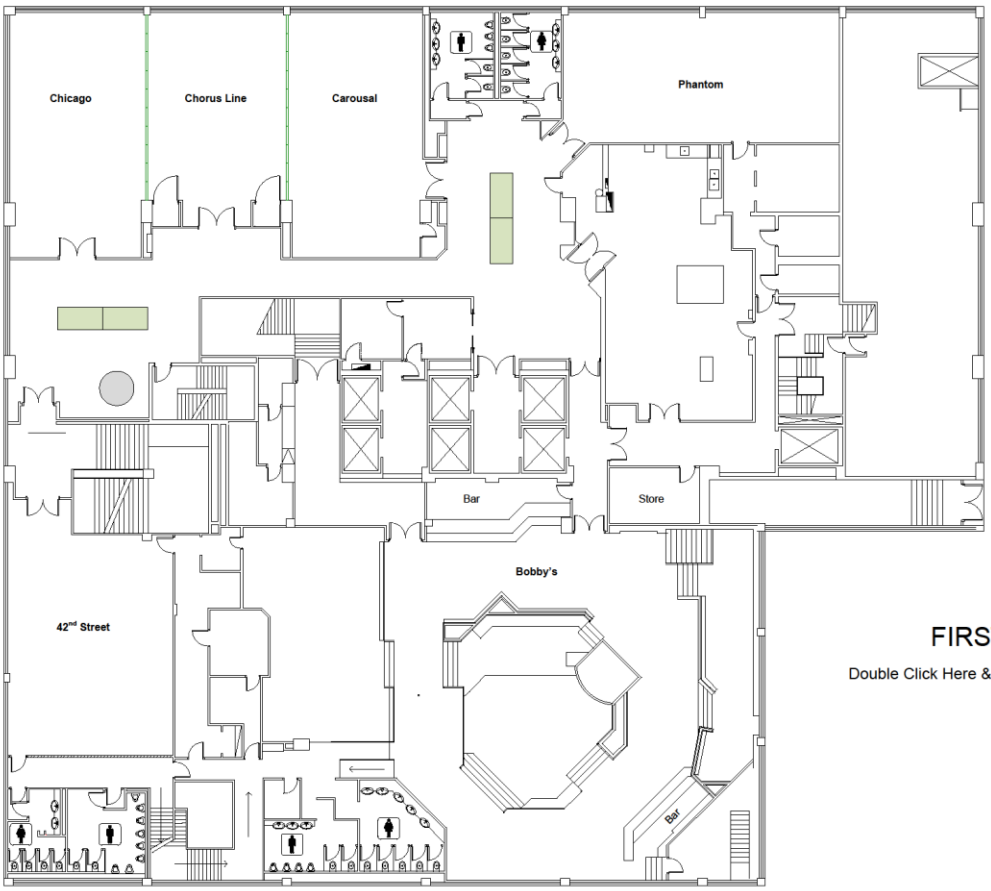

ROOMS

Broadway*	Welcome, Opening, Plenary Sessions
Chicago	Symposium 1 and 2; Concurrent Sessions 5 and 8
Chorus Line	Full day Workshop
Chorus/Carousel	Concurrent Sessions 4 and 9
42nd Street	Exhibitors, Posters, Morning/Afternoon tea
Bobby's	Lunch on Thursday & Friday Welcome Reception

* Chicago, Chorus Line & Carousel together

SPEAKERS

INTERNATIONAL KEYNOTE SPEAKERS

Professor Marilyn A. Huestis

Marilyn is a tenured senior investigator and Chief, Chemistry and Drug Metabolism Section, IRP, National Institute on Drug Abuse, National Institutes of Health and Adjunct Professor in the Department of Epidemiology and Preventive Medicine, School of Medicine, University of Maryland. Her research program seeks to discover mechanisms of action of cannabinoid agonists and antagonists, effects of in utero drug exposure, and the neurobiology and pharmacokinetics of designer drugs, the emerging face of drug abuse. Prof Huestis is focused on new medication targets for cannabis dependence, including oral tetrahydrocannabinol (THC), Sativex, and cannabidiol. She is interested in the disposition of drugs and metabolites in a wide variety of biological fluids and tissues following controlled drug administration; data that provide a scientific database for interpreting drug concentrations in alternative matrices. An area of special interest for Professor Huestis is investigating the effects of in utero drug exposure on child development and whether concentrations of drugs and/or metabolites in meconium predict adverse outcomes of in utero drug exposure. She has published 359 peer-reviewed manuscripts and book chapters and more than 500 abstracts were presented at national and international meetings.

A/Professor Kevin Sabet

Author, consultant, advisor to three U.S. presidential administrations, and assistant professor, Kevin A. Sabet, Ph.D., has studied, researched, written about, and implemented drug policy for almost 20 years. He has worked in the Clinton (2000), Bush (2002-2003) Administrations, and in 2011 he stepped down after serving more than two years as the senior advisor to President Obama's drug control director, having been the only drug policy staffer to have ever served as a political appointee in a Democrat and Republican administration. He has appeared in hundreds of forums and discussions promoting the ideas outlined in his first book, Reefer Sanity: Seven Great Myths About Marijuana, published by Beaufort. Dr. Sabet is the Director of the Drug Policy Institute at the University of Florida and an Assistant Professor in the College of Medicine, Department of Psychiatry. With Patrick J. Kennedy, he is the co-founder of Project SAM (Smart Approaches to Marijuana). He is also a policy consultant to numerous domestic and international organizations through his company, the Policy Solutions Lab. His current clients include the United Nations, where he holds a senior advisor position at the Italy-based United Nations Interregional Crime and Justice Research Institute (UNICRI), and other governmental and non-governmental organizations. He also recently served as the only non-medical doctor on the writing committee establishing the official position on marijuana legalization for the American Society of Addiction Medicine (ASAM). He received his Doctorate of Philosophy and Masters of Science from Oxford University as a Marshall Scholar in 2007 and 2002, respectively, and his B.A. with high honors in Political Science from the University of California, Berkeley in 200

Professor Jose Alexandre Crippa

Professor Crippa is an Associate Professor and Researcher at the Department of Neurosciences and Behavior, Faculty of Medicine, University of São Paulo (USP), Ribeirão Preto, São Paulo, Brazil (FMRP-USP) & Honorary Professor at the Institute of Psychiatry, University of London. He is the President of the Research Committee of the FMRP-USP. He is also Full member of the International Cannabinoid Reserch Society (ICRS). Prof Crippa previously studied at the Institute of Psychiatry in London the central effects of cannabinoids using functional neuroimaging (fMRI). He is the author or co-author of more than 280 published journal articles and 40 chapters, including a book titled Cannabis and Mental Health. Most of his basic and clinical research is focused on the therapeutical effects cannabidiol (CBD), one of the main cannabinoids, in neuropsychiatric disorders

NATIONAL KEYNOTE SPEAKERS

Professor Yvonne Cadet-James

Prof Cadet-James has a background in health, as a registered nurse and midwife followed by a career as an academic. Yvonne is currently the Chair of Indigenous Australian Studies at James Cook University where she is responsible for providing leadership in education and research especially in matters which affect Aboriginal and Torres Strait Islander peoples. Her research expertise includes empowerment of Aboriginal and Torres Strait Islander people to identify their own issues and practical solutions to those issues. Her other research interests lie in community based models to address alcohol, tobacco and cannabis use. As a Gugu Badhun Aboriginal woman Prof Cadet-James is particularly focused on strengthening the capacity of researchers and communities to ensure that research addresses priorities and meets ethical standards. She provides representation on international, national and local boards, committees and working groups.

Professor Olaf Drummer

Olaf is employed at the Victorian Institute of Forensic Medicine as Deputy Director (Academic Programs) and also holds the position of Professor and Head of the Department of Forensic Medicine, Monash University. He has had an executive position at the Institute since 1989.

A forensic pharmacologist and a toxicologist, he has been involved in the analysis of drugs and poisons and in the interpretation of their biological effects for almost 40 years. He lectures lecture widely on this subject and has given evidence in court in well over 250 cases, and has provided expert medico-legal reports in other parts of the world. He has published over 200 peer-reviewed scientific papers in journals and has published many other reports, book chapters, and is the main author of the book “The Forensic Pharmacology of Drugs of Abuse” (Arnold, June 2001) and co-editor of the e-book “forensic analysis of drugs”. He is the editor for drugs and toxicology submissions for the scientific journal, Forensic Science International and holds editorial board positions in a number of other scientific journals. Professor Drummer's formal qualifications include a Bachelor of Applied Science (Chemistry) from Royal Melbourne Institute of Technology (RMIT) (1974) and Doctor of Philosophy in Medicine (Ph.D.) in Pharmacology from Melbourne University (1980). He was President of The International Association of Forensic Toxicologists (TIAFT) from 2008-2011 and is the inaugural President of the Forensic and Clinical Toxicology Association (FACTA) of Australia and NZ (since 2010). He is an Honorary Fellow of the Royal College of Pathologists of Australasia (RCPA) and a founding Fellow of Faculty of Science of The Royal College of Pathologists of Australasia (RCPA).

Mr Bob Hopkins

My name is Bob, I'm a cannabis addict, though not a practicing one (albeit with the occasional lapse) for the last 15 years. Along the way, I initiated the Nimbin drug law reform movement that remains the most prominent cannabis user advocacy organisation nationally, founding the Nimbin Hemp Embassy, stood as a drug law reform candidate on a number of occasions in the NSW State Elections, and kicked off the annual Nimbin Mardi Grass Fiesta. I experienced a slow-burn epiphany that resulted in a re-evaluation of both my own cannabis habit, and a coming to odds with the HEMP (Help End Marijuana Prohibition) group over much of the information and attitudes they promulgated, especially with respect to their promotion of the use of cannabis and their support of free market distribution.

Dr Matthew Large

Matthew is a psychiatrist and psychiatric researcher at The Prince of Wales Hospitals and The University of New South Wales. He has published extensively on the co-morbidity between psychosis and substance use including the use of tobacco, cannabis and stimulants. He is most well-known for his research on the age at onset of psychosis and cannabis use.

Professor David Penington

Head, Melbourne Medical School, and Dean, Faculty of Medicine, from 1978 to 1985, Physician, Haematologist, Educator and Dean. He began his medical training at the University of Melbourne and went to Oxford on a scholarship in 1950, graduating there in 1955. After working as a medical specialist, teacher and researcher in London, he was appointed Professor of Medicine at the University of Melbourne in 1970 as Head of the Department of Medicine at St Vincent's Hospital. He served as Dean of the Faculty of Medicine for eight years from 1978 to 1985 and Vice-Chancellor of the University of Melbourne from 1988 to 1995. In recognition of his service to medicine and to the community, particularly in the field of medical education and health care, he was made a Companion of the Order of Australia in 1988. Prof Penington also exerted significant national influence during his leadership of the Medical School. He was a member of the National Health and Medical Research Council (1980-85), chaired the federal body which came to be known as the National AIDS Task Force (1983-87) and undertook critical work at the early stage of this epidemic. The report from the Commonwealth Inquiry into Rights of Private Practice in Public Hospitals (1984), produced under his chairmanship, was widely acclaimed as a landmark in the development of health policy in Australia.

A/Professor Nadia Solowij

Nadia Solowij, PhD, is an Associate Professor and ARC Future Fellow in the School of Psychology, University of Wollongong. She has been actively researching the effects of long term cannabis use for more than 25 years and is now the most published researcher in the world on the topic of cannabis and the brain. Nadia spent 15 years at the National Drug and Alcohol Research Centre, University of New South Wales, Sydney, establishing her primary area of expertise on the long-term cognitive effects of cannabis. She has used neuropsychological, psychophysiological and brain imaging techniques in her investigations, has over 90 scientific publications including her book Cannabis and Cognitive Functioning (Cambridge University Press), and has held over $4 million in grant funding. Her recent research has focused on memory, cognition and brain structure and function in adult and adolescent cannabis users and people with schizophrenia and comorbid cannabis use. Her current research examines the effects of different cannabinoids on brain function and vulnerability markers for psychosis.

Professor Murat Yucel

Murat is a Professor and Clinical Neuropsychologist and Director of MCIN. Murat's research has made major contributions to understanding the long-term effects of heavy substance use on the brain and behaviour (for example, why individuals addicted to heroin find it difficult to control their impulses and repeatedly relapse), as well as the impact of drug use on mental health (for example, links between early and heavy cannabis use and risk for psychosis). His findings have also challenged some widespread perceptions about drug use (for example, that cannabis has minimal effects on brain and behaviour). It has also made contributions to understanding the neurobiology of several psychiatric disorders including obsessive-compulsive disorder (OCD), schizophrenia, bipolar disorder and major depressive disorder. His discoveries have led to increased public and professional awareness on these topics and established his group at the forefront of addiction and psychiatric neuroscience research in Australia

WORKSHOP/SYMPOSIA SPEAKERS

FULL DAY WORKSHOP

Professor Jan Copeland

Jan is the founding Director of the National Cannabis Prevention and Information Centre (NCPIC) at UNSW Australia since 2007. She has worked in the addictions field for 25 years and is best known for her research developing and testing brief interventions for the management of cannabis use disorder among adults and adolescents. She has more than 300 publications, half of which are in international peer-reviewed journals. She has recently written a book, with her colleagues Sally Rooke and Etty Matalon, for Allen & Unwin *Quit Cannabis* that was released in Australia, US and Europe in 2015. Professor Copeland has a long standing commitment to service with community agencies and is currently Chair of the Drug and Alcohol Multicultural Education Centre and a director on the Board of Management of The McGrath Foundation's Odyssey House. Among other editorial roles she is an Associate Editor of *Drug and Alcohol Dependence*. She is a member of the US College on Problems of Drug Dependence and Chairs their international research committee. Additional memberships include the Australian Psychological Society, International Cannabinoid Research Society, Australian Professional Society on Alcohol and Drugs and the International Society for Research on Internet Interventions.

Dr Ken Pidd

Ken Pidd is Deputy Director (Research) at the National Centre for Education and Training on Addiction (NCETA) located at Flinders University. He has worked in the alcohol and other drug field for more than 15 years and has a strong interest in workforce development and the translation of research findings into practice. Ken holds a PhD in organisational psychology and prior to working for NCETA managed an industry based alcohol and other drug program. He has an on-going research and practice interest in this area and has produced numerous publications concerning the workplace and alcohol and other drug use.

Prof Ann Roche

Ann is the Director of the National Centre for Education and Training on Addiction (NCETA), Flinders University. She has 30 years' experience in public health and has worked as a researcher, educator, and policy analyst and has held academic posts at the University of Sydney, the University of Newcastle, The University of Queensland and Flinders University.She has worked as a consultant to the World Health Organization, has acted as an adviser for a wide range of government and non-government bodies, and has had extensive involvement with developing policy through national and jurisdictional committee work.

Ann's key research interest is in the identification and implementation of strategies to bring about professional practice and systems change in pivotal public health areas. She has published extensively in alcohol and drug-related public health areas, including over 130 papers and reports, with several books and book chapters.

A/Professor Kristina Phillips

Kristina Phillips, Ph.D. is a Clinical Psychologist and Associate Professor in the School of Psychological Sciences at the University of Northern Colorado (UNC). Her primary research interests focus on consequences associated with illicit substance use, risk reduction, intervention development, treatment outcome research, and ecological momentary assessment (EMA). One line of her research program focuses on a range of marijuana (e.g., craving) and psychological (e.g., impulsivity, depression) factors that may be impacting academic success among university students. The long-term objective of this research is to learn more about the impact of marijuana use in order to develop new prevention and intervention programs for students. A second research line focuses on assessing high-risk injection practices that lead to HIV, Hepatitis C and bacterial infections. With funds from the National Institute on Drug Abuse (NIDA), Dr. Phillips developed and tested a brief intervention for injection drug users in Denver, CO. She is now collaborating on a larger 5-year NIDA-funded project testing the efficacy of this brief intervention with hospitalized drug injectors in Boston, MA.

Dr Peter Gates

Peter has been in drug and alcohol research with NDARC since August 2002.
He has worked on projects investigating alcohol use in young Australians, specifically researching the impact of pre-mixed alcohol, and following this, he assisted with the introduction of the Australian Alcohol Treatment Outcome Measure for dissemination across non-government health organisations. Further, Peter has conducted research on the potency and contamination content of Australian cannabis. Peter began working as part of the National Cannabis Prevention and Information Centre (NCPIC) in 2007 investigating the barriers users face in receiving treatment specifically for their cannabis use. Peter completed his PhD in August 2012 evaluating the efficacy of the National Cannabis Prevention and Information Centre's Cannabis Information and Helpline.

Ms Etty Matalon

Etty is a Psychologist and the National Clinical Training Manager for the National Cannabis Prevention and Information Centre (NCPIC) since its inception, providing more than 60 workshops annually. She is also a consultant who runs her own private practice that provides relevant workplace training and seminars and was the past State President of the Australian Association for Cognitive and Behaviour Therapy for five years. She has 25 years clinical experience in the Alcohol and Other Drug Field having worked at two major teaching hospitals in Sydney; as the Clinical Co-ordinator for a women's detoxification and rehabilitation service where she introduced a Cognitive Behavioural Treatment Program and as the Program Manager at a Private Psychiatric Hospital. She taught Drug and Alcohol studies at the Institute of TAFE and has facilitated over 200 workshops and training seminars within Education, Health Services and the Defence Forces relating to Brief Intervention for Cannabis Use Disorders and Alcohol Treatment Guidelines. She has also run Relapse Prevention groups for inmates within Corrective Services.

Professor Marilyn A. Huestis

SYMPOSIUM 1

Dr Edward Ogden

Edward is a medical practitioner consulting in forensic medicine and the specialty of addiction medicine. He is currently a staff specialist in addiction medicine at St Vincent's Hospital in Melbourne and the Parkville Youth Justice Centre. The Department of Addiction Medicine provides drug and alcohol treatment based on applying current understanding of the neurobiology of addiction into meaningful clinical treatments. He is Deputy Director (Addiction and Forensic Medicine), Centre for Human Psychopharmacology, Swinburne University. He was awarded the Public Service Medal for services to Forensic Medicine on Australia Day 2005.

His research interests include the effects of alcohol and other drugs on human performance and the use of pharmacological approaches to treatment of addictions.

Dr Dianne Kirby

Dianne (Di) is a Consultant Psychiatrist and Addiction Medicine specialist. She is currently employed as a consultant psychiatrist at both Melbourne Health & Bendigo Health.

Dr Kirby spent many years as a general adult psychiatrist in community psychiatry, both inner city and rural, before developing a passion for addiction, which led to her completing an International Masters of Science in Addiction Studies (awarded jointly from Adelaide University, Kings College London, & Virginia Commonwealth University in the USA), followed by advanced training in Addiction psychiatry. She then went on to complete further training in Addiction Medicine.

Dr Kirby is also a member of the Australian Association of Smoking Cessation Professionals (AASCP), and is recognised as a tobacco treatment specialist.

A/Professor Yvonne Bonomo

Yvonne is a Physician in Addiction Medicine working with people with alcohol and drug problems through clinical practice, research and professional and community education. She works at the Department of Addiction Medicine, St Vincent's Hospital and is Clinical Associate Professor in Medicine at the University of Melbourne. She is also Head of the Women's Alcohol and Drug Service (WADS). Her clinical and research interests are in early intervention in alcohol and other drug abuse. She serves on the board of YSAS (Youth Health Advocacy Service) and has served on the Board of the Australian Drug Foundation. Yvonne has filled a number of roles on the behalf of the Australasian Chapter of Addiction Medicine (AChAM), Royal Australasian College of Physicians including Chair of Education and President of AChAM.

Dr Jon Cook

Jon Cook is the current Addiction Medicine Fellow at St Vincent's Hospital, Melbourne, and is a trainee in the Royal Australian College of Physicians Chapter of Addiction Medicine training program. He has a background in General Practice, working in community and Indigenous health. He is also employed at YSAS (Youth Support and Advocacy Service), a service for vulnerable young people with substance misuse and dependence.

Professor Con Stough

Con is Co-Director at the Swinburne University Centre for Human Psychopharmacology which houses 10 academic staff and 30 PhD students. The Centre for Human Psychopharmacology has published over 100 publications on clinical trials ranging from vitamins, herbal supplements, pharmaceuticals and illicit drugs across several populations including clinical disorders such as Down's Syndrome, Major Depression, GAD, Cognitive Impairment and ADHD as well as in healthy children, adolescents and in the elderly. Prof Stough was a member of the Neuroscience Panel of World Economic Forum, the scientific advisory panel of the International Society for Intelligence Research and is a Fellow of the American College of Nutrition. Prof Stough has received more than 15 ARC and NHMRC grants over the last 12 years and has more than 200 peer review publications. Prof Stough established the Drugs and Driving Research Unit at Swinburne ten years ago. Over this time his team has coordinated several randomized controlled trials with a range of illicit drugs such as cannabis, methamphetamine and amphetamine and alcohol.

SYMPOSIUM 2

Professor Jan Copeland

Ms Bernadette Rogerson

Bernadette Rogerson has a diverse background in human resource management, learning and development, operated her own business for a number of years and has worked in forensic settings delivering substance abuse and cognitive programs to Aboriginal and/or Torres Strait Island inmates. Bernadette joined the Community-based Health Promotion and Prevention Studies Group at James Cook University researching cannabis use, dependence and withdrawal across forensic settings. Bernadette has also conducted evaluations for Health and Wellbeing projects for regional and remote councils and Indigenous communities. Presently, Bernadette is completing a PhD in cannabis withdrawal and working with trauma-related paediatric inpatient services as a Provisional Psychologist.

Dr David Allsop

David gained his Master of Research in Animal Biology at the University of Manchester, UK. He completed his PhD in Evolutionary Biology at the University of Edinburgh, UK. He is currently a Senior Research Fellow in psychopharmacology in the School of Psychology and in the Discipline of Addiction Medicine at the University of Sydney. His broad interests are in psychopharmacology and clinical trials. He is particularly interested in the endocannabinoid system as it relates to health and wellbeing and the insights it offers for a biological understanding of diverse disease states. His earlier work focused on understanding cannabis dependence and withdrawal and the development of treatment interventions for cannabis use disorder, including pharmacotherapies such as a Cannabinoid Replacement. An emerging literature on the many potential therapeutic targets within the endocannabinoid system has led to a specific interest in the psychopharmacology and clinical applications of cannabinoid therapeutics. Working closely with preclinical and clinical colleagues he is interested in translating basic science into clinical evidence with emphasis on targeting the endocannabinoid system for a diverse range of disease states (epilepsy, cancer, mental health, addictions, metabolic diseases and pain). He is also interested in the development of novel targeted cannabinoid therapeutics, and the regulatory frameworks surrounding clinical work in this space.

A/Professor Nick Lintzeris

Nick is an Addiction Medicine specialist who has been involved for over two decades in clinical service delivery, research, professional education and policy activities in the field. He is internationally recognised as an expert in the treatment of opioid dependence, and has clinical and research interests in benzodiazepine, cannabis and psychostimulant use. He is Director of Drug and Alcohol (D&A) Services in South East Sydney Local Health District. Additionally, he is a practicing clinician. Between 2011-2013, Professor Lintzeris also served as Chief Addiction Medicine Specialist (part-time) for NSW Health, providing statewide leadership on policy for the D&A sector. Previously Professor Lintzeris was a recipient of a NHMRC Clinical Research Postdoctoral Fellowship based at the National Addiction Centre in London, UK, where he held clinical and research appointments. He has been active in policy development, having served on national and statewide policy groups and consulted to the WHO Mental Health Division. Currently he is a member of the Drug and Alcohol Program Council in Australia. He is Foundation Fellow of the Addiction Medicine Chapter of the Royal Australasian College of Physicians. He conducts treatment intervention studies, systematic reviews, service evaluation, health systems research, psychopharmacology, epidemiology and qualitative studies. He has a particular interest in the translation of research evidence into clinical practice.

Izabella Pokorski

Izabella joined the National Cannabis Prevention and Information Centre in July of this year, but has had a closely working relationship with the Centre since 2013 by coordinating the Cannabidiol (CBD) for the management of cannabis withdrawal study at Nepean Hospital. Izabella is now working with Prince of Wales and St Vincent's Hospitals on assessing a Brief Intervention for Cannabis and Amphetamine type stimulant users in an Emergency Department setting, as well as assessing the validity of the Cannabis Withdrawal Scale and the Cannabis Problems Questionnaire for use in clinical and research settings in a nationwide online survey

WEDNESDAY 7 OCTOBER

Workshop 1: Full Day: An introduction to cannabis
Venue: Chorus Line
Chair: Jan Copeland

9.00-9.15 **Jan Copeland:** Introduction

9.15-9.35 **Ken Pidd:** *Changes in cannabis use and related beliefs in Australia from 2004-2013*

9.35-9.55 **Ann Roche:** *Bongs and baby boomers: Prevalence and predictors of cannabis use among older Australians*

9.55-10.15 **Kristina Phillips:** *Post-legalization marijuana use among university students in Colorado, USA*

10.15-10.45 **Peter Gates:** *Cannabis-related harms*

10.45-11.15 Morning tea

11.15-12.15 **Marilyn Huestis:** *Cannabis effects, metabolism and elimination*

12.15-12.45 **Jan Copeland:** *Interventions*

12.45-1.30 Lunch

1.30-5.00 **Etty Matalon:** *Clinical Training Workshop: 3 levels of brevity for the delivery of interventions for cannabis use disorder within a clinical setting*

3.00-3.30 Afternoon tea

Symposium 1: Cannabis: what's the bother?
Venue: Chicago
Chair and Discussant: Dr Edward Ogden
9.15-12.45 with morning tea

Introduction: Edward Ogden

Dianne Kirby: *Marijuana and Madness*

Yvonne Bonomo: *Cannabis and the adolescent brain*

Jon Cook: *Medical marijuana, are there benefits?*

Con Stough: *Effects on human performance*

Edward Ogden: *Does treatment make any difference?*

Symposium 2: Cannabis Withdrawal
Venue: Chicago
Chair: Jan Copeland
1.30-5.00 with afternoon tea

1.30 **Jan Copeland:** *Overview of Cannabis Withdrawal*

2.10 **Bernadette Rogerson:** *Development of a culturally sensitive pictorial Cannabis Withdrawal Scale aligned with DSM-5 in a low literacy Australian Indigenous population*

2.30 **David Allsop:** *Cannabinoid Replacement Therapy (CRT) for the treatment of cannabis withdrawal and prevention of relapse to cannabis use*

3.00 Afternoon tea

3.30 **David Allsop:** *A randomized controlled trial of mirtazapine for outpatient cannabis withdrawal*

4.00 **Nick Lintzeris:** *A randomized controlled trial of daily aerobic exercise for inpatient cannabis withdrawal*

4.30 **Izabella Pokorski:** *Cannabidiol (CBD) for the management of cannabis withdrawal: a phase II proof of concept study*

4.30 **Discussion and wrap up**

THURSDAY 8 OCTOBER

8.30 **Indigenous Welcome to Country**
Opening: Senator The Hon Fiona Nash, Assistant Minister for Health

9.00 **Plenary Session 1**
Venue: Broadway
Chair: Jan Copeland
Professor Yvonne Cadet-James

Session 2: Current cannabis challenges
Venue: Broadway

9.45 **Chair:** Jan Copeland
Jan Copeland
Current cannabis challenges
Datablitz Session

10.00 **Natasha Nair**
"Pure Rush": Development of a serious game to educate young people about cannabis and illicit drugs
Shimpei Watanabe
Metabolic studies of synthetic cannabinoids PB-22 and 5F-PB-22 by Cunninghamella elegans
Gaur, Pragna
Trends and geographical presentation of cannabis leaf and related products seized in NSW over 5 years (from mid-2010 to mid-2015)

10.15 Morning tea with focus on posters

10.45 **Plenary Session 3**
Venue: Broadway
Chair: Jan Copeland

10.45 **Professor Marilyn Huestis**
Marijuana: from the street to the clinic

11.25 **Professor Jose Crippa**
Translational research of cannabidiol (CBD) in neuropsychiatry

11.55 **A/Professor Kevin Sabet**
Medicinal marijuana in the US

12.45 Lunch

1.30 **Concurrent Sessions 4 – 5**

Session 4: Aboriginal and Torres Strait Islander communities
Venue: Chorus Line/Carousel
Chair: Maurice Shipp

1.30 Yvonne Cadet-James *What has Culture got to do with Cannabis?*
2.00 Bernadette Rogerson: *Development of a culturally sensitive pictorial Cannabis Withdrawal Scale aligned with DSM-5 in a low literacy Australian Indigenous population*
2.30 Maurice Shipp

Session 5: Cannabis Interventions
Venue: Chicago
Chair: Peter Gates

1.30 Lesley Boyd: *Early Intervention for Cannabis related offences – providing treatment options rather than court*
1.50 Stephen Blyth: *Going online to reach people seeking help: early PotHelp progress*
2.10 Lisa Gibson: *Pilot testing the first evidenced-based smartphone app for the self-management of cannabis use*
2.30 Izabella Pokorski: *Very Brief Interventions for Cannabis Use*
2.50 Discussion

3.00 Afternoon tea

3.30-5.00 **Session 6:** Cannabinoids and driving
Venue: Broadway
Chair: Michael Farrell

3.30 **Catherine Milburn**
Steer Clear

3.50 **Peter Gates**
Survey of cannabis and driving in Australia

4.00 **Olaf Drummer**
Cannabis and Driving

4.30 **Marilyn Huestis**
Effects of Cannabis With and Without Low Dose Alcohol on Driving

6.30 – 9.30 Welcome Reception at Bobby McGees

FRIDAY 9 OCTOBER

9.00-11.00 **Plenary Session 7**
Venue: Broadway
Chair: Michael Farrell

9.00 **A/Professor Nadia Solowij**
Studies of acute cannabinoid administration in humans: what's the story with THC versus CBD?

9.40 **Professor Murat Yucel**
Repairing and preventing cannabis related brain harms: a dream or reality?

10.20 **Dr Matthew Large**
Cannabis; private, clinical, scientific & public perspectives

11.00 Morning tea

11.30-1.00 **Concurrent Sessions 8 – 9**

Session 8: *Cannabis and brain function*
Venue: Chicago
Chair: Peter Gates
11.30 Valentina Lorenzetti: *Cannabis use disorders and neuroanatomical alterations: Where is the evidence?*
11.50 Valentina Lorenzetti: *Abnormal brain function in adolescent cannabis users: A systematic review of the evidence*
12.10 Samantha Broyd: *Acute effects of THC and CBD alone and in combination on default-mode connectivity: a functional resting-state MRI study*
12.30 Lisa-Marie Greenwood: *Cannabidiol attenuates the effect of Δ9-tetrahydrocannabinol on EEG brain oscillations during rest*
12.50 Discussion

Session 9: *Cannabis prevention*
Venue: Chorus Line/Carousel
Chair: Lisa Gibson
11.30 Delyse Hutchinson: *Adolescent substance use and educational attainment: An integrative data analysis comparing cannabis and alcohol from three Australasian cohorts*
11.50 Kirsty Scholes-Balog: *Developmental trajectories of cannabis use among Australian adolescents: childhood predictors and young adult outcomes*
12.10 Katrina Champion: *Internet-based prevention for alcohol and cannabis use: 12-month outcomes from a cluster randomised controlled trial*
12.30 Amanda McDonald: *Cannabis prevention and awareness: findings of an Australian survey on mass media campaigns*
12.50 Discussion

1.00 Lunch Viewing of the Canadian movie CYCLES

2.00 **Plenary Session 10** Perspectives on cannabis and public policy
Venue: Broadway
Chairs: Jan Copeland and Michael Farrell

2.00 **Emeritus Professor David Penington**
Prohibition has failed will illicit drugs: Accepting the challenge of examining other approaches

2.40 **Mr Bob Hopkins**
My cannabis journey

3.20 **A/Professor Kevin Sabet**
Cannabis 2.0 (US policy and commercialization)

4.40 **Discussion and Closing**

POSTERS

Poster #	Name	Title
DB1	Nair, Natasha	“Pure Rush”: Development of a serious game to educate young people about cannabis and illicit drugs
DB2	Watanabe, Shimpei	Metabolic studies of synthetic cannabinoids PB-22 and 5F-PB-22 by Cunninghamella elegans
DB3	Gaur, Pragna	Trends and geographical presentation of cannabis leaf and related products seized in NSW over 5 years (from mid-2010 to mid-2015)
1	Acharya, Shiva Lal	Perceived Knowledge , attitude and Practices on Cannabis use among Opioid Substituent Therapy (OST) Clients in Nepal
2	Howard, John	Cannabis and its use among Hindu Sadhus at Pashupatinath Temple, Kathmandu, Nepal
3	Lewis, John	Rapid Elimination of Carboxy-THC in a Cohort of Chronic Cannabis Users
4	Lorenzetti, Valentina	Verbal and visuospatial learning deficits in current and former chronic cannabis users
5	Watanabe, Shimpei	Metabolic studies of synthetic cannabinoids UR-144 and XLR-11 by Cunninghamella elegans

ABSTRACTS

WORKSHOP 1

Introduction

Jan Copeland

In response to feedback from the 2012 conference calling for some introductory information about cannabis in general for those not specialising in research, treatment or policy in the area we are offering this overview of key issues with an emphasis on the "how to" of brief assessment and intervention delivery in the afternoon.

Changes in cannabis use and related beliefs in Australia from 2004 to 2013

Pidd, Ken[1] and Roche, Ann[1]
[1]NCETA, Flinders University, Adelaide, SA, Australia

Background and aims: While the prevalence of cannabis use among Australians has declined over the past decade, population level research concerning associated changes in beliefs and attitudes is scarce. To address this, a study was conducted that examined changes in use and related beliefs among Australians from 2004 to 2013.

Method: Secondary analyses of 2004 and 2013 National Drug Strategy Household Survey data (N=53,300).

Results: Population levels of cannabis prevalence (past 12 month use) declined significantly (p<.001) from 11.3% in 2004 to 10.2% in 2013. The exception to this decline was for those age 50+ years where prevalence rose significantly (p<.001) from 1.5% to 3.6%. The proportion of Australians who approved of cannabis use declined significantly (p<.001) from 23.3% in 2004 to 9.4% in 2013. Proportions who believed cannabis was a 'drug problem' or the drug of most concern also declined significantly (p<.001). Declines in these beliefs/attitudes were consistent across age and gender groups. Overall, there were no significant population level changes in support for increased penalties for use or opposition to the legalisation of cannabis use. However there were some significant age and gender related changes in these beliefs.

Conclusions: While cannabis use is declining among Australians, those aged 50+ years are a growing risk group. Population level declines in use appear not to be associated with changes in beliefs that cannabis use is a 'problem' or community concern. Rather, declines in use appear associated with a decline in the acceptability (approval) of use. These findings have important implications for population level prevention strategies.
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Bongs and baby boomers: Prevalence and predictors of cannabis use among older Australians

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Background and aims. Recent demographic shifts have resulted in unprecedented changes in the number of older Australians, and concomitant changes in their patterns of alcohol and drug use, including cannabis. However, little research has been undertaken among older individuals. This paper examines patterns and predictors of cannabis use among older Australians over the past decade.

Method: Secondary analyses were conducted on nationally representative data from two time points (2004 and 2013, N=7127 and 7506, respectively), sourced from the National Drug Strategy Household Survey. Descriptive analyses explored patterns of cannabis use among older Australians, and logistic regression explored predictors of use.

Results: Prevalence increased significantly (p<.001) from 1.5% to 3.6% among those aged 50+. The proportion of Australians aged 60+ years who used cannabis in the past 12 months increased significantly from 0.3% in 2004 to 1.2% in 2013 (p<.05). The largest increase was seen in those aged 60-69 (0.5% to 2.0%). Among those aged 60+ cannabis use was significantly less likely among those who were retired (OR: 0.6, 95% CI: 0.4-0.9) and married (OR: 0.3, 95% CI: 0.2-0.6), and significantly more likely among those who lived in rural areas (OR: 1.8, 95% CI: 1.2-2.6), drank alcohol at risky levels (OR: 2.5, 95% CI: 1.6-3.8), smoked (OR: 5.8, 95% CI: 3.8-8.9), and used other illicit drugs (OR: 3.6, 95% CI: 2.0-6.3).

Conclusions: In contrast to younger age groups (<40 years) where cannabis use has declined among 20-29 year olds, use among older Australians is significantly increasing. Despite this, the issue of cannabis use among older people has been largely overlooked. The policy and intervention implications of these trends will be addressed.

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Post-legalization marijuana use among university students in Colorado, USA

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[2]Applied Statistics and Research Methods, University of Northern Colorado, Greeley, CO USA

Background and aims: Marijuana is the most commonly abused illicit substance in the U.S., with high rates among young adults. Use of marijuana for medical purposes and the legalization of marijuana for recreational use in select U.S. states (Colorado and Washington) has been controversial, with concerns surrounding increased prevalence rates and harm. The current study aimed to assess the prevalence of marijuana use in college students in Colorado post-legalization, motives for using, and other trends in marijuana use.

Method: Participants included 300 college students recruited through introductory psychology courses who completed a series of self-report questionnaires and a marijuana urine screen. Participants were 61% female, predominantly Caucasian/White and Latino/Hispanic, and averaged 19.68 (SD = 1.32) years of age.

Results: Approximately 50% of participants reported use of marijuana within the last three months, over 40% used in the last month, and almost 30% tested positive on the urine screen. Twenty-two participants (7.3%) reported daily use of marijuana. Logistic and hurdle count regression models showed that male gender, Caucasian/White race, fraternity/sorority involvement, greater family income, and greater alcohol use were associated with increased number of days participants used marijuana in the last month. Among last month users, problem marijuana use was associated with greater coping, boredom, and alcohol motives.

Conclusions: Marijuana use was high in this sample of college students. Though it is unclear whether rates have increased since legalization, the data warrants increased monitoring and tailored interventions for students who use at higher rates (e.g., males, students who use marijuana to cope).

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Cannabis use: where's the harm?

Gates, Peter[1]
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Background and aims: The extent of cannabis-related harms continues to be fervently debated. While popular opinion describes a drug relatively free of harm, this is not consistent with a growing

evidence base of harms. This presentation will summarise the research literature on the harms associated with cannabis use including dependence, psychoses, educational attainment, respiratory and cardiovascular risks, and motor vehicle accidents. The workshop will include learning and teaching resources on cannabis harms and links to more detailed information

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Cannabis effects, metabolism and elimination

Huestis, Marilyn[1]
[1]National Institute on Drug Abuse, USA

Understanding how cannabis exerts its effects on the body is key to comprehending how the drug hijacks the normal endogenous cannabinoid system in our brain and the important role this system plays in our survival and normal functioning. The onset, peak and duration of effects and drug absorption, distribution, metabolism and elimination will be explored, and the differences in these parameters between occasional and chronic frequent cannabis smokers demonstrated with controlled cannabinoid administration data. Helpful models for differentiating new cannabis use from residual drug excretion will be introduced.

Jan Copeland - Interventions

3 'Brief' interventions for cannabis use disorder within a clinical setting

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As the demand for cannabis interventions increases internationally, and specialist cannabis clinics are being made available in Europe and Australia, there is a need for evidence-based treatments and guidelines to inform best practice.

This workshop will outline three interventions. One intervention is a very brief intervention (VBI) that is 30 minutes in duration and delivered opportunistically. The other two interventions are more comprehensive – one for treatment seekers and the other for ambivalent clients. Both these interventions are based on the research findings of randomised-controlled trials conducted by NCPIC staff and draw upon cognitive-behavioural therapy and motivational interviewing.

The workshop is suitable for all clinicians and healthcare practitioners who work in a variety of settings and services where clients present with cannabis use and/or other disorders. Participants will be made familiar with the various aspects of these interventions including screening, assessment, feedback, education and more comprehensive treatments.

SYMPOSIUM 1 - Cannabis: what's the bother?

Introduction

Ogden, Edward

The "penalties against the use of a drug should not be more damaging to an individual than the use of a drug itself" President Jimmy Carter, 1978

There is a social cost to making something illegal and stigmatising users. Cannabis is the most widely used illicit drug in our community. Making a popular activity illegal has the potential to cause more damage to users than the drug can.

One part of the community argues that legalisation of cannabis product recognises its 'health benefits'. Others argue that cannabis is not as bad as other drugs. They argue that liberalising access to cannabis is not associated with increase in drug use. Given the reality that a portion of the

community want to use cannabis, is there a reason to stigmatise them and the drug? Others argue that this drug causes mental illness and is associated with other physical and mental harms.

Attempts at control put the supply and distribution of the drug in the hands of a black market that is not regulated, does not pay tax and makes no contribution to the wider community. Prohibition brings otherwise law abiding citizens into contact with the illicit drug market that distributes other illicit drugs. The existence of a flourishing black market provides opportunities for corruption to flourish and diverts police resources from other activities. Many in the community question the wisdom of prohibition.

Is criminalising marijuana worth the bother? In this symposium we will offer five perspectives on issues around cannabis use and invite the audience to join us in a discussion around the utility of current government policies.

Marijuana and madness

Kirby, Dianne

The role of cannabis in causing schizophrenia and other psychotic illnesses has been a contentious issue for some time. It is clear that in people with an established psychotic illness, cannabis can trigger relapse, exacerbate symptoms, and adversely affect prognosis. It appears that the main psychotomimetic properties are mediated via delta-9-tetrahydrocannabinol (THC). Interestingly, another component of cannabis, cannabidiol, seems to have antipsychotic effects.

I will discuss the evidence for the role of cannabis in psychotic disorders, including a discussion of the relative risk of cannabis in the context of abuse of multiple substances, both licit and illicit, commonly seen in psychiatric settings.

Cannabis and the adolescents

Bonomo, Yvonne

I will present on the prevalence of cannabis use in young people in Australia. Cannabis withdrawal in young people will then be compared to cannabis withdrawal in adults, based on cross-sectional data. A summary of the findings from longitudinal studies on longterm outcomes of cannabis use in adolescents will be presented and in conclusion, some of the arguments for and against cannabis as a ‘gateway’ drug will be presented.

Medicinal marijuana, are there benefits?

Cook, Jon

The use of cannabis for medical purposes, evident throughout history, has become a topic of increasing interest. Yet on the present medical evidence, cannabis-based treatments will only be appropriate for a small number of people in specific circumstances.

Experience with cannabis as a recreational drug, and with use of psychoactive drugs that are prescribed and abused, should inform harm reduction in the context of medical cannabis.
In this presentation I will discuss the benefits and risks associated with changing the perception of cannabis from illicit drug to accepted medical treatment. What are the health benefits marijuana? Do the benefits outweigh the risks.

Effects on human performance

Stough, Con

In this presentation I will summarise the literature on the neurocognitive effects of cannabis with particular relevance to specific cognitive deficits using the Cattell Horn Carroll Model of cognition. Where possible I will also propose the mechanisms by which cannabis-cognition deficits are observed. As part of this presentation I will present the results of two randomized controlled studies conducted at Swinburne University that have examined the effects of different doses of the active

ingredient of cannabis on driving performance. Finally I will outline a current study that is underway on hemp.

Does treatment make any difference?

Ogden, Edward

There is no recognised treatment for cannabis withdrawal or cannabis addiction. For many years it was argued that cannabis was not a drug of dependence. There was no obvious physical withdrawal syndrome and there was no animal model of addiction. Since then addiction has been demonstrated in animals, especially with the more water soluble synthetic cannabinoids.

There is no recognised treatment paradigm for cannabis withdrawal or to deal with the cravings of cannabis dependence. There are a range of promising treatments that have been proposed ranging from cognitive behavioural therapy to cocktails of psychotropic drugs. Nabiximols and Dronabinol have potential for drug substitution just a methadone is use for narcotic addiction. Medications that have been shown to be useful effects are not approved for this purpose in Australia. This means that treatment is 'off label', not subsidised by the Pharmaceutical Benefits Scheme or unavailable because of regulatory constraints.

I will discuss the evidence for pharmacological interventions and the policy changes that might make treatment more accessible for those who want it.

Participants: *Is it worth the bother?*

Please join the team and make this a spirited discussion.

SYMPOSIUM 2 - *Cannabis Withdrawal*

Overview of Cannabis Withdrawal

Copeland, Jan[1]
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This presentation will provide an overview of cannabis withdrawal and its measurement as an introduction to the workshop on cultural issues and intervention approaches.

Cannabinoid Replacement Therapy (CRT) for the treatment of cannabis withdrawal and prevention of relapse to cannabis use

Allsop, David J.[1,2,3]; Lintzeris, Nicholas[2,3]; Copeland, Jan[4]; Dunlop, Adrian[5,6] and McGregor, Iain[1]
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Background and aims: Cannabis is a common recreational drug that is generally considered to have low addictive potential. However an increasing number of cannabis users are seeking treatment for dependence on the drug. There is interest in using agonist (substitution) pharmacotherapies to treat cannabis dependence and here we outline a novel approach involving a buccal spray (Nabiximols) that contains tetrahydrocannabinol (THC) and cannabidiol (CBD).

Method: Two double blind RCTs testing Nabiximols, first for treating cannabis withdrawal in an inpatient setting; and second, a protocol for a community based relapse prevention study will be presented.

Results: In the inpatient study, Nabiximols (peak dose 86.4 mg THC: 80 mg CBD) significantly suppressed cannabis withdrawal symptoms, retained patients in the inpatient treatment setting for longer, with no discernable intoxication or Adverse Event profile above that of placebo. A follow-up study examining longer-term (12 week) outpatient cannabis relapse prevention treatment using nabiximols is now underway (NHMRC project grant #1088902). The trial will address a range of issues important in future translation of nabiximols for cannabis dependence into routine clinical practice, including abuse liability, cognition and psychomotor performance, toxicological detection of illicit cannabis use additional to nabiximols, and cost effectiveness.

Conclusions: The development of an effective medication for assisting in the cessation of heavy cannabis use could have wide reaching clinical and public health benefits.

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A randomized controlled trial of mirtazapine for outpatient cannabis withdrawal

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Background and aims: This study investigates the effectiveness of mirtazapine, a sedating antidepressant, in a population of adults seeking treatment for cannabis use.

Method: Measures of drug use, withdrawal symptoms and sleep disturbances were collected on 81 cannabis dependent treatment seekers presenting to a specialist outpatient drug and alcohol treatment facility in Sydney, Australia. Participants were randomised to receive mirtazapine or placebo (double blind) for 28 days as an adjunct to standard cognitive behavior therapy (CBT).

Results: Cannabis use reduced significantly in both treatment groups from baseline to day 28, but the reduction was not significantly different between the mirtazapine group and the placebo group. Cannabis withdrawal, as measured by the Marijuana Withdrawal Checklist, was lower in the mirtazapine group at each timepoint than in the placebo group, but not at statistical significance. Sleep disturbance, as measured by the PSQI, was significantly suppressed by mirtazapine at day 28 relative to baseline, however a range of other sleep indicators were not impacted by mirtazapine. Mirtazapine did not influence changes in the levels of cannabis dependence between day 1 and day 28 of treatment, although both groups became markedly less dependent.

Conclusions: This study confirms that sleep disturbances during cannabis withdrawal can be attenuated by mirtazapine. However the lack of any enduring effect on cannabis use, cannabis withdrawal or treatment retention suggests that mirtazapine may not be a first line drug candidate for this indication.

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A randomized controlled trial of daily aerobic exercise for inpatient cannabis withdrawal

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Background and aims: There is increasing scientific appreciation of the beneficial effects of regular

exercise on mood, wellbeing and general health. Both preclinical and clinical studies also show that exercise "changes the brain", boosting the proliferation and survival of new neurons (neurogenesis) and increasing the volume of brain regions involved in mood and cognition, such as the hippocampus. Exercise appears to have equivalent efficacy to antidepressants in improving mood in those suffering from mild to moderate depression. Emerging evidence in the addictions field suggests that exercise may also be of benefit for managing drug withdrawal and maintenance abstinence.

Method: The study is a prospective, parallel-group randomized controlled trial comparing an exercise versus control intervention across a range of cannabis detoxification outcome measures during a 7-day inpatient admission, with follow-up at 28 days post-discharge. Specifically, the study will compare severity of cannabis withdrawal and cannabis cravings, detoxification completion rates, and adverse events between the two conditions in an intention-to-treat analysis. Mechanisms by which exercise affects cannabis withdrawal will be assessed through the analysis of markers of endogenous cannabinoids, and plasma and urine THC levels.

Results: To date 11 patients have been recruited to this ongoing study (n = stretching, n = exercise), 10 of which remained in the hospital for the full 7 day duration. Five of those have been successfully followed up at 28 days post discharge. Out of the 5 participants that have been followed up so far, 4 have successfully remained abstinent since leaving the hospital. There have been nil serious adverse events. Data from the night-time adverse events checklist show that 1 participant in the stretching condition condition reported moderate difficulty concentrating and nausea, 1 participant in the cycling condition reported moderate sweating, diarrhoea and paranoia, and another participant in the cycling condition reported moderate memory problems. No adverse events were reported as severe.

Conclusions: There is somewhat surprising demand, uptake and adherence to a daily physical exercise regimen during inpatient cannabis detox.

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A randomized controlled trial of daily aerobic exercise for inpatient cannabis withdrawal – Cannabidiol (CBD) for the management of cannabis withdrawal: a phase II proof of concept study

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While other cannabinoids show promise, CBD has the added advantages of being non-intoxicating, safe for driving and potentially suitable for those with co-occurring mental health disorders. This feasibility study aimed to test the safety, feasibility and acceptability of CBD for alleviating cannabis withdrawal symptoms in a 6 night inpatient detoxification program, examining the impact of CBD on withdrawal severity, detoxification completion and adverse events in a single participant repeated measures design with n=5 participants receiving 300mg of CBD twice daily for 5 days and an additional 3 participants received 600mg twice daily. Overall withdrawal scale scores decreased and in the key symptoms of craving, sleep difficulties and irritability in addition to symptoms of anxiety and depression, with the higher dose group reporting larger decreases in stress and anxiety. Treatment completion rates were higher among participants receiving the higher dose. CBD was acceptable to participants and staff, with no adverse effects.

PLENARY SESSION 1
Prof Yvonne Cadet-James

SESSION 2
Jan Copeland

"Pure Rush": Development of a serious game to educate young people about cannabis and illicit drugs

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Background and aims: Cannabis is the most widely used illicit drug among young people, with 12.7% of Australians aged 12 to 17 reporting use in the past year. There is clear need for early intervention to educate young people about the risks associated with cannabis and other drug use. Learning is most effective when it is interactive, enjoyable, and problem-based. Serious games utilise these principles and have the potential to engage adolescents who would not be receptive to traditional drug education. This paper describes the development of an arcade-style game, *Pure Rush*, which incorporates a social influence approach to educate young people about the harms associated with cannabis and other drug use.

Method: Initial consultation with Year 10 students (*n = 115)* informed the development of a serious educational game called *Pure Rush.* Benefits of game play were examined in a sample of 200 Year 9 students, who were randomly allocated to receive a traditional drug education lesson, or gameplay combined with the traditional lesson. Engagement with the lesson and knowledge of cannabis effects and potential harms were assessed before and after the lesson.

Results: The overwhelming majority of students rated *Pure Rush* as enjoyable, age-appropriate, informative, understandable and useful. Results indicated that knowledge of cannabis-related harms increased in both groups; however enjoyment of the lesson was greater for students who received the gameplay lesson.

Conclusions: These preliminary results suggest serious games have the potential to engage young people with drug education and increase knowledge of the potential harms associated with cannabis and other drug use.

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Metabolic studies of synthetic cannabinoids PB-22 and 5F-PB-22 by Cunninghamella elegans

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Background and aims: PB-22 and 5F-PB-22 are relatively new synthetic cannabinoids, which have been reported to be associated with deaths of users. This study intends to identify the metabolite profile of PB-22 and 5F-PB-22 produced by the fungus, *Cunninghamella elegans*, which has previously demonstrated the ability to produce metabolites of synthetic cannabinoids, JWH-018, JWH-073 and AM2201, in a similar manner to *in vivo* human studies.

Method: *C. elegans* cultures were grown in liquid media composed of glucose, glycerol, peptone, yeast extract, KH_2PO_4 and NaCl in distilled water. PB-22 and 5F-PB-22 were incubated with the fungal

culture for 72h and the resulting metabolites were analysed by LC-MS/MS and HR-MS/MS techniques.

Results: Several metabolites were detected including ester hydrolysis products with and without monohydroxylation, and monohydroxylation for both compounds as well as oxidative defluorination for 5F-PB-22. These results are comparable with human hepatocyte and HLM studies.

Conclusions: The fungus *C. elegans* produced metabolites which correlate well with human hepatocyte and HLM studies. *C. elegans* model thus appears to be a promising platform for investigating synthetic cannabinoid metabolism. Furthermore, the ease of scaling up with this fungus model has the potential to allow structural characterisation of major metabolites by NMR and/or production of reference materials.

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Trends and geographical presentation of cannabis leaf and related products seized in NSW over 5 years (from mid-2010 to mid-2015

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The NSWFASS -Illicit Drugs Analytical Unit (IDAU) conducts botanical and chemical identification of cannabis leaf and cannabis related products seized by New South Wales police.
Over many years IDAU provides these services to the police and judicial system. The data presented may give a 'snapshot' or representative sampling of drug seizure during mid-2010-Mid 2015.
Our poster also covers the major contributing geographical area and other related information.
The presentation presents different form of cannabis products, product's description, and content of THC and method of administration.

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PLENARY SESSION 3

Marijuana: from the street to the clinic

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Public opinion toward marijuana or cannabis is changing in the United States, with the movement towards medical (23 states and the District of Columbia) and legal (Washington, Colorado, Oregon and Alaska) cannabis. Cannabis is the most commonly used illicit drug in the world, and its use represents a major public health and safety problem. This is especially true for young people initiating cannabis smoking before age 16, a critical stage of brain development, as connections between different functional areas of the brain are changed, and brain volumes decreased. Decreases in intelligence, employment and increased enrollment in social welfare were documented in frequent, chronic cannabis smokers initiating use before the age of 15. Cannabis also impairs psychomotor impairment including driving. However, some cannabinoids have therapeutic potential and much more research is needed to make relevant new medications available. These potential pharmacotherapies require the same safety and efficacy requirements as other FDA-approved medications. The changing dynamics of cannabis medicalization and legal use and an appropriate balance is needed to protect the public health and safety, and to provide well-controlled research to develop safe and effective cannabinoid medications and delivery systems.

Translational research of cannabidiol (CBD) in neuropsychiatry

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Delta9-tetrahydrocannabinol (9-THC) is commonly accepted as the main constituent and responsible for most of the effects of the Cannabis Sativa plant. Another major cannabinoid compound is cannabidiol (CBD), formerly regarded to be devoid of pharmacological activity. However, laboratory rodents and human studies have shown that this cannabinoid is capable of preventing both psychotic-like and anxiety-like symptoms induced by high doses of delta-9-THC. Subsequent studies have demonstrated that CBD has antipsychotic and anxiolytic effects as observed using animal models and in healthy volunteers. Thus, this article provides a critical review of the research evaluating the antipsychotic potential of this cannabinoid. CBD appears to have a pharmacological profile similar to that of atypical antipsychotic drugs as observed using behavioral and neurochemical techniques in animal models. Additionally, CBD prevented human experimental psychosis and was effective in open case reports and clinical trials in patients with schizophrenia and with pathological anxiety with a remarkable safety profile. Moreover, fMRI results strongly suggest that the antipsychotic and anxiolytic effects of CBD on the psychotomimetic effects of 9-THC involve the striatum and temporal-limbic cortex that have been associated with psychosis and anxiety. In addition , basic and clinical research have shown the potential use of CBD in epilepsy, dependence and abuse of substances (marijuana and crack/cocaine), depression, bipolar disorder, sleep disorders and Parkinson, among others. Although the mechanisms of action are still not fully understood, the results observed support the idea that CBD may be a future therapeutic option in neuropsychiatric disorders, in general, and in psychosis and anxiety, in particular.

Medicinal marijuana in the US

Sabet, Kevin

Dr. Sabet will discuss the medical marijuana scene in the US – what does it look like? What are the outcomes? What is the latest on US research? He will discuss the issue of CBD (Cannabidiol) as well as the oft-misunderstood issue of marijuana scheduling and the role of the US Drug Enforcement Administration and Food and Drug Administration.

SESSION 4 - Aboriginal and Torres Strait Islander communities

What has Culture got to do with Cannabis?

Cadet-James, Yvonne[1]
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There is enough evidence to show that cannabis use for Aboriginal and Torres Strait Islander people is an issue and one of major concern for families and communities, professionals who work in the field, service providers and Government. While the social and economic factors surrounding cannabis use are well documented, less so is the impact on culture which is vital for the spiritual survival of future generations. There has been a varied success rate with different interventions and often a lack of formal evaluation results in some uncertainty about the level of success and sustainability. Research in this field has resulted in numerous recommendations to address the issue however in most cases these recommendations focus on what professionals, service providers and government should do to alleviate the problem. This presentation will focus on exploring success and recommendations which focus on groups and communities utilizing cultural traditional approaches to addressing problems in partnership with researchers, professionals, service providers and Government.

Development of a culturally sensitive pictorial Cannabis Withdrawal Scale aligned with DSM-5 in a low literacy Australian Indigenous population

Rogerson, Bernadette[1]; Copeland, Jan[2]; Schnierer, Liana[1]; Kidd, Garry[3];Watt, Kerrianne[1]; Cadet-James, Yvonne[4] and Clough, Alan R.[1]
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[4]School of Indigenous Australian Studies, James Cook University, Cairns and Townsville, Australia

Background and aims: Across the world issues of cannabis use and dependence are common health concerns, particularly for cohorts of typically heavy and prolonged users such as incarcerated and Indigenous populations. Upon cessation of cannabis, the withdrawal syndrome has been found to be clinically significant. In order to measure treatment effectiveness, a culturally sensitive and relevant measure of cannabis withdrawal is required. The Cannabis Withdrawal Scale (CWS) is the only validated measure of cannabis withdrawal syndrome, and has not been assessed for cultural appropriateness, in low literacy forensic populations. This study assessed withdrawal symptoms and severity in focus groups to ensure cultural relevance and suitability, to determine symptom alignment with the DSM-5 Cannabis Withdrawal criteria, and to investigate the addition of illustrations to represent each symptom for further testing upon ensuring face validity.

Method: A cultural expert reference group (*N* = 10) and nine focus groups (*N* = 58) comprised of incarcerated participants aged 18-56 years who identified as Indigenous in two high security prisons for men and women in north Queensland, Australia and an academic reference group (*N* = 9).

Results: A culturally sensitive pictorial scale aligned with DSM-5 Cannabis Withdrawal Syndrome criteria has been created.

Conclusions: This adaption of the validated CWS to ensure a culturally appropriate tool now uses language modification and the addition of a pictorial element for low literacy populations that will allow more accurate diagnosis and better treatment to prevent relapse and available for further validation and reliability testing for wider generalisation.

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Shipp, Maurice

SESSION 5 – Cannabis Interventions

Early Intervention for Cannabis related offences – providing treatment options rather than court

Boyd, Lesley[1]
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Background and aims: August 2011 saw the introduction of the Cannabis Intervention Requirement (CIR) scheme in WA, available to juveniles over 14 years who may receive up to two CIR's and adults on one occasion. This scheme aims to; a)Offer early intervention to first time offenders by directing them to a health intervention session in preference to the justice system, particularly young people, over 14; b) Encourage attendance at a one-on-one therapeutic intervention session about the legal and health implications of cannabis through a 'Sword of Damocles' incentive; c) Arm people with knowledge about the impacts of cannabis use and enable them to make informed, better choices about cannabis use into the future; d) Reduce demand for Police and Judicial System resources related to minor cannabis-related offending.

Method: In completing a CIS, approved drug counsellors' conduct a one-on-one open discussion that aims to engage the individual in a non-judgemental environment about; the adverse physical and mental health effects relating to cannabis, increased awareness of the laws relating to drug use and possession of drugs, social consequences of drug use and provide effective strategies to address drug using behaviours.

Results: As of January 2015 more than 6,500 CIR notices have been issued and over 4,540 people (69.6%) have been diverted from the criminal justice system to successfully complete their Cannabis Intervention Session (CIS).

Conclusion: Early results from the scheme report a vast improvement in outcomes for Police and Individuals. Individuals are using the opportunity to better understand the impact of cannabis on their lives. Further, the monitoring of recidivism rates of the first 1000 individuals who completed their CIS indicate more than 82% of people have not re-offended.

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Going online to reach people seeking help: early PotHelp progress

Milburn, Catherine[1] Stephen Blyth will be giving this presentation
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Background: PotHelp is an innovative online self-help website offering support to people who want to quit or cut back using cannabis. This is funded by the New Zealand Ministry of Health as part of a wider drug demand reduction strategy. The aim is to provide a readily available gateway to treatment for people ready to change.

Method: The website offers a non-threatening way for people to examine their cannabis use where and when they're ready to. A suite of interactive tools offers an entry point to self-directed change by individuals. This closely mirrors common approaches to therapy in the real world. Based on a foundation of video testimony from everyday Kiwis, a key aim is to assist visitors to acknowledge that change is possible. With motivation harnessed people are encouraged to regularly return to complete a series of online exercise, journal entries and view additional video.

Results: In the first 18 months of operation the website received over 27,000 visitors. Based on key indicators being measured, almost a third of visitors have shown signs of being highly engagement. However, the numbers registering are low, but those that do are deeply engaged. With support from an Expert Panel where website contents and usability is regularly reviewed, a schedule of improvements is expected to boost levels of activity. Initial feedback suggests that users value the website.

Conclusion: Providing online support for people with a drug dependency issue is showing early signs of being a valuable addition to treatment provision in New Zealand. As is common with web-based resources, significant effort and investment needs to be directed to usability enhancement in order to maximise the potential.

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Pilot testing the first evidenced-based smartphone app for the self-management of cannabis use

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Introduction: Cannabis is the most frequently used illicit drug in Australia, with almost 20% of ever users meeting criteria for a cannabis use disorder; however, less than one-third of those will receive treatment. To address this treatment gap, we developed a smartphone application for managing cannabis use, which has the potential to provide a private, readily accessible, and low-cost evidenced-based treatment alternative for cannabis users who want to quit or reduce their use.

Method: One hundred and eleven individuals (≥16 years) participated in a trial of the app which employed principles of MET and CBT – therapies that have been shown to effectively reduce cannabis use and related problems. Participants completed assessments of cannabis use, related

problems, dependence, distress, and self-efficacy at baseline, after 4 weeks use of the app, and again at one-month following loss of access to the app.

Results: The key findings of the study show significant declines in participants' cannabis use (p < .001), severity of dependence (p = .001), and distress (p = .002) following use of the app. Participants also reported significantly fewer cannabis-related problems (p < .001) and higher levels of self-efficacy in their ability to resist using cannabis (p < .001).

Discussion: Apps are a promising platform for the delivery of substance abuse interventions; however, they urgently require evidenced-based development and appropriate evaluation to ensure they are effective and have meaningful outcomes for users. This study demonstrates support for the efficacy of the first evidenced-based smartphone application intervention targeting the self-management of cannabis use.

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Very brief interventions for cannabis use

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Primary health care settings have been established as suitable settings for brief interventions for substance use related problems. This paper reports on the feasibility study of a very brief intervention for cannabis use in an ED setting in a pre-post design. The study (n=70) included follow-up data collected one-month following presentation to the ED and found the intervention was feasible and acceptable to participants. Further, compared with baseline, participants reported significantly fewer days of cannabis use; fewer cannabis-related problems and lower levels of dependence at one month follow-up. This has now been extended to a second site and including amphetamine type stimulants

SESSION 6 – Cannabinoids and driving

Steer Clear

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Background and aims: Steer Clear is an evidence based behavior change drug driving campaign launched in February 2014. Steer Clear has two main behavior change goals.
Increase the number of young people who: a) stop their friends from driving following cannabis use; b) choose not to drive following cannabis use.

Method: Steer Clear consists of several components to support the campaigns behavior change goals. These include the website, dope as drive (real life simulator) that travels the country to youth events, social media which encourages conversation and engagement, Real stories which captured users' experiences around driving high some of these stories were turned into animated gifs to help illustrate the message, a crash pack that encourages people to stay over at a mates rather than driving high and Mind blown which consisted of a series of videos that highlighted the dangers of driving high.
Central to the campaign is that young people (the Crew) are involved in the co-creation of campaign elements and marketing.

Results: Baseline survey results confirmed our behavior change goals and target audience are correct, with many respondents having experienced getting in the car with drivers who were under the influence and believe it is ok or not sure to drive after using cannabis. The survey is currently being repeated. Evaluations from campaign components clearly indicate Steer Clear is reaching and engaging with a significant number of young people.

Conclusions: Steer Clear is an innovative, fun and effective targeted campaign to reduce cannabis and driving among young people. Steer Clear has been successful in starting an ongoing conversation that keeps young people thinking about the harmful effects of driving high.

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Cannabis and driving

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Campaigns to reduce drugged driving continue to be a major thrust of road safety by polices forces around Australia. After alcohol, cannabis (as Δ^9-tetrahydrocannabinol, THC) is the most prevalent drug with a prevalence rate in fatally-injured drivers averaging 15% annually. Injured drivers tend to have a slightly lower incidence in Victoria at around 10%.
While cannabis can induce a range of cognitive and coordination deficits during its acute phase of intoxication it had been quite difficult to translate this to actual impairment, let alone raised crash risk, in an individual driver not showing signs of overt intoxication.
A series of case control and broader epidemiological studies have been conducted in Australia and now in other parts of the world that now demonstrate an increased crash risk even when overt intoxication (or impairment) is not present. These studies are reviewed together with the difficulties associated with the assessment of the involvement of cannabis in individual cases.
Random roadside detection of drugs has been conducted in Victoria since late 2004 as a deterrent to drugged driving and is now conducted by all mainland states. In Victoria alone 100,000 drivers will tested this coming year with THC one of the banned drugs. Statistics on the detection rate will be provided and compared to that seen in other driver types.

Synthetic cannabinoids are being detected in persons who come to the attention of police or Coroners. These have included JWH-122, JWH-122-pentenyl derivative, CRA-13 and PB-22. The detection rate and the type of drugs detected will be described.

Effects of cannabis with and without low dose alcohol on driving

Huestis, Marilyn[1]
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Cannabis impairs psychomotor impairment including driving, a major road safety issue, as cannabis-involved injuries and fatalities are the highest worldwide for any illicit drug. Data from our controlled cannabis administration studies in occasional and chronic frequent cannabis smokers illustrate the pharmacodynamics and pharmacokinetics in these two populations that impact drug policy for cannabis impaired driving. Following frequent cannabis intake, a large body burden of cannabinoids develops that exerts effects on cognition and psychomotor performance. Recent meta-analyses of cannabis impaired driving clearly document an approximate two-fold increase in risk of injury or fatality if there is measureable blood THC, and increases with increasing blood THC concentration. Results of our controlled cannabis administration study, with and without low dose alcohol, in the world's most advanced driving simulator, demonstrate the differences between cannabis and alcohol impaired driving, but show an additive impairing effect when combined.

Prevalence of driving under the influence of cannabis in Australia

Gates, Peter[1]
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Background and aims: The aim of this presentation is to examine the prevalence of driving under the influence of cannabis in Australia**.**

Method: A large online survey was conducted through social media of over 4,600 Australians.

Results: Of those who identified recent cannabis use, almost 70% had ever driven while still under the influence of cannabis and 16% indicated they had driven on a daily basis. One quarter of the sample thought that it would be very unlikely that they would be tested for drug driving.

Conclusions: People who drive under the influence of cannabis may not be aware of the negative impact on driving skills or the rising likelihood of being tested for drug driving across Australia.

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PLENARY SESSION 7

Studies of acute cannabinoid administration in humans: what's the story with THC versus CBD?

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Background and aims: Significant interest has arisen regarding opposing effects of the two primary compounds of cannabis: Δ^9-tetrahydrocannabinol (THC) and cannabidiol (CBD). This talk will describe studies of acute administration of these compounds to humans.

Method: Sixty-five healthy volunteers with varying prior cannabis exposure (range 5 lifetime uses to daily use) participated in randomised controlled trials of administration of vaporised THC and CBD,

each alone and in combination. Effects on psychological symptoms and cognition, and brain function by means of EEG or MRI, were examined in subsamples, comparing frequent and infrequent users. This overview talk will focus on symptoms, cognition and neurochemistry (GABA and glutamate levels), while specific EEG and other MRI results will be presented by others.

Results: THC generally impaired all measures to a greater degree in infrequent than frequent users. CBD did not attenuate the effects of THC for most measures, but in some conditions enhanced these effects, especially at low doses of CBD combined with THC in less experienced users. CBD alone showed psychoactivity relative to placebo. The two compounds showed differential effects on brain glutamate and GABA levels which were associated with brain functional measures.

Conclusions: The results of these studies suggest complex interactions between THC and CBD on psychological and brain function that may vary with proportional dose and degree of prior exposure to cannabis. The implications of these findings will be discussed in the context of considering the therapeutic potential of these cannabinoids, as well as the legalisation of cannabis for recreational use.

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Repairing and preventing cannabis related brain harms: A dream or reality?

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Background: While cannabis holds therapeutic potential, prolonged, heavy use of cannabis, especially its primary psychoactive constituent - delta-9-tetrahydrocannabinol (THC), is associated with adverse effects on the brain, especially the hippocampus. The extent to which these harms recover with abstinence is unknown. Furthermore, while cannabidiol (CBD), another key constituent of cannabis, has been suggested to protect against such harms, this has not been adequately examined in humans.

Method: We sought to address these gaps in the literature by using MRI to compare the hippocampal integrity of long-term, regular cannabis users who were either exposed to THC but not CBD, or exposed to both THC and CBD. We also conducted similar comparisons for regular cannabis users with unknown exposure to CBD, as well as former users who remained abstinent for extended periods. Using 3T-MRI data, we derived three well-validated indices of hippocampal integrity – namely, volume; n-acetylaspartate (NAA); and fractional anisotropy.

Results: Hippocampal integrity is indeed significantly deteriorated in cannabis users relative to controls. However, this deterioration may be ameliorated by cannabidiol and recovered through prolonged abstinence from cannabis.

Conclusions: The findings have major and unique implications for how we conceptualize the long-term effects of cannabis use in humans and how harm to the brain may be minimized by modifying levels of CBD in cannabis, and/or recovered with abstinence. These relatively simple and accessible remedial options should be further researched so as to establish the 'optimal' level of each to achieve the most efficacious outcomes.

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Cannabis; private, clinical, scientific & public perspectives

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Cannabis is a touch-stone for heated debate. Protagonists have perspectives that originate in their own experiences of cannabis use, the scientific evidence about the effectiveness and dangers of cannabis and the perspective of public discourse about the regulation of cannabis.
The substantial material presented will relate to recent research about cannabis and psychotic illness such as schizophrenia. The presenter will outline recent meta-analytically derived data that describes the use of cannabis in relation to the i) course of cannabis use and the onset of schizophrenia, ii) the association between cannabis use and schizophrenia iii) the course of cannabis use after the onset of schizophrenia and the iv) effect of continued cannabis use and cannabis cessation on people who have developed symptoms of schizophrenia.

The presenter will attempt to integrate the different perspectives on cannabis use by drawing on his own experiences, including as a psychiatrist, the experience of being a cannabis researcher and the experience participating in the public debate about cannabis.

SESSION 8 - Cannabis and brain function

Cannabis use disorders and neuroanatomical alterations: Where is the evidence?

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Background and aims: Cannabis use disorders (CUDs) affect 13.1 million individuals worldwide and represent the most vulnerable portion of regular cannabis users. Neuroanatomical adaptations specific to CUDs may mediate the significant adverse behavioral outcomes of CUDs.

Method: We reviewed findings from 20 structural neuroimaging studies on grey and white matter morphology in cannabis users that specifically included CUDs assessment.

Results: There is preliminary evidence for CUD-specific alterations within the striatum, medial temporal lobe, PFC, cerebellum and corpus callosum. Factors that may aggravate neurobiological alterations include earlier age of onset, higher lifetime exposure and CUD-associated problems, while abstinence may result in (partial) recovery. We cannot draw strong conclusions on CUD-specific neurobiological abnormalities given the lack of studies examining individuals with a diagnosed CUD.

Conclusions: The reviewed evidence on morphological abnormalities in CUDs indicate that there may be distinct neural substrates mediating cannabis addiction and compulsive use (e.g., striatum); and the neurotoxic effects of cannabinoids (e.g., hippocampus). Comparing subjects with and without CUDs is an essential step to characterize the neurobiology and develop new treatment strategies.

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Abnormal brain function in adolescent cannabis users: A systematic review of the evidence

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Background and aims: Cannabis use typically commences during adolescence, a period during which the brain undergoes profound remodelling and is particularly vulnerable to the impact of environmental insults. Chronic cannabis exposure may harm the adolescent brain and behavior, as neural remodelling occurs most markedly in brain areas that are high in cannabinoid receptors and that mediate cognitive control and emotion regulation. We aimed to examine the evidence to date on the impact of regular cannabis use on adolescent brain function.

Method: We used PubMed and SCOPUS to systematically review findings from functional neuroimaging studies of adolescent cannabis users.

Results: Thirteen studies examined brain function in samples of cannabis users (aged 13 to 18 years), while they performed working memory, inhibition and reward processing tasks. The majority of the studies found altered brain function, but intact behavioral task performance in adolescent cannabis users relative to non-cannabis using controls. Neural abnormalities involved most consistently hyperactivity in frontal-parietal networks, which are typically ascribed to cognitive control. Higher chronicity of cannabis use was associated with abnormal brain function in most samples. Only a minority of studies controlled for the potential confounding influence of variables that can also undermine brain function, such as tobacco and alcohol use, higher psychopathology symptoms (conduct, anxiety, mood disorders) and family history of psychiatric disorders and substance use.

Conclusions: There is emerging evidence for abnormal frontal-parietal network activity in adolescent cannabis users, particularly in those with more chronic levels of use. Brain alterations may reflect a compensatory neural mechanism that is required to allow normal behavioural performance. It remains unclear if cannabis exposure is primarily responsible for these alterations.

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Acute effects of THC and CBD alone and in combination on default-mode connectivity: a functional resting-state MRI study

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Background and aims: Previous research suggests Δ^9-tetrahydrocannabinol (THC) and cannabidiol (CBD) have opposite effects on cognition and brain function. THC is generally found to be psychotogenic and cognitively impairing, whilst CBD may ameliorate the deleterious effects of THC. In a double-blind crossover, placebo-controlled study, we examined the acute effects of THC and CBD alone and in combination on default-mode connectivity.

Method: Thirty volunteers (23 male) underwent four semi-randomised conditions (1.Placebo,

2.THC,6mg; 3.CBD,200mg; 4.THC,6mg+CBD,200mg) with BOLD images acquired during a 7 minute rest scan. Drugs were dissolved in 100% ethanol (serving as placebo) and vaporised using a Volcano® Vaporiser. Participants were divided into frequent and infrequent users on the basis of a median-split on lifetime cannabis use. Independent Components Analysis was used to identify the default-mode network and Region Of Interest analysis examined the effect of drug on functional connectivity in infrequent versus frequent users.

Results: Preliminary findings (n=23) suggest that relative to placebo, default mode connectivity in infrequent but not frequent users was impaired following both THC and CBD administration, albeit to a lesser extent with CBD. The combination of THC+CBD impaired connectivity relative to CBD, but not THC, an effect that was again most pronounced in infrequent users.

Conclusions: As the first study to examine the effects of THC and CBD alone and in combination on default-mode connectivity, preliminary results indicate impairing effects of both compounds and not the opposing effects suggested in previous studies.

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Cannabidiol attenuates the effect of Δ9-tetrahydrocannabinol on EEG brain oscillations during rest

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Background and Aims: Cannabidiol (CBD) is thought to ameliorate the psychotogenic and cognitively impairing effects of Δ^9-tetrahydrocannabinol (THC), and its anxiolytic and antipsychotic properties are of therapeutic interest. The current study aimed to elucidate potential mechanisms by investigating the acute effects of THC and CBD, alone and in combination, on resting-state EEG activity as a function of prior cannabis exposure.

Methods: Fifteen frequent (FREQ) and 15 infrequent cannabis users (inFREQ) participated in a double-blind, placebo-controlled, cross-over study involving 5 randomised vaporised drug conditions: a) Placebo; b) THC-8mg; c) CBD-400mg; d) THC-8mg+CBD-4mg [LoCBD+THC]; e) THC-12mg+CBD-400mg [HiCBD+THC]. Electroencephalograph (EEG) data were recorded (5min; resting) before and after drug administration. Post-drug EEG power was corrected by subtracting pre-drug power for each frequency band: delta, theta, alpha, beta, gamma1 and gamma2.

Results: THC increased alpha, beta, gamma1 and gamma2 power relative to placebo and CBD. THC also increased beta, gamma1 and gamma2 frequency bands when compared to LoCBD+THC and HiCBD+THC. CBD, relative to placebo, increased power in gamma1, with a trend increase in beta and gamma2. Alpha power was larger for inFREQ than FREQ users under THC and CBD, although no condition by group interactions were observed.

Conclusion: While CBD alone tended to increase EEG power, when combined with THC, CBD attenuated EEG power increases observed following THC alone. These findings concur with previous studies showing attenuation of the effects of THC by CBD but further investigation of excitatory and inhibitory systems is required to understand the therapeutic potential of CBD.

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SESSION 9 - Cannabis prevention

Adolescent substance use and educational attainment: An integrative data analysis comparing cannabis and alcohol from three Australasian cohorts

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Background and aims: The relative contributions of cannabis and alcohol use to educational outcomes are unclear. We examined the extent to which adolescent cannabis or alcohol use predicts educational attainment in emerging adulthood.

Method: Participant-level data were integrated from three longitudinal studies from Australia and New Zealand (Australian Temperament Project, Christchurch Health and Development Study, and Victorian Adolescent Health Cohort Study). The number of participants varied by analysis (N=2179-3678) and were assessed on multiple occasions between ages 13-25. We described the association between frequency of cannabis or alcohol use prior to age 17 and high school non-completion, university non-enrolment, and degree non-attainment by age 25. Two other measures of alcohol use in adolescence were also examined.

Results: After covariate adjustment using a propensity score approach, adolescent cannabis use (weekly+) was associated with 1½ to 2-fold increases in the odds of high school non-completion (OR=1·60, 95%CI=1·09, 2·35), university non-enrolment (OR=1·51, 95%CI=1·06, 2·13), and degree non-attainment (OR=1·96, 95%CI=1·36, 2·81). In contrast, adjusted associations for adolescent alcohol use were inconsistent and weaker. Attributable risk estimates indicated adolescent cannabis use accounted for a greater proportion of the overall rate of non-progression with formal education than adolescent alcohol use.

Conclusions: Findings are important to the debate about the relative harms of cannabis and alcohol use. Adolescent cannabis use is a better prognostic marker of lower educational attainment than adolescent alcohol use and identifies an important target population for preventive intervention.

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Developmental trajectories of cannabis use among Australian adolescents: childhood predictors and young adult outcomes

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Background and aims: Effective prevention of cannabis use and related harms relies on identification of developmental periods of vulnerability and determination of what places individuals at risk of experiencing negative cannabis-related consequences. To this end, this study aimed to identify distinct developmental trajectories of cannabis use among Australian adolescents, and to examine associations between trajectory group membership and 1) childhood social-environmental risk and protective factors; and 2) social and behavioural adjustment outcomes in young adulthood.

Methods: Participants were young people from Victoria, Australia (*n*=852, 53% female), who were part of the International Youth Development Study. Latent class growth analysis was used to identify distinct sub-groups of individuals who showed similar developmental patterns of cannabis use from average age 12 to average age 19.

Results: Three trajectories of cannabis use were identified: abstainers (62%), early onset users (11%), and late onset occasional users (27%). Early onset users were found to have the greatest number of behavioural adjustment problems at age 21. At age 11, risk factors associated with the community, family, and individual (e.g., rebelliousness) increased the risk of later membership in the early onset cannabis use group, while protective aspects of the family and school environment reduced the risk of later membership in this group.

Conclusions: Early onset of cannabis use, even at relatively low frequency during adolescence, places adolescents at risk of a range of adverse outcomes in young adulthood. Prevention and intervention efforts should focus on social-environmental factors during childhood, to delay or prevent uptake of cannabis use.

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Internet-based prevention for alcohol and cannabis use: 12-month outcomes from a cluster randomised controlled trial

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Background and aims: Alcohol and other drug use among young people is associated with significant social costs and harms. As such, there is a clear need to intervene early and deliver prevention before initiation to substance use occurs. This study aims to conduct a cross-validation trial of the *Climate Schools: Alcohol and Cannabis* course, an online school-based prevention program for alcohol and cannabis use.

Method: A cluster randomised controlled trial was conducted among 1103 students from 13 secondary schools in Sydney and Melbourne. Six schools received the *Climate Schools: Alcohol and Cannabi*s course and seven schools were randomised to a control group (health education as usual). Students completed a self-report survey at baseline, post-intervention (80%) and at a 12-month follow-up (86%). Mixed-effects regressions compared the groups on alcohol and cannabis use, knowledge and intentions.

Results: Compared to the control group, immediately post-test the intervention group reported significantly greater alcohol and cannabis knowledge, were less likely to have consumed any alcohol (sip or taste) in the past six months and were less likely to intend on using alcohol in the future.

However, there were no effects for binge drinking, cannabis use or intentions to use cannabis. Analyses of the 12-month data will also be conducted and reported.

Conclusions: These results provide added support for the online *Climate Schools: Alcohol and Cannabis* course as a feasible way of delivering alcohol and cannabis prevention. However analyses of longer-term follow-up data are need to provide a clearer indication of the efficacy of the intervention.

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Cannabis prevention and awareness: findings of an Australian survey on mass media campaigs

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Background and aims: According to the 2013 National Drugs Strategy Household Survey, cannabis remains the most commonly used illicit drug in Australia, with average age of first use at just over 16 years of age. Both Government and not-for-profit health sector organisations around the globe regularly implement new and unique campaigns aimed at building awareness of cannabis-use related harms in an effort to prevent uptake of the drug, or delay first use further. In order to continuously improve the effectiveness of such campaigns, several marketing principles need to be met, including two of note: the development of audience profiles that explore behaviours, motivations, interests, experiences and opinions; and regular evaluation of past and current approaches with a view to evolving approaches and techniques in the future.

In order to better inform awareness and prevention campaigns, the National Cannabis Prevention and Information Centre undertook an extensive market research survey aimed at better understanding young Australian cannabis users, and those who choose not to use the drug. This presentation will explore the results of an online survey from a prevention, awareness and campaign perspective.

Method: An online survey of N = 8,590 Australians aged 25 and younger was undertaken between 5 May and 12 May 2015, with more than 4,000 participants aged between 12 and 18. Promoted on Facebook, the survey explored participants' knowledge of access to and experience of cannabis. It assessed the effectiveness of key message topics from mental illness to peer-pressure, and enabled participants to evaluate a number of key prevention and awareness campaigns from around the world. Participants who completed the survey were placed in a draw for a $300 voucher.

Results: Young people primarily identified friends and the internet as key source of information, showed reservations about drug-related parental conversations, and identified several organisational types they most trust and don't trust to deliver drug-related information. The majority of young people believe cannabis should be legalised and base their opinion largely on what other countries are doing and what they hear in the media. Young people identified various traits they like and dislike about previous campaigns, noting most effective messages revolve around legal and mental health consequences. Of note, was an opposition to hyperbolic campaigns and messaging.

Implications: While this market research is only one step towards better understanding young Australians' relationship with social marketing and drug awareness campaigns, it points to a range of areas that may be further explored.

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PLENARY SESSION 10

Prohibition has failed with illicit drugs: Accepting the challenge of examining other approaches

Penington, David

Front and centre in current public debate on cannabis is the issue of its medicinal use. Strong commitment from State governments in NSW and Victoria, likely collaboration from Queensland and Tasmania, and recent support from the Senate Standing Committee on Legal and Constitutional Affairs Legislation in Canberra are likely to allow us to move, as have many other countries, to safe and effective medicinal cannabis for selected disorders. This is despite stirring a backlash from those with a deep, almost religious opposition to any 'freeing up' of prohibition of the 'evil' drug cannabis.

Much is now being learned about the constituent psychoactive elements of cannabis. The critical role of CBD in modifying the effects of THC on the endocannabinoid system, is rewriting the book on the link of cannabis to schizophrenia.

We need to learn from the outcomes of the Portuguese drug policy model for management of drug abuse as we start to look at alternative approaches to prohibition, including the potential of controlled provision of 'safe' cannabis as a public health issue**.**

My cannabis journey

Hopkins, Bob

My name is Bob, I'm a cannabis addict though not a practising one (albeit with the occasional lapse) for the last 15 years. Along the way I initiated the Nimbin drug law reform movement that remains the most prominent cannabis user advocacy organisation nationally, founding the Nimbin Hemp Embassy, stood as a drug law reform candidate on a number of occasions in the NSW State Elections, and kicked off the annual Nimbin Mardi Grass Fiesta. However I experienced a slow burn epiphany that resulted in a re-evaluation of both my own cannabis habit and a coming to odds with the HEMP (Help End Marijuana Prohibition) group over much of the information and attitudes they promulgated, especially with respect to their promotion of the use of cannabis and their support of free market distribution.

Cannabis 2.0 (US policy and commercialization)

Sabet, Kevin

Dr. Sabet's presentation is based on his book "Reefer Sanity: Seven Great Myths About Marijuana." In his presentation Dr. Sabet makes the claim that our greatest concern should be the inevitable rise of a second Big Tobacco industry, this time marketing marijuana to our children and youth. He will refer to the already arising problems in Colorado and Washington State as examples. His presentation concludes with an overview of our policy options, describing a smarter, science-based approach to marijuana policy that neither legalizes marijuana nor demonizes its users.

POSTER ABSTRACTS

Perceived Knowledge, Attitude and Practices on Cannabis Use among Opioid Substituent Therapy (OST) Clients in Nepal

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Background and aims: Globally, cannabis is the most prevalent type of illicit substance used among OST clients with estimates of concurrent use ranging from 50% to 85%. While there are concerns from those in Nepal providing Opioid Substitution Treatment (OST) about the prevalence of cannabis use, its potential impact on the physical and mental health of clients, treatment compliance, adherence to program, impacts on medication efficacy, and overall social and economic functioning, there is no local data to provide guidance.

Available international evidence as to the role of use of cannabis by people in OST and for those with HIV and HCV is equivocal. Some suggest a possible role of cannabis use easing induction to and exiting from MMT. However, others have identified issues, such as interactions with OST medications and a negative impact on liver disease in those with HCV, and WHO has advised caution.

This small exploratory survey at an NGO OST service in Kathmandu, Nepal aimed to assess prevalence of and reasons for cannabis use among ex-OST clients.

Method: Structured questionnaire, administered by Outreach Educators, and focus group discussion with ex OST clients.

Results: Mean age of the 20 ex-OST participants was 33, mean duration of cannabis use was 15 years, and weekly was use between 14 to 21 joints, with the majority using cannabis for pleasure, then to get 'high', to 'trip', increase appetite, relieve tension and for better sleep. Most used cannabis while initiating OST, stabilising on dose, and while withdrawing from OST. However, a majority believed that cannabis use increased cravings after cessation of OST, and began or continued use of other substances, including pharmaceutical opioids and benzodiazepines in addition to cannabis.

Conclusions: Greater attention to cannabis use of people in OST, raising potential negative consequences and developing effective interventions for those wishing to reduce or cease its use. Research could also focus on cannabis use and plasma methadone concentrations, and the initiation and exacerbation of serious mental health disorders for those on OST.

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Cannabis and its use among Hindu Sadhus at Pashupatinath Temple, Kathmandu, Nepal

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Background and Aims: Cannabis (ganja) has been used in Nepal for centuries and is mentioned it many Hindu scriptures, and is used for spiritual, cultural, medicinal and recreational purposes. Believed to be the loved substance of Hindu God Shiva, it is an integral part of Hindu society. However, its use and attitudes toward cannabis have been changing in recent years. Many clients on OST in Nepal claim that they use ganja for religious and spiritual reasons, and that its use is condoned by Lord Shiva and the Sadhus. However, there are concerns from the mental health field about cannabis use and psychosis, and from those providing Opioid Substitution Treatment that it may be associated with poor treatment compliance and relapse. The objective of this study was to

assess the knowledge, attitude and practices of cannabis use among the Hindu Sadhus during *Mahashivaratri festival 2014* at Pashupatinath Temple, Kathmandu.

Method: Using a structured questionnaire, in depth interview, 200 Sadhus of mean age 52 were interviewed at the Pashupatinath Temple.

Results: While 90% were daily users of ganja, other than for use by Sadhus to aid focus, concentration, meditation, self-control and relaxation, the majority believed that sacred scriptures do not indicate that Lord Shiva promoted its use. However, Naga Sadhus and those less educated were more dependent on ganja, believed Hindus should use it, that Lord Shiva condones its use, and give ganja to devotees. Only 64% of participants knew that cannabis was illegal in Nepal.

Conclusions: As a group, the Sadhus are poorly educated and hold diverse views as to the legality, and scriptural basis for use of ganja. Sadhus are influential, and the findings indicate a need to educate Sadhus about cannabis, involve them in policy development, and involve better informed Sadhus in the treatment of OST clients.

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Rapid Elimination of Carboxy-THC in a Cohort of Chronic Cannabis Users

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Background: Urinary 11-nor-Δ9-tetrahydrocannabinol-9-carboxylic acid (Carboxy-THC) concentrations, normalised to creatinine output, have been demonstrated to be a useful tool in the interpretation of the results of a series of urine tests for cannabis. These tests can be used to identify potential chronic cannabis users undergoing treatment for substance abuse or who may present occupational health and safety risks within the workplace. Conversely, the data can also be used to support claims of previous regular, rather than recent, cannabis use.

Aim: To corroborate other studies that showed the majority of chronic cannabis users eliminate cannabis from their urine within 1-2 weeks of becoming abstinent. Furthermore, the study aimed to identify both recidivists and those who claimed not to have re-used and who may have been unfairly treated as a result of a positive urine test.

Method: A cohort of chronic users underwent voluntary abstinence over a two-week period, and provided a supervised urine pre-abstinence and at two weekly intervals during abstinence.

Results: Out of 43 participants, the majority of chronic cannabis users (86%) reduced their urinary Carboxy-THC levels to below confirmatory cutoffs levels within two weeks. It was possible to determine whether rises in the graphs of normalised cannabis: creatinine were the results of re-use or release of depot stored cannabis towards the end of the elimination.

Conclusions: This data can assist both drug treatment staff and Environmental Health and Safety officers in assessing both potential health and impairment risks presented by chronic cannabis users.

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Verbal and visuospatial learning deficits in current and former chronic cannabis users

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Background and aims: Emerging evidence shows learning deficits in regular cannabis users. It remains unclear whether these deficits selectively affect specific domains of learning (i.e., verbal, visuospatial) and persist over prolonged abstinence from cannabis. This study aims to examine verbal and visuospatial learning deficits in regular cannabis users, and whether prolonged abstinence recovers these deficits.

Method: We cross-sectionally examined 127 psychiatrically healthy participants. Of these, 69 participants were current chronic cannabis users (using for a mean 15 yrs), 12 were former users abstinent for ~2.5 yrs (after using for a mean of 16 yrs), and 46 were non-cannabis using controls. We measured verbal and visuospatial learning via the California Verbal Learning Test and the Brown Location Test, respectively.

Results: The impact of cannabis use on learning was specific to the examined cognitive domain (verbal vs visuospatial learning) and abstinence status (current vs former use). Verbal learning deficits emerged in both current and former cannabis users, in word acquisition (Trial 1, sum of Trials 1-5, Trial B) and recall trials (short- and long delay free recall, long delay cued recall). Visuospatial learning deficits were subtler. Current users, relative to controls, performed worse in only 2 out of 15 visuospatial learning variables (long delay recall and retroactive interference). Former users showed no visuospatial learning deficits.

Conclusions: Cannabis use is linked to verbal learning deficits regardless of abstinent status. Extended abstinence may recover (already subtle) visuospatial learning deficits observed in current users.

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Metabolic studies of synthetic cannabinoids UR-144 and SLR-11 by *Cunninghamella elegans*

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Background and aims: With the rapid introduction of new synthetic designer drugs into the market, it is important to investigate the metabolic profile for drug testing purposes. This study intends to identify the metabolite profile of UR-144 and XLR-11 produced by *Cunninghamella elegans*, which has previously demonstrated the ability to produce metabolites of synthetic cannabinoids, JWH-018, JWH-073 and AM2201 in a similar manner to *in vivo* human and *in vitro* human liver microsomes (HLM) studies.

Method: *C. elegans* cultures were grown in liquid media composed of glucose, glycerol, peptone, yeast extract, KH_2PO_4 and NaCl in distilled water. UR-144 and XLR-11 were incubated with the fungal culture for 72h and the resulting metabolites were analysed by LC-MS/MS and HR-MS/MS techniques.

Results: Several metabolites were detected including monohydroxylation, dihydroxylation, and despentylhydroxylation for UR-144 and monohydroxylation, carboxylation and oxidative defluorination for XLR-11. These results are comparable with previously reported studies.

Conclusions: The fungus *C. elegans* produced metabolites which correlate well with human and other *in vitro* models. *C. elegans* model thus appears to be a promising platform for investigating synthetic cannabinoid metabolism. Furthermore, the ease of scaling up with this fungus model has the potential to allow structural characterisation of major metabolites by NMR and/or production of reference materials.

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