

research publications

Relevant publications examining issues to do with cannabis that have been published in the last month include the following:

Barrigón, M.L., Gurpegui, M., Ruiz-Veguill, M., Díaz, F.J., Anguita, M., Sarramea, F., & Cervilla, J. (2010). Temporal relationship of first-episode non-affective psychosis with cannabis use: A clinical verification of an epidemiological hypothesis. *Journal of Psychiatric Research* 44, 413-420.

Battisti, R.A., Roodenrys, S., Johnstone, S.J., Respondek, C., Hermens, D.F., & Solowij, N. (2010). Chronic use of cannabis and poor neural efficiency in verbal memory ability. *Psychopharmacology (Berl)* 209, 319-330.

Becker, B., Wagner, D., Gouzoulis-Mayfrank, E., Spuentrup, E., & Daumann, J. (2010). Altered parahippocampal functioning in cannabis users is related to the frequency of use. *Psychopharmacology (Berl)* 209, 361-374.

Chandra, S., Lata, H., Mehmedic, Z., Khan, I.A., & ElSohly, M.A. (2010). Assessment of cannabinoids content in micropropagated plants of cannabis sativa and their comparison with conventionally propagated plants and mother plant during developmental stages of growth. *Planta Medica* 76, 743-750.

Cheung, J.T., Mann, R.E., Ialomiteanu, A., Stoduto, G., Chan, V., Ala-Leppilampi, K., & Rehm, J. (2010). Anxiety and mood disorders and cannabis use. *The American Journal of Drug and Alcohol Abuse* 36, 118-122.

de Dios, M.A., Anderson, B.J., Herman, D.S., Hagerty, C.E., Caviness, C.M., Budney, A.J., & Stein, M. (2010). Marijuana use subtypes in a community sample of young adult women. *Women's Health Issues* 20, 201-210.

Eastwood, B., Bradley, B., Mogg, K., Tyler, E., & Field, M. (2010). Investigating the effects of a craving induction procedure on cognitive bias in cannabis users. *American Journal on Addictions* 19, 97-109.

Eggan, S.M., Mizoguchi, Y., Stoyak, S.R., & Lewis, D.A. (2010). Development of cannabinoid 1 receptor protein and messenger RNA in monkey dorsolateral prefrontal cortex. *Cerebral Cortex* 20, 1164-1174.

Farrimond, J.A., Hill, A.J., Whalley, B.J., & Williams, C.M. (2010). Cannabis constituents modulate Delta9-tetrahydrocannabinol-induced

hyperphagia in rats. *Psychopharmacology (Berl)* 210, 97-106.

Fokos, S. & Panagis, G. (2010). Effects of delta 9-tetrahydrocannabinol on reward and anxiety in rats exposed to chronic unpredictable stress. *Journal of Psychopharmacology* 24, 767-777.

Fusar-Poli, P., Allen, P., Bhattacharyya, S., Crippa, J.A., Mechelli, A., Borgwardt, S., Martin-Santos, R., Seal, M.L., O'Carroll, C., Atakan, Z., Zuardi, A.W., & McGuire, P. (2010). Modulation of effective connectivity during emotional processing by delta 9-tetrahydrocannabinol and cannabidiol. *The International Journal of Neuropsychopharmacology* 13, 421-432.

Greineisen, W.E. & Turner, H. (2010). Immunoactive effects of cannabinoids: Considerations for the therapeutic use of cannabinoid receptor agonists and antagonists. *International Immunopharmacology* 10, 547-555.

Huang, P., Liu-Chen, L.Y. & Kirby, L.G. (2010). Anxiety-like effects of SR141716-precipitated delta9-tetrahydrocannabinol withdrawal in mice in the elevated plus-maze. *Neuroscience Letters* 475, 165-168.

Hurley, J.M., West, J.B. & Ehleringer, J.R. (2010). Tracing retail cannabis in the United States: Geographic origin and cultivation patterns. *The International Journal on Drug Policy* 21, 222-228.

Indig, D., Copeland, J., Conigrave, K.M., & Arcuri, A. (2010). Characteristics and comorbidity of drug and alcohol-related emergency department presentations detected by nursing triage text. *Addiction* 105, 897-906.

Johnson, K., Mullin, J., Marshall, E., Bonn-Miller, M., & Zvolensky, M. (2010). Exploring the mediational role of coping motives for marijuana use in terms of the relation between anxiety sensitivity and marijuana dependence. *The American Journal on Addictions* 19, 277-282.

Jutras-Aswad, D., Zang, G. & Bruneau, J. (2010). Cannabis use correlates of syringe sharing among injection drug users. *The American Journal on Addictions* 19, 231-237.

Karschner, E.L., Barnes, A.J., Lowe, R.H., Scheidweiler, K.B., & Huestis, M.A. (2010). Validation of a two-dimensional gas chromatography mass spectrometry method for the simultaneous quantification of cannabidiol, delta(9)-tetrahydrocannabinol (THC), 11-hydroxy-THC, and 11-nor-9-carboxy-THC in plasma. *Analytical and Bioanalytical Chemistry* 397, 603-611.

Lemstra, M., Bennett, N., Nannapaneni, U., Neudorf, C., Warren, L., Kershaw, T., & Scott, C. (2010). A systematic review of school-based marijuana and alcohol prevention programs targeting adolescents aged 10-15. *Addiction Research and Theory* 18, 84-96.

Lenné, M.G., Dietze, P.M., Triggs, T.J., Walmsley, S., Murphy, B., & Redman, J.R. (2010). The effects of cannabis and alcohol on simulated arterial driving: Influences of driving experience and task demand. *Accident, Analysis and Prevention* 42, 859-866.

Lenton, S. & Allsop, S. (2010). A tale of CIN – the cannabis infringement notice scheme in Western Australia. *Addiction* 105, 808-816.

Madhavaram, H. & Couch, R.A. (2010). Utilization of a detection level of 25 ng/mL for cannabinoids in urine using a CEDIA® THCPLUS immunoassay: Application of this cut-off to urines of school children. *Forensic Science International* 198, 28-30.

McGrath, J., Welham, J., Scott, J., Varghese, D., Degenhardt, L., Hayatbakhsh, M.R., Alati, R., Williams, G.M., Bor, W., & Najman, J.M. (2010). Association between cannabis use and psychosis-related outcomes using sibling pair analysis in a cohort of young adults. *Archives of General Psychiatry* 67, 440-447.

Mewton, L., Teesson, M. & Slade, T. (2010). "Youthful epidemic" or diagnostic bias? Differential item functioning of DSM-IV cannabis use criteria in an Australian general population survey. *Addictive Behaviors* 35, 408-413.

Müller, H., Sperling, W., Köhrmann, M., Huttner, H.B., Kornhuber, J., & Maler, J.M. (2010). The synthetic cannabinoid spice as a trigger for an acute exacerbation of cannabis induced recurrent psychotic episodes. *Schizophrenia Research* 118, 309-310.

Vorspan, F., Guillem, E., Bloch, V., Bellais, L., Sicot, R., Noble, F., Lepine, J.P., & Gorelick, D.A. (2010). Self-reported sleep disturbances during cannabis withdrawal in cannabis-dependent outpatients with and without opioid dependence. *Sleep Medicine* 11, 499-500.

Wille, S.M., Samyn, N., del Mar Ramírez-Fernández, M., & De Boeck, G. (2010). Evaluation of on-site oral fluid screening using Drugwipe-5®[®], RapidSTAT® and Drug Test 5000® for the detection of drugs of abuse in drivers. *Forensic Science International* 198, 2-6.

commentary on research exploring the mediational role of coping motives for marijuana use in terms of the relation between anxiety sensitivity and marijuana dependence – a comment on Johnson and colleagues (2010)

Dion Alperstein

This study examined the relation between cannabis dependence and anxiety sensitivity (AS). AS is the fear of anxiety and aversive internal sensations. Johnson and colleagues (2010) posited that cannabis users with high levels of AS may be more likely to meet criteria for cannabis dependence than cannabis users with low levels of AS for a number of reasons. Firstly, those high in AS may use cannabis more often to deal with everyday stressors or in an effort to improve their negative mood symptoms. Secondly, if individuals high in AS are motivated to use cannabis more regularly, and do, they will be at an increased risk

of developing tolerance to the drug. Finally, individuals high in AS may be more motivated than individuals low in AS to continue using cannabis to avoid withdrawal. Previous research has shown AS to be significantly and positively related to the severity of self reported cannabis withdrawal symptoms. Thus, if individuals high in AS are more likely to experience intense withdrawal and are particularly fearful of these symptoms, they may be especially likely to continue use to avoid these negative symptoms.

In order to test this hypothesis, Johnson and colleagues examined 136 young adults (47% female, *M.age* = 21.9) who reported cannabis use in the past 30 days. Of these young adults, two thirds of the sample reported smoking cannabis at least once per week and one quarter of the sample reported use more than once per day. In total, 41 per cent of the sample met DSM-IV criteria for cannabis dependence. The authors found, through the statistical analysis of a number of self report measures, that AS was related significantly to cannabis dependence, independent of other

factors, such as tobacco and alcohol use. Furthermore, the relationship between AS and cannabis dependence was mediated by cannabis coping motives. In other words, individuals with high AS levels may become dependent upon cannabis by attempting to relieve aversive emotions and feelings through cannabis use. Although this study was limited by its use of self-report measures and cross-sectional nature, it provides preliminary evidence regarding the influence of AS and coping motives on cannabis dependence. This relationship has potential clinical importance for understanding the process through which individuals high in AS are more susceptible to cannabis use disorder in order to develop more effective treatments for those who wish to reduce their use.

Johnson, K., Mullin, J.L., Marshall, E.C., Bonn-Miller, M.O., & Zvolensky, M. (2010). Exploring the mediational role of coping motives for marijuana use in terms of the relation between anxiety sensitivity and marijuana dependence. *American Journal of Addictions* 19, 277-282.



Each issue we will examine some of the cannabis-related stories that have received media attention across the country. The headlines are listed below in bold, with a short summary and/or commentary regarding the content of the news story beneath.

If you are interested in obtaining a copy of a particular story, please contact Clare Chenoweth at c.chenoweth@unsw.edu.au

early cannabis dangers quantified

Australasian Science: May 2010

A study conducted by Brisbane's Mater Hospital on 228 sets of siblings

born in the early 1980s, has provided insight into the links between cannabis use and schizophrenia. Professor John McGrath of the University of Queensland explains that "the younger you are when you started to use cannabis – the greater the risk of having psychotic symptoms at age 21." Prof McGrath goes on to say that "early adolescence is a particularly vulnerable period for the brain."

pregnancy & birth Q&A

Practical Parenting: May 2010

In this advice column, a pregnant reader asks if her husband's occasional cannabis use could negatively affect his sperm and thus their unborn child. The reader is advised that cannabis can stay in a person's system for three months, negatively affect their fertility and make them feel "a bit flat, depressed and even precipitate a bout of more severe mental illness."

tincture of health

The Monthly: May 2010

This article discusses the work of Tony Bower, who cultivates cannabis and provides it in tinctures to patients

for medicinal use, through the Hemp Embassy in Nimbin, NSW.

new target for male contraceptive

Cosmos: May 1, 2010

Researchers at the University of California in San Francisco have found the trigger that activates sperm to start them swimming, which could lead to a male contraceptive and also explain the link between cannabis use and sperm damage. The study found that a protein that naturally occurs in the body, Hv1, is activated by a chemical that acts in a similar way to the active chemicals found in cannabis. The study raises the possibility that by activating the sperm prematurely, either by activating Hv1 or by cannabis use, they burn out before ejaculation.

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media stories this issue

new program offers carers helping hand: mental illness and substance abuse take toll on families

Maitland Mercury: May 4, 2010

Carer Assist Newcastle has recently created the Well Ways Duo program in Maitland, which aims to increase the capacity of carers for people with the dual diagnosis of mental illness and co-existing substance use issues to care effectively for themselves and their loved ones. One of the topics that will be discussed as part of the six-week program includes behaviours associated with cannabis use.

a growing risk in cannabis

City News: May 6, 2010

In an article about cannabis use rates in Queensland, NCPIC's helpline and website are featured as the resource to go to for help with cannabis use issues. The article discusses Queensland's Crime and Misconduct Commission's *Illicit Drug Markets in Queensland* report, which found that recent cannabis use in Queensland (9.5%) is slightly higher than the national average (9.1%). The CMC's Director of Intelligence, Chris Keen, also highlighted that fact that there are significant health and community harms associated with cannabis use. The article also quotes Dr Dennis Young, Executive Director of Bowen Hills' Drug Arm Australasia and Centre for Addiction Research and Education, who says "cannabis is the second most commonly used drug in Brisbane by young people, after alcohol."

and they call it the failure to thrive

The Weekend Australian: May 8, 2010

This article discusses a number of serious problems at an Indigenous community on Elcho Island, off the coast of Arnhem Land in the Northern Territory. Mental health problems, including people attempting to take their own lives, depression and paranoia are prevalent in the community. Joan Dhamarrandji, head of the mental health service in the community, attributes much of this to cannabis use, "...heavy cannabis use is always triggering psychosis when

there's a relationship problem people won't deal with: that's the big pattern."

marijuana (cannabis)

ZOO Weekly: May 10, 2010

This advertisement placed by the Australian Government as part of its National Drugs Campaign, gives information on cannabis, including its short and long-term effects and issues regarding cannabis and the law. The advertisement also mentions research discussed by NCPIC which shows that driving under the influence of cannabis can increase your chances of having an accident by 300 per cent. NCPIC's website and helpline are also listed in the 'Need help?' section.

drug-related issues a big concern

Central Midlands & Coastal Advocate: May 13, 2010

According to Moora Health Centre Manager Dr Bernard Chapman, depression and drug-related issues are the two main problems faced by mental health patients in the Moora region. Dr Chapman commented that cannabis was the main concern, as opposed to so-called 'harder drugs', "People think it's harmless but it's certainly not," he said. The article also mentions that the Australian Medical Association toughened its stance on cannabis in 2008 following studies that linked use of the drug with increased risk of schizophrenia and related psychoses.

hotels call on authorities to end fear game

Grenfell Record & Bland Advertiser: May 14, 2010

According to the recently released Bureau of Crime Statistics and Research (BOCSAR) Annual Report for 2009, possession and use of cocaine, narcotics generally, and cannabis had increased, with cannabis up by 12.5 per cent.

smoke gets in your lives

Gladstone Observer: May 17, 2010

This article features a 40 year-old man who is dependent on cannabis. He describes how his cannabis use is something he doesn't reveal to anyone in his life and that it has impacted on his mental health, relationships and well-being.

spike in drug use puts heat on rehab

City News: May 21, 2010

The Salvation Army's Brisbane Recovery Services Centre has reported a "spike in the number of young people seeking treatment for amphetamine and cannabis" dependence. Case worker, Mike Carter says the Centre "has been running at full-time capacity for ages" and "There's been a big increase in the amount of young people coming to our program under the age of 30." Mr Carter also commented that the average age of a person dependent on cannabis was decreasing.

cannabis use linked to early drop-outs

Sunday Canberra Times: May 23, 2010

An Otago University study of over 6000 young people from Australia and New Zealand has found that "the younger people start smoking cannabis the more likely they are to fail in the education system." According to the study, "rates of educational achievement were highest for those who had not used cannabis by the age of 18 and lowest for those who first used it before they were 15." Further, researchers explain that "cannabis may have neuro-physiological consequences that lead to changes in motivation and cognitive function and impaired educational achievement." Cannabis use itself may "also introduce young people to social contexts that encourage anti-conventional and precocious behaviours, which discourage educational achievement."

police up their war on weed

Area News: May 26, 2010

Griffith police have recently arrested a number of cannabis dealers and those in possession of the drug in an effort to reduce the problems caused by cannabis in the town. Property crime, driving under the influence of cannabis and mental health issues are discussed in this article as negative effects of cannabis use in the community.



clinical and medico-legal implications of drug testing for cannabis

Testing for drug use has developed from its origins during the late 1960s in clinical management, to present day testing in the workplace, sporting ground and law enforcement settings. The purpose of drug testing is highly dependent on the setting in which the testing is practiced. In the workplace, drug testing was introduced to deter drug use and ensure drug free work environments. In this way, workplace managers can adhere to their responsibility for reducing injuries and productivity impairments and maintain a safe working environment. In the sporting ground, testing was introduced to ensure an even playing field so that competitive athletes are not unfairly advantaged by using drugs that affect performance. In law enforcement, drug testing was introduced to determine culpability in criminal offences and to identify and prove the illicit use of drugs. Testing for drugs can be done through analysing urine, oral fluids, hair or blood. On-site testing is typically done through urine testing, as testing oral fluid has been shown to be comparatively less sensitive and testing hair and blood is typically thought to be too invasive.

Testing for cannabis use in urine is more specifically a test to identify the presence of tetrahydrocannabinol (THC) and/or its metabolites; 11-hydroxy-THC and 11-nor-

9-carboxy- Δ^9 -tetrahydrocannabinol (Carboxy-THC). This is possible as approximately 20 per cent of the THC consumed while using cannabis is excreted in urine. This test is typically initially performed via immunoassay and confirmed using gas chromatography-mass spectrometry. The urine will contain differing amounts of THC and its metabolites depending on how quickly they are eliminated from the urine. For example, there is very little THC in urine, as it is eliminated quickly, whereas Carboxy-THC is the main urinary metabolite as it is eliminated slowly. Unfortunately there is an enormous variability between individuals and how quickly THC and its metabolites are eliminated from urine.

Research on urine testing report great variance in the time it takes to eliminate Carboxy-THC from urine, ranging from eight hours up to two weeks. Variance depends mostly on the testing methods employed, an individual's metabolism and body mass index (BMI), as well as frequency and route of administration of cannabis use. To improve the accuracy of urine testing results, research has shown that it is best to conduct two tests with at least a 24 hour period between tests. This can help control for false positives that may be observed as the metabolites are being excreted or absorbed by fatty tissue. In addition, using a cut off of 50 ng/mL followed by a confirmatory cut off of 15 ng/mL of cannabis when testing for the presence of cannabis in urine, results in a confirmation rate of around 99 per cent.

The importance of introducing urine testing to the workplace and sporting ground has been debated since its inception. There are two related main arguments against the use of urine testing. Firstly, the need for testing is based on the assumption that cannabis use results in impairments when the individual is at work or competing. Although this assumption continues to be debated, the extent of research in the area supports the existence of both acute and long-term impairments that could remain while an individual worked

or competed. However, this leads to the second argument that irrespective of actual impairment, the urine testing employed is not yet capable of detecting current impairment. Rather, urine testing is best used to identify if cannabis was ever used, or recently used. Hence, the use of testing to reduce workplace accidents may be redundant. However, research regarding the introduction of workplace drug testing depicts related reductions in drug use and workplace accidents. Evidence of reductions in drug use following the implementation of workplace drug testing can be seen in several cross-sectional studies, including that of the US national household survey. Evidence in reductions of workplace injuries or accidents is not as clear. Although several studies have shown reductions in injuries following the implementation of workplace testing, the majority of studies do not account for other safety initiatives that were implemented simultaneously. Further, results from the largest US study of 256 companies that introduced workplace testing and 20,500 control companies were similarly unclear. This study depicted reductions in injuries for those in construction, manufacturing and services work sectors, however the reductions were small and could be explained by anomalies such as introducing testing when accident rates were particularly high.

Testing for cannabis use via urine analysis has become commonplace in the workplace, sporting arena and in law enforcement. However, much testing is done with a lack of knowledge regarding: a) the huge variances between one person and the next, in the time it takes for THC and its metabolites to be eliminated from urine, and b) the most accurate testing procedure. Until procedures improve and our understanding of how variances in results are caused and can be accounted for, caution is advised when testing for cannabis in urine.

For more information on this topic, [please click here](#) to see NCPIC's Bulletin 7: Clinical and medico-legal implications of drug testing for cannabis.



NCPIC is a consortium led by the National Drug and Alcohol Research Centre and is an Australian Government Department of Health and Ageing initiative

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