

# ncpic e-zine

june 2010

national cannabis  
prevention and  
information centre

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what's  
new in  
cannabis?

## what's new in cannabis?

### Drug Action Week activities

NCPIC was involved in a number of Drug Action Week (DAW) initiatives this year. We conducted a number of training sessions and presentations and provided promotional material to DAW events around Australia. These included events run by the Department of Education and Children's Services in Whyalla, Shoalhaven Aboriginal Community and Bankstown Community Drug Action Team. Training sessions on *Young people and cannabis* were also held in Townsville and Launceston.

## workforce development team report

Annie Bleeker  
*National Community Training Manager*

The Workforce Development team has had an extremely busy 2009/10. In twelve months the small team consisting of four full-time staff members, has completed a total of 167 trainings and trained over 2,700 health professionals from all over this vast continent. The team travelled to many rural and remote locations including Broken Hill, Moree, Weipa, Cooktown, Whyalla, Broome, Kununurra, Esperance, Stawell and East Gippsland to implement its Clinical, Community and Youth training sessions.

It was pleasing to note that approximately 52 per cent of the workshops conducted this financial year were in cities and/or urban locations; a further 33.5 per cent in rural locations and 14.5 per cent in remote locations.

Having a good reach into rural and remote locations enabled us to contribute to workforce development in populations that are not always able to access high quality training. Our reach into rural and remote areas of Australia is expected to continue in 2010/11.

The community education training workshop, *Everything you need to know about cannabis* continued to be popular and was conducted 70 times in 2009/10. A total of 23 *Young people and cannabis* workshops were implemented by Dr John Howard and demand for this training continues to increase. A total of 20 *Adolescent Cannabis Check Up (ACCU)* trainings and 14 *Brief intervention* trainings were also delivered this year.

The Workforce Development team also introduced the *Everything you need to know about cannabis* workshops into Indigenous communities which strengthens our commitment to the *Cannabis: it's not our culture* initiative. Over the last eighteen months, NCPIC



Participants at the 'Everything you need to know' workshop in Cairns – June 2010.

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## workforce development team report

has worked with seven Indigenous communities to develop artworks which tell stories about how gunja (cannabis) has affected their communities and the solutions they have found to deal with the issues. The Workforce Development team, the Communications team and one of our consortium partners, the National Drug Research Institute (NDRI), will continue to develop tools and work with Indigenous populations over the coming years.

A total of 13 *Everything you need to know about cannabis* workshops were conducted this year with Aboriginal health services, many in remote locations such as Cooktown (QLD) and Broken Hill (NSW). The National Community Training Manager, Annie Bleeker, also trained service providers and community members who are working with Alan Clough and colleagues from James Cook University looking at rates of cannabis use in remote communities in far North Queensland.

This past financial year also saw the launch of three new training programs for NCPIC. The Clinical Training Manager, Ms Etty Matalon, consulted with a group of training professionals in January 2010 and designed a *Train-the-trainer* (TTT) workshop for the Brief Intervention and Adolescent Cannabis Check Up which was rolled out nationally in the last quarter of the year. The workshop was advertised through alcohol and other drug networks and a screening tool was used to recruit participants. To date, eight TTT workshops have taken place in Sydney, Canberra, Melbourne, Brisbane, Townsville, Adelaide and Launceston (TAS). Workshops are also scheduled to occur in Perth and the Northern Territory in the next few months.

Another new program that was rolled out last financial year is the *Cannabis and the workplace* training program. An alcohol and other drug and workplace specialist consultant Donna Bull was hired by NCPIC to develop four new workplace training packages aimed at executives, OH&S staff, generalist staff and Employees Assistance Providers (EAP). In early January,

letters were sent out to a range of peak bodies representing the building and construction and hospitality industries and several Employees Assistance Providers. Meetings were held in February and March resulting in a great deal of interest in the programs.

A total of eight workshops were implemented by Donna Bull for the Workforce Development team; three with the Australian Industry Group in Sydney, Melbourne and Brisbane; two EAP trainings with Ausepsych in Melbourne and Drake Workwise in Sydney. An abbreviated version of the EAP workshop was also conducted with Railcorp, NSW. NCPIC also conducted a workshop with OH&S representatives from Country Energy NSW in Port Macquarie. The National Community Training Manager and Donna Bull also presented the workplace program to senior members of the ACTU who presented it to their Executive in June.

The last program that was rolled out this year was clinical training to accompany the dissemination of the *Management of cannabis use disorder: A clinicians guide* which was authored by Copeland, Frewen and Elkins in 2009. The guidelines provide a comprehensive overview of how to manage cannabis-related problems with clients. A total of 20 workshops were conducted by Etty Matalon and Donna Bull.

So all in all, it has been a very productive and busy year for our small team. The outputs have been huge and we are all looking forward to sitting back and planning the next few years of training activities. Watch out for NCPIC's new DVD *Clearing the Smoke* which is expected to be out later this year and will be accompanied by a training package.

A big thanks to John Redmond and Dion Alperstein for all the amazing support they have given the team in the last financial year. For further information about NCPIC's training workshops please visit our website, <http://ncpic.org.au/workforce/alcohol-and-other-drug-workers/training-and-workshops/>

## research publications

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

**Cornelius, J.R., Aizenstein, H.J. & Hariri, A.R.** (2010). Amygdala reactivity is inversely related to level of cannabis use in individuals with comorbid cannabis dependence and major depression. *Addictive Behaviors* 35, 644-646.

**El-Alfy, A.T., Ivey, K., Robinson, K., Ahmed, S., Radwan, M., Slade, D., Khan, I., Elsohly, M., & Ross, S.** (2010). Antidepressant-like effect of delta9-tetrahydrocannabinol and other cannabinoids isolated from cannabis sativa L. *Pharmacology, Biochemistry, and Behavior* 95, 434-442.

**Fischer, B., Rehm, J., Irving, H., Ialomiteanu, A., Fallu, J.S., & Patra, J.** (2010). Typologies of cannabis users and associated characteristics relevant for public health: A latent class analysis of data from a nationally representative Canadian adult survey. *International Journal of Methods in Psychiatric Research* 19, 110-124.

**Henquet, C., van Os, J., Kuepper, R., Delespaul, P., Smits, M., Campo, J.A., & Myin-Germeys, I.** (2010). Psychosis reactivity to cannabis use in daily life: An experience sampling study. *British Journal of Psychiatry* 196, 447-453.

**Ibrahim, A.K., Radwan, M.M., Ahmed, S.A., Slade, D., Ross, S.A., ElSohly, M.A., & Khan, I.A.** (2010). Microbial metabolism of cannflavin A and B isolated from cannabis sativa. *Phytochemistry* 71, 1014-1019.

**Jager, G., Block, R.I., Luijten, M., & Ramsey, N.F.** (2010). Cannabis use and memory brain function in adolescent boys: A cross-sectional multicenter functional magnetic resonance imaging study. *Journal of the American Academy of Child and Adolescent Psychiatry* 49, 561-572.

**Mullens, A.B., Young, R.M., Dunne, M., & Norton, G.** (2010). The Cannabis Expectancy Questionnaire for Men who have Sex with Men (CEQ-MSM): A measure of substance-related beliefs. *Addictive Behaviors* 35, 616-619.

**Purohit, V., Rapaka, R. & Shurtleff, D.** (2010). Role of cannabinoids in the development of fatty liver (steatosis). *The AAPS Journal* 12, 233-237.

**Schwabe, D.M., Milman, G. & Huestis, M.A.** (2010). Validation of an enzyme immunoassay for detection and semiquantification of cannabinoids in oral fluid. *Clinical Chemistry* 56, 1007-1014.

**van Gelder, M.M., Reefhuis, J., Caton, A.R., Werler, M.M., Druschel, C.M., Roeleveld, N., & National Birth Defects Prevention Study.** (2010). Characteristics of pregnant illicit drug users and associations between cannabis use and perinatal outcome in a population-based study. *Drug and Alcohol Dependence* 109, 243-247.

**Zeiger, J.S., Haberstick, B.C., Corley, R.P., Ehringer, M.A., Crowley, T.J., Hewitt, J.K., Hopfer, C.J., Stallings, M.C., Young, S.E., & Rhee, S.H.** (2010). Subjective effects to marijuana associated with marijuana use in community and clinical subjects. *Drug and Alcohol Dependence* 109, 161-166.

## commentary on research amygdala reactivity is inversely related to level of cannabis use in individuals with comorbid cannabis dependence and major depression – a comment on Cornelius and colleagues (2010)

Sally Rooke

The amygdala is located within the medial temporal lobe of the brain, and is involved in the processing of emotions, particularly anxiety. Previous research has found that individuals with major depression and anxiety disorders exhibit increased amygdala reactivity (Drevets, 2010).

The amygdala has a high density of CB1 cannabinoid receptors, and previous research suggests that cannabis consumption suppresses threat-related amygdala reactivity (Phan et al., 2008). Cornelius and colleagues (2010) investigated whether changes

in cannabis use that occurred during the course of fluoxetine treatment for comorbid cannabis dependence and major depression were associated with changes in amygdala reactivity following treatment. Six treatment recipients were subjected to pre- and post-treatment fMRI scans while they viewed images of fearful and angry faces.

During the 12-week course of fluoxetine treatment, five of the six participants showed reductions in cannabis use, with a mean reduction of 64 per cent, while one participant showed a 79 per cent increase in cannabis use. The authors found that all five participants who reduced their cannabis use demonstrated corresponding increases in threat-related amygdala reactivity. Interestingly, the one participant who showed increased cannabis use during the study demonstrated a decrease in threat-related amygdala reactivity.

The study supports the proposition that cannabis consumption suppresses threat-related amygdala activity; however, the sample size of just six, only one of whom showed increases in

cannabis use, is a significant limitation of the research. In spite of this, findings of the study point to some interesting avenues for future research, such as examining the role of the amygdala in the maintenance of cannabis use in individuals with mood disorders, and assessing the impact on cannabis use disorders of treatments that target amygdala reactivity.

**Cornelius, J.R., Aizenstein, H.J. & Hariri, A.R.** (2010). Amygdala reactivity is inversely related to level of cannabis use in individuals with comorbid cannabis dependence and major depression. *Addictive Behaviors* 35, 644-646.

**Drevets, W.C.** (2003). Neuroimaging abnormalities in the amygdala in mood disorders. *Annals of the New York Academy of Sciences* 985, 420-444.

**Phan, K.L., Angstadt, M., Golden, J., Onyewuenyi, I., Popovska, A., & de Witt, H.** (2008). Cannabinoid modulation of amygdala reactivity of social signals of threat in humans. *Journal of Neuroscience* 28, 2313-2319.



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](mailto:c.chenoweth@unsw.edu.au)

### **make way as monster tanks up drug message**

*Cairns Post: June 1, 2010*

An 11-tonne ex-military armoured personal carrier named the 'Green Monster' is being used by Tim White, an alcohol and other drugs psychologist, to raise awareness about the dangers of cannabis use and stop young people using the drug in Yarrabah. He is keen to bridge the gap in awareness in the local Indigenous community about the risks of cannabis use for young people in particular.

### **who is the 'high' roller?**

*MX Sydney: June 9, 2010*

A Florida study has found that about 80 per cent of poker players involved in the study had used "a drug or substance to enhance their poker skills." Cannabis was one of the drugs players used in an attempt to improve their game, however researcher Kevin Clauson said that players were "tricking themselves into thinking drugs would improve their playing."

### **crackdown to bring crack use down**

*Daily Liberal: June 9, 2010*

According to the 2008-2009 Illicit Drug Data Report conducted by the Australian Crime Commission, "cannabis remains the dominant illicit drug nationally in terms of arrests, seizures and use, but the number of seizures and arrests for amphetamines is now at its highest after steadily increasing over the past decade."

### **reduced brain function in drug users**

*Northern Daily Leader: June 12, 2010*

A recent conference presentation on a published paper by NCPIC staff member Robert Battisti received widespread media coverage this month. The paper titled 'Chronic use of cannabis and poor neural efficiency in verbal memory ability', published in the journal *Psychopharmacology*, discussed findings of a study conducted by Mr Battisti at the University of Wollongong. The study found that chronic cannabis users "can develop less efficient brains, as scans reveal a reduced use of their most direct neural pathways...[having a] taxing effect on the brain, using up more of its neural resources than necessary." For more information on this study's findings, please see the 'What do we know?' section of this e-Zine, written by Mr Battisti.

### **vowing to settle down**

*Sunday Telegraph: June 13, 2010*

A study of 909 people which began when they were in first or second grade at school and ran until they turned 19 to 20 found that those who were not married were forty percent "more likely to use marijuana and drink heavily compared to someone who was in a relationship."

### **valuable insights**

*Loddon Times: June 16, 2010*

This article covers some of the key themes of psychologist Michael Carr-Gregg's presentation at Wedderburn in Victoria. Alcohol and cannabis use among young people were focused on with warnings given about the links between cannabis use and mental health issues such as psychosis.

### **drug use nurtured**

*MX Brisbane: June 24, 2010*

New research recently published in journal *Addiction*, has found that "women with a genetic predisposition to substance use are also more likely to choose friends who smoke, drink or use drugs." This "alters a woman's environment in a way that encourages substance use, unlocking their genetic leanings in a type of self-fulfilling prophesy." The study which looked at more than 2000 female twins, also found that "genetic vulnerability to regular use of alcohol, cigarettes and cannabis was heightened by exposure to friends who use alcohol, cigarettes and drugs, which in turn alters her environment in a way that encourages substance use." In this way, study lead author Dr Agrawal says, "Nurture can also increase the effect of nature".



## chronic use of cannabis and poor neural efficiency in verbal memory ability

Australians rank among the world's top users of cannabis with many people using the drug quite regularly and often from quite early ages. Recent research conducted by NCPIC staff member Rob Battisti for his PhD at the University of Wollongong, published in the journal *Psychopharmacology* has indicated that long-term heavy users of cannabis have overall poorer verbal memory performance (i.e. memory for verbal information) than non-users. This research was conducted on 24 regular, heavy users without a history of other substance use and non-using healthy control (non-user) participants. While it is nothing new to find that cannabis impacts upon memory performance, this is typically considered to be mostly when a person is intoxicated (i.e. 'stoned'). This study examined cannabis users in the unintoxicated state.

While participants were completing the memory tasks, their brain electrical activity was measured using an electroencephalogram (EEG). EEG allows us to detect subtle changes in brain response while it is performing different cognitive tasks (e.g. a memory task) via examination of a specific brain response, called an event-related potential (ERP). It was found that the brains of cannabis users produced altered patterns of activity

that were indicative of what is known as *compensatory processing and poorer neural efficiency*. Essentially what this means is that the brains of cannabis users were still able to complete the memory task nearly as well (approximately 15% worse) than control participants, but that the connections in the brain that would normally be involved in the memory process were disrupted. Consequently, their brains had to form alternate *compensatory* pathways as the usual ones were not as accessible.

Quite startling though, was the finding that a longer history of cannabis use was related to a *recovery* of memory function; in other words, improved memory performance with a longer history of use. This indicates a process known as *neuroadaptation* whereby the brain is forced to use alternate neural pathways, whether due to injury or prolonged exposure to a substance (over many years), and effectively gets better at using these. An analogy for this is a freeway that connects two cities. The brain naturally seeks the path of greatest efficiency for functions (such as memory) that are regularly used. Over time, these pathways become more and more efficient, which may be compared to constructing a freeway between two cities – the fastest and easiest way of driving. It appears to be the case that the brains of chronic cannabis users cannot use these optimal pathways as effectively and they may therefore be required to use alternate pathways and/or have more difficulty using the regular ones. Using the freeway analogy, it would be like having a freeway that is covered in fog or potholes, that requires greater concentration (i.e. neural resources) to drive on, or else taking a road detour due to a roadblock on the freeway. These changes to travel still get them to their destination, but it may be more effortful or take longer than would be usual. However, with practice, any skill improves and the neuroadaptation findings suggest that cannabis users, over time, become more successful at using these alternate neural pathways, which

effectively equates to becoming skilled at using a road detour as you have to use it often.

While it is promising that recovery of function following prolonged use among current users may occur, this is at the cost of overall neural resources. This may hold implications for ageing. As we grow older we experience normal age-related cognitive decline, having fewer neural resources available to complete day-to-day tasks. For many, this is not a huge burden as they have had many years to become highly efficient with different skill sets (i.e. different cognitive functions) and still have sufficient resources available to tackle novel day-to-day challenges. If a person enters old age though on the back foot in terms of neural resource availability, they may find this process more difficult. In terms of the findings of the study, the brain functioning of cannabis users appeared to have an altered relationship with age, and showed similar patterns of activity to what has been observed in other studies among people who developed cognitive difficulties in later life. Additionally, greater changes in brain activity were associated with a younger age of cannabis use onset. The rapidly developing adolescent brain is much more sensitive to the influence of foreign chemicals than the fully mature adult brain and therefore changes seen may be exacerbated among people who begin using at an early age.

While it is unclear within the general research as to whether any permanent changes may be occurring, there is good evidence that abstaining for at least several months results in at least some improvement in cognitive function and potential recovery of brain structures that were previously impacted upon by use. Greater improvements would be expected over longer periods of abstinence. If neuroadaptation is able to occur in the presence of cannabis use though, it is therefore highly likely, and has been found in other research fields, that the brain is able to reorganise itself to result in recovery of function.



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

For further information on NCPIC, its work and activities please contact Clare Chenoweth on (02) 9385 0218

Street address:

National Cannabis Prevention and Information Centre (NCPIC)  
UNSW Randwick Campus  
NDARC UNSW  
R1 Level 1  
22-32 King Street  
Randwick NSW 2031

Postal address:

National Cannabis Prevention and Information Centre (NCPIC)  
PO Box 684  
Randwick NSW 2031