Overview

- History and epidemiology
- Mechanism of Action & Effects
- Cannabis & Psychosis
- Brief Review of Treatment for Cannabis Withdrawal and Relapse Prevention
- Where To Get More Information
Cannabis in History – Emperor Shen Nung 2700 BCE

- Cannabis for rheumatic pain, constipation, disorders of female reproductive system and malaria

- “If taken in excess will produce visions of devils...over a long term, it makes one communicate with spirits and lightens one's body”
Cannabis in History – Reefer Madness 1936
Cannabis in History – Medicinal Marijuana 2017
Q1-What % of New Zealand adults aged 15 years and over report using cannabis in the last 12 months?

A) Greater than 10%
B) 5-10%
C) 1-5%
D) Less than 1%
Question 1

Q1-What % of New Zealand adults aged 15 years and over report using cannabis in the last 12 months?

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B) 5-10%
C) 1-5%
D) Less than 1%
New Zealand Cannabis Use Survey

- **Patterns of cannabis use**
  - 11% of adults aged 15 years and over reported using cannabis in the last 12 months
  - 34% reported using cannabis at least weekly in the last 12 months

- **Cannabis and mental health harms**
  - 8% reported a time in the last 12 months that cannabis use had a harmful effect on their mental health - younger cannabis users (aged 25–34 years) were most affected

- **Cutting down and help to reduce cannabis use**
  - 87% did not report any concerns from others about their use
  - 1.2% had received help to reduce their level of drug use in the last 12 months
  - 3.6% who wanted help did not get it

- **Cannabis use for medicinal purposes**
  - 42% reported medicinal use in the last 12 months ie, to treat pain, etc - older cannabis users (aged 55+ years) were most likely to report

Cannabis Use 2012/13 New Zealand Health Survey
Prevalence of Cannabis Use, 2012

Use of cannabis in 2012 (or latest year available)

% of population aged 15-64

- <1
- 1.01 - 2.5
- 2.51 - 5
- 5.01 - 10
- >10
- No data available or no ARQ received

- Data older than 2008

Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Dashed lines represent undetermined boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. This final status of Jammu and Kashmir has not yet been agreed upon by the parties.

The final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.
Cannabis Products by Region

Map 8. Importance of cannabis herb and resin products, by subregion, 2006-2010

Dominant number of seizure cases
- Mainly cannabis herb (>80%)
- Predominance of cannabis herb (60-80%)
- Cannabis herb and resin (40-60%)
- Predominance of cannabis resin (60-80%)
- Mainly cannabis resin (>80%)
- No data available or no ARQ received

Source: UNODC data from the annual report questionnaire (2006-2010).
Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.
Question 2

Q2-Which of the following are found in the human brain?
A) Cannabinoid Receptors
B) Delta-9-tetrahydrocannabinol = D9THC
C) Neither A&B
D) Both A&B
Question 2

Q2-Which of the following are found in the human brain?

A) Cannabinoid Receptors

B) Delta-9-tetrahydrocannabinol = D9THC

C) Neither A&B

D) Both A&B (if using cannabis)
Cannabis Pharmacology

- Hemp plant = Cannabis Sativa
- Resin contains more than 80 cannabinoids, many psychoactive
- Most abundant psychoactive agent is delta-9-tetrahydrocannabinol = D9THC
Endocannabinoids Mechanism of Action

- CB1 - in cerebral cortex, hippocampus, cerebellum, basal ganglia, mesolimbic dopaminergic system

- CB2 - in immune cells

- At least five ligands
  - E.g. anandamide
Question 3

Q3-Regular use of cannabis use can lead to?
   A) Withdrawal on cessation
   B) Loss of motivation
   C) Possibly both A&B
   D) Neither A&B
Question 3

Q3-Regular use of cannabis use can lead to?
A) Withdrawal on cessation
B) Loss of motivation
C) Possibly both A&B
D) Neither A&B
Most people who try cannabis don’t develop problems
## Harms associated with cannabis use

### Table 2: Harms associated with cannabis use

| **Risks of acute intoxication** | impaired attention, memory, and psychomotor performance while intoxicated  
|                                | cannabis-induced psychosis  
|                                | increased risk of motor-vehicle accidents  
| **Most probable chronic effects** | subtle cognitive impairment in attention, memory, and the organisation and integration of complex information (of unknown reversibility, though not likely to be grossly debilitating)  
|                                | increased risk of developing a dependence syndrome  
|                                | adverse respiratory effects, such as chronic bronchitis (greater if cannabis is used with tobacco)  
| **Possible chronic effects** | increased exposure to xerostomia (dry mouth), which can lead to tooth decay, gum disease, and other oral-health issues  
|                                | some evidence that cannabis may affect human female fertility (cannabis has been found to reduce sperm count and testosterone levels in some male animals, but this has not been established in humans)  
|                                | in children who have been exposed to cannabis in the womb, more difficulties with problem-solving and attention, which may continue into adulthood and reduce education potential  
|                                | an increased likelihood of pre-cancerous changes  
|                                | increased rate of lung cancer  
|                                | increased possibility of heart attack in people who have risk factors for heart disease (e.g. obesity and/or cigarette smoking)  
| **Probable risks amongst specific populations** | associated with adolescent cannabis use:  
|                                | poorer school performance and outcomes  
|                                | lower levels of degree attainment by age 25  
|                                | higher unemployment  
|                                | lower levels of life satisfaction  
|                                | leaving the family home  
|                                | early sexual activity and teenage pregnancy  
|                                | other illicit drug use and dependence  
|                                | in women who continue to smoke cannabis during pregnancy, increased risk of having a low-birthweight baby (which can lead to mortality, morbidity, and disability)  
|                                | exacerbation of some mental health conditions such as depression, anxiety, and schizophrenia  

Adapted from Hall & Solowij, (1998); Room et al., (2008)
Cannabis and Psychosis

- **Differential Diagnosis**
  - Cannabis-induced psychosis
  - Acute psychosis that persists beyond the period of acute intoxication
  - Primary psychotic disorders with cannabis use

Where does drug-induced psychosis end and schizophrenia begin?
# Epidemiological Studies Examining Cannabis Use and Risk of Psychosis

<table>
<thead>
<tr>
<th>Country</th>
<th>Number</th>
<th>Follow up</th>
<th>OR (95% CI)</th>
<th>Study Design</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>4,494</td>
<td>NA</td>
<td>2.4</td>
<td>Population based</td>
<td>Tien et al, 1990</td>
</tr>
<tr>
<td>Sweden</td>
<td>50,053</td>
<td>25 yrs</td>
<td>2.1</td>
<td>Conscript Cohort</td>
<td>Andreasson et al, 1987; Zammit et al, 2002</td>
</tr>
<tr>
<td>Netherlands</td>
<td>4,045</td>
<td>3 yrs</td>
<td>2.8</td>
<td>Population based</td>
<td>Van Os et al, 2002</td>
</tr>
<tr>
<td>Israel</td>
<td>9,724</td>
<td>4-15 yrs</td>
<td>2.0</td>
<td>Population based</td>
<td>Weiser et al, 2002</td>
</tr>
<tr>
<td>New Zealand (Christchurch)</td>
<td>1,265</td>
<td>3 yrs</td>
<td>1.8</td>
<td>Birth-cohort</td>
<td>Fergusson et al, 2003</td>
</tr>
<tr>
<td>New Zealand (Dunedin)</td>
<td>1,253</td>
<td>15 yrs</td>
<td>3.1</td>
<td>Birth-cohort</td>
<td>Arsenault et al, 2002</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1,580</td>
<td>14 yrs</td>
<td>2.8</td>
<td>Population based</td>
<td>Ferdinand et al 2005</td>
</tr>
<tr>
<td>Germany</td>
<td>2,436</td>
<td>4 yrs</td>
<td>1.7</td>
<td>Population based</td>
<td>Henquet et al, 2005</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>8,580</td>
<td>18 months</td>
<td>1.5</td>
<td>Population based</td>
<td>Wiles et al, 2006</td>
</tr>
</tbody>
</table>

Random effects meta-analysis: 1.9
Why do only some Cannabis Users Develop Psychosis?
Factors Increasing the Risk of Psychosis

- **Individual**
  - Genes
  - Age of onset of cannabis use
  - Quantity used
  - Childhood trauma
  - Other vulnerabilities

- **Cannabis**
  - D9THC:CBD ratio
  - Synthetics
Genes that Increase Risk of Psychosis in Cannabis Users

- Hereditability greater for addiction (drug response, drug specificity) than initiation (risk taking)

- COMT – 1 study for, 1 against, a third about to be published (positive) Solowij – “COMT gene is not dead” – problem is interaction with COMT and other genes

- AKT1 – 2 studies published, a third about to be published

- BDNF – brain derived neurotrophic factor

- CNR1 – cannabinoid receptor 1

- Neuregulin 1 – SNP’s in neuregulin 1 increases the risk of cannabis dependence (Han et al, in press)
Age of onset of cannabis use

- Age of onset of psychosis for cannabis users was 2.7 years younger than for non-users

- Alcohol use was not associated with an earlier age of onset of psychosis

Large et al Arch Gen Psych 2011;68 (6):555-561
Quantity Used

- 45,570 Swedish army inductees followed up for 15 years

- Risk of schizophrenia x2.4 times greater in used cannabis by 18 years old cf non-users

- x6 greater risk for heavy users (> x50 times)

Zammit et al, BMJ 325: 1199-1204, 2002
Interaction Between Genes, Type of Cannabis Used and Frequency of Use

- Never use or occasionally use low-potency cannabis
  - Regardless of risk genes – no increased risk of psychosis

- Less than daily users of high potency cannabis
  - 2 risk genes – x3 risk of psychosis compared to no risk genes

- Daily users of high potency cannabis
  - 1 risk gene – x6 risk of psychosis compared to no risk genes
  - 2 risk genes – x8 risk of psychosis compared to no risk genes

Di Forti et al, 2014
Other Vulnerabilities

- Vulnerability of psychosis predicts THC use, and vice versa
  - Vulnerability for psychosis at ages 13 and 15 predicts cannabis use at ages 16 and 19
  - Cannabis use at age 16 predicts psychosis vulnerability at age 19

Lynskey M et al, Evid Based Mental Health Nov 2013 Vol 16 No 4
D9THC:CBD ratio

D9THC
- Partial agonist at CB1
- Increases psychotic symptoms
- Increases impairment of attention, memory and learning

Cannabidiol (CBD)
- Inverse agonist at CB1
- Is not hallucinogenic
- Has anxiety relieving properties
- Antagonises effects of THC

THC

CBD
Cannabis Use and Psychosis

- Cannabis is associated with the development of psychotic symptoms, and of schizophrenia

- Cannabis is neither necessary nor sufficient for the development of schizophrenia

- Dose-response relationship between cannabis use and psychotic symptoms
Cannabis Use in Schizophrenia

- Mixed evidence on impact of cannabis use in established schizophrenia
  - Worse psychosocial functioning, no impact on psychotic symptoms
  - Worse psychosocial functioning and psychotic symptoms (confounded by medication noncompliance?)
    - Hides L et al, Br J Psych 2006;189:137-143
Treatment of Cannabis Induced Psychosis

- D2 blockers do not offer ‘protection’ against acute THC psychosis in healthy controls or patients with schizophrenia


- Treat co-morbid psychiatric disorders

- Treat cannabis use disorder
  - Withdrawal management
  - Relapse prevention
Cannabis and other medications

- Cannabis may change the metabolism of some classes of medication e.g. antipsychotics
  
  Silvestri et al., 2000

- May need higher doses in regular cannabis smokers

- Cessation of cannabis use may lead to inadvertent toxicity e.g. induction of P450 isoenzyme CYP1A, which may impact on the metabolism of clozapine and olanzapine, by tobacco and cannabis

  de Leon, 2004
Question 4

Q5-What questions would you ask to assess possible problems associated with cannabis use?
Assessment

- Form of cannabis and method of administration
- Amount used and money spent each week
- Number of hours per day spent using, being intoxicated and recovering from use
- Activities undertaken whilst intoxicated
- Withdrawal symptoms
- Age when first tried and started to use regularly
- Other substances used
- Co-morbid – physical & mental health
- Psychosocial functioning
- Insight and motivation to change
- Treatment goals
# Assessment Tools

## Table 9: Assessment options

<table>
<thead>
<tr>
<th>Area</th>
<th>Tool</th>
<th>Items</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannabis diagnosis</td>
<td>DSM-IV-TR (APA, 2000)</td>
<td>6 items</td>
<td>All tools are in a structured interview format and can provide differential diagnosis</td>
</tr>
<tr>
<td></td>
<td>CIDI (Kessler et al., 1998)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SCID (First et al., 1997)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SCAN (Wing et al., 1990)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>GAIN (Dennis et al., 2002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fagerström Nicotine Dependence Scale (Heatherton et al., 1991)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco dependence diagnosis</td>
<td></td>
<td></td>
<td>Identification and severity of nicotine dependence</td>
</tr>
<tr>
<td>Severity</td>
<td>Severity of Dependence Scale (Gossop et al., 1992)</td>
<td>5 items</td>
<td>Assesses severity of dependence</td>
</tr>
<tr>
<td>Consumption</td>
<td>Timeline Followback (Sobell &amp; Sobell, 1996)</td>
<td>—</td>
<td>Can be used to assess cannabis use during the past year, but we suggest limiting assessment to the past 30 days to lessen client burden</td>
</tr>
<tr>
<td>Psychosocial issues</td>
<td>Cannabis Problems Questionnaires (CPQ for adults (Copeland et al., 2005 and adolescents Martín et al., 2006)</td>
<td>22 (adult) 27 (core)</td>
<td>Assesses a range of physical and psychosocial consequences of cannabis use</td>
</tr>
<tr>
<td>Withdrawal symptoms</td>
<td>Marijuana Withdrawal Checklist (Budney, Novy &amp; Hughes, 1999)</td>
<td>15</td>
<td>Assesses severity of withdrawal symptoms</td>
</tr>
<tr>
<td>Cognitive functioning</td>
<td>Adult/Youth Self Report (Achenbach &amp; Edelbrock, 1987)</td>
<td>126 items</td>
<td>Assesses cognitions</td>
</tr>
<tr>
<td></td>
<td>Mental Status Examination (Trzepacz &amp; Baker, 1993)</td>
<td>10 domains</td>
<td>Structured way of observing and describing a patient’s current state of mind</td>
</tr>
<tr>
<td>Readiness to change</td>
<td>“Readiness to Change” Scale (Rollnick et al., 1992)</td>
<td>12</td>
<td>Designed for use in medical settings</td>
</tr>
<tr>
<td>Mental health symptoms</td>
<td>Depression Anxiety and Stress Scale (DASS) (Lovibond &amp; Lovibond, 1995)</td>
<td>42 (mini version 21) questions 10 items</td>
<td>Rates severity of symptoms of depression, anxiety and stress Scale of psychological distress</td>
</tr>
</tbody>
</table>
DSM 5 Cannabis Related Disorders

R 08 Cannabis Use Disorder
R 09 Cannabis Intoxication
R 10 Cannabis Withdrawal
R 11 Cannabis-Induced Disorder Not Elsewhere Classified
Q6-Which of the following are effective treatments for cannabis dependence?
A) Diazepam 30mg daily for 1-2 weeks
B) 1-4 sessions cognitive-behavioural therapy
C) Quetiapine 50-100mg nocte for 1 week
D) All of the above
Question 5

Q6-Which of the following are effective treatments for cannabis dependence?
A) Diazepam 30mg daily for 1-2 weeks
B) 1-4 sessions cognitive-behavioural therapy
C) Quetiapine 50-100mg nocte for 1 week
D) All of the above
Treatment summary

- Good evidence for the efficacy of psychological treatment esp. CBT

  (Gates et al, 2016 – Cochrane review)

- Little evidence for any pharmacotherapies

  (Marshall et al, 2014 – Cochrane review)

- When possible, after withdrawal reassess and Rx co-morbidity e.g. psychosis, depression
## Cannabis Withdrawal Rx

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Medication</th>
<th>Psychosocial intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insomnia</td>
<td>Benzodiazepines (e.g., oxazepam 30mg o.d., temazepam 10-20mg o.d., zopiclon (7.5-15mg o.d.), zolpidem (10mg o.d) promethazine (25-50mg)</td>
<td>Sleep hygiene advice, stimulant control procedures, Progressive Muscular Relaxation</td>
</tr>
<tr>
<td>Irritability, restlessness, nervousness/anxiety</td>
<td>Benzodiazepines (e.g., diazepam 5mg t.i.d)</td>
<td>Meditation, exercise, relaxation techniques, family support and education</td>
</tr>
<tr>
<td>Headache, muscular ache, spasms and pain</td>
<td>Paracetamol (500mg q.i.d), NSAIDs (e.g., ibuprofen 400mg t.i.d), magnesium</td>
<td>Avoid caffeine and dehydration</td>
</tr>
<tr>
<td>Sweating, chills</td>
<td>Paracetamol, appropriate hydration and appropriate clothing</td>
<td></td>
</tr>
<tr>
<td>Nausea, nasal congestion</td>
<td>Antihistamine (e.g., promethazine, 25-50mg) metoclopramide (10mg b.d), prochlorperazine (25mg b.d)</td>
<td></td>
</tr>
</tbody>
</table>
# Psychosocial Interventions

<table>
<thead>
<tr>
<th>Withdrawal symptom</th>
<th>Suggested psychosocial interventions</th>
<th>Explanation of intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep problems</td>
<td>Progressive muscle relaxation</td>
<td>A relaxation technique designed to reduce the tension stored in the muscles. Particularly helpful for intrusive thoughts.</td>
</tr>
<tr>
<td></td>
<td>Imaginal relaxation</td>
<td>A guided approach that aims to create a safe and supportive space in the client’s mind.</td>
</tr>
<tr>
<td>Cravings</td>
<td>Urge surfing</td>
<td>A cognitive technique used to “ride out the (craving) waves”.</td>
</tr>
<tr>
<td>Anger/irritation</td>
<td>Challenging irrational beliefs</td>
<td>A technique for challenging beliefs that lead to unhelpful behavioural patterns.</td>
</tr>
<tr>
<td></td>
<td>Physical activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relaxation and coping strategies</td>
<td></td>
</tr>
<tr>
<td>Mood disturbances</td>
<td>Mood management:</td>
<td>Learning to effectively manage difficult emotions such as anger, depression, anxiety, and low self-esteem.</td>
</tr>
<tr>
<td></td>
<td>Coping strategies</td>
<td>Strategies to alleviate or cope with stressful situations in which the risk of relapse is high.</td>
</tr>
<tr>
<td></td>
<td>Activity scheduling</td>
<td>Timetabling pleasant activities that give enjoyment and challenge negative perceptions.</td>
</tr>
</tbody>
</table>
Psychosocial Interventions

Table 13: Randomised trials of behavioural treatments (adults and young adults)

<table>
<thead>
<tr>
<th>Author</th>
<th>N</th>
<th>Study design</th>
<th>Intervention</th>
<th>Outcome</th>
<th>Manual available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stephens et al., 1994</td>
<td>65</td>
<td>Adults, three groups, 12-month follow-up</td>
<td>16-session CBT group treatment vs 2-session MET vs delayed treatment control</td>
<td>Both treatment groups showed greater improvement than DTC on most cannabis outcome measures. No significant difference in outcomes between the two groups</td>
<td>N/A</td>
</tr>
<tr>
<td>Budney et al., 2006</td>
<td>60</td>
<td>Adults, three groups, no follow-up</td>
<td>6-session MET vs 6-session MET/CBT vs MET/CBT and voucher incentives (MET/CBT+V)</td>
<td>No significant differences in abstinence between MET and MET/CBT groups. MET/CBT+V had greater curations of abstinence and had more abstinence subjects at the end of treatment than the other two groups</td>
<td>No</td>
</tr>
<tr>
<td>Copeland et al., 2004</td>
<td>229</td>
<td>Adults, three groups, 6-month follow-up</td>
<td>6-session MET/CBT vs 3-session MET + MET vs DTC</td>
<td>Both treatment groups reported better outcomes (greater abstinence rates, fewer cannabis-use-related problems, less concern about cannabis use) than DTC.</td>
<td>No</td>
</tr>
<tr>
<td>Sinha et al., 2003</td>
<td></td>
<td>Young adults on probation, two groups, 1-month follow-up</td>
<td>3-session MET vs 3-session MET and vouchers</td>
<td>Vouchers enhanced treatment attendance, did not affect cannabis use. Note that the voucher incentive was for attendance and not abstinence.</td>
<td>N/A</td>
</tr>
<tr>
<td>Cannabis Treatment Research Project Group, 2004</td>
<td>450</td>
<td>Adults, three groups, multi-site, 12-month follow-up</td>
<td>9-session MET/CBT vs 3-session MET vs DTC</td>
<td>Both treatment groups showed greater improvement than DTC on most cannabis outcome measures. The 9-session MET/CBT reduced cannabis use and associated consequences more than the 3-session MET did.</td>
<td>Yes Steinberg et al., 2005</td>
</tr>
<tr>
<td>Budney et al., 2006</td>
<td>90</td>
<td>Adults, three groups, 12-month follow-up</td>
<td>14-session MET/CBT vs MET/CBT and vouchers (MET/CBT+V) vs vouchers alone</td>
<td>No differences on abstinence initiation during treatment, between MET/CBT+V and vouchers alone, but both superior to MET/CBT alone. MET/CBT+V had superior post-treatment abstinence to that of vouchers alone or MET/CBT alone</td>
<td>No</td>
</tr>
<tr>
<td>Carroll et al., 2006</td>
<td>136</td>
<td>Young adults, four groups, 6-month follow-up</td>
<td>MET/CBT vs MET/CBT and vouchers (MET/CBT+V) vs vouchers alone vs case management</td>
<td>Vouchers enhanced treatment retention and cannabis abstinence, with MET/CBT+V showing the best outcomes. MET/CBT enhanced self-reports of decreased cannabis use at the 6-month follow-up</td>
<td>N/A</td>
</tr>
<tr>
<td>Kadden et al., 2007</td>
<td>240</td>
<td>Adults, four groups, 12-month follow-up</td>
<td>MET/CBT vs MET/CBT and vouchers (MET/CBT+V) vs individual drug counselling (DC) vs DC and voucher</td>
<td>Vouchers engendered superior abstinence outcomes. MET/CBT+V showed the highest rates of abstinence at later follow-ups</td>
<td>N/A</td>
</tr>
<tr>
<td>Dennis et al., 2002</td>
<td>860</td>
<td>Young people 16–18 years old</td>
<td>5-session MET/CBT vs MET/CBT vs family support</td>
<td>All interventions demonstrated significant pre- to post-treatment effects over 12 months. No treatment was superior to another</td>
<td>Yes</td>
</tr>
<tr>
<td>Martin &amp; Copeland, 2008</td>
<td>60</td>
<td>Young people 16–19 years old</td>
<td>2 session MET vs delayed treatment control</td>
<td>Intervention group showed significantly greater reductions in frequency of use and of dependence symptoms</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Pharmacological interventions for withdrawal/relapse prevention

<table>
<thead>
<tr>
<th>Medication Type</th>
<th>Opioid Example</th>
<th>Cannabis Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Symptomatic Relief”</td>
<td>Buscopan, Lomotil etc</td>
<td>Mirtazapine</td>
</tr>
<tr>
<td>Antagonist</td>
<td>Naltrexone</td>
<td>Rimonabant (SR141716A)</td>
</tr>
<tr>
<td>Partial Agonist</td>
<td>Buprenorphine</td>
<td>JWH-073</td>
</tr>
<tr>
<td>Agonist</td>
<td>Methadone</td>
<td>Sativex (1:1 of D9THC &amp; cannabidiol)</td>
</tr>
</tbody>
</table>
Sativex trial design

Inpatient dosing regimen

Day:
1 2 3 4 5 6 7 8 9
No. Sprays:
8x2 8x4 8x4 6x4 4x4 2x4 0 0 0

Daily dose (in mg)

Abstinence Day

Sativex ((THC/CBD), n=27)
Placebo (n=24)
Suppression of cannabis withdrawal
Exercise for cannabis withdrawal

- 2 studies without control group –
  - 84 cannabis dependent veterans – moderate-high levels of physical activity were significantly less likely to lapse in the week following cannabis cessation (Irons, 2014)
  - 12 non-treatment-seeking individuals – 10 days of moderate-intensity aerobic exercise for 30 min resulted in significantly reduced cravings and levels of cannabis for up to 2 weeks (Buchowski, 2011)
Exercise for cannabis withdrawal

- **2 mechanisms of action** -
  - Aerobic exercise stimulates endogenous cannabinoids (more than endorphins) which
    - bind to cannabinoid receptors - reward, analgesia, stress relief
    - raise levels of brain-derived neurotrophic factor (BDNF) - increase positive mood
      
      (Heyman, Gamelin, 2012)
  
  - **Speeding the release of THC from fat cells, esp if BMI >25**
    
    (Wong, Montebello, 2013)
Concurrent tobacco use

- Most cannabis smokers in Australia smoke tobacco either in combination with their cannabis (91%) or separately as cigarettes (43%) (Copeland, Swift & Rees, 2001)

- Both substances impart a poor prognosis for successful cessation for the other, thus address both e.g. give NRT (Ford, Vu & Anthony, 2002; Stuyt, 1997; Sullivan & Covey, 2002)

- Limited evidence suggests during cannabis withdrawal there is no increase in tobacco consumption (Budney et al., 2003; Winstock et al., 2009)
Conclusions

- Cannabis use is widespread in New Zealand
- Most people who use cannabis do not develop psychiatric or medical problems
- There are numerous risk factors for developing a cannabis-induced psychosis
- Emerging role of medications for cannabis withdrawal and preventing relapse
- Despite limitations, there is evidence for psychotherapies for preventing relapse