

Cannabis: The Facts

British Toxicology Society - sponsored
1 day Symposium

11 October 2002

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INTRODUCTION AND BACKGROUND

Professor Gabrielle Hawsworth (University of Aberdeen)

RECENT ADVANCES IN THE PHARMACOLOGY OF CANNABINOIDS

Dr David Baker (University College, London)

THERAPEUTIC USES OF CANNABINOIDS

Professor Tony Moffatt (Royal Pharmaceutical Society of Great Britain)

WANTED AND UNWANTED EFFECTS OF CANNABIS IN MAN

Professor Heather Ashton (University of Newcastle)

MARIJUANA AND MADNESS

Professor Robin Murray (Institute of Psychiatry)

CLINICAL EFFECTS OF CANNABIS – PRESENT AND FUTURE

Professor John Henry (Imperial College School of Medicine, London)

TEACHING YOUNG PEOPLE ABOUT HARM AND RISK FROM CANNABIS

Mrs Mary Brett (Challoner School, Bucks)

CANNABIS – THE WAY FORWARD

Dr Ian Oliver (University of Teesside)

Wanted and unwanted effects of cannabis in man

**Prof Heather Ashton
(University of Newcastle)**

Prevalence of Cannabis Use by Young People in the UK

Group	Prevalence	Sample
School children	8-16 yrs 30-40%(1% smoke daily) 18 yrs – 59%	Survey of several 1000s of 8-18 yr olds
University Students	60% (20% weekly or more often)	Survey of 3699 students from 10 UK universities
Medical Students	46% (10% weekly or more often)	Survey of 785 medical students from 7 UK medical schools
Junior Doctors	30% (11% weekly or more often)	90 junior doctors in NE England

Therapeutic Potential of Cannabinoids

Antiemetic

Appetite stimulant

Analgesic

Anxiolytic

Muscle relaxant

Hypnotic

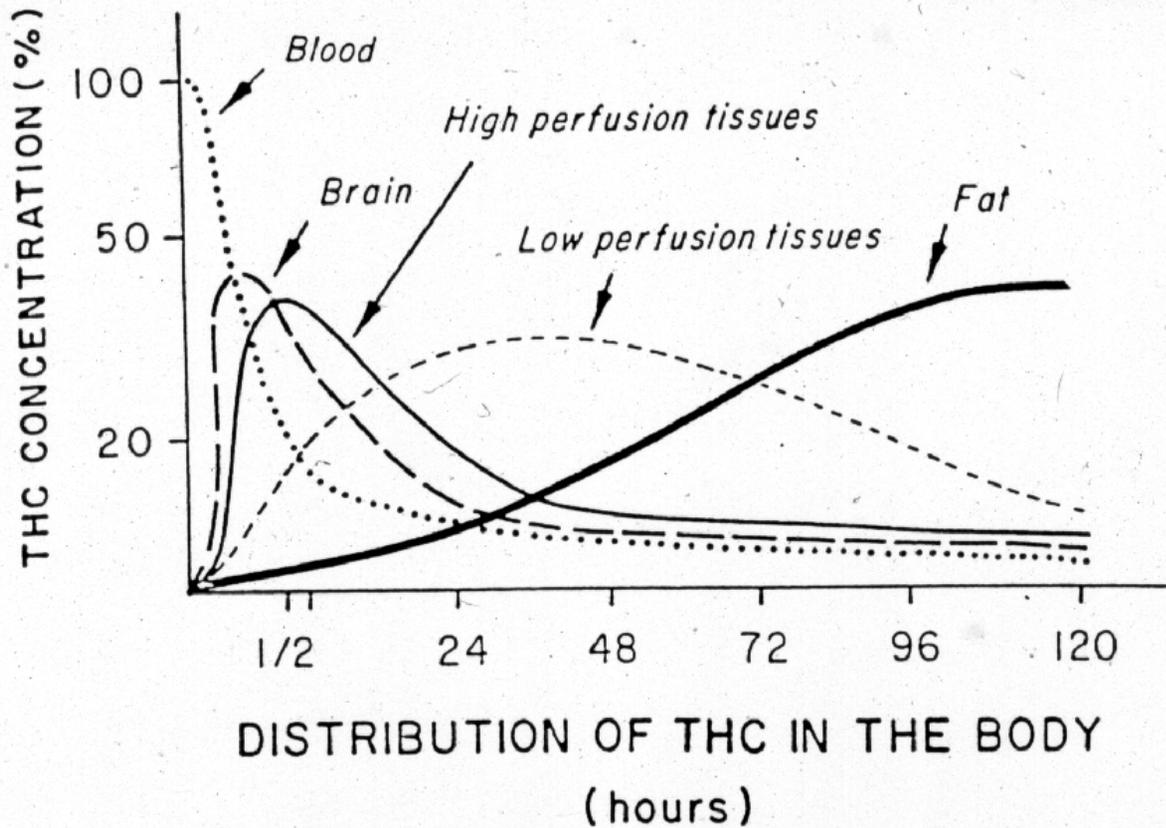
Anticonvulsant

Antidepressant

Antipyretic

Bronchodilator

Addictive effects with analgesics, phenothiazines and other drugs used in palliative care



DISTRIBUTION OF THC IN THE BODY
(hours)

Figure 4: The distribution of THC after a single administration in plasma and body tissues. Note the "biphasic" disappearance curve in plasma. The rapid phase (in minutes) indicates a rapid uptake of the drug by fat containing tissues. The slow phase (in days) shows the release of THC by these tissues. From D.S. Kreuz, J. Axelrod: D9-THC - Localisation in body fat. *Science*. 179:391 (1973).

Distribution of THC in Brain

Cerebral cortex - logical thought, reasoning, judgement

Hippocampus - memory functions, time appreciation

Limbic system nuclei - pleasure/reward centres

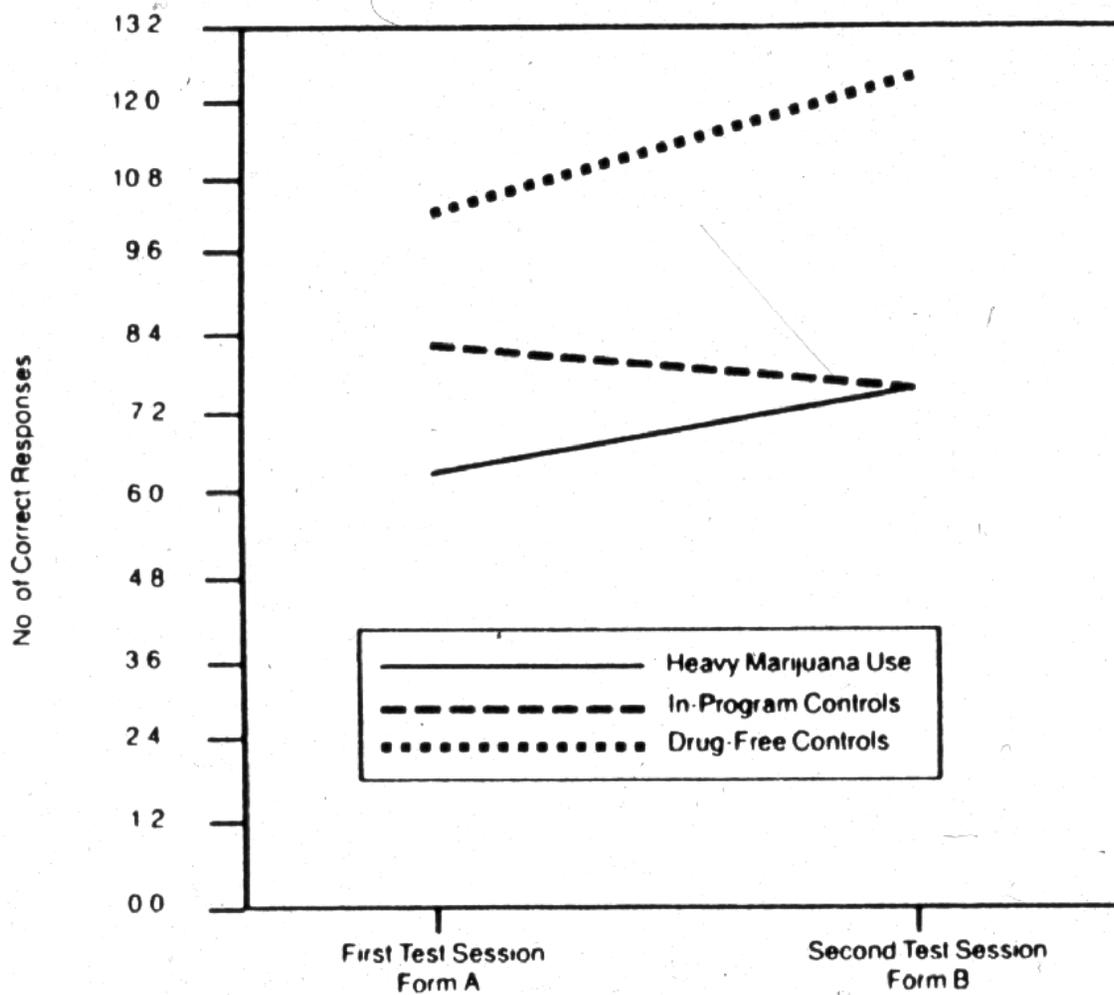
Sensory areas - perception of sound, colour etc

Motor areas - muscle co-ordination, psychomotor performance

Signs and symptoms of abstinence after abrupt cessation of oral cannabis (210mg/day for 11-21 days)

Mood changes	Hyperactivity
Disturbed sleep	Hiccups (rare)
Decreased appetite	Nasal congestion (rare)
Restlessness	Weight loss
Irritability	Hemoconcentration
Perspiration	Salivation
Chills	Tremor
Feverish feeling	Loose bowel movements
Nausea	Body temperature increase
Abdominal distress	Sleep EEG eye movement rebound
Tremulousness	Waking EEG changes
	Intraocular pressure increase

Source: Jones et al (1976)



Comparison of Wechsler Memory Prose Passages score soon after admission and 6 weeks later.

Cannabis Effects on Driving and Piloting Skills

Slowed reaction times

Poor detection of peripheral lights

Impaired co-ordination

Poor tracking ability

Impaired attention and memory

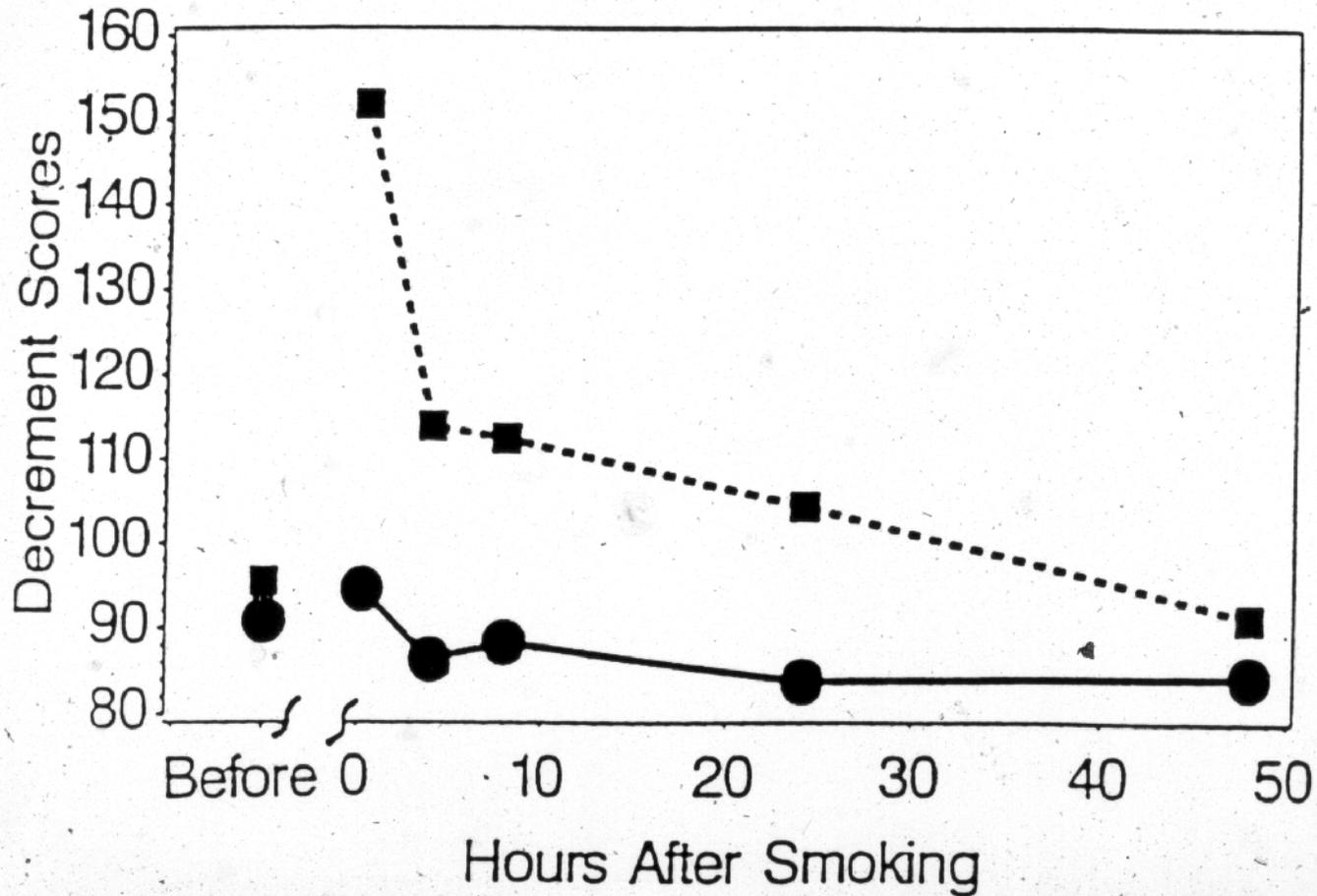
Deficits in complex task performance

Size and time distortion

Additive effects with alcohol

Pilot Performance Decrement Scores

Squares & Dashes = 20 mg Dose, Circles & Solid Line = Placebo



Some Psychiatric Effects of Cannabis

Anxiety, panic reactions

Flashbacks

Paranoid psychosis

Aggravation of schizophrenia

Interaction with alcohol



Risk of aggression

and violence

Costs of Cannabis Use 1

Personal

Community

Short Term

- | | |
|------------------------|--|
| Psychomotor impairment | - Traffic accidents (road, rail,air)
- Accidents at work and home |
| Cognitive impairment | - Educational underattainment (School, university, work training)
- Impaired work performance |
| Psychiatric disorders | - Acute psychosis, aggravation of schizophrenia, violence, crime
- NHS and prison costs |

Costs of Cannabis Use 2

Personal

Community

Long Term

Dependence

- NHS and voluntary service costs

Respiratory and cardiovascular disease

- NHS costs

? Long term cognitive impairment

- Impaired work performance

? Polydrug use

- NHS and social cost

Marijuana and Madness

**Professor Robin Murray
(Institute of Psychiatry)**

A brief history of cannabis and psychosis

- ★ First cases reported 150 years ago
- ★ Numerous anecdotal reports of individual cases of cannabis psychosis from many countries
- ★ Reports of cannabis-induced psychosis from Frank Knight in Jamaica in the 1960s
- ★ Series of reports from University Clinic in Amsterdam in the early 1990s

Substance abuse in Psychotic Patients

- ★ 119 patients with recent onset psychosis and 96 normal controls were interviewed about their use of alcohol and drugs

Grech et al (2002)

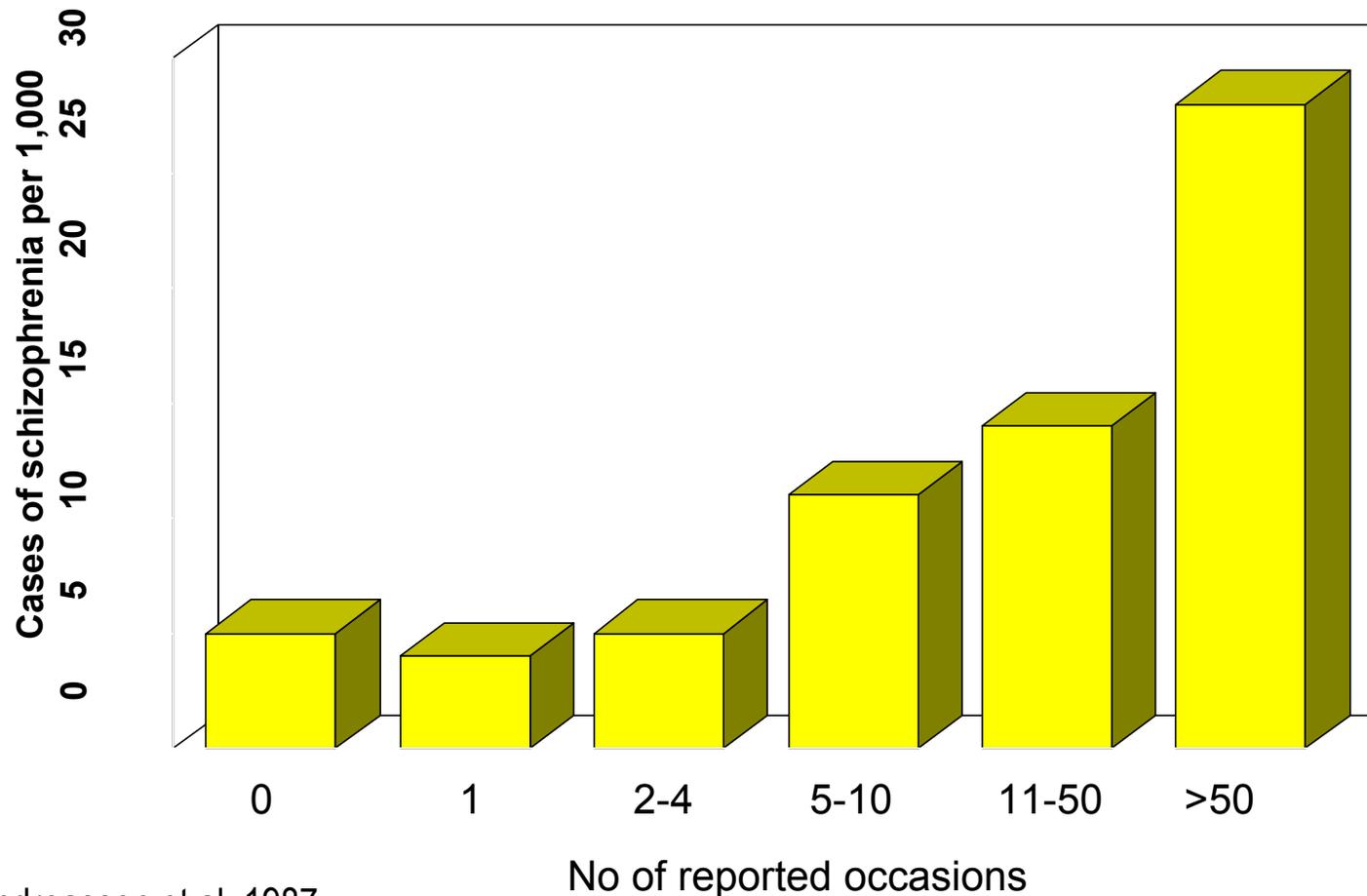
Abuse of Alcohol or Drugs

	Psychotic Patients %	Controls %	Odds Ratio
Alcohol	21	26	0.76
Cannabis	39	22	2.25**
Other drugs*	11	9	1.18

**P=.01

Grech et al, 2002

Cannabis consumption at age 18 and later risk of schizophrenia



Psychotic patients may use cannabis to:-

- * counteract the unpleasant effects of their symptoms - eg anxiety or negative symptoms
- * counteract the unpleasant effects of their treatment - eg excessive dopamine blockade
- * if cannabis use is therefore beneficial, its use might confer a better outcome

Effect of Cannabis Intake on Outcome of Psychosis at Four Years

	Positive Symptoms	Negative Symptoms	Continuous Course
No cannabis	1	1	1
Initially only	1.6	0.6	1.7
Both		1.1	

The situation in UK Psychiatric Units

- ★ Cannabis consumption by psychotic patients is now widely accepted as exacerbating the illness
- ★ It is a major problem for English psychiatric units with cannabis frequently being traded on in-patient wards
- ★ The Department of Health is advocating the establishment of so-called dual-diagnosis treatment teams

Swedish population-based cohort study

49,968 males were inducted into the army at age 18 in 1969–70, and then followed-up till 1983. 195 were admitted to hospital with an ICD-8 diagnosis of schizophrenia

Cannabis use at baseline and psychosis 2 years later

	OR	95%CI
No use	1	
Low use	1.23	0.4-4.2
Middle use	4.90	10.4-23.1
High use	6.81	1.8-25.9

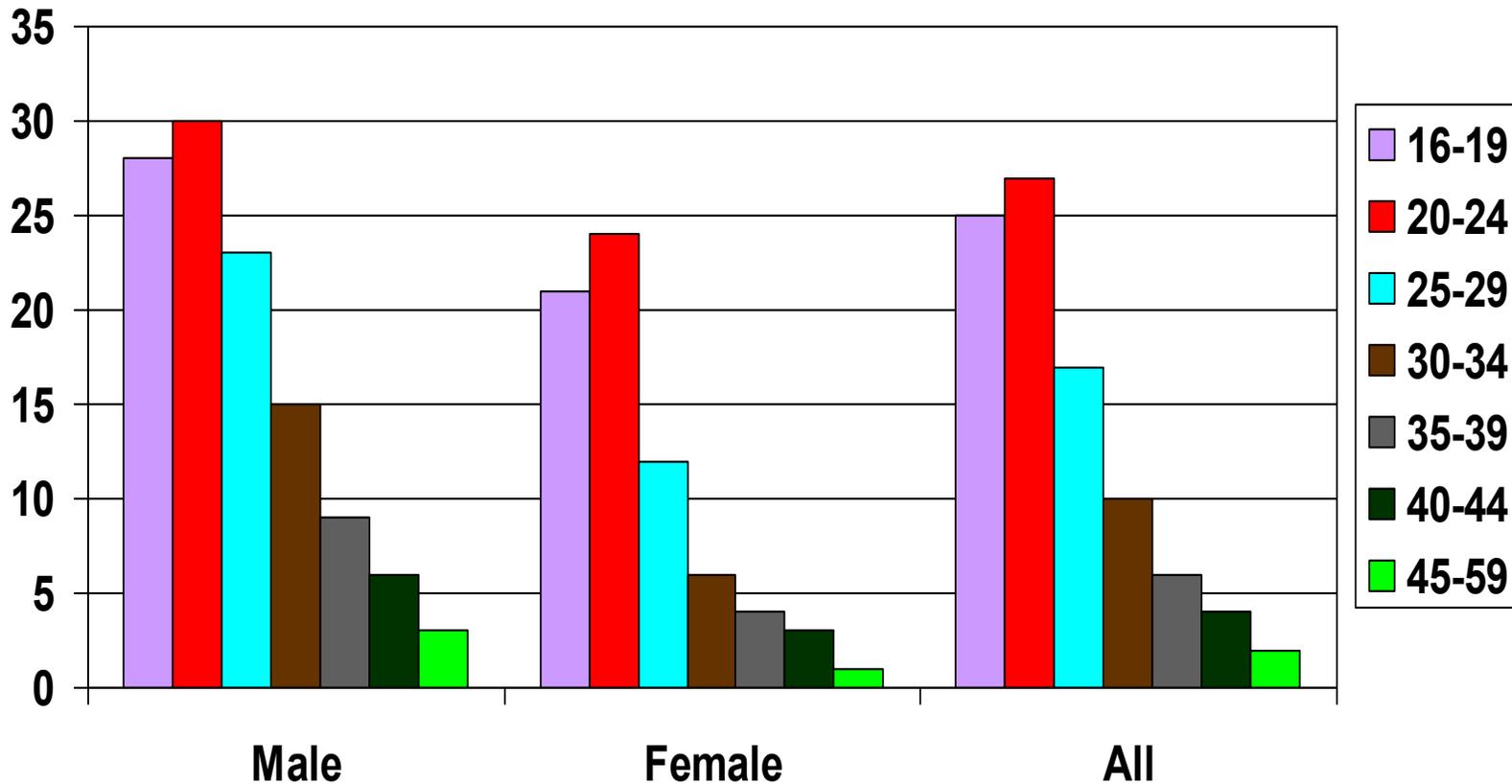
Experimental Studies

- ★ Cyril D'Souza and colleagues have been giving intravenous THC to normal and psychotic subjects
- ★ Normal individuals experience brief psychotic symptoms
- ★ Individuals who have been psychotic suffer a greater increase in psychotic symptoms

Clinical effects of cannabis – present and future

**Professor John Henry
(Imperial College School of
Medicine, London)**

Use (%) of cannabis in the last 12 months by age and gender



Data for England and Wales 2000 (British Crime Survey)

Compared with tobacco smoking marijuana smoking is associated with:

- ★ two-thirds larger puff volume
- ★ one-third larger inhaled volume
- ★ four-fold longer breath hold time
- ★ five-fold increase in blood carboxyhaemoglobin

*Wu TC et al. Influence of marijuana potency and amount of cigarette consumed on marijuana smoking pattern
J Psychoactive Drugs 1988;20:43-6*

CANNABIS INTOXICATION (DSM 4)

A) recent use of cannabis

B) behavioural or psychological changes during or shortly after use, e.g.

- * impaired motor coordination**
- * euphoria**
- * anxiety**
- * sensation of slowed time**
- * impaired judgement**
- * social withdrawal**

CANNABIS INTOXICATION (DSM 4)

C) 2 or more of the following within 2 hours of cannabis use:

- conjunctival injection**
- increased appetite**
- dry mouth**
- tachycardia**

D) Not due to a general medical condition
Not due to another mental disorder

Classification of Cannabis

[under Schedule 2 of Misuse of Drugs Act 1971]

- * Less harmful than other Class B substances (amphetamines, barbiturates, codeine-like compounds)**
- * However, this suggests that their harmful effects are equivalent**
- * Users may think that if they have had no harmful effects from cannabis then other Class B substances will be equally safe**
- * Council therefore recommends reclassification of all cannabis preparations to Class C**

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Lung Damage

- ★ **Bullous lung disease occurs after a shorter time than cigarette smoking, and has a different pattern**
- ★ **Incidence unknown**
- ★ **Alpha₁-antitrypsin deficiency excluded**

*Large lung bullae in marijuana smokers
Johnson MK et al. Thorax 2000; 55:340-2*

Heart and Lung Disease

**“Increased incidence of
bronchitis, asthma and lung
cancer as well as disorders of
the heart and circulation”**

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Heart and Lung Damage Longer Term

“Since cannabis use has only become commonplace in the past 30 years there may be worse news to come”

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Cannabis – The Way Forward

**Ian Oliver (University of
Teesside)**

Cannabis

There are 3 drugs derived from the plant:

- ★ **Marijuana** - refers to leaves & flowers - smoked as reefers, joints, roach, etc.
- ★ **Hashish** - potent resinous substance from dried plant usually smoked in pipes;
- ★ **Hash oil** - very potent, viscous liquid extract usually dropped onto normal cigarettes.

Cannabis

Plant contains **400** chemicals and over **60** cannabinoids. The smoke contains more than **2000** chemicals.

Delta 9 THC is the chemical responsible for producing the psychoactive effect.

Others such as cannabidiol and cannabinol may modify the effects of THC.

Cannabis is classified as a Dangerous Drug and is proven to be **addictive**.

Cannabis

Cannabis is known to affect adversely these systems :-

- ★ *central nervous*
- ★ *cardiovascular*
- ★ *respiratory*
- ★ *immune*
- ★ *reproductive*
- ★ *neuro-psychological*

Cannabis and Mental Health.

Cannabis is one of the most psychopathogenic of all narcotic preparations. In addition to the feelings of relaxation it is associated with: *delirium, psychosis, schizophrenia, anxiety disorders, depersonalisation syndrome, depression & suicide, amotivational syndrome and impulsively violent behaviour.* 1 in 10 of all users are thought to experience cannabis psychosis.

Cannabis & Mental Health.

2002 - University of Maastricht = smoking cannabis triples the risk of a psychiatric disorder - *hallucinations, paranoia, manic depression and schizophrenia* American Journal of Epidemiology.

Similar results found in NZ, Sweden & Israel.

Okayama University Japan found evidence that marijuana can cause genetic abnormalities linked with mental illness.

Cannabis & pregnancy.

Using cannabis during pregnancy/breast feeding is unsafe:~

- ★ birth weight/size lower;
- ★ increased risk of birth defects;
- ★ appears to enhance the risk of S.I.D.S;
- ★ affects neuropsychological performance in some which may persist into later life;
- ★ possible foetal-cannabis syndrome;
- ★ associated with childhood cancers.

Cannabis

Known toxins and carcinogens are stored in the fatty tissues of the body and are released over a period of days. Tests have shown traces up to 4 months after last ingestion.

A regular user is *never* free of THC.

Modern cannabis may be up to **40** times stronger than that used in the 1960s.

Cannabis use by Teenagers

Anything in excess of casual use poses a threat to the development of young people. Owing to immaturity and inner mental imbalance teenagers are more likely to react with psychiatric symptoms than adults. It is reasonable to assume that young people are more susceptible to the known adverse effects of cannabis than adults.

Cannabis as a medicine?

Some of the compounds found in cannabis do have a potential as a medicine but there are established and tested alternatives which are usually more effective. **No prescribed medication is smoked** because of uncertainty of dosage and purity/strength of the substance.

A.C.M.D

- ★ Cannabis is a harmful drug that impairs performance and presents a real health risk;
- ★ occasional use is dangerous for some;
- ★ regular use can result in dependence;
- ★ it can lead to the use of Class A drugs;
- ★ more research is *necessary* combined with a *public health education programme*.
- ★ *There may be worse news to come!*