

Dear Professor Hall and the Working Party Committee,

Thank-you for the opportunity to respond to the report and recommendations of the working party.

My response at this time was prompted by the encouragement of Ethical Medical Cannabis Supplies (EMCS). I have a registered business which holds the aim of facilitating development of environmentally and socially friendly industries. More than two years of researching the potential of the cannabis plant with regard to human, environmental and economic benefits, has convinced me of the immediate need for legislation to come into line with current scientific knowledge and public opinion, so that Australians may benefit from this most useful of plants.

Firstly may I commend you for finally attempting to address some of the issues surrounding the use of cannabis for medical purposes.

However the whole debate highlights a number of incongruities:

That many people find cannabis of so much therapeutic value that they are willing to risk criminal prosecution under the drugs act,

yet when compared to drugs readily available, either from the supermarket or by prescription, cannabis is remarkably safe and absurdly highly restricted.

Why do I need to write a whole submission just to allow even one severely ill patient access to medical cannabis?

when I could just write a prescription for a much more dangerous drug, with higher toxicity and commonly more side effects?

Thankfully the Working Party has acknowledged cannabis' medicinal value and recommends protection for the medical user and their care-givers from prosecution,

but otherwise it does very little to provide for these peoples' needs, forcing most of them, (except the experienced gardeners with both space, time and physical mobility – uncommon in the severely ill and their caregivers), into liaison with the black market and providing none of them with the means to quality assess the medicine they are using.

As a natural herb, providing food and medicine, cannabis has been safely used for thousands and thousands of years,

however the last few decades has seen the false ideas that cannabis is highly dangerous and useless medicinally, arisen to such an extent in broad sections of the community, (quite a coup for a propaganda campaign), that prohibition itself is creating new harms.

That non-profit groups working altruistically to provide medicinal grade cannabis, to only a few of the many people in desperate need, have made valiant attempts to include scientific quality control, and use 'herbal' cannabis which is arguably much better medicine than cannabinoid preparations,

but that to all intents and purposes the Working Party and NSW government seem set to; in the short term, deny people safe medicine; and in the long term penalize Australians in favor of less effective chemical isolates, synthetics and proprietary owned and controlled therapeutic goods, most likely imported, definitely of much greater economic and ecological cost and for generally lesser quality medicines.

Yours Sincerely,

Dr. Lisa Jackson

PS. When I started this I never intended it to be so long – sorry, hope you find it interesting anyway.

Response to;
Report of the Working Party on the
Use of Cannabis for Medical Purposes
February, 2001

Dr Lisa Jackson (M.B.B.S)
Et al.

Contents

<i>Contents</i>	3
<i>Introduction</i>	5
<i>Need for Medical Cannabis</i>	6
Patient need a priority	6
NSW	6
Global	6
Authorized Prescribed conditions	7
Risks to patients using poor quality cannabis	8
Microbial	8
Chemical	8
<i>Cannabis, cannabinoids and medicine</i>	9
Terminology	9
Bias	9
Pure cannabis	10
Active constituents	10
Seeds	10
Flowers	11
Resin	11
Interaction with the body	12
Medical value	14
Botanical cannabis medicine	14
Efficacy	15
Safety	16
Set setting	17
Summary – Medical Value	18
Development of medicines	19
Dosage	20
Titration of dose	20
Standardization	20
Patient dose titration	20
Delivery routes	21
Delivery methods	21
Inhalation	21
Oral	22
Development of delivery systems	22
Side effects and withdrawal	23
Problems with the cannabinoid orientation	24
Pure cannabis - benefits	25
<i>Medical grade cannabis</i>	26
Qualities	26
Supply of cannabis and cannabis derived products for medical use and research	27
Patient and care-giver production	27
Non-profit medical cannabis dispensaries	27
Regulated dispensaries of medical cannabis	28
Registered Therapeutic Goods	29
Black market supplies	30
Confiscated plants	30
	3

Production methods	31
Natural outdoors - organic	31
Advantages	31
Disadvantages	31
Outdoors – inorganic	31
Indoor growing	32
Advantages	32
Disadvantages	32
Summary	33
Storage	34
Preparations	34
Research	34
Legal	35
Authorization	35
Practitioners	35
Patients and care givers	35
Producers	35
Benefits of regulated supply	35
Social setting	36
Global setting	36
Funding	36
Education	36
Of health care practitioners	36
Of public	36
Of patients	36
Summary of response to the Working Party’s Recommendations	37
Conclusions	41
Appendix: A	42
A.1: [Need for greater genetic variety, how local medicinal cannabis could benefit the industrial (low-THC) hemp industry]	42
A.2: [advantages of changing state legislation regarding cannabis]	42
A.3: PROBLEMS WITH CURRENT SCHEDULING	43

Introduction

“Following calls by the Australian Medical Association (AMA) for people with cancer and AIDS to be prescribed cannabis for pain relief, the Government convened a working party to advise the Government on:

- Whether patients with some medical conditions should be allowed to use cannabis for medical purposes; and
- If so, how this might be achieved, while taking into account the clinical needs of patients and the legal and social issues without legalizing or decriminalizing the recreational use of cannabis”¹.

Despite the wording ‘*cannabis*’ and ‘*clinical needs*,’ from the very first recommendation of the working party report there is an apparent emphasis on pharmaceutical preparations of cannabinoids.

I find this distressing from the perspective of a practicing doctor, a taxpayer and potentially a patient or caregiver.

The Working Party has agreed with the conclusions of the British House of Lords and the United States Institute of Medicine that some cannabinoid substances may have value in the treatment of a limited range of medical conditions, yet there is a distinct lack of research into the medicinal value of cannabis which has not been addressed

In 1985 a review article on THC commented that “Two decades after the isolation of delta 1-THC (delta 9THC²) its mode of action is still obscure despite the enormous amount of research invested in it³.” Fifteen years on pharmaceutical preparations of THC are noted for their high expense and poor bioavailability, with patients commonly reporting they prefer to smoke cannabis⁴.

Whilst recommendation 5 acknowledges the importance of assessing the therapeutic efficacy of cannabis, it is ignored in recommendation 8 in favor of cannabinoids. Why is the research into chemistry and pharmacology to develop therapies with safer and more effective delivery already directed entirely into investigation of cannabinoids only? When the terms of reference of the WP include “To establish if and how *cannabis* can be effectively administered with the least harm to patients.”⁵ Additionally, Recommendation 5 has not yet occurred, and there has not yet been any assessment of the therapeutic efficacy of either cannabis or the cannabinoids.

The development of safer and more effective delivery of cannabis is relatively quite simple, (but still in need of research and development), and definitely more cost effective than for cannabinoids.

Irregardless of the outcomes of research, a significant number of ill people are currently using cannabis and will likely continue to do so in the future, hence the additional need for relevant research, education and delivery systems for cannabis.

The compassionate regime recommended by the working party will relieve the stress and criminal liability of current prohibition from patients and their caregivers. But the idea that patients and/or their care givers will be able to readily produce a small supply of cannabis places unnecessary burdens on these people already under stress; creates easily a six month delay in access to seasonal home grown medicine; provides no known quality seed stock; provides no quality assurance; puts them at risk of theft and home invasion; is quite difficult to achieve horticulturally; forcing people into hydroponic production, with its costs and risks; or necessitating cooperative efforts, much like the Californian compassion club system. People unable to manage this will be forced to return to the black market with its attendant legal and health risks.

For no other medicine are patients or their caregivers expected to, produce it themselves, or purchase it from the black market, and to manage quality control.

The production and supply of medical cannabis needs to be addressed legislatively, and with practical common sense.

Authorization, should consider the expertise of medical practitioners from a variety of systems including Western/allopathic, Chinese, Ayurvedic, homeopathic, naturopathic and other medicines who have traditionally used cannabis as an element in their medical practice. Additionally, many practitioners will need appropriate education, following sixty years of inexperience in its use. The combination of medical systems will enhance our understanding of how to safely and effectively use this herb as an effective tool in disease and symptom management.

There is a way to best address the needs of patients, practitioners and researchers, by changing state regulations to make cannabis a controlled natural product, restricting its access to patients authorized by suitably educated and accredited practitioners, and licensing secure organic production, of quality controlled and graded of potency, natural cannabis and cannabis products.

¹ http://www.druginfo.nsw.gov.au/druginfo/reports/medical_cannabis.html

² *Marijuana Chemistry*, Michael Starks, Ronin Publishing, 1990.

³ *Marihuana: much ado about THC*. [Review] , Schurr A., Comparative Biochemistry & Physiology - C: Comparative Pharmacology & Toxicology, Vol. 80(1) , pp1-7, 1985.

⁴ Australian Committee for Medical Cannabis, Submission to NSW medical Cannabis Working party, Feb, 2000, and Testimony of Lester Grinspoon, M.D. Associate Professor of Psychiatry, Harvard Medical School before the Crime Subcommittee of the Judiciary Committee U.S. House of Representatives, Washington, D.C. October 1, 1997

⁵ Report of the Working Party on Medical Cannabis, Vol. 2, pg 113, App B.

Need for Medical Cannabis

Patient need a priority

NSW

Need and demand evident – why else this report

The fact that so many patients still choose to use cannabis for its therapeutic effects, despite its illegality, is testimony to both this plants qualities as a medicine and patients right to choose.

Obviously patients should not be persecuted for using a natural medicine to improve their quality of life.

Australia currently has around 15,000 recorded cases of HIV⁶ and NSW has the highest numbers of people with HIV or AIDs of any State.⁷

“For many people living with HIV/AIDS, the use of cannabis is a vital component of their overall treatment regime and management strategies. Cannabis is used to maintain their life-extending allopathic treatments, making some of the side-effects they experience less acute and providing a better quality of life and more treatment choices. The issue cannot be treated academically but must give close consideration to the lived experience of those already using cannabis and gaining benefit from it.”⁸

"For patients, such as those with AIDS or undergoing chemotherapy, who suffer simultaneously from severe pain, nausea, and appetite loss, cannabinoid drugs might offer broad spectrum relief not found in any other single medication."⁹ Cannabis has at least equal, but probably greater potential to benefit people with these conditions.

- The rising rates of cancer and chemotherapy related nausea.

Many people suffering from wasting syndromes (associated with AIDs cancer, chronic disease, etc) are at risk of dying, effectively from starvation, long before federal, importation or therapeutic goods regulations could possibly be met. Thankfully, for the sake of those in need, NSW is in a position to amend its regulations and provide for safer use and research in a much shorter time.

- The large numbers of people with neurological disorders and unresponsive chronic pain.

"Clinical trials of cannabis for the treatment of MS and chronic pain should be mounted as a matter of urgency"¹⁰.

While it is good that patients may be able to avoid prosecution for medical cannabis under the recommendations of the Working Party, this still leaves them with few options on how to access safe, high quality supply of cannabis in their time of need.

Knowing that some patients may be particularly susceptible to the micro-organisms sometimes present in cannabis, and to provide no realistic supply, no access to quality control, and leaving them exposed to the risks of the black-market, could be seen as negligent.

Global

On a global level the incidence of AIDs related disease is dramatically on the increase. One of the main regions to be affected will be the Asia-Pacific region, where the disease burden will be immense and far beyond the economic and infrastructure resources of the already economically stressed countries involved. These countries will be in no position to pay for proprietarily restricted pharmaceutical cannabinoids. Local international neighbors will need to assist, with the development of know-how for safe, low cost, locally produced effective medicine.

⁶ *Epidemiological Fact Sheet on HIV/AIDS and sexually transmitted infections*, 2000 update, UNAIDS.

⁷ NCHECR Australia 2000, www.med.unsw.edu.au

⁸ *Medical Cannabis Submission*, Feb. 200, People Living With HIV/AIDS (PLWHA) published in Working Party Report Vol. 3

⁹ *Marijuana and Medicine, Assessing the Science Base*, Institute of Medicine

¹⁰ SCOST (1998), section 8.3.

Authorized Prescribed conditions

The potential usefulness of medicinal cannabis is much broader than the Working Party Report describes. Anecdotally there are a number of other conditions for which patients commonly medicate with cannabis, including; hepatitis C (HCV) infection, migraines, menstrual syndromes, opiate and alcohol withdrawal; because there is either no alternative medication, or patients feel cannabis is more effective and/or with less side effects than other medications available. Practitioners should not be expected to have to make special applications for patients in need of cannabis for unusual (not already recognized conditions) when their medical expertise tells them it is the most suitable choice in medication.

Risks to patients using poor quality cannabis

This section does not address the risks of cannabinoids as they are currently not available, for a discussion of problems associated with their use please see page 25, nor does it address the risks of prosecution due to cannabis laws.

It is apparent that Australia has performed minimal analysis of cannabis, so we are left with overseas reports, anecdotal subjective evidence and theory.

Additionally, there has been no research into the possible effects of disordered plant physiology due to artificial growing methods.

Microbial

“Viable fungal spores in marijuana pose the greatest hazard to immunocompromised patients”

Many of the patients currently using cannabis medicinally are immunosuppressed (AIDs, cancer and wasting syndromes are all strongly associated with reduced immunity to infection) and at increased risk of contracting opportunistic infections such as aspergillosis

“Although aspergillus is infrequently isolated from HIV-infected persons, the associated high mortality would support serious consideration of its clinical significance in those with advanced disease and risk factors¹¹.”

Physicians should be aware of this potentially lethal complication of marijuana use in compromised hosts.¹²

“A 34-year-old man presented with pulmonary aspergillosis on the 75th day after marrow transplant for chronic myelogenous leukemia. The patient had smoked marijuana heavily for several weeks prior to admission. Cultures of the marijuana revealed *Aspergillus fumigatus* with morphology and growth characteristics identical to the organism grown from open lung biopsy specimen. Despite aggressive antifungal therapy, the patient died with disseminated disease.”

Chemical

Black market cannabis may contain;

- Pesticides
- Fungicides
- Heavy metals
- Exogenous hormones (e.g. growth hormone) and other endocrine disrupting chemicals.
- High levels of relatively free elements, such as K (potassium), N (nitrogen), and P (phosphorus)
- Other drugs such as heroin (rarely)
- Foreign matter such as spider mite and web

¹¹ *Risk factors and outcomes associated with identification of Aspergillus in respiratory specimens from persons with HIV disease. Pulmonary Complications of HIV Infection Study Group.* Wallace JM, Lim R, Browdy BL, Hopewell PC, Glassroth J, Rosen MJ, Reichman LB, Kvale PA *Chest*, Jul 1998, pp. 131-7.

¹² *Fatal aspergillosis associated with smoking contaminated marijuana, in a marrow transplant recipient.* Hamadeh R, Ardehali A, Locksley RM, York MK. *Chest*, 1988 Aug. Issue 94(2) pp. 432-3

Cannabis, cannabinoids and medicine

Terminology

Cannabis, originally an Arabic word, refers to the plant, or parts of the plant of the genus and species *Cannabis* (Cannabinaceae family).

This submission has aimed to use the terms 'cannabis' and 'cannabinoid' in almost the same manner as defined in the Working Party Report.

According to the report the "term cannabis is used to refer to unpurified plant substances."¹³ However, *purify*, actually means to free of contaminating matter. Organic cannabis, flowers, resin, seed, etc, is basically just pure (uncontaminated) cannabis.

As for the term 'crude cannabis'; while it is correct in meaning unclassified or unanalyzed, or in a natural or unrefined state; it also carries misplaced negative connotations of lacking care, knowledge or skill.¹⁴

Bias

The Working Party Report volume II in its section in medical and therapeutic issues (part 2), presents us with

- "the medical value of cannabis and cannabinoids" acknowledges that they both have potential as medicines;
- however, the discussion of 'risks' are all affiliated solely with cannabis use;
- while the 'development of cannabinoid drugs' is addressed, the development of cannabis medicines is ignored.

This bias to cannabinoids, throughout the Working Party Report, perpetuates the partiality of the IOM report, which basically excluded medicinal cannabis as unviable due to lack of patentability and excessive US legal hurdles, disinclining pharmaceutical companies from developing it.¹⁵

The IOM report, however well intentioned, was generated within the setting of one sided research into cannabinoids.

"Beginning in the 1970s, thirty-five states passed legislation that would have permitted medical use of cannabis but for the federal law. Several of those states actually established special research programs, with the permission of the federal government, under which patients who were receiving cancer chemotherapy would be allowed to use cannabis. These projects demonstrated the value of both smoked marijuana and oral THC. The FDA then approved oral THC as a prescription medicine, but ignored the data that suggested that smoked marijuana was more useful than oral THC for some patients. With the approval of Marinol, this research came to an end."¹⁶

NSW potential to develop effective medicines to benefit the health of her population should not be subordinated to false and debasing US drug classifications (US, cannabis is classified as a Schedule 1 drug, meaning that it is classified as a drug with no medical uses and a high abuse potential¹⁷), and multinational pharmaceutical corporate dominance in the practice of health care.

Following the bias of numerous reports, the following review of cannabis and the cannabinoids is written with consideration of the natural origin of cannabinoids being merely a part of cannabis, and not the only constituents. It is not comprehensive, merely aimed to highlight a few relevant points.

¹³ Report of the Working Party on Medical Cannabis, Vol. 2, pg. 11.

¹⁴ Collins English Dictionary, Ed. P Hanks, Collins, 1982.

¹⁵ Report of the Working Party on Medical Cannabis, Vol. 2, section 8.6.

¹⁶ Testimony of Lester Grinspoon, M.D. Associate Professor of Psychiatry, Harvard Medical School before the Crime Subcommittee of the Judiciary Committee U.S. House of Representatives, Washington, D.C. October 1, 1997.

¹⁷ Report of the Working Party on Medical Cannabis, Vol. 2, App. G.

Pure cannabis

Pure as in natural, uncontaminated cannabis, various parts of this plant have traditionally been used in a medical fashion, including seeds, roots, flowers and resin

The following review looks at only a few of the active constituents of cannabis, in particular the seed, as this is often neglected in discussions on the medical uses of cannabis, despite their traditional medical use, the current need for high quality nutritional supplementation and that their sale and use for human consumption is commonly controlled drug legislation.

Active constituents

There are multiple active constituents in cannabis, including both cannabinoids and non-cannabinoids, such as the essential oils. Cannabis history as an 'illicit psychotropic' has probably increased research interest in THC, being a common cannabinoid, with predominantly central nervous system receptors and influence on mental state. While THC is obviously a significant element, which active constituent is viewed as the primary one, really depends on the sort after effect. Even the Pharmaceutical Society of Australia (NSW Branch), "is not clear which of these, alone or in combination, would be the most effective in treating various conditions."¹⁸

A few constituents are discussed below to highlight the fact that there are many active constituents in herbal cannabis. Although these constituents may benefit the body as a single element, the real prize lies in their natural combination, where; there are many active components; one element will moderate the adverse effects of another; and the benefits of several elements will combine to synergistically – dramatically increasing their effectiveness.

Seeds

Cannabis seeds contain a high ratio of beneficial essential fatty acids, and proteins, as well as carbohydrates and fibre. The carbohydrate are a useful nutritional source and the fibre (and whole seed) has a long history of use in bowel management.

Cannabis seed oil

Cannabis seed is about 1/3 oil; which is particularly high in unsaturated fats and essential fatty acids, additionally with a particularly beneficial ratio of linoleic acid LA (omega 6) to linolenic acid LNA (omega 3). They provide the richest most balanced natural single source of essential fatty acids available for humans¹⁹,

Functions of essential fatty acids

- Lowering Triglycerides
- Eradicating Plaque from arterial walls
- Lowering Blood Pressure
- Altering the production of leukotrienes, which aggravate inflammation in the body.
- Along with proteins and cholesterol, constructing bodily membranes.
- Adding strength and integrity to cell and capillary structures.
- Prolonging Blood Clotting time, which enhances healing.
- Assisting in the manufacture of haemoglobin.
- Assisting in the production of cholesterol, whilst at the same time helping to remove excess cholesterol.
- Preventing the growth of bacteria and viruses via the oxygenation of bodily tissues.
- Via the Oxygenation of cell membranes, improved endurance, better sleep-wake cycles, greater metabolic efficiency and higher disease tolerance.
- Assisting in the functions of glands and organs.
- Assisting in the function of hormones.
- Nourishing Skin, hair and nails via oxygenation and the delivery of fat-soluble vitamins A and E.
- Increasing the rate of fat metabolism in the body.
- Maintenance of proper temperature.
- Assist in the production of electrical currents, vital for a stable heart beat.
- Precursors to the production of Prostaglandins. Gamma Linoleic Acid (GLA) is particularly active in this area.

¹⁸ Pharmaceutical Society of Australia (NSW Branch), submission Feb 2000, quoted Report of the Working Party on Medical Cannabis, Vol. 2, pg 23.

¹⁹ *Hemp Foods and Oils for Health; Your Guide to Cooking, Nutrition and Body Care*, G. Leson, P. Pless and J. Roulac, Hemptec, 1997. And

Fats and Oils: The Complete Guide to Fats and Oils in Health and Nutrition, Udo Erasmus, Alive Books, 1986.

Prostaglandins are present in almost all body cells and act as catalysts for many physiological processes. They prevent abnormal blood clotting and nerve inflammation and promote better by dilating blood vessels. PGE-1 is the most important of the prostaglandins. It balances cholesterol and blood pressure levels and stimulates the production of T-lymphocytes, which strengthen immune capabilities.

Cannabis seed protein

The protein available from cannabis seed is of high quality and readily bioavailable, provides all of the essential amino acids, much of it in the form of the globulin edistin which is easy to metabolize.²⁰

Flowers

Cannabis flowers are basically vegetable matter and cannabis resin

Resin

Contain over 420 different compounds including some 60 or so cannabinoids,²¹ as well as essential oils and other compounds.

Essential oils

Anti-inflammatory effects and moderation of THC

Caryophyllene, has been demonstrated to have a gastric cytoprotective effect.²²

Quercetin, acts as an antioxidant.²³

Eugenol is a potent prostaglandin inhibitor.²⁴

Cannabinoids

Cannabichromene – anti-inflammatory effects²⁵

CBD – immune modulation and anti-inflammatory effects indicated as potentially beneficial in management of rheumatoid arthritis (animal studies)²⁶, and hence other painful inflammatory disorders
anecdotally it has anti-spasmodic activity and may act as a CB2 agonist in the gut

Cannabinoid - analogues

Pentyl – propyl groups

THC and CBD both have analogue forms with either a pentyl or propyl group side chain, the ratios of these analogues are under environmental influence, it is unknown how the analogues may differ in effects

Δ -8-THC

Δ -8-tetrahydrocannabinol (Δ -8-THC), a naturally occurring cannabinoid, is less psycho-active than THC and has been shown to be effective in preventing chemotherapy induced vomiting in children, with negligible side effects²⁷

11-hydroxy- Δ -9-THC

is a metabolite of THC and may play a role in prolonged appetite stimulation²⁸

²⁰ *Hemp Seed: The Most Nutritionally Complete Food Source in the World*, Lynn Osburn, Hemp Line Journal, July-August 1992, pp. 14-15, Vol. I, No. 1.

²¹ *Marijuana and Health* Report of a Study by a Committee of the Institute of Medicine, Turner, National Academy Press, Washington DC 1982

²² *Gastric cytoprotection of the non-steroidal anti-inflammatory sesquiterpene, beta-caryophyllene*, Tambe, Y., Tsujiuchi, H., Honda, G., Ikeshiro, Y., and Tanaka, S., *Planta Med*, 62 (5), 469-70, 1996.

²³ *Quercetin inhibits hydrogen peroxide (H₂O₂)-induced NF-kappaB DNA binding activity and DNA damage in HepG2 cells*, Musonda, C. A. and Chipman, J. K., *Carcinogenesis*, 19 (9), 1583-9, 1998.

²⁴ *Prostaglandins and cannabis-III. Inhibition of biosynthesis by essential oil components of marijuana*, Burstein, S., Varanelli, C., and Slade, L. T., *Biochem Pharmacol*, 24 (9), 1053-4, 1975.

²⁵ *Biological activity of cannabichromene, its homologs and isomers*, Turner, C. E. and Elsohly, M. A., *Journal of Clinical Pharmacology*, 21, 283S-291S, 1981.

²⁶ *The nonpsychoactive cannabis constituent cannabidiol is an oral anti-arthritis therapeutic in murine collagen-induced arthritis*, Malfait, A. M., Gallily, R., Sumariwalla, P. F., Malik, A. S., Andreaskos, E., Mechoulam, R., and Feldmann, M., *Proc Natl Acad Sci U S A*, 97 (17), 9561-6, 2000.

²⁷ *An efficient new cannabinoid antiemetic in pediatric oncology*. Aya Abrahamov, Avraham Abrahamov and R.Mechoulam, *Journal of the International Hemp Association*, Vol 2, No. 2, 1995

²⁸ Wall et al. 1983 quoted, Working Party Report, Vol 2, App D

Interaction with the body

The above description is only, of a few of the effects, of a few of the constituents of cannabis. These elements do not act alone, but in concert with one another and the patient to produce a range of effects.

The cannabinoids, and some of their metabolites, main mechanism of action is by, mimicking the body's own anandamides, and interacting with the cannabinoid receptors of which at least two are known (CB1 and CB2). They also interact with serotonergic²⁹, dopaminergic³⁰ and endorphin³¹ systems. Each ligand will behave with different degrees, of agonism or antagonism, and strength of binding to receptors, creating a mosaic of interaction and effects, to form an overall picture of balanced physiological effects.

Receptors

Cannabinoid receptors are found in the central and peripheral nervous systems, cardiac muscle, and the digestive system and uterus³². CB1 receptors are mainly confined to the CNS, while CB₂ receptors are found more in the periphery, often in conjunction with immune mechanisms³³.

The medicinal effects of cannabis cannot be defined in terms of single receptors, as it is the combination of physiological effects, induced by activation of multiple receptor types which combine to produce the over all effect, for example relief from inflammatory pain may be predominately effected in the CNS by CB1, but the peripheral analgesia and anti-inflammatory effects are induced by the CB2 receptor, it is only in conjunction that the overall benefit is achieved.

Synergy

There are numerous synergies (the working together of two or more elements to produce an effect greater than the sum of their individual effects) between the various constituents of cannabis in their interaction with the body³⁴.

For example,

Two endogenous cannabinoids anandamide and palmitylethanolamide have been shown to be over 100 times more effective in combination than alone³⁵

The combination of essential oil components of cannabis and THC in analgesia³⁶

Mitigation

The constituents cannabis will also moderate the effects of others, preventing any excesses of single constituents and reducing the occurrence of side effects. CBD moderates the effects of THC. Essential oils probably provide anti-inflammatory effects beneficial in the inhaled use of cannabis, when isolated THC seems to have an irritating and even bronchoconstrictive effect³⁷.

²⁹ *Anandamide, an endogenous cannabinoid receptor ligand, also interacts with 5-hydroxytryptamine (5-HT) receptor*, Kimura, T., Ohta, T., Watanabe, K., Yoshimura, H., and Yamamoto, I., *Biol Pharm Bull*, 21 (3), 224-6, 1998.

³⁰ *Dopamine D(2) receptor antagonists prevent delta(9)- tetrahydrocannabinol-induced antinociception in rats*, Carta, G., Gessa, G. L., and Nava, F., *Eur J Pharmacol*, 384 (2-3), 153-6, 1999.

³¹ *The role of endogenous opioids in enhancing the antinociception produced by the combination of D9- tetrahydrocannabinol and morphine in the spinal cord*. Pugh Jr., G. & Smith P. B. & Dombrowski, D.S. & Welch, S. P. (1996), *The Journal of Pharmacology and Experimental Therapeutics* 279:608-616.

³² *The endogenous cannabinoid signalling system: chemistry, biochemistry and physiology*. Vincenzo Di Marzo and Luciano De Petrocellis, 1997, *Internet Journal of Science - Biological Chemistry*.

³³ *Cannabis and cannabinoids: Pharmacology and rationale for clinical use*, Pertwee, R. G., *Pharmaceutical Science*, 3, 539-545, 1997.

³⁴ *From gan-zi-gun-nu to anandamide and 2-arachidonoylglycerol: The ongoing story of cannabis*, Mechoulam, R. and Ben-Shabat, S., *Nat Prod Rep*, 16 (2), 131-43, 1999.

³⁵ *Control of pain initiation by endogenous cannabinoids*, Calignano, A., La Rana, G., Giuffrida, A., and Piomelli, D., *Nature*, 394 (6690), 277-81, 1998.

³⁶ *Pharmacology of the essential oil of hemp at 5HT1A and 5HT2a receptors*, Russo, E., Macarah, C. M., Todd, C. L., Medora, R. S., and Parker, K. K., in 41st Annual Meeting of the American Society of Pharmacognosy, *Journal of Natural Products*, Seattle, WA, 2000.

³⁷ *Bronchial effects of aerosolized delta 9-tetrahydrocannabinol in healthy and asthmatic subjects*, Tashkin, D. P., Reiss, S., Shapiro, B. J., Calvarese, B., Olsen, J. L., and Lodge, J. W., *Am Rev Respir Dis*, 115 (1), 57-65, 1977.

Complex

Not only do constituents synergize and moderate with one another, but there is another layer of complexity due to the integrated nature of life, where patient and environmental factors cause considerable influence on the effects of cannabis.

E.g.

The body metabolizes ingested cannabinoids into metabolites which also cause effects.

Nutritional state with regard to essential fatty acids supports the functions of many of the body's homeostatic and immune functions, having an important influence in the landscape with which cannabis interacts

The influence of some cannabinoids varies with the time of day³⁸

Elaborate physiological links between neurology, psychology, endocrinology and immunity exist within the person, linking their state of body and mind with environmental and social factors, and creating convoluted interrelationship between the person, their environment and the influences these factors play in the effects of cannabis use.³⁹

Summary

This little discussion on the interaction of cannabis with the body has barely scratched the surface of the underlying complexity and detail. Most of this detail, and in particular the interactions between the multiple elements present in cannabis, remains poorly understood by modern science.

Thousands of years of practical experience in the safe use of medical cannabis can still guide us in its safe use today (with or without a scientific explanation to the nth degree).

If we are genuinely seeking to understand the medical value of cannabis then we need to evaluate it as it is, before we try to pull it apart, and that this must include its practical application and not just laboratory techniques

³⁸ *Inhibition of the cataleptic effect of tetrahydrocannabinol by other constituents of Cannabis sativa L.* Formukong EA, Evans AT, Evans FJ, Journal of Pharmacy & Pharmacology, Feb 1988, Vol. 40(2), pp. 132-4

³⁹ *Influence of environmental and social factors supported by animal studies such as; A novel female influences delta 9-THC effects on plasma hormone levels in male mice.* Dalterio S, Bartke A, Mayfield D., Pharmacology, Biochemistry & Behavior, Aug, 1981, Vol., 15(2), pp. 281-4.

Medical value

The Working Party Report assessment of the medical value of cannabis and cannabinoids, was based on IOM perspective, it provides a reasonable introduction to medical value, mostly of cannabinoids. Conveniently pure cannabis contains the cannabinoids and so could be considered to be able to achieve the results of single cannabinoids with the advantage of synergism between compounds and the balancing effects of other constituents in mitigating the side effects of isolated cannabinoids. As the report has already provided basic information the following is to address a few extra points.

A number of reports have acknowledged the medical value of **cannabis**.

SCOST

“cannabis almost certainly does have genuine medical applications, especially in treating the painful muscular spasms and other symptoms of multiple sclerosis (MS) and in the control of other forms of pain”⁴⁰

South Australian Parliamentary – Report on cannabis (1996)

“clear indications that cannabis may be of particular therapeutic value as an appetite stimulant in HIV-related wasting, in relief of nausea associated with cancer chemotherapy, and as an analgesic.”⁴¹

Botanical cannabis medicine

The polypharmacy of botanical remedies provides a number of advantages over single-ingredient drugs

- Have multiple active compounds which act through various different mechanisms
- Synergy between compounds
 - “...synergism may play a role in the widely held (but not experimentally based) view that in some cases plants are better drugs than the natural products isolated from them.”⁴²
- Mitigation of side effects
 - “Good evidence suggests that some side effects of tetrahydrocannabinol are mitigated by other volatile compounds present in the essential oil of marijuana. ... Other cannabinoids, terpenoids, and flavonoids can reduce tetrahydrocannabinol-induced anxiety, cholinergic deficits, and immunosuppression. Other compounds increase cerebral blood flow, enhance cortical activity, kill respiratory pathogens, and provide anti-inflammatory activity.”⁴³

⁴⁰ SCOST – quoted in Report of the Working Party on Medical Cannabis, Vol. 2., pg15

⁴¹ quoted, Report of the Working Party on Medical Cannabis, Vol. 2, pg 22

⁴² *From gan-zi-gun-nu to anandamide and 2-arachidonoylglycerol: The ongoing story of cannabis*, Mechoulam, R. and Ben-Shabat, S., *Nat Prod Rep*, 16 (2), 131-43, 1999.

⁴³ *Side effects of pharmaceuticals not elicited by comparable herbal medicines: the case of tetrahydrocannabinol and marijuana*. McPartland JM, Pruitt PL, *Altern Ther Health Med* 1999 Jul;5(4):57-62

Efficacy

Anti-inflammatory

“Experiments involving oral administration of THC suggested that THC was 20 times more potent than aspirin and twice as potent as hydrocortisone.”⁴⁴

Cannabis seed also has dietary benefits as anti-inflammatory agent, providing essential fatty acids which influence arachidonate metabolism and prostaglandin formation⁴⁵

Anti-emesis

“for these patients marihuana was clearly superior to both chlorpromazine and synthetic [delta-9]-THC.”⁴⁶

“In one study of 56 patients who got no relief from standard antiemetic agents, 78% became symptom-free when they smoked marihuana”.⁴⁷

Appetite stimulation

A strong relationship between smoking marijuana and increased frequency and amount of eating, 91% of users eat every time they smoke⁴⁸

Eating is of significant benefit to those suffering from anorexia (lack or loss of appetite for food), wasting and cachexia.

Nutrition

One of the most common conditions where patients find cannabis particularly useful is that of wasting diseases, where patients are commonly nauseated and anorexic (without desire to eat). In these conditions peoples bodies waste away due to reduced nutritional intake and/or impaired digestion in the face of disease processes draining the body of energy, and causing it to burn up non-essential tissues, such as muscles, in an attempt to find nutritional reserves to keep vital bodily processes running.

Once someone’s body has reached such an extreme state of depletion, various systems, including immunity, metabolism and endocrine, become increasingly impaired independent of other disease processes and the patient is caught in a downward spiral.

The health, quality of life and life prolonging benefits from improved nutrition are considerable.

“in 1955 the Czechoslovakian Tubercular Nutrition Study concluded that hemp seed was the “only food that can successfully treat the consumptive disease tuberculosis, in which the nutritive processes are impaired and the body wastes away”⁴⁹”

55 years on, consumptive, although not necessarily tuberculoid, disease is still a problem and on the increase, although now nausea and vomiting are more commonly associated. The only safe, effective and economic medicine currently potentially available that can address the factors involved in wasting disease is cannabis, which comes with the added immune bolstering benefit of essential fatty acids.

Elements that are involved in improved nutrition include;

- Stopping vomiting - inhaled anti-emetic – cannabis resin⁵⁰
- Prevention of nausea and vomiting - inhaled or oral, as tolerated anti-emetic – cannabis resin
- Increased nutritional intake - inhaled or oral, as tolerated, appetite stimulant – cannabis resin
- Increased nutritional quality - oral high nutritive foods – cannabis/hemp seed
- Increased digestion and absorption of nutrients - essential fatty acid supplements – cannabis/hemp seed oil

If medical cannabis food was to be under Therapeutic Goods regulations the costs of developing/supplying such life sustaining, anti-emetic, appetite stimulating food would be immense. However appropriate state regulation of natural cannabis would make this physically, legally and economically practical to achieve as soon as possible.

⁴⁴ Cannabinoids: The separation of central from peripheral effects on a structural basis, Evans, F. J., *Planta Med*, 57 (7), S60-7, 1991.

⁴⁵ *Hemp for health: The medicinal and nutritional uses of Cannabis sativa*, Conrad, C., Healing Arts Press, Rochester, VT, 1997.

⁴⁶ *In the Matter of Marijuana Rescheduling Petition*, Docket 86- 22, Affidavit of Daniel Daneac, M.D. Washington, DC: Drug Enforcement Agency; 1987. Referred to in *Marihuana as Medicine: A Plea for Reconsideration*, by Lester Grinspoon, MD James B. Bakalar, JD, Journal of the American medical Association, June, 1995.

⁴⁷ *Inhalation marihuana as an antiemetic for cancer chemotherapy*. Vinciguerra, V., et al. New York State Journal of Medicine 1988;88:525-527. Referenced in *ibid*.

⁴⁸ Study by Haines and Green, 1970. source: National Institute of Health: Workshop on the Medical Utility of Marijuana, 1997: Executive Summary, p. 9

⁴⁹ *The Great Book of Hemp*, Rowan Robinson, Park Street Press, 1996.

⁵⁰ cannabis resin either alone or as naturally occurs on/in cannabis flowers.

Safety

The cannabis plant has had a long relationship with humanity, at least 10,000 years of human use, and records of its medicinal uses date back at least 3,000 years. Over this time there has been little indication of any attendant hazards, despite its common use by cultures who recorded such things as adverse effects in their medical literature. – indicating that, at least in their natural forms cannabis and cannabis products are safe to use in the proper manner.

According to the World Health Organization, “The acute toxicity of cannabis is very low. There are no confirmed cases of human deaths from cannabis poisoning in the world medical literature. Animal studies indicate that the dose of THC required to produce 50% mortality in rodents is extremely high by comparison with other commonly used pharmaceutical and recreational drugs. The lethal dose also increases as one moves up the phylogenetic tree, suggesting by extrapolation that the lethal increases as one moves up the phylogenetic tree, suggesting by extrapolation that the lethal dose in humans could not be very easily achieved by smoking or ingesting the drug.”⁵¹

As noted in *The Health and Psychological Consequences of Cannabis Use*, National Drug Strategy (monograph series No. 25), regarding the standards applied to cannabis:

"The application of the same demanding standards to existing agents for the candidate diseases, and more generally, to existing psychoactive drugs that are widely used in medical practice, would denude the pharmacopoeia."

In comparison

Alcohol and paracetamol are both readily available, “over-the-counter” drugs which can and are abused resulting in liver disease, brain damage and death. As such, they provide a useful reference point for reviewing the status of cannabis as a drug

Cannabis, which is of low toxicity and offers considerable medical benefit, is classified as a Schedule 9 item, the most restrictive of all the drug schedules. It lies in stark contrast with alcohol, which despite its high morbidity, associated social harms and its risk of fatality from overdose or withdrawal, and with only one therapeutic application, is readily available. Similarly, paracetamol, a drug considered so benign that it is available in Australian supermarkets (but prohibited in the USA), is hepatotoxic and readily fatal in overdose. However, cannabis whose main symptoms of overdose are sleeping and possible anxiety due to dysphoric effects (which are often arguably attributable to the casualty's ill-founded fears, lack of situational understanding and consequently, mismanagement) has had **no** recorded incidences of death due to overdose.

	<u>Cannabis sativa</u>	<u>Paracetamol</u>	<u>Ethanol</u>
Schedule	S9	Nil or S2	Nil (?)
Legal restrictions	+++++	+	++
LD50, approx.	40,000	30-40	10
Potential medical value	+++++	+++	+
Medical usefulness	Multiple and diverse uses	Analgesia and antipyretic	One only - methanol overdose

51 WHO Project on Health Implications of Cannabis Use: *A Comparative Appraisal of the Health and Psychological Consequences of Alcohol, Cannabis, Nicotine and Opiate Use*. Referenced, Grinspoon and Bakalar, 1993; Rosencrantz, 1983. 16

Set setting

The patients internal state – set; and external environment – setting, both influence, the effects of a drug and its subjective experience. How significant these influences are varies between drugs.

For cannabis the influence of set and setting can be considerable. The Hindu system has traditionally acknowledged this in their methodology in cannabis use.⁵²

Andrew Weil, who was involved in university studies of cannabis in the 1970's commented;

“..where the influence of set and setting dwarfs the influence of the drug itself”⁵³

Set includes:

a persons beliefs and expectations of a drug
their general mental, emotional and physical state when they consume cannabis
and the functioning of their metabolic, endocrine and nervous systems.

Setting – includes:

Physical environment
Cultural and legal environment
Social – peace and quiet to lots of people and action.
The substance (drug) itself

The influence of patient factors in understanding the effects of cannabis and cannabinoids is supported by both human studies indicating the importance of psychological factors and in particular patient expectancies, in perceived drug effects⁵⁴. And by animal studies, which, for at least one set of circumstances, “suggest that the behavioral actions of cannabinoids are largely dependent upon the animal's existing state of arousal [set]”⁵⁵, and that, the acute and chronic effects of THC are influenced by environmental factors⁵⁶.

Regarding set from small human studies⁵⁷:

“the direction and degree of response to the different doses of delta 9THC depended on the personality characteristics of the subjects.”

The skin conductance reactivity, increased after drug in subjects with low basal (pre-drug) reactivity and decreased in those with high basal levels.

Why is this important

Because Cannabis can act as a mood enhancer, it is beneficial to ensure a comfortable setting and positive mental attitude for use of this medicine.

The potential for legal conflict can increase a persons general level of anxiety (even if not a consciously recognized process), which could lead to feelings of paranoia

The mental dichotomy of perceived and needed beneficial effects, in contrast with prohibitory legislation and the threat of prosecution, can make consumption of cannabis an unpleasant experience (anxiety, paranoia) for some potential medical users. However, if people with this tendency were able to feel safe and supported when consuming cannabis then it might be a more pleasant and healing experience.

⁵² *Thandai and chilam: traditional Hindu beliefs about the proper uses of Cannabis*. Morningstar PJ Journal of Psychoactive Drugs, 1985 Jul-Sep, Vol. 17(3), pp. 141-65

⁵³ The Natural Mind, by Andrew Weil

⁵⁴ *Effects of expectancies on subjective responses to oral delta9- tetrahydrocannabinol*. Kirk JM, Doty P, De Wit H , Journal of Neuroimmunology 1998 Mar 15;83(1-2):116-23, Feb. 1998.

An investigation of procedures reported to increase potency of marijuana: a chemical analysis and psychological interpretation. Stewart J, Nielsen PJ, Neidig PH, International Journal of the Addictions, July, 1978, Vol. 13(5) , pp. 831-7.

⁵⁵ *Delta-9-tetrahydrocannabinol, EEG and behavior:the importance of adaptation to the testing milieu*. Consroe PF, Jones BC, Chin L., Pharmacology, Biochemistry & Behavior, 1975 Mar-Apr, Vol. 3(2) , pp 173-7

⁵⁶ *Tolerance to delta9-tetrahydrocannabinol in adapted and nonadapted rabbits*. Martin P, Consroe P., Pharmacology, Biochemistry & Behavior, Dec. 1978, Vol. 9(6), pp. 753-8

⁵⁷ *The seed and the soil: effect of dosage, personality and starting state on the response to delta 9 tetrahydrocannabinol in man*. Ashton H, Golding J, Marsh VR, Millman JE, Thompson JW, British Journal of Clinical Pharmacology, 1981 Nov. Vol. 12(5), pp. 705-20.

For the inexperienced user, fear of losing control, may create anxiety as the patient begins to perceive the onset of effects from cannabis. However, appropriate education as to the actual effects of cannabis, and that the patient does remain in control and is able to manipulate how they respond.

Working with set and setting

Reports of successfully managed adverse episodes to cannabis, such as dysphoria, anxiety and paranoia, have generally been resolved simply with calm reassurance.

The positive influence of set and setting could be enhanced by combining cannabis medicine with appropriate adjunctive therapies such as, relaxation, meditative, and visualization practices. This could have the added benefit of reducing the required dose of cannabis.

Older patients and doctors, are particularly likely to have experienced negative, false propaganda regarding cannabis. This has the potential to cause uncertainty, and anxiety in both patients and doctors, which would act as a negative influence on set and setting respectively.

This could easily be remedied through the provision of appropriate information to patients, family and medical personal.

Summary – Medical Value

Cannabis offers an opportunity to develop medicines, from its flowers and seeds, which maximize benefits from the interrelationships of multiple compounds.

Medical value

	Cannabis medicines	Cannabinoid medicines
Medical practicalities	variety of preparations Versatile - broad spectrum effective low side effects	Few preparations narrower spectrum less effective – lost synergism risk of side effects
Safety and effectiveness	Good 1000's years of history	OK Mostly unapplied theoretical
\$	\$	\$\$\$\$
Value for money	****	- ? -
Benefit to NSW		
Triple bottom line	√ - humanitarian, empowers people √ - low energy use, non polluting √ - efficient use of economics	X – restricted by intellectual property rights X – high tech, high energy consumption X – expensive

Development of medicines

The section of the Working Party Report which looks at drug development (section 8, vol. II), has only addressed the development of cannabinoid drugs, ignoring issues surrounding development of cannabis medicines.

Suddenly the debate has gone from;

Could it be feasible to locally produce a safe, low cost range of medicines to ease the suffering, and increase the quality of life for people who might die in the next few months

To

“According to the IOM, the estimated cost of a developing and eventually marketing a single drug is in the range of US \$200 - \$350 million”⁵⁸

This section of the report basically centers around chemical manipulations in the aim of designing ‘better’ drugs. Obligating health care provision into association with the economics of patenting, therapeutic goods regulations and marketing. However pure cannabis might already be a better medicine, without the heavy hand of reductionist science

Cannabinoid drugs

The discussion of future directions has a strong desire to see cannabinoids made more water soluble. But what of the cannabinoids inherent interrelationship with fats, which includes;

- Being (THC) about 10,000 times more soluble in oily media than in water . This property aids its uptake from respiratory tract mucous membranes into blood, and from blood into the central nervous system.⁵⁹
- As well as the cannabinoids interrelationships with phospholipids

To make cannabinoids intrinsically water soluble involves a number of chemical synthetic steps, including changing the chemical nature of the cannabinoid and admixing with extraneous chemicals.⁶⁰

Being water soluble will effectively change the way the body relates with the cannabinoid, (for example a water soluble cannabinoid might be renally excreted, while previously in its natural form it was highly lipophilic with low interaction with the kidneys), presenting new challenges to the body with unknown consequences.

Cannabis medicines

The Working Party Report, section 8.6, Regulation of and market outlook for cannabis, which briefly touches on the idea of cannabis as a botanical medicine, is presented purely from the USA situation – gladly NSW is located in Australia, is in a position to legally permit the development of cannabis medicine.

This could follow a practical, safe, common sense model;

- of surveying the existing medical users and the cannabis (or cannabis products) they are using;
- to development of appropriate quality controlled supply of ‘medical grade’;
- development of controlled trials;
- research and development of improved delivery systems;

Incorporation of research findings, including patient preferences, into development best practice in production, supply, standard of preparation and education in an evolving processes of product development and medical learning.

⁵⁸ US Institute of Medicine Report (IOM) 1999, p.197, source Report of the Working Party on Medical Cannabis, Vol. 2, pg 55.

⁵⁹ Report of the Working Party on Medical Cannabis, Vol. 2, App. D.

⁶⁰ Report of the Working Party on Medical Cannabis, Vol. 2, pg 60.

Dosage

The Report claims that smoking dried cannabis produces uncertain dosage.⁶¹ But in terms of medical effectiveness, its not the absolute dose (e.g. x mg THC/kg body weight) that matters, but rather whether the patient receives the right dose to be effective.

Like many drugs, the amount of cannabis required to cause a particular effect will vary considerably between individuals, and in the same individual from day to day. Anecdotally, the effective dose of cannabis shows quite wide variation.

Drugs (which have a wide safety range) are often prescribed or sold with the direction of p.r.n. – pro re na'ta – according to circumstances, with a range of dosage for the patient, to moderate according to circumstances.

While the health practitioner can provide guidance, it is the patient who experiences the disease from day to day, who assesses their own response to the medicine, and who ultimately has to manage their own dose titration.

Titration of dose

Standardization

Most drugs come in a standardized form, so that both doctor and patient, know how much of a particular substance is consumed. With for example Marinol, which comes in 2.5, 5 and 10mg, is taken in discrete packages with 2.5mg the minimum.

With natural preparations of cannabis there is much greater potential to adjust dose. Lower potency preparations allow for finer manipulation of dose. Higher potency preparations provide for easy high dose administration and loading doses. With the patient directing dosage, with experience they can titrate a dose to suit personal needs and environmental demands, disregardless of whether it means they consume the equivalent of 1.5 mg, 4 mg or 6.85 mgs of THC.

Patient dose titration

While there are some conflicting reports on users abilities to successfully titrate cannabis dose. However there is a general view that it is naïve users who have trouble managing dose⁶². Indicating that this could be a readily learnt skill

That with appropriate education, preparations standardized for THC content, and some patient experience, it is reasonable to conclude that the majority of patients will reasonably easily be able to titrate their own dose of cannabis within quite reasonable limits, and certainly well within the bounds of safety.

Because factors such as environment, severity of symptoms, individual response to cannabis, may change significantly from day to day, causing distinct variations in effective dose, so there are distinct advantages if patients are able to successfully self titrate dose.

⁶¹ Report of the Working Party on Medical Cannabis, Vol. 2, pg59.

⁶² Australian Pharmacists Against Drug Abuse (APADA) submission and Lucy Charlesworth submission to Working Party on Medical Cannabis, Feb, 2000.

Delivery routes

This is not an either, or question (smoking versus oral).

Each method of delivery has its own distinct advantages, more or less appropriate, according to circumstances.

Systemic;	Rapid onset	- inhalation (vaporized or combusted)
	Slower onset	- oral (prolonged effect)
		- mucosal absorption
		- per rectum
		- per vaginam

Local; - topical

Delivery methods

Inhalation

Rapid onset, facilitates patients ability to titrate appropriate dose⁶³
Effective when oral medication not an option

Of Smoke

Smoking provides rapid onset and allows patients to titrate dose.⁶⁴

From the first puff the patient is able to assess the preparation (joint) for potency and taste, subsequently moderate intake according to their need.

Experienced patients moderate their intake with their method of smoking, however holding the breathe does not create significant increases in absorption.

Smoking poor quality cannabis may present the additional risks of inhaling fungal and chemical contaminants.

Assessment of the risks of smoking must also look at what else is burned and inhaled, including the quality of rolling paper and the use of added tobacco

Tobacco

Nicotine and probably other substance in tobacco, causes stimulation through activation of the adrenergic system, constricting blood vessels, increasing blood pressure and restricting lung expansion. Known cause of high morbidity and mortality, chronic obstructive airways disease (COAD) and cancer.

Cannabis

Acts through a different endogenous signaling system, one more involved with relaxation and modulation, reduces blood pressure (increases in heart rate probably due to, hearts response to reduced arterial pressure)

It has been theorized that cannabis, like sage, facilitates lung expansion. Although pre-cancerous cytological changes have been found in the airways of cannabis smokers, their progression to cancer is less certain. Development of COAD seems to be associated with tobacco use but not cannabis use.⁶⁵

Of vapor

Rapid onset, vaporization of dried cannabis flowers, hashish or resin oil.

The boiling points of the active constituents of cannabis are considerably lower than the flash point of the flower or resin.⁶⁶ Therefore they could be vaporized and inhaled, avoiding burning vegetable matter and reducing exposure to smoke, tar and carcinogens.

A number of vaporizers are currently available, however there are no specific details available, such as the temperature range and heating rate of the heating element.

⁶³ *PLWHA*: submission to the Working Party on Medical Cannabis, Feb, 2000

⁶⁴ Australian Professional Society on Alcohol and Other Drugs (APSAD) submission and Lucy Charlesworth submission to Working Party on Medical Cannabis, Feb, 2000.

⁶⁵ Tashkin, D. P., Simmons, M. S., Sherrill, D. L., and Coulson, A. H., Heavy habitual marijuana smoking does not cause an accelerated decline in FEV1 with age, *Am J Respir Crit Care Med*, 155 (1), 141-8, 1997.

⁶⁶ *Vaporization of Cannabinoids: a Preferable Drug Delivery Route*, by Tod H. Mikuriya, M.D., Schaeffer online library.

Oral

Avoids lung exposure, slow onset, prolonged action

Slower onset allows the patient to approach any mental effects in a more gradual pace, which can be less distressing for the inexperienced or anxious

Orally ingested cannabis flowers or resin is subject to extensive first pass effect of hepatic metabolism, which reduces amounts of active constituents reaching the systemic circulation and which yields 11-hydroxy-THC, may prolong the appetite stimulation effects, and which is more psychoactive than THC⁶⁷, - this needs to be considered in managing dosage.

The gastrointestinal tract has its own local neurological and paracrine signaling system. Cannabis will have local effects, following ingestion, via cannabinoid receptors (predominantly CB2) and other mechanisms.

Many of the active elements in cannabis (inc. cannabinoids, terpenoids and essential oils) are highly lipophilic, so gastrointestinal absorption is enhanced when they are ingested in the presence of other lipids (fats). However, biological activity of cannabinoids, might be altered by high levels of associated protein.⁶⁸

The lipid content of cannabis seed also has beneficial interactions with the gastrointestinal tract and may relate to local prostaglandin synthesis. Oral ingestion is the common route for essential fatty acid supplementation which can be combined with the appetite stimulating and anti-emetic properties for cannabis flowers.

Development of delivery systems

The Working Party Report discusses development of delivery systems for cannabinoids in terms of “significant gains to intellectual property”⁶⁹, and goes to reasonable lengths to highlight their potential, despite obvious problems to their development, such as cannabis lipophilic nature. This is a high tech, high cost approach, is not currently available⁷⁰ and will take considerable time to achieve and does nothing for harm prevention in the short term.

Regarding safer delivery systems for cannabis the following unreferenced statement was made. “Claims that these systems are “close to being developed” are incorrect.”⁷¹

However, Aromed a German company has already designed and made a vaporizer (patent pending).⁷² Additionally locally made vaporizers of variable quality are currently available in NSW.

The development of cannabis, rather than cannabinoid, lozengers should be relatively easy to develop in the near future.

Overall the report indicates that are a number of complex technical issues which need to be addressed for the development of alternative delivery systems for cannabinoids⁷³, not the least of which is development of cannabinoids in some aqueous form. However, despite the high tech, high expense nature of developing alternative delivery systems for cannabinoids, the report states that “the requisite funding is within the reach of State government sources with or without pharmaceutical industry partnership”⁷⁴

Likewise funding should be made available for development of alternative delivery systems for cannabis, for patient care and general harm reduction.

⁶⁷ *An efficient new cannabinoid antiemetic in pediatric oncology.* A. Abrahamov, A. Abrahamov and R. Mechoulam, Journal of the International Hemp Association, Vol 2, No. 2, 1995

⁶⁸ Delta-9-tetrahydrocannabinol-(THC)-mediated inhibition of macrophage macromolecular metabolism is antagonized by human serum proteins and by cell surface proteins. Tang JL, Lancz G, Specter S, International Journal of Immunopharmacology, Aug 1993, Vol. 15(6) , pp. 665-72.

⁶⁹ Report of the Working Party on Medical Cannabis, Vol. 2, pg 60.

⁷⁰ Report of the Working Party on Medical Cannabis, Vol. 2, App D.

⁷¹ Report of the Working Party on Medical Cannabis, Vol. 2, pg 59

⁷² excerpt www.aromed.com

⁷³ Report of the Working Party on Medical Cannabis, Vol. 2, pp 59-60 and Appendix D.

⁷⁴ Report of the Working Party on Medical Cannabis, Vol. 2, pg 61.

Side effects and withdrawal

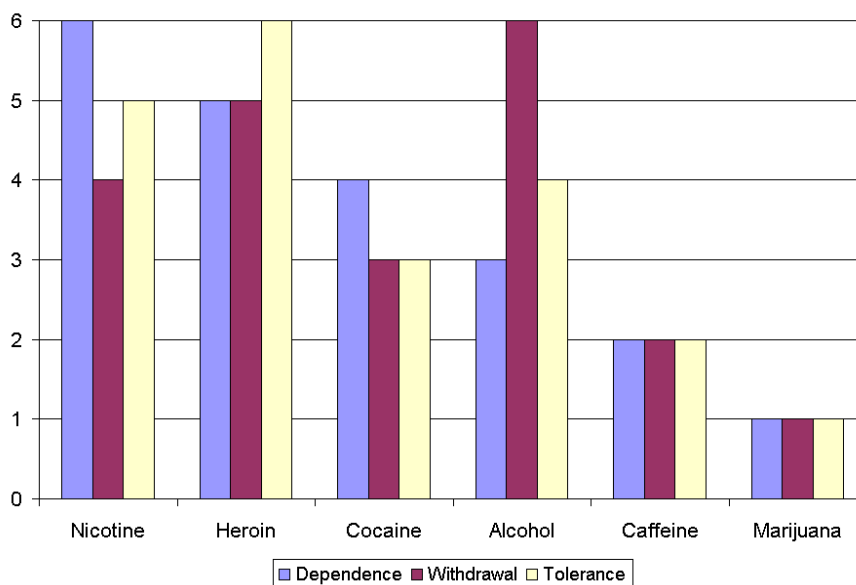
Side effects have been well reviewed – so just a couple of extra points.

Anecdotally some cannabis users report increased incidence and severity of withdrawal symptoms following chronic use of hydroponic cannabis, compared to 'bush', naturally grown cannabis.

Cannabis smoking, when mixed with tobacco can lead into and support a tobacco addiction.

When viewed in comparison with other commonly used drugs⁷⁵ cannabis is considered of low biological addictiveness. Withdrawal symptoms are minor, especially when compared with the prolonged and distressing symptoms of benzodiazepine withdrawal (a Schedule 4 drug) or the delirium tremens of alcohol withdrawal with its associated psychosis and potential fatality.

Cannabis' ability to provide analgesia, anxiolysis, and relaxation of gastrointestinal cramping through mechanisms independent of the endogenous opiate receptor system actually make cannabis a potentially useful agent in the management of heroin withdrawal.



“Two ounces of good quality cannabis is used for heroin addiction withdrawal period, - ‘we call it warm turkey’. There are thousands of ex-alcoholics and heroin addicts in the community who now only use cannabis as their panacea”⁷⁶

It is a commonly held belief that cannabis is useful in the management of many of the withdrawal symptoms of other drugs such as heroin and alcohol, and that its use reduces the occurrence of relapse.

⁷⁵ Data for chart from; “*Is Nicotine Addictive? It Depends on Whose Criteria You Use.*” Jack E. Henningfield, Ph.D. for NIDA, Reported by Philip J. Hilts, *New York Times*, Aug. 2, 1994

⁷⁶ Elder, of the illicit drug community

Problems with the cannabinoid orientation

By placing the debate within the domain of immense corporate pressures for intellectual property, market control and multimillion dollar economics has directed the scientific and government inquiries into, 'more reductionism is better', and that, 'natural cannabis is crude'.

However pushing of medicinal cannabis into a form like proprietary pharmaceuticals will make them more expensive, place numerous restrictions on their production, distribution and supply, and possibly be inferior in medical effectiveness.

Cannabis is ill suited to highly reductionist regulatory system (such as therapeutic goods), its toxicity is negligible, its side effects are relatively minor, on a safety assessment based on substance attributes it is safer than drugs available in the supermarket

There is currently a lack of holistic, foundation scientific knowledge on the practical medical application of cannabis, from which to base more specific lines of inquiry

Reductionism

The more one narrows ones field of view the more fine detail may be seen, but the overall picture and understanding of interactive processes becomes obscured somewhere outside the specific domain of inquiry. In the practice of medicine it is not so much whether the patient has ingested exactly 10mg of THC, but whether their general health and quality of life has improved, through beneficial influences bringing some harmony to a disordered complex biological system.

Aspirin, a standardized isolated pharmaceutical chemical, was originally derived from plants – meadowsweet and white willow bark. Aspirin is known for its wide benefits, but also for its strong association with gastro-intestinal ulceration and bleeding, in contrast to this, meadowsweet possess many of the properties of aspirin but is used to sooth stomach disorders and has no association with gastric ulceration⁷⁷. If a fraction of the amount of research and development had gone into herbal meadowsweet, as has gone into aspirin, then perhaps today we would have a herbal analgesia with all the benefits of aspirin, but without the morbidity and mortality of gastric ulceration.

⁷⁷ *The Healing Herbs*, M. Castleman, Bookman Press, 1991.

Pure cannabis - benefits

Benefits of natural cannabis as a therapeutic agent, lies not in patented pills, but in the empowerment of patients, care-givers and local health centers.

Natural cannabis and products are superior to isolates and synthesized cannabinoids:

- Natural balanced cannabinoid ratios and other beneficial elements, essential oils, etc.
- The synergistic and mitigating effects between constituents – more effective, less side effects
- Pattern variation in constituent/cannabinoid profile might relate to less habituation, and hence less tolerance development
- Their being more readily available and easier to produce.
- Being less patentable, freeing health care (everyone's right) from the issues of intellectual property and the global marketplace
- Lower production costs.
- Greater background knowledge on their safe application, due to thousands of years of their therapeutic use
- Less environmental costs in production, including less energy use
- The difficulty of studying each cannabinoid in isolation and the complexity of their compound effects.
- Organic
- 'Better taste' – traditional medicinal and culinary herbs, wines, and even tobacco are all distinguished re their qualities by some form of subjective appreciation – be it appearance, smell, texture, taste, or the experience of ingestion.
- Patients commonly show preference to cannabis over cannabinoid drugs (oral THC) when both are available⁷⁸.
- Community based practical health solutions, to many of the worlds most pressing health problems – that of AIDs and cancer, especially for underdeveloped nations.

⁷⁸ *Marihuana, the Forbidden Medicine*, Grinspoon L, Bakalar JB., Revised and Expanded Edition. New Haven: Yale University Press, 1997.

Medical grade cannabis

Qualities

Production: Organic, naturally grown
 Best agricultural practice
 Quality storage and packaging
 Australian

Source: Licensed growers
 Home grown with good skills

Variety of potencies
Variety of natural (herbal) preparations – food, resin, extract, etc
Variety of delivery methods – oral, inhaled, etc

Quality controlled

- Microbiologically safe – batches, especially those destined for inhalation, need to be checked for fungal and other microbiological contamination
- High food safety standards
- Graded and marked for THC content (+/- CBD⁷⁹) to facilitate effective patient titration of dose.

Medical application of cannabis

Considers the influences of set and setting when using potentially psychotropic medicines in patient management

Pattern matching between particular syndromes and cannabis cultivar attributes

Patient orientated

Food as medicine

⁷⁹ or other cannabinoid which may have significant influence subjective dose titration, - pending results of research.

Supply of cannabis and cannabis derived products for medical use and research

Patient and care-giver production

The recommendation that five plants etc is almost impossible in terms of growth and maturation patterns of an outdoor seasonal crop

The alternative, indoor production, to meet these requirements, would require, not only lights, but also some form of budding chamber and probably hydroponics – this would create more problems for patients and carry additional risks (see page 32).

<p>Strengths:</p> <p>Empowers patients and their care givers with a tool to relieve the patients suffering</p> <p>The act of gardening can be good for ones mental and physical health</p> <p>Potential for high quality medicine</p> <p>Quality control through traditional herbal growing practices.</p>	<p>Weaknesses:</p> <p>Additional stress to patient and caregivers</p> <p>Requires:</p> <ul style="list-style-type: none"> horticultural skill, location out of public view, time, physical ability physical energy. <p>Lack of practical experience</p> <p>Lack of analytical quality assessment</p> <p>Seasonal production,</p> <p>Need for safe storage</p> <p>Seeds sourced from black market</p> <p>Need to supplement supply from black market</p>
<p>Opportunities:</p> <p>Patient and caregiver education</p> <p>Increase patient role in managing their disease.</p>	<p>Threats:</p> <p>Theft and home invasion, fear and paranoia</p> <p>Crop failure, poor seeds, weather, etc</p> <p>Poor quality of cannabis</p>

Non-profit medical cannabis dispensaries

Current legal setting.

<p>Strengths:</p> <p>Only these type groups have cared enough to try and help these people in need and distress.</p> <p>They have current, practical knowledge on how to fulfill the need for supplies of medicinal grade cannabis.</p> <p>And are actively working to improve the quality of their service</p> <p>Not for profit</p>	<p>Weaknesses:</p> <p>Considered illegal</p> <p>Law makes criminals of people whose intentions are Innocent</p> <p>Legal obstructions to analytical facilities.</p>
<p>Opportunities:</p> <p>To be recognized by state regulations as legitimate producers/suppliers of medicinal grade cannabis</p> <p>Development of increasing quality of supply – evolving by integrating new information as it comes to light</p>	<p>Threats:</p> <p>At risk of being penalized for attempting to rectify a deficiency in the health care system, to the best of their abilities and when it is the law which is the incongruous element</p>

Regulated dispensaries of medical cannabis

Possible legal setting – natural controlled product produced by authorized non-profit medical cannabis growers/dispensaries

Strengths: Fastest option for development of legitimate, quality supply Quality controlled supply State regulated Could meet international obligations Local industry, jobs and expertise development. Genetic diversity – benefits to medicine and agriculture. Wide range of preparations	Weaknesses: Still needs to be instigated on a legislative level
Opportunities: Patient education Liaison and improved communications between researchers and users of medical cannabis	Threats: Failure of government to instigate appropriate regulations – lack of quality controlled supply available for patients

Registered Therapeutic Goods

<p>Strengths:</p> <p>Exactly standardized, qualitatively and quantitatively reproducible for every contained compound (?)</p>	<p>Weaknesses:</p> <p>Regarding cannabis – “almost impossible to produce a standardized product to satisfy the criteria set down by the Therapeutic Goods Administration” (due not only to its variability but also its <i>versatility</i>.⁸⁰)</p> <p>Isolation and/or synthesis of cannabinoids – see page 25</p> <p>Loss of synergism present in natural preparations – reduced medical effectiveness</p> <p>Very high costs.</p> <p>Excessively reductionist control mechanisms</p> <p>Significant time delay till available.</p> <p>Restricted production and access due to proprietary ownership and control.</p> <p>Reduced variety of preparations due to cost and regulations per preparation – reduced ability to individualize patient care.</p> <p>Foreign ownership</p> <p>Federal legislative hurdles such as Importation regulations.</p> <p>Federal control</p> <p>Monopolization (oligopolization) of ownership and control of a versatile, safe, broadly useful medicine.</p>
<p>Opportunities:</p> <p>Possibility for Australian enterprise</p>	<p>Threats:</p> <p>Restriction of access to certain patients, e.g.. Ability to pay.</p> <p>Importation threat to local businesses wishing to develop cannabis medicines</p> <p>Risk of federal impediments to their registration</p> <p>Lack of interest from pharmaceutical companies for their development.⁸¹</p>

⁸⁰ Pharmacy Guild of Australia (PGA) NSW, submission to the Working Party on Medical Cannabis.

⁸¹ Australian Pharmaceuticals Manufacturers Association submission to the Working Party on Medical Cannabis, and IOM report 1999.

Black market supplies

<p>Strengths:</p> <p>Readily available for those who know where/who. No regulations have to be changed</p>	<p>Weaknesses:</p> <p>Unknown quality, mostly NOT medicinal grade. Expensive Risk microbial and chemical contamination Inaccessible to inexperienced users, the aged, debilitated and people of varied ethnic, social, cultural and religious backgrounds. Expensive, with no option for government funding patients medications. Controlled by criminals. Illegal. No improvement in quality. No patient education. Non-conducive to medical research. Doesn't meet the aims of this Working Party.</p>
<p>Opportunities:</p> <p>To improve its public credibility by supplying cannabis to authorized patients who are unable to 'grow their own'.</p>	<p>Threats:</p> <p>Risk being offered harder drugs as alternative to cannabis Rip offs'</p>

Confiscated plants

Medical cannabis - Inappropriate, poor inconsistent quality, lack of access, local legal/regulatory issues, questionable in terms of 'basing a licit activity upon an illicit source'⁸².

Research – samples should be analyzed for content and quality for public health.

⁸² Working Party on Medical Cannabis, Vol. 2, pg 88.

Production methods

Despite last centuries demonization of cannabis, it has been safely grown and used for thousands of years, in its natural forms. Yet more recently there have been concerns that there is an increase in mental disorders, especially in youth, querying if this attributable to increased potency of cannabis, from the perspective that THC is the main psychoactive constituent. Halls review⁸³ of the THC content of Australian cannabis, while able to discount any major increase in THC content, and questioning any significant relationship with changing mental health patterns, highlights how little is actually known about the composition of cannabis available in Australia.

Growing methods have undergone significant changes over the past few decades, from natural, outdoor, cultivation, to hydroponic production under artificial lights (prompted by the need for concealment). These changes in growing conditions could in some way alter the plants natural physiology, perhaps changing the ratios of active constituents. Additionally, plant breeding has sped up, with particular cultivars being bred to suit the demands of the black-market – rapid growth, adapted to hydroponic conditions, potent high, etc, without necessarily providing a balanced pattern of constituents. Timing of harvest will also influence ratios of active constituents, e.g. the state of formation and breakdown of THC.

A number of non-THC constituents of cannabis, are known to moderate and balance the effects of THC, they not only influence the nature of the ‘high’, but probably also the development of tolerance and addictive behaviours.

Also, poor quality cannabis may also contain other elements (such as pesticides) which could affect the nervous and other body systems.

Despite all these potential differences in the cannabis that is consumed in Australia, hydroponic production and the extra risks of poor quality cannabis are rarely mentioned in the medical literature⁸⁴.

While it is possible to grow quite high quality organic cannabis hydroponically, it is not for the unskilled and/or debilitated, and rarely does the black market grow their hydroponics organically.

Natural outdoors - organic

Advantages

Easy to do organically, skills acquirable with appropriate education

Good soil - Plant is able to control its nutrient uptake from the soil
Full range of micronutrients available

Quality of soils and plant growth can be improved with natural/organic methods

High yield

Plants display natural characteristics

Should, if legally permitted, be able to find cultivars suited to local conditions, to utilize the plants natural adaptations to environmental conditions providing the ability to protect itself from fungal growth, etc

Disadvantages

Risk of prosecution, theft of plants, etc

Susceptible to adverse weather conditions

Seasonal supply - need for dry storage

Need access to land out of view of public

Outdoors – inorganic

Outdoor cannabis, on poor soil, with few skills, or with chemicals, especially if weather conditions are unfavorable will show many of the disadvantages of inorganic -indoor cannabis.

⁸³ *The THC Content of Cannabis in Australia: Evidence and implications*, Wayne Hall and Wendy Swift, National Drug and Alcohol Research Centre (NDARC) Technical Report No. 74, University of New South Wales.

⁸⁴ E.g. Cannabis and Psychosis Conference Papers, March '99, Victoria

Indoor growing

The prohibitionist setting has encouraged indoor cultivation of cannabis and the development of cannabis designed to favor the current black-market, this is typically high in THC, but not necessarily in as favorable a balance with other cannabinoids, such as CBD, CBN, etc

Currently in Europe, education campaigns are being run, encouraging the use of dirt over hydroponics, and the use of organic methods.

The more sophisticated the artificial the grow system the more it is able to overcome some of the following limitations, through energy consuming practices such as moveable lighting and computer driven environmental control – however these type of facilities would require considerable economy of scale – only possible by the large scale black market hydroponic producer, who are rarely that interested in expensive quality issues – i.e. into quick cash crop generation. For the small grower wishing to grow indoors it would be possible to design an adequate organic indoor system, using dirt, moveable lighting, etc, however it would have an initial outlay of maybe \$1,000 to set up, plus ongoing electricity bills.

Advantages

Easy to conceal or put in a spare room

Yield every 3-4 months or less

Does not require outdoor, out of sight, land

Disadvantages

Expensive

Lack of less well understood nutrients

Requires, lights, ventilation, nutrients +/- hydroponic system, nutrient analyzer, etc

High energy input required

High fossil fuel use

Theft of electricity by growers

Disruption normal physiology

Root system

While it maybe the flowers which are consumed the underdevelopment of the plants roots system in both hydroponic and aeroponic systems will affect the plants normal growth pattern

The root structure, provides the means for the cannabis plant to interact with the earth and solid elements, and is the foundation of cannabis' various qualities, this is dramatically altered in hydroponic and even more so in aeroponic systems. What effect this has on the plants physiological processes is unknown.

Direct exposure of the whole (relatively reduced) root system to raw nutrients does not provide the benefits of soil with its living processes, broader micronutrient profiles, microflora, and hydrological management.

Within a hydroponic system all the roots have a high exposure to raw nutrients, the plants are unable to moderate nutrient uptake like soil grown plants, through favoring particular areas of their root system (e.g.. Near surface – deeper tap root).

Artificial lighting

Distortion of normal plant physiological processes and regulatory mechanisms. The cannabinoid production and growth cycles including flowering and seed development relate to both light quantity and day length cycles.

Reduced spectrum of electromagnetic radiation available from halogen lights compared with sunlight

Abrupt light intensity changes, minimal cyclic variation

Natural light

Diurnal light cycle – night, dawn, morning midday, afternoon, dusk, early night

Season change – day length, smooth, gradual variation

Artificial light

day /night – absolute extremes

Environment

Reduced air flow and ventilation of grow rooms, (exaggerated by prohibition inducing increased concealment and stuffiness)

Humidity and low ventilation -> encourage fungal growth

Environmental influence on active constituent profile – e.g., THC:CBD⁸⁵

⁸⁵ *Cannabis: an environmentally and economically viable method for climate change mitigation*, Marc R Deeley, Thesis, University of Strathclyde

Multiple cloning

Fails to provide/allow the plant its natural mechanisms to evolve in balance with the environment and protect itself against pests and disease.

Development of particular strains, favored by growers particular preferences, but not necessarily appropriate chemovars for general consumption. Chemovars developed for their 'high' and not for medicinal attributes.

Inorganic

Possible contamination with

- Heavy metals contamination – cannabis is known for its ability to efficiently extract heavy metals from soils

- Pesticides

- Fungicides

- Fertilizers and excess relatively free K, Ph, Ca, etc.

- Hormones e.g.. Growth hormone and synthetic oestrogens

Anecdotally

Possible effects of disordered active constituent profile or chemical contamination

Different stone

Faster and more erratic thought processes, 'mental buzz'

increased incidence of anxiety

More rapid tolerance development

More addictive

Increased withdrawal symptoms - reduced sleep and appetite, irritability, and sweating

Summary

History has demonstrated the risks of increased harms associated with increasingly severe prohibitive legislation, leading to increased processing of drugs for the black-market. This was perhaps most obvious in Hong Kong with the increased morbidity and mortality associated with opiate use following tighter legislation prompted use to change from smoked opium to intravenous heroine.

While cannabis is obviously completely different to opiates, there remain unacknowledged risks attendant with prohibition driving cannabis production into artificial production and control by the black market. Such as chemically contaminated cannabis, fungal infections in susceptible individuals, etc, and possibly the changing nature of cannabis (active constituent profile) creating tendencies to increased problems particularly for youth.

The recommendation of the Working Party Report that authorized patients and care-givers be permitted to grow cannabis for medical use, fails to address how they will achieve a consistent high quality supply of medical grade cannabis. While a few of these people will have the means to grow outdoors, many of them will not. Expecting these people to develop small indoor grow setups is completely impractical considering costs and skills required to avoid chemical and microbial contamination.

Authorized non-profit medical cannabis growers/dispensaries have the potential to; develop knowledge in and implement best practice production methods; produce quality controlled medical grade cannabis; provide information and seed stock for patients who wish to grow their own medicine; provide information re production methods for harm reduction education.

Storage

Cannabis flowers must be properly dried prior to storage.

Storage conditions must be dry to prevent the growth of fungus which occurs under damp or humid conditions.

A strong growth of aspergillus fungus has been found on hydroponically grown, incompletely dried cannabis, stored in a sealed plastic bag (i.e. bagged wet).⁸⁶

Preparations

Numerous different medicinal preparations can be made from natural cannabis, which will include all cannabinoids, terpenoids, flavoids, etc present in the trichomes.

Including;

- Dried flowers
- Resin – hashish
- Foods - appetite stimulating nutrition
- Oil extract of flowers
- Tincture of flowers
- Extract from roots
- Homeopathics
- Tea

All medical preparations should be graded for quality with at least some batches tested for THC content to provide a guide for patients re potency using THC content as principle indicator.

The resinous compounds present in cannabis flowers and leaves readily dissolve in oil and mild heat)

Dilution with additional oil could allow a preparation to be standardized with respect to content of one or two main components (e.g. THC +/- CBD).

Quality management needs to extend from growing methods through to final medicinal product.

If found necessary cannabis could be sterilized by several methods⁸⁷ to reduce microbial risks to the immunocompromised.

Research

Research is required to address the gaps in scientific understanding of *Cannabis sativa*.

It would be remiss to fail to take a holistic scientific look at the potential of cannabis medicines, in all their diversity, before descending into reductionist paradigm, of isolated cannabinoids and patented technology.

Please see our draft proposal for medical research, submitted to the working party as a separate document

Medical research needs quality graded supply if it is to provide accurate information, and a conducive legal environment.

Research needs to be undertaken into basic chemistry and pharmacology of cannabis, for both medical and public reasons. Currently there is not even basic information on the composition of cannabis in Australia.

⁸⁶ pers comm. with microbiologist.

⁸⁷ Medical marijuana and its use by the immunocompromised. McPartland JM, Pruitt PL, Altern. Ther. Health Medicine, pg 39-45

Legal

With so many words above on the medical aspects of cannabis, as I'm not a lawyer I won't bore you with attempts to interpret State, Federal and International law. My current understanding of the relevant laws and treaties, leads me to believe that the suggestions presented in this paper; would not be in conflict with Federal legislation; would not contravene any of Australia's international obligations; are readily feasible on a state legislative level; and that these changes are likely to be acceptable to broad sections of the community, when presented with appropriate information.

This would be consistent with SCOST recommendation that cannabis should be allowed as an unlicensed medicine.⁸⁸

The broad effectiveness and versatility of cannabis is in its wholesomeness as a naturally occurring medicine, which is preserved in naturally formulated products. This makes state regulation controlling its production as a natural or herbal product so appropriate.

Cannabis remarkable safety profile should justify its exclusion from classification under therapeutic goods regulations which are overly restrictive and designed for pharmaceutical style chemical isolates and synthetic drugs.

State regulated natural production and supply would fulfill immediate medical and research needs and allow for the rapid development of quality control in medicinal cannabis. This would not make regulation of cannabis any less strict, but would facilitate the local cost effective development of safe, effective natural medicines, with diversity of preparations and versatility in medical care.

Authorization

Practitioners

The historical use of cannabis by various medical systems should be considered.

Mechanisms for authorization of suitably qualified health practitioners such as medical doctors (Western), doctors of Traditional Chinese Medicine, Ayurvedic medicine, etc, with recognized qualifications and expertise.

That authorization, should come with education for the practitioner on cannabis and its medical application.

The inclusion of non-western doctors as authorized practitioners will enhance the overall understanding of cannabis as medicine, as they bring with them additionally skills and traditional knowledge of medical cannabis use.

Patients and care givers

While it is good that patients may be able to avoid prosecution for medical cannabis under the recommendations of the Working Party, this still leaves them with only black-market supply – what other medical therapy are patients expected to purchase in the black market with only their own ability to provide quality control

Producers

Non-profit medical cannabis dispensaries need to be authorized and regulated to produce quality controlled natural cannabis

Benefits of regulated supply

Development of legal supply and distribution would enable a number of additional benefits

- Provision and development of patient education
- Liaison with between research and medical users

Additionally

The development of a seed bank; including both high and low THC *Cannabis sativa* cultivars, to ensure perpetuity of genetic diversity, and avoid some of the pitfalls associated with monogenetic or genetically restricted crops.

The development of an industry seedbank, to promote diversity of genetic strains should not monopolized by a single vested interest.

⁸⁸ Working Party on Medical Cannabis, Vol. 2, pg 17

Social setting

More than 83% of those surveyed in NSW, in 1995, responded that they agreed with permitting legal use of medical cannabis⁸⁹

“A two-year study by the Police Foundation's (UK) national commission on the misuse of drugs showed the classification of harmfulness by the 1971 Act no longer reflected scientific, medical or sociological evidence.”⁹⁰

Many countries, are currently in the process of assessing and revising their laws regarding cannabis, number of them have seen complete decriminalization or legalization as a viable option.

Global setting

Natural cannabis medicine would be a positive for health care in midst of globalization, poverty, and proprietary restriction of legal medical drugs.

Funding

Funding needs to be made available for independent research into the effectiveness and methodology of using cannabis medicinally.

There should be government support, for the development of natural medicines like cannabis which have the potential to reduce public health care costs.

That preparations of cannabis which maximize the benefits of synergism present in whole cannabis, and cannabis / nutritional or other combinations be given adequate research and funding to develop safe, effective medicines.

Education

Of health care practitioners

Many health care practitioners have had very little to do with the medical use of cannabis and will need appropriate education to correct deficits in knowledge

Of public

The public need to be informed about the medical use of cannabis.

Information regarding basic measures people can employ to improve safety in cannabis use should be made available as soon as possible, irregardless of the outcome of the working party.

E.g.. How to sterilize suspect cannabis, the need for flushing of hydroponic systems, risks of mixing tobacco in with cannabis, and chemicals from plastic water-pipes.

Of patients

All patients should be educated about how to safely and effectively use their medications, including warnings regarding due care with operation of machinery, etc. Family and care-givers will also need appropriate education.

If patients are going to 'grow their own' then they also need information on how to grow and store medicinal grade cannabis.

Education of patients could be facilitated through authorized medical cannabis dispensaries

⁸⁹ *Public Perceptions of Cannabis Legislation*, J. Bowman, and R. Sanson-Fisher, National Drug Strategy Monograph Series No. 28, Australian Government Publishing Service.

⁹⁰ *Why are they so afraid? Wise advice on cannabis is being ignored*, The Guardian, UK, 9 Feb. 2001.

Summary of response to the Working Party's Recommendations

3.1 MEDICAL AND THERAPEUTIC ISSUES

3.1.1 PHARMACEUTICAL CANNABINOIDS AND RELATED SUBSTANCES

Recommendation 1

While recognising the limitations of currently available pharmaceutical preparations of cannabinoids, the Working Party recommends that they should be subject to further clinical trials of safety and efficacy as described below.

There have been no Australian studies assessing the safety and efficacy of either cannabis or cannabinoids. Overseas studies have shown that patients often prefer natural cannabis to cannabinoid drugs, finding them more effective, with less side effects, easier to titrate correct dose and less expensive. It is unreasonable to prejudice research and development in favor of cannabinoids over cannabis. Pharmaceutical preparations of cannabinoids would be considerably more expensive to the State health care budget than natural cannabis medicines.

Recommendation 2

The Working Party recommends that the New South Wales Government through the Australian Health Ministers' Forum explore avenues for greater flexibility in new medication registration by the TGA based on the clinical needs of special populations.

The NSW government should also explore ways for regulated natural medicinal cannabis production and supply

3.1.2 OTHER RESEARCH RECOMMENDATIONS

Recommendation 3

That the Government consider funding or otherwise facilitating surveys of current medical users of cannabis and their carers to obtain an indication of how many persons are at risk of criminal prosecution for medical use of cannabis.

It would be helpful to know how many people are in need of medical cannabis.

The surveying of ill people should not unnecessarily burden them with pernicious influences, such as; labeling them and their carers as possible criminals; reminding them of the risks of criminal prosecution they might face, as consequence of using cannabis to manage their disease processes; and of the incongruities of current legislation and medical need; and the fear that honest answers might be 'dobbing' in their friends and carers.

If such a study is undertaken, then participants and their carers need to be, and feel safe from prosecution so that they are in a position to provide honest and accurate answers.

Recommendation 4

That the Government consider funding or otherwise facilitating surveys of potential medical users of cannabis and cannabinoids to obtain an indication of how many persons would wish to use cannabinoids for medical purposes under a more favourable regulatory regime.

Good

Recommendation 5

The Working Party recommends that randomised controlled clinical trials, and controlled studies in individual patients, be conducted on the therapeutic efficacy of cannabis and cannabinoids.

Yes, good

Please see our proposal research into the medical effectiveness of cannabis (and cannabinoids if available).

Recommendation 6

It urges the NSW government to consider funding or otherwise facilitating research for this purpose.

Hopefully they will, and how do we apply?

Recommendation 7

The Working Party recommends that the NSW Drugs Misuse and Trafficking Act 1985 be amended to ensure that there are no legal obstacles to the conduct of such trials.

Good

Recommendation 8

That additional research be conducted into the basic chemistry and pharmacology of cannabinoids with the aim of developing cannabinoids that have therapeutic effects and that may be delivered more safely and effectively than by smoking cannabis.

Why does this recommendation ignore the cannabis?

Basic analysis of currently available cannabis in Australia needs to be done for public health.

Cannabis has greater overall potential as a medicine than cannabinoids.

Safer delivery systems for cannabis are already available, but still need some refinement

3.1.3 AVAILABILITY OF CANNABIS FOR COMPASSIONATE USE**Recommendation 9**

The Working Party is in sympathy with the motivation and spirit of the recommendations in the Institute of Medicine and House of Lords reports. Accordingly, it recommends the introduction in NSW of a compassionate regime to assist those suffering from the range of illnesses identified above to gain the benefits associated with the use of cannabis without facing criminal sanctions, pending the development of safer and more efficient methods to deliver cannabinoids.

Yes, compassion and freedom from prosecution for medical users and their carers.

But it is impractical and unfair to expect all these people to be able to 'grow their own'.

Authorization of production and supply of quality controlled medical grade natural cannabis.

Medical cannabis supply should be available and continue to be available, unless demonstrated to be medically ineffective.

3.2 LEGAL AND REGULATORY ISSUES**3.2.1 ACCESS TO CANNABIS UNDER A COMPASSIONATE REGIME****Recommendation 10**

That the Government consider licensing the supply, including the importation, of cannabis, but only for the purposes of the clinical trials proposed in Recommendation 5.

Yes, there should be licensed supply, but it should be produced in Australia.

Recommendation 11

That a person should not be prosecuted if they have prior medical certification from an accredited medical practitioner that they suffer from a medical condition that may benefit from cannabis use.

Yes, they should not be prosecuted

Authorization of health care practitioners should include suitably qualified practitioners of Eastern and other medical systems.

Recommendation 12

That the onus be placed on the medical user of cannabis plant material to establish evidence of medical certification before use.

Then all patients should be entitled to ready access to the means of certification, especially for those in rural regions.

Recommendation 13

That the conditions included under this certification should be:

- ✎ HIV-related wasting and cancer-related wasting;
 - ✎ pain unrelieved by conventional treatments;
 - ✎ neurological disorders including (but not limited to) multiple sclerosis, Tourette's syndrome, and motor neurone disease;
 - ✎ nausea and vomiting in cancer patients undergoing chemotherapy which does not respond to conventional treatments.
- That, as this list may need to be amended in the light of further medical research, it should be specified by regulation rather than by primary legislation.

Health practitioners, suitably educated in the medical use of cannabis should, like with most other medications, be in the position to decide which medications are useful for which disorder, founded in scientific understanding and practical experience.

That a health care practitioner should not have to seek special exemptions, merely because their patient has an unusual disease

That if there is to be such a list of conditions then it should be extended to include management of symptoms of hepatitis C, migraines and other conditions. And that it be easy to amend.

3.2.2 LAWFUL SOURCES OF CANNABIS FOR MEDICAL USE

Recommendation 14

That certification be extended to the possession and use of small amounts of cannabis for medical use by patients.

Yes, and care givers, and researchers.

Recommendation 15

That the "small" amount of cannabis for the possession and use exemption should correspond to the small amount in the NSW Drugs Misuse and Trafficking Act 1985. At present this is 30 grams of cannabis leaf, 5 grams of cannabis resin, and 2 grams of cannabis oil.

How are patients supposed to be able to control the growth rates of their plants?

There are unacknowledged risks associated with artificial production methods.

That patients who 'grow their own' outdoors will need to be able to grow and store, a years supply each season, if suffering from a chronic condition.

Recommendation 16

That certification be extended to the growing of small amounts of cannabis for medical use by patients in their own homes.

Yes, but there also needs to be regulated quality controlled medical grade cannabis production and supply.

Recommendation 17

That, although the "small" amount of cannabis, as defined under the Drugs Misuse and Trafficking Act is five plants, consideration be given to lowering this limit for medical certification by allowing cultivation of up to five plants under 25 cm but only two above that height.

How is someone supposed to do this, plants grow in accord with the seasons, (unless artificially controlled with unknown risks)?

Recommendation 18

That no consideration should be given to altering the law to allow "compassion clubs" to operate legally.

There needs to be quality controlled production and supply of medical grade cannabis – authorized medical cannabis dispensaries

3.2.3 MEDICAL CERTIFICATION BY ACCREDITED MEDICAL PRACTITIONERS

Recommendation 19

That the possession, supply, administration and cultivation of cannabis for personal medical use by patients with one of the specified conditions only be considered lawful if the patient possesses a certificate to this effect from an accredited medical practitioner; and that this certificate should be renewed every six months.

OK

Recommendation 20

That “accredited medical practitioners” be trained in the following.

1. Certification of patients with:
 - HIV- or cancer-related wasting;
 - nausea secondary to chemotherapy that is unresponsive to conventional treatments;
 - neurological disorders such as multiple sclerosis;
 - or chronic pain that is unresponsive to conventional treatment.
2. Counselling patients about the health risks of cannabis smoking.

Medical practitioners should already trained in management of wasting disease, nausea, even if intractable, neurological disorders and chronic pain. And many patients with severe or chronic conditions have either a concerned primary health practitioner supported by specialist services experienced in particular syndromes. Health practitioners need to be trained in the proper use of medical cannabis, which should naturally include patient counseling and education, as many of them currently know little about the plant.

Recommendation 21

That legislative safeguards be established to ensure that no civil or criminal liability is incurred by any person authorised to medically certify cannabis, or assist in the proper medical certification of cannabis for recognised therapeutic purposes, if the certifier had reasonable grounds to believe that the patients had given informed consent.

3.2.4 EXTENSION OF MEDICAL CERTIFICATION TO CARERS**Recommendation 22**

That certification which renders lawful the possession, supply, administration and cultivation of cannabis be extended to carers of patients who are too ill or debilitated to obtain cannabis or to cultivate cannabis plants for their own use, as long as stringent criteria for extending this certification are met.

Yes, but there also needs to be regulated quality controlled medical grade cannabis production and supply.

3.2.5 EDUCATION**Recommendation 23**

That, if the recommendations in this report are adopted, the NSW Government conduct educational campaigns to inform the following people:

- patients who may qualify for certification;
- medical practitioners;
- the public in general.

of the benefits and possible risks of cannabis use for medical purposes, and of the implications of any legislative changes which may have to be introduced.

Yes there should be education of a variety of groups and the general public. It needs to be clear and concise, scientifically based and without bias.

Education re harm reduction for all cannabis users should already be available, but isn't – this needs to be addressed.

3.2.6 CONSULTATION AND EVALUATION**Recommendation 24**

That the Government consult with patients, carers, prescribers and other affected parties on the proposed changes and conduct a formal evaluation of the operation of the legislation after a trial period of two years.

Yes, consultation with patients, carers and health practitioners should happen.

However harm reduction measures should be developed immediately, and the consultation processes should not be protracted or delay patient access to medical grade cannabis.

Conclusions

Government policy, practices and legislation, need to;

- Come into line with public opinion, who believe medical cannabis use should be legal
- Provide for;
 - legal medical use of cannabis, by patients for whom it is believed cannabis, could prove or, has already demonstrated medical effectiveness;
 - immediate legal patient access to quality controlled cannabis;
 - development of regulated, non-profit, medical grade cannabis (natural product) supplies;
 - research into cannabis, and its medical use, including effectiveness, methods, delivery systems, etc;
 - appropriate education for public, patients and health care practitioners;
 - authorization of health care practitioners according to their understanding of, and education in, the medical use of cannabis.
 - authorization of patients and care-givers, according to practitioner discretion (as with most other medications).

I would appreciate the opportunity of discussing these issues further with the Working Party, and can be contacted via email ; lisaj@wild.net.au. or telephone; 0413 771103.

Appendix: A

Experts from Submission to The Victorian government Drug Policy Expert Committee, December, 1999⁹¹
For more information on the environmental aspects of cannabis please see, <http://www.green.net.au/gf>.

A.1: [Need for greater genetic variety, how local medicinal cannabis could benefit the industrial (low-THC) hemp industry]

Problems with restrictions to Industrial Hemp cultivation

While it is anticipated that low THC cannabis will be able to yield an economically feasible agricultural crop, restriction to low THC cultivars presents several linked disadvantages, including:

- restrictions to genetic stock, resulting in a limited pool of diminished genetic diversity;
- the limited approach may fail to provide the long term protection of cultivar viability or allow natural adaptation to occur in diverse climatic areas and districts.
- limited genetic material may exclude suitable cultivars which show a natural ability to resist diseases and pests and hence curtail the establishment of regional specific varieties suited upon the criteria set for the controlled cultivation
- reduces/ restricts the seed available for legal agricultural purposes to select variants which currently need to be imported at considerable cost and which may not be the most genetically robust and high yielding varieties to base a sustainable industry upon
- [Anedotally, the current most significant aspect is the indication that the vast majority of cannabis sativa cultivars with a THC content of <0.3 are geographically acclimatized to latitudes of > 50°, yet NSW is located around 30-35°. Cannabis growth cycle, especially as regards maturation and flowering is regulated by daylight length, causing cultivars acclimatized to latitudes further from the equator, will mature earlier, significantly reducing total yield of fibre/biomass and seed. Hence the need to develop local seed stock; having a larger range of chemovars available for seed stock development, could do much to strengthen the economic potnetial of industrial hemp]

A.2: [advantages of changing state legislation regarding cannabis]

.....government drug policy and legislation and their influence on societal perception of cannabis all relate to cultivation and use of any *Cannabis sativa* spp.

Cannabis sativa sp, whatever its THC⁹² content, has potential as a high-value agricultural crop. The crop presently is utilized elsewhere on the planet for provision of:

- food, shelter and clothing
- fuel
- medicine.

It shows promise of providing a renewable and ecologically sustainable means to generate:

- paper
- biodegradable polymers
- fine-grade (low viscosity) lubricants
- building products
- textiles
- cosmetics.

This in turn will:

- benefit regional and rural development
- create jobs
- alleviate pressure on forests, hydrological systems and therefore agricultural, town and city water supplies.

⁹¹ Legal Reforms for Development of Agriculture and Industry from Cannabis sativa Sp. For The Victorian government Drug Policy Expert Committee, December, 1999. L. Jackson, J. Hope.

⁹² TetraHydroCannabinols (THC) comprise a group of active constituents common to all cultivars of *Cannabis sativa* in widely varying degrees. They are the chemicals mostly associated with the “high” attained from the drug and have a wide therapeutic application.

Current laws and regulations severely restrict the development of this crop's potential to benefit both the environment and population of Australia. Additionally, they are perpetuating the false notions of cannabis as a dangerous drug, without therapeutic value, through the stigma associated with illicit drugs.

A.3: PROBLEMS WITH CURRENT SCHEDULING

The inconsistencies in the treatment of *Cannabis sativa* vis a vis other drugs and plants, creates a bias within both society's and the individual's relationship with and perception of cannabis. Thus:

- it denies patient access to a valuable therapeutic. The restrictions imposed by the schedule 9 classification completely restrict the use of *Cannabis sativa* for medicinal / therapeutic uses.
- legal restrictions on cannabis, make it illegal as a food despite its high nutritional and nutraceutical value.
- provides little acknowledgment of the deleterious effects of the act of prohibition itself, including its overall economic, and societal costs. Prohibition promotes crime and can serve to glorify substance abuse in some sub-cultures.
- denies the significance of "set and setting" (a persons beliefs and expectations of a drug and the environment, including legal, in which it is consumed), set and setting have considerable influence on the effects of cannabis.⁹³
- while research has demonstrated the effectiveness of *Cannabis sativa* as a therapeutic, implementation has been hampered by the legal constraints of prohibition.
- the contrast between the concept of marijuana as a dangerous, non-therapeutic drug and individual's perceptions of therapeutic benefit or relatively harmless recreational drug used by many, may create a dichotomy, the mental tension of which may be accentuated by anxiety associated with its illicit status and associated criminal risk
- some research over the past fifty years, conducted within a prohibitionist paradigm, is compromised in supporting the legal *status quo*.
- much research has been devoted in order to determine the effects of *Cannabis sativa* as a poison and the perceived negative effects impacting on society as an illicit drug. While this research fails to take a holistic view of the effects of *Cannabis sativa* it does mean that *Cannabis sativa* is one of the most extensively studied of any of the drugs, and yet it can only be concluded as non-toxic.
- diminishes the economic feasibility of a cannabis-based industry, through reduction in consumer and investor confidence due to misdirected concerns arising from ill-founded concepts which obscure the many beneficial aspects of *Cannabis sativa*.

⁹³ Dr Andrew Weil, M.D., *The Natural Mind*