SB

74

SENATE COMMITTEL REPORT

DATE: 4/4/05

FURTHER: Finance

DATE TURNED
IN TO OFFICE:_____

Judiciary Committee considered SENATE BILL NO. 74

SB 74 CRIMES INVOLVING MARIJUANA/OTHER DRUGS

"An Act making findings relating to marijuana use and possession; relating to marijuana and misconduct involving a controlled substance; and providing an effective date."

and recommends:

[ ] be **replaced** with _____ **CS** _____ (_____)

[ ] adopt **previous** _____ **CS** _____ (_____)

[ ] attached amendment(s)

[ ] adopt Letter of Intent by _____ Committee

[ ] further referral to _____ Committee

CS Senate Bill:
[ ] Same Title
[ ] New Title

SCS House Bill:
[ ] Same Title
[ ] Technical Title Change
[ ] New Title w/ SCR #_____

NEW FISCAL NOTE(S):

Department	Date	Fiscal	Indet.	Zero	FN#

PREVIOUS FISCAL NOTE(S):

Department	Date	Fiscal	Indet.	Zero	FN#

[ ] **APPROPRIATION - no fiscal note**

SIGNATURES AND RECOMMENDATIONS:	DO PASS	DO NOT PASS	NO REC	AMEND
			X	
			X	
			X	
			X	
CHAIR: Ralph Seekins	✓			

Feds Sound New Warning About Marijuana Use

By PAULINE JELINEK
Associated Press Writer

May 3, 2005, 8:05 PM EDT

WASHINGTON -- Youngsters who use marijuana are more likely to develop serious mental health problems, the government said Tuesday. A private group said law enforcement increasingly is targeting people who smoke and deal the drug.

Past medical studies have linked marijuana with a greater incidence of mental disorders such as depression or schizophrenia. But questions remain about whether people who smoke marijuana at a young age are already predisposed to mental disorders, or whether the drug caused those disorders.

Government officials say recent research makes a stronger case that smoking marijuana is itself a causal agent in psychiatric symptoms, particularly schizophrenia.

"A growing body of evidence now demonstrates that smoking marijuana can increase the risk of serious mental health problems," said John P. Walters, director of the White House Office of Drug Control Policy.

Administration officials pointed to a handful of studies to make their case. One, from the Substance Abuse and Mental Health Services Administration, found adult marijuana smokers who first began using the drug before age 12 were twice as likely to have suffered a serious mental illness in the past year as those who began smoking after 18.

The ratio was 21 percent to 10.5 percent. Those who first started as teens also were at significantly higher risk.

Also Tuesday, The Sentencing Project released a report that found the government's "war on drugs" has become the "war on drug" as police agencies increasingly target marijuana.

Begun in the 1980 the war on drugs was aimed at stopping large-scale narcotics traffickers, particularly those selling cocaine. But since 1990 more of the focus has been on catching users and low-level dealers. And more often than ever, the drug targeted is marijuana, according to the group, a national nonprofit organization that works on judicial reform and favors alternatives to

jail.

Of some 700,000 marijuana arrests in 2002, 88 percent were for possession, it said. And only one of every 18 of those arrests ended in a felony conviction.

"Arresting record numbers of low-level marijuana offenders represents a poor investment in public safety" and diverts resources from "more serious crime problems," said Ryan King, co-author of the report.

King found that in 1992 arrests for heroin and cocaine comprised 55 percent of all drug arrests and marijuana 28 percent. A decade later heroin and cocaine arrests accounted for less than 30 percent of all arrests, while marijuana's share had risen to 45 percent.

Jennifer deVallance, spokeswoman for the White House drug office, said there are many reasons for the greater focus on marijuana. Among them: Marijuana is the single largest drug of abuse in the nation, the strains are more potent than ever and more is known about health dangers.

"For the first time, more kids are seeking treatment for marijuana use than alcohol," she said.

The Sentencing Project called for renewed national discussion of the war on drugs, an idea echoed by the conservative American Enterprise Institute. The group reported last month that despite spending at about $40 billion a year now and toughening drug sentencing laws, "America continues to experience the Western world's worst drug problems."

An epidemic of heroin use more than three decades ago, followed by a 1980s epidemic of cocaine and crack, prompted a massive intensification in drug enforcement while giving short shrift to prevention and treatment, the institute reported. It decried budgeting that spends two-thirds of drug control funds on enforcement, 25 percent on treatment and just 12 percent on prevention.

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Associated Press reporter Kevin Freking contributed to this story.

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On the Net:

The Sentencing Project: http://www.sentencingproject.org

Office of National Drug Control Policy: http://www.whitehousedrugpolicy.gov

24-GS1054\F
Luckhaupt
5/4/05

CS FOR SENATE BILL NO. 74(JUD)

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-FOURTH LEGISLATURE - FIRST SESSION

BY THE SENATE JUDICIARY COMMITTEE

Offered:
Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

"An Act making findings relating to marijuana use and possession, relating to marijuana and misconduct involving a controlled substance; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

*** Section 1.** The uncodified law of the State of Alaska is amended by adding a new section to read:

PURPOSE. The purpose of this Act is to protect the health and safety of persons in this state and to provide legislative findings concerning this Act regarding marijuana and its effects in this state.

*** Sec. 2.** The uncodified law of the State of Alaska is amended by adding a new section to read:

FINDINGS. The type of marijuana available in the United States and Alaska today, and the changes in the patterns of usage of the drug, particularly by young Alaskans, Alaska Natives and those undergoing alcohol treatment, pose a threat to the public health and welfare

that justifies prohibiting possession in this state, even by adults at home. In this Act, the legislature has considered its duty to implement the right to privacy in art. I, sec. 22, Constitution of the State of Alaska, and its duty to promote the public health and welfare in art. VII, sec. 4, Constitution of the State of Alaska. To carry out the intent of the voters and the legislature, it will ultimately be necessary for the courts in Alaska to come to different conclusions about state statutes relating to marijuana than those expressed in Noy v. State, 83 P.3d 538 (Alaska App. 2003), and Crocker v. State, 97 P.3d 93 (Alaska App. 2004). To assist the courts in considering these issues, the legislature further finds that

(1) the potency of marijuana has increased dramatically since the 1960s and 1970s; the national average amount of delta-9-tetrahydrocannabinol (THC), the main psychoactive ingredient, was less than one percent then, but increased steadily in the 1980s and 1990s and by 2003 was six times higher, at 6.4 percent; marijuana grown and available in Alaska is much more potent than the national average, and has been tested with THC levels over 20 percent; the average potency of Alaska marijuana for the period 1993-2003 was over 10 percent and for 2003 was nearly 14 percent; Alaska marijuana today commands hundreds of dollars per ounce on the illegal market and is often sold in smaller amounts within the price range of teenagers; the increasing potency of marijuana corresponds to an increase in substance abuse treatment admissions, particularly youth 12 - 17 years of age, and in the number of persons seeking emergency medical care due to marijuana-related incidents;

(2) several hundred adults and children are admitted into treatment each year in Alaska for marijuana abuse, with more than half being children under 18 years of age and more than a third being Alaska Natives; pregnant women in Alaska use marijuana at a higher rate than the national average and the percentage of pregnant Alaska Native women using marijuana is more than double the national average and the average for non-Native Alaskan women; the percentage of Alaska Native high school youth who have used marijuana is significantly higher than among non-Native youth;

(3) there is evidence that many users become dependent on marijuana under the clinical standards applied by the Diagnostic and Statistical Manual of Mental Disorders IV; studies have shown that use of marijuana and withdrawal from marijuana affect some of the same neurochemical processes as known addictive drugs; Marijuana Anonymous chapters to treat marijuana addicts exist in a majority of states in the country. This is persuasive

evidence of marijuana's potential for users becoming dependent on it. Currently, one-third of all persons in Alaska treated for drug and alcohol problems are treated for marijuana abuse;

(4) early exposure of young people to marijuana increases the likelihood of lifelong health and social problems, makes it more likely that the person will later use more potent illegal drugs, and is associated with depression and an increased risk of attempting suicide;

(5) a high percentage of persons in treatment for alcohol abuse also abuse marijuana, particularly among Alaska Natives; although the relationship between marijuana and alcohol and other drugs is not fully understood, there is a correlative effect that makes it more difficult to treat alcoholism when marijuana is also used;

(6) marijuana consists of hundreds of different chemicals and can affect almost every organ and system in the body, including the lymph system, the heart, and the lungs; THC binds to receptors in the brain that should otherwise bind to naturally occurring brain chemicals; marijuana can affect memory, attention, judgment, and other cognitive functions and can impair motor coordination, time perception, and balance; marijuana smoke contains more carcinogenic hydrocarbons than tobacco smoke; marijuana often contains bacteria or fungus that are dangerous to humans, and is harvested and sold without removing pesticides and fungicides;

(7) a high percentage of persons arrested in this state, including adults and juveniles who commit violent offenses, have marijuana in their system at the time of the arrest; the percentage is particularly high for adults arrested for domestic violence who test positive for marijuana at the time of the arrest;

(8) if a parent uses marijuana, their children are four to five times more likely to become marijuana users; many high school students report that they have been able to get marijuana at home or from a relative; criminal penalties for possession of marijuana in the home will deter possession by adults and reduce its availability and accessibility to children; studies have shown that criminal penalties for possession of marijuana are effective in increasing the perception among teenagers of the risks of using the drug, thus reducing its use by young people;

(9) in Noy v. State, 83 P.3d 538 (Alaska App. 2003), the Alaska court of appeals allowed any person over 17 years of age to possess up to four ounces of marijuana in

their home; at the same time, the court held that possession of four ounces could legitimately be prohibited even in the home because it was reasonable for the legislature to conclude in 1982 that possession of four ounces is indicative of an intent to sell; the Noy decision also led the same court in Crocker v. State, 97 P.3d 93 (Alaska App. 2004) to adopt requirements for search warrants to investigate marijuana-growing that, in the words of the dissenting chief judge, make it "difficult for the state to enforce legitimate laws prohibiting the sale and possession of marijuana."

*** Sec. 3.** AS 11.71.040(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the fourth degree if the person

(1) manufactures or delivers any amount of a schedule IVA or VA controlled substance or possesses any amount of a schedule IVA or VA controlled substance with intent to manufacture or deliver;

(2) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances of an aggregate weight of one ounce or more containing a schedule VIA controlled substance;

(3) possesses

(A) any amount of a schedule IA or IIA controlled substance;

(B) 25 or more tablets, ampules, or syrettes containing a schedule IIIA or IVA controlled substance;

(C) one or more preparations, compounds, mixtures, or substances of an aggregate weight of three grams or more containing a schedule IIIA or IVA controlled substance;

(D) 50 or more tablets, ampules, or syrettes containing a schedule VA controlled substance;

(E) one or more preparations, compounds, mixtures, or substances of an aggregate weight of six grams or more containing a schedule VA controlled substance;

(F) one or more preparations, compounds, mixtures, or substances of an aggregate weight of **four ounces** [ONE POUND] or more

containing a schedule VIA controlled substance; or

(G) 25 or more plants of the genus cannabis;

(4) possesses a schedule IIIA, IVA, VA, or VIA controlled substance

(A) with reckless disregard that the possession occurs

(i) on or within 500 feet of school grounds; or

(ii) at or within 500 feet of a recreation or youth center; or

(B) on a school bus;

(5) knowingly keeps or maintains any store, shop, warehouse, dwelling, building, vehicle, boat, aircraft, or other structure or place that is used for keeping or distributing controlled substances in violation of a felony offense under this chapter or AS 17.30;

(6) makes, delivers, or possesses a punch, die, plate, stone, or other thing **that** [WHICH] prints, imprints, or reproduces a trademark, trade name, or other identifying mark, imprint, or device of another or any likeness of any of these upon a drug, drug container, or labeling so as to render the drug a counterfeit substance;

(7) knowingly uses in the course of the manufacture or distribution of a controlled substance a registration number that is fictitious, revoked, suspended, or issued to another person;

(8) knowingly furnishes false or fraudulent information in or omits material information from any application, report, record, or other document required to be kept or filed under AS 17.30;

(9) obtains possession of a controlled substance by misrepresentation, fraud, forgery, deception, or subterfuge; or

(10) affixes a false or forged label to a package or other container containing any controlled substance.

*** Sec. 4.** AS 11.71.050(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the fifth degree if the person

(1) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances

of an aggregate weight of **less than one** [ONE-HALF] ounce [OR MORE] containing a schedule VIA controlled substance;

(2) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than one-half ounce containing a schedule VIA controlled substance, for remuneration;

(3) possesses

(A) less than 25 tablets, ampules, or syrettes containing a schedule IIIA or IVA controlled substance;

(B) one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than three grams containing a schedule IIIA or IVA controlled substance;

(C) less than 50 tablets, ampules, or syrettes containing a schedule VA controlled substance;

(D) one or more p eparations, compounds, mixtures, or substances of an aggregate weight of less than six grams containing a schedule VA controlled substance; [OR]

(E) one or more preparations, compounds, mixtures, or substances of an aggregate weight of **one ounce** [ONE-HALF POUND] or more containing a schedule VIA controlled substance; **or**

(F) one or more preparations, compounds, mixtures, or substances containing a schedule VIA controlled substance while driving or operating a motor vehicle, aircraft, or motorized watercraft; or

(4) fails to make, keep, or furnish any record, notification, order form, statement, invoice, or information required under AS 17.30.

* Sec. 5. AS 11.71.060(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the sixth degree if the person

(1) uses or displays any amount of a schedule VIA controlled substance;

(2) [OR] possesses one or more preparations, compounds, mixtures, or

substances of an aggregate weight of less than **one ounce** [ONE-HALF POUND] containing a schedule VIA controlled substance;

(3) possesses one or more preparations, compounds, mixtures, or substances containing a schedule VIA controlled substance while a passenger in a motor vehicle, aircraft, or motorized watercraft;

(4) being the driver or operator of a motor vehicle, aircraft, or motorized watercraft, knowingly permits a passenger to possess one or more preparations, compounds, mixtures, or substances containing a schedule VIA controlled substance; or

(5) [(2)] refuses entry into a premise for an inspection authorized under AS 17.30.

* **Sec. 6.** AS 11.71.080 is amended to read:

Sec. 11.71.080. Aggregate weight of live marijuana plants. For purposes of calculating the aggregate weight of a live marijuana plant, the aggregate weight shall be **one-sixth of** the **measured** weight of the marijuana **plant after the roots of the marijuana plant have been removed** [WHEN REDUCED TO ITS COMMONLY USED FORM].

* **Sec. 7.** AS 11.71.050(a)(2) is repealed.

* **Sec. 8.** This Act takes effect immediately under AS 01.10.070(c).

SB 74 (RS)

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STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

January 20, 2005

The Honorable Ben Stevens
President of the Senate
Alaska State Legislature
State Capitol, Room 111
Juneau, AK 99801-1182

Dear President Stevens:

Under the authority of art. III, sec. 18, of the Alaska Constitution, I am transmitting a bill relating to marijuana. I believe it is time for the Alaska Legislature to take a stand and debunk the myth that marijuana is a harmless recreational drug.

It is very troubling to me that our young people have access to the drug and are using it. In recent years, Alaska had the highest rate in the nation of persons over the age of 12 trying marijuana for the first time. Approximately two-thirds of these new smokers were children ages 12 - 17. This same age group of children made up over half of the state's 363 treatment admissions in 2003 for marijuana abuse. Many more go untreated each year.

The problem is particularly great for Alaska Natives. In 2003, the self-reported rate of current use for Alaska Native students in the ninth grade (age 15) was 36.96 percent, nearly three times the rate for non-Native Alaska students. For tenth graders, the rate of current use by Alaska Native students was 41.77 percent. Alaska Natives also made up approximately 35 percent of the statewide treatment admissions for marijuana abuse in 2003. The numbers of our youths trying marijuana for the first time and entering treatment foretells a dim future if nothing is done.

Although marijuana smoke contains hundreds of substances, some of them carcinogenic, the principal psychoactive ingredient is delta-9 tetrahydrocannabinol (commonly known as THC). In the 1960's and 70's, marijuana was primarily used by college students and "hippies," and the average THC content was less than one percent. But today, the average THC content in marijuana is six times that level, at 6.4 percent. Drug dealers in Alaska have turned indoor marijuana growing into a science and marijuana grown here has been found with a THC content in excess of 20 percent. Our young people thus have access to, and are using, marijuana that is a potent hallucinogenic.

In 1975, the Alaska Supreme Court studied marijuana and concluded, in *Ravin v. State*, that the scientific evidence on its effects did not justify making it a

COMMITTEE COPY

crime for adults to possess small amounts in private. More recently, the Alaska Supreme Court has shown an unwillingness to reconsider the latest scientific evidence on the harmful effects of marijuana. A rational evaluation of marijuana's harmful effects must occur, and the Legislature should do that -- not the courts. This bill would provide a forum for the Legislature to hear expert testimony on the effects of marijuana and to make findings that the courts can rely on in cases where marijuana is an issue.

In addition to educating the Legislature, courts, and the public about the harmful effects of marijuana, this bill would deter possession and use of marijuana by increasing criminal penalties for certain types of possession. It also would provide a fair and efficient process for determining the usable weight of live marijuana plants in criminal prosecutions.

Current law makes it a class B felony to give or sell marijuana, and schedule IVA and VA controlled substances, to someone age 18 or younger, but only if the dealer is at least three years older. Right now, if a 19-year-old gives a small amount of marijuana to a 17-year-old, it is the lowest level misdemeanor offense. When the law classifies such conduct as such a low-level offense, it provides no deterrence for young adults.

Marijuana is particularly harmful for young users, and it should be a serious crime to give or sell marijuana to someone under age 21, no matter how old the "dealer" may be. Expanding the current class B felony penalty for providing marijuana, and schedule IVA and VA controlled substances, to someone under age 21, regardless of the age difference between the user and the dealer, would allow the Superior Court to punish adults who supply our youths.

The bill also would make it a class C felony (the lowest felony level) to possess four ounces or more of marijuana, compared to current law, which reserves this felony level only for those who possess a whole pound or more. Four ounces of high-THC marijuana has a street value of up to $2,000. Given the increase in the value and potency of marijuana, it is appropriate to apply higher penalties to possession of this amount.

The bill also would adjust misdemeanor penalties related to marijuana. The bill would make it a class A misdemeanor to possess one ounce or more of marijuana, as compared with current law, which allows misdemeanor penalties even for those who possess from a half-pound to up to one pound of marijuana. The bill would reserve the lowest misdemeanor penalties (class B misdemeanor), for possession of less than one ounce of marijuana, which is still a significant amount, both in dosage and cost.

The bill also tackles marijuana and driving, which even the Supreme Court in *Ravin* recognized as a potentially serious problem back in 1975. Unlike alcohol, there is no effective way for law enforcement officers to quickly and easily test the amount of marijuana in a person's blood, breath, or urine. Thus, the best way to deter using marijuana and driving is to prohibit it in motor vehicles. This bill would make it a class A misdemeanor for the driver of a motor vehicle to possess any amount while driving or operating a motor vehicle. This is the same level of offense as driving under the influence, although this bill does not require mandatory penalties as required for driving under the influence (DUI) offenses. The bill also would make it a class B misdemeanor if a passenger in a motor vehicle possesses any marijuana, or if the driver allows a passenger to do so.

Finally, the bill would provide a fair and efficient process for determining the usable weight of live marijuana plants. Under current statutory law, to determine the weight of marijuana from a growing plant, the law enforcement officers must harvest, dry, and process the marijuana just like a marijuana grower would. This is required for two reasons. First, the plants cannot be allowed to remain damp, or a mold will form that not only destroys the evidence, but is also dangerous to the officers handling the plants. Second, this processing is statutorily required because the plant can only be weighed after it has been "reduced to its commonly used form." (AS 11.71.080.) The obvious problem with this statute is that it forces the law enforcement officers to operate large marijuana drying and processing facilities at great expense and effort. The plants must be spread out and dried, and then the law enforcement officers must begin the laborious task of separating the less usable stalks from the leaves, buds, and flowers. Even then, there are often arguments in court about whether the law enforcement officers correctly processed the plants, or whether they left in too many stalks. This bill solves the problem by allowing the law enforcement officers to weigh the unprocessed harvested plants, and declares that one-sixth of that weight is used for determining what level of crime is involved. The one-sixth ratio was determined by experimentation of the Alaska State Troopers, and represents an average of several test batches of live marijuana plants that were dried and processed to their "commonly used form."

I urge your prompt and favorable action on this measure.

Sincerely yours,

Frank H. Murkowski
Governor

Enclosure

SENATE JUDICIARY COMMITTEE
Senate Bill 74

AMENDMENT #2
(Section, page and line numbers refer to the original version of the bill.)

- Delete Section 3 of the bill and re-number bill sections accordingly.

- Page 6, line 20:

Change "aggregate weight of one-half ounce or more"
to read "aggregate weight of **less than one ounce** [ONE-HALF OUNCE OR MORE]"

- Page 6, delete, that is, repeal, lines 22-25

Do not re-number paragraphs.

- Page 7, delete lines 22-25 and re-number paragraphs accordingly.

#1

SENATE JUDICIARY Committee AMENDMENT TO SB 74

Page 1, line 10, to page 4, line 10: **Delete Sec. 2 and Insert in its place:**

* **Sec. 2.** The uncodified law of the State of Alaska is amended by adding a new section to read:

FINDINGS. The type of marijuana available in the United States and Alaska today, and the changes in the patterns of usage of the drug, particularly by young Alaskans, Alaska Natives and those undergoing alcohol treatment, pose a threat to the public health and welfare that justifies prohibiting possession in this state, even by adults at home. In this Act, the Legislature has considered its duty to implement the right to privacy in art, I, sec. 22, and its duty to promote the public health and welfare in art. VII, sec. 4, of the state constitution. To carry out the intent of the voters and the Legislature, it will ultimately be necessary for the courts in Alaska to come to different conclusions about state statutes relating to marijuana than those expressed in Noy v. State, 83 P.3d 538 (Alaska App. 2003), and Crocker v. State, 97 P.3d 93 (Alaska App. 2004). To assist the courts in considering these issues, the Legislature further finds that:

(1) the potency of marijuana has increased dramatically since the 1960s and 1970s; the national average amount of delta-9-tetrahydrocannabinol (THC), the main psychoactive ingredient, was less than one percent then, but increased steadily in the 1980s and 1990s, and by 2003 was six times higher, at 6.4 percent; marijuana grown and available in Alaska is much more potent than the national average, and has been tested with THC levels over 20 percent; the average potency of Alaska marijuana for the period 1993-2003 was over 10 percent and for 2003 was nearly 14 percent; Alaska marijuana today commands hundred of dollars per ounce on the illegal market and is often sold in smaller amounts within the price range of teenagers; the increasing potency of marijuana corresponds to an increase in substance abuse treatment admissions, particularly youth aged 12-17, and in the number of persons seeking emergency medical care due to marijuana-related incidents;

(2) several hundred adults and children are admitted into treatment each year in Alaska for marijuana abuse, with more than half being children under 18 and more than a third being Alaska Natives; pregnant women in Alaska use marijuana at a higher rate than the national average and the percentage of pregnant Alaska Native women using marijuana is more than double the national average and the average for non-Native Alaskan women; the percentage of Alaska Native high school youth who have used marijuana is significantly higher than among non-Native youth;

(3) there is evidence that many users become dependent on

marijuana under the clinical standards applied by the Diagnostic and Statistical Manual of Mental Disorders IV; studies have shown that use of marijuana and withdrawal from marijuana affect some of the same neurochemical processes as known addictive drugs; Marijuana Anonymous chapters to treat marijuana addicts exist in a majority of states in the country. This is persuasive evidence of marijuana's potential for users becoming dependent on it. Currently, one-third of all persons in Alaska treated for drug and alcohol problems are treated for marijuana abuse;

(4) early exposure of young people to marijuana increases the likelihood of lifelong health and social problems, makes it more likely that the person will later use more potent illegal drugs, and is associated with depression and an increased risk of attempting suicide;

(5) a high percentage of persons in treatment for alcohol abuse also abuse marijuana, particularly among Alaska Natives; although the relationship between marijuana and alcohol and other drugs is not fully understood, there is a correlative effect that makes it more difficult to treat alcoholism when marijuana is also used;

(6) marijuana consists of hundreds of different chemicals and can affect almost every organ and system in the body, including the lymph system, the heart, and the lungs; THC binds to receptors in the brain that should otherwise bind to naturally occurring brain chemicals; marijuana can affect memory, attention, judgment, and other cognitive functions and can impair motor coordination, time perception, and balance; marijuana smoke contains more carcinogenic hydrocarbons than tobacco smoke; marijuana often contains bacteria or fungus that are dangerous to humans, and is harvested and sold without removing pesticides and fungicides;

(7) a high percentage of persons arrested in this state, including adults and juveniles who commit violent offenses, have marijuana in their system at the time of arrest; the percentage is particularly high for adults arrested for domestic violence who test positive for marijuana at the time of arrest;

(8) if a parent uses marijuana, their children are four to five times more likely to become marijuana users; many high school students report that they have been able to get marijuana at home or from a relative; criminal penalties for possession of marijuana in the home will deter possession by adults and reduce its availability and accessibility to children; studies have shown that criminal penalties for possession of marijuana are effective in increasing the perception among teenagers of the risks of using the drug, thus reducing its use by young people;

(9) in Noy v. State, 83 P.3d 538 (Alaska App. 2003), the Alaska court of appeals allowed any person over 17 to possess up to four ounces of marijuana in their home; at the same time, the court held that possession of four ounces could legitimately be prohibited even in the home because it was reasonable for the legislature to conclude in 1982 that possession of four ounces is indicative of an intent to sell; the Noy decision also led the same court in Crocker v. State, 97 P.3d 93 (Alaska App. 2004) to adopt requirements for search warrants to investigate marijuana-growing that, in the words of the dissenting chief judge, make it "difficult for the state to enforce legitimate laws prohibiting the sale and possession of marijuana."

SB 74 –Revised Findings
Examples of Testimony and Evidence Supporting Findings

(1) Increased potency and price of marijuana

- Tab "A" – Mississippi Monitoring Project Graphs and Charts
- Testimony of Dr. El Sohly in House Judiciary Committee; testimony of Capt. Al Storey in Senate HESS Committee; testimony of Capt. Ed Harrington in House and Senate Judiciary Committees
- Testimony of Dr. Edward Murray in Senate HESS Committee and House Judiciary Committee (relationship between doubling of potency in 1990s and doubling of emergency room admissions for marijuana incidents)
- Testimony of Bill Hogan, Director of Division of Behavioral Health, in Senate HESS and Judiciary Committees; testimony of Cristi Willer, Deputy Director of Behavioral Health in Senate HESS and Judiciary Committees and House Judiciary Committee

(2) Treatment admissions, abuse by youth, Alaska Natives, and pregnant women

- Tab "C" – Treatment admissions data from SAMHSA.
- Testimony of Bill Hogan, Director of Division of Behavioral Health, in Senate HESS and Judiciary Committees; testimony of Cristi Willer, Deputy Director of Behavioral Health in Senate HESS and Judiciary Committees and House Judiciary Committee
- Alaska Maternal and Child Health Data Book 2003, Women's and Children's & Family Health Fact Sheet 2005, Alaska Department of Health and Social Services;
- Tab "E" *2003 ALASKA YOUTH RISK BEHAVIOR SURVEY RESULTS.* (13.1% of Alaska students reporting use before age 13 vs. national average of 9.9%); (Alaska Native students 69.7% ever tried marijuana, 35.5% are current users; of all Alaska students 47.5% have ever tried marijuana and 24% are current users; compared with 41% and 22.4% nationally); (in a survey of pre-school parents in two rural Alaska villages, rates of use were three times higher than the national average); (41% of Alaska non-Native high school students have tried marijuana compared with 69% of Native students)

- Addendum. (In a survey of rural Alaskans admitted to treatment facilities, 17.9% of male Alaska Natives were found to have a marijuana disorder); (average age of first use for American Indian / Alaska Native population group has slipped down to 14 years old compared to 16 years for Alaska overall)

(3) Marijuana potential for dependence

- Tabs "C" and "D" generally
- Tab "C" *LEGALIZATION OF MARIJUANA: POTENTIAL IMPACT ON YOUTH, AMERICAN ACADEMY OF PEDIATRICS, TECHNICAL REPORT, 2004* "Scientists have demonstrated that the emotional stress caused by withdrawal from marijuana is linked to corticotropin-releasing factor, the same brain chemical that has been linked to anxiety and stress during opiate, alcohol, and cocaine withdrawal. Others report that tetrahydrocannabinol, the active ingredient in marijuana, stimulates release of dopamine in the mesolimbic area of the brain, the same neurochemical process that reinforces dependence on other addictive drugs."
- Tab "C" *ALASKA STATE PLAN FOR DRUG ABUSE PREVENTION, FY 77* (57 marijuana treatment admissions in FY 75 compared to an average of over 400 a year now) SAMHSA Treatment data set.
- Tanda, Munzar and Goldberg, *Self-administration behavior is maintained by the psychoactive incrediate of marijuana by squirrel monkeys (2000)* (Published in Nature Neuroscience, Nov. 2000, vol. 3, no. 11)
- Testimony of Dr. John Fielder in Senate HESS Committee; testimony of Cristi Willer, Deputy Director of Behavioral Health in Senate HESS and Judiciary Committees and House Judiciary Committee

(4) Early exposure of children to marijuana increases the likelihood of lifelong health and social problems, and makes it more likely that the person will go on to use more potent illegal controlled substances.

- Tabs "C" and "D" generally
- Tab "C", Table 5.1b, marijuana treatment admissions for youth aged 12-17 made up 63% of all treatment admissions in 2003.

- Tab "C", *ADOLESCENT DEPRESSION AND SUICIDE RISK, ASSOCIATION WITH SEX AND DRUG BEHAVIOR,* (Youth engaging in risk behaviors such as marijuana use are at increased odds for depression, suicidal ideation, and suicide attempts)
- Tab "C" *INITIATION OF MARIJUANA USE: TRENDS, PATTERNS, AND IMPLICATIONS, 2002, Joe Gfroerer, SAMHSA,* (Early initiation of marijuana use was associated with a greater risk of other drug use behaviors at age 26 or older, such as heroin use, cocaine use, etc., and with a greater risk of illicit drug dependence or abuse at age 26 or older) (6.3% percent of those initiating marijuana use at age 14 or younger were recent heavy users of other illicit drugs in comparison with the less than 1 percent of adults who had never used marijuana that reported heavy use of other illicit drugs).
- Tab "D", Linsky, et al., *Escalation of Drug Use in Early-Onset Cannabis Use vs. Co-twin Controls,* Journal of the American Medical Association, Jan. 22/29, 2003, vol. 289, no. 4)

(5) **<u>High percentage of persons in alcohol treatment also abuse marijuana</u>**

- Testimony of Bill Hogan, Director of Division of Behavioral Health, in Senate HESS and Judiciary Committees; testimony of Cristi Willer, Deputy Director of Behavioral Health in Senate HESS and Judiciary Committees and House Judiciary Committee
- Tab "C", *Alaska Natives Combatting Substance Abuse and Related Violence Through Self-Healing,* University of Alaska Anchorage (1999).

(6) **<u>Marijuana chemistry affecting the body and brain; carcinogenic and other dangerous substances.</u>**

- Tabs "C", and "D" generally
- *LEGALIZATION OF MARIJUANA: POTENTIAL IMPACT ON YOUTH, AMERICAN ACADEMY OF PEDIATRICS, TECHNICAL REPORT, 2004,* "Some of the significant neuropharmocologic, cognitive, behavioral, and somatic consequences of acute and long-term marijuana use are well known and include negative effects on short-term memory, concentration, attention span, motivation, and problem solving, which clearly interfere with learning, adverse effects on

coordination, judgment, reaction time, and tracking ability which contribute substantially to unintentional deaths and injuries among adolescents, and negative health effects with repeated use similar to effects seen with smoking tobacco."

- Tab "D": *BRITISH LUNG FOUNDATION, A SMOKING GUN*
- Testimony of Dr. David Murray in Senate HESS and House Judiciary Committees (receptors in brain)
- www.onlinepot.org, "How to Preserve Pot Potency" (articles on bacteria and fungus that grow on marijuana)

(7) A large percentage of persons arrested in this state, including adults and juveniles who commit violent offenses, have marijuana in their system at the time of arrest.

- Tab "A": *Descriptive Analysis of Sexual Assaults in Anchorage, Alaska* (Oct. 2003) Rosay and Longworthy, University of Alaska, Anchorage
- Tab "B": *Drug Use Among Arrestees in Anchorage* (Spring 2000) Alaska Justice Forum, University of Alaska, Anchorage

(8) Marijuana use by parents affects use by children; access by children; effectiveness of penalties in reducing use

- Tab "C" – State of Alaska Adolescent Health Survey, 1990 (Children in homes where parents used marijuana frequently were more likely (22.6% vs. 5%) than children in homes where parents did not use marijuana frequently to use themselves); (among youth perceiving parents would strongly disapprove of using marijuana only 5.4% had used marijuana in the past month vs. 28.7% in homes where the youth believed that their parents would only somewhat disapprove or neither approve or disapprove of their trying marijuana)
- Addendum: *Price and Enforcement Effects on Cocaine and Marijuana Demand,* Desimone and Farrelly, Economic Inquiry (January 2003)
- Addendum: *The joint demand for cigarettes and marijuana: evidence from the National Household Surveys on Drug Abuse,* Farrelly, et. al., Journal of Health Economics 20 (2001)
- Testimony of Cristi Willer, Deputy Director of Behavioral Health, in Senate HESS and Judiciary Committees and House Judiciary Committee

Existing Alaska Marijuana Crimes			Proposed Legislation
sells or gives ("delivers")	any amount to person under 19, and three years younger	class B felony	No change to existing law
grows, sells or gives or possesses with intent to deliver	1 ounce or more	class C felony	No change to existing law
possesses	1 pound or more	class C felony	**Changes to 4 ounces or more**
possesses	25 or more marijuana plants	class C felony	No change to existing law
possesses	any amount on school grounds and within 500 feet	class C felony	No change to existing law
possesses	1/2 pound to 1 pound	class A misdemeanor	**Changes to one to four ounces**
grows, sells or gives, or possesses with intent to deliver	1/2 ounce to 1 ounce	class A misdemeanor	**Prohibits growing, sale, gift, or possession with intent to deliver, less than one ounce**
grows, delivers or possesses with intent to deliver, for money	less than 1/2 ounce	class A misdemeanor	**Repealed**
uses or displays	any amount	class B misdemeanor	No change to existing law
possesses	up to 1/2 pound (up to 1/4 pound in home protected by court decision)	class B misdemeanor	**Changes to under one ounce**
possesses while driving or operating a motor vehicle	any amount	class B misdemeanor	**Makes this a class A misdemeanor**
driver of motor vehicle permits passenger to possess	any amount	This is not currently a crime in Alaska.	**Makes this a class B misdemeanor**

24-GS1054\G
Luckhaupt
4/29/05

Form G

CS FOR SENATE BILL NO. 74( )

IN THE LEGISLATURE OF THE STATE OF ALASKA

TWENTY-FOURTH LEGISLATURE - FIRST SESSION

BY

Offered:
Referred:

Sponsor(s): SENATE RULES COMMITTEE BY REQUEST OF THE GOVERNOR

A BILL

FOR AN ACT ENTITLED

"An Act relating to marijuana and misconduct involving a controlled substance; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

*** Section 1.** AS 11.71.040(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the fourth degree if the person

(1) manufactures or delivers any amount of a schedule IVA or VA controlled substance or possesses any amount of a schedule IVA or VA controlled substance with intent to manufacture or deliver;

(2) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances of an aggregate weight of one ounce or more containing a schedule VIA controlled substance;

(3) possesses

(A) any amount of a schedule IA or IIA controlled substance;

(B) 25 or more tablets, ampules, or syrettes containing a schedule IIIA or IVA controlled substance;

(C) one or more preparations, compounds, mixtures, or substances of an aggregate weight of three grams or more containing a schedule IIIA or IVA controlled substance;

(D) 50 or more tablets, ampules, or syrettes containing a schedule VA controlled substance;

(E) one or more preparations, compounds, mixtures, or substances of an aggregate weight of six grams or more containing a schedule VA controlled substance;

(F) one or more preparations, compounds, mixtures, or substances of an aggregate weight of **four ounces** [ONE POUND] or more containing a schedule VIA controlled substance; or

(G) 25 or more plants of the genus cannabis;

(4) possesses a schedule IIIA, IVA, VA, or VIA controlled substance

(A) with reckless disregard that the possession occurs

(i) on or within 500 feet of school grounds; or

(ii) at or within 500 feet of a recreation or youth center; or

(B) on a school bus;

(5) knowingly keeps or maintains any store, shop, warehouse, dwelling, building, vehicle, boat, aircraft, or other structure or place that is used for keeping or distributing controlled substances in violation of a felony offense under this chapter or AS 17.30;

(6) makes, delivers, or possesses a punch, die, plate, stone, or other thing **that** [WHICH] prints, imprints, or reproduces a trademark, trade name, or other identifying mark, imprint, or device of another or any likeness of any of these upon a drug, drug container, or labeling so as to render the drug a counterfeit substance;

(7) knowingly uses in the course of the manufacture or distribution of a controlled substance a registration number that is fictitious, revoked, suspended, or

issued to another person;

(8) knowingly furnishes false or fraudulent information in or omits material information from any application, report, record, or other document required to be kept or filed under AS 17.30;

(9) obtains possession of a controlled substance by misrepresentation, fraud, forgery, deception, or subterfuge; or

(10) affixes a false or forged label to a package or other container containing any controlled substance.

* **Sec. 2.** AS 11.71.050(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the fifth degree if the person

(1) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances of an aggregate weight of one-half ounce or more containing a schedule VIA controlled substance;

(2) manufactures or delivers, or possesses with the intent to manufacture or deliver, one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than one-half ounce containing a schedule VIA controlled substance, for remuneration;

(3) possesses

(A) less than 25 tablets, ampules, or syrettes containing a schedule IIIA or IVA controlled substance;

(B) one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than three grams containing a schedule IIIA or IVA controlled substance;

(C) less than 50 tablets, ampules, or syrettes containing a schedule VA controlled substance;

(D) one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than six grams containing a schedule VA controlled substance; or

(E) one or more preparations, compounds, mixtures, or

substances of an aggregate weight of **one ounce** [ONE-HALF POUND] or more containing a schedule VIA controlled substance; or

(4) fails to make, keep, or furnish any record, notification, order form, statement, invoice, or information required under AS 17.30.

*** Sec. 3.** AS 11.71.060(a) is amended to read:

(a) Except as authorized in AS 17.30, a person commits the crime of misconduct involving a controlled substance in the sixth degree if the person

(1) uses or displays any amount of a schedule VIA controlled substance;

(2) [OR] possesses one or more preparations, compounds, mixtures, or substances of an aggregate weight of less than **one ounce** [ONE-HALF POUND] containing a schedule VIA controlled substance; or

(3) [(2)] refuses entry into a premise for an inspection authorized under AS 17.30.

*** Sec. 4.** This Act takes effect immediately under AS 01.10.070(c).

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 1
Bill Version: SB 74
(S) Publish Date: 1/21/05

Revision Date/Time (Note if correction):
Dept. Affected: Public Safety

Title: An Act relating to marijuana use and possession; marijuana and misconduct controlled substance
RDU: Alaska State Troopers
Component: AST Detachments

Sponsor: Rules Committee
Requester: Governor
Component No.: 2325

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2005) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

Passage of this Act will have no fiscal impact on the Department of Public Safety. The potential increase in the number of arrests for violations can be handled by available staff. Provisions of this Act will help deter marijuana use and possession overall. The Act also addresses the issue of driving under the influence of marijuana which is a serious problem. Contrary to some contention on the subject, marijuana is not a harmless recreational drug.

Prepared by: Lieutenant Todd Sharp
Phone: 907-269-4532
Division: Alaska State Troopers
Date/Time: 1/20/05 2:20 PM
Approved by: Commissioner William Tandeske
Date: 1/20/2005
Agency: Department of Public Safety

(Revised 9/23/2004 OMB)

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 2
Bill Version: SB 74
(S) Publish Date: 1/21/05

Revision Date/Time (Note if correction):
Dept. Affected: Administration
Title: An Act relating to marijuana use and possession...
RDU: Legal and Advocacy Services
Component: Public Defender Agency
Sponsor: Rules Committee
Requester: Governor
Component No.: 1631

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services	115.5	115.5	115.5	115.5	115.5	115.5
Travel	4.8	4.8	4.8	4.8	4.8	4.8
Contractual	35.9	35.9	35.9	35.9	35.9	35.9
Supplies	2.7	2.7	2.7	2.7	2.7	2.7
Equipment	6.7	0.7	0.7	0.7	0.7	0.7
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**165.6**	**159.6**	**159.6**	**159.6**	**159.6**	**159.6**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF	165.6	159.6	159.6	159.6	159.6	159.6
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**165.6**	**159.6**	**159.6**	**159.6**	**159.6**	**159.6**

Estimate of any current year (FY2005) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time	1	1	1	1	1	1
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This proposed bill significantly increases the penalties for possession, use, and delivery of marijuana. It raises from a B misdemeanor to a B felony in many cases the delivery of marijuana, in any amount to someone under 21. Possession of 4 ounces or more of marijuane is raised to a C felony from a misdemeanor. It also adjusts the misdemeanor penalties related to marijuana and creates new misdemeanors for possessing marijuana while driving, permitting a passenger to possess it, or being a passenger in possession. This bill would have an impact on Agency operations. We handle 500 misdemeanor drug cases, primarily involving marijuana. At least half of these would become felonies. Felonies take more work than misdemeanors. Also more misdemeanors would be prosecuted for less amounts and vehicle related offenses. This will increase by 50% the current number of misdemeanor cases handled by the Agency. The Agency will need one full time attorney to meet this increased case and work load. The position would be in Kenai, since their numbers are increasing in this area, and almost match Anchorage.

Prepared by: Linda K. Wilson, Deputy Director
Phone: (907)334-4416
Division: Public Defender Agency
Date/Time: 1/19/05 10:32 AM
Approved by: Micheal Tibbles, Deputy Commissioner
Date: 1/19/2005
Agency: Department of Administration

(Revised 9/23/2004 OMB)

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 3
Bill Version: SB 74
(S) Publish Date: 1/21/05

Revision Date/Time (Note if correction):
Dept. Affected: LAW
Title "An Act making findings relating to marijuana use and possession; relating to marijuana and misconduct.."
RDU CRIMINAL
Component CDCO
Sponsor
Requester Governor
Component No.

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2005) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governo. **FY 2006 budget proposal:**

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This bill creates a new statutory section making findings regarding the mental and physical health risks, illegality and dangers of marijuana use. The bill makes changes to AS 11.71.030, .040, .050, and .060 concerning the crime of misconduct involving a controlled substance by adding additional offenses and significantly decreasing the amount of marijuana in possession that would constitute a violation. All of the conduct prohibited in this bill is already a crime in Alaska, although recent decisions by the appellate courts have made it difficult to investigate and prosecute some of these offenses. We do not expect the policies of police agencies to change significantly in response to this bill, and therefore we do not expect a workload increase above and beyond what was experienced before the courts made prosecution more difficult. Anticipated fiscal impact is zero.

Prepared by: Kathryn Daughhetee, Director
Phone 465-3673
Division Administrative Services Division
Date/Time 1/14/05 11:19 AM
Approved by: Kathryn Daughhetee for Gregg D. Renkes, Attorney General
Date 1/14/2005
Agency Department of Law

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 4
Bill Version: SB 74
(S) Publish Date: 1/21/05
Dept. Affected: Health & Social Services

Revision Date/Time (Note if correction):

Title: RELATING TO MARIJUANA USE AND POSSESSION
RDU: Juvenile Justice
Component: Probation Services

Sponsor: (RLS) BY REQUEST OF THE GOVERNOR

Requester: GOVERNOR
Component No.: 2134

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES (0)						

FUND SOURCE (Thousands of Dollars)						
1002 Federal Receipts						
1003 GF Match						
1004 GF						
1037 GF/Mental Health						
Other(Specify Type-do not abbreviate)						
Other(Specify Type-do not abbreviate)						
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2005) cost:
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal: ☐

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

This bill is not anticipated to have a significant impact on Division of Juvenile Justice staff workloads and therefore no fiscal impact.

Prepared by: Patty Ware — Phone 465-2112
Division: Juvenile Justice — Date/Time 01/20/2005
Approved by: Joel S. Gilbertson, Commissioner — Date 01/20/2005
Agency: Department of Health and Social Services

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number: 5
Bill Version: SB 74
(S) Publish Date: 4/4/05

Revision Date/Time (Note if correction):
Dept. Affected:

Title: Crimes Involving Marijuana/Other Drugs
BRU: Alaska Court System
Component: Trial Courts

Sponsor: Senate Rules
Requester: Governor
Component No.: 768

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services						
Travel						
Contractual						
Supplies						
Equipment						
Land & Structures						
Grants & Claims						
Miscellaneous						
TOTAL OPERATING	•	•	•	•	•	•
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)						
1002 Federal Receipts						
1003 GF Match						
1004 GF						
1005 GF/Program Receipts						
1037 GF/Mental Health						
Other (Specify Type--Do not abbreviate)						
TOTAL	•	•	•	•	•	•

Estimate of any current year (FY2005) cost: 0.0
Mark this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time						
Part-time						
Temporary						

ANALYSIS: *(Attach a separate page if necessary)*

Senate Bill 74 decreases from one pound to four ounces the amount of marijuana sufficient to constitute a felony offense for possession under AS 11.71.040. Under current law, possession of less than one pound of marijuana is a misdemeanor. Additionally, the bill creates new offenses related to marijuana possession in a vehicle and raises the penalties for certain delivery offenses. An increase in the number of felony filings impacts the court system because felony cases must go to a grand jury, the felony trial rate is much higher than the misdemeanor trial rate and, because those convicted of felony crimes are subject to supervised probation by the Department of Corrections, the court will see more petitions to revoke probation. Although these changes will impact the court system, the extent of that impact is too speculative to support a fiscal note at this time. However, if that impact proves to be significant the court system may return to the legislature with a request for additional funding.

Prepared by: Douglas Wooliver, Administrative Attorney
Phone 463-4750
Division: Alaska Court System
Date/Time 3/30/05 9:51 AM

Approved by: Doug Wooliver for Stephanie Cole, Administrative Director
Date 3/30/2005
Agency: Alaska Court System

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: SB 74
() Publish Date:

Revision Date/Time (Note if correction):
Dept. Affected: Corrections
Title: "Act making findings relating to marijuana use and possession; relating to marijuana and misconduct ..."
RDU: Institutional Facilities
Component: Institution Director's Office
Sponsor: Rules Committee
Requester: Governor
Component No.: 524

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services	•	•	•	•	•	•
Travel	•	•	•	•	•	•
Contractual	•	•	•	•	•	•
Supplies	•	•	•	•	•	•
Equipment	•	•	•	•	•	•
Land & Structures	•	•	•	•	•	•
Grants & Claims	•	•	•	•	•	•
Miscellaneous	•	•	•	•	•	•
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts	•	•	•	•	•	•
1003 GF Match	•	•	•	•	•	•
1004 GF	•	•	•	•	•	•
1005 GF/Program Receipts	•	•	•	•	•	•
1037 GF/Mental Health	•	•	•	•	•	•
Other (Specify Type--Do not abbreviate)	•	•	•	•	•	•
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2005) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time	•	•	•	•	•	•
Part-time	•	•	•	•	•	•
Temporary	•	•	•	•	•	•

ANALYSIS: *(Attach a separate page if necessary)*

The legislation proposes new statutory language that delineates findings regarding the mental and physical health risks, illegality and dangers of marijuana use. The bill makes changes to AS 11.71.030, .040, .050, .060 concerning the crime of misconduct involving a controlled substance by adding additional offenses, decreasing the amount of marijuana in possession that would constitute a violation, and increasing the penalties for possession, use and delivery of marijuana. Although most of the conduct prohibited in this bill already is a crime in Alaska, changes are proposed that will increase penalties for certain criminal activity. The legislation decreases from one pound to four ounces the amount of marijuana sufficient to constitute a felony under AS 11.71.040. The bill also creates new offenses related to marijuana possession in a vehicle and raises the penalties for certain delivery offenses. (more)

Prepared by: Sharleen Griffin, Director — Phone 465-4641
Division: Administrative Services — Date/Time 4/20/05 7:00 AM
Approved by: Portia Parker, Deputy Commissioner — Date 4/20/2005
Agency: Department of Corrections

FISCAL NOTE

STATE OF ALASKA **BILL NO.** SB 74
2005 LEGISLATIVE SESSION

ANALYSIS CONTINUATION

The penalty is increased from a misdemeanor to a class B felony for certain delivery of marijuana offenses, including any amount delivered to a person under 21 years of age. The changes proposed in the legislation most likely will increase both the number of cases, as well as the time served by offenders upon conviction, but accurate projections are difficult to assess.

In 2003 and 2004, the department incarcerated the following number of offenders charged with, or convicted of crimes similar to those being expanded or increased under the legislation.

AS 11.71.040, Misconduct involving a controlled substance in the fourth degree, a class C felony: In 2003, the Department of Corrections booked 1,617 individuals into its facilities who were charged with an offense under AS 11.71.040, , and 646 of those individuals were later convicted of a crime under AS 11.71.040. In 2004, 1598 were booked, and 618 were convicted. Convicted offenders served an average sentence of 1.5 years and 2.07 years respectively.

AS 11.71.050, Misconduct involving a controlled substance in the fifth degree, a class A misdemeanor: In 2003, the department booked 114 individuals, and 66 convictions. In 2004, 98 bookings and 186 convictions. Offenders served an average of 1.0 years and 1.1 years respectively.

AS 11.71.060, Misconduct involving a controlled substance in the sixth degree, a class B misdemeanor: In 2003, the department booked 652 individuals, and 186 convictions. In 2004, 593 bookings, and 99 convictions. Offenders served an average sentence of .79 years and .71 years respectively.

Although the changes proposed in the legislation will impact the Division of Institutions, Department of Corrections, the extent of that impact is too speculative to support a defined fiscal note at this time, and therefore it is indeterminate. However, if the impact proves to be significant, the department will return to the legislature with a request for additional funding.

FISCAL NOTE

STATE OF ALASKA
2005 LEGISLATIVE SESSION

Fiscal Note Number:
Bill Version: SB 74
() Publish Date:

Revision Date/Time (Note if correction)
Dept. Affected: Corrections
Title "Act making findings relating to marijuana use and possession, relating to marijuana ..."
RDU Probation and Parole
Probation and Parole Directors Ofc
Sponsor Rules Committee
Requester
Component No. 2684

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

OPERATING EXPENDITURES	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Personal Services	•	•	•	•	•	•
Travel	•	•	•	•	•	•
Contractual	•	•	•	•	•	•
Supplies	•	•	•	•	•	•
Equipment	•	•	•	•	•	•
Land & Structures	•	•	•	•	•	•
Grants & Claims	•	•	•	•	•	•
Miscellaneous	•	•	•	•	•	•
TOTAL OPERATING	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURES						
CHANGE IN REVENUES ( )						

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts	•	•	•	•	•	•
1003 GF Match	•	•	•	•	•	•
1004 GF	•	•	•	•	•	•
1005 GF/Program Receipts	•	•	•	•	•	•
1037 GF/Mental Health	•	•	•	•	•	•
Other (Specify Type--Do not abbreviate)	•	•	•	•	•	•
TOTAL	0.0	0.0	0.0	0.0	0.0	0.0

Estimate of any current year (FY2005) cost: 0.0
Check this box (X) if funding for this bill is included in the Governor's FY 2006 budget proposal:

POSITIONS

Full-time	•	•	•	•	•	•
Part-time	•	•	•	•	•	•
Temporary	•	•	•	•	•	•

ANALYSIS: *(Attach a separate page if necessary)*

The legislation proposes new statutory language that delineates findings regarding the mental and physical health risks, illegality and dangers of marijuana use. The bill makes changes to AS 11.71.030, .040, .050, .060 concerning the crime of misconduct involving a controlled substance by adding additional offenses, decreasing the amount of marijuana in possession that would constitute felonious conduct, and increasing the penalties for possession, use and delivery of marijuana. Although most of the conduct prohibited in this bill already is a crime in Alaska, changes are proposed that will increase penalties for certain criminal activity. The legislation decreases from one pound to four ounces the amount of marijuana sufficient to constitute a felony under AS 11.71.040. The bill also creates new offenses related to marijuana possession in a vehicle and raises the penalties for certain delivery offenses. (more)

Prepared by: Sharleen Griffin, Director — Phone 465-4641
Division: Administrative Services — Date/Time 4/20/05 7:01 AM
Approved by: Portia Park, Deputy Commissioner — Date 4/20/2005
Agency: Department of Corrections

(Revised 9/23/2004 OMB)

FISCAL NOTE

STATE OF ALASKA **BILL NO.** SB 74
2005 LEGISLATIVE SESSION

ANALYSIS CONTINUATION

The penalty is increased from a misdemeanor to a class B felony for certain delivery of marijuana offenses, including any amount delivered to a person under 21 years of age. The changes proposed in the legislation most likely will increase both the number of cases, as well as the time served by offenders upon conviction, but accurate projections are difficult to assess.

In 2003 and 2004, the department incarcerated the following number of offenders charged with, or convicted of crimes similar to those being expanded or increased under the legislation.

AS 11.71.040, Misconduct involving a controlled substance in the fourth degree, a class C felony: In 2003, the Department of Corrections booked 1,617 individuals into its facilities who were charged with an offense under AS 11.71.040, , and 646 of those individuals were later convicted of a crime under AS 11.71.040. In 2004, 1599 were booked in, and 618 were convicted. Convicted offenders served an average sentence of 1.5 years and 2.07 years respectively.

AS 11.71.050, Misconduct involving a controlled substance in the fifth degree, a class A misdemeanor: In 2003, the department booked 114 individuals, and 66 convictions. In 2004, 98 bookings and 186 convictions. Offenders served an average of 1.0 years and 1.1 years respectively.

AS 11.71.060, Misconduct involving a controlled substance in the sixth degree, a class B misdemeanor: In 2003, the department booked 652 individuals, and 186 convictions. In 2004, 593 bookings, and 99 convictions. Offenders served an average sentence of .79 years and .71 years respectively.

Although the changes proposed in the legislation will impact the Division of Probation and Parole, Department of Corrections due to an increase in the number of felons under probation and/or parole supervision, the extent of that impact is too speculative to support a defined fiscal note at this time, and therefore it is indeterminate. However, if the impact proves to be significant, the department will return to the legislature with a request for additional funding.

Comparison of current marijuana laws with Governor's Marijuana legislation in SB 74 and HB 96

			Proposed Legislation
delivery (sale or gift)	any amount to person under 19, and three years younger	class B felony	**any amount to person under 21, regardless of age difference**
grows, delivers or possesses with intent to deliver	1 ounce or more	class C felony	
possesses	1 pound or more	class C felony	**lowers to 4 ounces**
possesses	25 or more marijuana plants	class C felony	
possesses	any amount on school grounds and within 500 feet	class C felony	
possesses	1/2 pound to 1 pound	class A misdemeanor	**lowers to under one ounce**
grows, delivers or possesses with intent to deliver, but does not do so for money	1/2 ounce to 1 ounce	class A misdemeanor	
grows, delivers or possesses with intent to deliver, for money	less than 1/2 ounce	class A misdemeanor	
grows, delivers or possesses with intent to deliver, but does not do so for money	less than 1/2 ounce	It is unclear if this is even a crime in Alaska.	**Makes this a class B misdemeanor**
uses or displays	any amount	class B misdemeanor	
possesses	up to 1/2 pound (up to 1/4 pound in home protected by court decision)	class B misdemeanor	
possesses while driving or operating a motor vehicle	any amount	class B misdemeanor	**Makes this a class A misdemeanor**
driver of motor vehicle permits passenger to possess	any amount	This is not currently a crime in Alaska.	**Makes this a class B misdemeanor**

Prepared by Dept. of Law

April 2005

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AkCLU, experts say pot less harmful than alcohol or cigarettes

Prof who is a 40-year student of the effects of marijuana says public has been brainwashed

A representative from the Alaska Civil Liberties Union joined a handful of experts Friday to tell a Senate committee that marijuana is less harmful than alcohol and even tobacco.

"There has not been a single case of lung cancer or emphysema triggered by smoking marijuana found in medical literature," said Dr. Lester Grinspoon, an associate professor emeritus at Harvard Medical School who has studied the effects of pot for almost 40 years.

In his assessment, he said the public has been "brainwashed" on the effects of marijuana. Senators reviewing a criminalization bill were hesitant to agree.

The bill would make possession of an ounce of marijuana a misdemeanor. Possession of 4 ounces would be a felony. Currently Alaska courts grant privacy protection to those possessing up to 4 ounces.

Last week a White House drug adviser and others told the committee that marijuana is dangerous and should be criminalized.

The Senate Health, Environment and Social Services Committee approved the bill Friday, but committee chairman Fred Dyson, R-Eagle River, said his vote did not mean he supports the proposal.

"Three of the committee members felt comfortable that it should continue in the process. And I know Sen. (Donald) Olson and I both plan on doing some research," Dyson said.

The bill moves to the Judiciary Committee next and then to the Finance Committee before going to the floor for a vote. The House of Representatives must also review the bill.

Gov. Frank Murkowski is pushing this law to criminalize marijuana and get findings on the record in order to open and overturn a 2003 Court of Appeals case that ruled Alaskans have the right to possess small quantities of

marijuana in their homes.

Among the 19 findings in the bill are statements saying that marijuana is more addictive than heroin, it has a dramatically higher potency than before, and it leads smokers to commit violent crimes.

On Friday the AkCLU led a team of opponents who said the bill is based on a framework of evidence that is skewed to one view.

"The court will stand for a paper record of several hundred pages if the result is contrary to the evidence submitted," said Michael MacLeod-Ball, director of AkCLU.

The most debated finding throughout the afternoon was whether an increase in marijuana's potency has led to more addictions and associated problems.

"The marijuana of Cheech and Chong had a THC level of 1.5 percent," said John Bobo, adviser to the office of drug and alcohol policy U.S. Department of Transportation. He claims THC levels of homegrown pot today can be as high as 22 percent to 24 percent.

Mitch Earlewine, assistant professor of psychology at the University of Southern California, said that those high percentages are rare and the national average today is closer to 6 percent.

"When we give people cannabis that has 1 percent in the laboratory, they get a headache and claim it is placebo and they find it inactive and don't want to use it again," said Earlewine. "Obviously this wasn't the case in the 1970s or people wouldn't want to try it again."

Muscular sclerosis sufferer Jim Welch of Eagle River said the potency was a hidden "healthy" benefit: "That means I'm putting less smoke in my lungs."

Kelly Drew, a University of Alaska Fairbanks chemistry professor, phoned in to say that it is unlikely for marijuana to be addictive since it stays in the body's fat cells for about 30 days. Therefore, the body doesn't suffer withdrawal symptoms, she said.

Bobo also said that people under the influence of pot are more likely to commit accidents on the highways. The senators wondered why they haven't heard about marijuana being linked to such highway collisions.

"The media does not want to acknowledge there is a problem," said Assistant Attorney General Dean Guaneli, the bill's sponsor.

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http://juneauempire.com/stories/040305/sta_20050403002.shtml

Marijuana: Things Have Changed and Parents Choices Matter

A Parent's Choice to Use Marijuana Affects Their Children

- **"More adolescents who report their parents use marijuana frequently use marijuana themselves compared with youths whose parents do not use marijuana"** (22.6% to 5%). *The State of Adolescent Health in Alaska, May, 1990, p.41.*

- **"Among youths in 2003 who perceived that their parents would strongly disapprove strongly disapprove of trying marijuana or hashish once or twice, 5.4% used marijuana in the past month, vs. 28.7% of youths whose parents would not strongly disapprove"** *Overview of Findings from the 2003 National Survey On Drug Use and Health, Department of Health and Human Services, SAMHSA, Office of Applied Studies, 2004, p.23.*

The THC Content of Today's Alaska Marijuana is 14 Times Levels Found in Ravin

- **Average THC content in Alaska marijuana has steadily increased and averaged nearly 14% in 2003. This is approximately twice the national average THC content and 14 times stronger than THC content levels assumed and relied upon by the Alaska Supreme Court in weighing the harmful effects of marijuana.** ***State v. Ravin,*** **537 P.2d 494, 505 (Alaska 1975) ("Most marijuana available in the United State has a THC content of less than one percent.")** *Average THC Levels for Alaska, National Averages, Reports Prepared by Dr. Elsohly, University of Mississippi, National Center for Natural Products Research.*

The Face of Alaska Marijuana Use: Who Is Using Alaska's Powerful Marijuana?

Pregnant Mothers

- **Between 1990 and 2000, the rate of pregnant mothers in Alaska using marijuana remained fairly constant at about %. (400 to 450 newborns each year) This rate was approximately 67% higher than the national average (3%) for this time period and just slightly below the rate for Alaskan mother's prenatal alcohol use. (5.3%).** *Alaska Maternal and Child Health Data Book, 2003, State of Alaska, Department of Health and Social Services, Division of Public Health, Section of Maternal Child and Family Health, pp. 52-55; 150-151.*

- **The prevalence of prenatal marijuana use among Alaska Native pregnant mothers has been significantly higher than the overall state prevalence over the last decade. More than twice the state average in 2002. (3.5% Alaska average for prenatal marijuana use vs. 7.8% for Alaska Natives).** *Women's and Children's & Health Fact Sheet, 2005, State of Alaska, Department of Health and Social Services, (Information from Alaska Pregnancy Risk Assessment Monitoring System, PRAMS, 2002).*

- **Recent progress has been made and the overall rate of pregnant mothers in Alaska using marijuana was down to 3.5% in 2002. (Nearly 1 in 29)** *Women's, Children's, & Family Health Fact Sheet, 2005, State of Alaska Department of Health and Social Services. (Information from Alaska Pregnancy Risk Assessment Monitoring System (PRAMS), 2002.*

- **The approximately 400 to 450 Alaskan newborns exposed to marijuana may suffer negative physical and behaviorial effects. (Three recently published scientific studies found evidence a pregnant mother's marijuana use has negative physical and behaviorial effects).** *Porath AJ, Fried PA "Effects of Prenatal Cigarette and Marijuana Exposure on Drug Use Among Offspring" ("[m]ale offspring of mothers who reported using marijuana while pregnant had nearly four times the odds of initiating marijuana use compared to offspring whose mothers did not report using marijuana during pregnancy ... As data indicates that cannabinoid receptors are present in the placenta, and the fetal and neonatal brain, it is possible that prenatal exposure to marijuana also sensitizes the brain to the subsequent*

influence of marijuana consumed later in life. ... In summary ...the data suggest that in utero exposure to marijuana is associated with cigarette smoking and marijuana use initiation ... a reduction in rates of use may not only yield direct health benefits for the substance users ... it may also have unanticipated benefits for their offspring) ; Neurotoxicology Teratology, 2005 Mar-Apr; 27(2):267-77; Hurd, YL, Wang X, et.al., "Marijuana Impairs Growth in Mid-Gestation Fetuses": Neurotoxicology Teratology, 2005 Mar-Apr; 27(2):267-77; Wang X, et.al., "In Utero Marijuana Exposure Associated with Abnormal Amygdala Dopamine D2 Gene Expression in the Human Fetus", Biological Psychiatry, Dec. 2004, pages 909-915.

Pre-School Age Children and Their Parents

- **A study of rural Alaska villages found preschool parents aged 26-34 were using marijuana at a rate roughly 3 times the national average. (19% vs. 6.7%)** *Stillner, V, et.al., Drug Use in Very Rural Alaska Villages, Substance Use and Misuse, 1999.*

Elementary School Students

- **By sixth grade, (age 11) 7-10% of Alaskan students have tried marijuana.** *1995, Alaska Youth Risk Behavior Survey (7% of middle school students started smoking marijuana before age 11); 1999, Alaska Youth Risk Behavior Survey (8.5% of middle school respondents (excluding Anchorage) started smoking marijuana before age 11; 2003, Youth Risk Behavior Survey Results, Northwest Arctic Borough School District Middle School Survey: Unweighted (10.2% of students tried marijuana for the first time before the age of 11)*

- **Students who started smoking marijuana before the age of 11 usually make up from 25-30% of the overall group of middle school students reporting a lifetime use of marijuana.** *Id.*

- **Kids who started smoking marijuana before the age of 11 made up 40% of the juveniles placed in Alaska's secure juvenile facilities in a survey done in 1998.** *1999, Division of Juvenile Justice Survey of Youths in Secure Facilities.*

- **Kids who smoked marijuana 10 to 40 times or more a month made up 46% of the juveniles placed in Alaska's secure juvenile facilities.** *Id.*

- **67% of the youth in Alaska's secure juvenile facilities have smoked marijuana 100 or more times in their lives.** *Id.*

Middle School Students

- **Roughly one in four of all Alaska middle school students has at least tried marijuana.** *1995, Alaska Youth Risk Behavior Survey (26.1%); 1999, Alaska Youth Risk Behavior Survey (28.9%, unweighted excluding Anchorage).*

- **These middle school students make up some of the 3-4,000 youth aged 12-17 in Alaska that initiate marijuana use each year. (100 to 150 a day).** *Initiation of Marijuana Use, Trends, Patterns, and Implications, Gfroerer, J, Department of Health and Human Services, SAMHSA, Office of Applied Studies, 2002, Table 4.1.*

- **Many of the middle school students using marijuana are doing so before or during school.** *Middle school students were part of a 1990 survey of students in grades 7-12 which found 25% of students reporting marijuana use in the past year used marijuana before or during school. The State of Adolescent Health in Alaska, May, 1990.*

- **Middle school students may also start to make up the roughly 150-170 Alaskan youth aged 12-17 (on average for the years 2000-2003) admitted into a treatment facility primarily for marijuana abuse.** *Substance Abuse Treatment Admissions by Primary Substance of Abuse, SAMHSA TEDS data.*

High School Students

- **If you are one of the 6% of Alaska high school age students in an alternative high school due to being at risk for not graduating from a regular high school, there is an about an 85% chance you have used marijuana and a 53% chance you are a current marijuana user.** *Youth Risk Behavior Surveillance – National Alternative High School Youth Risk Behavior Survey, United States, 1998.*

- **If you are a Alaska Native high school student there is a 70% chance you have tried marijuana and a 35.5% chance you are a current user.** *2003, Alaska Youth Risk Behavior Survey.*

- **In high schools across the state, (excluding Anchorage) 18.8% of male students and 14.7% of female students have already tried marijuana for the first time by their freshmen year.** *1999 Alaska Youth Risk Behavior Survey.* **The national average for 2003 was 9.9% for all students.** *2003 National Youth Risk Behavior Survey Results.*

- **The average age of first marijuana use in Alaska is 16 years, but for American Indian / Alaska Native students (nationally), it is 14.1 years.** *SAMHSA, Office of Applied Studies, "Trends in Marijuana Incidence, Initiation of Marijuana Use: Trends, Patterns, and Implications Report", Table 3.6 and SAMHSA, Office of Applied Studies, Youth Substance Use: State Estimates from the 1999 National Household Survey on Drug Abuse, Table C.5.*

- **If you are high school age, a current user of marijuana, and have a predisposition to psychosis , your marijuana use increases the chances you will express a psychotic disorder or experience.** *Os, J., et.al., "Prospective Cohort Study of Cannabis Use, Predisposition for Psychosis, and Psychotic Symptoms in Young People", British Medical Journal, January, 2005.*

- **Daily use of marijuana by teenage females will also greatly increase (5 times) the chances of suffering from depression and anxiety. Weekly or more frequent use of marijuana by any teenager doubles the odds that you will suffer from depression and anxiety.** *Patton, G, et.al., Cannabis Use and Mental Health in Young People: Cohort Study, British Medical Journal, November, 2002.*

- **You may also be the one in six teenage drivers who drives while under the influence of marijuana.** *O'Malley, P., et.al., "Unsafe Driving by High School Seniors: National Trends from 1976 to 2001 in Tickets and Accidents After Alcohol, Marijuana and Other Illegal Drugs", Journal of Studies on Alcohol, May, 2003 (Data shows that 15% of U.S. high school seniors surveyed said they drove after using marijuana and 16% drove under the influence of alcohol).*

- **The New England Journal of Medicine has published results from a roadside study of reckless drivers (not impaired by alcohol) in which 45 % tested positive for marijuana. Another survey found that 68% of teen drivers who use drugs regularly reported they drive while under the influence of drugs.** *ONDCP, Press Release, Nov. 19, 2002.*

- **If you are a teenage driver who consumes both alcohol and marijuana and drives, the negative effects on your driving ability are magnified.** *National Highway Traffic Safety Administration, Traffic Tech, Number 201, June 1999, "Marijuana and Alcohol Combined Increase Impairment", ("The effect of combining moderate doses of alcohol and moderate doses of marijuana resulted in a dramatic performance decrement and levels of impairment as great as observed when at .14 BAC alone").*

- **If you are one of the approximately 75% of tobacco smokers who initiate their use as adolescents and you are a marijuana smoker, the additive effect of the carcinogens and other chemicals in marijuana increase the risk you will develop many respiratory symptoms associated with disorders common to tobacco use such as chronic bronchitis, chronic obstructive pulmonary disease, and cancer.** *State of Alaska, DHSS-Epidemiology Bulletin "Youth Tobacco Use", Results from the 2003 Youth Risk Behavior Survey; Moore, et.al., "Respiratory Effects of Marijuana and Tobacco Use in a U.S. Sample", Journal of General Internal Medicine, 2004.*

Adulthood

- **By the time you reach adulthood, if you are still using marijuana and have committed a crime and are incarcerated, you will be one of the 93% of Alaska inmates who have ever tried marijuana and may be one of the 23% of Alaska inmates with a marijuana disorder that needed treatment in the year prior to incarceration.** *State of Alaska, Department of Health and Social Services, Division of Alcoholism and Drug Abuse, "Substance Abuse Treatment Needs of Alaska's Newly Incarcerated Prisoner Population Prior to Incarceration, 2000.*

- **If your crime was rape, there is a 15% chance you used marijuana just prior to the assault and a little less than 10% chance that your victim was impaired by marijuana at the time of the rape.** *Descriptive Analysis of Sexual Assaults in Anchorage, October 2003.*

- **If you are Alaska Native and have a primary alcohol disorder for which you need treatment, it is more likely than not that you also have a secondary or co-occurring marijuana disorder.** *Alaska Natives Combatting Substance Abuse and Related Violence Through Self Healing, Center for Alcohol and Addiction Studies, January, 1999, (63% of native men and women with severe drinking problems surveyed in 1997 were also dependent on marijuana).*

- **If you are an Alaska Native male using marijuana, and you are seen at a community mental health center in rural Alaska, you may be one of the 17.4% of such patients with a diagnosis of marijuana dependence.** *Mental Disorders of Eskimos Seen at a Community Mental Health Center in Rural Alaska, Auon, S. et.al., Psychiatric Services, November 1998, vol.49, no. 11.*

- **If you committed a domestic violence crime and were arrested, there is a 69% chance you will test positive at the time of arrest for marijuana use.** *April, 2004, ONDCP Anchorage, Alaska, Profile of Drug Indicators.* **In comparison, there is only a 23% chance you would test positive for cocaine if you committed any type of violent crime.** *Id.*

- **If you somehow end up a drowning victim, you will be one of the 11% of drowning victims in Alaska that were found to have marijuana in their system.** *Drowning In Alaska Waters, Public Health Reports, v111, p.531-5, 1996.*

Tougher Criminal Penalties and Fines Have A Deterrent Effect
And Individuals Respond To Changes In How
The Government Treats Illegal Drugs

- **"The marijuana arrest rate has a strong negative effect [on use by adults] ... enforcement of drug possession violations reduces drug demand ... Changes in arrest rates [increase] for possession predict percentage point decreases of ... 3.0% in marijuana participation among juveniles";** *Price and Enforcement Effects on Cocaine and Marijuana Demand, Economic Inquiry, Desimone, J et.al., January, 2003;* **"[b]oth higher fines for marijuana possession and increased probability of arrest decrease the probability that young adults will use marijuana** *..." Farrelly, MC, et.al., The Joint Demand for Cigarettes and Marijuana: Evidence from the National Household Surveys on Drug Abuse" Journal of Health Economics, 2001;*

Chaloupka, FJ, et.al., "Do Higher Cigarette Prices Encourage Youth to Use Marijuana", National Bureau of Economic Research, Working Paper No. 6938, 1999 (Study of the 8th, 10th, and 12th grade surveys found marijuana decriminalization had a positive and significant effect on both the prevalence and quantity consumed of marijuana when median jail terms and fines were included in the model); Chaloupka, F.J., et.al, "The Demand for Cocaine and Marijuana by Youth", University of Chicago Press, 1999 (Data from the 1982 and 1989 Monitoring the Future Study showed individuals living in decriminalized states were significantly more likely to report use of marijuana in the past year); Saffer, H, and Chaloupka, FJ, "The Demand for Illicit Drugs", Economic Inquiry, 1999, (Analyzing data from the 1988, 1990, and 1991 NHSDA's and finding that decriminalization had a positive and significant effect on [reducing] marijuana prevalence).

SENATE JUDICIARY COMMITTEE
11 April 2005
WITNESS LIST

- BILL PARKER
  - Spokesman for Alaskans for Marijuana Regulation and Control

- WES MacLEOD-BALL
  - Director, Alaska Civil Liberties Union

- LESTER GRINSPOON, M.D.
  - Associate Professor of Psychiatry, Harvard Medical School

- SCOTT BATES
  - Economist, Boreal Economic Analysis and Research, Fairbanks

- ROBERT MALAMEDE, Ph.D.
  - Professor of Biology, University of Colorado at Colorado Springs

- TIM HINTERBERGER, Ph.D.
  - Associate Professor of Biomedicine, University of Alaska, Anchorage

- MITCH EARLEYWINE, Ph.D.
  - Associate Professor of Psychology, University of Southern California

- JIM WELCH
  - Medical Marijuana patient, Eagle River

absent

- DEBBIE SOULE
  - Medical Marijuana patient, Wasilla

WRITTEN TESTIMONY

- LESLIE IVERSON
  - Visiting Professor of Pharmacology, University of Oxford, England
- GREG CARTER, M.D.
  - Professor of Medicine, University of Washington, Seattle
- JACK COLE
  - Director, Law Enforcement Against Prohibition and retired narcotics police officer

Testimony to Senate Judiciary Committee
April 11, 2005

My name is Bill Parker. I am a former member of the Alaska House of Representatives, and I retired from state service as Deputy Commissioner of Corrections. Today I speak for Alaskans for Marijuana Regulation and Control.

S.B.74 attempts to recriminalize marijuana for adults in Alaska, in violation of the Alaska Constitution.

In 1975, in a landmark case known as Ravin, the Alaska Supreme Court ruled the privacy clause of the Alaska Constitution protects possession of a small amount of marijuana by adult Alaskans in their own homes for their own use. In 1975, the Alaska Legislature changed the statutes to decriminalize marijuana in Alaska.

Various attempts have been made in the 30 years since to attack this de-criminalization, both legally and politically.

An initiative in 1990 attempted to re-criminalize marijuana in Alaska, but initiatives change statutes, not the Constitution, and the initiative had no effect.

Many legal attempts have been made to test the constitutionality in the courts, all unsuccessful. The latest was last fall when the Alaska Supreme Court declined to take up the Appellate Court's latest ruling upholding Ravin.

S.B.74 is another attempt to attack the constitutional issue in a legal and political manner.

If S.B.74 passes with these findings, they will be admissible in court, and the administration will have new arguments that marijuana is much more potent and dangerous than in 1975, so much so that it is almost a different substance.

That is why the findings section of this bill is important. The findings are flawed. Expert witnesses from Alaska and Outside are going to explain those flaws today.

They will discuss the complex medical and sociological issues that other government panels have studied at length.

- The Shafer Commission's report to President Nixon in 1972, "Marijuana: Signal of Misunderstanding."
- The National Research Council's 1982 report, "An Analysis of Marijuana Policy."
- The Institute of Medicine's 1999 report, "Marijuana and Medicine: Assessing the Scientific Base."
- The 2002 report of the British Advisory Council on the misuse of drugs, "The Classification of Cannabis."
- The House of Commons Home Affairs Committee 2002 study, "The Government's Drug Policy: Is It Working?"
- Jamaica's 2001 National Commission on Ganja came to the same conclusion;

  Marijuana is not so harmful that the penalties for possession need to be increased.

S.B.74 would take Alaska in the opposite and wrong direction.

The State's witnesses could not be called objective observers. Those directly involved in implementing an administration's policies cannot evaluate those policies impartially. Evaluators should be independent academics.

The testimony today will show that the time schedule alone for S.B.74 is inadequate to evaluate marijuana in Alaska. We have submitted, in writing, the findings of experts in their fields who determine marijuana to be relatively harmless compared to alcohol. Each finding must be examined individually as the other commissions and committees have done with scientific integrity.

Here is a quick review of the evidence you will hear today:

Experts will point out the differences between scientific research and pseudo-science, the confusion between correlation and causation.

The administration's assertions about increased potency of marijuana are inaccurate and misleading in several respects:

- There are serious questions about the actual potency of marijuana today and yesterday. There is no reliable way to measure potency.
- There is no proof that marijuana is more addictive or dangerous than previously.
- In fact, more potent marijuana would result in people using less, because of the effect of autotitration.

The administration's treatment of statistics is misleading because most of their conclusions are court-ordered, not a clinical diagnosis of marijuana addiction or even a self-referral. Most had to choose between treatment or incarceration. Most chose treatment.

The rate of marijuana use among minors in Alaska is no higher today than it was in 1975. In fact, according to the government's own statistics, overall use in grades 6 through 12 in Alaska schools is lower now after 30 years of decriminalization.

Marijuana use by minors has not been shown to cause psychosis later in life.

Marijuana use does not induce violent behavior, rape, or child abuse.

The emergency room data used to show that marijuana is more dangerous today is not conclusive. The relation to marijuana in patients is so widely construed as to be meaningless. And the administration has overstated and misinterpreted the evidence of marijuana's link to lung cancer, juvenile crime, and the possibility of addiction and dependence.

The weight of scientific evidence available today discredits the old 'gateway drug' theory.

There are laws already in place to prohibit driving while impaired by alcohol or marijuana. These laws will remain in effect.

S.B.74 would have a bad effect on medical marijuana patients by jeopardizing their ability to possess marijuana if adult use of marijuana in the home is criminalized.

If the administration's aim is to promote the public health and welfare, re-criminalizing personal, adult use of marijuana in the home won't do it. Re-criminalization will only feed the black market and increase the social costs that flow from it.

And the spontaneous response by the citizen witnesses in the capitol and that the legislative information offices (LIOs) across the state show the Alaska public understands all this.

Science shows marijuana causes far less harm to the public health and welfare than alcohol or tobacco. And that's as true today as it was in 1975.

STATEMENT REGARDING ALASKA SB 74 AND HB 96

Scott Bates, Economist
Boreal Economic Analysis & Research, Fairbanks AK

Hello, my name is Scott Bates. I work for Boreal Economic Analysis & Research in Fairbanks. I have a Master of Science in Economics from the University of Alaska Fairbanks. I have worked on various projects as a research analyst over the last few years, and I am here to speak to you because I was involved in preparing a report called The Economic Implications of Marijuana Legalization in Alaska, prior to the vote on Ballot Measure 2 in 2004.

As detailed in that report, the costs to the State of Alaska of prohibiting marijuana include the actual costs of policing, prosecuting and corrections, as well as some indirect social costs. In total, we estimated that direct costs to the justice system are on the order of $16 million per year to prohibit marijuana. This was based on information gathered from the State, as well as data collected from the US DOJ, for State expenditures from 1997 to 2002. Social costs were estimated to amount to well over $7 million per year, including lost economic output, social services, and secondary offenses which occur as a result of probation violations and such. Based on our estimates from the report last year, I have estimated the additional costs that will result from passage of this bill.

Of the $16 million mentioned above, about $1.5 million were for law enforcement costs of marijuana arrests. This estimate was based on the fact that roughly 3.5% of all arrests in Alaska are for marijuana. Nationally the rate of marijuana arrests as a proportion of total arrests is approximately 5%.

It is reasonable to assume that if marijuana is recriminalized in Alaska, the proportion of marijuana arrests compared to total arrests will rise to become similar to the US average. In this case the costs of law enforcement would rise by at least $1 million, which is calculated by taking 1.5% of the average $68.1 million law enforcement budget for the last few years.

If committee members have looked at the fiscal notes that accompany this bill, they might have been surprised to see that the Department of Public Safety claims that "passage of this act will have no fiscal impact" on policing costs, because "The potential increase in the number of arrests for violations can be handled by available staff." More than one member of the Senate HESS committee found this difficult to believe, and I don't expect you to believe it either.

The rise in marijuana cases does not mean a similar decrease in other crimes. So if we consider the average $68 million budget for law enforcement, we have to ask, what will they give up in order to spend another million dollars on marijuana arrests? Since I am an economist, you know that the next words from me must be "opportunity costs." When we spend resources on a specific activity, we give up the opportunity to spend those resources on any other activities. Unless the law enforcement folks come to you and ask for more money, they are going have to decide which crimes are more important to

respond to—marijuana possession or other offenses.

Of all the components of the justice system affected by marijuana prohibition, policing is the *least* costly. The court system had average expenditures of $129.4 million over the last few years. Out of this total, we calculated that marijuana cases account for about $9.45 million per year on average. Clearly an increase in arrests will mean an increase in the court's case load. If the case load increase comparably to the arrest rate, the court system could have additional costs of about $4 million, bringing the total to $13.46 million for marijuana cases. Again, you may have found it difficult to believe the fiscal note submitted by the Department of Law, in which the attorney general's office anticipates no additional funding needs.

In fact, because my $4 million estimate is based on current levels of activity, we must conclude that the figure would actually be higher, since some crimes that are now misdemeanors would become felonies. You have heard or will hear that the Public Defender Agency anticipates a rise in their workload if this bill is enacted into law. Part of the reason is that felonies require more work than misdemeanors. I don't have the cost-per-case breakdown for Alaska, but we did find a fiscal note from the Iowa Legislative Services Agency regarding Iowa's costs of prosecution. In 2004 it was estimated that simple misdemeanors cost $14 to $300, serious misdemeanors were $100 to $5,000 and the lowest felonies ranged from $2,000 to $8,000. If Alaska's costs are similar, then it is clear how and why costs will rise. The Public Defender Agency says that the new law will result in at least 250 of its current misdemeanor cases becoming felonies, as well as a 50% increase in the number of misdemeanor cases they handle.

Corrections costs will also rise. Since we are more prone to incarcerate felons, there will be an increase in the number of felons who must be housed, although there may be more people convicted of marijuana misdemeanors who will be ordered to serve time as well. We estimated last year that approximately 132 people were incarcerated in one way or another because of marijuana convictions, at an estimated annual cost of $5.05 million. In keeping with my preceding calculations, we can expect an increase in corrections expenditures of about $2.16 million with the addition of roughly 56 inmates to the system.

The sum of the new costs is therefore estimated at $6.77 million, bringing the total average yearly direct costs of marijuana prohibition in Alaska to $22.77 million.

In the report prepared last year, we calculated some indirect costs as well. We estimated that lost productivity from marijuana prosecutions amounted approximately to $6 million annually in wages and benefits, plus taxes paid by the employer. This number rises to $8.26 million when we contemplate the increase in prisoner numbers. The lost productivity is actually higher because the value of the employee output should be higher than the combined costs of creating that output.

We also tried to estimate social service costs, which is tricky without a lot more inmate/family information. I would refer you to the original report for a detailed explanation of our estimation procedures, but our result for the current number of people in jail because of marijuana convictions easily surpasses $1 million when all types of

assistance are figured in. The addition of another projected 31 inmates with families adds another $450,000 to the potential costs.

6.2% of the corrections population is there because of parole and probation violations and may add another $500,000 to corrections costs if the relationship of marijuana offenders to total offenders holds to this level. This cost might rise to over $700,000 if the above inmate population increases occur.

In summary, then, if this bill is passed into law, and marijuana crimes are prosecuted as they are in the Lower 48, I have estimated that the annual direct costs to the criminal justice system will be $6.77 million, and the indirect costs of things like lost wages, family assistance, and secondary offenses will be another $3.35 million. In round numbers, we can look forward to an additional economic impact of $10 million, bringing the total costs of marijuana prohibition for Alaska to the range of $35 million to $40 million per year.

If prohibition *works*, one might argue that these costs are tolerable. But if prohibition *fails*, these costs are in *addition to* any social costs that actually stem directly from marijuana use. There is little doubt that many people will avoid a behavior if it is illegal. The questions we must ask are, by how much is marijuana use reduced, and is it worth the costs that result from prohibiting it.

Prohibition of marijuana shows little or no evidence of being effective in its primary goal, reducing consumption. In the interest of time, I won't discuss in detail the studies that demonstrated this in our report from last year. In fact, you only need to consider Finding #1 from this bill to realize that prohibition has failed: "marijuana has been for many years and continues to be the most commonly used illegal controlled substance in the United States".

I do not believe, based on the studies I have cited here and in last year's report, that there will be a significant reduction in the use of marijuana either through the higher risk of punishment or through the higher prices that will result. Violent crime and crimes against property may even rise, as they did after the recriminalization of marijuana in 1990.

I do believe that this Legislature has good intentions, such as reducing marijuana consumption by adolescents. However, it is virtually certain that increased penalties for marijuana use will fail to accomplish that, and instead will result in large cost increases to the people of this State. I strongly urge you to reject this bill.

STATEMENT REGARDING ALASKA SB 74 AND HB 96

Debbie Soule, medical marijuana patient

My name is Debbie Soule. I live in Wasilla. I am married, 55 years old, a grandmother and own my own business.

Seven years ago, my husband and I had a near fatal car accident. I broke everything from my neck down and then lost my right leg. The doctors had me on nine different medications. None of them worked. I was slowly being killed by all the medications they had to give me after our accident. And all of this after they insisted on keeping me alive. Now I have a life of pain and loss.

I found out from my doctor that I might get some relief from some of the pain by using marijuana. I thought about this for over two years before I tried it and found it worked better than any medication I had tried. I also found that it didn't leave me doped up and unable to function like all of the medication they had prescribed.

The problem I have found is that although Alaska supposedly has a medical marijuana law, the State of Alaska has made it impossible to find a doctor who will sign the paper work. When I wanted to try smoking pot to relieve my pain, my husband had to buy it illegally and feel like a criminal. Alaska's medical marijuana law simply doesn't help anybody. Even if I could find a doctor to sign my forms, what good does it do if there's no legal way for me to get it? I know the law allows me to grow up to 6 plants, but that's just not practical for a lot of patients, including me. Unless you fix the medical marijuana law in this state, patients will have to buy it the same way everybody else does. That's why keeping the protection for personal use under the Ravin decision is so important to me.

If this new law is passed, the situation for people who use medical marijuana will go from bad to worse. At least now, if I got arrested for having it without a doctor's signature, I would have some protection in the eyes of the courts. You want to take that away from me. Of course I understand you want to keep marijuana out of the hands of kids—everybody wants that. But you have to admit that when marijuana possession was made illegal in 1990, teenagers went on smoking it anyway. Why do you think going back to that kind of law will make any difference now? This new law won't do anything to help kids, but it will make it tougher for plenty of people in wheelchairs, like me, to get the one medicine that helps us the most.

I find it odd that our good senators don't have anything better to do with their time than to attack and try to outlaw my medication. Why aren't you doing anything about the panhandlers on every street corner in Anchorage? Why aren't you doing anything about our alcohol problem? Why don't you spend a week in a wheelchair and see what a problem your so called handicap accessibility is? If you really want to do some good for our great state, as you say you do, then why don't you spend your time on our horrific alcohol and domestic violence problems, on unemployment, on decent roads, homelessness, and out of control children? In fact, if you pass this law and tell the police to go back to arresting every marijuana user, they will have less time to spend on these other things that are far more important. Thanks a lot.

The doctors are willing to give me any medication I need to keep me comfortable and turn me into a drug addict until it finally kills me, but they won't sign for medical marijuana. I feel I will now live longer and be much healthier and in a lot less pain because I have chosen to smoke pot.

Written Testimony of Dr. Lester Grinspoon

I would like to thank the Chairperson and the members of this Committee for the opportunity to testify before you today.

My name is Dr. Lester Grinspoon. I believe that you have copies of my curriculum vitae and two of my books: Marihuana Reconsidered (Harvard University press, 1971, 1977 and Marihuana, the Forbidden Medicine (Yale University press 1993, 1997). To be very brief, I am an associate professor of psychiatry, emeritus at the Harvard Medical School. Shortly after graduating from the Harvard Medical School in 1955, I joined the faculty and over the ensuing 45 years combined research and teaching with some clinical practice. In 1967, I had finished writing my part of a book on our seven-year study of schizophrenia. As the senior author I had to wait to finally put it together for what two junior co-authors estimated would be two to three months before they completed their parts. Because I was at that time very much concerned about the great danger young people were exposing themselves to as they recklessly ignored government warnings about its dangers, I decided to devote this unanticipated free time to studying marihuana in the Countway library with the object of producing a

scientifically sound paper on the subject, one which I hoped to publish in a journal or periodical accessible to college-age people. Perhaps some would pay more attention to such a review than they apparently were to the material produced by the US Public Health Service and the National Institute of Drug Abuse. (A shortened version of the paper was published in Scientific American). As I delved into the medical, scientific and other literature I soon discovered, to my great surprise and consternation, that, despite my training in medicine and science, I had been brainwashed like most other American citizens about the dangers of this drug. After I finished the book on schizophrenia, I began work on Marihuana Reconsidered which was published by Harvard University press in 1971, a second edition in 1977 and republished as a classic in 1997. Briefly, after documenting that most of what we believe about the dangers of cannabis were mythical, I concluded that marihuana was far less harmful than either alcohol or tobacco and that its greatest harmfulness arose from the way we as a society were dealing with it. (At that time we were arresting about 300,000 mostly young people on marihuana charges; today the figure is about 750,000.).

In the time since that initial research, I have devoted much of my professional career to studying the

effects of marijuana, and I have to this day remained current and up-to-date with the latest research in this area.

Let me say at the outset that marihuana is no more harmful today than it was in 1975 when I testified in the Raven case. Street marihuana is arguably more potent than it was at that time but this does not mean increased risk because both medicinal and recreational users very quickly learn how to titrate the dose to achieve the desired effect. A user who smokes (or vaporizes) marihuana has to inhale less of a more potent sample and, conversely, more of one that is less potent. It follows that to the extent that inhaling the smoke is considered a risk factor for pulmonary disease, the more potent sample provides a healthier choice. However, I should hasten to add that the pulmonary risk from smoking marihuana has been greatly exaggerated. There is not a single case of lung cancer or emphysema attributable to smoking marihuana to be found in the medical literature. I believe that the lungs of marihuana smokers are at greater risk from prolonged exposure to the air of cities like Los Angeles or Houston (or any other city with poor air quality). However, for those, particularly in today's anti-smoking atmosphere, who wish to avoid smoke for any reason, there is now available

a device called a vaporizer which holds the temperature of the marihuana to be consumed in a temperature window which vaporizes the cannabinoids at a temperature which is below the ignition point; thus no smoke.

I wish I had time to address the other 18 "Findings" because so many are erroneous and none is supported by the large body of research data available in the literature. Let me briefly consider another "Finding", the one that states... "marihuana use by children is associated with an increased risk of attempting suicide." I believe that the intention here is to suggest that because there is an association, cannabis must be causal in this increment of risk. Psychiatry is becoming increasingly aware that children suffer from depression and that some of them commit suicide. Like other children, some of the depressed children will use marihuana. In fact, because marihuana is an effective antidepressant, some of them may have discovered it as a self-medication. However, there is no credible evidence that I know of that establishes marihuana as a causal.

I am struck by the fact that so many of these "Findings" are the same claims of marihuana toxicity that have been made and discredited more than once in the history of this substance. For example, schizophrenics and

patients suffering from other psychoses were thought to comprise a significant number of the patients admitted to Indian Insane Asylums in the second half of the 19th-century and the use of ganja was thought to be causative. It was for this reason that the British organized the Indian Hemp Drug Commission Study which was published in 1894. The commission examined 800 doctors, superintendents of insane asylums, and so forth. In a 3000 page, seven volume report the commission concluded that "There is no evidence of any weight regarding mental and moral injuries from the moderate use of these drugs." This report put to rest the belief that cannabis led to schizophrenia and other psychoses for a while, but it has recurred periodically, most recently during the last year are so. For example, a report from New Zealand with a study group of only 759 subjects, claims to have established that those who smoked marijuana three or more times by the age of 15 had a 10% higher chance of developing schizophrenia. Similarly, other studies from Great Britain and the Netherlands would predict greater numbers of schizophrenic patients. If these predictions were correct, given the number of young people who are or who have used cannabis, we would expect an increment in the incidence of schizophrenia. However, no such increment exists.

In "Finding" number two the assertion is made that "... [marihuana] has addictive properties similar to heroin and other similar illegal controlled substances..." Most of those who are sophisticated about cannabis would question whether the word addiction is even appropriate to this drug, and all would agree that the withdrawal syndrome seen with "heroin and other illegal controlled substances" are not observed upon cessation of marihuana use. The assertion made in "Finding" number four, that marihuana use "... makes it more likely that the person will go on to use more potent illegal controlled substances..." is simply a restatement of what was known as the "stepping stone hypothesis"; a belief which has long since been thoroughly discredited.

As I participate in these hearings, I am reminded of those which preceded the passage of the Federal Marihuana Tax Act of 1937, the first of the draconian legislation aimed at marihuana. A reading of the hearings before the House Ways and Means Committee that preceded the passage of the legislation demonstrates quite clearly how little empirical data was found to support the Act. Indeed, the enactment reflected far more the mass hysteria surrounding the subject than any concrete evidence of the drug's harmfulness. The hearings were characterized by brevity

and lack of information. Little expert medical, sociological, or scientific evidence was produced or listened to. I would urge this committee to acquaint itself with some of the excellent, comprehensive special reports and commission reports which have been developed over the past half-century. They would include:

The La Guardia Report (1944)

The Wooten Report (1968)

The Shafer Report (1972)

The Le Dain Commission (1973)

The Canadian Senate Special Committee on Illegal Drugs Report (2002)

I think that if this legislative body is as meticulous and comprehensive in collecting and assessing the data as these Commissions were, it will have a better chance of arriving at a sound judgment about whether the "harmfulness" of marihuana is sufficient to enact such a restrictive bill.

In conclusion, I must tell you that I have much more to say on this topic, but given the extremely short time allotted for these hearings, there is no way I can thoroughly respond to the erroneous findings proposed in

this bill. It would take days, if not weeks, to carefully review each of the studies and reports submitted by the government in order to fully explain to you the fallacies and inaccuracies. I have appended to this written statement a supplemental statement containing a point-by-point specific refutation of some of the proponents' more egregious assertions, with annotations and supporting documentation. Given a more realistic amount of time, I assure you that I could provide much more information and documentation that would be very relevant to your decision on this bill. In short, this committee cannot possibly hope to seriously consider in the amount of time allocated the relevant evidence necessary to reach accurate, science-based conclusions about the public health effects of marijuana. I would urge the committee to postpone action on this legislation until such time as a full and fair review of all the evidence is achieved.

I read, in a recent Alaskan newspaper report of an earlier hearing concerning this legislation, a comment by a committee chairman to the effect that he wants to see quick action on this legislation, and that it would just take too long to appoint a commission or order a full and complete study. For the record, I would just like to be clear that there is simply no way the members of this committee could

even begin to read all of the evidence that's been submitted to you in the time you have allotted for considering this legislation, much less have read it, and have it read carefully and critically by qualified experts such as would be necessary to fully understand the relevant science. The only conclusion that can be drawn from the "fast track" manner in which this is being undertaken is that your minds are already made up and that these hearings are merely window dressing to justify a preordained decision based on politics, not science.

Finally, I must caution you about the evidence submitted by the proponents of this legislation. It may be tempting to simply conclude that since witnesses on both sides of this issue of submitted reams of paper in support of their positions, the scientific community is equally divided on this topic. Nothing could be farther from the truth.

Virtually all of the studies and reports submitted by the proponents of this bill were funded or directly undertaken by the National Institute on Drug Abuse(NIDA)or other US government agencies. One might hope and expect that this would be an indication of unbiased, honest and accurate scientific inquiry. The sad truth is that when it comes to marijuana, NIDA and the United States government

cannot be said to be unbiased, honest or accurate. For too long in the United States, drug policy and especially marijuana policy has been driven by politics, not science. NIDA's mission is to facilitate research into the *harmful* effects of drugs, including marijuana. It is common knowledge within the scientific and academic communities of this nation that if one wishes to secure and maintain funding from NIDA, one's research had better be designed to produce results that are consistent with and which support the government's zero-tolerance marijuana prohibition policies. NIDA has a monopoly on the supply of marijuana for research purposes, and researchers seeking to show that the government has overstated the dangers of marijuana, or seeking to show that marijuana may be useful and efficacious as a medicine, have been denied funding or, even where independent funding has been obtained, have been denied access to the marijuana necessary to undertake the research. In effect, NIDA funding creates a research "machine" that produces study after study, report after report, seeking to support and justify the government's marijuana prohibition policies. But this result-oriented research never withstands the test of time, or the scrutiny of independent review and analysis. And every time a truly independent body has undertaken a comprehensive review of

the available scientific data, the conclusion has been that marijuana is far less harmful than alcohol or tobacco, and not nearly dangerous enough to justify harsh, criminal penalties for personal use by adults in the privacy of the home such as this proposed legislation. Again, I encourage you to review the findings of the La Guardia Report, the Wooten Report, the Shafer Report, the Le Dain Commission, the decision of DEA Administrative Law Judge Francis Young, the Canadian Senate Special Committee on Illegal Drugs Report of 2002, the two Institute of Medicine reports, and the books that have been submitted to you, including the two I wrote, the Mitch Earlywine book and the Lynn Zimmer and John Morgan book. All of this represents an unbroken and consistent line of research results from the past 60 years or more. The handful of NIDA and US government-funded research reports that the proponents of this bill have submitted to you must be viewed in the context of this massive body of research, and in the context of the political realities underlying the NIDA funding process.

You would no doubt view with a skeptical eye research regarding the safety and efficacy of a new drug if that research were commissioned and funded by a large pharmaceutical company with a financial stake in the results of the research. You must view with equal

skepticism results of marijuana research funded by NIDA, especially when the results of that research are contrary to the very large body of independent research that has accumulated over the past four decades.

Thank you again for the opportunity to testify before you today.

Annotated Supplemental Statement of Dr. Lester Grinspoon

As I have tried to make clear in my testimony, given the short period of time that has been allotted to consideration of this legislation, I have not been able to prepare a complete and careful analysis and refutation of all of the evidence submitted by the proponents of this legislation. Even a cursory review, however, reveals the following examples of inaccuracies, exaggerations, and incomplete or misleading assertions:

1) The Effect of Criminalizing Adult Use of Small Amounts of Marijuana in the Home Upon the Rates of Marijuana Use by Children:

The proponents of this bill submitted excerpts from a May 1990 report entitled "The State of Adolescent Health In Alaska," and relied upon it for assertions about adolescent marijuana use in Alaska. Yet only 4 pages of the report

have been submitted. From comments contained even on those 4 pages, however, it is clear that the Committee should obtain and review the *entire report* before reaching any conclusions about its relevance to this proposed legislation.

The proponents selectively quote the statistic that 22.6% of adolescents who report that their parents frequently use marijuana use marijuana themselves, versus 5% of youths whose parents do not use marijuana. Several points need to be understood in this regard, however.

First, the authors of the report state in the executive summary that due to the small sample size, they "cannot claim that the data are statistically generalizeable" to the entire student population.

Second, the methodology of the survey involved students self-reporting of both their own and their parents' drug use. It is quite probable that students who know that their parents would strongly disapprove of their marijuana use would be less likely to admit that they use marijuana, thus resulting in an underreporting of drug use by students whose parents do not use marijuana.

Third, the Supreme Court in Ravin noted that a report of the Journal of the American Medical Association in 1971 indicated that 24% of Anchorage school children in grades

six through twelve had used marijuana, as had 46% in grades eleven and twelve. These rates are remarkably consistent with (and in fact are somewhat higher than) those reported in this 1990 "State of Adolescent Health In Alaska" report. This means that by the proponent's own accounting, the effect of personal adult use of marijuana in the home having been legal in Alaska from 1975 until the time the report was published in 1990 was not an alarming increase in the number of children using marijuana, but in fact led to a slight *decrease*.

Fourth, the report notes that marijuana usage rates may be higher than would otherwise be the case because high school seniors are substituting marijuana use for alcohol use. While ideally high school seniors would use neither marijuana or alcohol, it is beyond debate that alcohol use by adolescents causes much more harm than marijuana use. Therefore, such a "substitution effect" may in fact be reducing overall harm. (See the attached 2004 article by Dr. Mikuriya, also referenced in Point Number 6), below).

Finally, and perhaps most importantly, the authors of this 1990 "State of Adolescent Health In Alaska" report state explicitly, in a passage not highlighted or even acknowledged by the proponents of this legislation in their testimony and submissions, that:

> "To look at these data in isolation from the other information collected in the Adolescent Health Survey is to ignore the dynamics which predispose to drug abuse. We know that those who do poorly in school are more likely to abuse substances; so, too, are those who are emotionally stressed. We know that those who are emotionally isolated are more likely to abuse drugs as are those who have been abused. **Simply stated, developing a substance abuse prevention program which does not address the predisposing factors and their interrelationships is most likely to fail. It is critical to understand the forces which predispose youth to abuse drugs if we are to assist them in developing chemical health.**" (emphasis added).[1]

Yet the proponents of this legislation are encouraging exactly this flawed and ineffectual approach, in a cynical attempt to sway this legislature and eventually the state Supreme Court on the basis of purported concern for Native Alaskan children. If the governor is truly concerned about the welfare of Native Alaskan and other children, he might seek appropriations and legislation to ameliorate the poor public school, housing and other social services available to them, to truly begin to address "the dynamics which predispose to drug abuse." Instead, the proponents of this legislation assert that criminalizing adult possession of small amounts of marijuana in the privacy of the home will

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[1] As noted in a recent report issued by the ACLU and others, the National Institute of Health has found that, "Native American women and their families often live in severe poverty – fifty percent of the households they head are below the poverty line. Native American/Alaska Native communities are also plagued by inadequate housing – in many cases with no indoor plumbing, severe electrical problems, and prolonged dysfunctional heating systems during the winter – unemployment, and toxic surroundings. (*Caught in the Net: The Impact of Drug Policies on Women and Families*, available online at http://www.FairLaws4Families.org, at p.10, citing *Office of the Director, National Institutes of Health, Women of Color Data Book, 74* (2d ed. 2002), available online at http://www.4.od.nih.gov/orwh/wocEnglish2002.pdf.

somehow afford greater protection to Alaskan children. There is absolutely no evidence to support this assertion, and in fact the available evidence points in exactly the opposite direction. The rates of marijuana use by Alaskan children has remained remarkably constant since the Ravin decision nearly 30 years ago; in fact, such use declined slightly between 1975 and 1990, a time period during which adult use of small amounts of marijuana in the privacy of the home was fully legal. Ravin was in force from 1975 to 1993; then from 1993 to 2003, the voter-approved initiative re-criminalizing all use was in effect; then from the time of the 2003 court of appeals decision in the Noy case to the present, the protection of Ravin has been back in effect. **If criminalizing adult use of small amounts of marijuana in the home were an effective method of reducing children's use, or, conversely, if permitting such adult use were an aggravating factor that increased children's use, one would expect to see such effects correlated with the different legal statuses of marijuana over the years. Instead, what 30 years of empirical data now shows is that whether adult use of small amounts of marijuana in the privacy of the home is legal or not has virtually no effect on the rates at which Alaskan children use marijuana.**

Illegality of cannabis has utterly failed to stem use

by youth. Legality with regulation could. The Canadian Senate Report, submitted to this Committee separately, addresses this.

Again, given the very little time I have had to review and respond to the proponents' submissions, the remainder of my comments are necessarily truncated:

2) Potency

a) Increases in average THC potency of confiscated marijuana have been greatly exaggerated. (ElSohly, M. A., S. A. Ross, et al. (2000). "Potency trends of delta9-THC and other cannabinoids in confiscated marijuana from 1980-1997." J Forensic Sci **45**(1): 24-30 (abstract attached)).

> The analysis of 35,312 cannabis preparations confiscated in the USA over a period of 18 years for delta-9-tetrahydrocannabinol (delta9-THC) and other major cannabinoids is reported. Samples were identified as cannabis, hashish, or hash oil. Cannabis samples were further subdivided into marijuana (loose material, kilobricks and buds), sinsemilla, Thai sticks and ditchweed. The data showed that more than 82% of all confiscated samples were in the marijuana category for every year except 1980 (61%) and 1981 (75%). The potency (concentration of delta9-THC) of marijuana samples rose from less than 1.5% in 1980 to approximately 3.3% in 1983 and 1984, then fluctuated around 3% till 1992. Since 1992, the potency of confiscated marijuana samples has continuously risen, going from 3.1% in 1992 to 4.2% in 1997. The average concentration of delta9-THC in all cannabis samples showed a gradual rise from 3% in 1991 to 4.47% in 1997. Hashish and hash oil, on the other hand, showed no specific potency trends. Other major cannabinoids [cannabidiol (CBD), cannabinol (CBN), and cannabichromene (CBC)] showed no significant change in their concentration over the years.

b) Moreover, no one has ever documented that increased potency means increased danger in cannabis. See attached article by Carlini. As already noted, people titrate their intake to achieve the desired effect. Also, as I stated earlier, higher potency marijuana is in fact almost certainly safer in terms of potential pulmonary risk since users smoke less.

c) Finally, it is important to recall that the concern the Alaskan Supreme Court expressed in the Ravin decision regarding higher potency cannabis was explicitly based upon three studies cited in the Court's decision, all from the early 1970s, in which it had been suggested that higher potency THC might cause DNA cellular damage, immune system damage, and reduced testosterone levels. All of these studies have been thoroughly discredited in the time since the Ravin decision, and no one, not even the proponents of this legislation, suggests today that these dangers are real. In other words, even if the marijuana available today does have slightly higher THC levels than in the 1970s, there is no reliable data to suggest that this increased potency results in any greater threat to public health such as to legitimize re-criminalizing adult possession of small amounts in the privacy of the home.

3) **Marijuana use and crime**: Documentation of cannabis metabolites in urine of criminals is meaningless in terms of cause and effect. It merely points to past use. Cannabis does not cause crime. *Psychological And Social Sequelae Of Cannabis And Other Illicit Drug Use By Young People: A Systematic Review Of Longitudinal, General Population Studies*. John Macleod, Rachel Oakes, Alex Copello, Ilana Crome, Matthias Egger, Mathew Hickman, Thomas Oppenkowski, Helen Stokes-Lampard, George Davey Smith, Published in The Lancet, May 15, 2004 (attached).

4) **Driving**: Most cannabis-only users drive cautiously, and the association is exaggerated by the proponents of this legislation. Please see attached chapter by Hadorn, and article by Movig.

5) **Dependency**: The proponents assertions in this regard are vastly over-stated. There is little evidence of any withdrawal syndrome (see Smith article attached).

6) **Increased Numbers of Persons Seeking Treatment for Marijuana "Addiction"**: Most "treatment" for "marijuana addiction" is coerced by the courts, families or employers, and the "patient" will not graduate until they admit their problem. This is a travesty of both justice and statistics.

There is little documentation of medical need. (See attached DAIS report.)

7) **Marijuana and Alcoholism:** Cannabis actually may ameliorate alcoholism. NIDA never publicizes the two important studies that document that free access to cannabis lowers alcohol intake: (See the attached Chapter 25 from Bozarth (ed. 1987), *Assessing Drug Reinforcement*, reprinting Mellc, N. K. and J. H. Mendelson (1978). "Marihuana, alcohol, and polydrug use: human self-administration studies." NIDA Res Monogr(20): 93-127 and Mello, N. K., J. H. Mendelson, et al. (1978). "Human polydrug use: marihuana and alcohol." J Pharmacol Exp Ther **207**(3): 922-35.) More recent documentation is available by Mikuriya (2004, attached), and also data on cannabis helping cure cocaine addiction in Brazil. (Labigalini, E., Jr., L. R. Rodrigues, et al. (1999). "Therapeutic use of cannabis by crack addicts in Brazil." J Psychoactive Drugs **31**(4): 451-5:

> This study ensued from clinical observations based on spontaneous accounts by crack abusers undergoing their first psychiatric assessment, where they reported using cannabis in an attempt to ease their own withdrawal symptoms. Throughout a period of nine months, the researchers followed up on 25 male patients aged 16 to 28 who were strongly addicted to crack, as diagnosed through the Composite International Diagnostic Interview (CIDI), according

> to CID-10 and DSM-IV diagnostic criteria. Most of the subjects (68%, or 17 individuals) ceased to use crack and reported that the use of cannabis had reduced their craving symptoms, and produced subjective and concrete changes in their behavior, helping them to overcome crack addiction. The authors discuss some psychological, pharmacological and cultural aspects of these findings.

Similar findings are also published from Jamaica (Dreher, attached).

8) **Marijuana and Pulmonary Risk**: I am not going to argue that smoke is completely innocuous, but the data submitted by the proponents of this bill is inaccurate, due to poor quality NIDA cannabis with stems and seeds. This is all documented in text and photos in the Chronic Use Study (attached). Also, never mentioned by the government is the development of alternatives to smoking marijuana that are becoming ever-more widely available, such as vaporizers (see Gieringer article, attached).

9) **Marijuana and Cardiac Risk**: Claims of cannabis producing heart attacks are exaggerated, as well. There is no epidemiological evidence of a real connection. (See Sidney, Beck et al. 1997; Sidney, "Cardiovascular consequences of marijuana use." J Clin Pharmacol **42**(11 Suppl): 64S-70 2002, copies attached:

> This review describes what is known about effects of marijuana and cannabinoids in relation to human

physiological and disease outcomes. The acute physiological effects of marijuana include a substantial dose-dependent increase in heart rate, generally associated with a mild increase in blood pressure. Orthostatic hypotension may occur acutely s a result of decreased vascular resistance. Smoking marijuana decreases exercise test duration in maximal exercise tests, increases the heart rate at submaximal levels of exercise. Tolerance develops to the acute effects of marijuana smoking and delta9-tetrahydrocannibol (THC) over several days to a few weeks. The cardiovascular responses that occur in response to THC are mediated by the autonomic nervous system, with recent findings also demonstrating that the human cannabinoid receptor system plays a role in regulating the cardiovascular response. Although several mechanisms exist by which marijuana use might contribute to the development of chronic cardiovascular conditions or acutely trigger cardiovascular events, there are few data regarding marijuana/THC use and cardiovascular disease outcomes. A large cohort study showed no association of marijuana use with cardiovascular disease hospitalization or mortality. However, acute effects of marijuana use include a decrease of the time until the onset of chest pain in patients with angina pectoris; one study has shown that marijuana may trigger the onset of myocardial infarctior. Patients who have coronary heart disease or are at high risk for the development of CHD should be cautioned about the potential hazards of marijuana use as a precipitant for clinical events. Research directions might include more studies of cardiovascular disease outcomes and relationships of marijuana with cardiovascular risk factors, studies of metabolic and physiologic effects of chronic marijuana use that may affect cardiovascular disease risk, increased understanding of the role of the cannabinoid receptor system in cardiovascular regulation, and studies to determine if there is a therapeutic role for cannabinoids in blood pressure control or for neuroprotection after stroke.

Sidney, S., J. E. Beck, et al. (1997). "Marijuana use and mortality." Am J Public Health **87**(4): 585-90:

OBJECTIVES: The purpose of this study was to examine the relationship of marijuana use to mortality. METHODS: The study population comprised 65,171 Kaiser Permanente Medical Care Program enrollees, aged 25 through 49 years, who completed questionnaires about smoking habits, including marijuana use, between 1979 and 1985. Mortality follow-up was conducted through 1991. RESULTS: Compared with nonuse or experimentation (lifetime use six or fewer times), current marijuana use was not associated with a significantly increased risk of non-acquired immunodeficiency syndrome (AIDS) mortality in men (relative risk [RR] = 1.12, 95% confidence interval [CI] = 0 89, 1.39) or of total mortality in women (RR = 1.09, 95% CI = 0.80, 1.48). Current marijuana use was associated with increased risk of AIDS mortality in men (RR = 1.90, 95% CI = 1.33, 2.73), an association that probably was not causal but most likely represented uncontrolled confounding by male homosexual behavior. This interpretation was supported by the lack of association of marijuana use with AIDS mortality in men from a Kaiser Permanente AIDS database. Relative risks for ever use of marijuana were similar. CONCLUSIONS: Marijuana use in a prepaid health care-based study cohort had little effect on non-AIDS mortality in men and on total mortality in women.

Additionally, recently published studies suggest that, in fact, cannabis may be cardioprotective. A new study by Steffens (attached) was published just this week, finding THC may help prevent atherosclerosis.

10) <u>Marijuana and Cognitive Effects</u>: The cognitive effects of cannabis have also been exaggerated by the proponents of this legislation. The two most comprehensive studies show no residual after brief abstinence: Pope, H. G., Jr. (2002). "Cannabis, cognition, and residual confounding." <u>Jama</u> **287**(9): 1172-4; Pope, H. G., Jr., A. J.

Gruber, et al. (2001). "Neuropsychological performance in long-term cannabis users." Arch Gen Psychiatry **58**(10): 909-15:

> BACKGROUND: Although cannabis is the most widely used illicit drug in the United States, its long-term cognitive effects remain inadequately studied. METHODS: We recruited individuals aged 30 to 55 years in 3 groups: (1) 63 current heavy users who had smoked cannabis at least 5000 times in their lives and who were smoking daily at study entry; (2) 45 former heavy users who had also smoked at least 5000 times but fewer than 12 times in the last 3 months; and (3) 72 control subjects who had smoked no more than 50 times in their lives. Subjects underwent a 28-day washout from cannabis use, monitored by observed urine samples. On days 0, 1, 7, and 28, we administered a neuropsychological test battery to assess general intellectual function, abstraction ability, sustained attention, verbal fluency, and ability to learn and recall new verbal and visuospatial information. Test results were analyzed by repeated-measures regression analysis, adjusting for potentially confounding variables. RESULTS: At days 0, 1, and 7, current heavy users scored significantly below control subjects on recall of word lists, and this deficit was associated with users' urinary 11-nor-9-carboxy-Delta9-tetrahydrocannabinol concentrations at study entry. By day 28, however, there were virtually no significant differences among the groups on any of the test results, and no significant associations between cumulative lifetime cannabis use and test scores. CONCLUSION: Some cognitive deficits appear detectable at least 7 days after heavy cannabis use but appear reversible and related to recent cannabis exposure rather than irreversible and related to cumulative lifetime use.

The Chronic Use Study (previously attached) also deals with this in detail, with review of past studies in Jamaica, Costa Rica and Greece.

11) Marijuana and Sexual Assaults: The data on sexual assaults are grossly misleading. There is absolutely no evidence whatsoever of any causal link between marijuana use and engaging in violent sexual behavior.

12) Emergency Room "Mentions": The data on emergency room visits presented by the proponents of this legislation are also grossly misleading. These "mentions" have little or nothing to do with the true reasons for the hospital visits. There is absolutely no evidence whatsoever of a causal link between marijuana use and increased numbers of emergency room visits.\

13) Psychosis: As I've discussed in my foregoing written testimony, there is no reliable evidence of a causal link between marijuana use and psychosis. The recent studies that purport to find a link conflate correlation with causality, and are based on sample sizes too small to be statistically valid for extrapolation. Persuasive refutations of these claims are found in the Macleod article published in the May 15, 2004 Lancet (attached and already referenced under point 2 of this addendum and in the Iversen, and Shiffman articles (attached).

14) Cancer: The evidence is much greater that cannabis helps prevent and treat cancer and the deleterious side effects of chemotherapy, than that it causes harm: (see

Hall, Guzman, Musty and Rossi, and Maccarrone articles, all attached).

15) <u>Marijuana and Prenatal Effects</u>: These claims presented by the proponents of this legislation are also vastly exaggerated. Please see the Dreher article, attached and already referenced in point 7), above, and Russo (at end of article, attached).

Jack A. Cole, New Jersey State Police Lieutenant (retired)
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My name is Jack Cole. I retired as a Detective Lieutenant after a 26-year career with the New Jersey State Police. For fourteen of those years I worked as an undercover narcotics officer. My investigations spanned the spectrum of possible cases, from street drug users to international "billion-dollar" drug trafficking organizations.

I am also the executive director of LEAP or Law Enforcement Against Prohibition. LEAP was founded by five former cops to give voice to members of law enforcement who believe the war against drugs is not only a dismal failure but a terribly destructive policy. In the 2 ½ years of our existence we have grown to over 2,000 members and we are no longer just cops—now we are police, judges, prosecutors, prison wardens—we even have retired DEA officers who help make up our bureau of 85 speakers.

Passing bills that raise criminal penalties and assess harsher sentences for non-violent drug offenses is very poor public policy.

1. From 1975 to 1990, Alaska had 15 years of decriminalized adult use in the privacy of the home (based on the Alaska Supreme Court opinion in Ravin);
2. From 1990 to 2003 AK had a return to full de facto prohibition (based on an initiative that purported to recriminalize marijuana); and
3. From 2003 to now, marijuana in the home was decriminalized again (based on the Alaska Court of Appeals decision in November).
4. According to Alaska's own statistics overall use among children in grades 6 to 12 has **decreased** since 1975, while across the United States that rate has

increased (30 % for 12th graders, 65% for 10th graders, and 88% for 8th graders).

For 35 years, with a budget of over ½ trillion dollars, the United States has fought the war on drugs with ever harsher policies. We have arrested 1.6 million people for nonviolent drug offenses—fully half of the arrests were for marijuana violations. Two million two-hundred-thousand are in prison in the US, far more per capita than any country in the world. And what do we have to show for all those ruined lives and misspent money: Today drugs are cheaper, more potent and far easier to get than they were in the 1970 when I started buying them undercover. I believe that is the very essence of a failed public policy.

Nearly a thousand young people went to jail as a direct result of what I did as an undercover narcotics agent.

I can't say how many of those children would have gone on to become valuable citizens had I not intervened, but I'm sure the number would be huge.

Think of all the folks you know who used an illegal drug as a youngster, then put the drugs behind them and went on to live productive lives. Many are now members of our government. George Bush, Bill Clinton, Al Gore, Dan Quail, Newt Gingrich. The line is too long to enumerate but they all had two things in common, they all used illegal drugs, then quit, and when they arrived at a position of power they all got selective amnesia so now they say police should arrest young people and destroy their life prospects for doing exactly what they did.

We have a saying at LEAP: You can get over an addiction, but you will never get over a conviction. A conviction will follow you every day for the rest of your life—every time you apply for a job it is over your head like an ugly cloud.

There are many unintended consequences of the war on drugs. When you prohibit a drug, even the worst drug, you don't cause less people to imbibe. All you do is create an underground market that is instantly filled with criminals.

Worse, you create an artificially inflated value for that drug that can be up to 17,000 percent of the initial investment—making marijuana worth more than gold and heroin worth more than uranium. I would suggest that whole armies of police can not arrested our way out of drug problems when prohibition creates such obscene profit motives for prospective dealers. Every time I arrested a drug dealer I was simply creating a job opening.

For those of you who think that by backing this bill you are in the mainstream of public thinking, let me say that I believe that is not true: In the last year LEAP started attending national and international law enforcement conferences. We kept track of the opinions of the nearly 1,200 officials we spoke to on a one-to-one level. Even we were surprised to find that after we spoke with them, 6% wanted to continue the war on drugs, 14% were undecided, but a whopping 80% agreed with us that we must end prohibition. The most interesting thing about that 80% was only a very small number of them realized that any other law enforcement officer felt as they did. Peer pressure to not appear soft on drugs or soft on crime is so strong that they don't talk to each other about their beliefs.

Please, don't pass bills that tie up more police hours in projects that do nothing to lessen the incidence of death, disease, crime, and drug addiction—let police get back to protecting us from violent crime. We will all be much better off.

Testimony to Senate Health and Social Services Committee
April 1, 2005

My name is Bill Parker. I am a former member of the Alaska House of Representatives, and I retired from state service as Deputy Commissioner of Corrections. Today I speak for Alaskans for Marijuana Regulation and Control.

S.B.74 attempts to re-criminalize marijuana for adults in Alaska, in violation of the Alaska Constitution.

In 1975, in a landmark case known as **RAVIN**, the Alaska Supreme Court ruled the privacy clause of the Alaska Constitution protects possession of a small amount of marijuana by adult Alaskans in their own homes for their own use. In 1975, the Alaska Legislature changed the statutes to de-criminalize marijuana in Alaska.

Various attempts have been made in the 30 years since to attack this de-criminalization, both legally and politically.

An initiative in 1990 attempted to re-criminalize marijuana in Alaska, but initiatives change statutes, not the Constitution, and the initiative had no effect.

Many legal attempts have been made to test the constitutionality in the courts, all unsuccessful. The latest was last fall when the Alaska Supreme Court declined to take up the Appellate Court's latest ruling upholding **RAVIN.**

S.B.74 is another attempt to attack the constitutional issue in a legal and political manner.

If S.B.74 passes with these findings, they will be admissible in court, and the administration will have new arguments that marijuana is much more potent and dangerous than in 1975, so much so that it is almost a different substance.

That is why the findings section of this bill is important. The findings are flawed. Expert witnesses from Alaska and outside are going to explain those flaws today. They include:

They will discuss the complex medical and sociological issues that other government panels have studied at length.

- The Shafer Commission's report to President Nixon in 1972, "Marijuana: Signal of Misunderstanding."
- The National Research Council's 1982 report, "An Analysis of Marijuana Policy."
- The Institute of Medicine's 1999 report, "Marijuana and Medicine: Assessing the Scientific Base."
- The 2002 report of the British Advisory Council on the misuse of drugs, "The Classification of Cannabis."
- The House of Commons Home Affairs Committee 2002 study, "The Government's Drug Policy: Is It Working?"
- Jamaica's 2001 National Commission on Ganja came to the same conclusion: Marijuana is not so harmful that the penalties for possession need to be increased.

S.B.74 would take Alaska in the opposite and wrong direction.

The State's witnesses could not be called objective observers. Those directly involved in implementing an administration's policies cannot evaluate those policies impartially. Evaluators should be independent academics.

Many harms attributed to marijuana are actually caused by the prohibition of marijuana. Our policies are making things worse, as the statistics presented last week by the state's witnesses demonstrate.

Prohibition is failing, completely and spectacularly, and will only get worse until we have the courage to look honestly at where we are and how we got here.

The testimony today will show that the compressed time schedule alone for S.B.74 is inadequate to evaluate marijuana in Alaska. We have submitted, in writing, the findings of experts in their fields who determine marijuana to be relatively harmless compared to alcohol. Each finding must be examined individually as the other commissions and committees have done with scientific integrity.

Here is a quick review of the evidence you will hear today:

Experts will point out the differences between scientific research and pseudo-science, the confusion between correlation and causation.

The administration's assertions about increased potency of marijuana are inaccurate and misleading in several respects:

- There are serious questions about the actual potency of marijuana today and yesterday. There is no reliable way to measure potency.
- There is no proof that marijuana is more addictive or dangerous than previously.
- Basic logic would determine that more potent marijuana would result in people using less , because of the effect of autotitration.

The administration's treatment of statistics is misleading because most of their conclusions are court-ordered, not a clinical diagnosis of marijuana addiction or even a self-referral. Most had to choose between treatment or incarceration. Most chose treatment.

The rate of marijuana use among minors in Alaska is no higher today than it was in 1975. In fact, according to the government's own statistics, overall use in grades 6 to 12 in Alaska schools is lower now after 30 years of decriminalization.

Marijuana use by minors has not been shown to cause psychosis later in life.

Marijuana use does not induce violent behavior, rape, or child abuse.

The emergency room data used to show that marijuana is more dangerous today is not conclusive. Because the relationship to marijuana in patients is so widely construed as to be meaningless. And the administration has overstated and misinterpreted the evidence of marijuana's link to lung cancer, juvenile crime, and the possibility of addiction and dependence.

The weight of scientific evidence available today discredits the old 'gateway drug' theory.

There are laws already in place to prohibit driving while impaired by alcohol or marijuana. These laws will remain in effect.

S.B.74 would have a bad effect on medical marijuana patients by jepordizing their ability to possess marijuana if adult use of marijuana in the home is criminalized.

If the administration's aim is to promote the public health and welfare, re-criminalizing personal, adult use of marijuana in the home won't do it. Re-criminalization will only feed the black market and increase the social costs that flow from it.

Science shows marijuana causes far less harm to the public health and welfare than alcohol or tobacco. And that's as true today as it was in 1975.

Shafer Commission, 1972

(National Commission on Marihuana and Drug Abuse), Commissioned by President Richard M. Nixon

- Commission members included 4 MD's, 2 PhD's, 1 theologian, and 5 elected officials
- 26 staff professionals, including additional MD's and PhD's, assisted the commission
- 49 support staff, analysts, and researchers were involved
- More than 1 year was spent in its investigations and preparation of its report

National Research Council of the National Academy of Science, 1982

"An Analysis of Marijuana Policy"

- 4 years of effort
- Included a review of the 1972 National Commission on Marijuana and Drug Abuse report
- Conclusion: "On balance, we believe that a policy of partial prohibition is clearly preferable to a policy of complete prohibition."

Institute of Medicine, 1999

"Marijuana and Medicine: Assessing the Science Base"

- Division of Neuroscience and Behavioral Health, IOM
- Took testimony from hundreds of doctors, scientists, treatment professionals, and many others
- Worked from 1997 to 1999
- Conclusions included:
  - **"Compared to most other drugs...dependence among marijuana users is relatively rare."**
  - **"There is no conclusive evidence that marijuana causes cancer in humans, including cancers usually related to tobacco use"**
  - **"It does not appear to be a gateway drug"**
  - **"Earlier studies purporting to show structural changes in the brains of heavy marijuana users have not been replicated with more sophisticated techniques."**

Report of the National Commission on Ganja, Jamaica, 2001

- "nine months of consultation and reflection,
- "visits to every parish and hearings amounting to 3776 pages of transcriptions"
- "The Commission is persuaded that the criminalisation of thousands of people for simple possession for consumption does more harm to the society than could be done by the use of ganja itself."

Advisory Council on the Misuse of Drugs, Great Britain, 2002

"The Classification of Cannabis under the Misuse of Drugs Act 1971"

- "…based on a detailed scrutiny of the relevant scientific literature, including four reviews commissioned by the Department of Health in 1998, as well as an update commissioned by the Home Office and completed in November 2001"
- "The Council … recommends the reclassification of all cannabis preparations to Class C [least harmful]."

House of Commons Home Affairs Committee, 2002

"The government's drugs policy: Is it working?"

- "We have taken oral evidence from 45 witnesses over a total of 11 evidence sessions."
- "...more than 200 people and organisations...provided written submissions..."
- "We support, therefore, the Home Secretary's proposal to reclassify cannabis from Class B to Class C."

Report of the Canadian Senate Special Committee on Illegal Drugs, 2002

"Cannabis: Position for Canadian Public Policy"

- "product of a team effort over a period of 2 years"
- The Parliamentary Research Branch synthesized and analyzed literature on legal studies and socio-criminological studies. In all, the Committee received 23 reports.
- Heard testimony from expert sociologists and lawyers, psychologists and physicians, police officers and criminologists
- The Committee held more than 40 days of public hearings…more than 100 persons from all backgrounds.

Even the most recent commission reports echo the findings of many earlier commissions, including the LaGuardia Commission in 1944, and going back to the British Indian Hemp Drugs Commission in 1894.

The independent reports have been astonishingly consistent for well over a century:

"...continued criminalization of cannabis remains unjustified based on scientific data on the danger it poses."

--Final Report of the Canadian Senate Special Committee, 2002

Index of Written Testimony

Alaska Senate HESS Committee

April 1, 2005

1. Lester Grinspoon, M.D., Associate Professor of Psychiatry Emeritus, Harvard Medical School, Curriculum Vitae, refer to list of Publications.

2. Kelly L. Drew, PH.D. Curriculum Vitae

3. Written Testimony of Kelly L. Drew, Associate Professor, Dept. Chemistry and Biochemistry, University of Alaska, Fairbanks

4. Written Testimony of Leslie Lars Iversen, PH.D., FRS, University of Oxford, England

5. Written Testimony of Mitch Earleywine, PH.D., Associate Professor of Psychology, University of Southern California

6. Written Testimony of Timothy Hinterberger, PH.D., Associate Professor, Biomedical Program, University of Alaska, Anchorage

Alaska Civil Liberties Union

Testimony of Michael W. Macleod-Ball, Executive Director
Senate HESS Committee
Senate Bill 74

The Alaska Civil Liberties Union opposes SB 74. It increases penalties for marijuana possession, thereby diverting enforcement resources from the investigation and prosecution of violent criminals to the investigation and prosecution of non-violent offenders of the possession laws. While we think that's not good policy, we oppose this bill primarily because it is designed specifically to restrict the uniquely Alaskan right to privacy.

SB 74 proposes, among other things, to increase penalties for marijuana ("MJ") possession. Under current law, if you have up to four ounces of MJ, for personal use in the home, the court rulings have said you can't be punished for that. Under the proposed law, if you possess an infinitesimal amount beyond that – you will be guilty of a Class C felony. If you pass this bill, that framework will be created – up to four ounces in the home – free....over four ounces – Class C felony – a crime on a par with incest or some classifications of statutory rape.

What's more – the law sets up yet another conflict with the state judiciary. The law creates penalties for possession of MJ under four ounces. One to four ounces will be a Class A misdemeanor and up to an ounce will be a Class B misdemeanor. When possession is in the home and non-commercial in nature – the enactment will be directly contrary to the court's interpretation of the scope of the privacy right set forth in the Alaska Constitution.

Alaskans adopted an express right of privacy and made it part of the state constitution in the 1970's. Shortly thereafter, the Alaska Supreme Court was called in to interpret that right of privacy in the Ravin case. In that case, the court was asked to decide whether the state had the right to bar possession of marijuana in the home – in other words, if someone had MJ in the home and if that MJ had no adverse impact on others, did the state have the right to go into that home without consent and arrest someone for simple possession.

After sifting through a great deal of evidence, the court decided that the Legislature had the authority to restrict marijuana possession in exercising its traditional public safety, health and welfare powers. However, it balanced that authority against the right of all Alaskans to a right of privacy – and set a somewhat higher standard for any law that might restrict the right of privacy. Some of the evidence the court weighed suggested that MJ was harmful and some suggested that MJ was not so harmful. The court said, in essence, that the degree of harm associated with MJ use was an important factor. If MJ was really harmful – proven to be addictive like heroin, proven to be associated with violent or aggressive behavior, for example – then there would be a sufficient rationale to justify restricting use and possession.

The normal standard to justify state action is a so-called 'rational basis' test. As long as there exists some rational basis for a law, the court presumes the law to be valid. However, where a fundamental right is restricted, the court has said that a higher standard must exist. It's not enough for there simply to be a rational basis between the law and the basis for the law. When a fundamental right exists, the relationship between the law's means and the law's ends must be close and substantial. And when a law narrows an individual's privacy right – a fundamental right is being restricted.

The court clearly said that possession and use of MJ is not a fundamental right. However, the right of privacy is fundamental and the personal possession and use of MJ in the home clearly restricts that fundamental right. The question for the court was whether the public safety purpose of the bill was so great as to justify the fundamental right restriction. The answer to that question depended in large part on the actual harm posed by MJ to society – separate and apart from the perceived harm. And so the court considered a wide range of evidence addressing the impact of MJ on society and individuals. The court considered the findings of a national commission appointed by President Nixon, as well as a wealth of scientific studies. The trial court had heard testimony from expert witnesses and considered written reports and books. In summary, the court chose not to say whether MJ is harmful or not – rather it said that the evidence was not overwhelming one way or the other. In light of the balanced nature of the evidence, the court determined that adequate justification did not exist for restricting the privacy right.

It's important to focus on the nature of the fundamental privacy right. The court considered the scope of the privacy right not in terms of marijuana usage – but rather in terms of those circumstances when an individual would have an expectation of privacy. In some senses the Ravin court's ruling was far broader than simply permitting use and possession of MJ in the home. It said that the constitutional right of privacy generally extended into one's private activities within the home – regardless of whether it's MJ use or some other activity.

> "...the authority of the state to exert control over the individual extends only to activities of the individual which affect others or the public at large as it relates to matters of public health or safety, or to provide for the general welfare. We believe this to be a tenet of a free society. The state cannot impose its own notions of morality, propriety, or fashion on individuals when the public has no legitimate interest in the affairs of those individuals. The right of the individual to do as he pleases is not absolute, of course; it can be made to yield when it begins to infringe on the rights and welfare of others."

The court said that alcohol was far more dangerous than MJ and that in light of conflicting studies, personal use and possession of MJ in the home fell within the privacy right.

Interestingly, it wasn't the Ravin court that came up with the four ounce limitation. Instead, that limit was determined by this Legislature. In the years following Ravin, this body adopted laws designed to bring state statutes into conformance with the court's ruling. Cases since then have generally deferred to the legislative four ounce threshold – though the high court has never said, to my knowledge, that four ounces is a magic number. Indeed, the court could easily say that there is no limit if the possession is entirely for private use – or it could say that four ounces is indeed the appropriate amount. We simply don't have guidance on that issue – except to the extent that the state's intermediate appeals court has blessed the framework.

The ACLU's policy is that criminalization of drug possession and use resolves nothing. It's the wrong way to prevent drug use and it's the wrong way to stop or reduce use. Even more important to the Alaska Civil Liberties Union is the goal of preserving our uniquely Alaskan right to privacy. It's generally conceded that the express right to privacy adopted by Alaskans in the 1970s and written into the state constitution is broader than the federal right to privacy inferred by federal courts from the Bill of Rights. It just so happens that my organization's drug policy goals and our basic mission of preserving and expanding individual civil liberties merge in the debate over this bill.

Because the restrictions of this bill impinge directly on a fundamental right embodied in the state constitution, it is incumbent on this legislature – and in particular on this committee – to determine the basis for the action. The court has already said that if the potential harm of MJ is not substantial – say, worse than the harm caused by alcohol or cigarettes, for example – an attempt to restrict purely private possession and purely private use in the home will unduly restrict the fundamental right to privacy in Alaska's constitution. In order to establish such substantial harm, this body must find, in effect, that there is no dispute about the harmful effects of marijuana. That means this committee must undertake a comprehensive review of the science in this area, much as the court did in Ravin, and conclude that there is no reliable science to support the relatively mild warnings about MJ that the Ravin court relied upon 30 years ago. Because of the wealth of evidence supporting the continued view of MJ as somewhat less dangerous than alcohol in most respects, it will simply be impossible for this committee to come to such a conclusion.

Even the studies put forward by the administration can be read in more than one way – and the administration's summary of some of these findings can at best be described as biased in favor of their interpretation of the facts. For example, one of the cited statistics asserted that 15% of rape suspects were under the influence of MJ. If you examine the actual report, though, you will see that 70% of the suspects were under the influence of alcohol – and there is no indication whether those that had used MJ had also used alcohol. Reading further into the report, you will see that the authors of the report were so concerned about the correlation between alcohol and this violent crime that they parsed out the alcohol subjects for further detail. And they ignored the MJ subjects – deeming that correlation too slight to be of further concern. But the administration did not highlight that context – arguably the more important conclusion of the study in question. Instead, they put the 15% figure out there by itself – hoping that no one would

pay attention to the narrative of the report itself. We have asked for a copy of the report to more fully examine whether other deceptive administration claims can be found – but our initial requests have been denied. Suffice to say, though, that this committee should not rely on the administration summaries of the evidence presented, because the conclusions are self-serving.

It's also important for this committee to recognize what concerns about MJ are relevant to this discussion. You have already heard about MJ as a huge cash crop – about huge increases in MJ discoveries in the state. You have heard about crime and driving issues. But your ability to legislate with respect to those issues is not restricted. The court rulings in this area have said quite clearly that there is nothing wrong with legislating against driving under the influence of MJ – or against commercial growing, selling, distributing. That's already the law of the land. And the court has said quite clearly that there is no right to possess and use MJ – it's the right of privacy that's sacrosanct. And since one's home is deemed to be one of the most private places – the bar is higher for the state to be allowed into the home to restrict behavior there. So the discussion about the negative impacts to society of marijuana as a cash crop or about driving issues or about breaking up large distribution rings is just not connected to the minor and private use in the home.

As a lawyer and representative of the Alaska Civil Liberties Union, it is not within my expertise to sit before you and testify about the degree of danger associated with minor and personal MJ possession and use. However, as a lawyer and ACLU representative, I can tell you that your evaluation of the science will have a significant bearing on whether this legislation is deemed legal or not. We see very serious problems with the findings as presented in the proposed bill. They are clearly one-sided and certainly not representative of weight of the scientific literature currently available. If left as they are, we believe the findings will be open to challenge as evidence of a prejudiced examination of the facts designed to improperly restrict the constitutionally protected right to privacy. Subsequent witnesses will present evidence that we believe will show the MJ is relatively harmless – certainly not any more harmful than the court determined in the 1970's.

In addition, I am presenting to the committee in written form a series of eight studies and articles – all of which will contradict the administration's position on the harmfulness of MJ. I will briefly summarize these studies at the end of my presentation – but in sum this committee will be hard pressed to state that the totality of the evidence weighs completely to one side or the other of this argument.

Therefore, I would urge the committee to adopt findings that are more balanced as to the issue of MJ's potential for harm. Each and every one of the findings addressing effects, impacts, or other characterizations of MJ are at least debatable and in their present state the findings are clearly biased. We believe a fair representation of the science will necessitate a complete revision of the findings. Alternatively, we would ask the committee to consider simply deleting the findings from the text of the bill.

We also strongly urge the committee to consider altering the penalties adopted in this bill. By this step the bill creates another class of felon – and turns the MJ user from being just that – a MJ user – into a criminal. The costs to the state and society are significant – in terms of prosecution and enforcement – and in terms of the impact on people in society. There is no evidence to suggest that the family of the individual who possesses over four ounces would benefit from the incarceration of the individual. In fact, quite the opposite is true. The burdens of single parenthood will befall the partners left behind – along with all the accompanying financial and emotional burdens associated with that state. The economic hardships will be borne by the wives, husbands, partners and children of those who are jailed – all for possessing a fraction of a gram more than the constitutionality protected amount of four ounces.

We can do better. We can focus on prevention and focus on it earlier. There are success stories with tobacco – and with drug use in other times and places. We can provide more and better outlets to help people stop drug use. It's unlikely that prison is the best place to learn to stop using drugs. In short, we believe this bill pursues the wrong policy – and its impact will be bad for Alaska families and a blow to individual privacy. Moreover, we believe that this bill will be subject to challenge – in the same manner as past attempts to legislate in this area – especially if the adoption of findings on this subject are one-sided and don't reflect the balance of science on this issue.

We urge you not to pass Senate Bill 74.

Thank you Mr. Chairman:

My name is Dr. Lester Grinspoon. I believe that you have copies of my curriculum vitae and two of my books: Marihuana Reconsidered (Harvard University press, 1971, 1977 and Marihuana, the Forbidden Medicine (Yale University press1993, 1997). To be very brief, I am an associate professor of psychiatry, emeritus at the Harvard Medical School. Shortly after graduating from the Harvard Medical School in 1955, I joined the faculty and over the ensuing 45 years combined research and teaching with some clinical practice. In 1967, I had finished writing my part of a book on our seven-year study of schizophrenia. As the senior author I had to wait to finally put it together for what two junior co-authors estimated would be two to three months before they completed their parts. Because I was at that time very much concerned about the great danger young people were exposing themselves to as they recklessly ignored government warnings about its dangers, I decided to devote this unanticipated free time to studying marihuana in the Countway library with the object of producing a scientifically sound paper on the subject, one which I hoped to publish in a journal or periodical accessible to college-age people. Perhaps some would pay more attention to such a review than they apparently were to the material produced by the US Public Health Service. (A shortened version of the paper was published in Scientific American). As I delved into the medical, scientific and other literature I soon discovered, to my great surprise and

consternation, that, despite my training in medicine and science, I had been brainwashed like most other American citizens about the dangers of this drug. After I finished the book on schizophrenia, I began work on Marihuana Reconsidered which was published by Harvard University press in 1971, a second edition in 1977 and republished as a classic in 1997. Briefly, after documenting that most of what we believe about the dangers of cannabis were mythical, I concluded that marihuana was far less harmful than either alcohol or tobacco and that its greatest harmfulness arose from the way we as a society were dealing with it. (At that time we were arresting about 300,000 mostly young people on marihuana charges; today the figure is about 750,000.).

Let me say at the outset that marihuana is no more harmful today than it was in 1975 when I testified in the Raven case. Street marihuana is arguably more potent than it was at that time but this does not mean increased risk because both medicinal and recreational users very quickly learn how to titrate the dose to achieve the desired effect. A user who smokes (or vaporizes) marihuana has to inhale less of a more potent sample and, conversely, more of one that is less potent. It follows that to the extent that inhaling the smoke is considered a risk factor for pulmonary disease, the more potent sample provides a healthier choice. However, I should hasten to add that the pulmonary risk from smoking marihuana has been greatly exaggerated. There is not a single case of lung cancer or emphysema attributable to smoking marihuana to be found in the medical literature. I believe that the lungs of marihuana smokers are at greater

risk from the air of cities like Los Angeles or Houston (or any other city with poor air quality). However, for those, particularly in today's anti-smoking atmosphere, who wish to avoid smoke for any reason, there is now available a device called a vaporizer which holds the temperature of the marihuana to be consumed in a temperature window which vaporizes the cannabinoids at a temperature which is below the ignition point; thus no smoke.

I wish I had time to address the other 18 "Findings" because so many are erroneous and none is supported by documentation. Let me briefly consider another "Finding", the one that states... "marihuana use by children is associated with an increased risk of attempting suicide." I believe that the intention here is to suggest that because there is an association cannabis must be causal in this increment of risk. Psychiatry is becoming increasingly aware that children suffer from depression and some of them commit suicide. Like other children, some of the depressed children will use marihuana. In fact, because marihuana is an effective antidepressant, some of them may have discovered it as a self-medication. However, there is no credible evidence that I know of that establishes marihuana as a causal.

I am struck by the fact that so many of these "Findings" are the same claims of marihuana toxicity that have been made and discredited more than once in the history of this substance. For example, schizophrenics and patients suffering from other psychoses were thought to comprise a significant number of the

patients admitted to Indian Insane Asylums in the second half of the 19th-century and the use of ganja was thought to be causative. It was for this reason that the British organized the Indian Hemp Drug Commission Study which was published in 1894. The commission exan..ned 800 doctors, superintendents of insane asylums, and so forth. In a 3000 page, seven volume report the commission concluded that "There is no evidence of any weight regarding mental and moral injuries from the moderate use of these drugs." This report put to rest the belief that cannabis led to schizophrenia and other psychoses for a while, but it has recurred periodically most recently during the last year are so. For example, a report from New Zealand with a study group of only 759 subjects, claims to have established that those who smoked marijuana three or more times by the age of 15 had a 10% higher chance of developing schizophrenia. Similarly, other studies from Great Britain and the Netherlands would predict greater numbers of schizophrenic patients. If these predictions were correct, given the number of young people who are or who have used cannabis, we would expect an increment in the incidence of schizophrenia. However, no such increment exists.

In "Finding" number two the assertion is made that "... [marihuana] has addictive properties similar to heroin and other similar illegal controlled substances..." Most of those who are sophisticated about cannabis would question whether the word addiction is even appropriate to this drug, and all would agree that the withdrawal syndrome seen with "heroin and other illegal controlled substances" are not observed upon cessation of marihuana use. The assertion made in "Finding"

number four, that marihuana use "... makes it more likely that the person will go on to use more potent illegal controlled substances..." is simply a restatement of what was known as the "stepping stone hypothesis";a belief which has long since been thoroughly discredited.

As I participate in these hearings, I am reminded of those which preceded the passage of the Federal Marihuana Tax Act of 1937 the first of the draconian legislation aimed at marihuana. A reading of the hearings before the House Ways and Means Committee that preceded the passage of the legislation demonstrates quite clearly how little empirical data was found to support the Act. Indeed, the enactment reflected far more the mass hysteria surrounding the subject than any concrete evidence of the drug's harmfulness. The hearings were characterized by brevity and lack of information. Little expert medical, sociological, or of the scientific evidence was produced or listened to. I would urge this committee to acquaint itself with some of the excellent comprehensive special reports and commission reports which have been developed over the past half-century. They would include:

The La Guardia Report (1944)

The Wooten Report (1968)

The Shafer Report (1972)

The Le Dain Commission (1973)

Canadian Senate Special Committee on Illegal Drugs Report (2002)

I think that if this legislative body is as meticulous and comprehensive in collecting and assessing the data as these Commissions were, it will have a better chance of arriving at a sound judgment about whether the "harmfulness "of marihuana is sufficient to enact such a restrictive bill.

In conclusion, I must tell you that I have much more to say on this topic, but given the extremely short time allotted for these hearings, there is no way I can thoroughly respond to the erroneous findings proposed in this bill. It would take days, if not weeks, to carefully review each of the studies and reports submitted by the government in order to fully explain to you the fallacies and inaccuracies. In short, this committee cannot possibly hope to seriously consider in the amount of time allocated the relevant evidence necessary to reach conclusions about the public health effects of marijuana. I would urge the committee to postpone action on this legislation until such time as a full and fair review of all the evidence is achieved. If the legislature does adopt these findings, I would urge you to fully annotate those findings with specific references to specific evidence in the legislative record.

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My name is Robert Melamede, Ph.D. I am submitting the following testimony regarding Senate Bill NO. 74. I am the Chairman of the Biology Department at the University of Colorado in Colorado Springs. Additionally, I am an active scientist involved in cancer research and I am a founder of a new biotechnology company that is developing novel approaches to treat cancers. I am also the father of four and grandfather of two.

The stated purpose of Bill 74, "The purpose of this Act is to protect the health and safety of persons in this state, and to provide legislative findings concerning this Act regarding marijuana and its effects in this state" is a valuable pursuit for any state to embark on. Unfortunately, the findings stated in the bill are, for the most part, in direct contradiction to those that would have been arrived at had modern peer reviewed science determined the bill's findings.

Finding 1 is correct. Marijuana is the most commonly used illegal drug in the United States.

Finding 2 is largely incorrect. While marijuana has some adverse affects on health, its benefits far out weight its harm. Regarding Finding 8, while smoking anything is a respiratory irritant, there is no evidence that smoking marijuana causes lung cancer. Recent peer-reviewed scientific findings clearly demonstrate that the nicotine found in tobacco causes cancer by preventing genetically damaged cells from dieing. **Cannabis does not contain nicotine, hence cells genetically damaged by the carcinogens in the smoke are insufficient to cause cancer in the absence of nicotine**. If the intent of Bill 74 is to protect the health of Alaskans it should be directed towards tobacco products that kill over 400,000 Americans yearly from respiratory and cardiovascular illnesses, including lung cancer.

In contrast to tobacco cannabis has many health benefits. Regarding Finding 7, the reason that the cannabinoid compounds exert multitudinous effects on the body is that they mimic the way our bodies function. **Current science shows that we all produce marijuana-like compounds that regulate all of our body systems (cardiovascular, neurological, immunological, respiratory, excretory, digestive, muscular-skeletal). Age related biochemical imbalances in these systems lead to diseases such as autoimmune diseases (diabetes, arthritis, ALS, Crohn's, and multiple sclerosis), cardiovascular disease (heart attacks and strokes), neurological diseases (Alzheimer's, Parkinson's) and cancers. Again, modern science indicates that cannabinoids that we produce or consume can delay the onset and reduce the severity of many of these illnesses.**

How can cannabis have so many positive health effects and yet be viewed as so dangerous? Again, the benefits come from how it mimics the way our bodies try to counter these illnesses by making marijuana-like compounds (endocannabinoids). The

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reason public policy has been contrary to the above scientific findings is due to the lag in widespread knowledge of these facts. For example, the Institute of Medicine report was released in 1998 and contained data that was a few years old. The bulk of the exploding level of research on cannabinoids has occurred since then. For example, the Institute report examined cannabis as an anti nausea agent potentially useful for cancer suffers. **We now know that cannabinoids kill a variety of cancer cells including those from breast, prostate, leukemia, lymphoma, glioma, and skin cancers.**

Regarding Finding 9, a recent article describes a new animal model for self-administration of marijuana (a measure of addictive behavior). The paper showed **that a monkey would self-administer THC only to a point and then would stop.** When extrapolated to equivalent human doses the study indicated that **a human would take a few drags and no more.**

The above experiment has important implications for current concerns regarding higher THC levels in current marijuana. Regardless of THC concentration, only a particular level of effect is desirable. Too much is avoided. Hence a logical conclusion is that the availability of strong cannabis means less would be consumed. It should be remembered that there is no achievable lethal dose of cannabis and consuming too much results in sleep.

Finding 10, regarding the increased number of individuals seeking treatment for cannabis use is a pathetic example of sacrificing the truth for an agenda. Persons arrested for marijuana possession are often given a choice between treatment or prison. Even with marijuana use, these persons are capable of making the logical decision in favor of treatment instead of incarceration.

The old Nahas studies referred to in Bill 74 do not reflect modern immunological knowledge. They were done with very high doses. beyond what anyone would use. His work has largely been discredited by the scientific community. The immune system has two arms to it, a pro-inflammatory TH1 response that is balanced by an anti-inflammatory Th2 response. Endocannabinoids, that we all produce, shift the immune response to TH2. Depending on circumstances this effect could be good or bad. We need a strong Th1 response to fight certain infections such as tuberculosis, Legionnaire's disease and leischmania infection. However, in a modern society most death occurs from age related diseases that are in fact exacerbated by an excessive TH1 response. Hence, as mentioned above, cannabis is good for autoimmune diseases such as diabetes, multiple sclerosis, arthritis and Crohn's disease, neurological diseases such as stroke and Alzheimer's disease, cardiovascular disease, as well as cancer. **THC has been show to directly kill a number of different cancer cells including breast, prostate, leukemia, lymphoma, glioma and skin cancer.**

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Cannabinoids regulate the biochemistry of our male and female reproductive systems. Excess consumption can impair sperm maturation and prevent the implantation of a fertilized egg into the uterine wall. These effects are not permanent and are readily reversed. In fact the uterus cannabinoid levels go down during ovulation to allow implantation but then are necessary for normal fetal development. **Keep in mind that cannabinoids are found in mother's breast milk where they are important for feeding and probably other functions such as sleep and stress relief in infants.**

Mother nature uses cannabinoids. Remember, every time every member of the legislature gets hungry, it is because they are giving themselves the munchies with the cannabinoids that they make. Every time they feel pain, the pain is less that it would be if they were not making cannabinoids to turn down the pain. When they are feeling relaxed and free of stress it is because cannabinoids that they make are helping them to feel better.

I have provided you with an article, Harm Reduction--The Cannabis Paradox. The article was peer reviewed and has been approved for publication in the Harm Reduction Journal. It contains references that verify the facts that I have testified to.

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Education:

Herbert H. Lehman College,	NYC	B.A.	1969	Anat/Phys.
Herbert H. Lehman College,	NYC	M.S.	1972	Molec/Biochem.
City University of New York,	NYC	Ph.D	1980	Molec/Biochem

Professional Experience

Chairman Biology Dept.	University of Colorado CS	9/01-present
Director	LCCRO Monoclonal Facility	1/93-2001
Assistant Research Professor	Univ. of Vermont	8/88-2001
Assistant Research Professor	N.Y. Medical College	1985-8/88
Research Associate	N.Y. Medical College	1978-1981
Graduate Fellow	Lehman College	1975-1978
Adjunct Lecturer	Lehman College	1970-1975
Part-time Lecturer	Bronx Comm. College	1970

Refereed Publications

1. Melamede, R. Harm Reduction-The Cannabis Paradox the Harm Reduction Journal. in press.
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1. Melamede, R. Cannabis and Tobacco: Different Carcinogenic Potentials submitted Harm Reduction Journal.

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Abstracts.

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2. Fields, Dana and Robert Melamede (2003), American Association for the Advancement of Science (AAAS). Entropomic Space.
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4. Robert Melamede (2002) The Costs of Marijuana Prohibition Colorado Policy Institute.
5. Robert Melamede and Karen Newell (2002), Coleman Institute. Does the Endocannabinoid System Interact with UCP-2 to Protect or Kill Cells?
6. Robert Melamede and Karen Newell (2001), Coleman Institute. The Role of Endogenous Cannabinoids in Controlling the Life, Death and Differentiation of Nerve Cells.
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Chapters:

1. Melamede, R. J. Indications for Cannabinoids: Autoimmune Diseases, in CANNABIS and CANNABINOIDS, Pharmacology, Toxicology and Therapeutic Potential, Haworth Press (U.S) April, 2002.
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3. Melamede Robert. Cannabis-whether like it of not. Chemistry and Industry. November 21, 2001 p.724
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Published Letters:

Journals

1. Robert Melamede (23 May 2003) British Medical Journal, A Science Based Evaluation of Cannabis and Cancer **http://bmj.com/cgi/eletters/326/7396/942#31878**

Newspapers:

1. Science Needed Aldergrove Star (CN BC) 12 Aug 2004 Amendment Could Enable Patients to Avoid Opiates Gazette, The (Colorado Springs, CO) 19 Jun 2004
2. Medical Marijuana Allard Ignores Legalization Benefits Gazette, The (Colorado Springs, CO) Apr 2004
3. Marijuana Is A MiracleRocky Mountain News (Denver, CO) 18 Dec 2003
4. Our Bodies Make, Use 'Pot'-Like Compounds Source: Rocky Mountain News (Denver, CO) 20 Jun 2003
5. Medical Marijuana Racine Journal Times, The (WI) 05 May 2003
6. Alternative Medicine? MARIJUANA CAN TREAT MANY DISEASES Source: Gazette, The (CO) 16 Apr 2003
7. Believe The Scientists And Patients Who Suffer Source: Ocean County Observer

(NJ) 14 Apr 2003

8. Ignorant Doctors Boulder Weekly (CO) 6 Feb 2003
9. Heed The Science Denver Post (CO) Fri, 08 Nov 2002
10. Get Educated On The Benefits Of Marijuana Las Vegas City Life (NV) Thu, 31 Oct 2002
11. Mind-Alteration Daily Camera (CO) 27 Feb 2002
12. DEA's Crackdown Doesn't Make Scientific Sense Athens News, The (OH) 17 Jan 2002

Presentations at Professional Meetings and Seminars:

1985-1986 Beckman, Cetus, Dupont, LKB Pharmacia, Whitehead Institute
1993 Immune Response Corporation
1995 Wellness Council of Upper Peninsula
1995 Jefferson Cancer Center
1996 IDEXX Laboratories Inc.
1996 Alteon
1997 Morphosys (Germany)
1997 Pyrosequencing (Sweden)
1998 Pentose Pharmaceuticals
2000 University of Texas at Tylor
2001 Sigma Psi, University of Colorado
2003 Lecture for Pillar (education in retirement)
2003 Safe Access Now Hayden Ca
2003 Oakland Cannabis Buyers Club
2004 broadcast 90 minute lecture on KMUD Radio in Los Angeles.
2004 University of Virginia, The Third National Clinical Conference on Cannabis Therapeutics.
2005 National Organization for the Reform of Marijuana Laws. San Fransico.
2006 Invited to present at The Fourth National Clinical Conference on Cannabis Therapeutics.

Meeting Attended and Presented Abstracts

American Association for the Advancement of Science 2003
Butcher Symposium 2002
Colorado Policy Studies 2002
Coleman Institute 2002
Coleman Institute 2001
Antibody Engineering Conference 2001

Grants and Research:

Principal Investigator

Automated Process for Sequencing Nucleotides and Site-specific Mutagenesis, Whitehead Associates: Venture Capital Support
$90,000 11/84-86
Development Grant to establish *in vitro* antibody technology at UVM.

Vermont Cancer Center $75,000 12/92-12/93
$45,000 1/94/-12-94
Development Grant A Novel Method for Determining Antigens that bind T-cells. Immune Response Corporation $30,000 1/94-12/94
NISSC - Modulation of Homeostatic Mechanisms to Reduce Biological Consequences of Radiation Exposure $10,000 6/03-12/03
Biologically Motivated Personalized Computation Forms for Wearable Computing. (with Dr. Semwal) NSF not funded
$200,000 2/04

Co-Principle Investigator

An Immunological Approach to Study DNA Damage and Repair
DOE $780,000 3/1/97-11/30/98
Repair of DNA Damage Induced by Ionizing Radiation
NIH: $764,694 4/82-3/95
Research-based Computer-assisted Undergraduate Molecular Biology Labs. NSF: $90,447 1/93-1/95

Patents and Disclosures

1. Automatable Process For Sequencing Nucleotides 9/5/89 USA Patent #4,863,849 (sold to PyroSequencing 1998)
2. Fluorometric Quantitation Mycoplasma Bromide USA Patent # 5,604,096, 2/18/97
3. A means of preserving organs and tissue for transplant, and for improving the success of transplantation (Disclosed 6/02)
4. Diagnostic And Therapeutic Treatments Related To Mitochondreal Disorders PCT, (application pending 5/13/03)
5. A method for treating a curing psoriasis (6/13/03,)

Gifts:

Monetary

Arranged $40,000 Gift from Weinstein Family to Bioenergetics Institute (2004)

Equipment:

2004 ABI Automated DNA Sequencer (used)
2003 BioTeK Fluorescent Plate Reader (used)
2002 BioTek Spectrophotometric Plate Reader (used)
2001 Visisble Genetics Sequencers (2) (used)

Founder-Newellink Corporation License agreement with CU brings in $180,000/yr for Dr. Newell's research, additionally, CU will receive royalties.

Students:

UCCS Students

Undergraduate

Michael Collins – graduated, Darus Bechamie graduated, Rafael Vega graduated, Chris Stubbs-current, Jackie Hartley-current, Mike Port-current, Anna Strompolos,

Graduate Students

Steven Barton (left for med school),
Kathleen May (left for Newell lab and Osteopath school), Brad Storrs (graduated MBS), Maria McGee current, David Owens, Shady Eshak

Masters Committee William Richardson, Cecilly Dupree, Amber Havermaule Darah Evans. Brian Resnick, James Tillman

Local High School Students

Karen Jones and Kristen Wells-received first place in regional Science Fair (2004), went on to the internationals and each received $45,000 scholarships for their cannabis and cancer project. In 2005 they place 4th in the regional science fair.

Courses:

Taught

Biol 203 Microbiology, Fall 2001-current, fall and spring semesters
Biol 400 Endocannabinoids and Medical Marijuana, fall and spring semesters fall 2002-current.
Biol 401 spring 05

Guest Lecturer

Cell biology, Immunology, Advanced Immunology, Bioinfomatics, Computer Science

Professional Organizations

AAAS
Sigma Xi
ICRS (International Cannabinoid Research Society)
Vermont Cancer Center
NECSI (New England Complex System Institute)
University of Colorado Center for Computational Biology

Service on-Campus:

Chairman Biology Department (current)
Director of MBS Program (current)
NIH Institutional Review Committee (formerly Recombinant Research Committee, current)
Alternate member of IACUC (current)
Chairs Advisory Committee to the Dean
Budget and Planning Committee
Search Committee Dean of Education
Search Committee Exercise Science position

Search Committee Biochemistry Position (Biology Department)
Search Committee Biochemistry Position (Chemistry Department)

Service off-Campus

12/05 Board Member Sensible Colorado
10/18/04 Café Scientifique
9/18/04 Back to the Bluffs UCCS
8/21/04 Dean Becker Radio Show-Cultural Baggage KPFT Houston Texas
4/1/04 Million Marijuana March Acasia Park
12/9/03 PILLAR Institute for Learning in Retirement
11/03 Radio Interview Jim Dexter Show Utah KTKK
10/4/03 Fallfest presentation
10/23/02 FreeThinkers
10/12/02 Luncheon at BSCS with Bruce Alperts President of National Academy of Sciences
10/2/02 Radio Interview Colleen Brookes Show Denver WKBI
9/28/02 UCCS Fall Fest
9/15/02 Acasia Park Hemp Rally
9/2/02 Radio Interview Jim Dexter Show Utah KTKK
08/17/02 Denver HempFest
3/20/02 Member of TriBeta Society
01/15/02 Judged Black Forrest Peyton Middle School Science Fair

Abstract

Harm Reduction--The Cannabis Paradox
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This article examines harm reduction from a novel perspective. Its central thesis is that harm reduction is not only a social concept, but also a biological one. More specifically, evolution does not make moral distinctions in the selection process, but utilizes a cannabis-based approach to harm reduction in order to promote survival of the fittest. Evidence will be provided from peer-reviewed scientific literature that supports the hypothesis that humans, and all animals, make and use internally produced cannabis-like products (endocannabinoids) as part of the evolutionary harm reduction program. More specifically, endocannabinoids homeostatically regulate all body systems (cardiovascular, digestive, endocrine, excretory, immune, nervous, musculo-skeletal, reproductive). Therefore, the health of each individual is dependant on this system working.

Introduction

The concept of harm reduction is at the heart of conflicting international drug policies. The Dutch pioneered this approach. Today most European countries and Canada have embraced the idea that society benefits most when drug policy is designed to help people with drug problems to live better lives rather than to punish them. In contrast, the United States federal policy demands rigid zero tolerance with overwhelming emphasis on incarceration of offenders (the Drug War). Although, seemingly reasonable arguments can be made to support both sides of the dispute, the recent global trend towards harm reduction has resulted from the acknowledgement that drug use has been a part of all societies throughout history and the realization that repressive policies are expensive, ineffective, and often harmful.

A dramatic example of the benefits that can result from a harm reduction approach to drugs is seen with needle exchange programs. While prohibitionists argue that providing clean injection equipment promotes drug use, the facts do not support this contention. For example, the Australian needle exchange program is credited with keeping the HIV/AIDS infection rate very much lower than what is typically found globally (http://www.chr.asn.au/about/harmreduction). Commonly cited examples of the failed repressive policies championed by the United States are the now repealed alcohol prohibition and the current drug war. Crime, financial support for terrorism, disrespect for the law, and destruction of families, communities, and ecosystems can all be attributed to drug prohibition. Yet, the staggering cost of the drug war, driven by United States policy and taxpayers' money, amounts to many billions of dollars a year.

Cannabis is the third most commonly used drug in the world, following tobacco and alcohol. In the United States, much of the drug war is focused on marijuana (over 700,000 people arrested last year alone). Is there justification for this policy? The gateway theory states marijuana use leads to the use of other drugs, and drives the U.S. policy despite evidence that suggests alcohol and tobacco use may foster the gateway effect [1] [2]. In contrast, countries that support harm reduction focus their enforcement and social support efforts on "hard drugs." Consequently, many countries have effectively decriminalized marijuana. Holland, having the most liberalized drug laws, does not have more cannabis users (over age twelve) than do more repressive countries, and the per capita number of heroin users is also lower (http://www.minjust.nl:8080/a_beleid/thema/drugs/drugs.htm). The Dutch Ministry of Justice estimates that 0.16% of cannabis users are heroin users. This figure does not support cannabis being a gateway drug. Data from the 2000 National Household Survey on Drug Abuse (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration) also shows that the vast majority of people who try cannabis do not go on to use hard drugs.

A little explored question is what does harm reduction specifically mean with respect to cannabis consumption? This article will address cannabis harm reduction from a biological perspective. Two directions will be examined: what are the biological effects

of cannabis use and what are the social effects that emerge from the biological foundation.

Like many substances that are put into the human body, there can be positive or negative consequences that result from cannabis consumption, depending on amount, frequency, quality, and probably most importantly, the idiosyncratic biochemistry of the user. Prohibitionists concentrate their efforts on the negative effects of cannabis use, while anti-prohibitionists tend to focus on the positive effects. If we assume that both sides have valid arguments, the issue to be resolved is one of balance between the negative and positive effects. Would a policy of tolerance, or prohibition, be more likely to reduce ha. 1 overall? Which policy would better serve society as a whole, as well as problematic drug users?

Biological science can be more objectively evaluated than social science. The central theme that will be presented in this article is that appropriate cannabis use reduces biological harm caused by biochemical imbalances, particularly those that increase in frequency with age. Proper cannabis use, as distinguished from misuse, may have significant positive health effects associated with the way cannabis mimics natural cannabinoids. In essence, it is proposed that the endocannabinoid system, selected by 600 million years of evolution, is a central mediator of biological harm reduction through its homeostatic activities. The social implications of cannabis use will be viewed as emerging from the biological platform. Herein lies the paradox of cannabis and harm reduction. Is appropriate use of cannabis better than no use?

The Controversy

Cannabis use can be divided into three categories, recreational, medical, and religious. The latter will not be examined in this article. Some, including those who favor or oppose cannabis use, presume recreational and medical use are the same. On the one side, it is often claimed that any cannabis use is justified by some underlying medical need. On the ot er side, cannabis use is presumed to have no medical value, with the implication that those who use it are simply "getting stoned." While the former claim may be too extreme, the latter defies current scientific understanding of the biological functions of the endocannabinoids. While many people are reluctant to approve recreational cannabis use, it appears that most people support medical use. The United States Federal Government denies that there is any valid medical use for cannabis, while the National Institute of Drug Abuse (NIDA) provides marijuana on a monthly basis to a few medical users through the compassionate Investigatory New Drug (IND) program of the Food and Drug Administration (FDA). Nevertheless, a number of states, through either legislative action or voter initiative, have approved the use of medical marijuana[3].

Current Federally Approved Medical Marijuana Uses

In order to better assess arguments for and against the medical use of marijuana, the scientific evidence for the health benefits of cannabis will be reviewed below. It should be noted that the federally supplied cannabis users have been receiving and using cannabis for 11 to 27 years with clinically demonstrated effectiveness in the treatment of glaucoma, chronic musculoskeletal pain, spasm and nausea, and spasticity of multiple

sclerosis [4]. Furthermore, there is no evidence that these patients have suffered any negative side effects of their cannabis use.

The Endocannabinoid System

Cannabis preparations have been used medically for thousands of years for illnesses such as epilepsy, migraine headaches, childbirth, and menstrual symptoms. However, it is only relatively recently that the active components have been identified and their mechanisms of action have begun to be understood. While delta-9-tetrahydrocannabinol (THC) was first synthesized by Mechoulam in 1967 [5], it was not until 1990 that the cannabinoid receptor was localized in the brain [6] and cloned [7]. Since then, discoveries in the field have proceeded at an ever-increasing pace. The discovery of cannabinoid receptors on cells naturally prompted the search for internal compounds (endogenous ligands) that would activate the receptors since it seemed unlikely that cannabis receptors had evolved so people could partake of cannabis. In 1992, anandamide was discovered[8]. This lipid metabolite was the first ligand of an ever-expanding class of molecules known as endocannabinoids (internal marijuana-like compounds) to be discovered. Endocannabinoid synthesis, degradation, transport, and receptors together form the endocannabinoid system.

The broad therapeutic potential that can result from correctly manipulating the endocannabinoid system is just beginning to be realized[9][10]. In fact, major pharmaceutical companies, and university researchers all around the world are now engaged in the cannabinoid-related research [11]. Their efforts focus on learning how the endocannabinoid system functions, and on how to manipulate it in order to increase or decrease its activity, depending on the illness or condition under consideration. GW Pharmaceuticals in Britain has been developing and testing a plant extract-based product line that is in clinical trials in Britain and Canada [12]. The results thus far have been positive to the extent that Bayer AG has entered into a 25-million-dollar distribution agreement for GW's still unapproved product, Sativex. In contrast, Sanofi Research has developed an antagonist that will inhibit the ability of endocannabinoids to stimulate hunger and thus potentially be useful for weight control.

Evolution of Endocannabinoids

The cannabinoid system appears to be quite ancient [13][14], with some of its components dating back about 600 million years to when the first multicellular organisms appeared. The beginnings of the modern cannabinoid system are found in mollusks [15] and hydra [16]. As evolution proceeded, the role that the cannabinoid system played in animal life continuously increased. It is now known that this system maintains homeostasis within and across the organizational scales of all animals. Within a cell, cannabinoids control basic metabolic processes such as glucose metabolism [17]. Cannabinoids regulate intercellular communication, especially in the immune [18] and nervous systems [19]. In general, cannabinoids modulate and coordinate tissues, organ and body systems (including the cardiovascular [20], digestive [16], endocrine [21], excretory [22][23], immune [18], musculo-skeletal [24], nervous [19], reproductive [25], and respiratory [26] systems). The effects of cannabinoids on consciousness are not well

understood, but are well known, and underlie recreational cannabis use. These effects also have therapeutic possibilities [27].

Cannabinoids: Homeostatic Regulators

The homeostatic action of cannabinoids on so many physiological structures and processes is the basis for the hypothesis that the endocannabinoid system is nothing less than a naturally evolved harm reduction system. Endocannabinoids protect by fine-tuning and regulating dynamic biochemical steady states within the ranges required for healthy biological function. The endocannabinoid system itself appears to be up- or down-regulated as a function of need. As will be detailed later in this article, endocannabinoid levels naturally increase in the case of head injury and stroke [28], and the number of cannabinoid receptors increases in response to nerve injury and the associated pain [29]. In contrast, the number of cannabinoid receptors is reduced when tolerance to cannabinoids is induced [30].

Physical Characteristics of Living Systems

To illustrate the multidimensional biochemical balancing act performed by cannabinoids, a variety of endo- and exocannabinoid activities will be reviewed below. In order to appreciate these activities a brief introduction to cell biology may provide the context for this review. All life is dependant upon the maintenance of its dynamic organization through sufficient input of nutrients and removal of wastes. The more complicated an organism is, the more complex the coordination required to accomplish the essential tasks necessary to maintain this vital flow of inputs and outputs. Coordination requires communication. Cells communicate by thousands of different, but specific, receptors on cell surfaces that respond to thousands of different, but also specific, molecules (ligands) that bind to the receptors. A receptor that is bound to its activating ligand causes biochemical changes to occur in the cell. In response to such regulatory signals on the membrane, biochemical regulation within the cell occurs at the level of gene expression as well as at the level of enzyme action and other processes outside the nucleus. Ultimately these changes, through complex biochemical pathways, allow cells to divide, carry out specialized tasks, lie dormant, or die. Any of these cellular activities, when not properly coordinated, can result in illness. Two major categories of disease states are those that result from acute illness commonly caused by infections and those that are age-related. Historically, in the United States, the cause of death has transitioned from being pathogen-induced to age-related. Current scientific literature regarding cannabis indicates that its use is often bad for the former but good for the latter (see Immunology section below).

Cannabinoids and Brain Disorders

Since cannabis' action on the brain is most widely known due to its recreational use, the nervous system will serve as the starting point for examining cannabinoid activity as an example of a natural biological harm reduction system. Numerous disease states associated with the nervous system will be seen as potential targets for cannabinoid-based therapy [31]. The nervous system is composed of nerve and supporting cells. In addition to the role cannabinoids play in a healthy nervous system [32], the regulatory effects of cannabinoids in cases of stroke [28], Parkinson's disease [33], Huntington's disease [34],

amyotrophic lateral sclerosis (ALS) [35], Alzheimer's disease [36], glioma (a type of brain tumor), [37] multiple sclerosis [38], seizures[39], and pain [40][41] will be examined.

Cannabinoids and the Healthly Brain

In a healthy individual, cannabinoids play a direct role in neurotransmission of many nerve cell types. They exhibit the unusual property of retrograde transmission, in which the cannabinoid neurotransmitter diffuses backwards across the neural cleft to inhibit the presynaptic action potential [42]. This function essentially regulates the sensitivity of a nerve cell by acting as a feedback mechanism that prevents excessive activity. Some nerve cells die when they are excessively stimulated by excitatory neurotransmitters (excitotoxins) such as glutamate. Cannabinoids can reduce the level of stimulation and protect against this form of cell death [43][44]. In addition to their down-regulatory effect on neurotransmission, cannabinoids play other roles in reducing this type of cell death (biological harm reduction) by regulating the role of interleukin-1 (IL-1) and the IL-1 receptor antagonist (IL-1ra) [45]. For example, cannabinoids were shown to modulate the release of IL-1ra thereby protecting against IL-1 assisted cell death [46].

The role of cannabinoids in neurological health and disease goes beyond the prevention of cell death and regulates neuronal differentiation. Cannabinoid receptors are functionally coupled to the fibroblast growth factor receptor (FGF). The FGF receptor, when stimulated, activates lipid catabolism via diacylglerol (DAG) lipase which causes the hydrolysis of DAG to produce 2-arachidonyl glycerol (2AG) [47]. 2AG is an endocannabinoid shown to be important for axon growth and guidance.[48]. This function is critical for nerves to innervate their target effectors. The ability to control these fundamental neurological activities, in conjunction with the anti-inflammatory properties of cannabinoids, is likely to have important regenerative health benefits for people suffering from neurological damage as occurs with stroke or injury [28].

Multiple Sclerosis

Both animal and human studies provide strong evidence of the therapeutic potential of cannabinoids to provide relief from a number of neurological disease states [49]. The use of cannabinoids to treat people suffering from multiple sclerosis (MS) is an excellent example of the importance of "medical marijuana" as an agent of harm reduction.[50] MS is a neurodegenerative disease in which the immune system attacks components of the nervous system. The axons of many central nervous system (CNS) neurons are surrounded by a myelin sheath that acts much like an insulator around a wire. MS is associated with the degradation of the myelin sheath that leads to loss of axon function and cell death, thus producing the disease symptoms.

Cannabis-based therapies for the treatment of MS can provide symptomatic and true therapeutic relief. On the one hand, cannabinoids help to reduce spasticity in an animal model of MS (chronic relapsing experimental autoimmune encephalomyelitis (CREAE) [51]. However, the involvement of the cannabinoid system in the etiology of MS goes much deeper. MS is in reality an autoimmune disease. In order to appreciate why

cannabinoids can have in important role, beyond what has already been mentioned, in treating MS on a mechanistic level [52], a brief introduction to immunology is required.

Cannabinoids and the Immune System

The role of the immune system is simplistically thought of as protecting us from foreign attack. More inclusively, however, the immune system has the biological function of modulating the life, death, and differentiation of cells in order to protect us. The immune system accomplishes these tasks, in part, by balancing two mutually opposed pathways known, respectively, as the "Th1" and "Th2" response. The Th1 immune response is critical for fighting infections caused by specific infectious agents [53]. This function is inhibited by cannabinoids. Thus cannabinoids are important homeostatic modulators of the immune system. While often classified as immune inhibitors, cannabinoids actually promote the Th2 response while they inhibit the Th1 response. Therefore cannabinoids are immune system modulators. A specific cannabinoid receptor (Cb2) [54] is found on most cells of the immune system.

Th1 Immune Response

The Th1 pathway is proinflammatory and functions by inducing the defensive production of free radicals that are vital for fending off pathogens, especially intracellular pathogens, such as those that cause Legionnaire's disease, Leishmania, and tuberculosis. Accordingly, the use of cannabis should be avoided when the Th1 arm of the immune system is needed to fight a particular disease. Although contagion as well as immune suppression may have been involved, a recent study supports this perspective, in that a cluster of new tuberculosis cases was traced to a shared water pipe [55]. Free radical production, inflammation and cell-mediated immunity are characteristic of the Th1 response. The targeting of infectious organisms, or infected cells, by a Th1 immune response results in healthy surrounding cells being exposed to free radicals. Much as if radiation had been applied, there is collateral damage that occurs with a targeted Th1 immune response.

Cannabinoids and Th1 Mediated Auto-Immune Diseases

In contrast to the Th1 immune response, the Th2 immune response promotes the humoral arm of the immune system. It turns down the Th1 response, is characterized by antibody production, and is typically anti-inflammatory. Ideally, the Th1 and Th2 pathways are functionally balanced to optimally meet the survival needs of an organism in its environment. In reality however, many autoimmune diseases, and other age related diseases, are characterized by an excessive Th1-driven immune response at the site of the of the tissue damage involved. Multiple sclerosis, arthritis, Crohn's disease, and diabetes are all diseases that fall into this category.

The therapeutic impact of cannabinoids on these diseases can be dramatic. For example, when rodents were given experimental autoimmune encephalomyelitis (EAE) as an MS animal model and were treated with cannabinoids, the results were profound [56]. In a study that involved both guinea pigs and rats, 98% of the EAE animals that were not treated with THC died. In contrast, greater than 95% of THC-treated animals survived. They had only mild symptoms with a delayed onset or no symptoms at all. The capacity

of cannabinoids to down-regulate a spectrum of auto-immune diseases should serve as a warning against the long term use of CB1 inhibitors for weight control. Such drugs are currently in the regulatory pipeline [57] and one of the participants in the clinical trial unexpectedly developed multiple sclerosis [58].

Cannabinoid Actions-Biphasic Responses

The brief interludes into cell biology, neurology, and immunology provide a biological platform for considering how cannabinoids might impact a variety of other disease states. It is important to keep in mind that in its role as a general homeostatic modulator, too much or too little cannabinoid activity can be harmful. Cannabinoid levels or concentration ranges vary as a function of an organism's genetics, the cell types under consideration, and their health and environment. Care must be taken when evaluating the scientific literature on cannabinoids and their effects. Cannabinoids often exhibit biphasic responses [59]. Low doses of cannabinoids may stimulate the Th2 immunological response, whereas high doses may inhibit the Th2 response and shift the balance in favor of a Th1 response. From a harm reduction perspective, these observations demonstrate the critical importance of dose-dependent, disease-dependent, state-dependent, and individually tailored approaches to cannabis therapeutics [60].

The use of cannabinoids in the treatment of Parkinson's disease is an example of a condition where excessive or deficient cannabinoid activity may prove problematic. Parkinson's disease results from the loss of levo-dopamine (L-dopa) producing neurons. In an animal model of Parkinson's disease, L-dopa producing cells are killed with 6-hydroxydopamine. Rats so treated exhibit spontaneous glutamatergic activity that can be suppressed by exo- as well as endocannabinoids [61]. The standard treatment for Parkinson's disease involves L-dopa replacement therapy. Unfortunately, this treatment often results in dyskinesia (abnormal voluntary movements). Recent clinical trials have shown that cannabinoid treatment reduces the reuptake of gamma-aminobutyric acid (GABA) and relieves the L-dopa-induced dyskinesia [33], as well as L-dopa induced rotations in 6-hydroxydopamine-lesioned rats [62]. In contrast to the potential benefits of cannabinoid agonists just cited, using a different animal model, the cannabis antagonist SR141716A reduced reserpine-induced suppression of locomotion [63]. Thus, in this model locomotion was restored by inhibiting the endocannabinoid pathway.

Cannabinoids and Cancer

Possibly the greatest harm-reducing potential afforded by cannabinoids comes from their use by cancer patients. Cannabinoids possess numerous pharmacological properties that are often beneficial to cancer patients. Many people are aware of the anti-emetic and appetite stimulating effects of cannabinoids [64]. A systemic study designed to quantify the efficacy of cannabinoids as an anti-emetic agent examined data from 30 randomized controlled studies that were published between 1975 and 1997 and included 1366 patients who were administered non-smoked cannabis [65]. For patients requiring a medium level of control, cannabinoids were the preferred treatment (between 38% and 90%). This preference was lost for patients requiring a low or a high level of control. Sedation and euphoria were noted as beneficial side effects, whereas dizziness, dysphoria, hallucinations, and arterial hypotension were identified as harmful side effects.

The cancer cell killing [66] and pain relieving properties of cannabinoids are less well known to the general public. Cannabinoids may prove to be useful chemotherapeutic agents [67]. Numerous cancer types are killed in cell cultures and in animals by cannabinoids. For example, cannabinoids kill the cancer cells of various lymphoblastic malignancies such as leukemia and lymphoma [68], skin cancer [69], glioma [70], breast and prostate cancer [71], pheochromocytoma [72], thyroid cancer [73], and colorectal cancer[74]. Since 2002 THC has been used in a clinical trial in Spain for the treatment of glioma [75]. However, not all cancers are the same, and cannabinoid-induced biochemical modifications, while effective in killing the cells of some cancers, as indicated above, can have the opposite effect on the cells of other types of cancer. For example, recent work has shown that the synthetic cannabinoid, methanandamide, can promote the growth of lung cancer cells by a receptor independent pathway that involves the up-regulation of COX2 [76]. Although much has been learned about the therapeutic value of cannabinoid agonists and antagonists in different situations, scientific understanding of how to appropriately modulate the endocannabinoid pathways remains preliminary, with much remaining to be learned.

Cannabinoids and Pain

One area of current research that has begun attracting public interest is the pain relieving potential of cannabinoids, for both cancer [77] and non-cancer patients [78]. Medicine based on cannabis extract has demonstrated positive effects for pain relief [79]. Recently, an intrinsic role for cannabinoids in pain circuitry was discovered: the endocannabinoid AEA was identified as the natural ligand for the vanilloid receptors [80]. Vanilloid receptors, which are ligand-gated cation channels, are primary targets for the treatment of pain [81]. The cannabinoids seem to function in a pathway parallel to the opioid pathway [82] and are thought to exert anti-nociceptic activity at the level of the spinal cord and the brain [83], although they can also act peripherally by inhibiting mast cell degranulation [84]. In recognition of the pain relieving properties of cannabinoids, England [11] and Canada [41] are using cannabis preparations to provide relief to citizens suffering from a variety of disorders. Human trials have established that co-administration of cannabinoids can dramatically lower opioid use and can provide pain relief for neurogenic symptoms where other treatments have failed [85]. Recently, the topical application of the synthetic cannabinoid WIN 55,212-2 significantly enhanced the antinociceptive activity of morphine, opening the door for possible cannabis-induced pain relief with reduced cognitive side effects [86]. The intrinsic role of endocannabinoids in modulating pain is further supported by the up-regulation of the CB1 receptor in rats following nerve damage [29]. Once again, nature has selected cannabinoids to reduce harm.

Smoking and Lung Cancer

Fundamental to any consideration of cannabis-based harm reduction, as a biological phenomenon or as a policy, is how to best administer the drug. Smoking cannabis preparations, in contrast to oral administration [87], has the benefit of rapid action that allows self-titration of the drug's activity [88][89]. Unfortunately, cannabis smoke contains numerous carcinogenic compounds [90]. In fact, cannabis smoke may contain more tars than tobacco smoke [91]. However, despite the fact that cannabis smoke does

produce cellular changes that are viewed as precancerous, a major epidemiological study does not find that cannabis smoking is associated with tobacco related cancers [92]. A number of recent studies provide a scientific foundation for the clear relationship between tobacco smoking and lung cancer, a relationship that does not hold true for cannabis smoke (manuscript submitted to HRJ). For example nicotine, acting via nicotine receptors, is critical in the development of tobacco related cancer by inhibiting the death of genetically damaged cells [93]. Tobacco also promotes the development of blood vessels needed to support tumor growth [94] whereas cannabis inhibits tumor vascularization in nonmelanoma skin cancer [69] and glioma [95]. Although conclusions derived from an oft-cited study examining the carcinogenic effects of cannabis, tobacco, and cannabis combined with tobacco claims to show a link between cannabis smoking and head and neck cancer [96]. But these results do not hold up under scrutiny. The study does support a link between tobacco use that is exacerbated by concurrent cannabis use and the development of head and neck cancer. However, the "cannabis use only" group was composed only of two subjects, undermining the statistical relevance of conclusions regarding this group.

Smoking Alternatives

Regardless of whether or not smoking cannabis can cause lung cancer, smoking anything containing partially oxidized hydrocarbons, carcinogens, and irritants a priori, is not healthy and will have negative health consequences. Fortunately, harm-reducing alternatives exist. While often touted as a problem, the availability of high THC cannabis with high levels of THC permits less cannabis to be smoked for therapeutic effects. Additionally, methods of vaporizing the active ingredients of cannabis have been shown to successfully remove most compounds of concern while efficiently delivering the desired ones [97]. These results contrast with a recent Australian study that found that the use of a water pipe, or bong, failed to reduce tars or carbon monoxide delivered to the smoker [98]. GW Pharmaceuticals is developing an oral spray that should prove to be an additional safe and effective alternative delivery system [12] and valuable to medical cannabis users. The company has also identified strains with defined ratios of various cannabinoids for which specific medicinal value will be determined.

Cannabinoids Affect Drug Metabolism

Another important cannabis and harm reduction topic that must be considered is that of how the use of cannabis impacts on the pharmacokineticsof other drugs [99]. A number of drugs are metabolized by the P450 family of isoenzymes, including numerous cannabinoids [100]. Even though cannabinoids stimulate the transcription of P450 (2A and 3C), they also directly inhibit the activity of this enzyme [101]. There are likely to be pros and cons associated with P450 inhibition. P450 activity activates procarcinogens in tobacco smoke to create active cancer-causing mutations [102]. Thus, the inhibition of these enzymes by cannabinoids may minimize some of the negative consequences of smoke inhalation. On the other hand, many pharmaceutical drugs are metabolized by these enzymes. The reduction of the rate of drug metabolism by cannabinoids with pharmokinetic consequences has been shown for cocaine [103], barbiturates [104], opiates [105], alcohol, the antipsychotic haloperidol [106], and others [107].

Thus far, both endo- and exocannabinoids are seen to reduce harm in numerous circumstances. Cannabinoid-based therapies have been especially helpful for the treatment of a variety of neurological and immunological disorders. Yet, we have only scratched the surface of the scientific literature on cannabinoids and their biological effects. Nevertheless, it should be apparent that cannabinoids have enormous medical potential as we learn to manipulate the natural cannabinoid harm reduction system that has evolved in the animal kingdom.

A fundamental question that remains unanswered is how basic, complex biochemical phenomena, as touched on briefly in this article, collectively emerge as substantial contributors to health and behavior. In far-from-equilibrium thermodynamic systems, such as living organisms, there are discontinuities between underlying molecular dynamics and associated emergent macroscopic phenomena [108]. In such systems, small changes (called "perturbations") can amplify with consequences for the organization of the whole system. The cannabinoids help to regulate an amazingly broad range of biochemical events. All of these effects have genetic foundations. As such, natural genetic/biochemical variation in a population can be expected to have significant effects on health and behavior. It should be expected that in a population distribution of cannabinoid levels and sensitivities, as a function of an individual's health/disease status, some individuals would naturally need to increase their cannabinoid activity while others would need theirs lowered. Although the focus of this paper has been to suggest the many circumstances in which higher cannabinoid activity would be beneficial, these circumstances will necessarily differ among individuals with different congenital cannabinoid levels and sensitivities. Therefore, reduced cannabinoid activity would be beneficial under some conditions. A prime example of potential harmful effects of excess cannabinoids is their effects on pregnancy where low levels are needed but high levels are harmful [109].

Behavioral Effects: Self-administration and Reward

The broad homeostatic activities of cannabinoids that have been developed in this article have been rooted in hard science. The extension of these ideas to the psychological and behavioral levels is intrinsically more speculative, but remains consistent with the literature. For years, researchers have looked into the possible addictive qualities of cannabis. The lack of significant reward behavior was indicated by the lack of self-administration in primates. Experiments examining preference in rats demonstrated that low doses of THC could induce place preference but that higher doses produced drug aversion [110], again demonstrating the homeostatic nature of cannabinoids. Self-administration is typical of most psychoactive drugs of abuse. Hence, one could conclude that marijuana has a low potential for abuse.

Some may question the conclusion that cannabis has a low abuse potential since an animal model using squirrel monkeys was recently developed in which self-administration behavior was maintained using THC [111]. Interestingly, and consistent with the notion that the cannabinoid system is a biological homeostatic harm reduction mechanism, the self-administration of THC ranges from 2 to 8 ug/kg and peaks at 4 ug/kg [112]. Thus, in this animal model a controlled dose is chosen. To further put these

experiments in perspective, the dose used must be examined more closely. A 1-gram joint of 10% THC content would contain 100 mg of THC. The self-administered dose schedule chosen by the animal of 4 ug/kg would correspond to 360 ug of THC (approximately 1/278 of the joint) for a 200-pound human. Similarly, in rats, the intravenous self-administration of the synthetic cannabinoid Win 55,212-2 also occurred in a biphasic manner, with a maximum response occurring at 12 ug/kg.[113] The self-regulated, controlled use of low drug doses is not characteristic of addictive drugs of abuse.

Additional cannabinoid involvement in reward behavior is suggested by the increased activity of dopaminergic neurons stimulated with psychoactive cannabinoids [114]. This pathway is shared by other major drugs of abuse including, morphine, ethanol, and nicotine [115]. However, the production of glucocorticoid hormones that are normally produced in response to stress [116], are suppressed by cannabinoids [117]. Are cannabinoids addictive, is pleasure addictive, or is a low stress state addictive?

Cannabinoids and Stress

Stress and reward are complicated components of addictive behavior. How does repeated use of THC influence these states? A recent study examines this question by measuring glucose utilization in different areas of the rat brain following repeated treatment with THC [118]. After 7 and 21 days of THC treatment, THC no longer resulted in reduced glucose utilization in many areas of the brain typically affected by a single THC dose (most cortical, thalamic, and basal ganglia regions). In contrast, glucose utilization in other areas of the brain remained unaltered (nucleus accumbens, mediodorsal thalamus, basolateral amygdala, portions of the hippocampus and median raphe). Thus while the effects of THC on body temperature and locomotor activity become resistant to repeated THC administration, those areas involved in many higher brain functions remain responsive to THC. This differential adaptation to THC administration is consistent with a low addictive potential. The best evidence that demonstrates the absence of an addictive response to cannabis use is the fact that most people who use it do not continue to use it, and stop using it without any effort.

The stress-relieving properties of cannabinoids are an important aspect of their pharmacological activity. An interesting mechanism by which cannabinoids may promote stress relief is through their effects on memory. Cannabinoids control the extinction of painful memories [119]. What a blessing for those suffering from debilitating or life threatening illnesses: cannabinoids may help them to forget their misfortune.

Independent of the direct addictive or non-addictive properties of cannabis, the cannabis-opioid connection will be examined in more detail. Both drug families function (not necessarily exclusively) through biochemical pathways that are regulated by specific receptor-ligand interactions. However, there appears to be, as yet not fully defined, crosstalk between these pathways [120]. For example, CB1 receptor knockout mice are non-responsive to CB1 cannabinoid activities and show reduced addictive effects of opiates [121]. Similarly, Lewis rats showed enhanced sensitivity to morphine self-administration after treatment with the synthetic cannabinoid CP55040 [122]. Examining the cannabis-opioid connection from the other direction, chronic morphine administration

results in some down-regulation of cannabinoid receptors along with a significant reduction in 2AG [123]. These results show both positive and negative feedback relationships between the endocannabinoid and opiate systems. They also suggest that cannabinoids might serve to reduce the symptoms of opiate withdrawal [124].

The possibility that cannabinoids could serve as an addiction interrupter was demonstrated in rats where the synthetic cannabinoid agonist Win 55-212,2 reduced intravenous self-administration of cocaine [125]. Similarly, recent studies indicate that THC may facilitate nicotine withdrawal in mice [126] and inhibit alcohol preference in a model of alcoholism [127]. The opposite indications, that blocking cannabinoids receptors could serve as an addition interrupter has also been made [128].

Behavioral Complexity

Behavioral processes and their complexities set humans apart from other animals. Can we simply extrapolate from animal to human behavior? It is one thing to comparatively examine the molecular and cell biology of animals and extrapolate to humans. However, the behavioral repertoire of humans appears to be dramatically enhanced over other animals and is therefore more difficult to connect between the species. Evolutionary relationships show that the cannabinoid receptors are located in the more advanced areas of our brains. Again, any population is always a spread around the average value of any parameter. A subset of the human population will inevitably retain a more primitive behavioral repertoire. Is this subset more susceptible to addictive behavior or psychological problems that could result from cannabis consumption? Has the cannabinoid system been optimized for the regulation of more primitive behavior or, alternatively, is it better optimized for the behavioral flexibility required of modern humans? Indeed, is there any evidence that the cannabinoid system, like our cortical capacity, may enable even greater behavioral flexibility in the more complex societies and altered environments of the future?

Answers to these questions are suggested by the data of human cannabis consumption. Most people who use cannabis in their youth stop using it as their lives progress. Most do so as a natural part of their development. They do so without outside intervention or help. They do so without ever having become heroin users, schizophrenic, or motivationally compromised. These facts indicate that for the majority of people who try marijuana, it is not addictive, does not lead to heroin use, nor is it a trigger for the onset of psychological problems. However, due to the complexity of cannabinoid activities, it is likely that in a small percentage of the population, cannabis use may foster problems. The biology presented in this paper suggests that such individual differences should be expected. We must learn to identify individuals who would be negatively affected by cannabis use; they are the people that an intelligent drug policy would help to identify and assist. In contrast, our policy criminalizes the majority of users and further harms them, perhaps psychologically as well as medically, through its repercussions.

The use of cannabis—and any mind-altering drug—by young developing minds rightfully remains an area of focus and concern. For example, is there a relationship between cannabis use and schizophrenia? Schizophrenia is characterized by distortions of

reality, disturbances of language and thought processes, and social withdrawal. Certainly, aspects of cannabis intoxication parallel these symptoms. It is feared that cannabis can precipitate this state [129], especially in susceptible individuals [130]. It has been suggested that schizophrenics (or potential schizophrenics) fall into two categories with respect to cannabis use [131]. One group may find symptomatic relief in the use of cannabis, while the other may actually take the risk of inducing the onset of the disease. The complexities of this issue are illuminated by the unpredictable behavior of interacting complex systems such as the nervous and immune systems, as will be considered below.

In an important recent study, De Marchi et al [132], examined the endocannabinoid levels in healthy volunteers and compared them to that of schizophrenic patients, both before and after successful antipsychotic treatment. Patients suffering with acute disease had significantly higher anandamide levels in their blood than did the normal individuals or patients in clinical remission. Might these elevated cannabinoid levels be contributing to the disease symptoms, and what might be causing them? Cannabinoids act homeostatically across biological subsystems. A possible immune involvement in schizophrenia has long been suspected, and immunological parameters have been implicated in the disease. For example, there is an inverse correlation between schizophrenia and rheumatoid arthritis; an individual generally does not get both illnesses [133]. Interestingly, schizophrenia has been correlated with HLA type, *Toxoplasma gonodii* infection, and exposure to cats [133]. *Toxoplasma gonodii* infects brain neurons, and is best controlled with a strong pro-inflammatory immune response. Endocannabinoids modulate the pro-inflammatory TH1 response by up-regulating the anti-inflammatory Th2 response. Hence, it is likely that some individuals idiosyncratically respond to *Toxoplasma gonodii* infections by producing excess endocannabinoids and suffering the associated abnormal mental state. Antipsychotic drugs have actually improved the outcome of infection with this parasite[134].

Conclusions

Evolution has selected the endocannabinoids to homeostatically regulate numerous biological phenomena that can be found in every organized system in the body, and to counteract biochemical imbalances that are characteristic of numerous damaged or diseased states, in particular those associated with aging. Starting from birth, cannabinoids are present in mother's milk [135], where they initiate the eating process. If the activity of endocannabinoids in the mouse milk is inhibited with a cannabinoid antagonist, the newborn mice die of starvation. As life proceeds, endocannabinoids continuously regulate appetite, body temperature, reproductive activity, and learning capacity. When a body is physically damaged, the endocannabinoids are called on to reduce inflammation, protect neurons [136], regulate cardiac rhythms [137] and protect the heart form oxygen deprivation [20]. In humans suffering from colorectal cancer, endocannabinoid levels are elevated in an effort to control the cancer [74]. They help relieve emotional suffering by reducing pain and facilitating movement beyond the fears of unpleasant memories [119].

While this review is far from complete, it attempts to provide a conceptual overview that supports the endocannabinoid system as being nature's method of harm reduction. There

is a pattern to all the cannabinoid-mediated activities described. Many of the biochemical imbalances that cannabinoids protect against are associated with aging. Aging itself is a system-wide movement towards chemical equilibrium (away from the highly regulated far-from-equilibrium state) and as such is an imbalance from which all living organisms suffer. In contrast, the harmful consequences of cannabis use, however exaggerated they often appear to be, are likely to represent significant potential risk for a minority of the population for whom reduced cannabinoid levels might promote mental stability, fertility or more regulated food consumption.

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STATEMENT REGARDING ALASKA SB 74 AND HB 96

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I am an Associate Professor in the Biomedical Program and the Department of Biological Sciences at the University of Alaska Anchorage. I have been the chair of the Nervous System course in the medical school curriculum of the WWAMI Program at UAA since 1992, with an affiliate appointment in the Department of Biological Structure at the University of Washington School of Medicine. I mention my University affiliations only to establish my credentials; my statements are not intended to represent the official positions of the University of Alaska or the University of Washington, their administrations, or their boards of regents.

Although I have not personally conducted research on the health effects of marijuana use, I am well acquainted with the current literature on this topic. More importantly, I do have first-hand experience in the process of scientific peer review, and I understand of how consensus is established among biomedical researchers.

It is important to remember that science is a continuously adjusting and self-correcting process. Therefore, the most recent consensus on any question reflects not only the most recent data, but it also incorporates all prior research and earlier consensus positions. My point is that the most recent reviews are generally the best, what may be called "state-of-the-art". The vast majority of evidence cited in support of SB 74 are older, preliminary studies, which have not been confirmed by other researchers. It ignores entire bodies of research showing little or no harm from marijuana. It is not good science.

One of the courses we teach to medical students in the University of Washington and the Alaska WWAMI program is about how to critically read and evaluate the medical literature. Besides emphasizing the most recent data, we emphasize that different sorts of papers carry different weight. A well-designed review of many experimental studies is more valuable than any single experimental study alone. When you look at the information cited in support of SB 74, it turns out that those papers are predominantly not review articles. My 1st-year medical students would easily be able to find their way to the latest, thoroughly reviewed literature on marijuana's health effects, such as the article by Dr. Iversen in the February 2005 issue of Current Opinions in Pharmacology that we have included in the written testimony for this hearing.

In the hierarchy of scientific consensus, the most authoritative conclusions are usually those from expert panels and commissions, since they conduct the most extensive review. A number of independent commissions, both in this country and abroad, have investigated the effects of marijuana. We don't have time today to discuss all of them, but one of the best known is the 1972 National Commission on Marijuana and Drug Abuse, appointed by President Richard Nixon. After reviewing the scientific evidence, they were "of the unanimous opinion that marijuana is not such a grave problem that individuals who smoke marijuana, and possess it for

that the drug effects of marijuana are causally linked to the subsequent abuse of other illicit drugs." What the gateway theory presents as a causal explanation is a statistical association between common and uncommon drugs. People who have used less common drugs, such as heroin, cocaine and LSD, are likely to have also used marijuana. Most marijuana users never use any other illegal drug. Indeed, for the large majority of people, marijuana is a *terminus* rather than a gateway drug (Zimmer & Morgan, 2002, p. 32).

"(5) a high percentage of adults arrested in this state for domestic violence test positive for marijuana at the time of arrest;"

This would be a meaningful statement only if the percentage of people arrested for domestic violence who test positive for marijuana metabolites were significantly higher than the percentage of people in the general population who would test positive. Another meaningful comparison might be between domestic violence arrestees and people arrested for other types of offenses. But in the absence of any appropriate comparison, this statement conveys essentially no information. To suggest that marijuana use causes violence is completely contradicted by a large body of research, addressed in more detail by Dr. Earleywine in his testimony. Almost all human and animal studies show that marijuana *decreases* rather than *increases* aggression.

"(6) marijuana use by children is associated with an increased risk of attempting suicide;

(7) marijuana consists of over four hundred different chemicals and can affect almost every organ and system in the body, including the lymph system, the heart, and the lungs; marijuana can disrupt memory, attention, judgment, and other cognitive functions and can impair motor coordination, time perception, and balance, especially in children;"

I believe that other witnesses are speaking specifically to these points, so I would simply like to remind the Committee to pay careful attention to any statement such as Finding #6, that marijuana use *is associated with* some particular harm. A statistical association is not, by itself, evidence that marijuana *caused* the harm. Only a longitudinal study that randomly assigns people to either smoke marijuana or not smoke it can produce evidence of causation. Obviously that has not been done, so we're forced to try and draw conclusions from retrospective association studies, which is much more difficult.

Finding #7 is an interesting example of the way the authors of this bill play fast and loose with the facts. The statement that "marijuana...can impair motor coordination, time perception, and balance, especially in children" sounds consistent with what we know about the short-term effects of marijuana in adults--but in fact, no study has ever been conducted in which children were given marijuana and tested for motor function, etc.! The reference to children can only have been added to the bill text in order to sensationalize.

"(8) marijuana smoke contains more carcinogenic hydrocarbons than tobacco smoke and a person who smokes several marijuana cigarettes a week may be taking in as many cancer-causing chemicals as someone who smokes a full pack of tobacco cigarettes every day;"

This assertion, that marijuana smoke contains approximately 20 times the concentration of carcinogenic hydrocarbons found in tobacco smoke, sounds like a gross exaggeration--the source

per cent of those admissions in the U.S. last year were ordered by judges, and the proportion of people entering treatment as a result of a court order has risen substantially. This reflects a sea-change in U.S. criminal justice. Since 1990, there has been an explosion in the number of U.S. "drug courts" which allow individuals charged with some drug offences to avoid jail if they follow a carefully supervised treatment program. At the same time, the idea of "therapeutic justice," as it is sometimes called, has been widely adopted by regular U.S. courts. As a result, Americans charged with marijuana possession today are routinely given a choice between punishment or treatment. Not surprisingly, most choose treatment. Add to this the numbers of high school students required to seek treatment as part of school disciplinary action and workers directed into treatment programs as a result of workplace drug testing, and the increase is readily accounted for. What must be emphasized is that in the vast majority of these cases, treatment occurs *without* there having been a clinical diagnosis of marijuana abuse.

Regarding the disproportionate number of treatment admissions among Alaska Natives, the foregoing should make it clear that it would be readily explained by a higher arrest rate for marijuana possession among Natives. Data by ethnicity are not available, but generally speaking, it appears that the rural arrest rate for marijuana is higher than that for the Anchorage census area. That in turn suggests a disproportionately higher marijuana arrest rate for Alaska Natives.

"(11) Alaska consistently ranks in the top 10 states, and occasionally in the top five states, nationwide, in the amount of marijuana illegally grown indoors, and large amounts of marijuana grown in this state are sold throughout the state and exported to other parts of the United States; the price of high-quality marijuana is hundreds of dollars per ounce and thousands of dollars per pound; testimony received by the legislature in 1999 and confirmed in 2005, shows that marijuana often sells for $500 or more per ounce;"

The most prominent effect of the prohibition of any popular commodity is inflated pricing. Interestingly, marijuana use has been found to be extremely unresponsive to price (Pacula et al., 2001). The elasticity of demand with respect to price was –0.06. That is, a 1% increase in price results in only a 0.06 percent decline in demand. Another way of saying this is that a 16.67% increase in price is required to reduce demand by just 1%. The most recent study available (DeSimone & Farrelly, 2003) found that "adult marijuana demand was not related to its own price" and that for juveniles, price was also irrelevant. This is further demonstration that increased criminal penalties are not an effective means of reducing consumption.

"(12) a large percentage of persons arrested in this state, including adults and juveniles who commit violent offenses, have marijuana in their system at the time of arrest;"

Exactly the same comments apply to this finding as to Finding #5: it would be a meaningful statement only if the percentage of people arrested for violent offences who test positive for marijuana metabolites were significantly higher than the percentage of people in the general population who would test positive. Furthermore, it contradicts the vast literature showing no association between marijuana use and aggression.

"(13) marijuana use by a parent has been, and will continue to be, a major contributing factor to children having easy access to and using marijuana;"

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STATEMENT REGARDING S.B, 74 AND H.B. 96

MITCH EARLEYWI E, PH.D., Associate Professor of Psychology, University of Southern California; author, *Understanding Marijuana* (Oxford University Press, 2002)

Like the language in S.B. 74 and H.B. 96, many media reports suggest that cannabis (marijuana) has increased in potency quite dramatically in recent years. These reports have generated considerable debate, and in fact the magnitude of the increase is difficult to document and is most likely greatly exaggerated. In addition, the assumption -- clearly implied in the bills' findings -- that increased marijuana potency translates into greater danger from the drug is untrue.

Reports of a stronger drug actually began over 30 years ago. By the middle of the 1980s, some authors suggested that marijuana's potency had increased by a factor of 100 (MacDonald, 1984). These claims clearly suffered from exaggeration or misinformation. Other arguments about increased potency arose from the University of Mississippi's Potency Monitoring Project, a program that reports the average THC content of cannabis taken in drug arrests. Estimates were extremely low in the 1970s, sometimes below 1%. But these figures are inherently suspect, because cannabis with this little THC has no impact on subjective experience -- that is, it does not produce a "high." The idea that a drug with no effects would increase dramatically in popularity over the years, as marijuana clearly did during the 1960s and 1970s, makes little sense. Thus, these estimates from the 1970s were probably inaccurate reflections of the amount of THC in marijuana available at the time.

Investigators hypothesize that the data from the Potency Monitoring Project underestimate the true amount of THC in marijuana from the 1970s. First, the estimates were based on very few samples of seized cannabis. In some years there were no more than 50 samples to analyze (PMP, 1974-1996). In addition, police may have stored the marijuana in hot lockers that allowed the THC to degrade rapidly (Mikuriya & Aldrich, 1988). Despite the small samples and poor storage, the average THC content in 1976 was 2% (ElSohly, Holley, & Turner, 1984).

An alternative source of potency information, an independent laboratory in California, analyzed many more samples than the Potency Monitoring Project. This laboratory found a large range in THC concentration. In 1973 this laboratory tested over 100 samples and found that marijuana had an average of THC content of 1.6 % (Ratcliffe, 1974). Later analyses ranged up to almost 8% THC (Perry, 1977). Thus, the idea that all, or even most, cannabis of the 1970s had less than 1% THC seems unlikely. Ratcliffe's (1974) estimate of an average potency level of 1.6% may be conservative but credible; the 1976 estimate of 2% may be closer to the truth. And clearly, marijuana much stronger than 2% was available in the mid-1970s

Potency data from the 1980s through the middle of the 1990s suggest that THC content continued to vary dramatically from strain to strain and sample to sample. With improved storage techniques and much larger samples, the Potency Monitoring Project found THC concentrations varied from 2% to almost 4%. Average concentrations approached 4% THC in 1984, 1988, 1990, and 1991 (PMP, 1974-1994). Trends in the rest of the 1990s showed comparable THC content, with a peak around 4.5% THC in 1997. Other cannabinoids like cannabinol and cannabidiol have not increased in

concentration over the years (ElSohly, et al., 2000). Thus, claims of 1000% (Cohen, 1986) or 10,000% (MacDonald, 1984) increases in marijuana potency are clearly inaccurate. A threefold elevation from approximately 1.5% in the early 1970s to 4.5% in the late 1990s may be closer to the truth. A simple doubling from an average of 2% to an average of 4% also seems the most plausible.

Although many media reports warn that increased potency translates into greater danger, scientific data suggest otherwise. Recent alarms about increased mentions of marijuana in emergency rooms have received a great deal of attention, with many authors positing that stronger cannabis has created more emergency room visits. In fact, the data that allegedly support these allegations are extremely questionable. Emergency rooms have no estimates of the strength of the cannabis used by those who appear for treatment. The purported increase in reports of cannabis use in emergency rooms likely stem from improved assessments by emergency room personnel or a gradual decrease in the stigma associated with use of the plant, not from ill-effects caused by marijuana use. Previous work suggests that emergency room assessments of drug use were wildly inaccurate (Roberts, 1996). Because marijuana appears incapable of causing fatal overdoses, it is implausible that the reported increase in ER "mentions" of marijuana is due to life- or health-threatening reactions caused by cannabis.

Marijuana with greater amounts of THC is probably less hazardous than weaker cannabis. First of all, acute administration of the drug is essentially non-toxic. No one has ever died from THC poisoning. Smoking enough cannabis to ingest a lethal amount of THC may be physically impossible. Estimates of a fatal dose of any drug arise from some rather gruesome animal research. Different groups of animals receive large amounts of a

drug until a particular dosage kills 50% of them. Researchers refer to the dose that is lethal for 50% of the animals as the LD 50. Investigators then extrapolate from these data to estimate a lethal dose for humans. The LD 50 for THC is approximately 125 milligrams for every kilogram of body weight (Nahas, 1986). Thus, a 160 pound (approximately 73 kilogram) person would need 9,125 milligrams of THC to have a 50% chance of dying. A typical marijuana cigarette weighs one gram and contains roughly 20 milligrams of THC, suggesting that a lethal overdose would require smoking roughly 450 joints in a brief period . Furthermore, at least 50% of the THC is destroyed in the burning process or lost to sidestream smoke. Given this loss, 900 joints would be a more appropriate estimate of a fatal amount (Doweiko, 1999). The 900 joints would weigh roughly 2 pounds. Although experienced users tell many exaggerated tales about smoking large amounts of cannabis, this dosage exceeds 100 times the quantity typically consumed by the heaviest users.

Marijuana with larger percentages of THC actually has benefits. Stronger cannabis leads to smoking smaller amounts. Smoking smaller quantities could provide some protection against the health problems normally associated with inhaling smoke. Smokers may take smaller, shorter puffs when using more potent marijuana (Heishman, Stitzer, & Yingling, 1989). Smoking less may decrease the amount of tars and noxious gases inhaled, limiting the risk for mouth, throat, and lung damage (Matthias, et al., 1997). Obviously, avoiding smoke completely would eliminate these problems. Thus, eating or vaporizing cannabis products may have fewer negative consequences than smoking them.

For the reasons outlined above, I believe it is inappropriate to base penalties for marijuana-related offenses on purported dangers related to an increase in cannabis potency.

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STATE OF ALASKA, SENATE BILL No 74 "An Act making findings relating to marijuana use and possession;"

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Statement:

It is an honor and privilege to address the Alaskan State Senate about an issue that affects a large number of Alaskans and their families. Our purpose is to assess risks of marijuana use and ask if increased penalties are warranted based on these risks. First, I would like to introduce myself and testify to my expertise in the area of drug abuse and marijuana. I am a life-long Alaskan. I moved to Alaska with my family in 1976. I am an alumna of West Valley High School and UAF. I left Alaska in 1981 for graduate and post-doctoral training. I returned to Alaska in 1990 and have since been employed at UAF where I am currently an Associate Professor in the Department of Chemistry and Biochemistry. I have devoted my life to the study of the brain and how drugs and naturally occurring drug-like chemicals affect the brain. After receiving a Bachelor of Science degree in psychology at UAF, I did graduate work at Mount Sinai School of Medicine in New York, NY, and at Albany Medical College in Albany, New York. My Ph.D. training and research was in neuropharmacology. Pharmacology is the study of the theory and principles of drug action. Neuropharmacology is the study of the theory and principles of drug action on the brain. I was trained by Dr. Stanley Glick, an established neuropharmacologist who has studied drug addiction and abuse and pharmacotherapies for drug addiction for more than 4 decades. My Ph.D. thesis showed how learning is involved in drug addiction. Learned, drug seeking behavior, is now recognized as a primary target for treatment of addictions. I received three years of post-doctoral training at the Karolinska Institute in Stockholm, Sweden in the laboratory of Dr. Urban Ungerstedt, another preeminent neuropharmacologist who pioneered our understanding of dopamine, a neurotransmitter now known to lie at the heart of addiction, motivation and reward. I have published 33 peer reviewed papers and 5 book chapters regarding addiction and aspects of drugs and the brain. I was a leader in establishing a neuroscience program at UAF funded in 2000 by a $7.5 million grant from the National Institutes of Health. Most recently I am recognized as an expert on neuroprotection and neuroplasticity in hibernation, a phenomenon my laboratory studies as a model of tolerance to stroke and neurodegenerative disease such as Alzheimer's and Parkinson's disease. Here I comment on findings purported by the legislature to suggest that

marijuana poses a threat to the public health that justifies prohibiting its use and possession in the state of Alaska, even by adults in private.

Legislative findings and witness s responses:

The legislature finds that:
(1) marijuana has been for many years and continues to be the most commonly used illegal controlled substance in the United States;

Estimates of the number of Alaskans who use marijuana emphasizes the numbers of Alaskans who will be affected by this legislation. In addition to users of marijuana, their families are affected by legal and health related consequences of marijuana use and highlights the importance of rational and informed discussion of these risks.

(2) marijuana has many adverse health and social effects, and there is evidence that it has addictive properties similar to heroin and other similar illegal controlled substances;

Addiction, operationally defined as drug-seeking behavior, is a combined effect of drug reward and drug withdrawal. Reward, as well as desire to reduce unpleasant symptoms of withdrawal, increases frequency of drug seeking behavior. Human epidemiological data (i.e., statistical analysis of patterns of use) as well as animal data rank addictive properties of marijuana below tobacco, alcohol, cocaine and heroin. Regarding human use, evidence suggests that as few as 10% of individuals who experiment with marijuana become daily users (cf. McRae et al., 2003), and others (Anthony et al., 1994) report that dependence among users is highest for tobacco, followed by heroin, alcohol, cocaine and finally cannabis.

Drug	*Dependence among users (%)*	
	Male	Female
Tobacco	33	31
Heroin	22	25
Alcohol	21	9
Cocaine	18	15
Cannabis	12	5

* Dependence is defined by DSM-III criteria, evaluated via a modified Composite International Diagnostic Interview. Adapted from Anthony et al., (1994).

Laboratory animal data is consistent with low addictive potential of cannabis where positive-reinforcing and dependence-producing actions of THC, the active ingredient in marijuana, have been difficult to demonstrate (reviewed by Tanda and Goldberg, 2003). Three standard techniques, known as conditioned place preference, intracranial self-stimulation, and self-administration, are used to assess addictive potential. All three of these techniques have failed to show consistent, positive reinforcing effects of THC. While Tanda and Goldberg (2003) argue that 3 decades of negative findings regarding abuse potential of marijuana are due to suboptimal conditions

of drug preparation and rates of intravenous administration, other drugs of abuse have not been difficult to optimize for animal studies.

The low addictive potential of cannabis may be due, in part, to the fact that abstinence seldom produces pronounced signs of withdrawal (Anthony et al., 1994; Tanda and Goldberg, 2003). THC is stored in fat tissue, due to its high fat solubility and then slowly released. This slow release likely prevents development of a pronounced withdrawal syndrome when cannabis use is abruptly stopped (Grotenhermen, 2003). Overall, given the difficulty in training animals to self-administer THC and the absence of pronounced withdrawal symptoms, the suggestion that marijuana has addictive properties similar to heroin and other illegal substances is not warranted.

Anthony et al, 1994, Experimental and Clinical Psychopharmacology, 2(3), 244-268.
Grotenhermen, 2003, Drug Disposition, 42(4), 327-360.
McRae et al., 2003, Journal of Substance Abuse Treatment, 24, 369-376.
Tanda and Goldberg, 2003, Psychopharmacology, 169(2), 115-34.

(3) in addition to concerns about marijuana use generally, the legislature is particularly concerned with the rates of use of marijuana by young people and Alaska Natives, which exceed national averages; and,
(4) early exposure of children to marijuana increases the likelihood of lifelong health and social problems, and makes it much more likely that the person will go on to use more potent illegal controlled substances;

A model known as the "gateway theory" of adolescent drug use was first proposed by Kandel (1975). The gateway theory suggests that adolescents typically use tobacco or alcohol before progressing to illicit substances including marijuana. Later studies showed that cigarette or alcohol use predicts subsequent illicit drug use for females while alcohol use predicts progression to illicit drug use in males (reviewed in Helstrom et al., 2004). After cigarette and alcohol use, progression may continue to marijuana, though the cause of this progression is unknown. The simplest explanation for the observed progression is that access to and use of cannabis may reduce perceived barriers against the use of other illegal drugs and provide access to the illicit market of more addictive drugs of abuse such as heroin, cocaine and methamphetamine (Lynskey et al., 2003).

Kandel, 1975, Science, 190, 912-914
Lynskey et al., 2003, JAMA. 2003;289:427-433
Helstrom et al., 2004, Prevention Science,Vol 5(4), 267-277

(5) a high percentage of adults arrested in this state for domestic violence test positive for marijuana at the time of arrest;

To interpret the relationship between positive tests for marijuana and arrests for domestic violence one would need to know, first, what analytical tests were used and, second, if these individuals also tested positive for alcohol. Marijuana intoxication reduces incidence of violence (Hoaken and Stewart, 2003) so a causal relationship is unlikely. Marijuana persists in fatty tissues and consequently plasma where the half-life for elimination varies between 20 to 57 hours (Grotenhermen, 2003).

Grotenhermen, 2003, Drug Disposition, 42(4), 327-360.

Hoeken and Stewart, 2003, Addictive Behaviors, 28, 1533-1554.

(7) marijuana consists of over four hundred different chemicals and can affect almost every organ and system in the body, including the lymph system, the heart, and the lungs; marijuana can disrupt memory, attention, judgment, and other cognitive functions and can impair motor coordination, time perception, and balance, especially in children;

Marijuana contains a large number of chemicals because it consists of the leaves and flowers of plants. Plants are complex mixtures of chemicals. Tobacco, for example is equally as complex, however, nicotine is the primary active ingredient in tobacco. Similarly, delta-9-tetrahydrocannabinol (THC) is the primary active ingredient in marijuana. THC is a chemical that affects the body by interacting with receptors. Receptors are specialized docking sites on cells and drugs bind to these receptors. Receptors that recognize THC are called cannabinoid receptors. There are two types of cannabinoid receptors, CB1 and CB2. Marijuana or THC will have effects where ever these receptors are located. Distribution of these receptors in the brain explains why marijuana intoxication is associated with effects on memory and motor function. Recently, it was found that activation of cannabinoid receptors on immune cells (microglia) in the brain prevents Alzheimer's disease pathology (Ramirez et al., 2005). Activation of CB1 receptors is also known to have therapeutic potential in Parkinson's disease and stroke.

Two other chemicals found in marijuana are cannabinol and cannabidiol. These compounds have some properties similar to THC, but cause less psychoactive effects. These chemicals do, however, have beneficial effects because they, like THC, are antioxidants (Hampson et al., 2000). We consume complex mixtures of chemicals in the foods we eat everyday and sometimes worry that they may cause cancer or other adverse effects. Most evidence on marijuana, however, is pointing to positive effects. Like the complex mixture of chemicals in blueberries, red wine, and chocolate, the mixture of chemicals in marijuana may have beneficial effects on health. Research is focused on identifying the key beneficial components so that these may be isolated and developed as drugs. Most evidence suggests that THC, the ingredient that causes the high also causes positive effects elsewhere in the body through activation of CB1 receptors.

Ramirez et al., 2005, J. Neuroscience, 25(8), 1904-1913
Hampson et al., 2000, Ann N Y Acad Sci. 2000;899:274-82.

(8) marijuana smoke contains more carcinogenic hydrocarbons than tobacco smoke and a person who smokes several marijuana cigarettes a week may be taking in as many cancer-causing chemicals as someone who smokes a full pack of tobacco cigarettes every day;

The real health risks associated with chronic marijuana use may include chronic bronchitis, impaired lung function and increased risks of some types of cancers of the respiratory tract (Moore et al., 2005). Prohibition may be the greatest barrier in identifying these real health risks because prohibition interferes with accurate reporting of marijuana use.

Moore et al., 2005, J Gen Intern Med.,20(1), 33-7

(9) the potency of marijuana in the 1960s and 1970s was very low compared to the potency in 2005; the average amount of delta-9-tetrahydrocannabinol (THC), the main psychoactive ingredient, nationwide, was less than one percent in the 1960s and 1970s, but has increased steadily in the 1980s and especially the 1990s, and by 2003 was more than six times that level, at 6.4 percent; in addition, marijuana grown in this state is often more potent than national averages, and has been tested with THC levels of over 20 percent; marijuana of the potency generally available in 2005 is a strong hallucinogenic drug that can command hundreds of dollars per ounce on the illegal market; the increasing potency of marijuana corresponds to an increase in the number of persons seeking emergency medical care for marijuana-related incidents;

Increased potency does not mean that increased amounts are consumed. People (and animals) typically take less of a drug if the drug is more concentrated. This means that more potent marijuana will likely cause people to smoke less and this will decrease risk of respiratory complications. When research animals are enticed to self-administer THC (Justinova et al., 2003) the amount administered decreases as concentration is increased until animals stop taking the drug at all because the high concentrations produce unpleasant side-effects.

Justinova et al., 2003, Psychopharmacology, 169(2):135-40.

(11) Alaska consistently ranks in the top 10 states, and occasionally in the top five states, nationwide, in the amount of marijuana illegally grown indoors, and large amounts of marijuana grown in this state are sold throughout the state and exported to other parts of the United States; the price of high-quality marijuana is hundreds of dollars per ounce and thousands of dollars per pound; testimony received by the legislature in 1999 and confirmed in 2005, shows that marijuana often sells for $500 or more per ounce;

The cost of marijuana seems irrelevant to the public health risks unless high costs are driving users to crime to pay for marijuana. In contrast to heroin, cocaine and methamphetamine abusers, no evidence exists to suggest that a significant proportion of marijuana users resort to crime to pay for the drug. This is consistent with a low addictive potential of marijuana.

(12) a large percentage of persons arrested in this state, including adults and juveniles who commit violent offenses, have marijuana in their system at the time of arrest;

Marijuana intoxication is known to decrease violent behaviors (Hoeken and Stewart, 2003) suggesting that other drugs, most likely alcohol, are responsible (Parker, 2004).

Hoeken and Stewart, 2003, Addictive Behaviors, 28, 1533-1554.
Parker, 2004, J Psychoactive Drugs, Suppl 2,157-63.

(13) marijuana use by a parent has been, and will continue to be, a major contributing factor to children having easy access to and using marijuana;

Legal and financial hardships incurred by parents as a result of the penalties for possessing marijuana may cause substantially greater detriment to families than does the increased risk of marijuana use by children (Robertson et al., 1996).

Roberson et al., 1996, Br J Gen Pract., 46(412), 671-4.

Summary and Conclusions:

In summary, evidence does not support the assertion that marijuana poses a threat to the public health that justifies prohibiting its use and possession in this State, especially by adults in private. Issues regarding access to children warrant further investigation into the impact of access through illicit channels.

STATE OF ALASKA, SENATE BILL No 74 –"An Act making findings relating to the use and possession..."

EXPERT WITNESS STATEMENT:

PROFESSOR LESLIE LARS IVERSEN, PhD, FRS, University of Oxford, England

Professor Leslie Iversen. PhD, FRS Brief Curriculum Vitae:

Visiting Professor of Pharmacology, University of Oxford 1999-
Director of the Wolfson Centre for Research on Age Related diseases at Kings College London (1999-2004).
Director of the Neuroscience Research Centre for Merck & Co Inc in the UK (1983-1995)
Director of the Medical Research Council Neurochemical Pharmacology Unit in Cambridge, England (1970-1983)

Well known for his research on how drugs interact with chemical messengers in the nervous system and has published more than 300 scientific papers on this topic.
Fellow of the Royal Society of London, and Foreign Associate Member of the US National Academy of Sciences.

Acted as Scientific Advisor to the UK House of Lords Select Committee on Science & Technology review of Cannabis (1998-2000)
Author of "The Science of Marijuana" Oxford University Press, 2000
Member of the UK Government "Advisory Council on the Misuse of Drugs"
Member of the UK Royal College of Physicians Working Party on medicinal cannabis 2004-2005.

Statement:

As a scientist with expert knowledge of the medical and scientific literature on cannabis (marijuana) I feel that the statements in Senate Bill No 74 give an inaccurate picture of the scientific data about marijuana. I wish to make the following comments:

Increased potency of modern marijuana:

It is frequently stated that modern-day marijuana is 10-20-times more potent than that available in the 1960's or 1970's. But the available evidence does not support this conclusion. Scientists at the University of Mississippi Potency Monitoring project in the USA have been measuring the THC content of marijuana seizures since the 1970's. They have reported an increase of approximately 3-fold in the potency of herbal marijuana in the past 3 decades, and this is still by far the most widely used product. The European Monitoring Centre for Drugs and Drug Addiction published an overview of cannabis potency in Europe in July 2004, and reached similar

conclusions in Europe. Some samples originating from Cannabis plants grown under optimal conditions indoors may contain as much as 15-20% THC but these remain relatively rare and account for only a minority of marijuana use.

Addictive nature of marijuana:

It is recognized that some frequent heavy users of marijuana can become psychologically dependent on the drug, but few scientists would rate this in the same category of addictiveness as heroin, cocaine or amphetamines. Unlike heroin addiction, dependence on marijuana affects a minority of regular users (approximately 10%) and most dependent marijuana users are able to quit. I would rate marijuana as more similar to alcohol than to heroin in addictive potential.

Association of marijuana use with domestic violence:

This is an unusual allegation; in most instances intoxication with marijuana is not associated with violent aggressive behavior – although this may occur in rare examples. The abuse of alcohol is far more likely to be a cause of public and domestic violence.

Marijuana contains more than 400 different chemicals:

All plant derived foods or drugs contain complex mixtures of chemicals. Tomato juice, for example, contains more than 400 different chemicals – but this does not make it harmful. The leaves and flowers of the Cannabis plant (marijuana) contain more than 70 complex organic chemicals known as cannabinoids. But of these only one –delta-9-tetrahydrocannabinol (THC) - is capable of activating the cannabinoid receptor in human brain. The other cannabinoids have no known pharmacological activities and are generally regarded as harmless.

Marijuana impairs higher brain functions:

Marijuana temporarily impairs memory and other aspects of cognitive brain function, but this is no different from any other intoxicant drug – for example, alcohol. There is no evidence that marijuana use leads to significant long term damage to the brain.

Marijuana smoke is carcinogenic:

Marijuana smoke contains a similar mixture chemicals to that found in tobacco smoke, including some known carcinogens. Although a single marijuana joint delivers more tar to the lungs than a tobacco cigarette it is very difficult to see how someone smoking several marijuana joints a week could be thought to equate to a cigarette smoker consuming a full pack each day. The arithmetic simply does not add up. Furthermore, although there is a hypothetical risk of lung cancer from marijuana smoke, there is no evidence for such a relationship in fact.

Summary and Conclusions:

Marijuana contains an intoxicant drug (THC) that has modest dependence liability; the smoke can irritate the lungs and there is a potential risk, as yet unproven, of lung cancer. Nevertheless, I conclude that the medical risks associated the marijuana use do not equate to those of "harder" drugs such as heroin, cocaine or amphetamines. In my view marijuana is a relatively safe drug, and its use does less medical/social harm than alcohol or tobacco.

References:

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Iversen L (2003) Cannabis and the Brain, *Brain*, **126**: 1252-1260 .

Iversen L (2004) Long term effects of exposure to cannabis. *Current Opinion in Pharmacology*, **5**: 69-72

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Oxford
March 18th, 2005

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April 07, 2005

Testimony of Gregory T. Carter, MD

This document is provided in regards to Alaska State Senate Bill No. 74 and House Bill 96, which intend to re-criminalize marijuana. I wish to comment on a number of scientific inaccuracies in the "findings" section of these bills. I am a practicing physician and medical researcher, studying the medicinal uses of marijuana (cannabis). I have published and lectured in this area extensively. This is all documented in my curriculum vitae, which I have also made available.

The overall health consequences of recreational marijuana use -- even heavy, chronic use -- are fairly minor, particularly if one avoids smoking. This is something an increasing number of marijuana users are doing by use of relatively simple devices known as vaporizers. The addiction and dependence potential of marijuana is relatively low, much lower than tobacco and alcohol. According to an Institute of Medicine study in 1999, the addiction rate of marijuana is less than half that of alcohol and less than one-third that of tobacco. A proportion of regular users of cannabis will develop some tolerance. A number of studies have demonstrated that acute cannabis smoking produces minimal effects on complex cognitive task performance in experienced cannabis users.

Marijuana does not cause aggression or violent behavior but rather tends to reduce it. In contrast, alcohol is well documented to lead to aggression in some people. Statements in SB 74 legislation (section 2.5) such as, "A high percentage of adults arrested in this state for domestic violence test positive for marijuana..." are misleading and meaningless without a complete analysis of the dependent and independent variables involved in the episodes. To the degree that such statements are intended to imply that marijuana is a cause of violence, the research overwhelmingly suggests that such a conclusion is simply wrong. This is much akin to the early links purportedly found between coffee drinking and cancer, which later turned out to be spurious. They simply reflected the fact that many coffee drinkers also smoked tobacco.

Indeed marijuana is a complex plant, with several existing phenotypes, each containing over 400 chemicals. Approximately 70 are chemically unique and classified as plant cannabinoids. There are also naturally occurring cannabinoids produced in the human body and these are part of our natural physiology controlling mood, pain, and appetite, among other functions. Delta-9 tetrahydrocannabinol (THC) is the most powerful psychoactive ingredient in marijuana, and this is the active ingredient in

dronabinol (Marinol). The Food and Drug Administration (FDA) first licensed and approved dronabinol in 1986 for treatment of nausea and vomiting associated with chemotherapy. The indication was expanded in 1992 for the treatment of anorexia associated with weight loss in patients with AIDS wasting syndrome.

Dronabinol was initially made available by prescription as a schedule II drug, the most restrictive category of drugs that are legal for medical use under federal law. However, since there has never been a reported overdose or serious, life-threatening side effect, the United States Drug Enforcement Administration, in cooperation with the Food and Drug Administration, reclassified the scheduling status of dronabinol from a Schedule II (CII) to a Schedule III (CIII) controlled substance. Under this less-restrictive schedule, dronabinol prescriptions can now be phoned in, with multiple refills authorized on a single prescription. Dronabinol is 100% THC, the strongest ingredient in natural marijuana, and the Federal government licenses it with minimal prescribing restrictions. The strongest natural marijuana—which is only seen relatively rarely—would only contain 25-30% THC by weight. From a pharmacological perspective, marijuana is actually remarkably safe, with relatively low toxicity, notably lower than that of many legal medicinal and recreational drugs. Lethal doses in humans have never been described. The theoretical lethal dose in 50 percent (LD50) is estimated to be 1 to 20,000 or 1 to 40,000. In plain English, that means, it would require 1500 pounds of cannabis smoked in fifteen minutes to induce a lethal effect. In contrast, you can quite easily kill yourself with a bottle of extra-strength Tylenol or aspirin.

The claim that today's marijuana is so much stronger and more dangerous than it was in 1975 (made in section 2.9), implying that it is effectively a different drug, is scientifically preposterous. The same, ridiculous argument could be made regarding today's coffee, comparing a triple shot espresso drink of today with the Maxwell House of yesterday. The only difference between this example and marijuana is that one can overdose on caffeine and there are potentially serious health consequences of extreme caffeine intake, including cardiac arrhythmia, acute hypertension, and stroke. With marijuana, no such consequences have been documented.

Further, according to the Federal Government's own website (WhiteHousedrugpolicy.gov), which was last updated on October 16, 2004, the average potency of marijuana today stands at approximately 5 percent THC. Indeed, this figure is an increase over past years. THC content averaged 4 percent in the 1990s, and just under 3 percent for the 1980s. However, in terms of drug strength, this increase is nearly inconsequential. Marijuana poses no risk of fatal overdose, regardless of THC content, and studies indicate that recreational pot smokers readily distinguish between high and low potency marijuana and moderate their use accordingly just as an alcohol consumer would drink fewer ounces of (high potency) bourbon than they would ounces of (low potency) beer.

With regard to the increase in people allegedly in treatment for "marijuana abuse" (mentioned in section 2.10), this is reflective of the increase in marijuana arrests, as the majority of such admissions are court mandated. This is a sign of more aggressive law enforcement, not proof of addiction. Since 1995, approximately 5.5 million Americans have been arrested on marijuana charges. Nearly 90 percent of them were charged with possession only, and approximately one out of three were first-time, youthful (age 14 to 19 years old) offenders. Naturally, most judges are hesitant to sentence these defendants to jail or saddle them with a criminal record. Their only alternative is drug

treatment.

What is the end result of all this? Admissions to drug rehabilitation clinics among adolescent marijuana users have increased dramatically since the mid-1990s. However, this rise in marijuana admissions is due exclusively to a proportional increase in teens referred to drug treatment by the criminal justice system. In fact, since 1995, the proportion of admissions from all sources other than the criminal justice system has actually declined, according to the federal Drug and Alcohol Services Information System (DASIS). Consequently, DASIS reports that today, "over half (54 percent) of all adolescent marijuana admissions [are] through the criminal justice system," with an additional 25 percent coming from referrals from schools and substance abuse providers.

Although recent science has provided truly astounding evidence about cannabis and its relative dangers and benefits, government studies from around the world have affirmed this for over a century. As far back as 1894, The Indian Hemp Drugs Commission concluded, "the moderate use of hemp drugs is practically attended by no evil results at all." In 1925: The Panama Canal Zone Report concluded, "The influence of marijuana has apparently been greatly exaggerated. There is no evidence that it has any appreciably deleterious influence on the individual using it." In 1944 the LaGuardia Commission Report concluded "there is no direct relationship between the commission of crimes of violence and marijuana. Marihuana does not lead to morphine or cocaine or heroin addiction." In 1969, the British Wooten Report stated, "we think that the dangers of marijuana use as commonly accepted in the past have been overstated. There is no evidence that in Western society serious physical dangers are directly associated with the smoking of cannabis."

More recently, in 1970, the Canadian LeDain Commission Report found that "physical dependence to cannabis has not been demonstrated and it would appear that there are normally no adverse physiological affects occurring with abstinence from the drug, even in regular users." In 1972 the National Commission on Marihuana and Drug Abuse, also known as the Nixon Commission, concluded "there is little proven danger of physical or psychological harm from the experimental or intermittent use of natural preparations of cannabis. Moreover, existing social and legal policy is out of proportion to the individual and social harm engendered by the drug." In 1972, the Dutch Baan Commission found that "cannabis does not produce tolerance or physical dependence. The physiological effects of the use of cannabis are of a relatively harmless nature."

In 1977, the Commission of the Australian Government concluded, "one of the most striking facts is that its acute toxicity is low compared with that of any other drugs. No major health effects have manifested themselves in the community." In 1982, the National Academy of Sciences Report observed "over the past 40 years, marijuana has been accused of causing an array of antisocial effects including, provoking crime and violence, leading to heroin addiction, and destroying the American work ethic in young people. "These beliefs have not been substantiated by scientific evidence." In 1995, the report by the Dutch Government concluded, "cannabis is not very physically toxic. Everything that we now know leads to the conclusion that the risks of cannabis cannot be described as 'unacceptable.'" In 1999, the Institute of Medicine published a series of reports on marijuana, documenting it's low toxicity and high therapeutic potential.

Arguably marijuana is neither a miracle compound nor the answer to everyone's ills. Yet it is not a compound that deserves the tremendous legal and societal commotion

that has occurred over it. Over the past 30 years, the United States has spent billions in an effort to stem the use of illicit drugs, including marijuana, with limited success. Some very ill people have had to fight long court battles to defend themselves for the use of a compound that has helped them. There is no evidence that recreational marijuana use has increased in states that allow for its medicinal use. Moreover, prohibition strategies have never proven terribly effective at limiting the use of a substance for any reason, whether alcohol or other compounds. In my opinion, the medicinal marijuana user should never be considered a criminal in any state. Most major medical groups, including the Institute of Medicine, agree that marijuana is a compound with significant therapeutic potential. Over a decade ago the Drug Enforcement Administration (DEA) studied the medicinal properties of cannabis *[Re Marijuana Rescheduling Petition,* United States Department of Justice, Drug Enforcement Administration, Docket No. 86-22, 9/6/1988]. After considerable study, Administrative Law Judge Francis L. Young concluded that marijuana should be transferred to schedule II to make it available to doctors and patients, stating:

> "There are those who, in all sincerity, argue that the transfer of marijuana to Schedule II will *send a signal that marijuana is "OK"* generally for recreational use. This argument is specious. It presents no valid reason for refraining from taking an action required by law in light of the evidence . . . .The evidence in this record clearly shows that marijuana has been accepted as capable of relieving the distress of great numbers of very ill people, and doing so with safety under medical supervision. It would be unreasonable, arbitrary and capricious for DEA to continue to stand between those sufferers and the benefits of this substance in the light of the evidence in this record."

Judge Young's recommendation was ignored. Marijuana remains in schedule I. During the past thirty years, researchers, mostly funded by the federal government, have studied every conceivable way that marijuana might be harmful to individual users and society. They have found very little evidence of any major physiological, psychological or social harm that can be directly attributed to marijuana. Despite all this, over a decade later the DEA and the rest of the federal government persist in their policy of total prohibition.

The scientific process continues to evaluate the therapeutic effects of marijuana through ongoing research and assessment of available data, and the trend is clearly toward greater appreciation of marijuana's beneficial effects and relatively low toxicity. Our legal system should take a similar approach, using science and logic as the basis of policy making rather than political views and societal trends that are more reflective of a paranoia over perceived potential harmful effects of recreational marijuana use, which, in fact, are not substantiated by the medical literature.

While Alaska does have a medical marijuana law, my understanding is that patients have great difficulty obtaining their medicine, and some have already testified that they fear this legislation will make their already-difficult situation even worse. That alone should be reason to look upon this legislation with great skepticism.

Respectfully submitted.

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CURRICULUM VITAE

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EDUCATION:	1981	Bachelor of Science (B.S.), Honors, Physiology University of California, Davis
	1982	Master of Science (M.S.), Physiology University of California, Davis B.A. Horwitz, Ph.D., advisor
	1986	Doctor of Medicine (M.D.) Loyola University Chicago Stritch School of Medicine
INTERNSHIP:	1986-87	Internal Medicine University of California, Davis Medical Center
RESIDENCY:	1987-90	Physical Medicine and Rehabilitation University of California, Davis Medical Center
FELLOWSHIP:	1990-91	National Institute on Disability and Rehabilitation Research Neuromuscular Disease post-doctoral research fellow, W.M. Fowler, Jr., M.D., advisor
MEDICAL LICENSURE:	1987	California G060691
	1994	Washington MD00031534
BOARD STATUS:	1987	Diplomate, National Board of Medical Examiners Certificate 320604
	1991	Diplomate, American Board of Physical Medicine and Rehabilitation, Certificate 3481
	1992	Diplomate, American Board of Electrodiagnostic Medicine, Certificate 1562

ACADEMIC APPOINTMENTS:

1990-1994	Assistant Professor of Physical Medicine and Rehabilitation, University of California Davis, School of Medicine

1994-99	Clinical Assistant Professor of Rehabilitation Medicine, University of Washington, School of Medicine
1999-present	Clinical Associate Professor of Rehabilitation Medicine, University of Washington, School of Medicine
2003-present	Adjunct Associate Professor of Physical Medicine and Rehabilitation, University of California Davis, School of Medicine
2005-pending	Clinical Professor of Rehabilitation Medicine, University of Washington, School of Medicine (promotion submitted to Academic Senate by Department Chairman)

CURRENT ACTIVE HOSPITAL PRIVILEDGES:

Providence Hospital Centralia

Providence Saint Peter Hospital

University of Washington Hospitals (U.W. Medical Center, Harborview Medical Center, Fred Hutchinson)

Children's Hospital and Regional Medical Center

PROFESSIONAL EXPERIENCE:

1991-94	Medical Director, Outpatient Clinical Services and Muscular Dystrophy Association Clinics, Department of Physical Medicine and Rehabilitation, University of California, Davis Medical Center
1994-	Attending Physician, Department of Rehabilitation Medicine, University of Washington Medical Center, Seattle, WA
1994-	Medical Director, Physical Medicine and Rehabilitation Services, Providence Centralia Hospital, Centralia, WA
1995-2000	Co-Director, Muscular Dystrophy Association Clinics at: Providence St. Peters Hospital, Olympia, WA, and Mary Bridge Childrens Hospital, Tacoma, WA.
1999-	Regional Medical Director, Physical Medicine and Rehabilitation Services, Providence Health System, Southwest Washington Service Area
2000-	Director, Adult and Pediatric Muscular Dystrophy Association Neuromuscular Disease Clinics at Mary Bridge Childrens Hospital, Tacoma, WA and Providence St. Peters Hospital, Olympia, WA.
2000	Medical Director, Hospice Program, Providence Sound Home Care, Lewis County
2001	Medical Consultant for Quality Assurance, Electrodiagnostic Medicine, Washington State Department of Labor and Industries

2002	Co-Director, Muscular Dystrophy Association-Amyotrophic Lateral Sclerosis Center, University of Washington
2003	Medical Consultant for Quality Assurance, Physical Medicine and Rehabilitation, Washington State Department of Labor and Industries
2004	Chair, Quality Improvement Council, Providence Centralia Hospital
2004	President elect, Medical Staff, Providence Centralia Hospital
2004	Medical Consultant/Peer Reviewer for Board of Medical Quality Assurance, State of Washington

PROFESSIONAL MEMBERSHIPS:

Fellow, American Academy of Physical Medicine and Rehabilitation

Fellow, American Association of Electrodiagnostic Medicine

Diplomate, Association of Academic Physiatrists

Washington Physicians for Social Responsibility

POST GRADUATE MINI-FELLOWSHIPS

1995	MayDay Fellowship, University of Washington, School of Medicine, Multidisciplinary Pain Center, John Loeser, M.D., advisor
1999	Hartford Foundation Geriatric Medicine Fellowship, University of Washington, School of Medicine, Department of Internal Medicine, Division of Gerontology and Geriatric Medicine, Itamar Abrass, M.D., advisor

HONORS/AWARDS:

1980-81	University of California President's Undergraduate Fellowship (awarded twice)
1981	Graduation with Honors, University of California, Davis
1981	University of California, Davis, Departmental Citation for Outstanding Undergraduate Accomplishment
1991	Citation Award for Outstanding Contributions to the Sacramento Area Special Olympics
1994	Best Research Paper Published by a Physiatrist Award from the American Academy of Physical Medicine and Rehabilitation/Education and Research Foundation: **Carter GT**, Kikuchi N, Abresch RT, Walsh SA, Horasek S, Fowler WM: Effects of exhaustive concentric and eccentric exercise on murine skeletal muscle. *Arch Phys Med Rehabil* 1994; vol. 75, no. 5:555-559.

1995	National Catholic Education Association Distinguished Graduate Award
1998	Excellence in Research Writing Award, Association of Academic Physiatrists: Wineinger MA. Abresch RT, Walsh SA, **Carter GT**: Effects of aging and voluntary exercise on the function of dystrophic muscle from mdx mice. *Am J Phys Med Rehabil* 1998; 77(1):20-7.
2001-	*Best Doctors*, listing, elected by peers; www.bestdoctors.com
2002	Excellence in Clinical Care Award, Muscular Dystrophy Association
2003-	Listing in "Guide to America's Top Physicians"; Consumers' Research Council of America; www.consumersresearchcncl.org
2005	AcademicKeys Who's Who in Medical Sciences Eduction: http://medicine.academickeys.com/whoswho.php

PROFESSIONAL/ACADEMIC ACTIVITIES

1991-94	Qualified Medical Examiner, Worker's Compensation Fund, State of California
1992-	*Ad Hoc* Referee, *Muscle & Nerve, Archives of Physical Medicine and Rehabilitation, American Journal of Physical Medicine and Rehabilitation*
1992-	Advisory Board, Charcot-Marie-Tooth International
1994-	Ethics Committee, Providence Centralia Hospital
1996-	Approved Medical Examiner, Department of Labor & Industries, State of Washington
1995-6	Rehabilitation Technical Advisory Committee/Governor's Trauma Steering Committee, State of Washington
1996-98	Editor-in-Chief, *Journal of Neurovascular Disease*
1997-99	Executive Board, Lewis County Children with Special Needs, Inc.
1998	Guest Editor, *Physical Medicine and Rehabilitation Clinics of North America* volume on Rehabilitation of Neuromuscular Disorders. Philadelphia, W.B. Saunders Co., 1998.
1998-99	Editorial Board, EMG On-line Case of the Month Series, American Academy of Physical Medicine and Rehabilitation, www.aapmr.org
1998-	Participating Respondent, Muscular Dystrophy Association "Ask the Experts" on-line forum, www.mdausa.org
1998-	Co-Chair, Ethics Committee, Providence Centralia Hospital
1998-	Ethics Committee, Providence St Peter Hospital, Olympia, WA
1999-	Editorial Board, *The American Journal of Hospice and Palliative Care*

1999-	Chairman, Pharmacy and Therapeutics/Infection Control Committee, Providence Centralia Hospital
1999-	Medical Advisory Board, Muscular Dystrophy Association, Southwest Washington
2000	Guest Editor, *Physical Medicine and Rehabilitation Clinics of North America* volume on Advances in the Diagnosis and Management of Peripheral Nerve Disease. Philadelphia, W.B. Saunders Co., (print date Feb 2001).
2001	Practice Parameter Joint Committee, American Academy of Neurology and the American Academy of Physical Medicine and Rehabilitation, "Approach to the Diagnosis of Polyneuropathy in the Clinic"
2002	Clinical Services Advisory Committee, Muscular Dystrophy Association, National Office, Tucson, AZ
2002	Faculty, Dannemiller Memorial Education Foundation (by invitation)
2002	Practice Guidelines Committee, American Academy of Physical Medicine and Rehabilitation (by invitation of Dr. Dan Dumitru, President of AAPM&R)
2002	Neuromuscular Guidelines Steering Committee, Joint Committee, American Academy of Neurology and the American Academy of Physical Medicine and Rehabilitation
2002	Neuromuscular Disease Self Assessment Examination Subcommittee, American Academy of Physical Medicine and Rehabilitation
2003	Board Examiner, by invitation, American Board of Physical Medicine and Rehabilitation
2004-	Editorial Board, *The Journal of Clinical Neuromuscular Disease*

GRANTS/CLINICAL TRIALS:

1990-91 National Institute on Disability and Rehabilitation Research Training Grant #G0087C2005 (post-doctoral fellowship)

1990-93 Project Director, National Institute on Disability and Rehabilitation Research Training Center Grant #H133B80016-03

1993-94 Director of Research and Co-Director, National Institute on Disability and Rehabilitation Research Training Center Grant #H133B30026.

1996-Program Evaluation Subcommittee/Advisory Committee, National Institute on Disability and Rehabilitation Research Training Center Grant #H133B30026.

1997-Charcot Marie Tooth Research Fund, Providence Healthcare Foundation

1998-Principal Investigator, National Institute on Disability and Rehabilitation Research Training Center Grant #HB133B980008: Pain in Neuromuscular Disease: Incidence, Severity and Relationship to Physical Impairment and Disability; funding 10/01/98 -

10/01/2003.

1998-Program Evaluation Subcommittee/Advisory Committee, National Institute on Disability and Rehabilitation Research Training Center Grant #H133B980008.

2002-Co-investigator (Mark Jensen, Ph.D., principal investigator), National Institutes of Health Program Project Grant 2P01HD33988-06A1; Relationship Between Pain and Disability in Neuromuscular Disease

2003-Principal Investigator, Endo Pharmaceuticals, Protocol EN3220-010: LidodermLabel Testing Trial

2003-Principal Investigator, National Institute on Disability and Rehabilitation Research Training Center Grant # H133B03118: Promotion of Health and Wellness Through Community Recreation and Exercise: Impact of Impairment, Pain, Self-efficacy, and Envornomental Barriers in Neuromuscular Disease; funding approved 10/01/03 - 10/01/2008.

2003-Principal Investigator, Genzyme sponsored trial for alpha-glucosidase replacement in children and adults with Acid Maltase Deficiency (Pompe's disease)

2003-Co-principal investigator, Prednisone trials in Duchenne Muscular Dystrophy, through the Cooperative International Neuromuscular Research Group (CINRG)

NATIONAL PRESENTATIONS:

1994	Co-Chairperson and Course Faculty, "Natural History Profiles of Neuromuscular Diseases", presented at the American Academy of Physical Medicine and Rehabilitation Annual Meeting, Los Angeles, CA
1996	Course Faculty, "Palliative and Rehabilitative Strategies in ALS", University of Texas, Health Sciences Center, San Antonio
1996	Chairperson and Course Faculty, "Update on Motor Neuron Disorders"; by invitation; American Association of Electrodiagnostic Medicine annual meeting
1998	Moderator and Course Faculty: "STIR MRI: Usefulness Compared to Electromyography as a Diagnostic Tool for Neuromuscular Disorders", presented at the American Academy of Physical Medicine and Rehabilitation Annual Meeting
2001	"Adaptations to Exercise in Animal Models of Neuromuscular Disease"; by invitation; Consensus Conference on Muscle Physiology; San Diego, CA
2001	"Magnetic Resonance Spectroscopy in Metabolic Myopathies"; by invitation; American Association of Electrodiagnostic Medicine, Albuquerque, NM
2001	Plenary Session faculty, by invitation, "Magnetic Resonance Imaging: Anatomic and Physiologic Aspects of Muscle Evaluation";, American Association of Electrodiagnostic Medicine, Albuquerque, NM

2002	Dannemiller Memorial Education Foundation invited faculty; Seminars on Painful Neuropathies: Diagnostic Approach, Pathophysiology,and Treatment, Seattle, WA and Dallas, TX
2003	Chairperson and Course Faculty, by invitation, "The Role of Exercise in Neuromuscular Diseases", presented at the American Academy of Physical Medicine and Rehabilitation Annual Meeting, Chicago, IL
2003	Grand Rounds, by invitation, "Adaptations to Exercise in Animal Models of Neuromuscular Disease"; Loyola University Medical Center, Department of Orthopedics and Rehabilitation; Chicago, IL
2004	"Chronic Pain in Persons with Neuromuscular Disease"; joint scientific meeting of the American Pain Society and the Canadian Pain Society. Vancouver, British Columbia, Canada
2004	Course faculty, by invitation, "Rehabilitation Management of Peripheral Neuropathy", presented at the American Academy of Neurology Annual Meeting, San Francisco, CA
2004	Course faculty, by invitation "Rehabilitation Management of Peripheral Neuropathy"; presented at the American Academy of Physical Medicine and Rehabilitation Annual Meeting, Phoenix, AZ
2005	Course faculty, by invitation "The Role of Cannabinoids in Treating Neruomuscular Disorders"; presented at the National Organiation for the Reform of Marijuana Laws (NORML) Annual Meeting, San Francisco, CA
2005	Course faculty, "Electrophysiological Tools and Their Use in the Rehabilitation of Myopathies", by invitation; presented at the American Academy of Neurology Annual Meeting, San Francisco, CA (pending April 10)
2005	Course faculty, by invitation; "Methods of Assessing Muscle Function in Neuromuscular Disease"; Course C, American Association of Electrodiagnostic Medicine, Monterey, CA, (pending September)
2005	Plenary Session faculty, by invitation; "Rehabilitation of Neuromuscular Disorders"; Plenary Session, American Association of Electrodiagnostic Medicine, Monterey, CA, (pending September)

ON-GOING DIDACTIC PRESENTATIONS

1. Yearly Grand Rounds speaker, Department of Rehabilitation Medicine, University of Washington

2. Lecturer, Board Review Course; "Muscular Dystrophy and Other Related Disorders"; Department of Rehabilitation Medicine, University of Washington

3. Lecturer, "Muscular Dystrophies"; Graduate School of Physical and Occupational Therapy; University of Washington

PUBLICATIONS (MedLine citations are noted with PMID number):

1. Guttas JJ, **Carter GT,** Horwitz BA. Plasma membrane protection against the acute effects of inorganic lead on the respiratory rates of intact liver cells. *J Toxicol Environ Health* 1983; 12:731-737 PMID:6668620 [PubMed – indexed for Medline]

2. Kilmer DD, **Carter GT,** Lieberman JS. Prophylaxis in control of seizures in brain injured patients. *West J Med* 1988; 49(2):266-7

3. **Carter GT,** Yang CS, Abresch RT, Lieberman JS, Fowler WM. Pulmonary assessment in patients with facioscapulohumeral dystrophy [abs]. *Arch Phys Med Rehabil* 1989; 71(11):A67

4. **Carter GT,** Kilmer DD, Rosen BS. The peril of espresso machines. *West J Med* 1990; 153(6):664-5 PMID:2293482 [PubMed – indexed for Medline]

5. **Carter GT,** Fowler WM, Lieberman JS. Maximum static airway pressures in patients with limb-girdle and facioscapulohumeral dystrophy [abs]. *Arch Phys Med Rehabil* 1990; 71(10):822

6. **Carter GT,** Kilmer DD, Bonekat HW, Lieberman JS, Fowler WM. Phrenic nerve involvement in Charcot-Marie-Tooth disease [abs]. *Arch Phys Med Rehabil* 1991; 72(10):827

7. **Carter GT,** Longley KJ, Entrikin RK. Muscular dystrophy in *mdx* mice: electromyograpny and nerve conduction [abs]. *Faseb J* 1991; 5(4):A900

8. **Carter GT,** Longley KJ, Walsh SA, Entrikin RK. Lack of effect of amitriptyline in murine myotonia [abs]. *Faseb J* 1992; 6(4):A1299

9. **Carter GT,** Johnson ER, Bonekat HW, Lieberman JS. Laryngeal diversion in the treatment of intractable aspiration in motor neuron disease. *Arch Phys Med Rehabil* 1992; 73(7):680-682 PMID:1622326 [PubMed – indexed for Medline]

10. **Carter GT,** Kilmer DD, Bonekat HW, Breslin EH, Johnson ER. Pulmonary function in hereditary spinocerebellar ataxia [abs]. *Arch Phys Med Rehabil* 1992; 73(10):1000

11. Johnson ER, **Carter GT,** Fowler WM. Spine deformity profiles in neuromuscular disease [abs]. *Arch Phys Med Rehabil* 1992; 73(10):1001.

12. **Carter GT,** Kilmer DD, Bonekat HW, Lieberman JS, Fowler WM. Evaluation of phrenic nerve and pulmonary function in hereditary motor and sensory neuropathy, type I. *Muscle Nerve* 1992; 15:459-462 PMID:1565114 [PubMed – indexed for Medline]

13. **Carter GT,** Longley KJ, Entrikin RK. Electromyographic and nerve conduction studies in the *mdx* mouse. *Am J Phys Med Rehabil* 1992; 71(1):2-5 PMID:1739439 [PubMed – indexed for Medline]

14. Longley KJ, Entrikin RK, **Carter GT,** Horasek SJ. Antagonism of myotonia by dexamethasone in muscular dystrophy of the chicken [abs]. *Faseb J* 1992; 6(4):A1299

15. **Carter GT,** Longley KJ, Walsh SA, Entrikin RK. Lack of effect of amitriptyline in murine myotonia. *Am J Phys Med Rehabil* 1992; 71(5):279-282 PMID:1388974 [PubMed – indexed for Medline]

16. Breslin E, Booth J, Lord B, **Carter GT,** Bonekat HW, Volz B, Mercer K, Siefkin A. Respiratory responses to unsupported arm exercise (UAE) in Charcot Marie Tooth (CMT) [abs]. American Thoracic Society *Am Rev*

Resp Dis 1993; 147(4):A532

17. Abresch RT, Fowler WM, Larson DB, Horasek SJ, Walsh SA, **Carter GT**. Contractile abnormalities in dystrophin-less (*mdx*) mice [abs]. *Med Sci Sports Exer* 1993; 5(5):S15

18. Breslin EH, **Carter GT**, Mercer K, Bonekat HW, Lee K. Fatigue in patients with Charcot-Marie-Tooth [abs]. *Arch Phys Med Rehabil* 1993; 74(11):1256-57

19. **Carter GT**, Bonekat HW, Milio L. Successful pregnancies in the presence of spinal muscular atrophy: two case reports. *Arch Phys Med Rehabil* 1994; 75(2):229-231 PMID:8311683 [PubMed – indexed for Medline]

20. Wineinger MA, **Carter GT**, Abresch RT, Walsh SA, Horasek SJ, Fowler WM. Effect of aging on the histological, biochemical and contractile properties of dystrophin-deficient (*mdx*) mice [abs]. *J Cell Biochem* 1994; S18D:525

21. **Carter GT**, Wineinger MA, Walsh SA, Horasek SJ, Abresch RT, Fowler WM. Effect of voluntary wheel-running exercise on muscles of the *mdx* mouse [abs]. *J Cell Biochem* 1994; S18D:526

22. **Carter GT**, Kilmer DD. Posterior interosseus nerve entrapment in the presence of hereditary motor and sensory neuropathy, type I [abs]. *Muscle Nerve* 1994; 17:1085

23. **Carter GT**, Kikuchi N, Horasek S, Walsh SA. The use of fluorescent dextrans as a marker of sarcolemmal injury. *Histo Histopathol* 1994; 9(3):443-447 PMID:7526906 [PubMed – indexed for Medline]

24. Kawasaki RI, **Carter GT**, McDonald CM, Kilmer DD. Electromyographic and muscle biopsy findings in limb girdle syndromes [abs]. *Arch Phys Med Rehabil* 1994; 75(9):1050

25. **Carter GT**, Kikuchi N, Abresch RT, Walsh SA, Horasek S, Fowler WM. Effects of exhaustive concentric and eccentric exercise on murine skeletal muscle. *Arch Phys Med Rehabil* 1994; 75(5):555-559 PMID:8185449 [PubMed – indexed for Medline]

26. **Carter GT**. Neuromuscular disorders, in Dell Orto AE, Marinelli RP (eds): *Encyclopedia of Disability and Rehabilitation*. New York, Simon & Schuster MacMillan, 1995; pp. 509-515

27. **Carter GT**, Wineinger MA, Walsh SA, Horasek SJ, Abresch RT, Fowler WM. Effect of voluntary wheel-running exercise on muscles of the *mdx* mouse. *Neuromusc Disord* 1995; 5(4):323-331 PMID:7580246 [PubMed – indexed for Medline]

28. **Carter GT**, McDonald CM, Chan TT, Margherita AJ. Isolated femoral mononeuropathy to the vastus lateralis: EMG and MRI findings. *Muscle Nerve* 1995; 18:341-344 PMID:7870114 [PubMed – indexed for Medline]

29. **Carter GT.**: Phrenic nerve involvement in Charcot-Marie-Tooth disease. *Muscle Nerve* 1995; 18:1215-1216 PMID:7659121 [PubMed – indexed for Medline]

30. Fowler WM, Abresch RT, Aitkens SA, **Carter GT**, Johnson ER, Kilmer DD, McCrory MA. Impairment and disability profiles of neuromuscular diseases: design of the protocol. *Am J Phys Med Rehabil* 1995; 74(5):S62-69 PMID:7576423 [PubMed – indexed for Medline]

31. McDonald CM, Abresch RT, **Carter GT**, Fowler WM, Johnson ER, Kilmer DD. Profiles of neuromuscular disease: Duchenne muscular dystrophy. *Am J Phys Med Rehabil* 1995; 74(5):S70-92 PMID:7576424 [PubMed – indexed for Medline]

32. McDonald CM, Abresch RT, **Carter GT**, Fowler WM, Johnson ER, Kilmer DD. Profiles of neuromuscular disease: Becker muscular dystrophy. *Am J Phys Med Rehabil* 1995; 74(5):S93-103 PMID:7576425 [PubMed – indexed for Medline]

33. ER Johnson, **Carter GT**, Kilmer DD, Abresch RT, Fowler WM, Wanlass RL. Profiles of neuromuscular disease: myotonic muscular dystrophy. *Am J Phys Med Rehabil* 1995; 74(5):S104-116 PMID:7576418 [PubMed – indexed for Medline]

34. McDonald CM, Abresch RT, **Carter GT**, Fowler WM, Johnson ER, Kilmer DD, Wright NC. Profiles of neuromuscular disease: limb-girdle syndromes. *Am J Phys Med Rehabil* 1995; 74(5):S117-130 PMID:7576419 [PubMed – indexed for Medline]

35. Kilmer DD, Abresch RT, Aitkens SG, **Carter GT**, Fowler WM, Johnson ER, McDonald CM. Profiles of neuromuscular disease: facioscapulohumeral dystrophy. *Am J Phys Med Rehabil* 1995; 74(5):S131-139 PMID:7576420 [PubMed – indexed for Medline]

36. **Carter GT**, Abresch RT, Fowler WM, Johnson ER, Kilmer DD, McDonald CM, Wright NC. Profiles of neuromuscular disease: hereditary motor and sensory neuropathy, types I and II. *Am J Phys Med Rehabil* 1995: 74(5):S140-149 PMID:7576421 [PubMed – indexed for Medline]

37. **Carter GT**, Abresch RT, Fowler WM, Johnson ER, Kilmer DD, McDonald CM. Profiles of neuromuscular disease: spinal muscular atrophy. *Am J Phys Med Rehabil* 1995, 74(5):S150-159 PMID:7576422 [PubMed – indexed for Medline]

38. **Carter GT**, Fritz RC. Electromyographic and lower extremity STIR MRI findings in lumbar radiculopathy [abs]. *Muscle Nerve* 1996; 19:1215-1216

39. **Carter GT**, Kilmer DD, Szabo RM, McDonald CM. Focal posterior interosseus neuropathy in the presence of hereditary motor and sensory neuropathy, type I. *Muscle Nerve* 1996; 19:644-648 PMID:8618563 [PubMed – indexed for Medline]

40. **Carter GT**. Stroke rehabilitation: where are we going? [editorial] *J Neurovas Dis* 1996; 1(2):6

41. **Carter GT**, Fritz RC. Pancreatic adenocarcinoma presenting as a monomelic motor neuronopathy. *Muscle Nerve* 1997; 20:103-105 PMID:8995591 [PubMed – indexed for Medline]

42 **Carter GT**. Smoking cessation: part of stroke rehabilitation. [editorial] *J Neurovas Dis* 1997; 2(1):4

43 **Carter GT**, Abresch RT, Walsh SA, Wineinger MA. The *mdx* mouse diaphragm: exercise-induced injury. *Muscle Nerve* 1997; 20:393-394 PMID:9052828 [PubMed – indexed for Medline]

44. **Carter GT**, Fritz RC. Electromyographic and lower extremity STIR MRI findings in lumbar radiculopathy. *Muscle Nerve* 1997; 20:1191-1193 PMID:9270680 [PubMed – indexed for Medline]

45. **Carter GT.** Rehabilitation management of neuromuscular disease. *J Neuro Rehab* 1997; 11(2):1-12

46. **Carter GT**, Arnot CF, Silverya A, Luetkenhaus C, Parcel M, Emerick CE, McCrory MA. Body mass index does not correlate with functional outcome in acute stroke rehabiiitation. *J Neurovas Dis* 1997; 2(5): 189-192

47. **Carter GT**, Fritz RC. Should every unclear neuromuscular symptom be termed "paraneoplastic"?

[commentary] *Muscle Nerve* 1997; 20:1204-1205

48. Lew HL, Robinson LR, **Carter GT**. Auditory P300 event-related potentials are promising predictors for outcome in non-traumatic coma. *J Neurovas Dis* 1997; 2(6): 265-267

49. **Carter GT.** Habitat for an aging, physically impaired humanity. [editorial] *J Neurovas Dis* 1998; 3(7):5

50. Wineinger MA, Abresch RT, Walsh SA, **Carter GT.** Effects of aging and voluntary exercise on the function of dystrophic muscle from mdx mice. *Am J Phys Med Rehabil* 1998; 77(1):20-7 PMID:9482375 [PubMed – indexed for Medline]

51. Willick SE, Margherita AJ, **Carter GT**. Isolated superior gluteal nerve injury: two case reports. *Muscle Nerve* 1998: 21:951-953 PMID:9626259 [PubMed – indexed for Medline]

52. Burns DM, **Carter GT**. The relation between lesion location/regional blood flow and post stroke depression/apathy. *J Neurovas Dis* 1998; 3(4):149-151

53. **Carter GT**. Does managed care work for stroke rehabilitation? [editorial] *J Neurovas Dis* 1998; 3(5):189

54. Fowler WM; **Carter GT**, Kraft GH. Role of physiatry in the management of neuromuscular disease. *Phys Med Rehabil Clin N Am* 1998; 9(1):1-8 PMID:9894132 [PubMed – indexed for Medline]

55. **Carter GT,** Miller RG. Comprehensive management of amyotrophic lateral sclerosis. *Phys Med Rehabil Clin N Am* 1998; 9(1):271-284 PMID:9814144 [PubMed – indexed for Medline]

56. **Carter GT**, Jensen MP, Galer BS, Kraft GH, Crabtree LD, Beardsley RM, Abresch RT, Bird TD. Neuropathic Pain in Charcot Marie Tooth disease. *Arch Phys Med Rehabil* 1998; 79:1560-4 PMID:9862301 [PubMed – indexed for Medline]

57. **Carter GT**, Butler LM, Abresch RT, Ugalde VO. Expanding the role of hospice in the care of amyotrophic lateral sclerosis. *Am J Hosp and Palliat Care* 1999; 16(6): 707-710 PMID:11094907 [PubMed – indexed for Medline]

58. Abresch RT, Jensen MP, **Carter GT**. Assessment of pain and health-related quality of life in slowly progressive neuromuscular disease [abs]. *Arch Phys Med Rehabil* 2000; 81:1289

59. **Carter GT,** Robinson LR, Chang VH, Kraft GH. Electrodiagnostic evaluation of traumatic nerve injuries. *Hand Clinics* 2000; 16(1):1-12 PMID:10696572 [PubMed – indexed for Medline]

60. Ugalde VO, Breslin EH, Walsh SA, Bonekat HW, Abresch RT, **Carter GT.** Pursed lip breathing improves ventilation in myotonic muscular dystrophy *Arch Phys Med Rehabil* 2000; 81:472-8 PMID:10768538 [PubMed – indexed for Medline]

61. McDonald CM, **Carter GT**, Fritz RC, Anderson MW, Abresch RT, Kilmer DD. Magnetic resonance imaging of denervated muscle: comparison to electromyography. *Muscle Nerve* 2000; 23(9):1431-34 PMID: 10951448 [PubMed – indexed for Medline]

62. **Carter GT**, McDonald CM. Preservation of function in Duchenne dystrophy with long-term pulse prednisone therapy. *Am J Phys Med Rehabil* 2000; 79(5):455-58 PMID:10994887 [PubMed – indexed for Medline]

63. **Carter GT,** Galer BS. Advances in the management of neuropathic pain. *Phys Med Rehabil Clin N Am* 2001;

12(2):447-460 PMID:11345017 [PubMed – indexed for Medline]

64. Abresch RT, Jensen MP, **Carter GT.** Health quality of life in peripheral neuropathy. *Phys Med Rehabil Clin N Am* 2001; 12(2):461-472 PMID:11345018 [PubMed – indexed for Medline]

65. **Carter GT,** Rosen BS. Marijuana in the management of amyotrophic lateral sclerosis. *Am J Hosp Palliat Care* 2001; 18(4):264-70 PMID:11467101 [PubMed – indexed for Medline]

66. Steinborn J, Alison K. Chinn, **Carter GT**: The latest buzz on medicinal marijuana: a legal and medical perspective. *Am J Hosp Palliat Care* 2001; 18(5):295-6 PMID:11565181 [PubMed - indexed for Medline]

67. **Carter GT**, Krivickas LS. Adult motor neuron disease, in Kirshblum S, Campagnolo DL, DeLisa JA, (eds): *Spinal Cord Injury Medicine*. Philadelphia, Lippincott, Williams, & Wilkins, 2002, pp. 537-552

68. Abresch RT, **Carter GT,** Jensen MP, Kilmer DD. Assessment of pain and health-related quality of life in slowly progressive neuromuscular disease. *Am J Hosp Palliat Care 2002; 19(1):39-48* PMID:12173612 [PubMed – indexed for Medline]

69. **Carter GT,** Sullivan MD. Antidepressants in pain management. *Curr Opin Investig Drugs* 2002; 3(3):454-458 PMID:12054096 [PubMed – indexed for Medline]

70. **Carter GT**, Weydt P. Cannabis: old medicine with new promise for neurological disorders. *Curr Opin Investig Drugs* 2002; 3(3):437-440 PMID:12054093 [PubMed – indexed for Medline]

71. Barron, DW, **Carter GT**. Assisted suicide, the death instinct, and Dr. Jack Kervorkian: a brief analysis. *Journal of Terminal Oncology* 2002, 1(1):41-46

72. Street V, Meekins G, Lipe HP, Seltzer W, **Carter GT**, Kraft GH, Bird TD: Charcot-Marie-Tooth neuropathy: Phenotypes and genotypes of four new mutations in the MPZ and Cx 32 genes. *Neuromusc Disord* 2002; 12:643-650 PMID:12207932 [PubMed – indexed for Medline]

73. **Carter GT**, Abresch RT, Fowler WM: Adaptations to exercise training and contraction-induced muscle injury in animal models of neuromuscular disease. *Am J Phys Med Rehabil* 2002;(81)S:151-161 PMID: 12409820 [PubMed – indexed for Medline]

74. Krivickas LS, **Carter GT**. Amyotrophic lateral sclerosis: Clinical Commentary. *J Spinal Cord Med* 2002; 25(4):274-276 PMID:12482168 [PubMed – indexed for Medline]

75. Weydt P, Weiss MD, Moller T, **Carter GT**. Neuroinflammation as a therapeutic target in amyotrophic lateral sclerosis. *Curr Opin Investig Drugs* 2002 3(12):1720-1724 PMID:12528305 [PubMed – indexed for Medline]

76. **Carter GT**, Krivckas LS, Weydt P, Weiss MD, Miller RG. Drug therapy for amyotrophic lateral sclerosis: where are we now? *Iı gs* 2003 6(2):147-153 PMID:12789618 [PubMed – indexed for Medline]

77. **Carter GT,** England JD, Hecht TW, Han J, Weydt P, Chance P. Electrodiagnosis of hereditary motor and sensory neuropathies. *Phys Med Rehabil Clin N Am* 2003; 14:347-363 PMID:12795520 [PubMed – indexed for Medline]

78. Han JJ, **Carter GT,**. Hecht TW, , Schuman NE, Weiss MD, Krivickas LS. The amyotrophic lateral sclerosis center: a model of multidisciplinary management, in Grabois M, Henely EJ, (eds): *Critical Reviews in*

Physical Medicine and Rehabilitation. New York, Begell House, Inc, 2003, vol. 15(1):21-40

79.. **Carter GT.** Discontinuing life support: whose call? A physician's perspective. *Am J Hosp Palliat Care 2004; 21(1):61-65*

80. **Carter GT,** England JD, Chance PF. Charcot-Marie-Tooth disease: electrophysiology, molecular biology, and clinical management. *IDrugs* 2004; 7(2):151-159. PMID:15057660 [PubMed – indexed for Medline]

81. Amtmann D, Weydt P, Johnson KL, Jensen MP, **Carter GT.** Survey of cannabis use in patients with amyotrophic lateral sclerosis. *Am J Hosp Palliat Care* 2004; 21(2):95-104 PMID:15055508 [PubMed – indexed for Medline]

82. Weiss, MD, Weydt P, **Carter GT.** A role for rational polypharmacy in the treatment of amyotrophic lateral sclerosis. *Expert Opinion on Pharmacotherapy* 2004; 5(4):735-746 PMID:15102560 [PubMed – indexed for Medline]

83. **Carter GT,** Weydt P, Kyashna-Tocha M, Abrams DI. Medical marijuana: rational guidelines for dosing. *IDrugs* 2004; 7(5):464-470 PMID:15154108 [PubMed – indexed for Medline]

84. **Carter GT.** Pharmacologic approaches to geriatric pain management. *Arch Phys Med Rehabil* 2004 85 (6 Suppl):50 PMID:15221726 [PubMed – indexed for Medline]

85. **Carter G T.** When should the scope of care extend beyond the patient? A physician's perspective. *Am J Hosp Palliat Med 2004; 21(4):294-295* PMID:15315193 [PubMed – indexed for Medline]

86. **Carter GT.** Medical marijuana: historical and modern perspectives for rehabilitation. ADVANCE for Directors in Rehabilitation 2004; 13 (7):31-35.

87. **Carter GT,** Ugal e VO. Medical marijuana: Emerging applications for the management of neurological disorders. *Phys Med Rehabil Clin N Am* 2004; 15(4):943-954 PMID:15458761 [PubMed – indexed for Medline]

88. **Carter GT.** Developing an evidenced-based case for polyneuropathy. *The Physiatrist* 2004; 20(8):3.

89. Krivickas LS, **Carter GT.** Motor neuron disease, in DeLisa JA, Gans BM, Walsh NE (eds): *Physical Medicine and Rehabilitation: Principles and Practice, 4th edition.* Philadelphia, Lippincott, Williams, & Wilkins 2005; pp. 931-956.

90. England JD, Gronseth GS, Franklin G, Miller RG, Asbury AK, **Carter GT,** Cohen JA, Fisher MA, Howard JF, Kinsella LJ, Latov N, Lewis RA, Low PA, Sumner AJ. Distal symmetrical polyneuropathy: Definition for clinical research. *Muscle Nerve.* 2004; 31(1):113-123 PMID:15536624 [PubMed – indexed for Medline]

91. **Carter GT.** Shoring up strength. Exercise plays an important role for people with neuromuscular disease. ADVANCE for Directors in Rehabilitation 2004; 13(11):33-34.

92. Jensen MP, Abresch RT, **Carter GT.** The reliability and validity of a self-reported version of the functional independence measure in persons with neuromuscular disease and chronic pain. *Arch Phys Med Rehabil* 2005; 86(1): 116-122. PMID:15641001 [PubMed – indexed for Medline]

93. England JD, Gronseth GS, Franklin G, Miller RG, Asbury AK, **Carter GT,** Cohen JA, Fisher MA, Howard JF, Kinsella LJ, Latov N, Lewis RA, Low PA, Sumner AJ. Distal symmetrical polyneuropathy: Definition

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101. McDonald CM, **Carter GT**, Han JJ, Benditt JO. Rehabilitation management of Duchenne muscular dystrophy. in Chamberlain JC, Rando T, (eds): *Duchenne Muscular Dystrophy: Advances in Therapeutics*. New York, Marcel Dekker Publishing Co. (in press)

102. **Carter GT.** Rehabilitation Management of Peripheral Neuropathy. *Semin Neurol* 2005 (in press)

103. Hodapp JA, **Carter GT,** Kraft GH, Bird TD. Double trouble in Charcot-Marie-Tooth disease: mutation in the PMP-22 gene concommitant with another gene mutation producing a novel phenotype [abs]. *Neurology* (accepted)

104. McDonald CM, **Carter GT**, Abresch RT, Widman L, Styne DM, Warden N, Kilmer DD. Body Composition in Duchenne Dystrophy using Impedance Analysis and Dual X-ray Absorptiometry. *Am J Phys Med Rehabil* (accepted)

105. **Carter GT,**.VandeKieft GK, Barron DW. Who's life is it anyway? The federal government versus the state of Oregon on the legality of physician-assisted suicide. *Am J Hosp Palliat Med* 2005 (accepted)

106. Han JJ, Ra JJ, Abresch RT, Robinson LR, Chamberlain JS, **Carter GT**. Electromyographic studies across the lifespan of the mdx mouse: developing an in vivo tool for evaluating therapeutic interventions. *Muscle Nerve* (submitted)

107. McDonald CM, Han JJ, **Carter GT.** Rehabilitation of children and adults with myopathies, in Braddom RL (ed): *Physical Medicine and Rehabilitation, 3rd edition.* Philadelphia, WB Saunders Publishing Co. (submitted)

108. Weiss, MD, Ravits, JM, Schuman N, **Carter GT**. A4V superoxide dismutase mutation in apparently sporadic amyotrophic lateral sclerosis resembling neuralgic amyotrophy. *Neurology* 2005 (submitted)

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110. Hodapp JA, **Carter GT,** Kraft GH. Bird TD. Double trouble in Charcot-Marie-Tooth disease: mutation in the PMP-22 gene concommitant with another gene mutation producing a novel phenotype. *Arch Neuro* (full manuscript in prep)

ON-LINE PUBLICATIONS

1. **Carter GT:** Posterior Interosseus Neuropathy. www.aapmr.org CME On-line EMG Case of the Month Series May 1998

2. **Carter GT:** Femoral Mononeuropathy. www.aapmr.org CME On-line EMG Case of the Month Series September 1998.

3. **Carter GT:** Paraneoplastic Neuropathy. www.aapmr.org CME On-line EMG Case of the Month Series Febraury 1999.

4. **Carter GT**: e-Medicine: Rehabilitation Management of Neuromuscular Diseases. Physical Medicine and Rehabilitation: http://www.emedicine.com/pmr/topic233.htm

Law Enforcement Against Prohibition

Jack A. Cole

Executive Director
jackacole@leap.cc (781) 393-6985 www.leap.cc

"This is Not a War on Drugs—it's a War on People."

Jack Cole knows about the war on drugs from several perspectives. Cole retired as a Detective Lieutenant after a 26-year career with the New Jersey State Police. For twelve of those years Cole worked as an undercover narcotics officer. His investigations spanned the spectrum of possible cases, from street drug users and mid-level drug dealers in New Jersey to international "billion-dollar" drug trafficking organizations. Cole ended his undercover career living nearly two years in Boston and New York City, posing as a fugitive drug dealer wanted for murder, while tracking members of a terrorist organization that robbed banks, planted bombs in corporate headquarters, court-houses, police stations, and airplanes and ultimately murdered a New Jersey State Trooper.

After retiring, Cole dealt with the emotional residue left from his participation in the unjust war on drugs by working to reform current drug policy. He moved to Boston to continue his education. Cole holds a B.A. in Criminal Justice and a Masters degree in Public Policy. Currently writing his dissertation for the Public Policy Ph.D. Program at the University of Massachusetts, his major focus is on the issues of race and gender bias, brutality and corruption in law enforcement. Cole believes ending drug prohibition will go a long way toward correcting those problems.

Cole has taught courses to police recruits and veteran officers on ethics, integrity, moral decision-making, and the detrimental effects of racial profiling. He has also presented papers at international conferences and spoken on drug policy reform in the European Parliament, as well as over 300 times to students, educators, professional, civic, benevolent, and religious groups in Australia, Canada, Central America, Europe, New Zealand, and across the United States. Cole is passionate in his belief that the drug war is steeped in racism, that it is needlessly destroying the lives of young people, and that it is corrupting our police. Cole's discussions give his audience an alternative prospective of the US war on drugs from the view of a veteran drug-warrior turned against the war.

To book a speaker contact
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EXPERIENCE:

March 2002 to Present

LAW ENFORCEMENT AGAINST PROHIBITION (LEAP)
Founding member and executive director of 2,000 member international, nonprofit educational organization giving voice to police, judges, prosecutors, corrections officials, and former DEA agents, who are working to lower the incidence of death, disease, and addiction by ending drug prohibition. LEAP has a bureau of 85 Law-Enforcement Speakers and membership in 48 countries.

June 2001 to Present

RECONSIDER: Drug Policy Forum, Syracuse, New York
Public speaker on the failed current drug policies, offering alternative reform policies driven by the concept of "harm reduction."

May 2001 to June 2001

Regional Community Policing Institute of New England
Contracted to teach "Building Trust: Community Policing Philosophy" to all members of Providence, Rhode Island Police Department.

March 2000 to August 2000

Northeastern University, Center for Criminal Justice Policy Research
Created interactive multimedia presentations on compact disks to be used by the Regional Community Policing Institute in teaching a course titled "Building Trust: Ethically Based Community/Police Partnerships to police throughout New England."

May 1998 to July 1999

McCormack Institute, University of Massachusetts
Process evaluator for the Office of Community Oriented Policing Service, U.S. Department of Justice. Evaluated the first year start-up process for the Regional Community Policing Institute of New England.

October 1996 to September 1999

Massachusetts Criminal Justice Training Council
Public policy consultant engaged in evaluating and certifying all of the police academies and academy instructors in Massachusetts. Installed and maintained LAN and WAN computer networks to provide access for Police Academies throughout Massachusetts. Taught courses in Ethics and Moral Decision Making to entry-level police officers at Norwood Police Academy.

June 1997 to January 1998

Streamline, Inc. and NCMMOS, Inc.
Public policy consultant on law enforcement issues during the creation of "Policing in Massachusetts: The Beat Goes On," an interactive multimedia program to train police instructors on the Massachusetts Criminal Justice Training Council's new curriculum and pedagogy for "Policing in a Democratic Society."

June 1996 to September 1996

Mayor Thomas Menino's Commission on the Boston Municipal Police Served as public policy consultant assisting in evaluating the effectiveness and efficiency of the Boston Municipal Police.

October 1964 to March 1991	**New Jersey State Police, Retired, Lieutenant** Duties included: Supervising Alcoholic Beverage Control Enforcement Unit, Missing Person Unit and Child Sexual Exploitation Squad, Fugitive Unit, and various cases of International Narcotic Trafficking; creating the first statewide-computerized tracking systems for the Fugitive and Missing Persons Units and software for laptop computers capable of streamlining the control of the evidence handling at crime scenes. Investigative duties included case management and computer programming, surveillance, undercover activities, and intelligence analysis during fourteen years in the Narcotic Bureau. Other responsibilities included training police from Florida, Michigan, New Jersey and Virginia in fugitive apprehension and missing person recovery.
Special Assignments:	**International - Billion Dollar - Cocaine Conspiracy** Originated and directed a three-year investigation of a Colombia-based cocaine-trafficking organization. Worked eighteen months with the Drug Enforcement Administration and the Office of the United States Attorney in Brooklyn, New York, preparing that case for a prosecution. The case resulted in the first official acts of drug-policy diplomacy between the US and Colombia.
	National Terrorist Investigation Deep cover operative and intelligence officer for a three-year State Police investigation responsible for the capture of all members of a terrorist organization that robbed banks, planted bombs in corporate headquarters, court-houses, police stations and airplanes and in 1981 murdered a New Jersey State Trooper.
1974 to 1984	**Battered Person's Resource Center, Inc.** Cofounder, Treasure, grant writer, and public speaker. Trained personnel from law-enforcement, courts, hospitals, welfare agencies, and the public, about issues of domestic violence.
1976 to 1984	**Jersey Battered Women's Service** A founding member with served five years on the Board of Trustees and headed the speakers bureau for the first federally-funded battered women's shelter in New Jersey.
EDUCATION:	**University of Massachusetts** Doctoral Candidate in Public Policy Program, 1994 to present. Master of Science in Public Policy, 1999 Bachelor of Science in Criminal Justice, 1994
MILITARY:	**United States Marine Corps** – Four years
SPEAKING VENUES:	Spoke on drug-policy reform around the world at over 340 venues including civic, professional, religious, and educational organizations—appearances on 58 radio and 19 television programs and interviews in 57 newspapers, as well as a testifying before 6 State legislative committees and the European Parliament in Brussels, Belgium.

Alaska State Legislature

Please enter into the record my testimony to the SENATE JUDICIARY
Committee name

Committee on SB74 Crimes Involving Marijuana, dated 4-11-05
Bill/Subject

THE "FINDINGS" SUPPORTING THIS STATUTE ARE ARGUEABLE ASSERTIONS AND NOT SOLID FACTS. THERE IS EVIDENCE OF SOMETHING DOES NOT MAKE IT FACT. THERE IS EVIDENCE NEIL ARMSTRONG AND APOLLO ELEVEN NEVER WENT TO THE MOON. THE "EVIDENCE" DOES NOT MAKE IT TRUE.

HOW CAN THE THREAT TO SOCIETY FROM AN ADULT, ONLY, WITH 4 OUNCES, ONLY, OF MARIJUANA, ONLY, IN THEIR HOME, ONLY, FOR PERSONAL USE, ONLY, BE SUCH A GRAVE THREAT AS TO GIVE THE EXECUTIVE AND LEGISLATIVE BRANCH ENOUGH OF A COMPELLING INTEREST TO OVERRIDE THE JUDICIAL BRANCH AND YET NOT BE OF SUFFICIENT COMPELLING INTEREST TO PROVIDE ADDITIONAL FUNDING TO HANDLE THE HUNDREDS OF NEW FELONY CASES THAT THE DEPARTMENT OF ADMINISTRATION FISCAL NOTE PREDICTS THIS WILL CREATE.

FAMILIARIZE YOURSELVES WITH ALASKA STATUTES SEC. 11.76.110, INTERFERENCE WITH CONSTITUTIONAL RIGHTS, ESPECIALLY (3), A CLASS A MISDEMEANOR

Signed: James Barhart JAMES BARHART
Testifier

SELF AN ALASKAN ADULT COVERED UNDER RAVIN
Representing (Optional)

P.O. BOX 872533 WASILLA, ALASKA 99687
Address

746-2828
Phone number

Alaska State Legislature

Please enter into the record my testimony to the Judiciary, HES, Finance
Committee name

Committee on SB 74 - Crimes Involving Marijuana, dated 3/21/05, 4/11/05 Whenever it goes to finance
Bill/Subject

There has been no proof beyond a reasonable doubt that any of the "findings" in Sec. 2 are true or not misleading. And I object to the Governor and the legislature using these hearings to present one sided "expert" testimony to support the "findings" just so that they can be used later as "facts" They are not facts! I also object to the governor's attempt to go around the constitution and bypass the Alaska Supreme Court with this unconstitutional unlawful bill. This is clearly an attack on the Constitution of Alaska. I also object to the fact that there is no honest fiscal plan. I can't believe no additional enforcement funding would be needed.

Signed: Deborah Anne Bloom
Testifier

Representing (Optional)

7362 W. Parks Hwy #327, Wasilla 99654-9132
Address

Phone number

Brian Hove

From: Michael W. Macleod-Ball [mwm@akclu.org]
Sent: Wednesday, April 20, 2005 11:21 AM
To: Brian Hove
Subject: AkCLU testimony

Attachments: testimony-mwm05411.doc

testimony-mwm054
11.doc (31 KB)...

Brian -

In today's hearing, I told the committee that I'd submit my written testimony. I'm not sure that you have it. The Chairman referenced my written testimony when he was discussing the exhibits with Mr. Parker - but he may have been referring to my written testimony to HESS. The points for Judiciary are somewhat different. I have attached my written testimony intended for Judiciary to this email and would appreciate your making it part of the record in accordance with my comments to the committee earlier today.

Also, the Chairman said that the Committee would be notifying the parties when the bill was due to come up again. Will we be included in that group or was he simply referring to the administration folks to whom he was speaking at the time?

Thanks.

Wes

Michael W. Macleod-Ball, Executive Director Alaska Civil Liberties Union P. O. Box 201844
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Alaska Civil Liberties Union

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Testimony of Michael W. Macleod-Ball, Executive Director, before the Senate Judiciary Committee Regarding SB 74 (marijuana legislation)

Thank you Chairman Seekins for this opportunity to address the committee. I'd also like to thank your staff for doing their best to keep us up to date on schedules and the like and for keeping their good humor despite their many competing interests. My name is Michael Macleod-Ball and I'm the executive director of the Alaska Civil Liberties Union.

I have submitted a written copy of my testimony before the Senate HESS committee for your consideration. Today, I'd like to address several other points that we believe to be important for this committee to consider.

History of legislation and case law

First, it's important to fully understand the history - the context in which this debate exists. The Ravin decision of 1975 has been much maligned as the decision that legalized marijuana in Alaska. That reputation is unfair and only part of the story. Ravin was much more about defining the scope of privacy than it was about legalizing marijuana. The privacy amendment to the Alaska Constitution had only recently been enacted at the time of the Ravin decision.

At its core, Ravin stood for the proposition that there are zones of privacy and if the government makes a law invading that privacy zone, it needs to be for a compelling reason. In that sense, the privacy right is just like any other fundamental right – free speech, right to worship – restrictive legislation needs a strong justification....something more than the basis for legislative action that doesn't infringe upon a fundamental right. You wouldn't enact a law barring all public discussion of whether marijuana is harmful. You wouldn't enact a law barring all Presbyterians from worshipping. Similarly, you wouldn't enact a law restricting an individual's right to be left alone.

Ravin declared that there is a protected zone of privacy in one's home. Ravin also stands for the proposition that an activity that doesn't harm someone else is due greater deference. In evaluating marijuana laws in light of the privacy amendment, the Ravin court said that the risks of marijuana were not so great as to justify state infringement of the zone of privacy.

It's important to note what Ravin did not do. It did not bar legislation related to driving under the influence. It did not bar legislation aimed at prohibiting commercial cultivation. It did not bar legislation prohibiting sales of marijuana. It did not bar legislation prohibiting use by minors. And no court decision since then has done any of

these things. So – all the talk by the administration about marijuana as a cash crop, needing to bar sales to kids, etc., is irrelevant to the issues before you in this bill. Such things are illegal now and will be illegal in the future.

After the Ravin decision, this body adopted legislation in effect codifying its terms. That legislation was the origination of the four ounce threshold for personal possession in the home, not the court decision. In 1990, a referendum attempted to recriminalize marijuana. Just last year, an appeals court overturned that decision. Once again, the decision was not about marijuana per se, but rather about the procedural means by which a constitutional right can be restricted. A constitutional amendment requires a 2/3 vote of the legislature plus the affirmative vote of the populace. It was logical that the court would not permit the dilution of a duly adopted constitutional provision based solely on a referendum. To do otherwise would have discounted the right of the legislature to initiate such constitutional provisions.

Because the referendum was not a valid procedure to change the constitution, the court was left to determine the state of the law with respect to marijuana – and it was clear that the law in effect immediately prior to the referendum would control. That law included the four ounce limit for personal use and possession which this law seeks once again to overturn.

Some risk isn't enough

As noted previously, the Ravin court acknowledged that marijuana had some risks associated with it. It considered a wealth of evidence, more in some ways than this panel has, and concluded that there was debate about the risks of marijuana, some evidence suggested greater risk than other evidence. That risk, however, was insufficient to justify government intrusion into the privacy of the home. What's more – the court even anticipated the presence of children in the home and said that even with kids in the home there was insufficient threat to public safety or welfare to justify a government invasion of the privacy of the home.

Findings should match the facts and the state's claims are exaggerated

Taking it all together, the obvious question is whether there is any way the legislature can act to restrict marijuana use and possession in the home. We believe the answer is 'no' given the current state of the science and the nature of the right being infringed.

The risks associated with the private possession of marijuana for personal use in the home simply haven't been demonstrated to exist – if they even exist to any greater degree than they did in the 1970's. In this bill, the findings overstate the known risks of marijuana in the hope that the courts will defer to these findings and agree that the stated risks justify restriction. To counter those exaggerations, you will hear testimony from internationally renowned experts who will tell you that the risks of marijuana are not substantially greater than 30 years ago. You will hear them say that the findings do not

reflect the best science. You will hear them say that the administration's testimony exaggerates or misleads or takes scientific conclusion out of context.

Compare this to the administration's overstatements: At a hearing last week, they asserted that kids get their pot at home from family. But you look at the actual study they relied on to make that statement, you'll see that kids mostly get their pot from friends. Only a small fraction get it from family members. And there is no indication that when they get pot from the home, they're getting it from adult family members. The materials submitted to Senate HESS and the testimony provided there made the alarming claim that 15% of rape suspects have smoked marijuana in the hours before the arrests. But if you look at the study from which that claim is drawn, you'll find that over 70% of those same suspects have consumed alcohol in the hours before arrest. And you'll find there is no indication whether the marijuana smokers also drank alcohol...and you'll find that the authors of the study were so concerned with the alcohol correlation that they provided much additional follow on information about alcohol use. And you'll find they deemed the marijuana link minor, perhaps trivial, in scientific terms...and deemed it unworthy of more detailed review. Those are just two examples of the administration's overstatements – if you had more time to look at their information, you might just find more.

If you want to be honest with the Alaskan public about this by adopting accurate findings, you have to admit that the weight of the evidence does not support the findings and does not justify a restriction on private possession of small amounts of marijuana for personal use in the home. The evidence may suggest driving while under marijuana's influence should be banned – but it already is and this legislation doesn't change that. It may suggest that commercial cultivation should be banned – but it already is and this legislation doesn't change that. This legislation does ban possession of any amount, no matter how small, even for private consumption in the home – and the findings are a smokescreen, without any support relevant to that restriction.

Findings will be subject to judicial review

The end result of this will be another court challenge...and the court this time will be left in the position not of defining the privacy right and not of explaining the proper way to amend the constitution, but rather of revealing the fallacy of these proposed findings. When a fundamental right is involved, the court will not simply defer to legislative findings. Clarence Thomas, when on the appellate court, said that simply saying so cannot make black into white or slavery into freedom. In this case, simply saying there is justification to invade the privacy of the home won't make it so. If this legislature doesn't wish to take the time to evaluate all the science methodically and with impartiality, the courts will certainly do so. And they'll find what other eminent and impartial panels have found – that marijuana has some risks, but far fewer than alcohol, tobacco, and other substances.

Criminalization doesn't help – it just creates more criminals and poverty

What should this legislatur do? If, as we suspect, there is a predisposition to ban marijuana in public and in private, then a constitutional amendment is the only way to go. We'd oppose such a movement, but there would be no doubt of the validity of the process, if successful. Significantly, nothing has been offered to show that criminalization works. The administration has decried the increase in usage rates – and impliedly blamed the court's privacy rulings. But as discussed earlier, we had effective prohibition for close to 15 years from the referendum until the decision negating that vote. If the administration's claims of increased usage are true, they occurred in a climate of perceived prohibition. If the concern of this legislature is really usage rates, why not focus on things that have been shown to work for other substances. Focus on education, focus on prevention.

At the very least, focus on all of the science presented to you today – if you look at it with an open mind, we believe you will be unable in good conscience to approve the findings you have before you in support of a restriction on a fundamental right.

Thanks for your attention and I'll be happy to answer questions.

Senator French:

I've printed lists of all cases from CRIMES that we received in 2003-2004 where the most serious charge of conviction was for MICS 4, MICS 5 or MICS 6. I think the best way of assessing sentences is to look at the most serious charge. It is possible to also look at cases where the marijuana charge is a secondary offense to something more serious, but I think that just adds a complicating factor to getting an handle on the typical sentences imposed.

There were approximately 220 MICS 4 convictions per year, with by far the majority being for possession of heroin, cocaine, methamphetamine and other dangerous drugs. Of the 15% of MICS 4 convictions that involved marijuana, the vast majority of those were for growing, selling or possessing with intent to sell one ounce or more, which is not changed by the bill. There were only four MICS 4 cases per year (eight total cases for the two-year period) of possession of one pound or more of marijuana. It appears that all of them involved marijuana growing. Only one of those eight defendants received any jail time, and that was only one month; five of the eight received SIS judgments. The average period of probation was 32 months, with 24 months being the shortest and 40 months the longest period of supervision. It seems reasonable to conclude, for purposes of fiscal note analysis, that judges will not impose sentence more severe than this if the legislature makes it a MICS 4 offense to possess from 4-16 ounces of marijuana.

Of the approximately 70 MICS 5 convictions annually, there was less than a handful each year involving possession of ½ to 1 pound of marijuana. The reason such cases are rare is that persons with that much marijuana are usually convicted of MICS 4 or 5 for growing, selling of possessing with intent to sell. Half of these defendants received no jail time at all, and the other half received sentences of 10-30 days, with periods of probation ranging from one to three years. Under the bill, these handful of offenders would be prosecuted for MICS 4, and would likely receive sentences comparable to those described in the preceding paragraph, that is, little or no jail time, and a probationary sentence.

Of the approximately 500 MICS 6 convictions each year, the vast majority are convicted as a result of public possession. This is anecdotal, because of the way the MICS 6 statute is written. However, drug prosecutors in Anchorage, Fairbanks, and Kenai, who handle 67% of all MICS 6 cases, all independently told me that by far the most common scenario, comprising upwards of 90% of the cases, is possession of marijuana in a motor vehicle, as a result of the driver being stopped for a traffic violation. An analysis of the sentences imposed in MICS 6 cases appears in the footnote.[1]

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[1] Of the 500 MICS 6 sentences, approximately 40 received active jail sentences (actual imprisonment) of one to five days, another 10 got 6-10 days, 9 were sentenced to 11-20 days, 3 served 21-40 days, 3 got 41-60 days and only one got the maximum sentence of 90 days. The

MICS 6 cases involving in-home possession of four ounces to ½ pound of marijuana are quite rare, again because persons with that much marijuana are usually convicted of MICS 4 or 5 for growing, selling of possessing with intent to sell.

MICS 6 cases involving in-home possession of less than four ounces of marijuana are rare and are generally dismissed. We do not expect there to be any significant change in the way police agencies deal with in-home possession of less than four ounces. As I indicated in committee testimony, it is likely that such cases will never come to the attention of prosecutors unless some other crime brings the police to the residence. In any event, cases of in-home possession of less than four ounces would become MICS 5 under the bill. As described in the preceding paragraph, MICS 5 cases involving possession of ½ to one pound ordinarily receive suspended sentences or only a very short period of jail time, and we do not expect any significant change in sentences for amounts less than four ounces.

In the committee today you also asked about the number of marijuana arrests. I don't have the number of arrests, but I can tell you how many defendants were referred. In 2003 we received cases with 1480 defendants charged with at least one MICS 6 count, 184 defendants charged with at least one MICS 5 count, and --- defendants charged with at least one MICS 4 count. These numbers include cases in which there were other charges, including more serious charges.

Let me know if you have questions.

Dean
April 20, 2005

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remaining 86% (more than 430 defendants) received no jail time. I looked up the two defendants who, between 2003-2004, received maximum sentences of 90 days, and found that both had records of other convictions. As I was flipping through the list, and out of curiosity, I also looked up the record of a person who got a sentence of 50 days, one Travis Smallwood. Aside from vehicle theft, criminal mischief, driving with a suspended license and a previous conviction for MICS 6, Mr. Smallwood was also charged with SAM2 and convicted of SAM3 in 2000, and later two cases of failing to register as a sex offender were dismissed. In 2002 he was charged with MICS 4 and convicted of MICS 5, apparently involving selling marijuana. Then in 2003 he was convicted of MICS 6 and got 50 days. The prosecutor in the Smallwood's SAM case? Hollis French.

Alaska Civil Liberties Union

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FAX TRANSMISSION COVER SHEET

To: Sen. Ralph Seekins Date: 04/27/05

Firm: _____ Fax #: 465-5241

From: Michael W. Macleod-Ball, Executive Director

3 Pages in Transmission (Including Cover Sheet)

NOTES:

See attached letter requesting time to address revised findings on Senate Bill 74.

Alaska Civil Liberties Union

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April 27, 2005

Sent via fax (907-465-5241)
Original via regular U. S. Mail

Senator Ralph Seekins
Chairman, Senate Judiciary Committee
Alaska State Legislature
State Capitol, Room 125
Juneau, AK 99801-1182

RE: Senate Bill 74 – *An Act making findings relating to marijuana use and possession....*

Dear Chairman Seekins:

I am writing in regard to the above referenced bill and, in particular, the Senate Judiciary Committee's consideration of revised findings recently offered by the administration.

As you are aware from testimony presented by the administration, the findings associated with the bill are critical to its ability to survive judicial challenge. Administration representatives have recently put forward alternative findings, and in the course have acknowledged that the original findings were overstated, misleading, or deficient in some way. As you are also aware, such was the thrust of the testimony of many of the opponents of the bill before your committee as well as before the Senate Health, Education and Social Services ("HESS") Committee previously.

We are now faced with a new set of findings, yet the opponents of the bill have not had the opportunity to provide input on the new proposed findings. In many ways, the new findings are as deficient as the originals. Given their importance to the bill, it is essential for the committee to hear expert commentary on the new findings so that they can gauge their validity and appropriateness. In particular, while we believe it would be most appropriate for HESS to evaluate these findings, in the absence of referring the bill back to HESS and because the corresponding bill has not received a HESS referral on the House side, it's essential that the Judiciary Committee commit to a full hearing on these revised findings.

We would agree to limit the presentation of testimony to the validity of the revised findings alone. You are aware that we wanted additional time to make a more detailed presentation on the findings in their original form. For purposes of this request, we would restrict our expert testimony from delving into further discussion of the substance of the bill or its constitutionality – except as it relates directly to the revised findings. As before, we continue to maintain that a full understanding of all the scientific research about marijuana would take months of hearings. However, we will gratefully accept any time the Committee is willing to

provide on the subject and will do our best not to waste the Committee's time with superfluous or irrelevant information. We will also work with the committee to establish a limited list of witnesses to be invited to testify.

Our experts are scattered across the country, so some advance notice would be helpful. We will make do, however, with whatever flexibility you can provide. You should feel free to contact me and I will in turn contact our team of experts to arrange their attendance at the appointed time. My office number is listed above or you can reach me on my cell phone at 230-0665.

Sincerely,

MWMacL-Ball

Michael W. Macleod-Ball
Executive Director
mwm@akclu.org

cc: Sen. Charlie Huggins (by fax only – 465-3265)
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Testimony on SB 74 before the Senate Judiciary Committee, 4 May 2005

I am an Associate Professor in the Biomedical Program and the Department of Biological Sciences at the University of Alaska Anchorage. I have been the chair of the Nervous System course in the medical school curriculum of the WWAMI Program at UAA since 1992, with an affiliate appointment in the Department of Biological Structure at the University Of Washington School Of Medicine. I mention my university affiliations only to establish my credentials; my statements are not intended to represent the official positions of the University of Alaska or the University of Washington, their administrations, or their boards of regents.

The reason I have taken the time to testify against SB 74 and HB 96 is that, as a medical educator, I find it extremely troubling that these bills attempt to disregard the existing scientific consensus on the health, social, and economic effects of our current marijuana policy and replace it with so-called "findings" that have little or no validity. In my previously submitted written testimony, I tried to describe the process by which genuine scientific consensus is determined, and I included a point-by-point rebuttal of the original findings, based on the best of these published reviews and commission reports. You also received testimony from a number of other independent experts who pointed out major errors in the findings of the bills.

On April 11 before this Committee, the Asst. Attorney General admitted that the original findings in SB 74 were so seriously flawed that the Administration had no choice but to withdraw them and replace them with revised findings. On April 20 we received these revised findings, and we were not surprised to see that they continue to adopt statements of alleged fact that were utterly refuted in both written and oral testimony provided by multiple experts. Although some statements in the original findings have been removed, they have been replaced with new allegations that are equally unsupportable or illogical. In the interest of time, I will concentrate on the entirely new statements in the revised findings.

Finding 1

The claim of "dramatically" increased potency rests the unbelievable value of 1% THC from the "1960s and 1970s". The statement that "marijuana today...is often sold in smaller amounts..." is evidence that any increase in potency *is* resulting in use of smaller quantities. The line about teenagers' price range is ridiculous on its face: kids have always bought and sold pot in quantities they can afford. The claim that large numbers of persons seek emergency medical care due to marijuana related incidents is not supported by any peer-reviewed data. In fact, the very latest clinical data show that use of cannabis is not independently associated with injuries requiring hospitalization, according to the March 2005 issue of the Journal of Trauma Injury, Infection, and Critical Care. A research team at State University of New York at Buffalo, Department of Family Medicine, conducted a retrogression analysis of approximately 900 trauma patients with positive toxicology screens for drugs and alcohol. The authors found, "Alcohol and cocaine use is independently associated with violence-related injuries, whereas opiate use is independently associated with nonviolent injuries and burns. ...Associations of positive toxicology test results for...cannabis...with injury type, injury mechanisms, and outcomes were not statistically significant."

Finding 2

The claim that hundreds of Alaskans undergoing treatment for marijuana abuse is evidence of great harm we have already - butted on three fronts: any "correspondence" between increased potency and increased "treatment admissions" is entirely spurious, not evidence of causation; "treatment admissions" are overwhelmingly coerced; and "emergency medical care due to marijuana-related incidents" deceitfully distorts the data. High rates of coerced treatment of youngsters and Natives may simply reflect their greater exposure to legal and school disciplinary actions, resulting from their lower socioeconomic status.

Finding 3

Regarding dependence on marijuana, we have heard testimony from Deputy Director of Behavioral Health Christi Willer* that DSM-IV includes as evidence of "dependence" simply getting caught! As a neuroscientist, I am particularly annoyed to see completely misleading references to basic neurochemistry. In fact, many, many behaviors "...affect some of the same neurochemical processes" as does THC consumption, including eating, sex, and even shopping. Regarding Marijuana Anonymous, it turns out that these "Anonymous" organizations exist for everything from gambling and overeating, to lip balm use and cluttering. There are Clutterers Anonymous chapters in CA (16 chapters), DE, CN, DC, MD, ME, MA, MI, MN, NE, NJ, NY, OH, PA, TX, VA, and WA—is this "persuasive evidence" of anything?

Finding 4

This revised finding makes claims that confuse correlation with causation and that were already thoroughly rebutted. The latest issue of the journal Psychiatry Research reports that among recent cannabis users, average age of schizotypal symptoms significantly *preceded* age of first use of cannabis. When cases were analyzed individually, the authors affirmed that the majority of respondents in the "Recently Used" [marijuana] group reported schizotypal personality disorder symptoms *prior* to their initiation of use. The authors wrote that "Although researchers recognize an association between cannabis use and psychosis, whether or not cannabis contributes to the development of psychosis remains less clear...The current study...suggest[s] a temporal precedence of schizotypal traits *before* cannabis use in most cases. These findings do not support a causal link between cannabis use and schizotypal traits."

Finding 5

The complex interplay between alcohol abuse and marijuana use was well addressed in previous testimony, particularly that by Dr. Lester Grinspoon. Please note the term used here, "correlative effect"— I challenge the Asst. Attorney General to define it, and I would not blame the Committee members if they feel insulted by this attempt to befuddle them with meaningless, pseudoscientific jargon.

Finding 6

As we have previously noted, the large variety of chemical compounds found in marijuana is of no particular significance. No one disputes that THC binds to neuronal receptors—if it didn't it would have no effect. The relative carcinogenic properties of cannabis smoke vs. tobacco smoke have already been addressed, by me and by others. Regarding bacteria and fungus, there is no evidence (other than anecdotal) that cannabis harbors pathogenic species[†]. Pesticide and fungal contamination, to the degree that it exists, is an artifact of prohibition; under cannabis regulation

there would be standards limiting contamination, and enforcement thereof (as there are for Dutch medicinal cannabis).

Finding 7

The claim that marijuana use is associated with violent crime we have already completely debunked. Frankly I am amazed to see it still appearing in these revised findings. (People are not found to have "marijuana in their system" [sic], nor are they even found to have THC in their systems—they are found to have THC's inactive metabolites.)

Finding 8

This finding begins by again confusing correlation with causation, here regarding the coincidence of parent and child use. It then goes on to misstate the data: the NSDUH Report "How Kids Obtain Marijuana," March 14, 2004, does *not* say they most often "get marijuana at home," it says "they obtained it...inside a home, apartment, or dorm" as opposed to "in a public building, outside in a public area, inside a school building, or outside on school property." Since "family member" is undefined in the report, it may very likely have been an older brother or cousin who does not live in the same household. The lack of deterrent effect from criminal penalties has already been addressed in prior testimony.

The references accompanying the revised findings are also deeply flawed. To give just one example, under (3), the second bullet where it reads "Scientists have demonstrated ..." refers to a July 1997 report in the journal Science wherein "Rats were treated daily for 2 weeks with the potent synthetic cannabinoid HU-210. Withdrawal [was] induced by the cannabinoid antagonist SR 141716A". Nobody believes that this realistically models cannabis use by humans, as explained by Grinspoon and others in a response in the August 1997 issue of Science. In the 7 years since the report, it has not been replicated or extended by any lab, including the authors' own, nor did it influence the conclusions of the later British and Canadian commissions on marijuana that we have cited.

Do the Committee members really want to burden themselves with having to weigh scientific evidence ranging from neuropharmacology to family dynamics? I respectfully suggest that trying to hold hearings on complex medical and sociological studies is an inappropriate use of Alaska legislators' extremely limited and valuable time. If the Alaska State Senate truly wishes to produce reliable findings on marijuana, they should do as many other legislative bodies around the world have done and convene an expert commission, and then give it plenty of time to do its work. I would further respectfully suggest that, for now, the Senate has no alternative but to remove all findings from this bill.

These revised findings before us today are just as bad if not worse than the original ones. Twice now, the Administration has presented you with a set of findings that you would, I believe, have been embarrassed to pass into law. How many chances are you going to give the Administration to work on them? The Legislature simply does not have time to do the job of screening multiple sets of flawed findings brought to it by an Administration that wishes to "assist" "...the courts in Alaska to come to different conclusions about state statutes..."

* It is worth noting that every one of the witnesses who has testified in support of this bill has a vested interest in seeing laws against marijuana maintained and seeing this bill passed. With all due respect to the Asst. Attorney General, Behavioral Health personnel, and members of the federal Office of National Drug Control Policy, their livelihoods (and to a lesser extent, that of the State Troopers) benefit from maintaining the perception that marijuana is a dangerous drug. Our expert witnesses, on the other hand, are independent academics who have no financial or other vested interest in one side of the issue or the other.

Furthermore, the opinions of Behavioral Health staffers regarding the need in rural Alaska to increase penalties for marijuana possession are not the only opinions out there. I had a chance to talk last month with the personnel director at the YKHC hospital in Bethel. He was discussing their problems with turnover (40% annually) and the poor preparedness of high school students for work or further education. I asked him about substance abuse as part of the problem, and specifically whether increasing penalties for marijuana would make any difference. He said it would not.

† According to the Lip Balm Anonymous Home Page, "Overuse of a balm or jelly creates a crust on the lips which traps bacteria and fungi creating a state of permanent inflammation."