

NIDA NIDUS of NONSENSE

1970s THC is good for cancer  
treatment – kill the research  
Life long THC results in leaner  
tumor free rodents that live  
Longer than littermates – kill  
the research

# History

- 1975 Munson et al reported in the Journal of the National Cancer Institute Antineoplastic Activity of Cannabinoids THC and CBN and CBD in virus induced leukemia, Lewis lung adenocarcinoma cells.
- THE END



# Cannabinoids for Cancer Treatment: Progress and Promise

Sami Sarfaraz, Vaqar M. Adhami, Deeba N. Syed, Farrukh Afaq, and Hasan Mukhtar

Chemoprevention Program, Paul P. Carbone Comprehensive Cancer Center and Department of Dermatology, School of Medicine and Public Health, University of Wisconsin, Madison, Wisconsin

**Abstract** . **Cancer Res 2008 68:339-42**

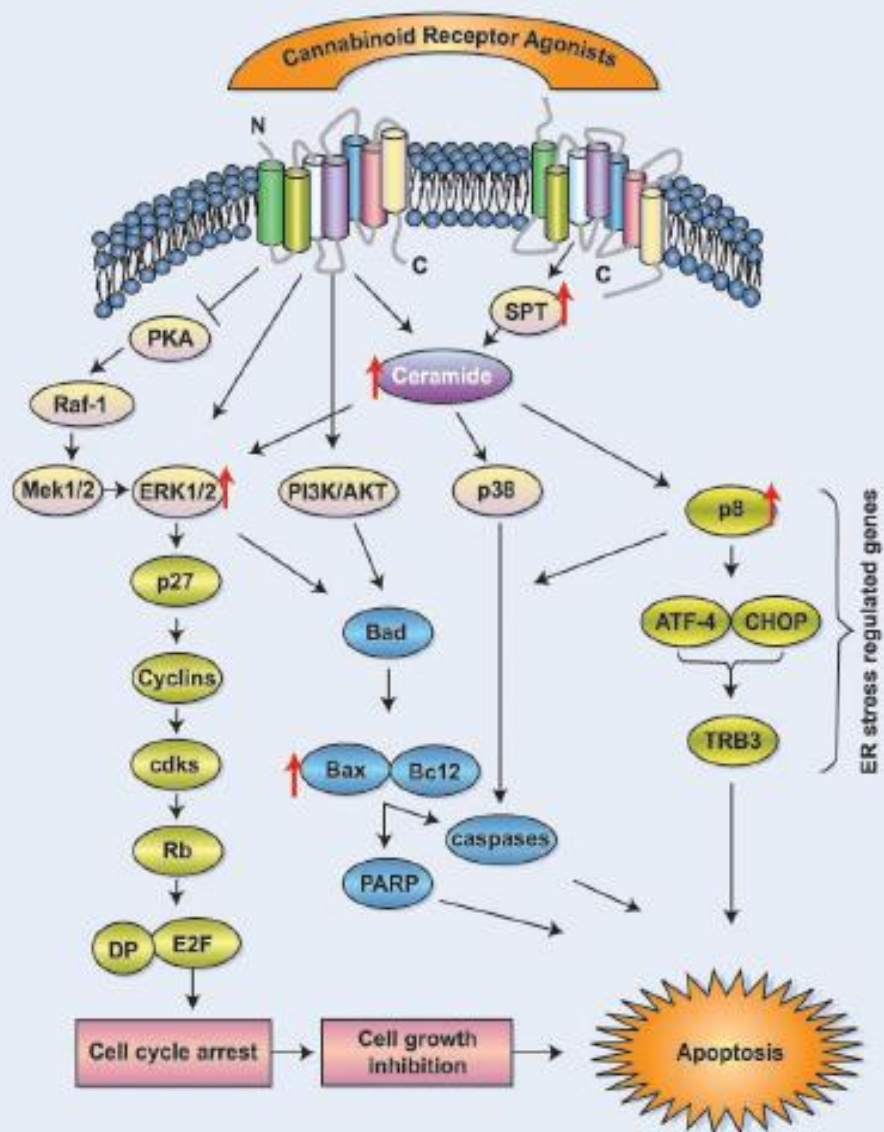
**Cannabinoids are a class of pharmacologic compounds that offer potential applications as antitumor drugs, based on the ability of some members of this class to limit inflammation, cell proliferation, and cell survival. In particular, emerging evidence suggests that agonists of cannabinoid receptors expressed by tumor cells may offer a novel strategy to treat cancer. Here, we review recent work that raises interest in the development and exploration of potent, nontoxic, and nonhabit forming cannabinoids for cancer therapy. [Cancer Res 2008;68(2):339–42]**

## **Cannabinoid Receptors: A Brief Overview**

Cannabinoid refers to a group of chemicals naturally found in the marijuana plant *Cannabis sativa L.* and includes compounds that are either structurally or pharmacologically similar to  $\Delta(9)$ -tetrahydrocannabinol or those that bind to the cannabinoid receptors. It was earlier thought that cannabinoids exert their physiologic and behavioral effects via nonspecific interaction with cell membranes. Although anticancer effects of cannabinoids were

## **Cannabinoids in the Treatme**

Cancer is a disease characterized by uncontrolled cell growth and their ability to spread. This is often caused by damage to DNA, resulting in mutations that affect the apoptotic machinery. Thus, agents that can maintain steady-state cell population by modulating signaling intermediates leading to inhibition of cell growth are useful for targeted therapy of cancer. In this review, we develop novel targets and mechanisms for the management of cancer. A significant milestone in the use in cancer treatment came through the discovery of the utility of these compounds for targeting cancer cells. In the early 1970s, cannabinoids were shown to significantly prolong the life of mice bearing Lewis lung carcinoma (and references therein). In subsequent years, mechanisms for these effects were analyzed. Cannabinoids inhibited tumor cell growth by modulating different cell signaling pathways in lymphomas, prostate, breast, lung, skin, and colon (2–7). Encouraging data about the inhibition of tumor growth by cannabinoid receptor agonists in some



- In all studies, mean body weights of dosed male and female rats and mice were lower than controls but feed consumptions were similar.

Obesity and Cannabis Use: Results From 2 Representative National Surveys

Yann Le Strat\* and Bernard Le Foll

Initially submitted January 29, 2010; accepted for publication March 24, 2011.

The role of cannabis and endocannabinoids in appetite regulation has been extensively studied, but the association of cannabis use with weight in the general population is not known. The authors used data from 2 representative epidemiologic studies of US adults aged 18 years or older, the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; 2001–2002) and the National Comorbidity Survey–Replication (NCS-R; 2001–2003), to estimate the prevalence of obesity as a function of cannabis use. The adjusted prevalences of obesity in the NESARC and the NCS-R were 22.0% and 25.3%, respectively, among participants reporting no use of cannabis in the past 12 months and 14.3% and 17.2%, respectively, among participants reporting the use of cannabis at least 3 days per week. These differences were not accounted for by tobacco smoking status. Additionally, after adjustment for sex and age, the use of cannabis was associated with body mass index differences in both samples. The authors conclude that the prevalence of obesity is lower in cannabis users than in nonusers.

- In the 2-year studies, survival of dosed rats was higher than controls; that of mice was similar to controls. Incidences of testicular interstitial cell, pituitary gland adenomas in male rats, mammary gland fibroadenoma and uterus stromal polyp in female rats, and hepatocellular adenoma/carcinoma in male and female mice were reduced in a dose-related manner.

Marihuana NIDA  
Researchers learned  
funding depends on  
**claiming harm** – some  
silly examples

*Neurology* 2002;59:1337-1343

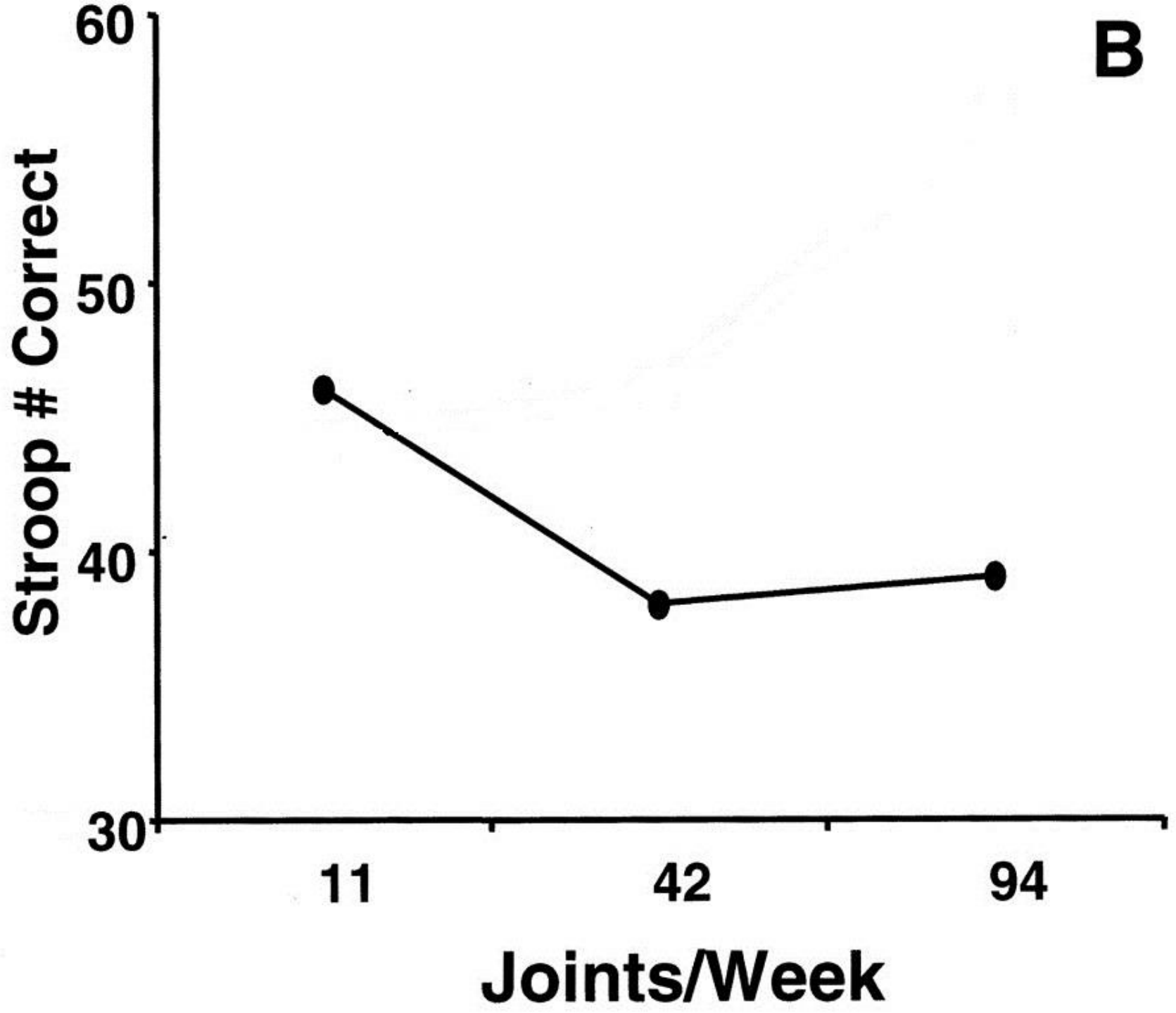
© 2002 [American Academy of Neurology](#)

Dose-related neurocognitive effects of marijuana use

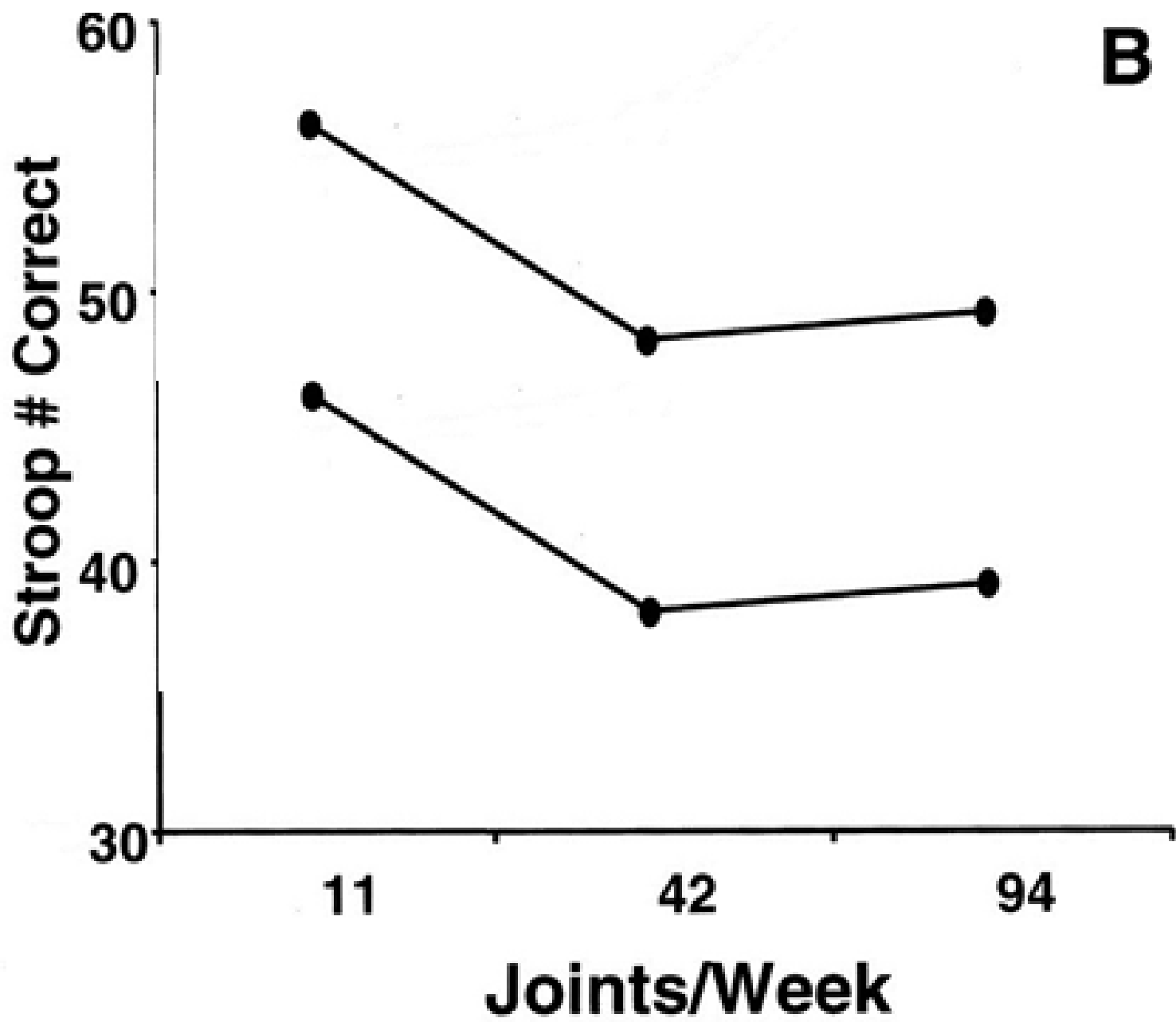
K.I. Bolla, PhD, K. Brown, MPH, D. Eldreth, BA, K. Tate, BA and J.L. Cadet, MD

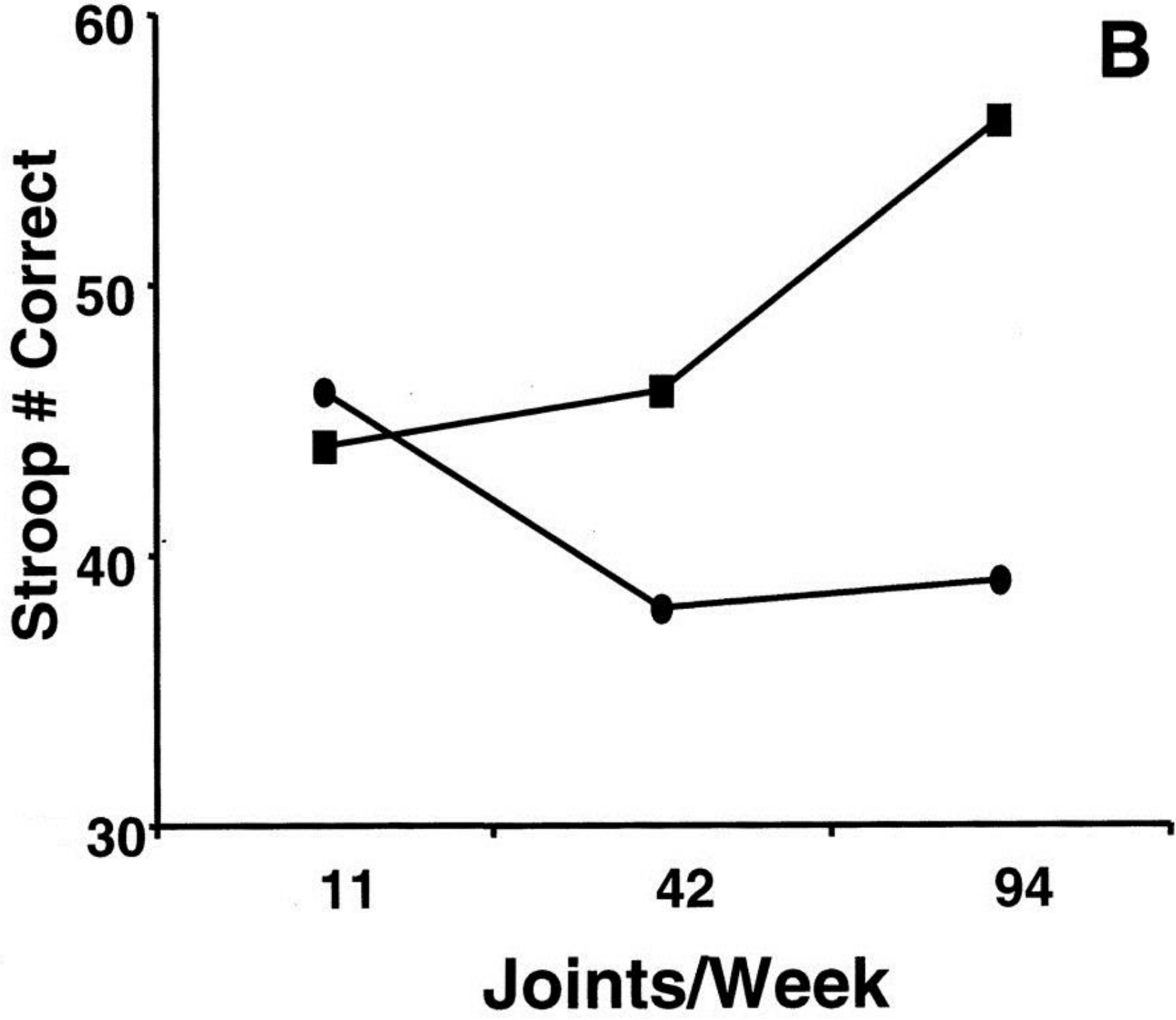
***Conclusions:*** Very heavy use of marijuana is associated with persistent decrements in neurocognitive performance even after 28 days of abstinence. It is unclear if these decrements will resolve with continued abstinence or become progressively worse with continued heavy marijuana use.

**B**









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STATE OF VERMONT

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### ***Brain Development***

Development of the brain continues through adolescence and young adulthood, making adolescents particularly susceptible to the negative effects of marijuana.

### ***Lower Educational Achievement***

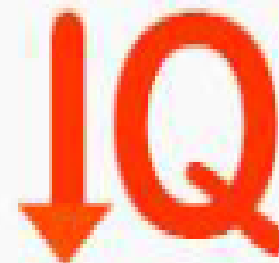
Data from three long term studies consistently showed lower educational achievement as a negative impact of adolescent marijuana use.

### ***Decline in IQ Points***

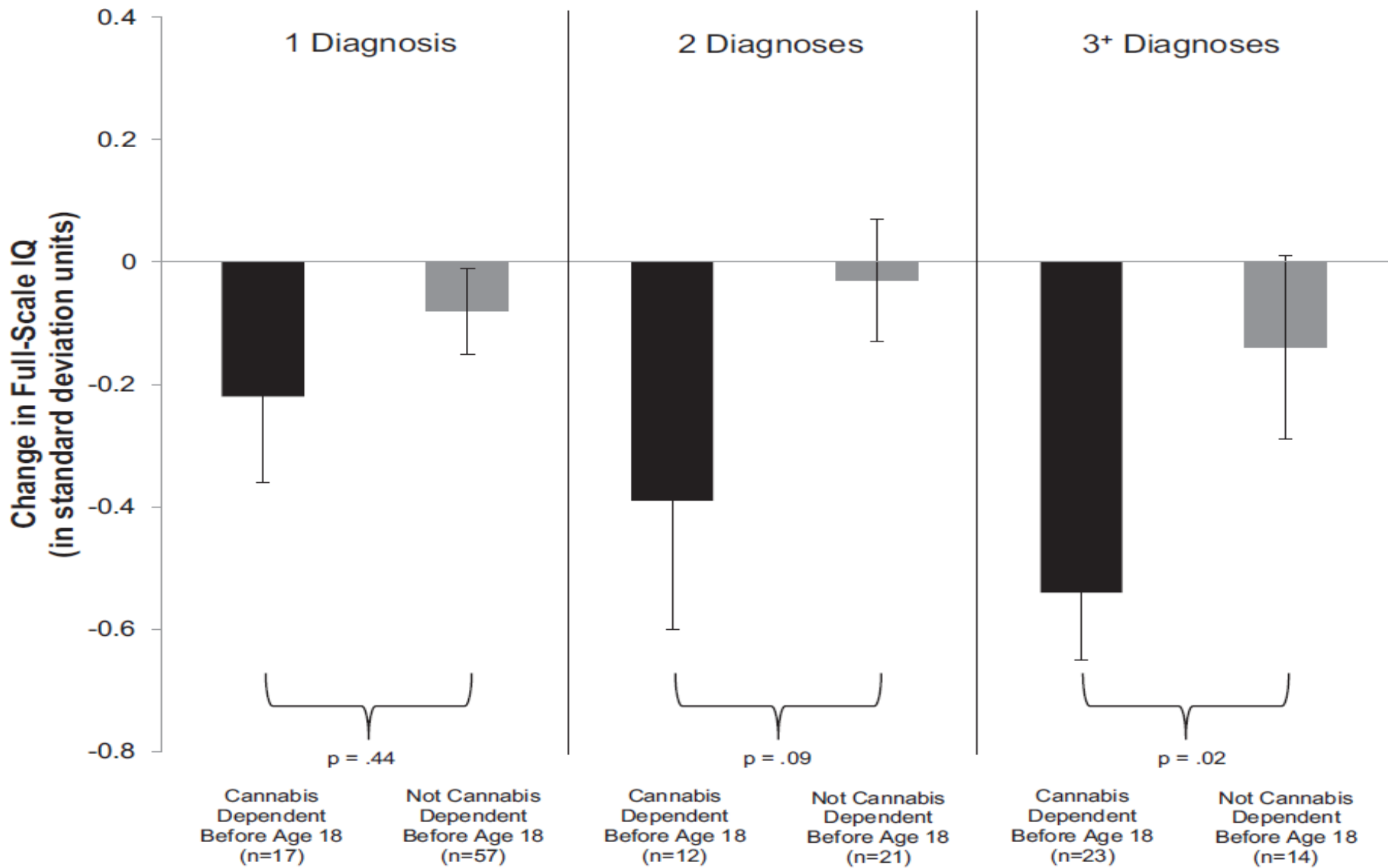
A recent National Institute on Drug Abuse (NIDA) funded review of scientific literature on adolescent marijuana use suggests that earlier use is associated with poorer attention span and reduced IQ.

### **More Information:**

- [Considering Marijuana Legalization: Insights for Vermont](#) (exit VDH) 2015 RAND Corporation report outlines options and issues regarding marijuana legalization in Vermont.
- [Health Effects of Marijuana Use Among Vermont School-Aged Youth](#)
- [Marijuana Use and Educational Outcomes](#) (exit VDH) (NIDA)



Regular heavy marijuana use by teens can lead to an IQ drop of up to **8 points**<sup>1</sup>



*Table 4. Ethnic identity and life outcomes by age 25 before and after control for cannabis use during ages 14–21*

Outcome	Before adjustment			After adjustment		
	OR/IRR	95% CI	p	OR/IRR	95% CI	p
Education						
Leaving school without qualifications	2.21	1.42–3.44	<0.0001	1.88	1.18–3.01	<0.01
Gaining university degree by age 25	0.17	0.08–0.37	<0.0001	0.19	0.08–0.41	<0.0001
Income and employment						
Below median income level, age 25	2.04	1.37–3.06	<0.001	1.91	1.27–2.87	<0.01
Unemployed for ≥6 months, ages 21–25	2.18	1.32–3.57	<0.01	1.88	1.12–3.14	<0.05
Welfare dependent, ages 21–25	2.63	1.76–3.93	<0.0001	2.40	1.59–3.62	<0.0001
Mental health						
Rate of mental disorders, ages 21–25	1.51	1.13–2.01	<0.01	1.34	1.01–1.77	<0.05
Criminal offending						
Self-reported property/violent offending, ages 18–21	4.69	2.46–8.91	<0.0001	2.64	1.46–4.77	<0.001
Intimate partner violence						
Intimate partner violence perpetration, ages 24–25	2.08	1.37–3.17	<0.001	1.97	1.29–2.99	<0.0001
Intimate partner violence victimization, ages 24–25	2.61	1.71–3.97	<0.0001	2.48	1.64–3.72	<0.0001

CI, confidence interval; IRR, incidence rate ratio; OR, odds ratio.

# Persistent cannabis users show neuropsychological decline from childhood to midlife

Madeline H. Meier<sup>a,b,1</sup>, Avshalom Caspi<sup>a,b,c,d,e</sup>, Antony Ambler<sup>e,f</sup>, HonaLee Harrington<sup>b,c,d</sup>, Renate Houts<sup>b,c,d</sup>, Richard S. E. Keefe<sup>d</sup>, Kay McDonald<sup>f</sup>, Aimee Ward<sup>f</sup>, Richie Poulton<sup>f</sup>, and Terrie E. Moffitt<sup>a,b,c,d,e</sup>

*Psychological Medicine* (2016), 46, 877–889. © Cambridge University Press 2015  
doi:10.1017/S0033291715002482

ORIGINAL ARTICLE

## Which adolescents develop persistent substance dependence in adulthood? Using population-representative longitudinal data to inform universal risk assessment

M. H. Meier<sup>1\*</sup>, W. Hall<sup>2,3</sup>, A. Caspi<sup>4,5,6</sup>, D. W. Belsky<sup>7,8</sup>, M. Cerdá<sup>9</sup>, H. L. Harrington<sup>4,5</sup>, R. Houts<sup>4,5</sup>, R. Poulton<sup>10</sup> and T. E. Moffitt<sup>4,5,6</sup>

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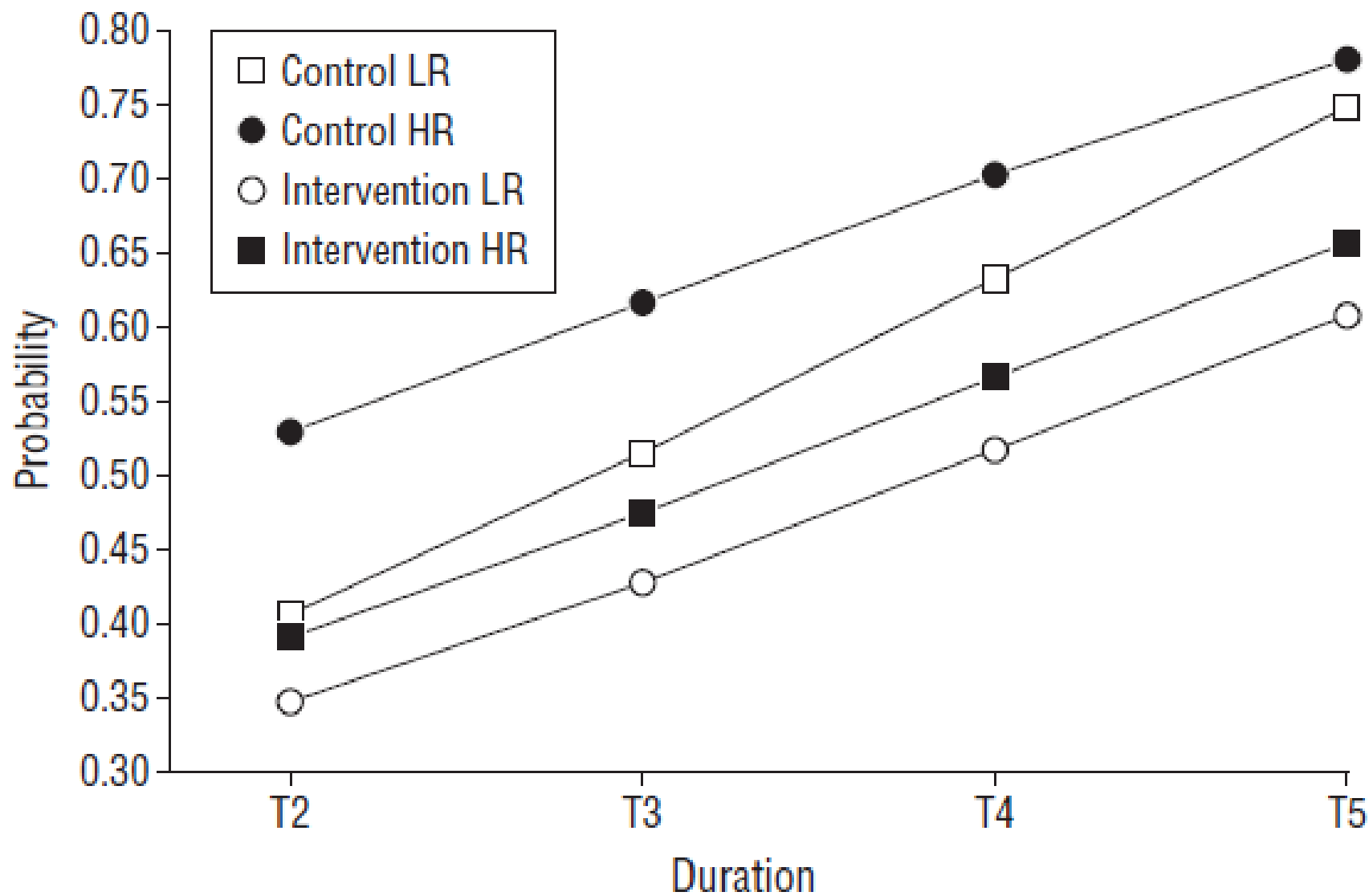
Risk factor removed from the cumulative risk index	AUC for the cumulative risk index
No risk factors removed	0.80
Low family socioeconomic status	0.80
Family history of substance dependence	0.79
Childhood conduct disorder	0.79
Childhood depression	0.79
Early exposure to substances	0.79
Adolescent frequent alcohol use	0.80
Adolescent frequent tobacco use	0.75
Adolescent frequent cannabis use	0.80
Male	0.78

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Patricia Conrod,  
Psychiatry Grand Rounds  
25 October, 2013

**Individual and population level  
benefits of targeting personality  
risk factors for psychopathology  
in school based interventions**





Thursday  $7 \mid 2^2(7) \mid 16$

569

704

$\frac{11^2}{10}$

20:30  
21:30  
22:30  
23:30  
24:30  
25:30  
26:30  
27:30  
28:30  
29:30  
30:30



## Get pencils and paper out:

Lianna makes two 4-digit numbers using each of the digits 1, 2, 3, 4, 5, 6, 7 and 8 exactly once. If Lianna makes the numbers so that adding them gives the smallest possible total, what is that total?

Which is important as **high IQ is a risk factor** for Drug use – cohort from England over 11,000 participants, and

at 42-50 years old continued **drug use** is associated with **better cognitive function** – cohort 6,713 participants

# Cannabis Use Is Quantitatively Associated with Nucleus Accumbens and Amygdala Abnormalities in Young Adult Recreational Users

JodiM.Gilman,1,4,5

JohnK.Kuster,1,2\*SangLee,1,6\*MyungJooLee,1,6\*ByoungWooKim,1,6

NikosMakris,3,5 AndrevanderKouwe,4,5

AnneJ.Blood,1,2,4,5†andHansC.Breiter1,2,4,6†

TheJournalofNeuroscience, **April16,2014**

# Daily Marijuana Use Is Not Associated with Brain Morphometric Measures in Adolescents or Adults

XBarbaraJ.Weiland,<sup>1</sup> RachelE.Thayer,<sup>1</sup> XBrendanE.Depue,<sup>2</sup> AmithrupaSabbineni,<sup>1</sup>  
AngelaD.Bryan,<sup>1</sup> andKentE.Hutchison<sup>1</sup>

TheJournalofNeuroscience, **January 28, 2015**

# REPUBLICAN BRAIN

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The Science of Why They  
Deny Science—and Reality

CHRIS MOONY 2012

# NIDA PROPAGAND is BAD –

This has resulted in **well meaning people** harassing kids about cannabis use, **overlooking the diagnosis** that would lead to successful intervention and change the **UNFORTUNATE OUTCOMES.**



After over 40 years of searching for harm from

**MARIHUANA**

**NIDA = NADA**

*Weed is illegal because it's  
a dangerous drug that destroys families.*

**FALSE**

**Cannabis is illegal** because it can  
treat cancer, PTSD, seizures, anxiety,  
glaucoma, and depression, which means  
no money for pharmaceutical  
companies.



# The Good News

Medical Cannabis states have **fewer fatal automobile accidents**, on weekends and **reduced opiate over doses**, after enactment, possibly due to cannabis substitution for more toxic drugs.

Legal Cannabis states note a **decline in beer consumption**, possibly due to cannabis substitution for **beer**.

**ALL GOOD**

Medical Cannabis laws **did not result in:**  
**Teens** increasing use rates,  
Or **recreational** use in general –  
evidence from ED visits and arrestees.  
No evidence of **birth defects** from use.  
There **were drops in violent crimes**

<http://www.safeaccessnow.org/briefingbook115>

So who is going to start using Cannabis when it is **legal**?

**The kids already have access** from dealers who would rather make money off a pocket full of pills than a knapsack of marijuana.

**20 – 35 year olds have the same access already.**

Which leaves **adults** who  
do not like risk taking and  
do not want access to dealers,  
but would shield their garden,  
And keep the grand kids out  
of their precious medicine.

Olders substitute cannabis for Big Pharma chemicals! \$165M/year

What sort of problems do adults have that require medication?

**Musculoskeletal:** osteoarthritis, pain, osteoporosis (bone loss), gout, loss of muscle mass, fractures.

**Hormonal:** Diabetes, slower metabolism.

**Neurologic:** dementia, Parkinson's disease, strokes, poor vision, hearing impairment, balance problem

**And Psychiatric:**

depression, anxiety,

Sleep disturbances – insomnia, OSA

These problems can be addressed  
by cannabis.





**Dr. Sanjay Gupta Talks Truth,  
Immorality, Opioids and “Weed” 4**

**N.Y. / REGION** | When Retirement Comes With a Daily Dose of **Cannabis** NY Times 20 Febraury, 2017



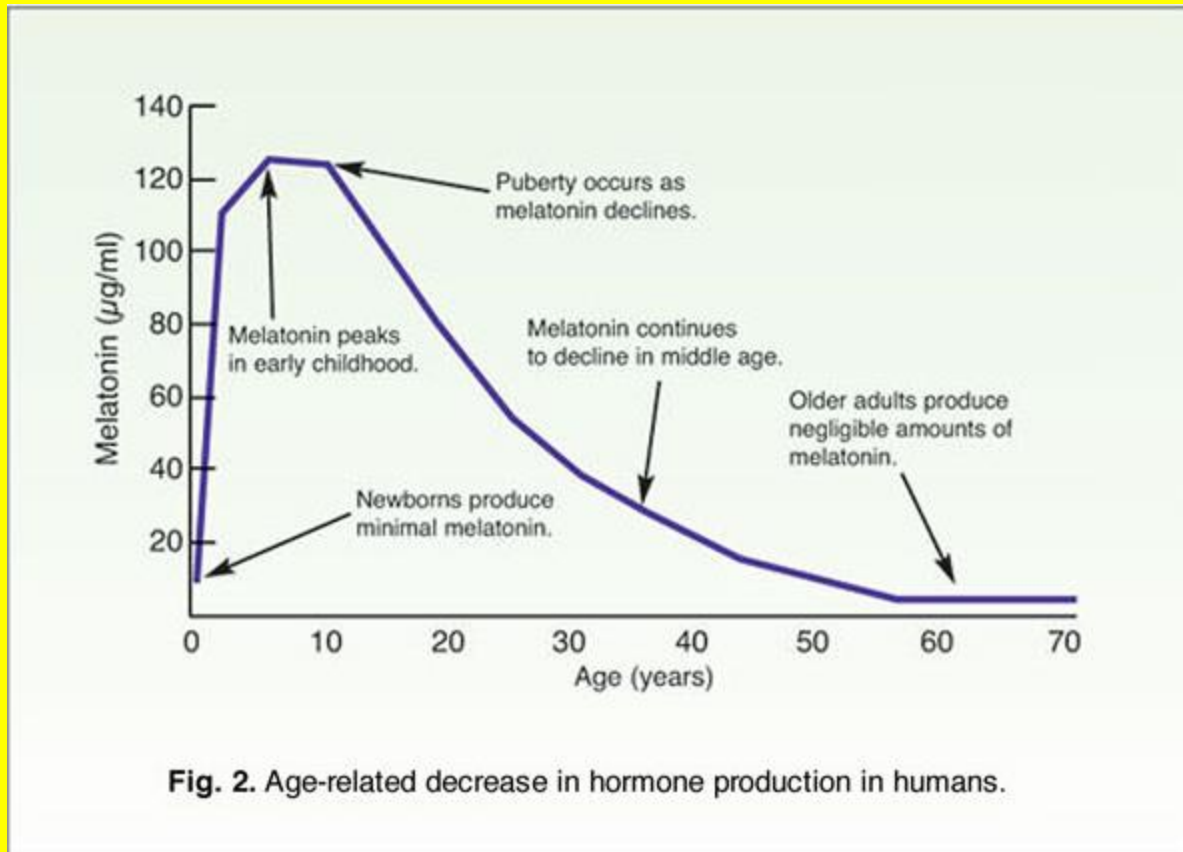
Ruth Brunn, 98, taking her medicinal marijuana with vitamin water at the Hebrew Home at Riverdale in New York City earlier this month. Yana Paskova for The New York Times

# What happens with sleep in aging?

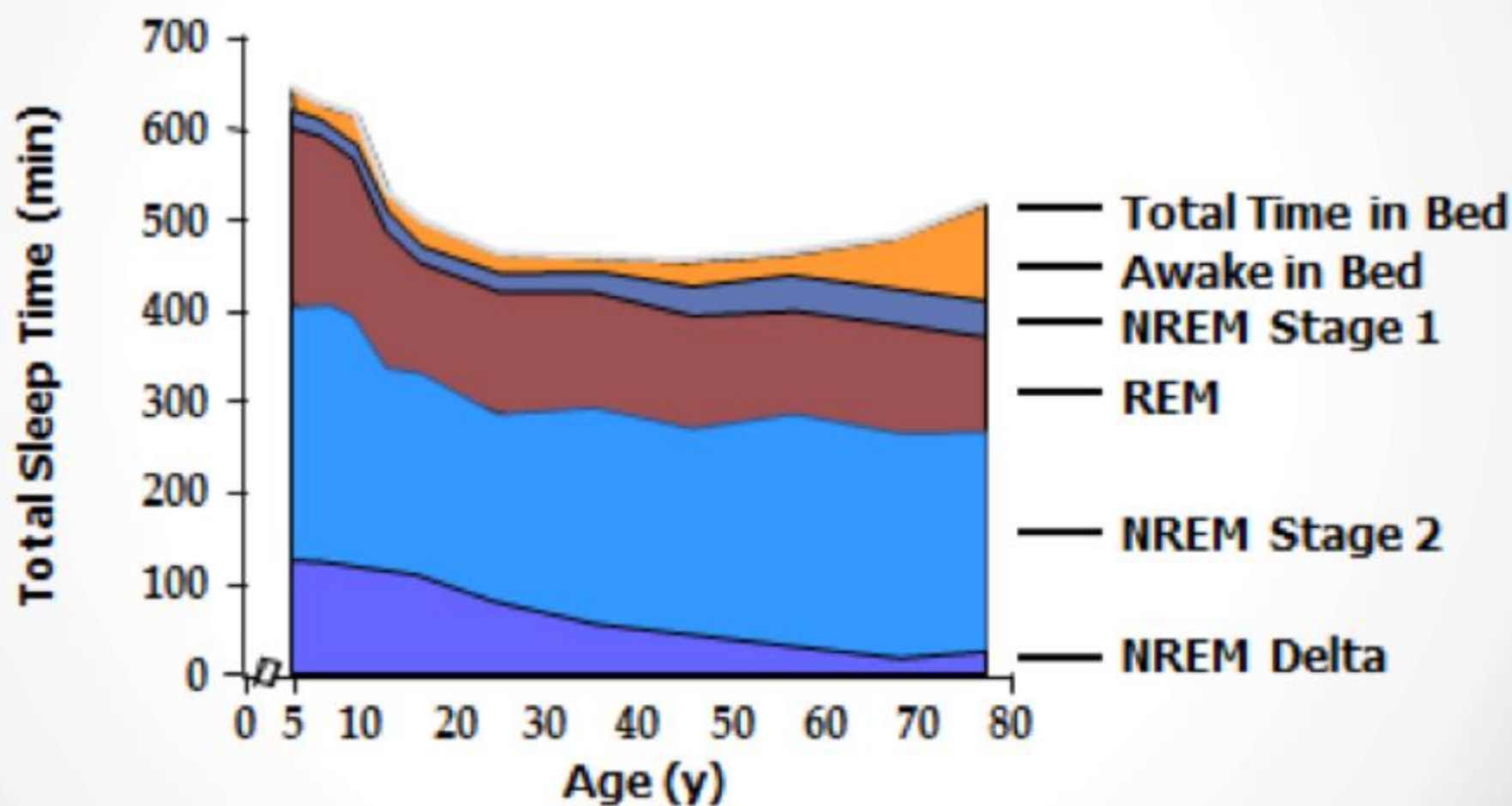
The biological clock begins to get floppy around age 30 years.

## Melatonin –

## Zeitgeber for hypothalamic hormonal functions



# Sleep Across the Life Span



EM = rapid eye movement; NREM = nonrapid eye movement

Lack of sleep -> increased ghrelin – makes you eat more  
and decreased leptin signals starving => obesity

**Decreased SWS** (19% at 20, 3% midlife) -> **decreased growth hormone**

After age 50 **cortisol increases** -> **loss of bone and muscle,**

**Obesity, insulin resistance HTN and neuronal death**

Suprachiasmatic nucleus, zeitgeber to the pineal gland gets funky

-> fragmented biorhythm, **less efficient sleep, more naps, death**

What to do? Invoke the relaxation reflex,

**Sleep hygiene**, light and dark, eating

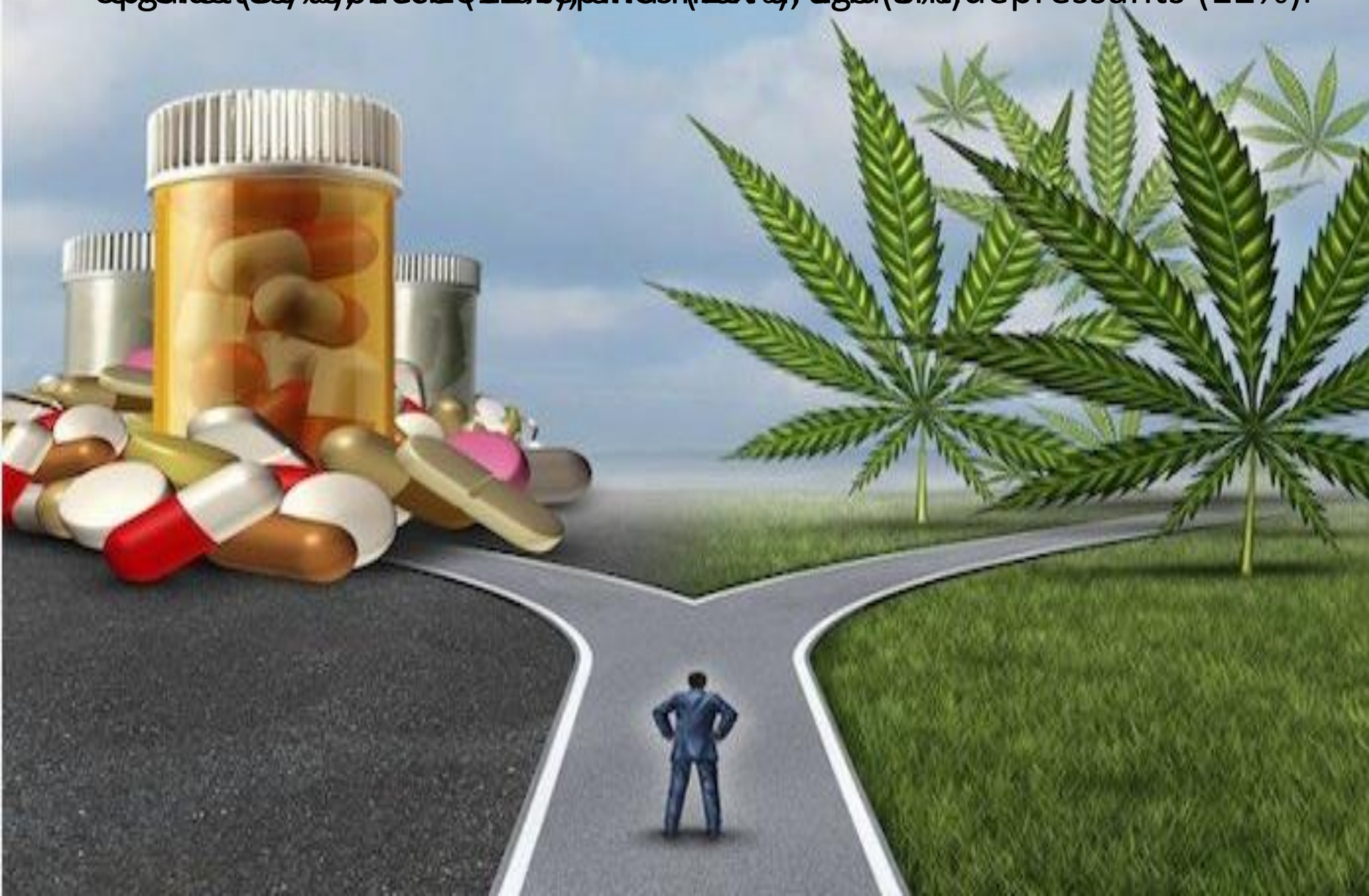
Vigorous **exercise**, the endocannabinoids

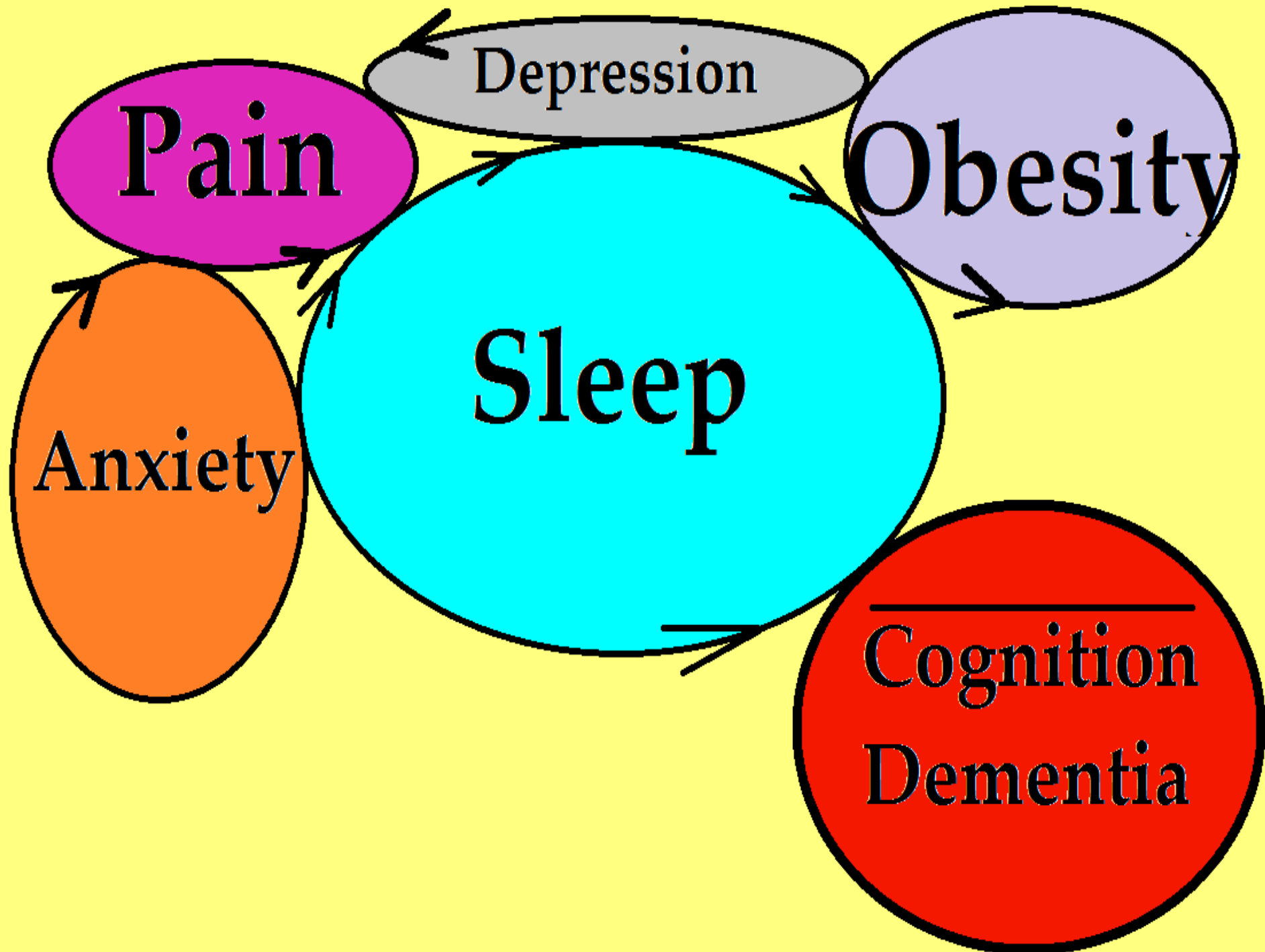
sauna, **avoid GABA** sedatives, alcohol

**Breathing in sleep** – OSA, UARS

upper airway resistance syndrome

2017 study also reported cannabis substituted for prescription drugs (25%),  
cigarettes (30%), beer (12%), painkillers (16%), drugs (3%), depressants (12%).





**Pain**

**Depression**

**Obesity**

**Sleep**

**Anxiety**

**Cognition  
Dementia**

# Sleep and Dementia,

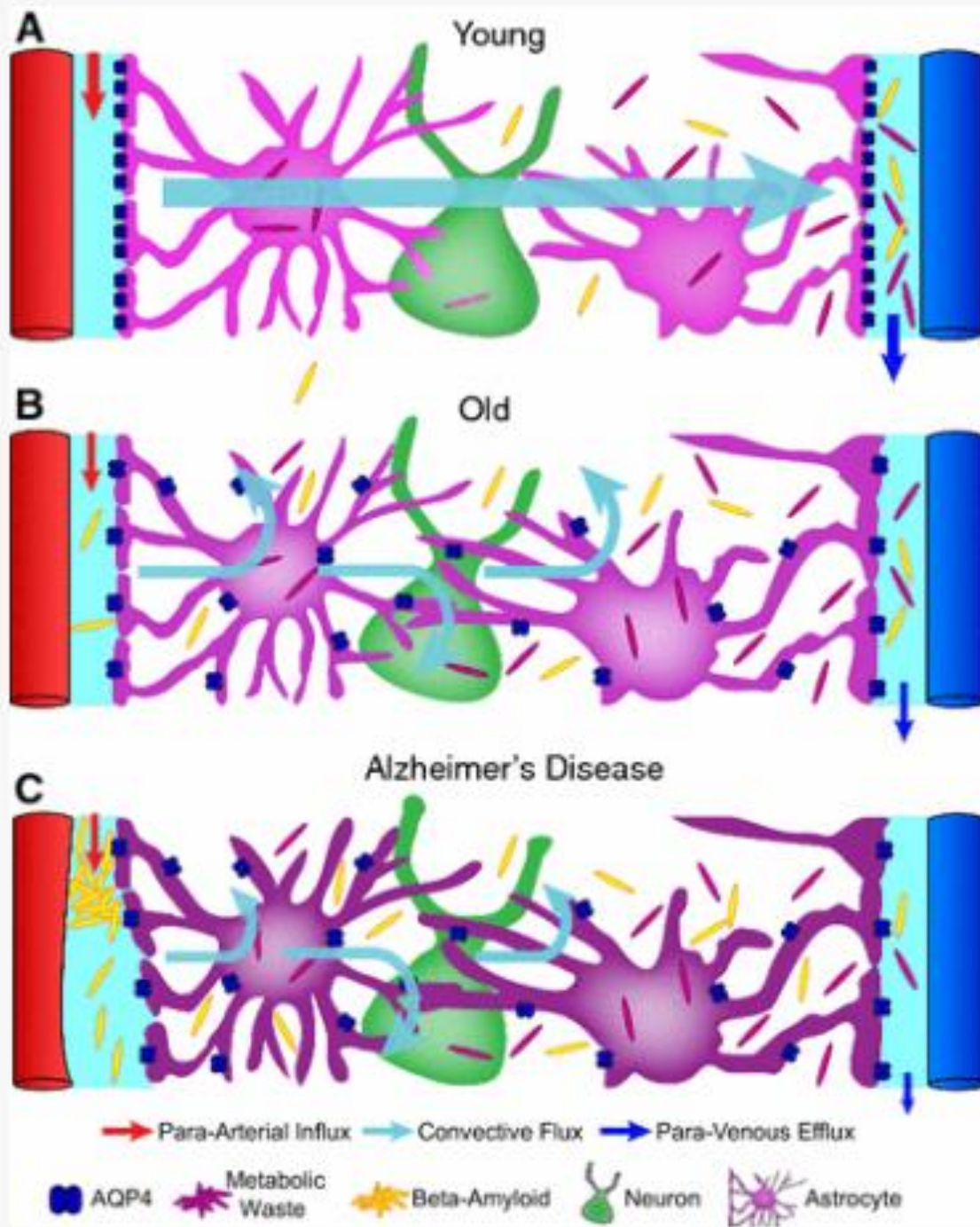
**Endocannabinoids and cannabis help by  
Increasing Slow Wave Sleep**


**Less PHARMA**

Including **42% less opiates** for pain

And less **Benzos** for anxiety and insomnia





Obesity CPAP Cannabis  
Exercise 

**Pain**

Exercise 

Cannabis

**Opiates**

**Benzos**

Muscle

Relaxants 

Better Sleep

Badder Sleep

Anxiety

 Exercise

Cannabis

 Benzos

Booze

# Institute of Medicine Report, 1999

**CONCLUSION:** At this point, our knowledge about the biology of marijuana and cannabinoids allows us to make some general conclusions:

**\*Cannabinoids likely have a natural role in pain modulation, control of movement, and memory.**

\*The natural role of cannabinoids in immune systems is likely multifaceted and remains unclear.

\*The brain develops tolerance to cannabinoids.

\*Animal research demonstrates the potential for dependence, but this potential is observed under a narrower range of conditions than with benzodiazepines, opiates, cocaine, or nicotine.

\*Withdrawal symptoms can be observed in animals, but appear to be mild compared to opiates or benzodiazepines, such as diazepam (Valium®).

**CONCLUSION:** The **psychological effects of cannabinoids, such as anxiety reduction, sedation, and euphoria can influence their potential therapeutic value** Those

effects are potentially undesirable for certain patients and situations, and beneficial for others.

# Care and Feeding of the Endocannabinoid System: A Systematic Review of Potential Clinical Interventions that Upregulate the Endocannabinoid System

John M. McPartland , Geoffrey W. Guy, Vincenzo Di Marzo

[Care and feeding of the endocannabinoid system.pdf](#)

relax, eat, sleep, forget, and protect

# Kick Back and Heal

Yoga, massage and meditation - unknown

agent	anti inflamm + 2xhydrocortisone 20xASA	analgesic CB1&2	muscle relaxant +	antioxidant +	tumor cell toxic +	antifungal	MERSA cidal	GABA uptake inhibitor	anti depressant via 5HT1A antagonist	anti convulsant	sedative	TRPV2 agonist	broncho dilatory	5HT1A agonist anti anxiety	addiction Rx inhibiting insula	GABA uptake inhibitor	CB1 blocker antipsych	TRPV1	mono terpinoids	skin permeability	pulmonayr absorption	ach inhibitor	
THC													+		+								
CBD	+	+		+	+		+			+					+	+			+				
CBC						+	+		+														
CBG	+	alpha2	+		+	+	+	+	+														
THCV																							
CBDV										+													
CBN	+				+		+				+	+											
pinene	+						+																+
limonine				+	+				+	+	14%up 35%up		+							+	+		
linalool	+		+		+					+	73%down	+		+		+							
Caryophyllene	CB2	+													+					sesqui			
nerolidol						+															+		
myrcene	+	+	+							+													
beta-asarone																							+

agent	anti inflamm + 2xhydrocortisone 20xASA	analgesic CB1&2	muscle relaxant +	antioxidant +	tumor cell toxic +	antifungal	MERSA cidal	GABA uptake inhibitor	anti depressant via 5HT1A antagonist	anti convulsant	sedative	TRPV2 agonist	broncho dilatory	5HT1A agonist anti anxiety	addiction Rx inhibiting insula	GABA uptake inhibitor	CB1 blocker antipsych	TRPV1	mono terpinoids	skin permeability	pulmonayr absorption	ach inhibitor	
THC	+	2xhydrocortisone 20xASA	CB1&2	+	+	+	+																
CBD	+	+			+		+			+													+
CBC						+	+		+														+
CBG	+	alpha2	+		+	+	+	+	+														
THCV																							+
CBDV										+													
CBN	+				+		+					+	+										
pinene	+						+																
limonine					+		+		+	+	14%up 35%up									+	+		
linalool	+		+		+					+	73%down	+		+		+							+
Caryophyllene	CB2	+													+					sesqui			
nerolidol						+															+		
myrcene	+	+	+							+													
beta-asarone																							+

# CHEMOTYPES

Bottom Line:

**Cannabis is safer than OTC**

medicines like ASA and Tylenol

**Side effects in the elderly such as  
anxiety reduction, sedation,**

**euphoria, pain control, N3 sleep**

**Good for therapeutic value!**

In Summary:

NIDA – Propaganda-Vomit

H170- Oldtimers – Sleep –

Anxiety – Pain – Inflammation

Cannabis - Good