Cannabis

CANNABIS GROWS AND THEIR HAZARDS

Cannabis

Topics

Legislation
Chemical Hazards
Electrical Hazards
Mold Hazards
Cultivation
Extractions
Grow sites

Cannabis

WHAT IS CANNABIS
OR
HEMP?

Cannabis

Is it Legal
Or
Illegal?

Cannabis

Which has THC?

All Cannabis has THC!

CANNABIS

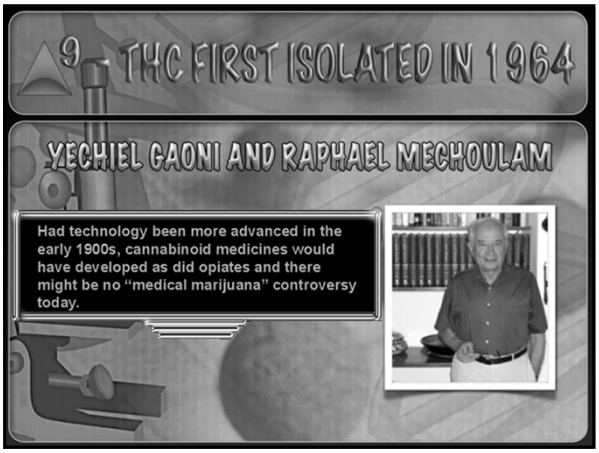
DRUGS DERIVED FROM THE VARIOUS SPECIES OF CANNABIS PLANTS

MARIJUANA

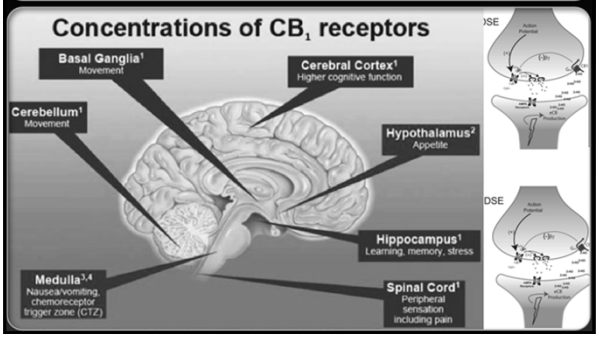
CONCENTRATED CANNABIS
- **HASHISH, HASHISH OIL**

SYNTHETIC CANNABIS
- **MARINOL, DRONABINOL**

SYNTHETIC CANNABINOIDS
- **SPICE, K2,(Over 700 compounds)**



IN THE EARLY 1990'S TWO CANNABINOID RECEPTORS CB1 AND CB2, WERE IDENTIFIED AND CLONED



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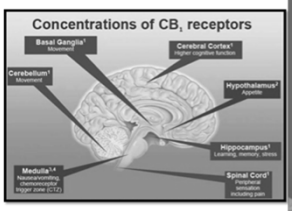
Toxicology

- CB1 receptors
  - Psychoactive effects
  - Euphoria
  - Lack of coordination
  - Disorientation
- CB2 receptors
  - Pain perception
  - Inflammatory response



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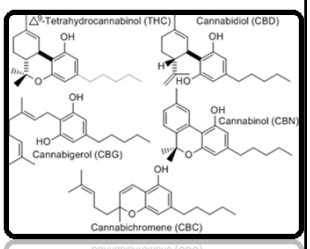
The Cannabinoids

Cannabinoids are unique to cannabis

Over 80 cannabinoids identified

- **Most are not psychoactive**
- **6 prominent in most species**



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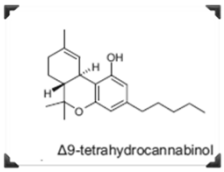
The Cannabinoids

Δ^9-Tetrahydrocannabinol (Δ^9-THC)

- **Most active cannabinoid**
- **Responsible for the psychotropic effects of the drug**
- **Present in all strains of cannabis**



Δ9-THC

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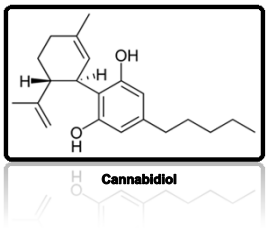
The Cannabinoids

Cannabidiol (CBD)

- **Appears in all strains of cannabis**
  - **Concentration varies (trace – 95%)**
- **Has sedative effect**
- **Has effect on Immune System**
- **Has effect on opioid receptors for pain**



Cannabidiol

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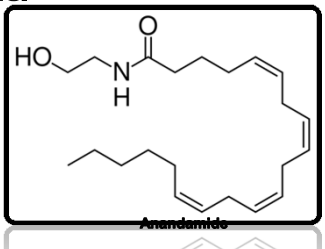
The Cannabinoids

Cannabinoid receptors are activated by a neurotransmitter called Anandamide.



Anandamide

Cannabis

The Cannabinoids

Anandamide

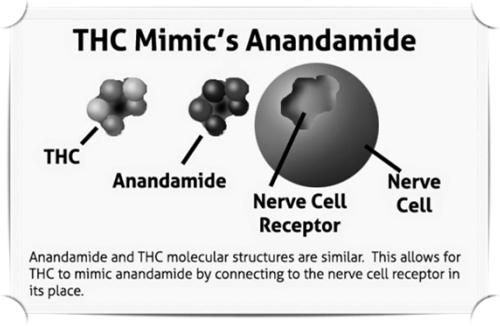
In the body it plays a key role in:

- **Depression**
- **Appetite**
- **Memory**
- **Fertility**

Anandamide binds to CB1 and CB2 receptors in the brain and other parts of the body.

Cannabis

The Cannabinoids



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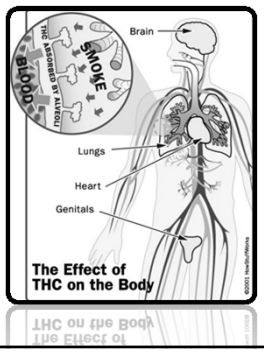
Cannabis Pharmacology

Smoking Marijuana

- **THC enters the body through the lungs**
  18% - 50% absorbed
- **Lungs immediately absorb THC where it enters the blood**
- **Once in the bloodstream, the effects are felt within seconds**



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Cannabis Pharmacology

Ingesting Marijuana

- **THC enters the stomach and absorbed into the blood**
  - **5% - 20% absorbed**
- **THC travels to the liver and rest of body**
- **THC absorbs slower by this route**
  - **Results in lower THC levels, but longer lasting effects**

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Cannabis Pharmacology

Physical effects of THC wear off after 1 to 2 hours

Half-life of THC = 20 hours to 10 days depending on dose

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Cannabis Pharmacology

Drug	Urine	Blood	Hair
MJ-Single Use	1 – 7+ days	12 – 24 hours	Doubtful
MJ-Regular Use	7 – 100 days	2 – 7 days	Months
Amphetamines	1 – 3 days	24 hours	Months
Cocaine	1 – 3 days	1 – 3 days	Months
Heroin/Opiates	1 – 4 days	1 – 3 days	Months
PCP	3 – 7 days	1 – 3 days	Months

California NORML Guide

Majority of THC eliminated in the feces (65%)

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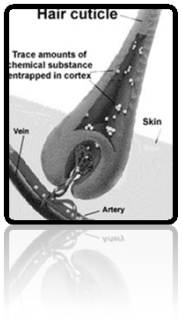
Cannabis Pharmacology

Drug metabolites (including MJ) become trapped in the cortex of hair



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Cannabis Pharmacology

MJ broken down into metabolites in the body

2 most popular

- **11-hydroxy-THC**
  - **Primary metabolite**
  - **Psychoactive in the body**
- **11-nor-9-carboxy-THC**
  - **Metabolized from 11-hydroxy-THC**
  - **Not psychoactive**

Cannabis

METABOLITES OF THC

DELT-9THC 2 - 3 HOURS	***YES***	***YES***
OH-THC 4 - 6 HOURS	***MILD***	***YES***
C - THC 3 - 6 DAYS	***NO***	***YES***
BUZZ'N?		**IMPAIRMENT?**

Cannabis

NHTSA's "Crash Risk" Study

The drug most frequently detected in the oral fluid and blood of drivers was THC:

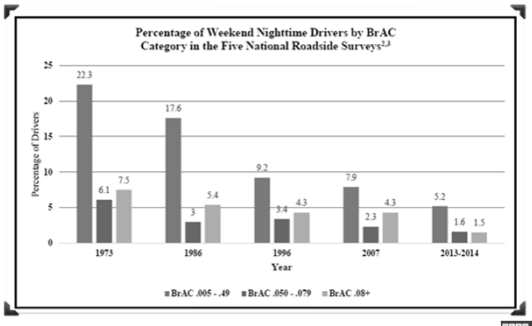
7.6 percent (n = 234) of the crash-involved drivers

6.1 percent (n = 379) of the control drivers.

The unadjusted odds ratio for THC was 1.25, representing a significantly elevated risk of crashing by about 1.25 times or 25 percent.

NHTSA

Cannabis



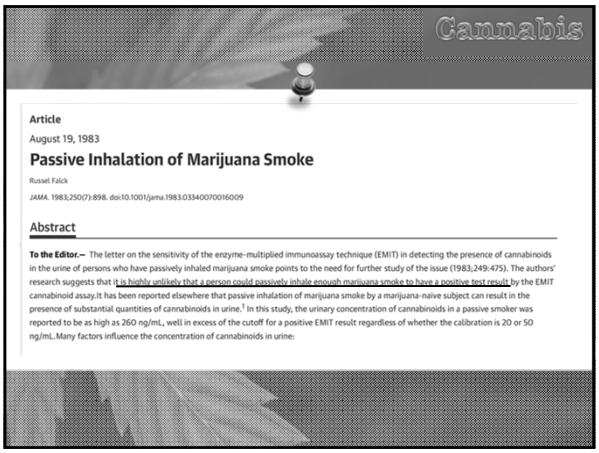
NHTSA

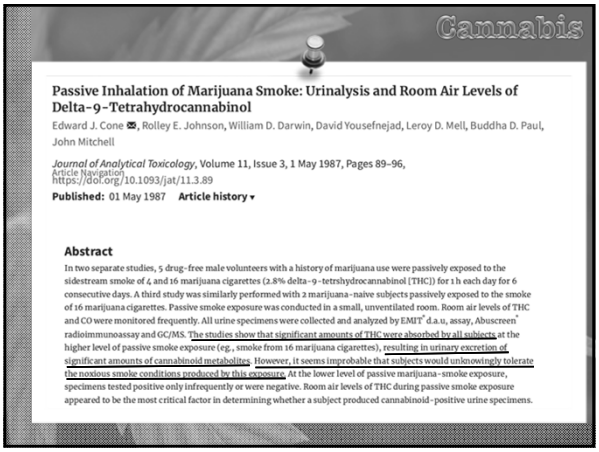
Cannabis

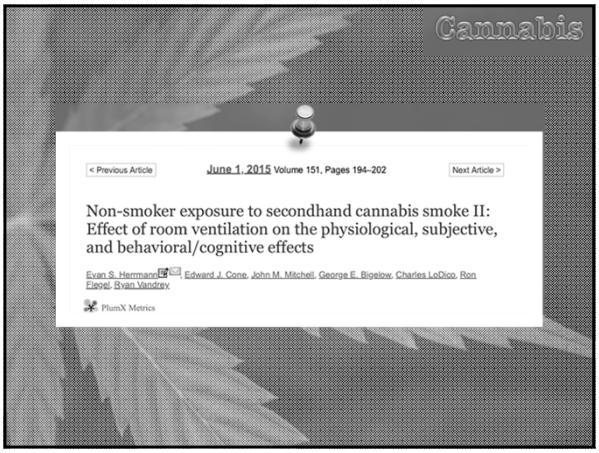
Weekend Nighttime Prevalence of Alcohol and THC in 2007 Compared to 2013-2014

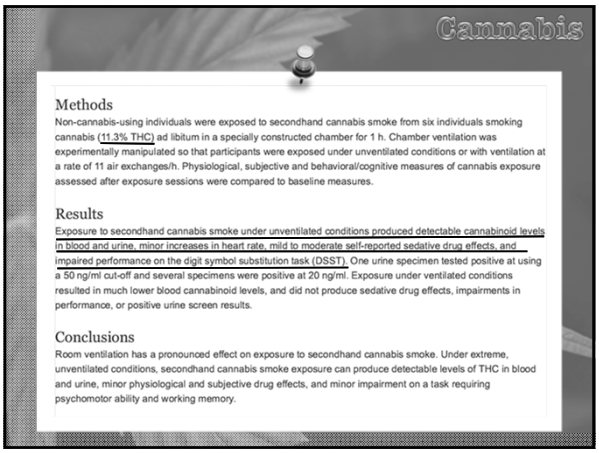
Substance	2007	2013 - 2014
Alcohol	12.4%	8.3%
THC	8.6%	12.6%

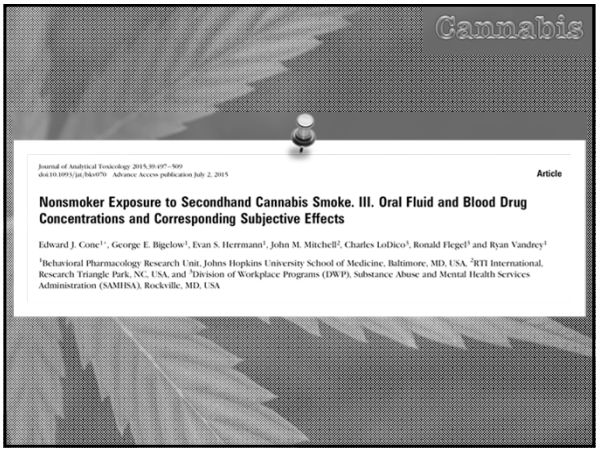
NHTSA

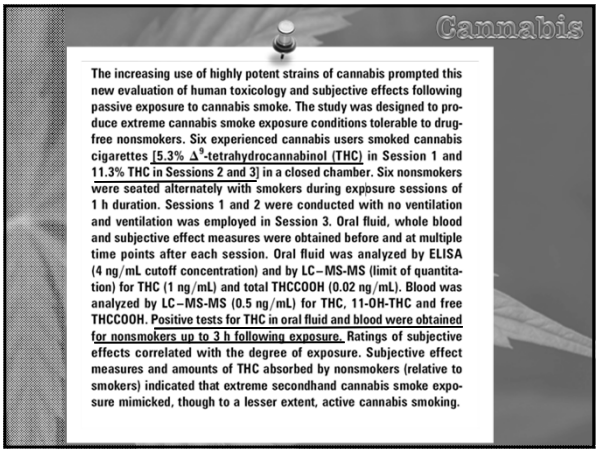

Cannabis
Article
August 19, 1983
Passive Inhalation of Marijuana Smoke
Russel Falck
JAMA. 1983;250(7):898. doi:10.1001/jama.1983.03340070016009
Abstract
To the Editor.— The letter on the sensitivity of the enzyme-multiplied immunoassay technique (EMIT) in detecting the presence of cannabinoids in the urine of persons who have passively inhaled marijuana smoke points to the need for further study of the issue (1983;249:475). The authors' research suggests that it is highly unlikely that a person could passively inhale enough marijuana smoke to have a positive test result by the EMIT cannabinoid assay.It has been reported elsewhere that passive inhalation of marijuana smoke by a marijuana-naive subject can result in the presence of substantial quantities of cannabinoids in urine.[1] In this study, the urinary concentration of cannabinoids in a passive smoker was reported to be as high as 260 ng/mL, well in excess of the cutoff for a positive EMIT result regardless of whether the calibration is 20 or 50 ng/mL.Many factors influence the concentration of cannabinoids in urine:


Cannabis
Passive Inhalation of Marijuana Smoke: Urinalysis and Room Air Levels of Delta-9-Tetrahydrocannabinol
Edward J. Cone, Rolley E. Johnson, William D. Darwin, David Yousefnejad, Leroy D. Mell, Buddha D. Paul, John Mitchell
Journal of Analytical Toxicology, Volume 11, Issue 3, 1 May 1987, Pages 89–96,
Article Navigation
https://doi.org/10.1093/jat/11.3.89
Published: 01 May 1987 Article history
Abstract
In two separate studies, 5 drug-free male volunteers with a history of marijuana use were passively exposed to the sidestream smoke of 4 and 16 marijuana cigarettes (2.8% delta-9-tetrshydrocannabinol [THC]) for 1 h each day for 6 consecutive days. A third study was similarly performed with 2 marijuana-naive subjects passively exposed to the smoke of 16 marijuana cigarettes. Passive smoke exposure was conducted in a small, unventilated room. Room air levels of THC and CO were monitored frequently. All urine specimens were collected and analyzed by EMIT® d.a.u. assay, Abuscreen® radioimmunoassay and GC/MS. The studies show that significant amounts of THC were absorbed by all subjects at the higher level of passive smoke exposure (eg , smoke from 16 marijuana cigarettes), resulting in urinary excretion of significant amounts of cannabinoid metabolites. However, it seems improbable that subjects would unknowingly tolerate the noxious smoke conditions produced by this exposure. At the lower level of passive marijuana-smoke exposure, specimens tested positive only infrequently or were negative. Room air levels of THC during passive smoke exposure appeared to be the most critical factor in determining whether a subject produced cannabinoid-positive urine specimens.


Cannabis
< Previous Article
June 1, 2015 Volume 151, Pages 194–202
Next Article >
Non-smoker exposure to secondhand cannabis smoke II: Effect of room ventilation on the physiological, subjective, and behavioral/cognitive effects
Evan S. Herrmann, Edward J. Cone, John M. Mitchell, George E. Bigelow, Charles LoDico, Ron Flegel, Ryan Vandrey
PlumX Metrics


Cannabis
Methods
Non-cannabis-using individuals were exposed to secondhand cannabis smoke from six individuals smoking cannabis (11.3% THC) ad libitum in a specially constructed chamber for 1 h. Chamber ventilation was experimentally manipulated so that participants were exposed under unventilated conditions or with ventilation at a rate of 11 air exchanges/h. Physiological, subjective and behavioral/cognitive measures of cannabis exposure assessed after exposure sessions were compared to baseline measures.
Results
Exposure to secondhand cannabis smoke under unventilated conditions produced detectable cannabinoid levels in blood and urine, minor increases in heart rate, mild to moderate self-reported sedative drug effects, and impaired performance on the digit symbol substitution task (DSST). One urine specimen tested positive at using a 50 ng/ml cut-off and several specimens were positive at 20 ng/ml. Exposure under ventilated conditions resulted in much lower blood cannabinoid levels, and did not produce sedative drug effects, impairments in performance, or positive urine screen results.
Conclusions
Room ventilation has a pronounced effect on exposure to secondhand cannabis smoke. Under extreme, unventilated conditions, secondhand cannabis smoke exposure can produce detectable levels of THC in blood and urine, minor physiological and subjective drug effects, and minor impairment on a task requiring psychomotor ability and working memory.


Cannabis
Journal of Analytical Toxicology 2015;39:497–509
doi:10.1093/jat/bkv070 Advance Access publication July 2, 2015
Article
Nonsmoker Exposure to Secondhand Cannabis Smoke. III. Oral Fluid and Blood Drug Concentrations and Corresponding Subjective Effects
Edward J. Cone[1]*, George E. Bigelow[1], Evan S. Herrmann[1], John M. Mitchell[2], Charles LoDico[3], Ronald Flegel[3] and Ryan Vandrey[1]
[1]Behavioral Pharmacology Research Unit, Johns Hopkins University School of Medicine, Baltimore, MD, USA, [2]RTI International, Research Triangle Park, NC, USA, and [3]Division of Workplace Programs (DWP), Substance Abuse and Mental Health Services Administration (SAMHSA), Rockville, MD, USA


Cannabis
The increasing use of highly potent strains of cannabis prompted this new evaluation of human toxicology and subjective effects following passive exposure to cannabis smoke. The study was designed to produce extreme cannabis smoke exposure conditions tolerable to drug-free nonsmokers. Six experienced cannabis users smoked cannabis cigarettes [5.3% Δ9-tetrahydrocannabinol (THC) in Session 1 and 11.3% THC in Sessions 2 and 3] in a closed chamber. Six nonsmokers were seated alternately with smokers during exposure sessions of 1 h duration. Sessions 1 and 2 were conducted with no ventilation and ventilation was employed in Session 3. Oral fluid, whole blood and subjective effect measures were obtained before and at multiple time points after each session. Oral fluid was analyzed by ELISA (4 ng/mL cutoff concentration) and by LC–MS-MS (limit of quantitation) for THC (1 ng/mL) and total THCCOOH (0.02 ng/mL). Blood was analyzed by LC–MS-MS (0.5 ng/mL) for THC, 11-OH-THC and free THCCOOH. Positive tests for THC in oral fluid and blood were obtained for nonsmokers up to 3 h following exposure. Ratings of subjective effects correlated with the degree of exposure. Subjective effect measures and amounts of THC absorbed by nonsmokers (relative to smokers) indicated that extreme secondhand cannabis smoke exposure mimicked, though to a lesser extent, active cannabis smoking.

Cannabis

Contents lists available at SciVerse ScienceDirect

Child Abuse & Neglect

ELSEVIER

Brief Communication

Infant with altered consciousness after cannabis passive inhalation

Yehoshua Zarfin [a,*,1], Enav Yefet [a,1], Said Abozaid [a], Wael Nasser [a], Tamer Mor [a], Yoram Finkelstein [b]

[a] Department of Pediatrics, Baruch Padeh Medical Center, Tiberias, Israel
[b] Service and Unit of Neurology and Toxicology, Shaare Zedek Medical Center, Jerusalem, Israel

Cannabis

Case report

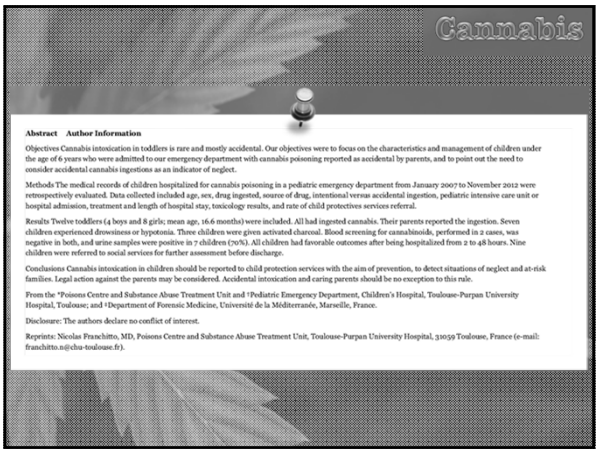
A previously healthy 13-month-old male infant was admitted to the emergency ward due to apathy, unresponsiveness, loss of appetite and mild fever (38 °C). His parents, a young couple who were vacationers in the area, noticed that once the infant woke up he appeared ill, did not respond to verbal stimuli and refused to eat. They ruled out convulsive fits and the possibility of digestion of toxic substances. Physical examination disclosed mild fever (37.9 °C), lethargy with intermittent restlessness, normotensive fontanel and equal pupils reactive to light. The physical examination was otherwise unremarkable. Complete blood count showed mild microcytic anemia with normal white blood cells count. Blood chemistry including electrolytes, liver enzymes and renal functions was normal. Erythrocyte sedimentation rate, urinalysis, Electrocardiogram (ECG) and chest roentgenogram were normal. Blood and urine cultures were obtained and intravenous ceftriaxone was started. Retrospectively, these cultures were sterile. Qualitative toxicology urine screen was performed by using lateral flow chromatographic immunoassay (INNOVACON), confirmed for accuracy above 97% by Gas Chromatography/Mass Spectrometry (GC/MS). This screen revealed the presence of THC, which was double checked and verified in an additional urine sample. At this stage, the parents admitted that in the evening before they had participated in a party of 20 cannabis smokers in the parents' room at a resort house where the infant was sleeping. Consequently, the infant was passively exposed to cannabis smoke for several hours. A child welfare worker interviewed the parents and was under the impression that the parents were genuinely amazed that cannabis smoke could harm their baby and that intentional abuse or neglect was unlikely in this case. During hospitalization the child was monitored and within hours showed marked improvement under supportive treatment. He was discharged after 48 h under the supervision of the social department.

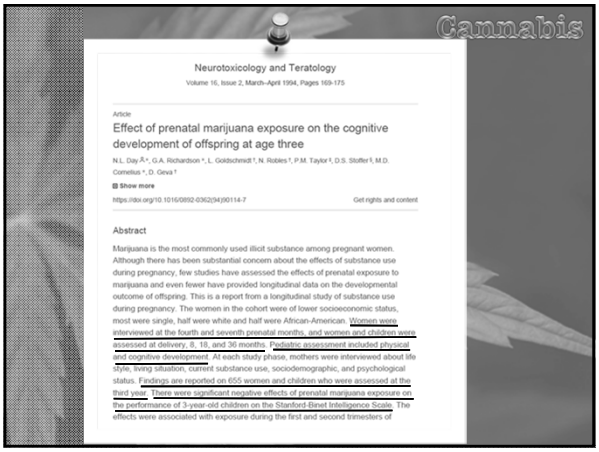
Cannabis

Parental Cannabis Abuse and Accidental Intoxications in Children: Prevention by Detecting Neglectful Situations and At-Risk Families

Pélissier, Fanny MD*; Claudet, Isabelle MD, MSc*; Pélissier-Alicot, Anne-Laure MD, PhD†; Franchitto, Nicolas MD, PhD*

Pediatric Emergency Care: December 2014 - Volume 30 - Issue 12 - p 862–866
doi: 10.1097/PEC.0000000000000288
Original Articles


Cannabis
Abstract Author Information
Objectives Cannabis intoxication in toddlers is rare and mostly accidental. Our objectives were to focus on the characteristics and management of children under the age of 6 years who were admitted to our emergency department with cannabis poisoning reported as accidental by parents, and to point out the need to consider accidental cannabis ingestions as an indicator of neglect.
Methods The medical records of children hospitalized for cannabis poisoning in a pediatric emergency department from January 2007 to November 2012 were retrospectively evaluated. Data collected included age, sex, drug ingested, source of drug, intentional versus accidental ingestion, pediatric intensive care unit or hospital admission, treatment and length of hospital stay, toxicology results, and rate of child protectives services referral.
Results Twelve toddlers (4 boys and 8 girls; mean age, 16.6 months) were included. All had ingested cannabis. Their parents reported the ingestion. Seven children experienced drowsiness or hypotonia. Three children were given activated charcoal. Blood screening for cannabinoids, performed in 2 cases, was negative in both, and urine samples were positive in 7 children (70%). All children had favorable outcomes after being hospitalized from 2 to 48 hours. Nine children were referred to social services for further assessment before discharge.
Conclusions Cannabis intoxication in children should be reported to child protection services with the aim of prevention, to detect situations of neglect and at-risk families. Legal action against the parents may be considered. Accidental intoxication and caring parents should be no exception to this rule.
From the *Poisons Centre and Substance Abuse Treatment Unit and †Pediatric Emergency Department, Children's Hospital, Toulouse-Purpan University Hospital, Toulouse; and ‡Department of Forensic Medicine, Université de la Méditerranée, Marseille, France.
Disclosure: The authors declare no conflict of interest.
Reprints: Nicolas Franchitto, MD, Poisons Centre and Substance Abuse Treatment Unit, Toulouse-Purpan University Hospital, 31059 Toulouse, France (e-mail: franchitto.n@chu-toulouse.fr).


Cannabis
Neurotoxicology and Teratology
Volume 16, Issue 2, March–April 1994, Pages 169-175
Article
Effect of prenatal marijuana exposure on the cognitive development of offspring at age three
N.L. Day, G.A. Richardson, L. Goldschmidt, N. Robles, P.M. Taylor, D.S. Stoffer, M.D. Cornelius, D. Geva
Show more
https://doi.org/10.1016/0892-0362(94)90114-7
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Abstract
Marijuana is the most commonly used illicit substance among pregnant women. Although there has been substantial concern about the effects of substance use during pregnancy, few studies have assessed the effects of prenatal exposure to marijuana and even fewer have provided longitudinal data on the developmental outcome of offspring. This is a report from a longitudinal study of substance use during pregnancy. The women in the cohort were of lower socioeconomic status, most were single, half were white and half were African-American. Women were interviewed at the fourth and seventh prenatal months, and women and children were assessed at delivery, 8, 18, and 30 months. Pediatric assessment included physical and cognitive development. At each study phase, mothers were interviewed about life style, living situation, current substance use, sociodemographic, and psychological status. Findings are reported on 655 women and children who were assessed at the third year. There were significant negative effects of prenatal marijuana exposure on the performance of 3-year-old children on the Stanford-Binet Intelligence Scale. The effects were associated with exposure during the first and second trimesters of


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ELSEVIER
journal homepage: www.elsevier.com/locate/neutera
Review article
Prenatal marijuana exposure impacts executive functioning into young adulthood: An fMRI study
CrossMark
Andra M. Smith, Ola Mioduszewski, Taylor Hatchard, Aziza Byron-Alhassan, Carley Fall, Peter A. Fried
University of Ottawa, School of Psychology, Ottawa, ON K1N 6N5, Canada
Carleton University, Department of Psychology, Ottawa, ON, Canada
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Received in revised form 4 May 2016
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Keywords:
fMRI
Prenatal marijuana
Working memory
Impulsivity
Cognition
Neurophysiology
ABSTRACT
Understanding the potentially harmful long term consequences of prenatal marijuana exposure is important given the increase in number of pregnant women smoking marijuana to relieve morning sickness. Altered executive functioning is one area of research that has suggested negative consequences of prenatal marijuana exposure into adolescence. Investigating if these findings continue into young adulthood and exploring the neural basis of these effects was the purpose of this research. Thirty one young adults (ages 18–22 years) from the longitudinal Ottawa Prenatal Prospective Study (OPPS) underwent functional magnetic resonance imaging (fMRI) during four tasks; 1) Visuospatial 2-Back, 2) Go/NoGo, 3) Letter 2-Back and 4) Counting Stroop task. Sixteen participants were prenatally exposed to marijuana while 15 had no prenatal marijuana exposure. Task performance was similar for both groups but blood flow was significantly different between the groups. This paper presents the results for all 4 tasks, highlighting the consistently increased left posterior brain activity in the prenatally exposed group compared with the control group. These alterations in neurophysiological functioning of young adults prenatally exposed to marijuana emphasizes the importance of education for women in child bearing years, as well as for policy makers and physicians interested in the welfare of both the pregnant women and their offspring's future success.
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Cannabis

Marijuana impairs growth in mid-gestation fetuses

Y.L. Hurd[a,*], X. Wang[a], V. Anderson[b], O. Beck[c], H. Minkoff[d,e], D. Dow-Edwards[f]

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[b]Department of Pathology, State University of New York Downstate, Brooklyn, NY, United States
[c]Karolinska Institute, Department of Medicine, Clinical Pharmacology Section, Stockholm, Sweden
[d]Department of Obstetrics and Gynecology, Kings County Hospital Center, Brooklyn, NY, United States
[e]Department of Obstetrics and Gynecology, Maimonides Medical Center, Brooklyn, NY, United States
[f]Department of Physiology/Pharmacology, State University of New York, Downstate, Brooklyn, NY, USA

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Available online 8 December 2004

Abstract

Marijuana (*Cannabis sativa*) is the most commonly used illicit drug by pregnant women, but information is limited about the effects of prenatal cannabis exposure on fetal development. The present study evaluated the influence of early maternal marijuana use on fetal growth. Women electing voluntary saline-induced abortions were recruited at a mid-gestational stage of pregnancy (weeks 17–22), and detailed drug use and medical histories were obtained. Toxicological assays (maternal urine and fetal meconium) were used in conjunction with the maternal report to assign groups. Subjects with documented cocaine and opiate use were excluded. Main developmental outcome variables were fetal weight, foot length, body length, and head circumference; ponderal index was also examined. Analyses were adjusted for maternal alcohol and cigarette use. Marijuana (*n*=44)- and nonmarijuana (*n*=95)-exposed fetuses had similar rates of growth with increased age. However, there was a 0.08-cm (95% CI −0.15 to −0.01) and 14.53-g (95% CI −28.21 to 0.86) significant reduction of foot length and body weight, respectively, for marijuana-exposed fetuses. Moreover, fetal foot length development was negatively correlated with the amount and frequency of marijuana use reported by the mothers. These findings provide evidence of a negative impact of prenatal marijuana exposure on the mid-gestational fetal growth even when adjusting for maternal use of other substances well known to impair fetal development.

Cannabis

MJ Popularity

The demand for this drug:

- **MJ users 12 years or older**
  - **In 2007, an estimated 19.9 million Americans aged 12 or older were current (past month) illicit drug users.**
    - **Marijuana was the most commonly used illicit drug (14.4 million past month users).**

2007 National Survey on Drug Use and Health: National Findings

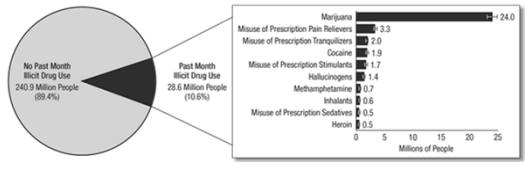
Cannabis

MJ Popularity

The demand for this drug:

In 2016 there was an estimated 28.6 million people aged 12 or older who were current illicit drug users.

An estimated 24.0 million Americans aged 12 or older in 2016 were current users of marijuana.



2007 National Survey on Drug Use and Health: National Findings

Cannabis

MJ Popularity

Use Disorder:

In 2016, 584,000 adolescents aged 12 to 17 had a marijuana use disorder in the past year

Approximately 1.7 million young adults aged 18 to 25 had a marijuana use disorder in the past year

approximately 1.7 million adults aged 26 or older had a marijuana use disorder in the past year,

2016 National Survey on Drug Use and Health: National Findings

Cannabis

Addiction Liability

- **Reproducible tolerance**
- **Physical dependence**
- **Cannabinoid Hyperemesis Syndrome**

Cannabis

Syndrome Described

After 21 days of heavy use

- **Onset 10 hours of cessation**
- **Peaks within 48 hours**
- **Terminates by fifth day of abstinence**

Cannabis

Syndrome Described

- **Agitation**
- **Restlessness**
- **Irritability**
- **Depression**
- **Tremor**
- **Nausea**
- **Anorexia**

NIDA NATIONAL INSTITUTE ON DRUG ABUSE

NIDA News Release

Contact: Beverly Jackson
Sheryl Massaro
301-443-6245

FOR RELEASE, April 20, 1999

Chronic Marijuana Users Become Aggressive During Withdrawal

People who have smoked marijuana daily for many years display more aggressive behavior when they stop smoking the drug, according to a new study by researchers at Harvard Medical School. The study, funded by the National Institute on Drug Abuse (NIDA), National Institutes of Health, is further evidence that a withdrawal syndrome is associated with abstinence from long-term marijuana use, and suggests that aggressive behavior is part of this syndrome.

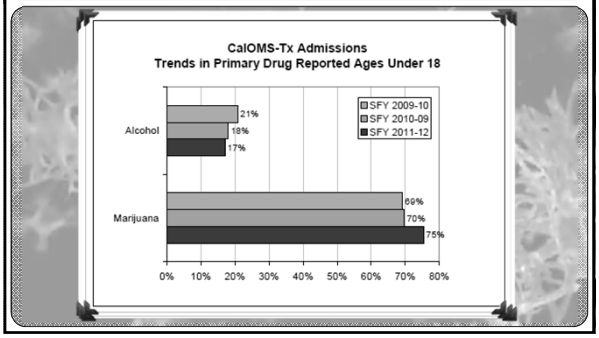
Human and animal studies conducted since the early 1970s have suggested the existence of a marijuana withdrawal syndrome, characterized by insomnia, restlessness, loss of appetite, and irritability. "This syndrome - although less dramatic than the withdrawal syndrome associated with alcohol, opiate, or cocaine withdrawal - may contribute to relapse among those dependent on marijuana," says NIDA Director Dr. Alan I. Leshner. "People addicted to marijuana may continue to use the drug at least partly to prevent the onset of withdrawal symptoms. Identifying the exact nature of this syndrome is crucial to developing treatment strategies for those attempting to stop their marijuana use."

Cannabis

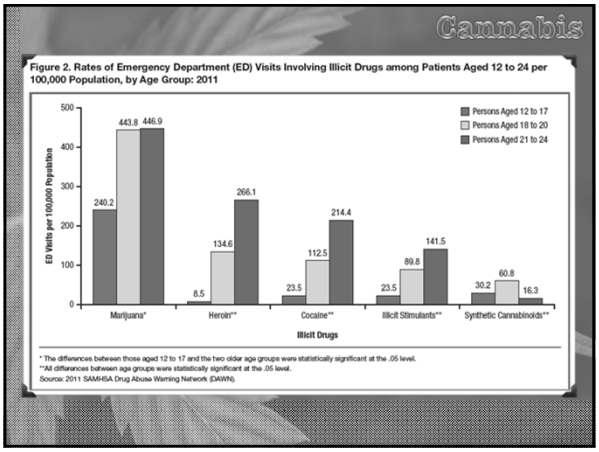
As the prevalence of cannabis-use disorder increases, so does demand for treatment. To date, psychosocial treatment remains the primary approach utilized, despite high nonresponse and relapse rates (70%).

There is a clear need to improve current treatment options, and medications may be a useful adjunct to aid in successful treatment outcomes; however, there are currently no approved medications for the treatment of cannabis-use disorder.

Californians in Treatment
CA ADP June 2012



Cannabis

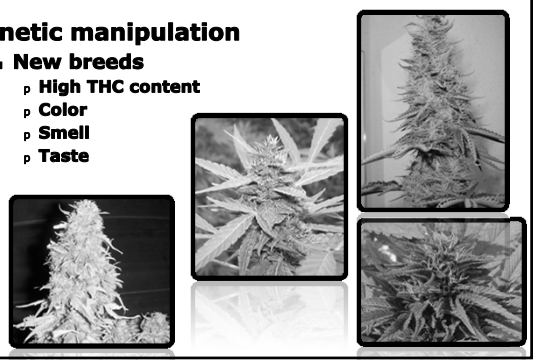


Cannabis

New Breed of Plant

Genetic manipulation

- **New breeds**
  - **High THC content**
  - **Color**
  - **Smell**
  - **Taste**



Cannabis

THC Concentrations

New breed of plant

- **2008 Average THC content = 10.1%**
- **Highest THC content 37.2%**
- **Highest hash oil = 81.7%**

Cannabis

THC Concentrations

Average THC concentrations expected to rise for next 5 – 10 years

Expected average 15 – 16%

Mahmoud ElSohly

Director Mahmoud ElSohly, University of Mississippi Potency Monitoring Project

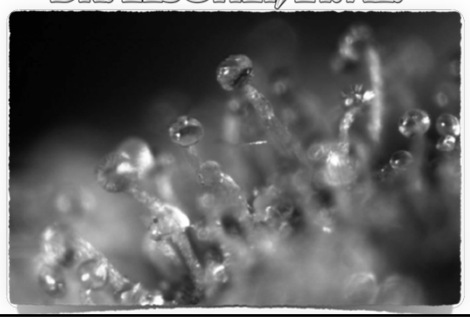
Cannabis

THC CONTENTS:

SATIVA	**.5 - 6%**
INDICA	**8 - 10%**
RUDERALISE	**.5 - 6%**
HIGHBRED	**8 - 10%**
HASHISH	**8 - 10% (37%*)**
HASHISH OIL	**20 - 60% (80+%)**
SINSEMILLA	**8 - 37%**

Cannabis

CANNABIS POTENCY TRENDS
DR. ELSOHLY, ET. AL.



Cannabis

CANNABIS POTENCY TRENDS
DR. ELSOHLY, ET. AL.

TABLE 7—*Average concentrations of four cannabinoids found in illicit cannabis samples.*

	Type of Sample														
	Ditchweed					Marijuana					Sinsemilla				
	No. of Seizures	THC, %	CBD, %	CBC, %	CBN, %	No. of Seizures	THO, %	CBD, %	CBC, %	CBN, %	No. of Seizures	THC, %	CBD, %	CBC, %	CBN, %
1980	6	.26	1.01	.03	.06	120	1.24	.01	.13	.57	26	6.33	.32	.23	.14
1981	20	.32	2.26	.06	.02	209	1.83	.14	.16	.45	31	6.58	.49	.22	.14
1982	30	.44	1.72	.04	.11	435	3.07	.25	.19	.35	14	7.10	.31	.29	.19
1983	60	.45	1.17	.00	.06	1145	3.30	.16	.17	.31	17	7.87	.82	.18	.28
1984	50	.42	1.79	.00	.11	1030	3.31	.17	.17	.35	36	6.67	.26	.24	.36
1985	111	.48	1.34	.03	.04	1449	2.83	.19	.15	.24	52	7.28	.43	.27	.38
1986	147	.31	1.67	.03	.08	1370	2.36	.15	.16	.22	32	8.43	.09	.26	.41
1987	103	.34	2.11	.04	.10	1550	2.96	.17	.18	.31	43	7.93	.40	.23	.35
1988	82	.39	1.69	.03	.13	1640	3.18	.20	.15	.31	98	7.62	.55	.20	.35
1989	111	.29	1.54	.10	.04	1075	3.04	.25	.14	.24	86	6.95	.37	.20	.19
1990	93	.33	2.29	.11	.02	1108	3.24	.23	.18	.21	61	10.10	.25	.24	.14
1991	283	.31	2.09	.07	.02	2148	3.09	.23	.20	.18	75	10.53	.45	.26	.20
1992	128	.31	1.76	.07	.00	3336	3.08	.18	.20	.38	76	8.57	.42	.24	.17
1993	200	.37	1.66	.07	.01	3031	3.38	.27	.20	.30	123	5.77	.91	.25	.14
1994	147	.38	1.97	.15	.59	3024	3.50	.46	.22	.32	104	7.49	1.20	.25	.12
1995	163	.41	1.56	.11	.19	4429	3.73	.37	.20	.38	164	7.51	.96	.28	.12
1996	117	.38	2.11	.12	1.77	2138	3.87	.49	.24	.36	168	9.22	1.19	.34	.19
1997	55	.48	2.05	.15	.05	1805	4.15	.61	.27	.24	111	11.53	.86	.29	.13

Cannabis

CANNABIS POTENCY TRENDS
DR. ELSOHLY, ET. AL.

% of Dry Weight of Delta-9 THC
In All Domestic and Non-Domestic Samples Analyzed by the Project
As of March 15, 2009

		# of samples	Arithmetic average	Highest concentration	Lowest concentration
All samples	Cannabis	65247	4.68	37.20	.00
	Hashish	1365	7.07	66.33	.01
	Hash Oil	476	16.57	81.70	.01
Domestic	Cannabis	21609	3.36	33.12	.00
	Hashish	10	12.14	52.87	.16
	Hash Oil	5	17.41	31.65	.21
Not domestic	Cannabis	43638	5.33	37.20	.01
	Hashish	1355	7.03	66.33	.01
	Hash Oil	471	16.56	81.70	.01

Cannabis

THIS IS NOT SINSEMILLA - IT HAS SEEDS

Cannabis

NO SEEDS

Cannabis

THE SPECIES OF CANNABIS

CANNABIS SATIVA L.
CANNABIS INDICA
CANNABIS RUDERALISE

SINSEMILLA

"WITHOUT SEEDS"

IT IS A GROWING TECHNIQUE

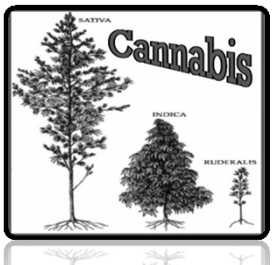
Cannabis

Species of Cannabis

Legally all cannabis is classified as *Cannabis Sativa L*

Specifically:

- ***Cannabis sativa***
- ***Cannabis indica***
- ***Cannabis ruderalis***
- ***Cannabis afghanica***



Cannabis

Species of Cannabis

Cannabis Sativa

- **Tall – up to 19 feet**
- **Narrow bladed leaves**
- **Better for outdoors – grows to fast for indoors**
- **Can have high THC content**
- **Can have low THC content (hemp)**

Cannabis

Species of Cannabis

Cannabis

Species of Cannabis

Cannabis Indica

- Short, bushy growth
- Broad leaves
- Good for indoor grows
- Can have distinctive odors
  - Skunk or cat urine
  - Sweet and exotic
- High THC to CBD ratio
  - Causes a heavy incapacitating stone
- Some strains have purple leaves around buds

Cannabis

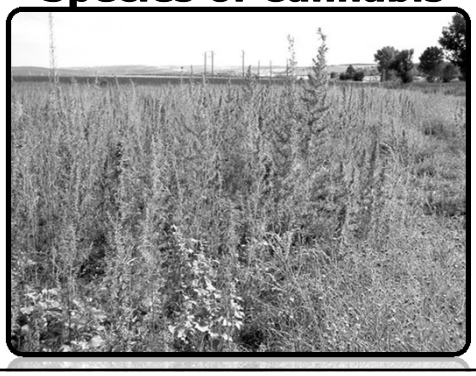
Species of Cannabis

Cannabis Ruderalis

- Short, weedy, scrubby plant
- Low THC content
  - Auto flowering
- Has been cross-breed with *sativa*, *indica*, and *afghanica*

Cannabis

Species of Cannabis



Cannabis

Species of Cannabis

Cannabis Afghanica

- Short, broad leaves
- Seldom reaches 6 ft
- High cannabinoid content
  - Often grown to make hashish
- Often grouped into the *Indica* category

Cannabis

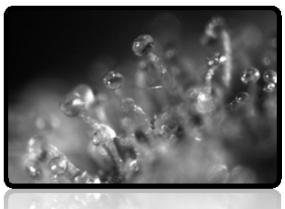
The Terpenes

Major component of MJ resin

Give the plant its characteristic smell and taste

Altering the ratios of terpenes in MJ plant effects:

- Smell
- Taste



Cannabis

Questions?