



# MEDICAL MARIJUANA USE AND ABUSE

No disclosures

Paula Christianson-Silva RN, MS, ANP-BC

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# Objectives

Based on the current body of research-based evidence, you will be able to:

1. State the primary clinical indications for medical marijuana use.
2. Describe the primary adverse health effects of marijuana.
3. Counsel patients on the clinical implications of marijuana use and legalization.

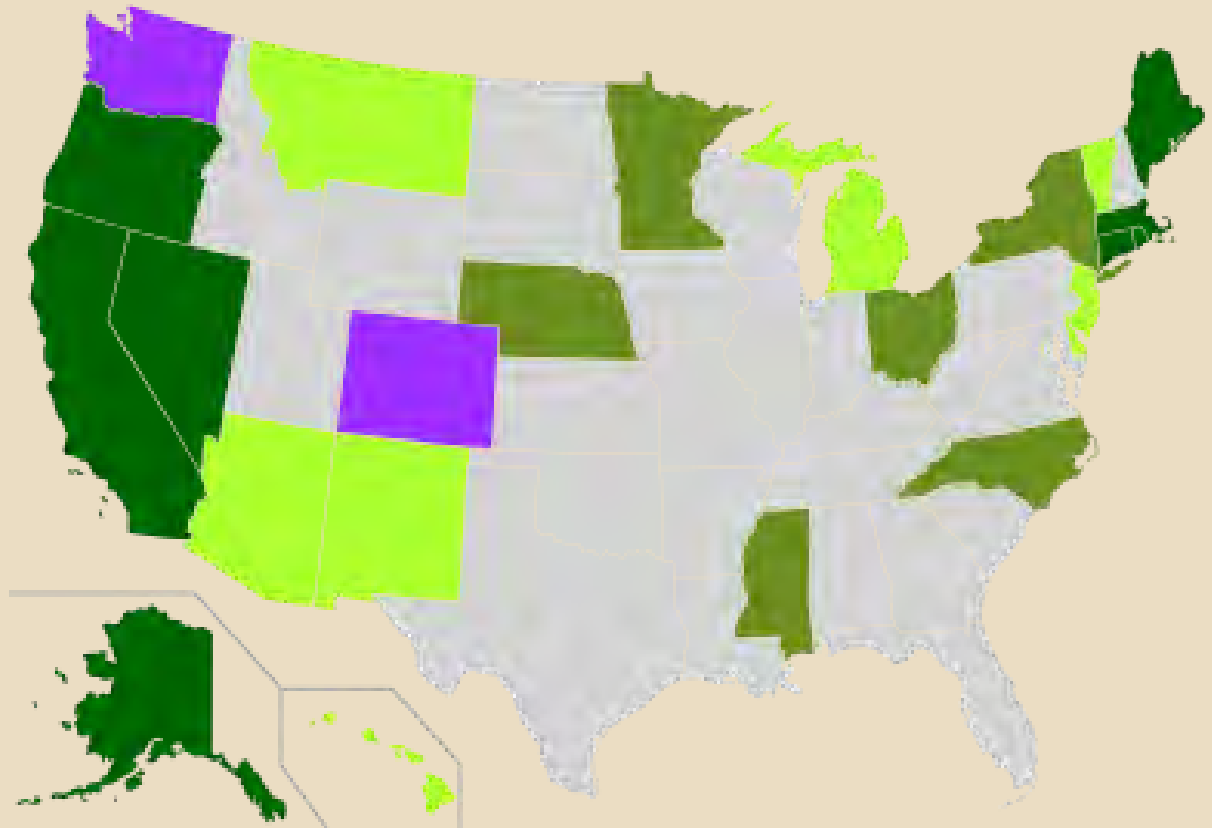
# Background Information

Purple – 2 states  
with legalized  
cannabis

Dark Green – 8  
states with medical  
cannabis and  
decriminalization  
laws

Light Green – 7  
states with medical  
cannabis laws

Medium Green – 6  
states with  
decriminalization  
laws



# Marijuana Legislation - CA

## Proposition 215 / Health & Safety Code 11362.5 / The Compassionate Use Act of 1996

first state to establish a medical marijuana program

allows people with cancer, AIDS and other chronic illnesses the right to grow or obtain medical marijuana when recommended by a **physician** (MD or DO)

does not affect federal law – DEA Schedule 1 Controlled Substance

## Proposition 36 / The Substance Abuse and Crime Prevention Act of 2000

allows qualifying defendants convicted of non-violent drug possession offenses to receive probation if they agree to participate in and complete a licensed community drug treatment program.

## Senate Bill 420 / The Medical Marijuana Protection Act of 2003

established an identification card system for medical marijuana patients issued through the CA Dept of Public Health, County Public Health Departments

allows for formation of non-profit patient collectives

# Marijuana Legislation - CA

Proposition 19 / The Regulate, Control & Tax Cannabis Act November 2010  
Defeated 46% to 54%

would have legalized marijuana and allowed local governments to tax and regulate the sale of marijuana and its related activities

Senate Bill 1449 signed September 2010, effective January 1 2011

reduced charge of possession of up to one ounce of cannabis from a misdemeanor to a violation, with a \$100 fine and no mandatory court appearance or criminal record



Evidence Based Practice (EBP)

## Clinical Indications for Marijuana Use

U.S. Research is limited due to classification as DEA Schedule I Controlled Substance, controlled by the National Institute on Drug Abuse, not the Food and Drug Administration.

# Clinical Indications for Marijuana Use

Anorexia  
&  
cachexia

EBP

In advanced HIV disease -

2 studies demonstrated effectiveness of Dronabinol **1,2**

In advanced cancer -

Jatoi et al (2002) – Megestrol more effective than Dronabinol **3**

Cannabis-In-Cachexia-Study-Group (2006); multicenter, double blind, placebo-controlled – oral cannabis extract and tetrahydrocannabinol not significantly effective **4**

# Clinical Indications for Marijuana Use

Multiple  
Sclerosis

EBP

Possible benefit for pain, spasticity and depression, not statistically significant **5**



# Clinical Indications for Marijuana Use

Chemotherapy  
induced  
nausea &  
vomiting

EBP

10 studies – 1980s and early 90s

Cannabinoids more effective than placebo and are at least comparable to other antiemetics

Since 5-HT<sub>3</sub> receptor antagonists (Zofran/ondansetron) introduced, not recommended in clinical guidelines 6

# Clinical Indications for Marijuana Use

## Anecdotal Reports

Possible Uses for:  
Chronic Neuropathic Pain  
Chronic Musculoskeletal Pain  
ALS  
Migraine Headaches  
Other severe nausea

## Clinical Guidelines

Not recommended over traditional therapy for:  
Glaucoma 7

# Clinical Indications for Marijuana Use

CA SB 420

“Serious Medical Condition” means all of the following:

Acquired immune deficiency syndrome (AIDS)

Anorexia

Arthritis

Cachexia

Cancer

Chronic Pain

Glaucoma

Migraine

Persistent muscle spasms, including but not limited to,  
spasms associated with multiple sclerosis

Seizures, including, but not limited to, seizures associated  
with epilepsy

Severe nausea

# Clinical Indications for Marijuana Use

CA SB 420  
continued

Any other chronic or persistent medical symptom that either:

Substantially limits the ability of the person to conduct one or more major life activities as defined in the Americans with Disabilities Act of 1990 (Public Law 101-336).

If not alleviated, may cause serious harm to the patient's safety or physical or mental health.



## Adverse Health Effects of Marijuana Use

Evidenced Based Practice (EBP)

# Adverse Health Effects of Marijuana Use

Pharmacologic Effects

Simplified

EBP

Cannabis contains over 400 compounds, 60 cannabinoids

Primary psychoactive cannabinoid is delta-9-tetrahydrocannabinol (THC)

THC binds to protein, accumulates in fatty tissue and is slowly released

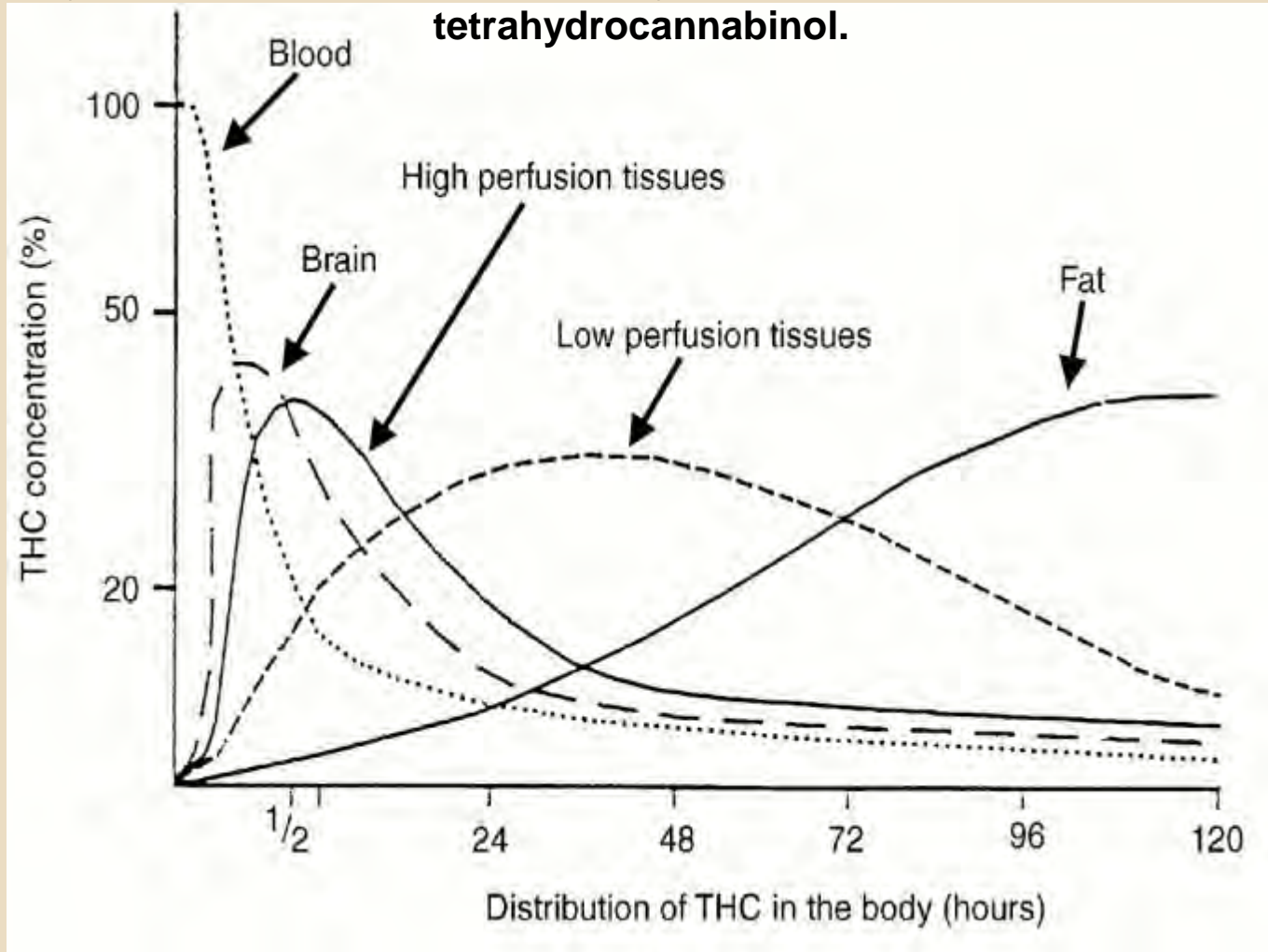
THC easily crosses BBB and binds to CB1 receptors in brain and CB2 receptors in brain and immune cells

Repeated stimulation of CB1 receptors causes desensitization and down regulation

THC is metabolized by multiple hepatic enzymes, excreted in urine and feces

Reduced bioavailability with oral ingestion due to hepatic first pass metabolism

**Fig. 2 Distribution of THC in the body. The distribution of THC after a single administration in plasma and body tissues. Note the biphasic disappearance in plasma. The rapid phase (in minutes) indicates a rapid uptake of the drug by fat-containing tissues. The slow phase (in days) shows the release of THC by these tissues (Nahas, 1975). THC, tetrahydrocannabinol.**



# Adverse Health Effects of Marijuana Use

Pulmonary

Smoke contains 3X tar of cigarette smoke **9**

Multiple studies:

No association between long-term use and airflow obstruction

Short-term bronchodilation effect

Irritant effect – increase in cough, sputum production, wheezing, bronchitis, asthma exacerbation, cystic fibrosis exacerbation

**10**

Moore et al (2005); US epidemiologic study – higher rates of COPD **11**

EBP



# Studies That Reported Effects of Long-term Marijuana Inhalation on Respiratory Complications

**Table 3. Studies That Reported Effects of Long-term Marijuana Inhalation on Respiratory Complications**

Source	Study Design	No of Subjects	Results	Control for Confounding	Mean Generic Quality Score	Mean Exposure and Disease Specific Quality Score
Bloom et al. <sup>18</sup> 1957	Cross-sectional	990	Multivariable analysis shows association between intensity and duration of nontobacco cigarettes and cough, phlegm, and wheeze	Tobacco	14	3
Henderson et al. <sup>20</sup> 1972	Case series	200	Cannabis smokers complained of pharyngitis (n = 150), rhinitis (n = 26), chronic bronchitis (n = 20), and asthma (n = 4)	None	4.5	0.5
Moore et al. <sup>20</sup> 2006	Cross-sectional	6728	Marijuana use associated with respiratory symptoms, chronic bronchitis, coughing on most days, phlegm, wheezing, and chest sounds without a cold	Tobacco	17.5	3
Sherrill et al. <sup>20</sup> 1991	Observational cohort	1802	Marijuana smoking associated with cough, phlegm, and wheeze	Tobacco	13.5	3
Taylor et al. <sup>18</sup> 2000	Cross-sectional	943	Marijuana use associated with wheezing apart from colds, exercise-related shortness of breath, nocturnal waking with chest tightness, and morning sputum production	Tobacco	12.5	3
Tashkin et al. <sup>20</sup> 1987	Cross-sectional	448	Marijuana smokers had increased rates of chronic cough, sputum production, wheeze, and more than 1 prolonged episode of bronchitis during the previous 3 y compared with the nonsmokers	Tobacco	11.5	3
Gaeta et al. <sup>21</sup> 1996	Case-control	200	44% of asthma group compared with 20% of control group admitted to or tested positive for recent substance use (OR, 3.14; P<.001). In acute bronchospasm group, 82% admitted to recently using inhaled substances compared with 55% of controls (OR, 3.63; P<.02). No difference in proportions of asthma and control groups that reported marijuana use.	None	12	1
Tennant, <sup>21</sup> 1980	Case series	36	Marijuana smokers complained of increased amounts of dyspnea and excess sputum production	None	7	2
Boulogouris et al. <sup>20</sup> 1976	Cross-sectional	62	Verbal hoarseness was detected in 4 of 44 hashish users and 2 of 38 controls. Two of 44 users and 1 of 38 controls had signs of emphysema.	None	8	1.5
Chopra, <sup>20</sup> 1973	Cross-sectional	124	Laryngitis, pharyngitis, bronchitis, dyspnea, asthma, irritating cough, hoarse voice, and dryness of the throat were more common in those who smoked higher daily dose of marijuana.	None	3	1
Mehndiatta and Wip, <sup>20</sup> 1975	Cross-sectional	75	Cannabis smokers complained of weight loss, cough, dyspnea, and poor sleep	None	8	1.5
Polen et al. <sup>21</sup> 1993	Cross-sectional	902	Marijuana smokers reported more days ill with cold, flu, or sore throat in past year than nonsmokers	Tobacco	15	3
Stern et al. <sup>20</sup> 1987	Cross-sectional	173	In patients with cystic fibrosis, 20% of marijuana users noted immediate and 5% noted long-term improvement in symptoms; 30% of users noted immediate and 40% noted long-term worsening of symptoms.	None	13	1
Tennant and Prendegast, <sup>20</sup> 1971	Case series	31	39% of marijuana smokers complained of rhinopharyngitis and 29% complained of bronchitis	None	4	0.5

Abbreviation: OR, odds ratio.

**10** Tetrault, J. M. et al. Arch Intern Med 2007;167:221-228.

# Adverse Health Effects of Marijuana Use

Cancer

EBP

Known carcinogens

Direct association to Lung Cancer not proven;  
3 studies demonstrated premalignant  
effect on bronchial epithelium **12,13**

5 studies with conflicting evidence on  
association with Head and Neck Cancer **14**

Chacko et al - Increased rate of TCCA of  
Bladder with marijuana users, tobacco use  
possible confounding variable **15**

# Adverse Health Effects of Marijuana Use

Central  
Nervous  
System

EBP

Large meta-analysis and an epidemiologic study – no long term cognitive deficits  
**16, 17**

Neuroimaging studies – decreased volume of amygdala and hippocampus, cumulative effect **18**

Definite short term effect on attention, performance, memory and psychomotor speed; 9 studies associated it with an increased risk for MVA, especially fatal collisions **19**

# Adverse Health Effects of Marijuana Use

Central  
Nervous  
System

Adolescents

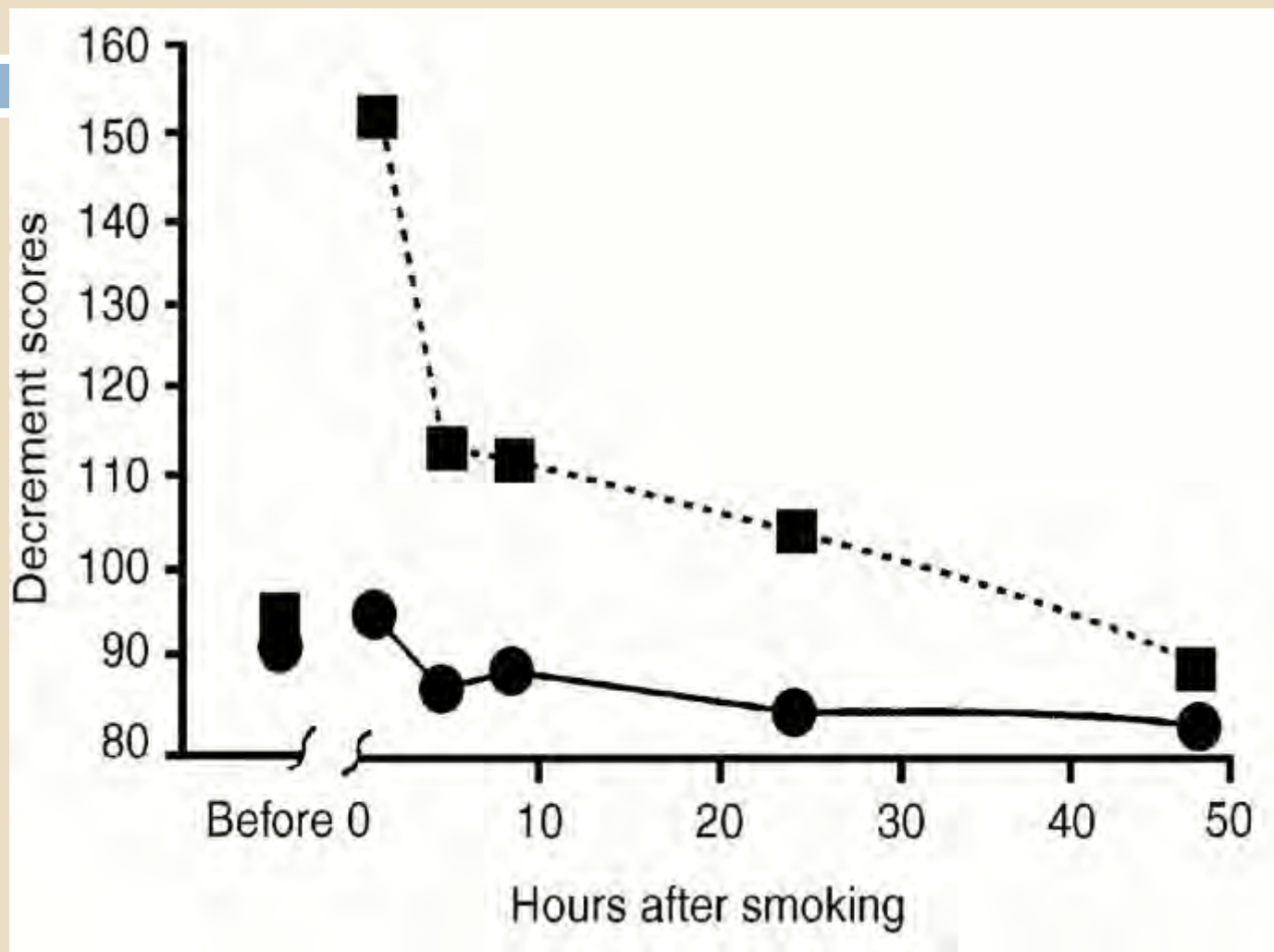
EBP

Published July 2012 –

1037 participants followed birth-age 37

Neuropsychological decline in adolescent-onset cannabis users, not restored by abstinence **37**

Fig. 4 Effect of smoking a cannabis cigarette containing 20 mg tetrahydrocannabinol (THC) on pilot performance in a flight simulator landing task (Leirer et al, 1991). - - {blacksquare} - -, 20 mg THC; --[UNK]--, placebo.



# Adverse Health Effects of Marijuana Use

Psychiatric

Significant evidence that marijuana causes psychosis, probably through effect on dopamine release **20**

EBP

Conflicting evidence on exacerbation of symptoms or relapse in known psychotic illness **21**

No evidence for increased risk of Depression **22**

No evidence of decreased motivation as measured by Apathy Evaluation Scale (Barnwell et al 2006) **23**

# Adverse Health Effects of Marijuana Use

Cardio-vascular

EBP

Intoxication – tachycardia, little or no change in BP **24**; high doses – bradycardia, hypotension

Reports of reversible EKG abnormalities

Possible danger to elderly of severe postural hypotension **25**

Mittleman et al (2001); large MI study – MI rarely triggered by marijuana; risk 5X higher within one hour of smoking **26**

# Adverse Health Effects of Marijuana Use

Immune  
System

Suppresses immune functions

Effect on infection rates not studied **27**

EBP



# Victoria



Original Medical Marijuana Plant

# Adverse Health Effects of Marijuana Use

Reproductive

EBP

Men -

Decreases testosterone production

May decrease libido and lead to erectile dysfunction and gynecomastia **28**

May decrease sperm count and motility leading to infertility **29**

Women -

Chronic use increases prolactin levels leading to galactorrhea **30**

# Adverse Health Effects of Marijuana Use

Dental

EBP

Large prospective study (Thomson et al 2008) – associated with higher incidence of periodontal disease at age 32; researchers controlled for tobacco use, dental hygiene and dental care **31**

# Adverse Health Effects of Marijuana Use

Ophthalmic

EBP

Yazulla (2006) – causes corneal vasodilation and decreased intraocular pressure 32

# Adverse Health Effects of Marijuana Use

Pregnancy

EBP

Prenatal effect –

Ottawa Prenatal Prospective Study (1999) – no significant association to growth measures at birth; children of heavy users (6 joints per week) had smaller head circumference at all ages **33**

Johns Hopkins (1990) – no association with prematurity or congenital abnormalities **34**

Avon Longitudinal Study (2002) – 12,000 women; no association with preterm birth, NICU admission or mortality; slight decreased birth weight in weekly users, but not occasional users **35**

# Adverse Health Effects of Marijuana Use

Obesity

EBP

Warren et al (2005) – negative correlation between BMI group and percent marijuana use 36

# Adverse Health Effects of Marijuana Use

DSM-IV

Example ICD-9 codes

Cannabis intoxication (Drug-Induced Delirium)	292.81
(Cannabis withdrawal)	none
Cannabis abuse, unspecified	305.20
Cannabis dependence, unspecified	304.30
Cannabis dependence, in remission	304.33

# Discussion Questions

- Is medical marijuana sometimes prescribed when not clinically indicated?
- Does marijuana lead to use of other drugs?
- Is marijuana as harmful as cigarettes and alcohol?
- When, if ever, should you recommend marijuana to a patient?
- If marijuana becomes legal, will it be safer?
- Other?



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Thank you

Paula Christianson-Silva RN, MS, ANP-BC

pchristianson-silva@nursing.arizona.edu

silvafamily@yahoo.com