

# Incorporating Brief Intervention Approaches into Conversations on Campus and Addressing Marijuana in a Changing Legal Climate



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## Overview of today

### Big thanks to Megan Hopkins

**Agenda:**

- 10:00-10:15 Why brief interventions?
- 10:15-11:05 Stages of change, Motivational Interviewing overview, and OARS of MI
- 11:05-11:15 Break
- 11:15-12:15 Examples of hooks related to cannabis/marijuana and practice with strategies
- 12:15-1:00 Lunch
- 1:00-2:00 More practice, and research on cannabis/marijuana most relevant on a college campus
- 2:00-2:30 Implementation issues and final Q&A

## College Student Alcohol Use: Prevention Messaging



## Traditional Messages

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## Harm Reduction

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### ***What is Harm Reduction?***

- The most harm-free or risk-free outcome after a harm reduction intervention *is* abstinence.
- However, harm reduction approaches acknowledge that *any steps toward reduced risk are steps in the right direction*

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**How are these principles implemented in an intervention with college students?**

- Legal issues are acknowledged.
- Skills and strategies for abstinence are offered.
- However, if one makes the choice to drink, skills are described on ways to do so in a less dangerous and less risky way.
- A program provider, student affairs professional, peer health educator, or clinician must elicit personally relevant reasons for changing.
  - This is done using the Stages of Change model and Motivational Interviewing.

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**The Stages of Change Model**

(Prochaska & DiClemente, 1982, 1984, 1985, 1986)



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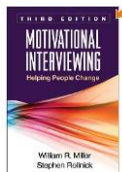
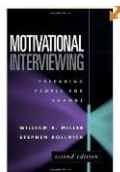
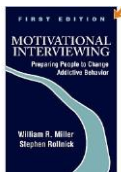
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**Motivational Interviewing**



Miller & Rollnick, 1992, 2002, 2012

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## Brief Interventions and Motivational Interviewing

Non-judgmental	Non-confrontational	Meet people where they are
Elicit personally relevant reasons to change	Explore and resolve ambivalence	Discuss behavioral change strategies when relevant

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## What is resistance?

- Resistance is verbal behaviors
- It is expected and normal
- It is a function of interpersonal communication
- Continued resistance is predictive of (non) change
- Resistance is highly responsive to our style
- Getting resistance? Change strategies.

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## Goals of a Brief Intervention

- When there are signs of potential risks and/or existing harms, provide early intervention
- If ultimately in line with what motivates the individual, prompt contemplation of change
- If ultimately in line with what motivates the individual, prompt commitment to change or even initial action
- Reduce resistance/defensiveness
- Explore behavior change strategies and discuss skills to reduce harms

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### *What Does All of This Mean?*

- A conversation with a student can impact health
- You don't have to deliver an intervention per se – you might plant a seed or a student might connect with resources
- The important thing is having that conversation and the tone/style/approach of that conversation
- Fortunately, brief intervention strategies can guide these



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### *What Does All of This Mean?*

- Research utilizing non-clinicians in the delivery of these interventions show clear impact
- Conversation can lower defensiveness
- Conversation can keep student open to change
- This sets the student up for success!
- The conversation can be collaborative, without you solving the problem for the person you're talking to

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### **The Spirit of Motivational Interviewing**

- Direct persuasion is not an effective method for resolving ambivalence.
- We are directive in helping participants examine and resolve ambivalence.

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## Motivational Interviewing

### *Basic Principles*

(Miller and Rollnick, 1991, 2002)



1. Express Empathy
2. Develop Discrepancy
3. Roll with Resistance
4. Support Self-Efficacy

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## Four Principles of Motivational Interviewing

- Express Empathy
  - Research indicating importance of empathy
- Develop Discrepancy
  - Values and goals for future as potent contrast to status quo
  - Student must present arguments for change

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## Four Principles of Motivational Interviewing

- Roll with Resistance
  - Avoid argumentation
  - Confrontation increases resistance to change
  - Labeling is unnecessary
  - Our role is to reduce resistance, since this is correlated with poorer outcomes
  - If resistance increases, shift to different strategies
  - Objections or minimization do not demand a response

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## Four Principles of Motivational Interviewing

- Support Self-Efficacy
  - The students we're working with are responsible for choosing and implementing change
  - Confidence and optimism are predictors of good outcome in both people involved in a conversation

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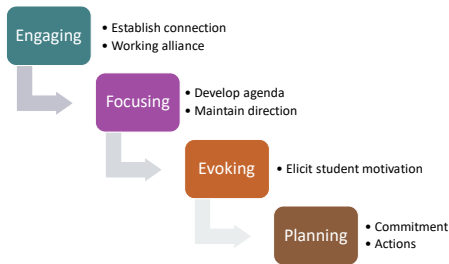
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## Four Processes of MI



Miller & Rollnick, 2012

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## Motivational Interviewing

- Is NOT a trick
  - MI is NOT a way of making people do what you want them to do
  
- MI honors autonomy – cannot remove choice
- MI cannot manufacture motivation not already there
- MI is not a verb
  - You don't "MI" someone
  - or do MI "on" or "to" someone
- Rather you do MI "for" or "with" someone

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## Motivational Interviewing

- In a nutshell...
  - Interpersonal style
  - Not restricted to formal counseling settings
  - Guided by philosophy and understanding of what triggers change



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## Motivational Interviewing

- Philosophy of Change
  - Change occurs naturally
  - The likelihood that change will occur is strongly influenced by interpersonal interactions
  - Empathic, positive interventions seem to facilitate change
  - People who believe they are likely to change do so
  - What people say about change is important
  - MOTIVATION IS FUNDAMENTAL TO CHANGE

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## Building Blocks for a Foundation

- Strategic goal:**
- Elicit Self-Motivational Statements
    - "Change talk"
    - Self motivational statements indicate an individual's concern or recognition of need for change
    - Types of self-motivational statements are:
      - Problem recognition
      - Concern
      - Intent to Change
      - Optimism
    - Arrange the conversation so that *students* makes arguments for change

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## OARS:

### Building Blocks for a Foundation

- Ask **Open-Ended Questions**
  - Cannot be answered with yes or no
  - We do not know where answer will lead
    - “What do you make of this?”
    - “Where do you want to go with this now?”
    - “What ideas do you have about things that might work for you?”
    - “How are you feeling about everything?”
    - “How’s the year going for you?”
    - “Tell me more about that.”
    - This is different than the closed-ended “Can you tell me more about that?” or “Could you tell me more about that?”

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What open-ended questions could you ask that might prompt consideration of “consequences”?

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### Finding potential hooks: An Example

- “What are the good things about \_\_\_\_\_ use for you?”
- “What are the ‘not-so-good’ things about \_\_\_\_\_ use?”
- “What would it be like if some of those not-so-good things happened less often?”
- “What might make some of those not-so-good things happen less often?”

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OARS:

Building Blocks for a Foundation

- **Affirm**
  - Takes skill to find positives
  - Should be offered only when sincere
  - Has to do with characteristics/strengths
    - “It is important for you to be a good student”
    - “You’re the kind of person that sticks to your word”

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OARS:

Building Blocks for a Foundation

- **Listen Reflectively**
  - **Effortful process: Involves Hypothesis Testing**
    - A reflection is our “hypothesis” of what the other person means or is feeling
  - **Reflections are statements**
    - Student: “I’ve got so much to do and I don’t know where to start.”
    - One of us: “You’ve got a lot on your plate and feel really overwhelmed.”
    - Student: “Yes, I really wish things weren’t this way” **or...** “No, I’m just not really motivated to get things started.”
  - “Either way, you get more information, and either way you’re receiving feedback about the accuracy of your reflection.”  
(p. 179, Rollnick, Miller, & Butler, 2008)

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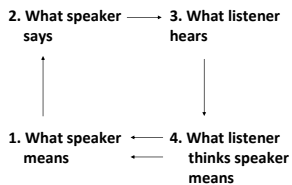
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Reflective Listening:  
A Primary Skill

- “Hypothesis testing” approach to listening
- Statements, not questions (so voice goes down)
- Takes hard work and practice



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## Types of reflections...

### "I've been feeling stressed a lot lately..."

- **Repeating**
  - "You've been feeling stressed."
- **Rephrasing**
  - "You've been feeling anxious."
- **Paraphrasing**
  - "You've been feeling anxious, and that's taking its toll on you."
- **Focusing on emotional component**
  - "That's taking its toll on you."

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## Motivational Interviewing Strategies

### • Reflection

My partner won't stop criticizing me about my drinking.

*You're feeling frustrated about that.*

-- or --

*You wish things weren't that way.*

-- or --

*It feels to you like your partner is always on your case.*

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## Motivational Interviewing Strategies

### • Double-Sided Reflection

Student: I've been drinking with my friends in my room. My parents are always lecturing me about it. They're always saying that it makes my depression worse.

One of Us: *You get a hard time from your parents about how drinking affects your depression.*

Student: Yeah... I mean, I know that it affects my mood a little, but I don't drink that much and when I do, I really enjoy it, you know?

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## Motivational Interviewing Strategies

- **Double-Sided Reflection**

One of us: *What do you enjoy about drinking?*

Student: I like the fact that it helps me chill out with my friends.

One of us: *So on the one hand you enjoy drinking because of its social effects, and on the other hand you've noticed that it has some effect on your mood.*

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## OARS:

### Building Blocks for a Foundation

- **Summarize**

- Periodically to...

- Demonstrate you are listening
- Provide opportunity for shifting

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### Scenario: The Flu Shot AUDIT-C score of 8

QUESTIONS	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks do you have on a typical day when drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

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**Patient:** Let's get this shot over with -- no sickness for me! That waiting room is disgusting, though.

**Provider:** What happened in the waiting room? (*Open question*)

**Patient:** Oh, just a lot of coughing people. Plus, I had to wait longer than I thought, and need to get to the library. I've got way too much to do!

**Provider:** On top of everything else you have going on, having to wait wasn't so helpful for your day. (*Reflection*)

**Patient:** Yes. Exactly....thank you....

**Provider:** What's going on school-wise? (*Open question*)

**Patient:** I'm just getting really behind on stuff. I really want to get into my major, so I HAVE to turn things around.

**Provider:** Doing well academically is really important to you. (*Affirm*)

**Patient:** Yes. And that's why I feel kind of stupid.

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**Provider:** What makes you say that? (*Open question*)

**Patient:** I have this paper due, and I keep going out with my friends instead of staying home to work on it.

**Provider:** You're getting behind, and aren't feeling great about that. (*Reflection*)

**Patient:** No. I'm not feeling great. I need better will power.

**Provider:** Tell me what you mean. (*Open question*)

**Patient:** We wind up partying. Even when I say I'll just have one drink, it turns into more.

**Provider:** These nights look good on paper, and you wind up not liking how you feel when school work doesn't get done. (*Reflection*)

**Patient:** Right. Then, I get so much farther behind, it just starts piling up.

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**Provider:** I want to respect that you wanted to get in-and-out of here today, though it sounds like you've got a lot on your plate and have noticed a link between going out with friends and not getting done what you want to get done. Prior to coming in here, you answered some questions about your drinking...if it's o.k. with you, I'd like to talk about that for just a minute or two. (*Summary, and asking permission*)

**Patient:** Sure.

**Provider:** I know what you put down on your survey, but before we get into that, walk me through what a typical week looks like for you in regards to your drinking. (*Open question*)

**Patient:** Lately, I go out in a pretty big stretch of days. I don't drink Sunday, Monday night I have meetings for the student group I'm a part of, and Tuesday night I don't drink because of my stupid early Wednesday class. So, I guess I drink Wednesday through Saturday.

**Provider:** How much do you typically drink? Remember from the survey that a "standard drink" is 12 ounces of beer, 4 ounces of wine, and one measured shot of hard alcohol. (*Open question*)

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**Patient:** I pretty much only drink hard alcohol. I usually have 3 shots when I go out, but on Fridays will have 6.

**Provider:** So, on average, you drink 4 nights per week – 3 of those nights, you have 4 shots, and on one night, you have 6 shots. **(Summary).**

**Patient:** That's right.

**Provider:** What are your thoughts about your drinking right now? **(Open question).**

**Patient:** I don't know. I feel like that's a lot more than I drank during my first year.

**Provider:** That concerns you. **(Reflection).**

**Patient:** A little.

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**Provider:** Well, the reason we ask all students those questions about alcohol is to be able to identify and talk with students who may be experiencing some risks or issues related to their drinking. You're expressing some concern, and that's consistent with the responses you filled out. What do you make of that? **(Open question)**

**Patient:** I'm not like an alcoholic or anything.

**Provider:** Your drinking isn't causing issues to that level. **(Reflection in response to resistance).**

**Patient:** No. But, I do go out more than I should on school nights.

**Provider:** On a scale from 1 to 10, where 1 is not-at-all and 10 is a great deal, how important would you say it is to make a change in your drinking. **(eliciting change talk).**

**Patient:** I guess I'd say a 3.

**Provider:** What makes it a 3 instead of a 2 or a 1? **(another question to elicit change talk).**

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**Patient:** I really can't get any further behind in school. If I do, I might not get into my major.

**Provider:** There are strong academic reasons for making a change. **(Reflection)**

**Patient:** I think that's true.

**Provider:** What do you think would be a step in the right direction for you, if anything? **(Open question)**

**Patient:** Instead of studying in my room, where everyone knows where to find me, I could go to the library at night. That's a lot farther away from where we normally drink.

**Provider:** A new study place will help you stick to what's most important. **(Reflection)**

**Patient:** I think so.

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**Provider:** Certainly, whatever you choose to do is up to you. It sounds like you've come up with a plan to try and avoid situations in which it would be too tempting to drink when offered. If it's o.k. with you, we can check in about what's going on with your drinking at the appointment you made in 3 weeks. *(Summary, and making plan to revisit use)*

**Patient:** OK.

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**Some examples of effects of marijuana that can be tied into “hooks,” personally-relevant reasons to change and/or discrepancies for students you’re working with**

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**Impact on attention, concentration, and memory**

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## Marijuana and cognitive abilities

### • Effects on the brain

- Hippocampus
  - Attention, concentration, and memory
- Research with college students shows impact on these even 24 hours after last use (Pope & Yurgelun-Todd, 1996)
- After daily use, takes 28 days for impact on attention, concentration, and memory to go away (Pope, et al., 2001)
- Hanson et al. (2010):
  - Deficits in verbal learning (takes 2 weeks before no differences with comparison group)
  - Deficits in verbal working memory (takes 3 weeks before no difference with comparison group)
  - Deficits in attention (still present at 3 weeks)



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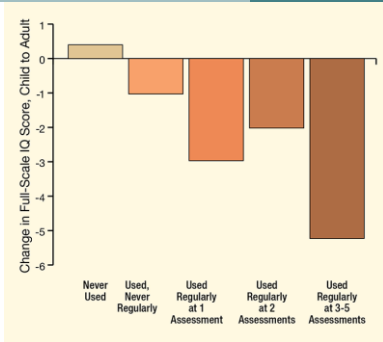
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Meier, et al (2012)

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## Relationship Between Cannabis Use and Academic Success

- More frequent marijuana use is associated with more discontinuous enrollment, skipping more classes, and lower GPAs (Arria, et al., 2013, 2015)
- Any marijuana use is associated with lower GPA, and decreasing and frequent marijuana use over time is associated with less current enrollment and being less likely to graduate on time (Sureken, et al., 2016)

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## Relationship Between Cannabis Use, Alcohol Use, and Academic Success

- Alcohol and marijuana are both associated with lower GPA; when entered in same regression, effects of alcohol became non-significant (Bolin, Pate, McClintock, 2017)
- Students using both marijuana and alcohol at moderate to high levels have significantly lower GPAs over two years (Meda, et al., 2017)
  - Students who moderate or curtail substance use improved GPA (Meda, et al., 2017)

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## Mental Health

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## Cannabis Use Associated with Risk of Psychiatric Disorders (Hall & Degenhardt, 2009; Hall, 2009; Hall 2013)

- **Schizophrenia**
  - Those who had used cannabis 10+ times by age 18 were 2-3 times more likely to be diagnosed with schizophrenia
  - “13% of schizophrenia cases could be averted if cannabis use was prevented (Hall & Degenhardt, 2009, p. 1388)”
- **Depression and suicide**
  - “Requires attention in cannabis dependent” (Hall, 2013)



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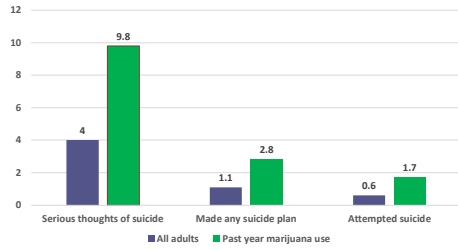
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Percentage endorsing item as a function of past year marijuana use



<https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FFR3-2015/NSDUH-DR-FFR3-2015.pdf>

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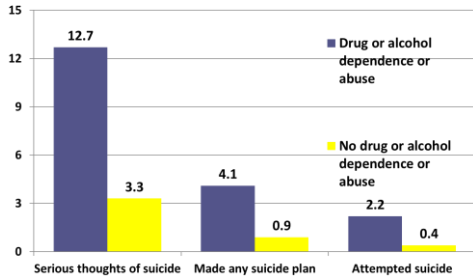
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Percentage endorsing item as a function of having (or not having) a substance use disorder



<https://www.samhsa.gov/data/sites/default/files/NSDUH-DR-FFR3-2015/NSDUH-DR-FFR3-2015.pdf>

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**Driving after use**




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## Impaired driving and duration of effects

### • Effects on the brain

- Authors of I-502 set DUI at 5 ng THC/ml of blood for those over 21 (any positive value for those under 21)
- Why 5 ng? Similarities in impairment to .08% for alcohol
- How long does it take to drop below 5 ng?
- Grotenhermen, et al., (2007) suggest it takes 3 hours for THC levels to drop to 4.9 ng THC/ml among 70 kg men
- From a public health standpoint, Hall (2013) recommends waiting up to 5 hours after use before driving
- New article encourages waiting at least 6 hours after use (Fischer, et al., 2017)




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## Driving within 3 hours of use

### Driving after marijuana use

"During the past 30 days, how many times did you drive a car or other vehicle within three hours after using cannabis (e.g., marijuana, hashish, edibles)?"

	2014	2015	2016	2017
Never	50.59%	55.29%	58.19%	58.56%
1 time	14.13%	13.13%	12.50%	12.85%
2-3 times	13.28%	12.34%	11.97%	11.98%
4-5 times	6.43%	4.35%	3.48%	4.48%
6 or more times	15.57%	14.88%	13.85%	12.12%

\*\*There are declines in driving after marijuana use between cohort 3 and cohort 1 ( $p < .05$ ) and between cohort 4 and cohort 1 ( $p < .01$ ), as well as a significant linear trend ( $p < .01$ ). \*\*

Source: Young Adult Health Survey, 2017 data report

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### AMONG 21-25 YEAR OLDS ONLY

"During the past 30 days, how many times did you drive a car or other vehicle within three hours after using cannabis (e.g., marijuana, hashish, edibles)?"

	2014	2015	2016	2017
Never	50.79%	59.61%	57.99%	61.00%
1 time	13.90%	10.26%	11.60%	11.81%
2-3 times	13.18%	15.08%	11.30%	13.02%
4-5 times	7.11%	3.41%	2.28%	4.68%
6 or more times	14.86%	15.78%	15.89%	11.03%

\*\*For those 21+, there are declines in driving after marijuana use between cohort 4 and cohort 1 ( $p < .01$ ), as well as a significant linear trend ( $p < .01$ ). \*\*

Source: Young Adult Health Survey, 2017 data report

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Crime | Data | Local News | Marijuana  
**More pot use found in fatal crashes, data says**

Originally published August 19, 2015 at 8:05 pm | Updated August 20, 2015 at 2:45 pm

**Marijuana use appears to have increased as a factor in deadly crashes last year in Washington.**



By Bob Young  
Seattle Times staff reporter

Marijuana use appears to have increased as a factor in deadly crashes last year in Washington.

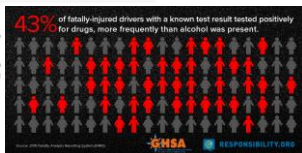
New data from the Washington Traffic Safety Commission shows the number of drivers involved in fatal crashes with THC in their body increased from 38 in 2013 to 73 that year. About half those 73 drivers had active THC — the main psychoactive chemical in pot — above the level that legally determines intoxication.

**Drugged driving eclipses drunken driving in tests of motorists killed in crashes**

By Anthony M. Capria | 4/26/17 12:00 PM

For the first time, statistics show that drivers killed in crashes are more likely to be on drugs than drunk.

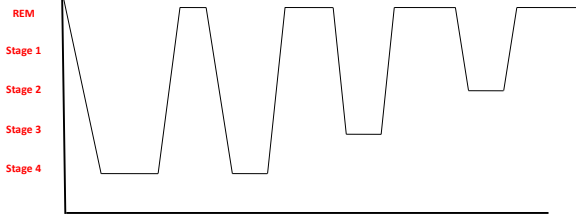
Fifty-three percent of drivers tested in fatal crashes in 2015 had used a legal or illegal drug, eclipsing the 37 percent who tested above the legal



Released 4/26/17: <http://www.ghsa.org/resources/drugged-driving-2017>

***Substance use and sleep***

With marijuana, two things happen...  
Extension of Stage 4 or "deep" sleep and REM deprivation



Angarita, et al., 2016

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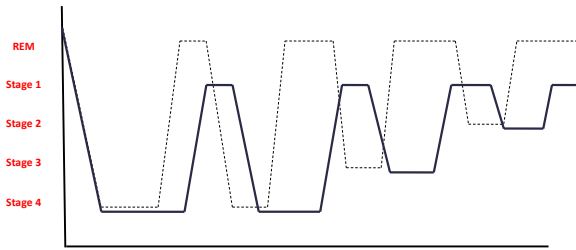
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Angarita, et al., 2016

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**"The munchies"**

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## Marijuana's impact on the body...

- "The munchies" (Mahler et al., 2007)
  - Stimulation of anandamide



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## Heart health

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29 = beats per minute increase in heart rate after marijuana use



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## Triggering Myocardial Infarction by Marijuana

Murray A. Mittleman, MD, DrPH; Rebecca A. Lewis; Malcolm Maclure, ScD; Jane B. Sherwood, RN; James E. Muller, MD

**Background**—Marijuana use in the age group prone to coronary artery disease is higher than it was in the past. Smoking marijuana is known to have hemodynamic consequences, including a dose-dependent increase in heart rate, supine hypertension, and postural hypotension; however, whether it can trigger the onset of myocardial infarction is unknown.

**Methods and Results**—In the Determinants of Myocardial Infarction Onset Study, we interviewed 3882 patients (1258 women) with acute myocardial infarction an average of 4 days after infarction onset. We used the case-crossover study design to compare the reported use of marijuana in the hour preceding symptoms of myocardial infarction onset to its expected frequency using self-matched control data. Of the 3882 patients, 124 (3.2%) reported smoking marijuana in the prior year, 37 within 24 hours and 9 within 1 hour of myocardial infarction symptoms. Compared with nonusers, marijuana users were more likely to be men (84% versus 67%,  $P<0.001$ ), current cigarette smokers (68% versus 32%,  $P<0.001$ ), and obese (43% versus 32%,  $P=0.008$ ). They were less likely to have a history of angina (12% versus 23%,  $P<0.001$ ) or hypertension (36% versus 44%,  $P=0.002$ ). The risk of myocardial infarction onset was elevated 4.8 times over baseline (95% confidence interval, 2.4 to 9.5) in the 60 minutes after marijuana use. The elevated risk rapidly decreased thereafter.

**Conclusions**—Smoking marijuana is a rare trigger of acute myocardial infarction. Understanding the mechanism through which marijuana causes infarction may provide insight into the triggering of myocardial infarction by this and other, more common stressors. (*Circulation*. 2001;103:2805-2809.)

**Key Words:** cannabis ■ myocardial infarction ■ epidemiology ■ cross-over studies

Marijuana is the most widely used illicit drug in the United States. In 1998, >72 million Americans, accounting for 33% of the population older than 12 years, had

in patients with chronic stable angina.<sup>1,2</sup> Furthermore, there are several reports of myocardial infarction occurring in close proximity to marijuana use in otherwise low-risk

## Athletic performance

Sports Med Clin (2015) 45:137-143  
DOI 10.1007/s40279-015-0162-3

CURRENT OPINION



### Cannabis and Exercise Science: A Commentary on Existing Studies and Suggestions for Future Directions

Ardië S. Gilman<sup>1</sup> · Kent E. Hitchcock<sup>1</sup> · Angela D. Bryan<sup>1</sup>

### Showed marijuana use decreased physiological work capacity and reduced maximal exercise duration

Published online: 16 July 2015  
© Springer International Publishing Switzerland 2015

**Abstract** Policies regarding cannabis use are rapidly changing, yet public officials have limited access to scientific information that might inform the creation of these policies. One important area in which to begin investigations is the link between recreational cannabis use and health, specifically exercise. There are common anecdotal reports that cannabis decreases motivation, including motivation to exercise. On the other hand, there are also anecdotal reports that cannabis is used prior to athletic activity. In fact, the World Anti-Doping Agency includes cannabis as a prohibited substance in sports partly because it is believed that it may enhance sports performance. At the current time, there is limited scientific evidence to support either one of these opposing lay perspectives.

#### Key Points

Currently, the specific relationship—positive or negative—between cannabis use and physical activity/sport, and the mechanisms that might mediate this relationship, are unclear.

Examination of the extant literature suggests potential biological and/or neurocognitive effects of cannabis use on exercise performance, motivation, and recovery.

Future research exploring the effects of cannabis use on sports and exercise behavior has the potential to make valuable contributions that will inform public

## What do the scientists conclude?

**“The use of marijuana by the elite athlete prior to competition may result in danger to that particular athlete or others as a result of impairment of response or inappropriate decision making.” (Hilderbrand, 2011, p. 628)**

**Because of... “decreased exercise performance, possibly secondary to increases in heart rate and blood pressure, which may alter perceived exertion, marijuana may be considered an ergolytic agent.” (Pesta, et al., 2013, p. 10)**

### ergolytic

erg·o·ly·tic (ér-gō-lī'tik)

Pertaining to any substance that impairs exercise performance.  
[ergo- + G. *lysis*, a loosening]

Journal of Science and Medicine in Sport 20(2017) 829-839

Contents lists available at ScienceDirect

**Journal of Science and Medicine in Sport**

Journal homepage: [www.elsevier.com/locate/jssm](http://www.elsevier.com/locate/jssm)

Review

**Cannabis: Exercise performance and sport. A systematic review**

Michael C. Kennedy  
Clinical Pharmacology & Toxicology, St. Vincent's Hospital Medical School, UNSW, Sydney, Australia

**ARTICLE INFO**

**ABSTRACT**

**Objective:** To review the evidence relating to the effect of cannabis on exercise performance.

**Design:** A systematic review of published literature.

**Methods:** Medline/Pubmed/Embase/ERIC to the principal psychotropic component of cannabis.

**A search was conducted using PubMed, Medline and Embase searching for cannabis, marijuana, cannabinoids and THC, in sport and exercise, the contents of sports medicine journals for the last 40 years, as well as cross references from journals and a personal collection of papers. Only English language literature was reviewed and only articles that specified the details of a formal exercise program or protocol. Individuals in rehabilitation or health screening programs involving exercise were included in the study. Any non-identified adverse reactions in the marijuana group. Review articles, opinion pieces, policy statements by sporting bodies and regulatory agencies were excluded.**

**Results:** Only 15 published studies have investigated the effects of THC consumption with exercise performance. Of these studies, seven reported any improvement in aerobic performance. Exercise-related outcomes were shown to be inhibited, in terms of functional fitness, time taken to reach maximum power output and in some results from 100m of distance and strength is probably reduced. Some subjects could not complete an exercise protocol because adverse reactions caused by cannabis. An important finding relates to drug testing, as that aerobic exercise was shown to cause only very small increases in THC concentrations.

**Conclusion:** THC does not enhance aerobic exercise or strength.

## Kennedy (2017)

- Found 15 published studies that looked at effects of THC and exercise
  - Number that showed improvement in aerobic performance?
    - ZERO.
- No evidence of increased strength or endurance, and “may impair abilities in extreme situations” (p. 829)
- No data to support claims of analgesic or muscle relaxing properties for athletes.



95 = number of days in which THC-COOH can be detected in urine  
(Verstraete, 2006)



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### Example: Putting the OARS together

- **Student:** Wow. I had another rough weekend.
- **One of us:** What happened? (Open Question)
- **Student:** Everyone seems to be doing better than me. I got upset, and, like I always do when I get depressed, I drank.
- **One of us:** You feel like you're struggling more than everyone else, and want things to feel different. (Reflection)
- **Student:** I do! Everyone else seems to be handling academics as well as having a social life. I can't do both very well.
- **One of us:** You'd like more of a balance. (Reflection)
- **Student:** Exactly.
- **One of us:** What would that look like? (Open Question)

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### Example: Putting the OARS together

- **Student:** I'm not sure, but work hard, play hard is not working for me.
- **One of us:** You know what works for you and what doesn't. (Affirm)
- **Student:** I just need to be more disciplined during the week. Then I can play more on the weekend without feeling guilty.
- **One of us:** What could you do differently during the week? (Open-Ended Question)
- **Student:** I could pick a time for studying and stick to it, every day, Monday through Friday. Then, I can let myself off the hook Friday night and Saturday.

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### Example: Putting the OARS together

- **One of us:** Having a schedule that lets you pace yourself will give that you that balance you're looking for. (Reflection)
- **Student:** I really think it would.
- **One of us:** So, although the last few weekends have been rough, you have a plan for moving forward that you feel good about. If it's o.k. with you, let's talk more about what your schedule could look like. (Summary)

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## Resistance

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### Resistance Strategies

- **Why is it important to pay attention to resistance?**
  - Research relevant to resistance and outcomes
  - Motivational Interviewing focuses on reducing resistance

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## Types of Resistance

- **Argument**
  - Challenging
  - Discounting
  - Hostility
- **Interruption**
  - Talking over
  - Cutting off
- **Ignoring**
  - Inattention
  - Non-response
  - Non-answer
  - Side-tracking
- **Denial**
  - Blaming
  - Disagreeing
  - Excusing
  - Reluctance
  - Claiming Impunity
  - Minimizing
  - Pessimism
  - Unwillingness to change

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## Talking with someone you're concerned about...

- Do what you can to meet people where they are in terms of readiness to change
- Talk to a student when he or she is free of distractions
- Ask open-ended questions
- Don't make assumptions
- Don't label behavior
- Don't judge behavior
- Remain calm and empathic/understanding

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## Talking with someone you're concerned about...

- Describe behavior or specific consequences
- Ask about their thoughts and concerns, and what they might want to do, if anything
- Be aware of resources on campus
- Be OK with a person not wanting to talk or accept your referral
- Consult with a supervisor or other staff when needed
- Be careful not to take on too much

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## More on marijuana

JOURNAL OF PSYCHOACTIVE DRUGS  
2017, VOL. 49, NO. 3, 303-317  
<https://doi.org/10.1080/02701372.2017.1334488>



Check for updates

### Placebo Effects of Edible Cannabis: Reported Intoxication Effects at a 30-Minute Delay

Malloy J. E. Loflin, Ph.D.<sup>a</sup>, Mitch Earleywine, Ph.D.<sup>b</sup>, Stacey Farmer, M.A.<sup>c</sup>, Melissa Slavin, M.A.<sup>c</sup>, Rachel Luba, B.S.<sup>c</sup>, and Marcel Bonn-Miller, Ph.D.<sup>d</sup>

<sup>a</sup>Fellow, National Center for PTSD Training and Dissemination Division, VA Palo Alto Health Care System, Menlo Park, CA, USA; <sup>b</sup>Professor, Department of Psychology, University at Albany SUNY, Albany, NY, USA; <sup>c</sup>Graduate Student, Department of Psychology, University at Albany SUNY, Albany, NY, USA; <sup>d</sup>Adjunct Assistant Professor, Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA

#### ABSTRACT

Previous research has demonstrated the ability of non-active smoked cannabis cigarettes to induce subjective effects of intoxication (i.e., placebo effect). No studies have been conducted to test whether edible forms of cannabis, which are associated with a significant delay in onset of effect, are able to induce a placebo effect. In the present study, 20 participants were told that they would receive an edible cannabis (edgopy) containing a high dose of tetrahydrocannabinol (THC), but were instead given a placebo control. Measures of intoxication and mood were taken at baseline, 30 minutes, and 60 minutes post-ingestion of the placebo (edgopy). Results of four repeated-measures ANOVAs found significant and quadratic changes across time in cannabis (ARC) (vs. placebo) intoxication ( $F(2,18) = 4.00, p < .01, \eta^2 = .22$ ) and negative mood ( $F(2,18) = 3.99, p = .05, \eta^2 = .19$ ). Changes in positive mood and the overall measure of general intoxication (ARC) failed to reach significance. The present study provides preliminary evidence that a placebo effect can be induced with inert edible agents when participants are told that they are receiving active THC. This is the first known study to demonstrate an edible cannabis intoxication placebo effect.

#### ARTICLE HISTORY

Received 12 January 2017

Revised 14 April 2017

Accepted 4 May 2017

#### KEYWORDS

Cannabis; edibles; expectancy; marijuana; placebo

Loflin, et al., 2017

## Loflin, et al. (2017)

- Asked participants to refrain at least 8 hours before study
- Told to plan for a variable end (1.5-6 hours depending on dose they would receive)
- Told they would be in one of three rooms (no dose, low THC, high THC)
- Cubicles (no interaction), and had to rate music and comedy clips, color designs, and compute math problems

Loflin, et al. (2017)

- Used Hemp Pops
  - Hemp seed oil (no active elements of THC or CBD), glucose syrup, citric acid, sugar, natural flavors, and colors #2 and #5



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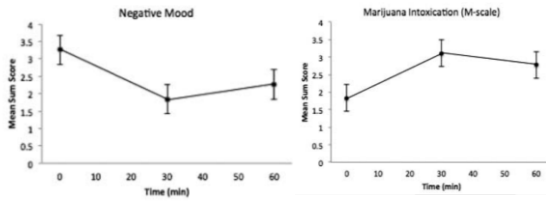
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Placebo effects need to be explored

- For example...
  - Sativa – typically described as uplifting and energetic
  - Indica – typically described as relaxing and calming
- “We would all prefer simple nostrums to explain complex systems, but this is futile and even potentially dangerous in the context of a psychoactive drug such as cannabis” (Piomelli & Russo, 2016, *Cannabis and Cannabinoid Research*)
- Differences in observed effects could be due to other content (which is rarely assayed) or what is reported to potential consumers

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**National Survey on Drug Use and Health: Trends in Prevalence of Marijuana/ Hashish for Ages 12 or Older, Ages 12 to 17, Ages 18 to 25, and Ages 26 or Older; 2015 (in percent)\***

Drug	Time Period	Ages 12 or Older	Ages 12 to 17	Ages 18 to 25	Ages 26 or Older
Marijuana/ Hashish	Past Year	13.50	12.60	32.20	10.40
	Past Month	8.30	7.00	19.80	6.50

Source: SAMHSA NSDUH

**High-risk events**

**Is 4/20 an Event-Specific Marijuana Holiday? A Daily Diary Investigation of Marijuana Use and Consequences Among College Students**

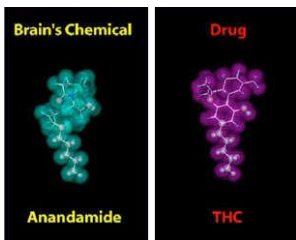
ADRIAN J. BRAVO, PhD,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100,101,102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144,145,146,147,148,149,150,151,152,153,154,155,156,157,158,159,160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,189,190,191,192,193,194,195,196,197,198,199,200,201,202,203,204,205,206,207,208,209,210,211,212,213,214,215,216,217,218,219,220,221,222,223,224,225,226,227,228,229,230,231,232,233,234,235,236,237,238,239,240,241,242,243,244,245,246,247,248,249,250,251,252,253,254,255,256,257,258,259,260,261,262,263,264,265,266,267,268,269,270,271,272,273,274,275,276,277,278,279,280,281,282,283,284,285,286,287,288,289,290,291,292,293,294,295,296,297,298,299,300,301,302,303,304,305,306,307,308,309,310,311,312,313,314,315,316,317,318,319,320,321,322,323,324,325,326,327,328,329,330,331,332,333,334,335,336,337,338,339,340,341,342,343,344,345,346,347,348,349,350,351,352,353,354,355,356,357,358,359,360,361,362,363,364,365,366,367,368,369,370,371,372,373,374,375,376,377,378,379,380,381,382,383,384,385,386,387,388,389,390,391,392,393,394,395,396,397,398,399,400,401,402,403,404,405,406,407,408,409,410,411,412,413,414,415,416,417,418,419,420,421,422,423,424,425,426,427,428,429,430,431,432,433,434,435,436,437,438,439,440,441,442,443,444,445,446,447,448,449,450,451,452,453,454,455,456,457,458,459,460,461,462,463,464,465,466,467,468,469,470,471,472,473,474,475,476,477,478,479,480,481,482,483,484,485,486,487,488,489,490,491,492,493,494,495,496,497,498,499,500,501,502,503,504,505,506,507,508,509,510,511,512,513,514,515,516,517,518,519,520,521,522,523,524,525,526,527,528,529,530,531,532,533,534,535,536,537,538,539,540,541,542,543,544,545,546,547,548,549,550,551,552,553,554,555,556,557,558,559,560,561,562,563,564,565,566,567,568,569,570,571,572,573,574,575,576,577,578,579,580,581,582,583,584,585,586,587,588,589,590,591,592,593,594,595,596,597,598,599,600,601,602,603,604,605,606,607,608,609,610,611,612,613,614,615,616,617,618,619,620,621,622,623,624,625,626,627,628,629,630,631,632,633,634,635,636,637,638,639,640,641,642,643,644,645,646,647,648,649,650,651,652,653,654,655,656,657,658,659,660,661,662,663,664,665,666,667,668,669,670,671,672,673,674,675,676,677,678,679,680,681,682,683,684,685,686,687,688,689,690,691,692,693,694,695,696,697,698,699,700,701,702,703,704,705,706,707,708,709,710,711,712,713,714,715,716,717,718,719,720,721,722,723,724,725,726,727,728,729,730,731,732,733,734,735,736,737,738,739,740,741,742,743,744,745,746,747,748,749,750,751,752,753,754,755,756,757,758,759,760,761,762,763,764,765,766,767,768,769,770,771,772,773,774,775,776,777,778,779,780,781,782,783,784,785,786,787,788,789,790,791,792,793,794,795,796,797,798,799,800,801,802,803,804,805,806,807,808,809,810,811,812,813,814,815,816,817,818,819,820,821,822,823,824,825,826,827,828,829,830,831,832,833,834,835,836,837,838,839,840,841,842,843,844,845,846,847,848,849,850,851,852,853,854,855,856,857,858,859,860,861,862,863,864,865,866,867,868,869,870,871,872,873,874,875,876,877,878,879,880,881,882,883,884,885,886,887,888,889,890,891,892,893,894,895,896,897,898,899,900,901,902,903,904,905,906,907,908,909,910,911,912,913,914,915,916,917,918,919,920,921,922,923,924,925,926,927,928,929,930,931,932,933,934,935,936,937,938,939,940,941,942,943,944,945,946,947,948,949,950,951,952,953,954,955,956,957,958,959,960,961,962,963,964,965,966,967,968,969,970,971,972,973,974,975,976,977,978,979,980,981,982,983,984,985,986,987,988,989,990,991,992,993,994,995,996,997,998,999,1000

**ABSTRACT Objectives:** Given the popular association between April 20 ("4/20") and marijuana, the present study examined marijuana use and consequences on 4/20 compared with other dates in order to test whether 4/20 is a high-risk, event-specific occasion for smoking among college student marijuana users. **Method:** Fifty-nine college student marijuana users from three different large U.S. universities located in Virginia, New Mexico, and Colorado completed daily diary surveys (10 sessions over a 2-day April 16-17 and 29 general screening pre-diary sessions on 12 days April 18-29). **Results:** Marijuana use on 4/20 was associated with increased marijuana use but provided little evidence for an association with more problems use of that day (e.g., 10-12%, 2017).

**Conclusions:** The study provides preliminary support for 4/20 as a date associated with increased marijuana use but provides little evidence for an association with more problems use of that day (e.g., 10-12%, 2017).

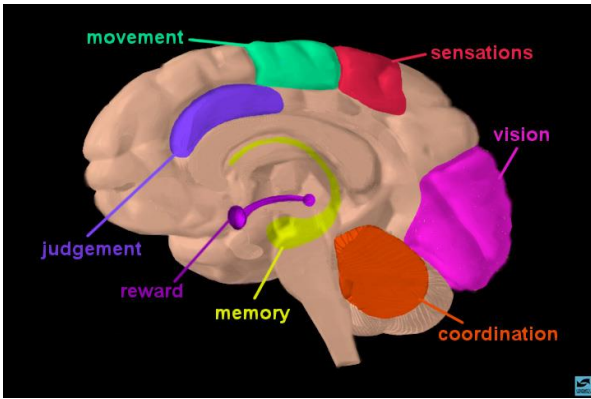
**Bravo et al (2017) found:**

- More people used on 4/20 than weekdays or weekends
- People reported more unique sessions of use on 4/20 than weekdays or weekends
- People used more grams on 4/20 than weekdays or weekends



Anandamide is an endogenous cannabinoid that has an impact on the brain on pleasure, memory, thinking, concentration, movement, coordination, and perception of senses and time.

Source: NIDA, 2017



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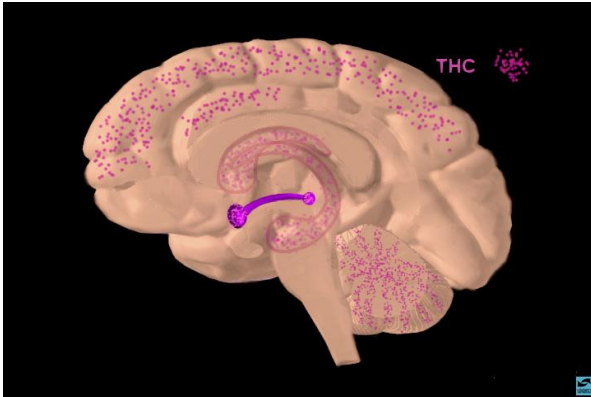
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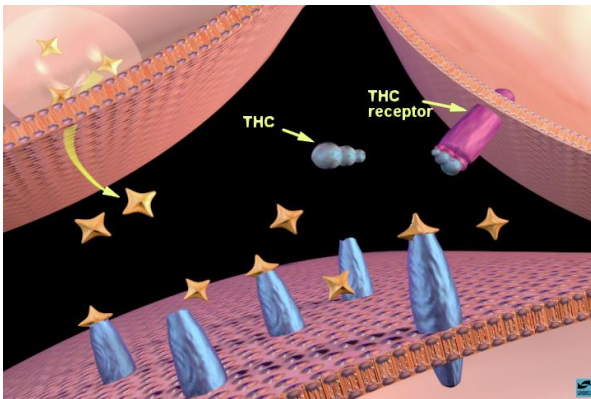
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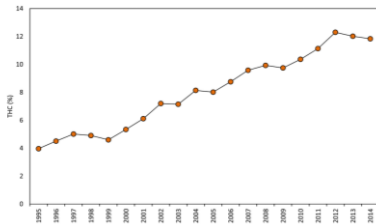
Elsohly, M.A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last 2 decades (1995-2014) – Analysis of current data in the United States. *Biol Psychiatry*, 79, 613-619.

Archival Report

Changes in Cannabis Potency Over the Last 2 Decades (1995-2014): Analysis of Current Data in the United States

Mahmoud A. Elsohly, Zulfika Mehmedic, Susan Foster, Chandrani Gon, Sumen Chandni, and James C. Church

**ABSTRACT**  
BACKGROUND: Marijuana is the most widely used illicit drug in the United States and all over the world. Reports indicate that the potency of cannabis production has been increasing. The report examines the concentration of cannabinoids in high-cannabis samples seized by the US Drug Enforcement Administration over the last 2 decades, with particular emphasis on  $\Delta^9$ -tetrahydrocannabinol and cannabidiol.  
**METHODS:** Samples in this report were analyzed over time from materials submitted by the Drug Enforcement Administration and processed for analysis using a reliable gas chromatography with flame ionization detector method.  
**RESULTS:** Between January 1, 1995, and December 31, 2014, 16,891 samples of cannabis preparations were received and analyzed. The data showed that although the number of analyzed samples seized over the last 2 years has declined, the number of marijuana samples has increased. Overall, the potency of high-cannabis seized material has consistently increased over time since 1995 from ~4% to 1995 to ~12% in 2014. The cannabidiol content has decreased on average from ~0.28% in 2005 to ~0.15% in 2014, resulting in a change in the ratio of  $\Delta^9$ -tetrahydrocannabinol to cannabidiol.





El Sohly, M.A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last two decades (1995-2014) – Analysis of current data in the United States. *Biol Psychiatry*, 79, 613-619.

Washington State Impact Report



www.mfiles.org



Average THC for Marijuana Flower by Strain		
SATIVA	HYBRID	INDICA
		
Average THC: 22.11%	Average THC: 21.56%	Average THC: 21.19%
THC Range: 11% - 30%	THC Range: 14% - 29%	THC Range: 12% - 29%

SOURCE: UNCLE SAM'S POT SHOP CAPITAL HET IDIOTS and BERNHOTS

Average potency (nation) = 13.18%  
 Average potency (Seattle) = 21.62%

Concentrates average potency (nation) = 55.85%  
 Concentrates average potency (Seattle) = 71.71%

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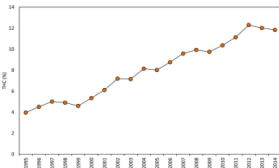
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El Sohly, M.A., Mehmedic, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last two decades (1995-2014) – Analysis of current data in the United States. *Biol Psychiatry*, 79, 613-619.

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**“How addictive  
 is marijuana?”**

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Criterion	DSM-IV substance dependence	DSM-5 substance use disorder
Tolerance	✓	✓
Withdrawal	✓	✓
Taken more/longer than intended	✓	✓
Desire/unsuccessful efforts to quit use	✓	✓
Great deal of time taken by activities involved in use	✓	✓
Use despite knowledge of problems associated with use	✓	✓
Important activities given up because of use	✓	✓
Recurrent use resulting in a failure to fulfill important role obligations		✓
Recurrent use resulting in physically hazardous behavior (e.g., driving)		✓
Continued use despite recurrent social problems associated with use		✓
Craving for the substance		✓

DSM-5 Cannabis Use Disorder Criteria



Mild: 2-3 symptoms  
 Moderate: 4-5 symptoms  
 Severe: 6+ symptoms

## A quick word about medical cannabis use

### EPILEPSY CURRENTS

#### Current Review

In Clinical Science



#### Cannabidiol: Promise and Pitfalls

Timothy E. Welty, PharmD<sup>1</sup>  
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Over the past few years, increasing public and political pressure has supported legalization of medical marijuana. One of the main thrusts in this effort has related to the treatment of refractory epilepsy—especially in children with Dravet syndrome—using cannabidiol (CBD). Despite initiatives in numerous states to at least

and controlled and excluded case series, case reports, and expert opinion. They were able to identify only 4 randomized controlled studies reported in the literature, and they included a letter to the editor and an abstract. The total number of subjects enrolled in these studies was 48 (11–14). While only four studies and a letter to the editor were in the actual analysis, the authors included a complete reference listing of all articles reviewed for inclusion.

These reports suffered from a number of design flaws, including incomplete baseline quantification of baseline seizure frequency, indeterminate time periods for outcome determination and, in some cases, inadequate (or missing) statistical analysis—in general, a lack of sufficient detail to adequately evaluate and interpret the findings. Limitations aside, several studies did report that administration of adjunctive CBD did not result in meaningful changes in seizure frequency (11–13).

Cunha et al. reported a 2-phase pilot study of CBD versus placebo in normal volunteers and patients with refractory secondarily generalized epilepsy (14). In the first phase, 15 normal volunteers received CBD or placebo in a double-blind fashion, at a dose of 3 mg/kg for 30 days. The second phase was also double-blinded in 15 patients with epilepsy receiving 200 to 300 mg daily of CBD or placebo for 135 days. Patients continued baseline AED. All subjects tolerated CBD well, with no serious adverse events. Four of the epilepsy patients receiving CBD were “almost free of convulsive crisis” for the duration of the study. Three other patients receiving CBD had a partial

are not subject to regulations governing labeling, purity, and reliability. In other words, currently, there is no guarantee of consistency between products, or even differing lots produced by the same manufacturer. Without independent testing (e.g. USP certification) of CBD products for content and purity, as well as bioavailability testing of specific products, uncertainty surrounds the use of available CBD products in routine clinical settings.

#### Conclusions

At this time, there does seem to be a growing body of basic pharmacologic data suggesting there may be a role for CBD, especially in the treatment of refractory epilepsy. However, given the lack of well-controlled trials, we must also ask if we are getting ahead of ourselves. Clearly, this is an emotionally and politically charged issue. If this were any other uninvestigated pharmaceutical compound, would we feel as compelled to make the agent widely available before statistically valid class I evidence was available for review? Until data from well-designed clinical trials are available and reliable, and standardized CBD products that are produced using GMP are available, caution must be exercised in any consideration of using CBD for the treatment of epilepsy. In the meantime, based upon promising preliminary data, further clinical research should be wholeheartedly pursued.

Welty, et al., 2014 (p. 251) GMP = “Good Manufacturing Practices”

#### Review Article

### A selective review of medical cannabis in cancer pain management

Alexis Blake<sup>1</sup>, Bo Angela Wan<sup>1</sup>, Leila Malek<sup>1</sup>, Carlo DeAngelis<sup>1,2</sup>, Patrick Diaz<sup>1</sup>, Nicholas Lau<sup>1</sup>, Edward Chow<sup>1</sup>, Shannon O’Hearn<sup>1</sup>

<sup>1</sup>McMaster, Hamilton, Ontario, Canada; <sup>2</sup>Ontario Cancer Centre, Sunnybrook Health Sciences Centre; <sup>3</sup>Yale Div. Faculty of Pharmacy, University of Toronto, Toronto, Ontario, Canada

Correspondence: Dr. Conception and design: A. Blake, E. Chow, S. O’Hearn; (II) Administration support: BA Wan, L. Malek, P. Diaz; (III) Provision of study materials or patients: N. Lau; (IV) Collection and assembly of data: A. Blake, BA Wan, L. Malek, S. O’Hearn; (V) Data analysis and interpretation: All authors; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors. Correspondence to: Dr. Alexis Blake, MSc, McMaster Corp, Hamilton Industrial Park, Hamilton, Ontario, Canada. Email: alexis.blake@mcmaster.ca

**Abstract:** Ineffective management of cancer-associated chronic and neuropathic pain adversely affects patient quality of life. Patients who do not respond well to opioid analgesics or have severe side effects from the use of traditional analgesics are in need of alternative therapeutic options. Anecdotal evidence suggests that medical cannabis has potential to effectively manage pain in this patient population. This review presents a synthesis of representative clinical studies, from small pilot studies conducted in 1971, to double-blind placebo-controlled trials conducted in 2014 that evaluated the efficacy of cannabidiol.

Authors reviewed published literature and conducted a lit review on Medline for all articles between 1975 and 2017 that included key words of “cannabis,” “THC,” “CBD,” “Nabiximol,” “cancer,” and “pain.”

Found five studies that met criteria for inclusion.

## Challenges with medical cannabis research

- Schedule I substance
- Lack of dosing guidelines
  - Ideally, research would need to find a dose that provides maximum relief with minimal side effects
- As it is, optimal doses seem to vary person to person
- Often are taking many other treatments (medical, herbal, or otherwise)
- Generalizability is challenging (e.g., 3 of the 5 studies had less than 50 participants)
- Trials need to consider differences in cannabinoid pharmacokinetics and pharmacodynamics among individuals
- Standardized and validated evaluation and reporting of side-effects is warranted

Blake, et al., (2017)

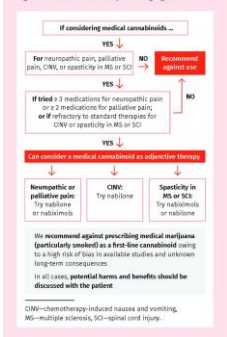
Blake et al. *Canadian Journal of Pain*

Table 1. Summary of seven studies (26-32) with their respective side effects (continued).

Study	Percentage of patients experiencing side effects with each treatment arm (%)				
	THC 20 mg	THC 10 mg	THC 5 mg	THC 2.5 mg	Placebo
Wong et al. (26, n=10)	THC 20 mg	THC 10 mg	THC 5 mg	THC 2.5 mg	Placebo
Chronic pain	60	30	30	10	30
Headache	40	40	40	40	20
Dizziness	70	70	40	20	0
Nausea/vomiting	60	70	40	60	20
Constipation	60	40	40	20	10
Wong et al. (26, n=24)	THC 20 mg	THC 10 mg	Control 80 mg	Control 100 mg	Placebo
Chronic pain	60	30	30	30	30
Headache	40	70	30	40	20
Dizziness	60	70	40	60	20
Nausea/vomiting	60	40	20	10	0
Constipation	60	30	20	10	0
Johnson et al. (27, n=17)	Placebo				
Chronic pain	10	10	10	10	10
Headache	10	10	10	10	10
Dizziness	10	10	10	10	10
Nausea/vomiting	10	10	10	10	10
Constipation	10	10	10	10	10
Porter et al. (28, n=20)	Placebo				
Chronic pain	10	10	10	10	10
Headache	10	10	10	10	10
Dizziness	10	10	10	10	10
Nausea/vomiting	10	10	10	10	10
Constipation	10	10	10	10	10
Lyons et al. (29, n=18)	Placebo				
Chronic pain	10	10	10	10	10
Headache	10	10	10	10	10
Dizziness	10	10	10	10	10
Nausea/vomiting	10	10	10	10	10
Constipation	10	10	10	10	10
Unpublished benefits	10	10	10	10	10

Side effects documented across the five studies evaluated in Blake, et al., (2017), p. 220

Figure 1. Medical cannabinoid prescribing algorithm



Only are recommending for neuropathic pain, palliative and end-of-life pain, chemotherapy-induced nausea and vomiting, and spasticity due to multiple sclerosis or spinal cord injury...

AND

If tried traditional therapies/treatments first...

# Separating reported medical use from management of withdrawal

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## Motivations for Use

- Research team utilized qualitative open-ended responses for using marijuana among incoming first year college students to identify which motivations were most salient to this population

Lee, Neighbors, & Woods (2007)

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## Motivations for Use

Motive Category	Proportion of participants endorsing motive	Proportion of primary motives	
Enjoyment/fun	Enjoyment (e.g., be happy, get high, enjoy feeling)	52.14%	24.03%
	Conformity (e.g., peer pressure, friends do it)	42.81%	16.40%
Social enhancement	Experimentation (e.g., new experience, curiosity)	41.25%	29.36%
	Social enhancement (e.g., bonding with friends, hang out)	25.71%	8.66%
Boredom	Boredom (e.g., something to do, nothing better to do)	25.08%	4.15%
	Relaxation (e.g., to relax, helps me sleep)	24.64%	6.97%
	Coping (e.g., depressed, relieve stress)	18.14%	5.10%
	Availability (e.g., easy to get, it was offered)	13.74%	2.23%
Altered perception	Relative low risk (e.g., low health risk, no hangover)	10.88%	0.95%
	Altered perception (e.g., to enhance experiences, make time tick faster)	10.66%	1.81%
Activity enhancement	Activity enhancement (e.g., music sounds better, every day activities more interesting)	5.68%	0.80%
	Rebellion (e.g., rebelling against parents, thrill of something illegal)	5.21%	0.32%
	Alcohol intoxication (e.g., I was drunk)	4.42%	0.47%
	Food enhancement (e.g., enjoy good food, food tastes better)	3.79%	0.00%
Image enhancement	Anxiety reduction (e.g., be less shy, feel less insecure)	3.31%	0.00%
	Image enhancement (e.g., to be cool, to feel good)	2.85%	0.32%
	Celebration (e.g., special occasion, to celebrate)	1.26%	0.16%
Celebration	Medical use (e.g., alleviate physical pain, have a headache)	1.26%	0.16%
	Habit (e.g., feeling was addictive, became a habit)	0.95%	0.00%

Lee, Neighbors & Woods (2007)

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Relaxation (to relax, helps me sleep)	24.64%	6.97%
Coping (depressed, relieve stress)	19.14%	5.10%
Availability (e.g., easy to get, it was offered)	13.74%	2.23%
Relative low risk (e.g., low health risk, no hangover)	10.88%	0.95%
Altered perception or perspectives (e.g., to enhance experiences, makes things more fun)	10.88%	1.81%
Activity enhancement (e.g., music sounds better, every day activities more interesting)	5.68%	0.80%
Rebellion (e.g., rebelling against parents, thrill of something illegal)	5.21%	0.32%
Alcohol intoxication (e.g., I was drunk)	4.42%	0.47%
Food enhancement (e.g., enjoy good food, food tastes better)	3.78%	0.00%
Anxiety reduction (e.g., be less shy, feel less insecure)	3.31%	0.00%
Image enhancement (e.g., to be cool, to feel cool)	2.85%	0.32%
Celebration (e.g., special occasion, to celebrate)	1.26%	0.16%
Medical use (physical pain, have headache)	1.26%	0.16%
Habit (e.g., using was addictive, became a habit)	0.95%	0.00%

Lee, Neighbors & Woods (2007)

## Withdrawal: Cannabis

### Diagnostic Criteria 292.0 (F12.288)

- A. Cessation of cannabis use that has been heavy and prolonged (i.e., usually daily or almost daily use over a period of at least a few months).
- B. Three (or more) of the following signs and symptoms develop within approximately 1 week after Criterion A:
  1. Irritability, anger, or aggression.
  2. Nervousness ~~or anxiety~~.
  3. ~~Sleep difficulty~~ (e.g., insomnia, disturbing dreams).
  4. ~~Decreased appetite~~ or weight loss.
  5. Restlessness.
  6. ~~Depressed mood~~.
7. At least one of the following physical symptoms causing significant discomfort: abdominal pain, shakiness/tremors, sweating, fever, chills, ~~or headache~~.
- C. The signs or symptoms in Criterion B cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- D. The signs or symptoms are not attributable to another medical condition and are not better explained by another mental disorder, including intoxication or withdrawal from another substance.

## Drug Interactions

- **Potentiation**
  - Occurs when one has used two drugs that work in the same direction
    - Alcohol + Marijuana
- Instance where  $1+1 > 2$
- Marijuana and alcohol used at the same time “can result in excessive CNS depression” (Seamon, et al., 2007, p. 1041)

## Opportunities and lessons learned:

How you talk about marijuana matters...a lot!

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## Discussing marijuana...word choice matters

- **“Do you smoke marijuana?”**
  - A person who uses edibles daily can honestly say “no”
  - If screening with a yes/no, consider “do you use marijuana?”
- **“Do you use marijuana?” or “have you used marijuana?”** followed by, “What does your marijuana use look like?”

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## How Can We Use This Information to Prevent & Reduce Harm from Marijuana?

- **Reduce Motivation to Use/Misuse**
  - **Already signs of some efforts of wanting to change:**
    - Tried to set limits on use
      - Those using 2-3 times per month or less: 34.1%
      - Those using weekly or more: 54.0%
    - Tried to cut down
      - Those using 2-3 times per month or less: 27.0%
      - Those using weekly or more: 39.5%
  - **Effective coping; healthy alternatives**

Data Source: DBHR/UW Washington Young Adult Health Survey  
Slide content: Kilmer & Larimer presentation to Strategic Prevention Enhancement Meeting (July 2016)

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## How Can We Use This Information to Prevent & Reduce Harm from Marijuana?

- Increase motivation to change for those using more heavily or at risk for addiction
  - Brief Motivational Interventions show promise
    - Pilots of brief interventions with mandated students (e.g., Marijuana and Other Drug workshop)
    - In-person, personalized feedback interventions with facilitators trained in motivational interviewing (e.g., Lee, et al., 2013)
  - Chance to provide education about addiction and withdrawal

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## Social norms: Perception versus reality

- People are influenced by their subjective interpretation of a situations rather than by the actual situation (Lewin, 1943).
- We are influenced by our perception of others' attitudes, behaviors, and expectations rather than by their actual attitudes, behaviors, or expectations.
- Our perceptions and interpretations are often inaccurate.

Source: Neighbors & Kilmer (2008)

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## Norms Clarification

- Examines people's perceptions about:
  - Acceptability of excessive behavior
  - Perceptions about the prevalence of drinking among peers
  - Perception about the rates of drinking by peers



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## NORM PERCEPTION

- In survey of 5990 participants, 67.4% of students said the hadn't used MJ in the past year
  - Thus, "most" students don't use marijuana
- Only 2% of students got this right!
  - 98% of students perceived the typical student to use at least once per year
- Misperceptions were related to use and consequences

Kilmer, et al. (2006)

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## Personal marijuana use

(assessed separately from medical use)

### Any Personal Marijuana, past year

Cohort 1 (2014): 43.51%

Cohort 2 (2015): 46.29%

Cohort 3 (2016): 44.76%

No significant overall trend, nor differences across cohorts

No significant differences in frequency of use

Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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## Personal marijuana use

(assessed separately from medical use)

### Perception remains that the typical person uses:

Percentage of cohort who perceive typical person to use

1x/year or more:

Cohort 1 (2014): 97.59%

Cohort 2 (2015): 97.58%

Cohort 3 (2016): 98.39%

Percentage of cohort who perceive typical person to use

1x/week or more:

Cohort 1 (2014): 52.84%

Cohort 2 (2015): 47.24%

Cohort 3 (2016): 54.37%

Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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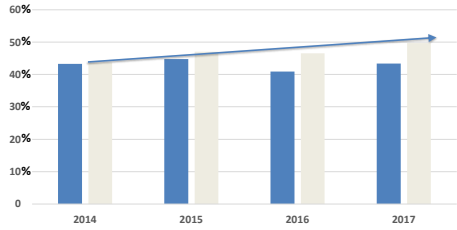
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Data Source: DBHR/UW Washington Young Adult Health Survey 2017 data report

### Past year personal marijuana use by age group



**\*\* Significant interaction ( $p < .05$ ) – no change for those under 21, but for those over 21, there is an increasing linear trend in marijuana use over time/cohort ( $p < .05$ ); additionally, the difference is statistically significant for cohort 4 vs. cohort 1 ( $p < .01$ ).\*\***

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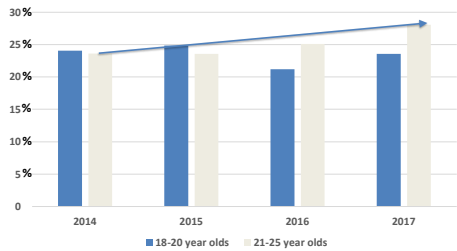
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Data Source: DBHR/UW Washington Young Adult Health Survey 2017 data report

### Past month personal marijuana use by age group



**\*\* no linear trend over time for those 18-20; among those 21-25, we see a significant increasing trend over time in at least monthly use ( $p < .05$ ) and, when treating cohort as a dummy variable, we also see a significant difference between Cohort 4 and Cohort 1 ( $p < .05$ ).\*\***

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**What are some of the things that contribute to norms related to marijuana in Washington?**

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**“It’s just weed...”  
or  
“It’s not addictive...”**

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**From a state legislator outside of  
Washington:**

**“Low dependence rates:**

A study by researchers at the National Institute on Drug Abuse (Anthony, Warner, & Kessler 1994) found that among people who had ever used marijuana, 9% had experienced marijuana dependence at some point in their life.”

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- DSM-I: 1952
- DSM-II: 1968
- DSM-III: 1980
- DSM-III-R: 1987
- DSM-IV: 1994
- DSM-IV-TR: 2000
- DSM-5: 2013

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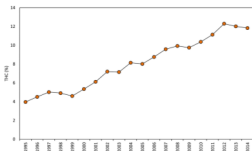
## Comparative Epidemiology of Dependence on Tobacco, Alcohol, Controlled Substances, and Inhalants: Basic Findings From the National Comorbidity Survey

James C. Anthony, Lynn A. Warner, and Ronald C. Kessler

According to the Diagnostic and Statistical Manual (3rd ed., rev., American Psychiatric Association, 1987) drug dependence among Americans 15-54 years old, we found about 1 in 4 (24%) had a history of tobacco dependence, about 1 in 10 (10%) had a history of alcohol dependence, and about 1 in 13 (7.5%) had a history of dependence on an inhalant or controlled drug. About one third of tobacco smokers had developed tobacco dependence and about 15% of drinkers had become alcohol dependent. Among users of the other drugs, about 15% had become dependent. Many more Americans age 15-54 have been affected by dependence on psychoactive substances than by other psychiatric disturbances now accorded a higher priority in mental health service delivery systems, prevention, and sponsored research programs.

The aim of this article is to report basic descriptive findings from new research on the epidemiology of drug dependence syndromes, conducted as part of the National Comorbidity Survey (NCS).

relates of tobacco dependence, alcohol dependence, and dependence on other psychoactive drugs (Kessler et al., 1994).



El Sohly, M.A., Mehmmed, Z., Foster, S., Gon, C., Chandra, S., & Church, J.C. (2016). Changes in cannabis potency over the last two decades (1995-2014) - Analysis of current data in the United States. *Biol Psychiatry*, 79, 613-619.

***“News” articles, particularly alongside pro-health messages***

SEATTLE PET GUIDE

# Trending Now: High-End Pet Travel and Marijuana for Dogs

Massage and Canna-treats are the newest ways we're pampering our animals.

By Allison Williams • 4/17/2017 at 8:00am • Published in the May 2017 issue of Seattle Met



### Pets on Pot

Sorry, Nancy Reagan. First Washington went from "Just Say No" to legal recreational marijuana, and now dogs and cats across the state are on weed too—there are more pooches on pot these days than on a gluten-free kibble diet.

But call off the D.A.R.E. lectures: Animals aren't actually getting high. (These might be Fido's reasons...)

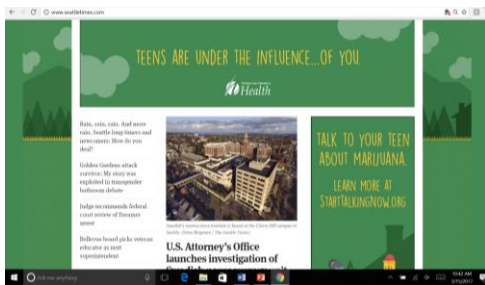


### Popular Content

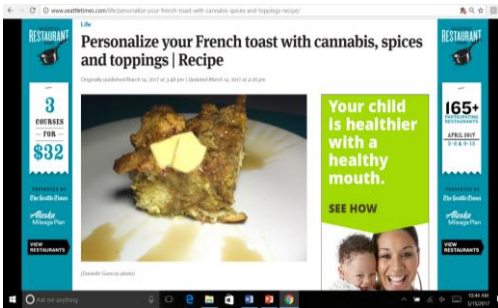


By Sarah Hines  
**An Insider's Guide to the Valley's Best On-Mountain Adventures**

Seattle Times, March 16, 2017



Seattle Times, March 16, 2017



### Holiday food, wine and cannabis pairings

Originally published December 6, 2018 at 9:26 am



The Englewood Reporter

Guide to complementing your meal with the varied flavors and aromas of different cannabis strains.

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www.seattletimes.com/5/cannabis-kale-chips-that-will-make-your-weekend-recipe/

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Food & Drink Pacific NW Magazine Outdoors Wellness Home & Decor Pets Cannabis Race & Ride

Your child is healthier with a healthy mouth. **RIGHTY MOUTH** LEARN HOW

Life

### Cannabis kale chips that will make your weekend | Recipe

Originally published March 2, 2017 at 9:22 am | Updated March 2, 2017 at 12:30 pm



Your child is healthier with a healthy mouth.

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*Emergence of more visible  
"open-air drug market"*

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# SPD BLOTTER

"Officers Shall Not Take Any Enforcement Action—Other Than to Issue a Verbal Warning—For a Violation of I-502."

Written by Jonah Spangenthal-Lee on December 5, 2012



Getting baked outside? Seattle police to look other way

Wednesday, December 5, 2012 by Vanessa Ho

KING 5, 12/6/12:

"...At least for now, Seattle Police plan to look the other way on the latter part until people get used to the new law."



## Seattle Police Release Hilarious Statement About Legalized Marijuana

By Joe Vetruba December 5, 2012 1:35 PM



### MARIJUANA: Seattle Police to Pot Smokers: 'Responsibly Get Baked, Enjoy Lord of the Rings Marathon'

POSTED BY GEORGE FRENCH ON FRI, DEC 7, 2012 AT 9:04 AM

## Seattle police to hand out Doritos to Hempfest attendees instead of public consumption tickets

By William Breathes in News, Say what?  
Thursday, August 15, 2013 at 11:20 am

3 Comment

Seattle Police won't be ticketing people for public consumption at this weekend's Hempfest. Instead, they'll be issuing munchies along with information on the newly-passed marijuana laws in Washington state.



THIS STICKER IS NOT A LAWYER AND CANNOT PROVIDE YOU WITH LEGAL ADVICE

**HEMPFESTERS!** We thought you might be hungry. We also thought now might be a good time for a refresher on the do's and don'ts of I-502.

**DON'TS** Don't drive while high. Don't give, sell, or shotgun weed to people under 21. Don't use pot in public. You could be cited but we'd rather give you a warning. **DO'S** Do listen to Dark Side of the Moon at a reasonable volume. Do enjoy Hempfest.

**Remember:** respect your fellow voters and familiarize yourself with the rules of I-502 at [seattle.gov/police/marijwhatnow](http://seattle.gov/police/marijwhatnow) **SPD**

WARNING: THE CONTENTS OF THIS PACKAGE ARE AS DELICIOUS AS THEY APPEAR




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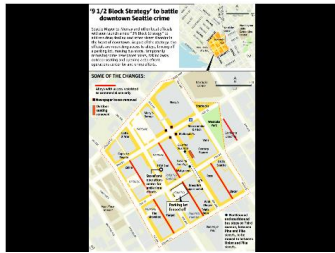
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## Seattle tackles drug dealing, disorder in downtown core

Originally published April 21, 2015 at 7:06 pm | Updated April 23, 2015 at 4:31 pm | Corrected



On 4/21/15 from Seattle Times:

“City officials and business leaders say they are embarking on an ambitious effort to shut down open-air drug dealing and associated crime in Seattle’s downtown core with its new ‘9½ Block Strategy.’”

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“Seattle residents and visitors should not be forced to navigate a dangerous open-air drug market between the downtown retail core and Pike Place Market,” Murray said.

From Seattle Times, April 23, 2015

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# 100 drug arrests kick off new push against downtown crime

Originally published April 23, 2015 at 11:15 am | Updated April 24, 2015 at 6:27 pm



The arrests, dubbed "Operation Crosstown Traffic," involved undercover officers who made 177 purchases of heroin, meth, marijuana, crack cocaine and other drugs from 186 street dealers."

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# 20 suspected dealers arrested in U District drug sting

Originally published September 18, 2015 at 6:34 am | Updated September 18, 2015 at 7:47 pm



"Seattle police arrested 20 alleged drug dealers this week...along University Way.

Eight of the suspects have been arrested more than 25 times"

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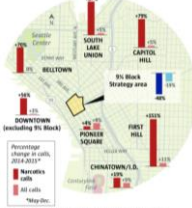
## Did Seattle's downtown drug crackdown push crimes elsewhere?

Originally published September 3, 2016 at 8:00 am | Updated September 4, 2016 at 8:28 pm



### During targeted crackdown, different crime trends

In the eight months after the launch of the 9% Block Strategy, calls to the police about narcotics and other illegal activities dropped in Seattle's downtown core but rose in surrounding neighborhoods.



Source: Seattle Times, September 4, 2016

www.seattletimes.com/seattle-news/marijuana/4-pot-stores-caught-selling-to-minors

Local News | Marijuana

## 4 pot stores sold marijuana to underage buyers in state sting

Originally published May 20, 2015 at 12:28 pm | Updated May 20, 2015 at 3:39 pm | Corrected

In the state's first checkup on recreational-marijuana stores, four of 22 stores sold pot to underage buyers, according to the Liquor Control Board.



By Evan Bush  
 Seattle Times staff reporter

In the state's first checkup on recreational-marijuana stores, four of 22 stores sold marijuana to underage buyers, according to the Liquor Control Board (LCB).

The state last week announced it would use 18- to 20-year-old buyers as part of a compliance-check program launching this month.

If asked for identification, the buyers were directed either to say they did not have ID or present a real state-issued identification. People must be 21 and older to legally buy marijuana.



Source: Seattle Times

Local News | Marijuana

# State sting finds 19 pot shops selling to minors

Originally published July 16, 2013 at 4:52 pm | Updated July 18, 2013 at 8:12 pm



By Bob Young

In a sting using underage investigators, the Liquor Control Board found that 19 of 157 recreational pot stores in the state sold to minors.

Just two shops in King County broke the law, according a Thursday report from the board. American Mary in Seattle and Dockside Cannabis in Shoreline.

Between mid-May and the end of June, investigative aides between 14 and 20 years old went into stores and either presented their true identification or none at all. Businesses cited for selling to minors face a 10-day suspension or \$2,500 fine. A second violation requires a 30-day suspension; a third strike could mean a lost license. Employees who sold pot to minors could face criminal charges.

The checks resulted in an 88 percent compliance rate. When the state has checked liquor sellers, between 85 and 92



\$1 FOR 4 WEEKS  
ON LATEST SEAHAWKS NEWS

Source: Seattle Times

Crime | Local News

# Watch the video: Burglars ram car into Greenwood pot shop, then loot it

Originally published March 28, 2013 at 1:22 pm | Updated March 28, 2013 at 2:22 pm



A video car rammer in the Hove & Hove pot shop in Greenwood during a burglary. (Courtesy of Hove & Hove)

Early Friday morning, someone in a car drove through the front door of the Seattle business.

By Seattle Times staff

It was a classic smash-and-grab burglary, according to surveillance videos released Friday by Hove & Hove, a Greenwood marijuana store.

The video shows four people in a car plowing into the shop's front door early Friday and looting pot stored behind the counter.

Advertisement for 'IN THE GIG HARBOR' real estate listing with 'NOW SELLING!' banner and contact information.

Crime | Local News | Marijuana | Northwest

# Authorities: Man with machete robbed Kingston pot shop

Originally published August 7, 2013 at 9:52 am | Updated August 7, 2013 at 8:02 pm

The man walked into the Green Tiki Cannabis shop Monday morning and made off with some product after he pulled out a large, black-colored machete, police say.



By The Associated Press  
The Associated Press

BRIMERTON, Wash. (AP) — Western Washington authorities are looking for a man who used a machete to rob a Kingston marijuana shop.

Share story

f Share

✉ Email

The Kitsap Sun reports police say the man entered the Green Tiki Cannabis shop Monday morning and made off with some product after he pulled out a large, black-colored machete.



***Impact of advertisements,  
billboards, and other media  
needs to be assessed***

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**Media**

Brief summary from Kilmer, J.R., Kilmer, R.P., & Grossberg, P.M.(2014). The role of media on adolescent substance use: Implications for patient visits. *AM STARs: Adolescent Medicine, 24*, 684-697.



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**Potential role of media**

- **Impact of media exposure related to alcohol (including television, advertisements, and movie content)**
  - In a review of 13 studies, 12 of the 13 showed media exposure was associated with increased likelihood of:
    - Initiating drinking among abstainers
    - Increased consumption among those already drinking

Anderson P, de Bruijn A, Angus K, Gordon R, Hastings G. (2009). Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol and Alcoholism, 44*:229-243

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**Decisions/messaging by parents**

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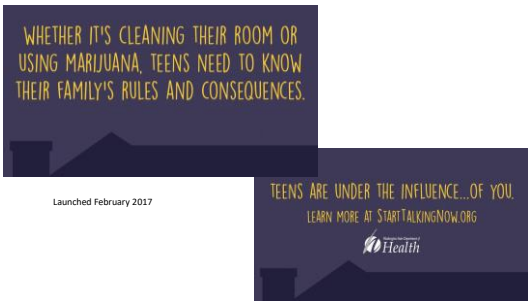
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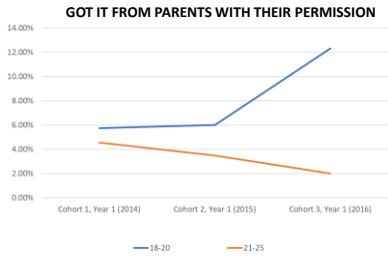
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Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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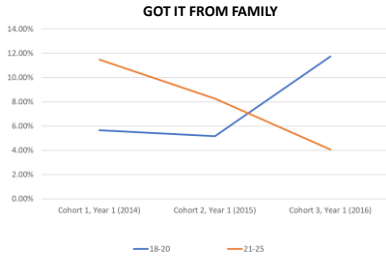
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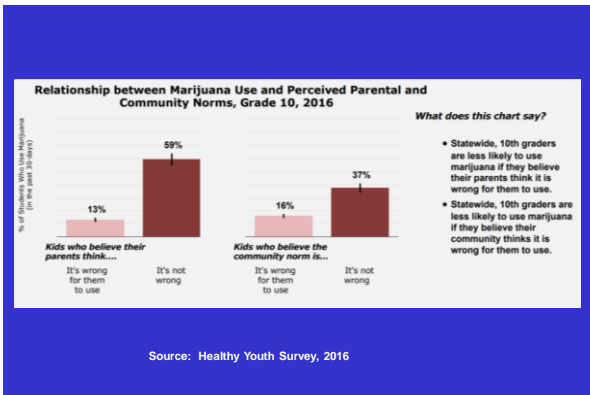
Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

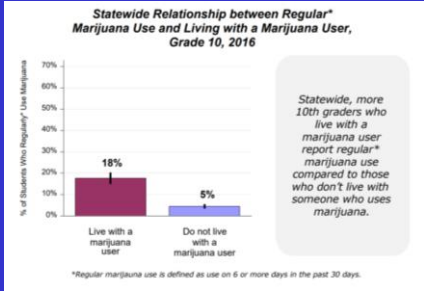
## Where 18-20 year olds get marijuana

Decreasing trend significant  
Increasing trend significant

WHERE DO PEOPLE GET MARIJUANA, 18-20 year olds				
	2014	2015	2016	2017
From friends	72.86%	76.24%	69.68%	77.40%
Gave money to someone	23.29%	26.47%	34.72%	41.45%
Got it from someone				
w/medical mj. card	17.60%	14.12%	4.30%	5.24%
Got it from a med. disp.	13.65%	18.99%	5.58%	4.72%
Got it at a party	22.99%	22.14%	23.08%	24.92%
Got it from family	5.65%	5.18%	11.75%	9.73%
Got it some other way	11.64%	4.12%	6.12%	9.02%
Bought from retail store	0.99%	4.58%	1.73%	1.92%
Got it from parents				
with permission	5.75%	6.02%	12.33%	10.44%
Grew it themselves	1.91%	1.15%	1.65%	0.23%
Stole it from store/disp.	0.00%	0.00%	0.00%	0.00%

Data Source: DBHR/UW Washington Young Adult Health Survey 2017 data report  
UNIVERSITY of WASHINGTON





Source: Healthy Youth Survey, 2016

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***Presence of other pro-marijuana content outside of designated stores***

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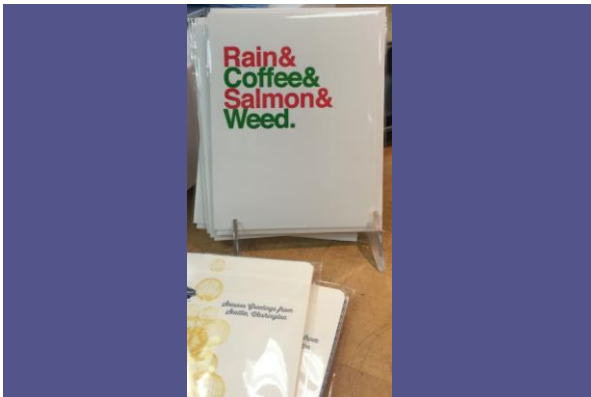
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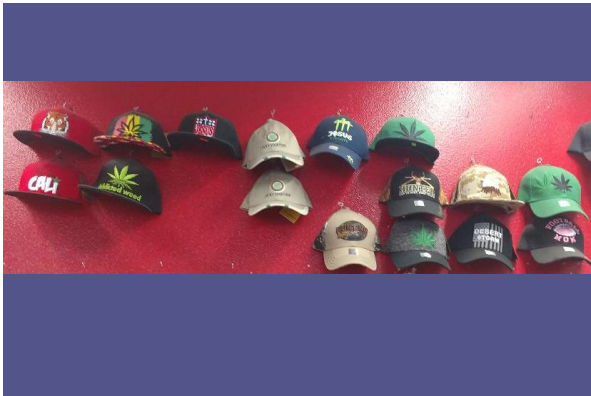
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**Considering why norms matter  
in Young Adult Health Survey**

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**Weighted Analyses of  
DBHR Young Adult Health Survey  
Cohort 1 change from Year 1 (2014) to Year 3 (2016)**

Select findings that demonstrate potential shifts within cohort over time

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**ODDS RATIOS:  
Predicting Year 3 marijuana use by five factors at time 1**

• ANY MARIJUANA USE, YEAR 3

<b>Predictor</b>	<b>OR</b>	<b>p-value</b>
• Physical risk of regular marijuana	0.71	p<.001
• <i>The more risky they see regular marijuana use, the less likely they are to use</i>		
• Psychological risk of regular marijuana	0.59	p<.001
• <i>The more risky they see regular marijuana use, the less likely they are to use</i>		
• Perceived ease of access	0.65	p=.001
• <i>The more difficult to obtain marijuana, the less likely they are to use</i>		
• Injunctive norms for regular marijuana	0.64	p<.001
• <i>The more they see marijuana use as unacceptable, the less likely they are to use</i>		
• Descriptive norms for marijuana	1.08	p=.047
• <i>The higher they perceive norms to be, the more likely they are to use</i>		

All models adjusted for age, sex, and baseline level of the outcome

Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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**ODDS RATIOS:**

**Predicting Year 3 marijuana use by five factors at time 1**

• AT LEAST WEEKLY MARIJUANA USE, YEAR 3

<u>Predictor</u>	<u>OR</u>	<u>p-value</u>
• Physical risk of regular marijuana	0.58	p<.001
• <i>The more risky they see regular marijuana use, the less likely they are to use</i>		
• Psychological risk of regular marijuana	0.45	p<.001
• <i>The more risky they see regular marijuana use, the less likely they are to use</i>		
• Perceived ease of access	0.54	p=.001
• <i>The more difficult to obtain marijuana, the less likely they are to use</i>		
• Injunctive norms for regular marijuana	0.51	p<.001
• <i>The more they see marijuana use as unacceptable, the less likely they are to use</i>		
• Descriptive norms for marijuana	1.12	p=.022
• <i>The higher they perceive norms to be, the more likely they are to use</i>		

All models adjusted for age, sex, and baseline level of the outcome

Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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**ODDS RATIOS:**

**Predicting Year 3 marijuana use by five factors at time 1**

• NUMBER OF MARIJUANA-RELATED CONSEQUENCES, YEAR 3

<u>Predictor</u>	<u>OR</u>	<u>p-value</u>
• Physical risk of regular marijuana	0.76	p=.001
• <i>The more risky they see regular marijuana use, the less likely they are to experience consequences</i>		
• Psychological risk of regular marijuana	0.61	p<.001
• <i>The more risky they see regular marijuana use, the less likely they are to experience consequences</i>		
• Perceived ease of access	0.53	p<.001
• <i>The more difficult to obtain marijuana, the less likely they are to experience consequences</i>		
• Injunctive norms for regular marijuana	0.69	p<.001
• <i>The more they see marijuana use as unacceptable, the less likely they are to experience consequences</i>		
• Descriptive norms for marijuana	1.1	p=.004
• <i>The higher they perceive norms to be, the more likely they are to experience consequences</i>		

All models adjusted for age, sex, and baseline level of the outcome

Data Source: DBHR/UW Washington Young Adult Health Survey 2016 data report

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• Special thanks to:

- Megan Hopkins
- Linda Major
- Diane Brown
- Amy Brown

Jason Kilmer – [jkilmer@uw.edu](mailto:jkilmer@uw.edu)

Center for the Study of Health & Risk Behaviors

<https://depts.washington.edu/cshrb/>

Health & Wellness

<http://livewell.uw.edu/>

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