Discussing Marijuana on Campus: Lessons Learned, Research Questions, and Prevention Needs

Jason R. Kilmer, Ph.D.
University of Washington
Assistant Professor
Psychiatry & Behavioral Sciences
Assistant Director of Health & Wellness
for Alcohol & Other Drug Education
Division of Student Life

Overview of this presentation

• Review emerging research questions
• Discuss prevention and intervention developments
• Consider possible roles for peers and professionals
• Consider lessons learned (with an eye toward implications for your campuses)

Marijuana legalization status

[Map showing states with marijuana legalization status]

Questions/Challenges

Research questions related to a changing legal climate

• How will use by youth and adolescents be affected?
  • 19% of seniors said they would try mj or increase use if legalized

Source: Kilmer & Lee (2013)
Research questions related to a changing legal climate

- How will use by youth and adolescents be affected?
- 19% of seniors said they would try MJ or increase use if legalized
- How is DUI reliably measured, and how long after use should one wait before driving?

Source: Kilmer & Lee (2013)

Impaired driving and duration of effects

- Effects on the brain
  - Reaction time is impacted
    - DUI implications
    - 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

Driving (among 18-25 year olds who reported using at least once in the past 30 days)

<table>
<thead>
<tr>
<th></th>
<th>OBSERVED</th>
<th>WEIGHTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving within 3 hours of using</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 times</td>
<td>0 times</td>
</tr>
<tr>
<td></td>
<td>1 time</td>
<td>1 time</td>
</tr>
<tr>
<td></td>
<td>2-3 times</td>
<td>2-3 times</td>
</tr>
<tr>
<td></td>
<td>4-5 times</td>
<td>4-5 times</td>
</tr>
<tr>
<td></td>
<td>6 or more times</td>
<td>6 or more times</td>
</tr>
<tr>
<td></td>
<td>52.5%</td>
<td>50.59%</td>
</tr>
<tr>
<td></td>
<td>14.2%</td>
<td>14.13%</td>
</tr>
<tr>
<td></td>
<td>12.7%</td>
<td>13.28%</td>
</tr>
<tr>
<td></td>
<td>6.4%</td>
<td>6.43%</td>
</tr>
<tr>
<td></td>
<td>14.2%</td>
<td>15.57%</td>
</tr>
</tbody>
</table>

Source: Washington Young Adult Health Survey
UW CSHRB & Washington DBHR
PI: Kilmer (March, 2015)
Research questions related to a changing legal climate

• How will use by youth and adolescents be affected?
• 19% of seniors said they would try mj or increase use if legalized
• How is DUI reliably measured, and how long after use should one wait before driving?
• Will increased availability result in increased use (regardless of age group)?

Source: Kilmer & Lee (2013)

Impact of Outlet Density for Alcohol

• Restrictions on alcohol retail outlet density.
  ▫ Higher density of alcohol outlets is associated with higher rates of consumption, violence, other crime, and health problems.
  ▫ Higher level of drinking rates associated with larger number of businesses selling alcohol within one mile of campus

From: "A Call to Action: Changing the Culture of Drinking at U.S. Colleges," NIAAA Task Force

Research questions related to a changing legal climate

• How will use by youth and adolescents be affected?
• 19% of seniors said they would try mj or increase use if legalized
• How is DUI reliably measured, and how long after use should one wait before driving?
• Will increased availability result in increased use (regardless of age group)?
• What, if any, are the guidelines for moderate or low-risk use (e.g., harm reduction strategies) for marijuana use?
• Will an illegal market truly be avoided through legalization & sales through state-regulated stores?

Source: Kilmer & Lee (2013)
What do the data tell us about rates of use right now?

Substance Use Data from Monitoring the Future Study

- Any illicit drug • 38.9% report past year use
- Marijuana • 35.5% report past year use
- Any illicit drug other than marijuana • 19.0% report past year use  

- Important to keep abstainers abstaining
  • 12.8% who first tried marijuana at age 14 or younger meet criteria for dependence or abuse, compared to 2.6% who first used after 18 (SAMHSA, 2011)

Considering Responses:

What Works and What Lessons Can We Learn From Alcohol?
Lesson Learned Number One?
How we discuss marijuana with students matters...a lot...

OARS:
Building Blocks for a Foundation

- Ask Open-Ended Questions
  - Cannot be answered with yes or no
  - We, as the ones asking the question, 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 school 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?"

What open-ended questions could you ask that might prompt...

...consideration of “consequences”?

...change talk?

...consideration of strategies for making changes?
Finding potential hooks, change talk, and behavior change strategies: An Example

- “What are the good things about marijuana use for you?”
- “What are the ‘not-so-good’ things about marijuana 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?”

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?”

We can improve our assessment of what college students and young adults experience
MARIJUANA CONSEQUENCES MEASURES

• Most college student marijuana consequence measures adapted from established alcohol measures
• May not adequately capture experiences of students
• Particularly important to capture unwanted effects if hoping to provide feedback on “consequences” in motivational enhancement programs.
• Students (n=207) were asked to identify up to five effects of marijuana use that “may not have been so good”
  ▫ 805 separate effects identified
  ▫ 193 students listed at least one consequence/effect
  ▫ 88% of these listed 3 or more consequences

Top 10 Endorsed Marijuana Consequences: Study 1

1. Eating (e.g., eating too much)
2. Sleep problems
3. Productivity, apathy, motivation issues, or boredom
4. Cognitive abilities, attention, or concentration problems
5. Memory problems
6. Problems with lungs or coughing
7. Feeling antisocial or experiencing social awkwardness
8. Physical difficulties outside of lungs, cough, mouth, or throat (e.g., feeling dizzy, sick, uncoordinated, etc.)
9. Not getting things done
10. Spending too much money

Notes: Preliminary analyses suggested that among the top ten types of consequences generated by participants, only two (not getting things done and financial impact) were reflected in items from the RMPI, and these two were the ninth and tenth most mentioned consequences.

MEASURE DEVELOPMENT

• 22 item College Marijuana Consequence Scale was developed
• Compared responses to the 18-item Rutgers Marijuana Problem Index (RMPI)
• 410 students who used marijuana at least once in the past 30 days

<table>
<thead>
<tr>
<th>College Marijuana Consequence Scale</th>
<th>Rutgers Marijuana Problem Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 376 listed at least one consequence</td>
<td>• 230 listed at least one consequence</td>
</tr>
<tr>
<td>• 85.3% listed 3 or more consequences</td>
<td>• 56.9% listed 3 or more consequences</td>
</tr>
<tr>
<td>• Average number of consequences = 6.8</td>
<td>• Average number of consequences = 3.3</td>
</tr>
</tbody>
</table>
CONCLUSIONS/NEXT STEPS

Current version is 26 items combining the most face valid items for both measures

Relevant consequences may not be captured on other measures of YA harms/risks

Independent of what studies say about “negative effects,” if there’s a consequence/harm/effect identified by a student as unwanted, this can prompt consideration of change

Understand the relevance and salience of consequences to the population we’re working with

Future studies can test usefulness with non-college samples

What are we doing about intervention and prevention?

Risk Perception

• 43% of marijuana users experienced a past year academic consequence
  ▫ Only 20% perceived risk for a future academic consequence, compared to 71% of abstainers

• 35% of marijuana users experienced a past year social consequence
  ▫ Only 9% perceived risk for a future social consequence compared to 55% of abstainers

Kilmer, et al. (2007)
Tier 1: Evidence of Effectiveness Among College Students

- Combining cognitive-behavioral skills with norms clarification and motivational enhancement interventions.
  - Reductions in drinking rates and associated problems (e.g., ASTP)
- Offering brief motivational enhancement interventions.
  - Reductions in drinking rates and associated problems (e.g., BASICS)
- Challenging alcohol expectancies.
  - Reductions in alcohol use

From: “A Call to Action: Changing the Culture of Drinking at U.S. Colleges,” NIAAA Task Force

Goals of a Brief Intervention

- Prompt consideration of change
- Prompt commitment to change
- Reduce resistance/defensiveness
- Plant seeds
- Explore behavior change strategies

Personalized Feedback Interventions

Participants

- Two public PNW universities/colleges
- Screening criteria:
  - 5+ days use MJ past month
- Demographics (N = 212)
  - 45.3% Female
  - 74.8% White
- Mean Use at Screening
  - 7.6 joints per week / 14.2 days past month (Campus 1)
  - 10.5 joints per week / 18.3 days past month (Campus 2)

Procedures

- Screening / Baseline
  *Randomized to condition post baseline (106 control, 106 intervention)
- In-person Personalized Feedback Intervention
  *Unable to complete in person, option for mailed feedback (85% received in-person or mailed)
- 3- and 6-month Follow-up
  85.4% completed 3 mos, 82.5% completed 6 mos.
Our Findings

3 Month Outcomes
1. # Days in last 30
2. # Joints per week
3. Hours high per week
4. Consequences

6 Month Outcomes
1. # Days in last 30
2. # Joints per week
3. Hours high per week
4. Consequences
At 3 months, intervention participants reported 24% fewer joints smoked per week relative to control participants.

At 3 months, intervention participants reported 21% fewer hours being high per week relative to control participants.

Thoughts from iCHAMP

- Very encouraging results!
- No difference in # of days used, but how students are using within day
- Six months?
  - Assessment effects?
  - Seasonal effects?
  - Need for booster sessions?
- Attendance rates
  - 85% received feedback; 55% in-person
  - How do we get non-treatment seeking, non-mandated individuals to attend an intervention?
Mandated students

Interventions for marijuana use

- The limited number of studies involving college students nevertheless suggest motivational framework in an in-person intervention is promising (e.g., McCambridge & Strang, 2004; Miller, et al., 2001; White, et al., 2006)

- However, motivational interviewing-based interventions work with a range of drugs other than alcohol within the general adult dependent population, including in groups (e.g., Stephens, Roffman, & Curtin, 2000; Budney, et al., 2000; Longshore & Grills, 2000; Baker, Boggs, & Lewin, 2001; Van Horn & Bux, 2001)

Interventions for marijuana use

- Need for group had been established.
- No “Tier I” type of interventions for marijuana use
- Motivational-enhancement based interventions have demonstrated success with mandated students for alcohol
- Motivational-enhancement based groups can impact drug use in the general adult population
- MOD was developed using ASTP as a model
Intervention follow-up

- In research studies, randomized controlled trials with behavioral outcomes are ideal (i.e., inclusions of comparisons to a control group with longitudinal follow-up)
- Not ideal, however, for judicial/conduct needs, nor realistic
- Measure to assess intent to change and contemplation
- Using that exact measure, pilot data were collected to see if the workshop "performs" the way a motivational-enhancement based program should

MOD Content

- Elicit the “good” things and the “not-so-good” things about marijuana use from students
- Where applicable, bring in what the science says about the consequences students have identified
- Where applicable, highlight ways in which these “not-so-good” things can be reduced or eliminated
- Explore what would make some of those “not-so-good” things happen less often
- Review other substances when relevant and/or of interest to the participants

Next steps...

- Now that post-intervention surveys have been collected as pilot data, move toward follow-up with behavioral outcomes
- Continue to incorporate new scientific findings into conversations with students
- Examine elements/components contributing to intent to change and/or actual change
- Further identify strategies for reducing harm
Some topics and potential roles for peers and professionals

Norms

Role of peers
Social norms: Perception versus reality

• People are influenced by their subjective interpretation of a situation 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)

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

Norm Perception

• In survey of 5990 participants, 67.4% of students said they 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)
Consider the following as it applies to peer leaders...

- We know that student perceptions of the substance use decisions made by peers impacts that student’s own use
- However, student perceptions of substance use decisions by leaders are even more impactful
- What does this mean for peer health educators, RAs, campus officers, and others?

Role of professionals

Norms

- Not clear guidelines for social norms mass marketing
- But...
  - Can collect data on what is happening for use in personalized normative feedback
  - Can be careful about statements or messages that feed into a misperceived norm
  - Take steps to ensure abstainers and/or those in recovery know they’re not alone and feel supported in decision to not use
Policies

Rubington’s R.A. Research
Rubington (1993, 1996)

- Studied trends in sanction/violation data
  - Suggested that if decrease in violations occur...
    - Some new policy or program might be working
    - Students might be “wising up” as to where and when to do their drinking
    - Residents and R.A.s might negotiate what will and will not be sanctioned
    - R.A.s might get less strict in their enforcement

Role of peers
Rubington’s R.A. Research
Rubington (1993, 1996)

- Different R.A. styles (“by the book,” “laid back,” or “in between”), and there is variability in styles of enforcement depending on the site of the offense
  - Too laid back can cause loss of control on one’s floor
  - Too strict can result in efforts to circumvent the policy

Role of professionals

Support for policies and enforcement is there!

- A small group students may be quite vocal on campus to the point administrators withhold policy changes assumed to be unsupported by the student body (Lavigne, et al., 2008)

- Among students, Saltz (2007) found a “universal tendency” to underestimate student support for policies
Saltz (2007) conclusions (p. 459)

• “...campuses would actually have more incipient support for a variety of alcohol prevention policies than is likely to be perceived by the students themselves, and, by extension, administrators and others belonging to the campus community.”

• “...Unless students are persuaded that such support is not limited to a fringe element, new policies are likely to be met with at least passive, if not active, resistance.”

Saltz (2007) conclusions (p. 459)

• “...This then, suggests that today's campus prevention interventions, which now often comprise campaigns to correct students' perception of peer alcohol consumption, may want to incorporate a parallel effort to correct their perception of peer support for policies as well.”

• “This information may prove revelatory to some, and critical to the chances of having a significant impact on alcohol-related problems on campus, which is the ultimate target.”

Raise awareness and clarify expectations as soon as possible
Dear Students:

As most of you I presume already know, State Initiative 502 (I-502) - legalizing, under state law, the possession of a small quantity of marijuana – was adopted in the November 2012 general election and takes effect December 6, 2012. I-502 revised state law regarding the regulation, taxation and criminal and civil penalties for the production, distribution and possession of marijuana. While I-502 decriminalized the possession and use of small quantities of marijuana for those 21 and over, it is important to note that under federal law, the possession and use of even small amounts of marijuana remain a federal crime. Though voters in the state passed the Initiative, possessing and using marijuana on or in any University facilities will remain against the law.

As a recipient of federal funds, such as financial aid and federal grants and contracts, the University of Washington must comply with the Safe & Drug Free Schools and Communities Act and the Drug-Free Workplace Act. Compliance requires maintaining a drug-free campus. If the University does not comply with federal laws and regulations on marijuana possession and use on campus, it risks losing federal funds. Accordingly the passage of I-502 will not change current University of Washington policies prohibiting production, distribution, possession or use of marijuana on University property or during University-sponsored activities. A violation of these policies may lead to sanctions under the student conduct code, the general code of conduct or the University rules applicable to faculty and staff.

It is also important to note that even I-502 continues to make it unlawful for anyone, whatever their age, to open a package containing marijuana or consume marijuana in a public place. And I want to emphasize to you that policies and procedures prohibiting the use of marijuana at the University will not change as a result of I-502. For students who feel marijuana is causing problems for themselves or their friends, feel free to contact:

Health and mental health

E-mail sent to all students on 12/3/12
(legalization began 12/6/12)

From: Eric S. Godfrey [mailto:egodfrey@u.washington.edu]
Sent: Monday, December 03, 2012 11:41 AM
To: ‘egodfrey@uw.edu’
Subject: FW: Update on Initiative 502 - Use and Possession of Marijuana
Role of peers

Many students might be slipping through the cracks

- 96.1% with an alcohol use disorder do not receive services (Wu, et al., 2007)
- Only 36% who screen positive for depression receive medication or services (Eisenberg, et al., 2007)
- Of 125 suicides reported by Counseling Centers, only 14% were current or past clients (Gallagher, 2014)

The Jed Foundation:
Role of professionals

Talk to counseling and health center providers about what this could mean on their end

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)

- Screening suggestions
  - Revised CUDIT-r
Considering withdrawal (and management of withdrawal)

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)

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Proportion of Male Students</th>
<th>Proportion of Female Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enjoyment/Fun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved feeling of self (e.g., happier, calmer, feeling better)</td>
<td>82.14%</td>
<td>24.63%</td>
</tr>
<tr>
<td>Social enhancement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved relationships (e.g., make friends, friends feel better)</td>
<td>74.57%</td>
<td>34.78%</td>
</tr>
<tr>
<td>Boredom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relieves boredom</td>
<td>41.25%</td>
<td>35.89%</td>
</tr>
<tr>
<td>Altered perception</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved ventilation (e.g., brain fog, dizziness)</td>
<td>28.90%</td>
<td>18.32%</td>
</tr>
<tr>
<td>Activity enhancement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved mood</td>
<td>24.64%</td>
<td>9.61%</td>
</tr>
<tr>
<td>Food enhancement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved appetite</td>
<td>13.19%</td>
<td>5.06%</td>
</tr>
<tr>
<td>Celebration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved feeling</td>
<td>10.30%</td>
<td>1.01%</td>
</tr>
<tr>
<td>Improved appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved appearance</td>
<td>3.08%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Medical purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved mood</td>
<td>5.08%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Lee, Neighbors & Woods (2007)
Motivations for Use

<table>
<thead>
<tr>
<th>Motive Category</th>
<th>Perceptual/Emotional Motivation</th>
<th>Proportional Use of Cannabis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relaxation/mood alteration (e.g., feel happy, get high, enjoy feeling)</td>
<td>34.14%</td>
<td>34.24%</td>
</tr>
<tr>
<td>Contentment (e.g., feel content, friends te)</td>
<td>42.91%</td>
<td>16.34%</td>
</tr>
<tr>
<td>Emotional stability (e.g., feel secure, life is Ok)</td>
<td>47.15%</td>
<td>35.98%</td>
</tr>
<tr>
<td>Social reinforcement (e.g., bonding with friends, hang out)</td>
<td>20.71%</td>
<td>9.08%</td>
</tr>
<tr>
<td>Anhedonia (e.g., nothing to do, nothing better to do)</td>
<td>28.89%</td>
<td>4.13%</td>
</tr>
<tr>
<td>Antidepressants (reduce anxiety)</td>
<td>24.04%</td>
<td>8.07%</td>
</tr>
<tr>
<td>Anxiety reduction (reduce anxiety)</td>
<td>18.14%</td>
<td>6.15%</td>
</tr>
<tr>
<td>Availability (e.g., easy to get, not expensive)</td>
<td>13.74%</td>
<td>2.02%</td>
</tr>
<tr>
<td>Mystical experiences (e.g., feel spiritual, connection to others)</td>
<td>10.39%</td>
<td>3.08%</td>
</tr>
<tr>
<td>Anxiety reduction (reduce anxiety)</td>
<td>10.52%</td>
<td>1.01%</td>
</tr>
<tr>
<td>Medical use (reduce nausea, vomiting)</td>
<td>9.06%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Resilience (e.g., coping with stress, find of something new)</td>
<td>8.07%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Alcohol replacement (e.g., less drunk)</td>
<td>4.67%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Food replacement (e.g., feel good)</td>
<td>3.19%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Drug replacement (e.g., in place of alcohol)</td>
<td>2.09%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Pain management (e.g., feel better)</td>
<td>1.06%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Habit (e.g., feels better, can't stop)</td>
<td>1.06%</td>
<td>0.06%</td>
</tr>
</tbody>
</table>

Lee, Neighbors & Woods (2007)

Withdrawal: Cannabis

Diagnostic Criteria

292.0 (F11.280)

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. Thrice (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. Increased appetite.
   6. Depressed mood.
   7. At least one of the following physical symptoms causing significant discomfort: abdominal pain, dry complaints, vomiting, 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.

Finally? Students are hungry for information...peers and professionals can get it in their hands
As we move forward on college campuses...

- Are “smoke free” policies enough?
  - Edibles, vaporizers, e-cigarettes
  - What focus do we need to put (if any) on messages about food at parties (e.g., we warn about not accepting a drink when students don’t know what’s in it)?
- How might applications/enrollment be impacted (if at all)?
- What message about enforcement are students getting (and are they seeing mixed messages)?
- What is the impact of off-campus businesses that see an opportunity?
- What is impact on border states/provinces (and campus visitors)?

Future directions

- Current grant supplement to study effects of marijuana legalization
- Recently completed Washington Young Adult Health Survey – 2,101 18-25 year olds across the state
- Continue to evaluate prevention efforts
- Realize that any one thing you do (or any one drug you target) is part of an overall prevention puzzle
- We’re all in this together – learn from successes and challenges

Lessons Learned

- Any one thing we do is a part of an overall puzzle.
  - Consider where your particular piece fits
  - Identify the other pieces in your community when considering a strategic plan or approach
    - Policies/Enforcement Efforts
    - Environmental approaches
    - Partnerships/Coalitions
    - Prevention/Intervention Efforts
    - Screening
    - Outreach
    - Bystander approaches
    - Find the missing pieces
Some Basics on Marijuana

- Movement
- Sensations
- Vision
- Judgement
- Reward
- Memory
- Coordination

THC
MARIJUANA USE – onset

- When smoked...
  - Effects begin immediately
  - Last 1-3 hours
- When consumed in food or drink...
  - Effects begin 30-60 minutes
  - Last up to 4 hours

NIDA (2012)

MARIJUANA USE – effects after use

- Feel euphoric or "high" due to action in the reward system of the brain
- After euphoria passes, may feel sleepy or depressed
- Occasionally produces anxiety, fear, distrust, panic

NIDA (2012)

MARIJUANA USE – effects after use

- With high doses, may experience acute toxic psychosis
  - Hallucinations
  - Delusions
  - Depersonalization
- Seem more likely when high dose is consumed in food/drink rather than smoked
- Specific causes of symptoms unknown
Impact on sleep (and, importantly, subsequent days)

Absorption and Oxidation of Alcohol

- Factors affecting absorption
  - What one is drinking
  - Rate of consumption
  - Effervescence
  - Food in stomach

- Factors affecting oxidation
  - Time!
  - We oxidize .016% off of our blood alcohol content per hour
Time to get back to .000%

- .08%?
  - 5 hours
    (.080%....064%....048%....032%....016%....000%)
- .16%?
  - 10 hours
    (.160%....144%....128%....112%....096%....080%....064%....048%....032%....016%....000%)
- .24%?
  - 15 hours
    (.240%....224%....208%....192%....176%....160%....144%....128%....112%....096%....080%....064%....048%....032%....016%....000%)
Next day, increase in:
- Daytime sleepiness
- Anxiety
- Irritability
- Jumpiness

Next day, feel:
- Fatigue

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

Sleep impairment documented as persistent effect of marijuana use
NIDA (2012)
Next day, just like with alcohol, increase in:
- Daytime sleepiness
- Anxiety (note that there is a Cannabis Induced Anxiety Disorder)
- Irritability
- Jumpiness

Next day, feel:
- Fatigue
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 (at 3 days, not 2 weeks or 3 weeks)
    - Deficits in verbal working memory (at 3 days, at 2 weeks, not 3 weeks)
    - Deficits in attention (still present at 3 weeks)

Marijuana use trajectories: relationship to “discontinuous” enrollment

<p>| | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chronic/Hyper</td>
<td>44.5</td>
<td>40.7</td>
<td>20.2</td>
<td>4</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Minimal</td>
<td>4.6</td>
<td>40.7</td>
<td>20.2</td>
<td>4</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discontinuing</td>
<td>235</td>
<td>85.5</td>
<td>74.4</td>
<td>7.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continuous</td>
<td>96.7</td>
<td>74.4</td>
<td>100</td>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Marijuana’s impact on the body...

- Effects on heart rate and blood pressure
  - Increases heart rate  
    - NIDA (2012)
    - On average, 29 beats per minute increase  
    - Raises blood pressure

- Effects on lungs
  - Vital lung capacity  
    - NIDA (2012); Tsai, Calvarese, & Simmons (1978)
  - Symptoms of chronic bronchitis
  - Carcinogen exposure  
    - Cohen (2002); NIDA (2012)
    - 70% more benzopyrene in mj smoke than tobacco smoke
    - 50% more polyaromatic hydrocarbons in mj smoke than tobacco smoke
Marijuana’s impact on the body…

• A word about impact on motivation
  ▪ Definitely hard to measure but it could be any one (or more) of the following (or a yet to be determined additional factor)...  
  ▪ Hippocampus impacts motivation
  ▪ Marijuana’s impact on sleep
  ▪ Block passage of nutrients between cells

Marijuana’s impact on the body…

• “The munchies” (Mahler et al., 2007)
  ▪ Stimulation of anandamide

Thank you!

Special thanks to Cherise Murphy and Eric Davidson

Jason Kilmer
jkilmer@uw.edu