

Weed on Campus (Part 1)

It's time to reduce the harm.

Introduction

The ever-changing landscape of marijuana research combined with radical changes in the legal status of marijuana possession and use pose continued challenges to college and university alcohol and other drug education and abuse prevention specialists. The default position of “it’s illegal” is quickly eroding. Additionally, the plethora of both reliable and questionable marijuana research readily available online arms opponents and proponents of marijuana use with an unprecedented level of information.

Complicating matters even further, it seems as though any stance taken on marijuana use has at least one, if not many more contradictory pieces of research that could dispel or support that position. And, often students rarely look beyond the initial supportive research they may find to bolster their position, which more often than not supports marijuana use. As a result, a potential barrier to effective campus abuse prevention programs is student skepticism about campus sponsored marijuana related messages that may overstate the risks of use. Additionally the roots of that skepticism may be found in, and exacerbated by, parents who may have attempted to emphasize the risks of use while intentionally or not, modeling risky marijuana or other drug use. To address this skepticism and initial resistance to abuse prevention programs while fostering meaningful discussion about the risks associated with marijuana use, I believe a non-judgmental environment will promote the most effective results. Prevention specialists and health educators must assist students in understanding that when identifying research based “risk” it is not saying right or wrong, good or bad.

In developing effective marijuana education and abuse prevention programs, it might be worthwhile to look at effective alcohol-related strategies. The risk of suffering judicial sanctions as an alcohol abuse prevention strategy is somewhat effective with some students in preventing and/or delaying the onset of alcohol consumption. For instance, when my daughter was in her later teens I asked her why she didn’t drink. After careful consideration she answered simply, “I don’t want to get in trouble.” As an educator, I was hoping for an answer that included: her concerns about the impact of alcohol on her competitive figure sating; the risks presented by our family history of alcoholism; or maybe a dislike for the loss of control. But no, it was quite simple, she didn’t want to get in trouble. For some students, the risk of “getting in trouble” might be effective in preventing and/or delaying the onset of marijuana use as well. However, in the current climate of increased legalization around the country, judicial concerns are now being minimized. I believe effective marijuana abuse prevention strategies must include a strong harm reduction component. The goals of this public health model should include:

- Encourage abstinence as the lowest risk choice.
- Delay the onset of use for those who choose to consume marijuana.
- Provide strategies for minimizing the risk of problems associated with use.
- Reduce the level of use and risk for the development of a marijuana use disorder for heavy users.
- Provide assistance for anyone experiencing a marijuana use disorder.

Harm Reduction

On an international level, the concept of harm reduction is at the heart of conflicting strategies for drug abuse prevention. Most European countries and Canada have embraced the idea that the most effective drug policy is designed to help people who experience some level of alcohol, marijuana or other drug use disorder live better lives rather than to punish them. And yet in the United States, college and university administrators are faced with the question of whether or not to conduct harm reduction strategies or follow the zero tolerance policies mandated by federal regulations. Regardless of the policies that state and local legislators enact regarding marijuana legalization, the Drug Free Schools and Communities Act (DFSCA) requires campuses to follow federal guidelines, meaning that marijuana use and possession remains illegal on the college campus. Failure to comply with the DFSCA regulations can result in a loss of federal funding, so enforcement of federal laws is essential.

A basic tenet of harm reduction is an acceptance of the fact that there has rarely ever been, and rarely ever will be, totally drug-free societies. On the micro level, that tenet is applicable to a large majority of college and university campuses as well. Strategies for reducing the harm associated with alcohol or other drug use including marijuana should be viewed through a lens of public health, utilizing accurate,

fact-based alcohol and other drug education including applicable information about marijuana related injuries and health concerns as well as effective drug treatment for problematic use.

While a harm reduction approach to marijuana use is currently being promoted and practiced by many college health educators, it remains controversial. Some campus officials view harm reduction as tacit approval of marijuana use and that a zero tolerance effort is the most effective means of addressing marijuana related problems. The ongoing debate, often emotional and irrational, is a major obstacle to the evaluation of effective programming and realistic reduction of marijuana related harm, particularly when the type and extent of harms are disputed. Biased views of marijuana related problems held by many in this debate compromise the delivery of a consistent, believable abuse prevention message to students. The measurement of the costs and benefits of harm reduction initiatives and the evaluation of policy is thereby compromised.

Assisting Students with a Harm Reduction Approach

There is a major schism in the perception of marijuana, with polarizing views expressed by vocal proponents and opponents. Clearly many people have and can consume marijuana occasionally without any significant repercussions. Additionally, medical marijuana is a reality and its many benefits as such continue to be discovered. But students must realize consumption as a medical aid is quite different than recreational use. Proponents argue it is a natural, relatively harmless drug with many beneficial properties that has had its image tarnished by lies, myths and misguided media portrayals of use. Others claim the risks associated with marijuana use have been understated and that it is a toxic drug that causes widespread harm. Without condoning use, students can be provided with information that will limit the risks associated with marijuana use.

Avoiding Legal Risks Although medical and recreational use is legal in a few states, it remains illegal to use or possess marijuana under federal law.

- If you are using marijuana to deal with a health problem, confirm that you have all the necessary medical documentation. Be sure you are getting your marijuana from a legitimate, legal source.
- Buying in large amounts to save money could be breaking serious trafficking laws particularly if you are passing it on to others.
- Be discreet about marijuana use. Flaunting your marijuana use in public is asking for legal trouble.

Protecting Your Lungs There are many risks associated with ingesting marijuana by smoking that can lead to respiratory problems.

- Eat marijuana products or consume marijuana drinks to eliminate smoking related harms. Use caution. When eating or drinking, it is harder to gauge the amount you are consuming. Also, the effects could be more intense and last longer than when smoking.
- Don't inhale deeply or hold the smoke in for a long period. Deep inhalation will deliver more carbon monoxide and other toxic by-products to your brain. Besides, THC is absorbed relatively quickly and the deep, lengthy inhalation is unnecessary.
- Vaporizing heats rather than burns the marijuana material. Initial research indicates that vaporizing marijuana reduces (but does not completely eliminate) the toxic by-products of burning the plant material.
- Although risky from the standpoint of level of impairment, smoking higher quality marijuana (high THC levels) minimizes the need for lengthy, deep inhalation to receive the desired effect.
- Using a bong, especially with ice water, can cool the smoke and reduce some of the risk of harm.
- Mixing marijuana with tobacco simply increases the risk for further smoke damage.

Checking Motivation Marijuana could cause long-term problems with motivation. These problems can creep up without notice.

- Set weekly, monthly and annual goals for yourself, whether to improve your education, your job prospects or achieve something significant.
- Each week, month, year evaluate how closely you have come to achieving your goals.

Avoiding Car Crashes and Other Incidents Causing Injury or Death Although dying from a marijuana overdose is virtually impossible, injuries and death due to other activities while impaired could occur.

- Do not drive, operate dangerous machinery or engage in any high risk activity while under the influence of marijuana.

- Wait at least 3 hours after last use of marijuana (even longer if using edibles) before driving, operating dangerous machinery or engaging in high risk activity.
- Be conscious of a “hangover effect” the day after heavy smoking which could result in mild yet undetected impairment.

Monitoring Mental Functions Marijuana can have detrimental effects on mental functioning affecting learning, memory and academic performance in particular for young adults.

- If you see that your grades are slipping, ease off the marijuana for a while. A few weeks of abstinence might provide the clarity you need for better academic performance.
- Avoid using marijuana before activities that require intact cognitive functioning such as homework, exams, classes, etc.
- Don’t use marijuana for a few days before an important exam, presentation or other academic challenge.
- Be honest with yourself in evaluating the role marijuana may be playing in your academic life.

Monitoring Emotional Health For those with some pre-existing condition or susceptibility to mental health issues (schizophrenia, paranoia, etc.), marijuana use can have detrimental effect on emotional stability.

- Using marijuana as a way of dealing with unpleasant feelings and emotional difficulties can backfire and intensify those difficulties and challenges.
- Be sure you are resolving, not just avoiding, emotional challenges.
- Discontinue use if feelings of paranoia are too intense for you.
- If you do experience some ongoing emotional turmoil, be sure you seek professional help.
- Use only in a safe place with trusted friends.

Avoiding a Marijuana Use Disorder Regular use of marijuana (daily, weekly) can easily lead to a moderate or severe marijuana use disorder.

- Try using smaller amounts and less often.
- Take days or weeks off to reduce the THC buildup in your system.
- Keep track of your marijuana use in order to become more aware of your patterns.
- Be specific about your plans for use and stick with those plans (how often, when, where, why, etc.).
- Take a 30 day break from marijuana use. This enables the system to clear out much of the THC, reduce tolerance, and get over the discomfort of withdrawal that you might feel when stopping.
- Identify what might trigger urges that are in conflict with your plans to use, and consider strategies for addressing and managing those triggers.
- Ask yourself if this is a moment to use that is in accord with your new plans.
- Remember, altering life style choices to accommodate your use of marijuana (Ex: changing friends; quitting sports teams; dropping out of college; etc.) is a strong sign of the presence of a marijuana use disorder.

Other Concerns There are a number of other considerations regarding marijuana use:

- Mixing marijuana with alcohol or any other drugs can increase the level of impairment putting you at greater risk for a problem.
- It is suggested that when combining alcohol with marijuana, consuming the alcohol prior to the marijuana increases the risk for nausea and vomiting.
- Marijuana may interfere with the normal functioning of prescribed medication. Check with your doctor about that possibility.
- Sharing a joint, blunt, bong, etc. increases the risk for spreading colds, infections or other problems.
- Keep bongs, vaporizers and other implements clean.
- If consuming an edible or drink, the effects tend to take longer to “kick in.” Do not assume the delay is an indication of a need for more.

High-risk groups Certain groups may be at a higher risk of developing a marijuana use disorder including:

- adolescents: in particular with regard to negative impact on brain development;
- pregnant women: potential increase in the risk of having a low birth weight baby;
- those with respiratory or cardiovascular disease, whose conditions may be aggravated by smoking;

- those already experiencing a substance use disorder or other mental health issue

Conclusion

There are few studies demonstrating the effectiveness of marijuana abuse prevention efforts or any agreement regarding best practices in dealing with this issue. Drawing from alcohol abuse prevention, the implementation of a social norms program addressing misperceptions about peer marijuana use could have a meaningful positive impact. There are some encouraging results from computer-based approaches to brief interventions employing a motivational enhancement style. Utilizing brief motivational interviewing techniques such as Brief Alcohol Screening and Intervention for College Students (BASICS) and motivational enhancement allow a student to explore for him/herself the discrepancies between the desired outcomes and their actual experiences as a marijuana user. The effectiveness of a harm reduction strategy or any other education and abuse prevention strategy may take time to manifest. Results may not be immediately obvious or easily measurable. Prevention specialists must be realistic and flexible in their approach to marijuana related harms and continue to incorporate research findings in harm reduction and other abuse prevention strategies whenever possible.

Weed on Campus (Part 2: Student Athletes)

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Weed on Campus (Part 1)

Given the myriad of challenges and debates regarding marijuana use, effective campus marijuana education and abuse prevention programs must continue to take a realistic and honest approach to providing accurate and applicable information to students. Regrettably however, the classification of marijuana by the U.S. Controlled Substances Act and the Drug Enforcement Agency as a Schedule 1 drug inhibits in-depth research and the development of any meaningful insights into its impact on one of the highest profile extracurricular activities on college campuses, athletics.

Historically, athletics was thought to provide an alternative to involvement in high risk drinking and other drug use, including marijuana. We see today that clearly there is no “protective bubble” surrounding athletics. For instance, in a 2013 NCAA survey of student athletes, 70.9 percent of Division I football players acknowledged using alcohol in the previous 12 months and 19.3 percent acknowledged using marijuana or synthetic marijuana. In men's basketball, reported use was 58.1 percent for alcohol and 11.3 percent for marijuana/synthetic marijuana.

Student athletes are immersed in a campus climate that provides tacit approval for, if not outright support of, high risk alcohol and other drug use. Consider these trends. The number of students reporting daily marijuana use has been steadily increasing for the past eight years. The number of college students reporting any marijuana use annually has been on the increase as well. Heated debates regarding medicinal use, legalization and the pros/cons of “weed” abound. Marijuana is the most widely used mind-altering drug consumed on college campuses besides alcohol. As a result, marijuana use is one of the most controversial health related challenges faced by students and administrators today.

Student athletes deal with many of the same questions and challenges regarding marijuana use faced by their non-athlete peers. However, student athletes also face additional pressures including the impact of marijuana use on their athletic performance as well as more stringent drug policies enforced, to varying extents, by athletic departments. Additionally, it has been suggested some athletes are driven to alcohol and other drug use due to increased pressures and difficulties in balancing a social life along with full course loads, sport practices and conditioning.

Beyond the ivy walls, marijuana use among U.S. adults has approximately doubled over a decade, according to government surveys. Recreational use is now legal in four states. The aged “Reefer Madness” stigma associated with marijuana use is disappearing, just as the black and white film used to create that classic also disintegrates. And regrettably, many of those who could provide leadership for student athletes in understanding the value of healthy decision making - professional athletes - continue to simply shirk any responsibility for guidance to younger athletes.

Just a click away are hundreds and hundreds of websites touting biased conclusions regarding the pros and cons of marijuana use, legalization and medical marijuana. Athletic department support staff along with campus alcohol and other drug educators can assist student athletes in clarifying this onslaught of confusing, misleading and often inaccurate information promoted by both opponents and supporters of marijuana use.

Changing Attitudes = Changing Policies

Student athletes testing positive for use of performance enhancing drugs typically face at least a one-year suspension after their first positive test. However, sanctions for testing positive for “street drugs” such as marijuana are not only much less punitive but vary from campus to campus as much as the array of mascots representing the teams.

As society's views on marijuana use change, the nation's biggest universities have been adjusting their sanctions for marijuana use by student athletes. As a matter of fact, even the NCAA, which has been testing for marijuana and other street drugs at championship events since the 1980s has altered its sanctions. In August 2014, the NCAA cut in half the penalty for student athletes who fail screenings for substances like marijuana at its championship events. Many of the schools in the major conferences are not punishing student athletes as harshly as they were 10 years ago for testing positive for marijuana and other drugs. For example, on some campuses a third failed test previously meant dismissal whereas now it might be a half-season suspension.

Those who test positive a first time for marijuana may now typically receive counseling and lose no playing time. A second positive test may result in some lost playing time and/or other sanctions. The extent of suspensions or potential dismissals for second and third positive test results will, more often than not, be dependent on the department policy. Some policies call for no sanctions until the third positive test. Many athletic departments do not test for so-called recreational drugs at all. The Big 12 Conference screens for recreational drugs, but it does not sanction athletes who test positive. Instead, Big 12 officials more often than not notify the school of a positive test and leave any discipline to the school. Some athletic departments provide “safe harbor” programs for student athletes who come forward and acknowledge drug use before they are tested.

Impact on Student Athlete Performance

The specific effects of marijuana use on student athletes' lives including their athletic performance, both short term and long term, depend on many variables including how much and how often it is used, the type of cannabis consumed, the way in which it is used, the setting in which it is consumed, the expectations of the user, and whether or not it is used in conjunction with other drugs. There are limited potential benefits that may be experienced by some users but are of no value to other users. The potential negative outcomes seem more likely. However when discussing marijuana with student athletes, maintaining credibility is critical in delivering effective educational programs. It should be acknowledged that some users may experience some or many of these problems whereas there may be other users who experience only minimal problems.

Due to the Schedule I classification of marijuana and the resulting legal restrictions, there is little reliable, comprehensive research available yet on specifically how marijuana affects athletic performance while either under its influence or the potential long term consequences. As long as marijuana is considered a Schedule 1 drug, it is difficult to study its effects on athletic performance. Although limited, what research there is supports what most experts instinctively suspect:

- minimal performance enhancement for most athletes
- significant risk for negative impact on performance

Potential Performance Enhancement:

There is limited evidence and primarily anecdotal that marijuana may provide some potential gains in performance.

Pain: Marijuana decreases perceptions of pain. As a result, its pain-reducing benefits - whether during or after training - may be enticing for student athletes involved in grueling contact sports. Additionally, since the marijuana high somewhat mimics the impact of the body's natural endorphins, theoretically it could help increase the pain threshold and, like a runner's natural high, make it easier to push through a tough workout. Marijuana-based medicine can also play a potential role in treating a wide range of disorders associated with the pain of inflammation.

Stress Reduction: The euphoric effect which for some users reduces anxiety, may result in a more balanced performance from a competitor who may otherwise be too nervous before an important event. These psychoactive effects while under the influence could be considered a form of unfair enhancement.

Respiratory System: The potential performance enhancing quality of marijuana has been recognized by the NCAA and other agencies. The World Anti-Doping Association's ban on competing while stoned is based on studies that show marijuana can decrease anxiety and increase airflow to the lungs by acting as a bronchodilator, something that decreases resistance in the airways thereby potentially improving performance potential.

Sleep: Many users report that relaxation, pleasure and improved sleep were the main motivations for using marijuana. However, to date no research has objectively demonstrated that marijuana use has resulted in observable increases in performance due to relaxing the athlete or improving sleeping patterns.

Weight Management: Like so much surrounding marijuana use, the findings regarding weight management are inconclusive and seemingly contradictory. The tetrahydrocannabinol in marijuana is active in the hyper-production of the appetite stimulant Neuropeptide Y. The result is the so-called "munchies" and the consumption of excessive empty calories in junk food. It may also contribute to weight loss due to the increased metabolic rate associated with marijuana. And yet again, it is used as an appetite stimulant for those dealing with HIV and some forms of cancer. The late Robin Williams provided an interesting perspective on the topic, "the only way it's a performance enhancing drug is if there's a big f---ing Hershey Bar at the end of the run."

Potential Risks

Marijuana is seen by some college students as a purely recreational drug just like alcohol and consumption serves as a rite of passage in college. And, just like alcohol, this perception fails to acknowledge the potential dangers of use. While it's still unlikely marijuana can be a *direct* performance enhancing drug, its negative impact on performance can at times be subtle and yet at other times can also be quite profound. Contrary to some popular opinion, marijuana use can be harmful. For the few benefits it may produce, there is seemingly a much greater number of potential risks.

Accidents: Impaired hand-eye coordination and other risky motor control side effects could lead to slips, falls or other types of accidents, especially in adventure oriented sports like mountain biking, rock climbing or skiing that could be disastrous. Decreased anxiety can also lead to dangerous decisions.

Cardiovascular System: Marijuana use is associated with an increase in resting heart rate and blood pressure. While participating in athletic activity, this initial resting increase can become even more dangerous as the physical activity multiplies that potentially risky increase. These concerns can also lead to dangerous complications for anyone with a pre-existing heart condition. Also, marijuana use can potentially decrease aerobic capacity resulting in poor performance in endurance sports.

Brain Function: Regular marijuana users can experience memory and learning problems, distorted perceptions, attention deficit and difficulty thinking. Research with college students shows an impact on these factors even 24 hours after the last use. (After daily use, it can take up to or more than 28 days for impact on attention, concentration, and memory to dissipate.) This can significantly impact effective participation in team sports that necessitate complex strategies and plays.

Academics: Poor academic performance is closely associated with regular marijuana use. Sustained marijuana use may directly affect academic achievement due to difficulty in problem solving ability and poor memory. Some surveys reveal that college students who used marijuana regularly were less likely to study and more likely to have a GPA of B or less. According to a Harvard study, other factors associated with marijuana use include spending larger amounts of time at parties and socializing, spending less time studying, and perceiving community service as unimportant.

Immune System: Marijuana cannabinoids present even further contradictory concerns regarding the immune system. The primary concern is they could potentially weaken the immune system resulting in a greater risk for debilitating sickness. Due to their immunosuppressive nature, they could cause

increased susceptibility to cancer and infections. And yet, there is some evidence that there may be benefits of marijuana use in not only treating the nausea associated with chemotherapy but in other aspects of the fight against cancer. Further research may prove its value in treating a large number of clinical disorders where suppressing the immune response is actually beneficial.

Addiction: Frequent marijuana use may not only be physically damaging but emotionally harmful as well. Based on the quantity and frequency of use, some marijuana users develop marijuana use disorders that can be as extreme as addiction. This can lead to depression, decreased motivation and poor athletic and academic performance.

Implications for Education and Abuse Prevention

Effectively responding to problematic marijuana use by student athletes is a moving target. On the one hand the use of any mind altering drugs including alcohol and marijuana poses risks for a negative impact on athletic performance requiring an effective educational approach for those found responsible for use. On the other hand, a punitive response with graduated sanctions can potentially discourage problematic use as well. Developing the right balance between education and sanctioning remains a challenge.

The federal Drug Free Schools and Communities Act currently provides some federal guidance for administrators. However, American society is quickly approaching a fork in the road. The results of the upcoming Presidential election will more than likely lead us down one of two paths. The conservative direction will more than likely lead to increased enforcement of the federal ban on marijuana use. The liberal direction could result in more states allowing for medicinal use with recreational use not far behind. With this in mind campus administrators might benefit from the creation of a committee (yes another committee!) to review current policies and procedures addressing marijuana use:

- differences in sanctions between alcohol and marijuana policies and sanctions.
- differences in policy violations resulting sanctions for possession versus use.
- sanctions for repeated violations of policy regarding possession and use.
- participation in campus functions while under the influence of marijuana.
- threshold for permitting medicinal use and manner of consumption.
- vaporizing versus smoking versus edibles.
- athletic team policies for restrictions on possession and use for student athletes.
- sanctions during the season versus off season.

As indicated in the **Weed on Campus (Part 1)**, I believe effective marijuana abuse prevention strategies must include a strong harm reduction component. The goals of this public health model should include:

- Encourage abstinence as the lowest risk choice.
- Delay the onset of use for those who choose to consume marijuana.
- Provide strategies for minimizing the risk of problems associated with use.
- Reduce the level of use and risk for the development of a marijuana use disorder for heavy users.
- Provide assistance for anyone experiencing a marijuana use disorder.

Brief motivational interviewing such as that utilized in the Brief Alcohol Screening and Intervention for College Students (BASICS) program can promote a non-judgmental environment to assist student athletes in exploring their marijuana use. In doing so it can help them identify their reasons for use, understand the impact their use can have on their athletic performance, evaluate the impact it may already be having on their performance and identify and implement strategies to minimize if not completely cease harmful marijuana use.

I have had the wonderful opportunity to work with student athletes around the country. The combination of adventurous spirit and youthful feelings of invincibility exuded by these gifted athletes is certainly inspiring. All perspectives of this perplexing challenge regarding marijuana use need to be assessed to arrive at an understanding that will benefit as many as possible without harming others. Further research, effective educational programs and meaningful treatment for those experiencing marijuana problems can help student athletes maximize their athletic and academic potential.

Weed on Campus (Part 3: Gateway Drug?)

"...because underage smoking and alcohol use typically precede marijuana use, marijuana is not the most common, and is rarely the first, "gateway" to illicit drug use. There is no conclusive evidence that the drug effects of marijuana are causally linked to the subsequent abuse of other illicit drugs." **Institute of Medicine of the National Academy of Sciences; commissioned by United States Congress**

"Marijuana is a gateway drug. We have an enormous addiction problem in this country." **Chris Christie; New Jersey Governor, Presidential Candidate**

"I was given my first joint in the playground of my school. I'm a heroin addict now, and I've just finished my eighth treatment for drug addiction." **Lawrence H.; student**

"I was an honor student in college and am now a very successful lawyer. I have been smoking weed for almost 20 years. I usually fire up four or five times a week. And, I have never had the desire to move on to any stronger drugs. The strongest drug I use is bourbon." **Jason T.; lawyer**

Introduction

Marijuana is often thought of as a "soft drug" with many college students claiming that it is relatively harmless, particularly as compared to the much more widely consumed and socially acceptable drug, alcohol. When considering the harm and risks to college students associated with either drug, marijuana or alcohol, these students certainly have a valid argument. High risk alcohol use undoubtedly impacts the lives and academic success of far more students than marijuana due to the impact it has on not only the drinkers themselves but also on other students caught in the wake of the significant level of so-called second hand binge effects. You don't need to look very far to see the extent of those effects in the headlines reporting the consequences of heavy drinking including fights, poor class participation and performance, disrupted sleep in the residence halls, property damage, injuries, deaths and much more. Marijuana use on the other hand has a much lower profile when it comes to campus behavioral issues.

And, even though marijuana use can contribute to many significant personal challenges and campus problems, it does not garner the kinds of headlines alcohol does. I have presented many of those challenges and problems in "Weed on Campus - Parts 1 and 2." For many years campus education and abuse prevention specialists have labeled marijuana as a "gateway drug" utilizing that label in prevention messaging. The resulting "gateway drug theory" or hypothesis refers to the belief that one drug — marijuana in this case — leads the user to subsequent use and potential abuse of other, what might be identified as "hard drugs" such as cocaine, heroin, LSD, and methamphetamine. As a matter of fact, in spite of marijuana having a reputation for being a non-problematic substance, and even being beneficial within the context of medical marijuana, some have argued that the biggest harm marijuana poses is its function as a gateway to other harder drug use. Identifying marijuana as a gateway drug however is contrary to the experiences of most marijuana users. Most do not graduate to harder drugs. And, for those who do, there remains significant discrepancy regarding which drug - alcohol, tobacco, or even marijuana - serves as the initial "gateway" drug subsequently leading to the use of illicit drugs such as cocaine and heroin.

If the point of Chris Christie's statement is simply the use of marijuana tends to precede the use of other drugs, research supports that contention. But, here's the rest of the story. Yes, studies confirm that the majority of those who smoke marijuana are more likely to use other drugs however these studies show a **correlation without showing causation** which is a commonly misunderstood phenomenon in science. Additionally, his statement fails to identify the numerous other contributors - gateways - to the "enormous addiction problem in this country."

Support for the Gateway Drug Theory

The gateway drug theory suggests a marijuana user will seek more potent drugs after experiencing the marijuana high. And, that experience - getting high - in and of itself contributes to the desire for harder drugs. The gateway drug theory also suggests the marijuana user will move to more potent drugs as his or her tolerance to marijuana builds. There is some research that may support these views.

Research on adolescent rodents indicates that early exposure to cannabinoids decreases the reactivity of brain dopamine reward centers later in adulthood. This could help explain why using marijuana at an early age can contribute to increased vulnerability for drug abuse and addiction to other drugs of abuse later in life. This increase in vulnerability has also been reported in epidemiological studies. These results are consistent with animal experiments showing marijuana's ability to "prime" the brain for enhanced responses to other drugs. For example, rats previously administered THC show heightened behavioral response when later exposed to THC. This heightened response is also observed when the primed rats are exposed to other drugs such as morphine. This phenomenon is called *cross-sensitization*.

Further, there are some animal studies that suggest there may be changes in the brain produced by the presence of marijuana that can be long lasting when the animal is exposed to it as an adolescent. Researchers conducting these studies treated adolescent rats with THC (Tetrahydrocannabinol - marijuana's primary psychoactive ingredient). The rats were then given the opportunity to self-administer heroin as adults. The THC-treated rats consistently increased their heroin usage, while those rats that had not been treated with THC maintained a steady level of heroin intake. They concluded that, at least in rats, chronic exposure to THC during adolescence could indeed be responsible for increased vulnerability to use of more potent drugs in adulthood.

Whether or not these findings as well as other research on lab rats generalize to humans remains debatable but they are consistent with the idea of marijuana as a gateway drug. However, other than the research mentioned above and a few other studies, there is limited evidence that supports conclusively any type of direct causation as suggested by the gateway drug theory. It must also be considered that alcohol and nicotine might also prime the brain for a heightened response to other drugs and are, like marijuana, typically used before a person progresses to other, more harmful substances.

Alcohol as a Gateway

It is not surprising that most users of illicit drugs have used marijuana first. Since marijuana use typically precedes rather than follows the initiation of illicit drug use, it could certainly be considered a gateway drug. Actually most drug users begin with alcohol and/or nicotine before marijuana, before they are even of legal age. Because underage use of tobacco and alcohol typically precedes marijuana use, in truth, marijuana is rarely the first gateway to more potent drug use. As early as 1985, a study published in the *Journal of Youth and Adolescence* concluded that "students do not use illicit drugs unless they also use alcohol."

Nicotine and alcohol, two other drugs that are widely available to young people, are often among the first drugs used, and have been found to have similar gateway-oriented effects as marijuana in animal studies. One such study, published in the journal *Science Translational Medicine* in 2011, showed that treating mice with nicotine induced genetic changes increased the response to cocaine. Interestingly, this only worked in one direction, when the mice were treated with nicotine and then co-treated with both nicotine and cocaine; if cocaine was administered first, the effect was not seen, suggesting there may be a gateway effect from nicotine to cocaine.

A *Missouri Western State University* study conducted in 2009 found that a majority of subjects examined - 67 percent - went on to smoke marijuana after they had already begun consuming alcohol, not the other way around. "We found that for our study, the more alcohol someone drinks the more likely they will be to want to smoke marijuana," wrote the study's authors. "Marijuana is called the gateway drug. It is considered the worst drug available because it supposedly causes its users to move on to harder drugs. What people don't realize is that marijuana use comes after someone is already using alcohol and tobacco," they wrote.

Results of a recent study found in the *Journal of School Health* shed further light on this question. In an attempt to establish which substances teens typically use first, a team of researchers from Texas A&M and the University of Florida examined data from 2,800 U.S 12th graders interviewed for the *Monitoring the Future* - an annual study conducted to monitor drug use on a national level. It was found that "the vast majority of respondents reported using alcohol prior to either tobacco or marijuana initiation." Additionally, of those three main substances -- alcohol, tobacco and marijuana - teens were least likely to start using pot before the others. Alcohol was considered to be the gateway drug, leading to the use of tobacco, marijuana, and other illicit substances. Moreover, students who used alcohol exhibited a significantly greater likelihood of using both licit and illicit drugs.

Gateway Experience

The science supporting a biological causation of marijuana use leading to harder drugs is at best questionable. Clearly, the biological evidence for a gateway effect is varied and difficult to interpret. Perhaps, rather than viewing marijuana as a gateway drug, it might be more accurate and useful to view the use of marijuana as a gateway experience. In addition to the potential for biological factors, other mechanisms such as a person's social environment are also critical in a person's risk for harder drug use. There are a number of ways to illustrate this.

- People who are more vulnerable to drug-taking might simply be more likely to start with a readily available substance like marijuana, tobacco, or alcohol, and their subsequent social interactions with other drug users increases their chances of trying other drugs. This would suggest there is no causal link from marijuana to the other drugs, but simply a function of marijuana's general availability versus other more difficult-to-obtain substances.
- Early use of marijuana can expose the user to a subculture more accepting of not only marijuana use but also other drugs as well.
- Exposure to illicit drug use in the form of marijuana, introduces the user to not only the world of drug use but also to drug dealers who also may have harder drugs to offer, such as LSD, cocaine, and heroin.
- Someone who uses marijuana regularly may simply be more likely to engage in risk-taking behavior and thus seek out the other drugs. This also would suggest there is no causal link from marijuana to the other drugs, but the user playing out further risk-taking behavior.
- Having crossed the line from alcohol or tobacco into the world of "other drug" use such as marijuana, the leap to more potent drugs is less dramatic than an initiation to illicit drug use commencing with heroin or cocaine for instance.
- The use "soft drugs" such as marijuana could provide the user with a relatively low risk psychoactive experience perhaps making the naive users more open to experimenting with other illicit drugs. If viewing this initial marijuana use as a gateway experience one could make the case that if they had not taken marijuana in the first place, they would not have been lured into a false sense of security around drug use and so would never have progressed to other, more harmful substances. But, there is nothing to say that alcohol would not do the same.

Apparently other research questions the role of the specific drugs contributing to high risk use of alcohol or other drugs. Some studies indicate the question of which drugs young adults start with is much less important than the question of *how early* they start using. It is suggested that the early onset of any drug use, whether alcohol, tobacco, or other drugs exerts a powerful influence over future health risk behaviors. Some researchers found that the earlier teens and young adults started using alcohol, the more likely they were to go on to try other drugs. As a matter of fact, those who had their first drink in 6th or 7th grade went on to try an average of nearly two illicit substances later in life. By contrast, kids who waited until 12th grade to drink had only tried an average of 0.4 substances.

Conclusion

While Governor Chris Christie argues for enforcement of the federal status of marijuana as an illegal substance based on his belief that it is a gateway drug leading to the use of harder drugs, there is no conclusive evidence that one actually causes the other. Though there are correlations between marijuana use and other drugs, the science on this topic is far from settled. Just because marijuana smokers might be more likely to later use cocaine, heroin or other highly addictive drugs, it does not imply that using marijuana causes one to use those other drugs. Marijuana does not appear to be a gateway drug to the extent that it is the cause or even that it is the most significant predictor of serious drug abuse. Care must be taken not to attribute cause to association.

The current epidemic of heroin use in many areas of the United States might suggest that addressing marijuana as the so-called gateway drug might be an effective prevention effort. However, reviewing the findings from numerous studies supports the notion that when developing elementary and secondary school education and abuse prevention programs, it would be more cost effective for school and public health officials to focus prevention efforts, policies, and monies, on addressing adolescent alcohol use. I don't mean to single out Governor Christie however his stance is shared by many legislative decision makers who are making tainted decisions regarding alcohol and marijuana. My somewhat cynical side questions the influence the alcohol industry may have in the development of alcohol and other drug abuse prevention programs. Governor Christie insists that any taxes collected from the sale of legalized marijuana is "blood money." Christie continuing, "I'm not going to put the lives of children and citizens at risk to put a little more money into the state coffers, at least not on my watch," If taxes on legalized marijuana amount to "blood money," I question the fact that legislators including Governor Christie

seem to have no qualms with accepting taxes on the sales of alcohol. As a matter of fact, in 2013, Governor Christie signed a bill expanding the state's production of hard liquor. This bill allows distillers to produce 640 gallons of hard spirits per year, provided they pay a \$938 licensing fee.

Implications

First and foremost, continued use of the gateway theory as a prevention message undermines the credibility of alcohol and other drug education and abuse prevention specialists. This complex dynamic over simplified into a "bumper sticker" prevention message is, quite frankly, counter productive.

Although the concept of "in loco parentis" has disappeared from higher education, we can gain some insights from the suggestions made to parents regarding alcohol and drug education for their children.

- **Establish consistent and firm boundaries.** Both excessively strict and excessively lax regulations can be disruptive in the minds of college students. Also, lax enforcement of campus policies can lead to mixed messages concerning regulations.
- **Nurture a positive relationship between administration and students.** Involving students in campus marijuana use policy development as well as education and abuse prevention programs can enrich a meaningful and effective relationship between students and administrators.
- **Campus marijuana and other drug policy should be based in science.** Are the sanctions associated with marijuana use and high risk alcohol consumption consistent with the potential harm that the use of either might cause? Do these sanctions make sense to students?
- **Keep students involved.** Emotional distance and lack of involvement in campus events and programs can result in students participating in alternative activities including high risk alcohol and other drug use.
- **Seek professional support.** Participating in regional committees and organizations dealing with alcohol and other drug issues can contribute to a more comprehensive abuse prevention approach. Bear in mind that professionals vary greatly in their opinions about alcohol and other drug education, abuse prevention and discipline.
- **Guide campus environment.** Chaos including inconsistent policy enforcement, mixed messages regarding education and abuse prevention, conflicting campus events and entertainment can lead to ineffective discipline, elevated behavior problems and reduced desire to understand and adhere to the campus marijuana and other drug policy by students. A calm, organized atmosphere on campus can help maintain a healthy and safe campus.

Many colleges and universities have reduced budgets for addressing alcohol and other drug education and abuse prevention strategies. In this time of budget cutting, it is critical that abuse prevention messages be based in science and not simplistic, time-worn, ineffective and misleading information such as marijuana is a "gateway drug."

For further information about: "Weed on Campus" and other presentations:

Jim Matthews, M.Ed. is the author of three books regarding college drinking concerns. He has conducted his "Beer, Booze and Books" program and for more than 500,000 students on more than 500 campuses around the United States and Canada. His latest program "Weed on Campus" includes his entertaining yet educational approach to the increasing concern about marijuana use by college students.