By Christine Miller PhD

Physicians Families and Friends for a Better Vermont

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IS MARIJUANA A SAFE DRUG?

We all know individuals who have been able to use marijuana and be happy, successful and productive members of society. The precise proportion of users who fall into this category is not known, but what is clear is a substantial percentage of people cannot use marijuana with impunity. Unfortunately, you can't tell ahead of time who that is going to be. There is no genetic test, no psychological profile, no family history screening that is reliable. The question becomes not how many fatalities does use of marijuana cause, but can a young person use it occasionally, i.e. "responsibly", like having a single beer once a month or once a week, and be sure that they'll be O.K.? The answer is no, particularly in regards to psychotic outcomes. Some individuals experience acute psychosis after their first use.

1) **Psychosis:** hundreds of peer-reviewed, scientific articles show a correlation between marijuana use and psychotic outcomes such as schizophrenia, too numerous to list here. **The question of whether marijuana is causal for psychosis has been answered in the affirmative by applying standard principles of causation used in pharmacological and epidemiological research**:

   - Dose response effect, so that heavier use of more potent product results in more users developing schizophrenia (Zammit et al., 2002; van Os et al., 2002; DiForti et al., 2009; DiForti et al., 2015)
   - Administration of the active ingredient (Δ^9-THC) in the clinic under controlled conditions causes psychotic symptoms (D'Souza et al., 2004; Morrison et al., 2011; Bhattacharyya et al., 2011; Freeman et al., 2014).
   - Self-medicating is not that likely, because many will try to quit to avoid the psychotic symptoms before they become too impaired (Fergusson et al., 2005), e.g. comedian Seth McFarlane; but for others it may be too late (as seen in The Other Side of Cannabis, Heartsgate Productions, 2015).
   - Marijuana use generally comes *before* the psychosis, not vice-versa (Arseneault et al., 2002; Henquet et al., 2005; Kuepper et al., 2011).
   - In users who have schizophrenia, the age of onset is earlier than for non-users, similar to the effect of carcinogens in causing an earlier onset of a suite of cancers (Veen et al., 2004; Barnes et al., 2006; Large et al., 2011)
   - Of all recreational drugs, marijuana use is the most likely to result in chronic psychosis (Niemi-Pynttari et al., 2013).

What percentage experience a psychotic outcome? The low to moderate-strength marijuana available in the last century was shown to trigger single psychotic symptoms (paranoia, racing thoughts, delusions, hallucinations) in 12% to 15% of users (Thomas, 1996; Barkus et al., 2006; Smith et al., 2009). Of those with such "prodromal" symptoms, about 35% can be expected to develop full psychosis, i.e. a constellation of symptoms occurring at once (Cannon et al., 2008). For about half of these individuals, conversion to chronic schizophrenia spectrum disorder occurs irrespective of family history (Arendt et al., 2008; Niemi-Pynttari et al., 2013). The result for low to moderate-strength marijuana was about a 2.5-fold increased risk of schizophrenia, but **for the high strength product available today, the risk for schizophrenia is 5-fold compared to non-users (DiForti et al., 2015). That increase in risk translates into about one out of every twenty users if they don't quit in time.** Is this impact limited to adolescence? Given that the brain continues to develop in males through the late twenties (see figure on back), it seems unlikely that the risk for chronic psychosis is limited to adolescent users. Furthermore, administration of THC to adults in a clinical setting results in psychotic symptoms (D'Souza et al., 2004; Morrison et al., 2011. Bhattacharyya et al., 2011; Freeman et al., 2014).

Posts or interviews about paranoia, a symptom of psychosis, at www.marijuana.com forums (very easy to find before Feb. 2015, and then they began screening them out?):

a) http://www.marijuana.com/blog/news/2014/10/how-neil-young-deals-with-marijuana-induced-paranoia/: "(Howard) Stern noted that he had given up weed due to the oft-cited side affect (of paranoia)"
b) Help please, new smoker issues! One more thing I heard Valium helps with weed and people with paranoia Im prescribed 2mg is that enough? Or should I take 2 tablets Post by: ScottyDaWeedFan, Jan 10, 2015 in forum: Health and Wellness, http://www.marijuana.com/community/threads/help-please-new-smoker-issues.310224/
c) Will I ever be able to smoke again?...thought people were trying to kill me. I was diagnosed with manic-paranoia and bipolar disorder. Here's the full story: I used to be a chronic...Post by: TheGoatKing, Dec 28, 2014 in forum: Science http://www.marijuana.com/community/threads/will-i-ever-be-able-to-smoke-again.310308/
d) sensitivity...more than once, i very quickly feel TOO HIGH and get extreme paranoia, have difficulty speaking, and when it is really bad, i basically go catatonic....Post by: highdyhigh, Dec 28, 2014 in forum: Medicinal Marijuana http://www.marijuana.com/community/threads/sensitivity.161305/#post-2979423

e) Horrible trips, please help...and I never really had much of a problem other than occasional paranoia and anxiety. But one time, I smoked a bowl (nothing more than usual) and I...Post by: Madiweed, Nov 20, 2014 in forum: The 420 Lounge Panic attacks. http://www.marijuana.com/community/threads/horrible-trips.309862/#post-2978395

f) ...I felt so many different messed up things. I had the worst paranoia I had ever had. My heart felt like it was going to burst. I couldn't breathe...Post by: Kyle McLean, Apr 28, 2013 in forum: Health and Wellness http://www.marijuana.com/community/threads/panic-attacks.307538/

g) Bad Experience, don't know If I can smoke again...by what I was saying which just turned into a downward spiral of paranoia. I couldn't control my thoughts and after a while I started building...Post by: peaceinatimeofwar, Mar 2, 2013 in forum: Surveys, Polls and Questions http://www.marijuana.com/community/threads/bad-experience-dont-know-if-i-can-smoke-again.307216/

2) **Risks for anxiety, panic, and depression are increased by marijuana use:** Zuardi et al., 1982; Thomas, 1996; Patton et al., 2002; Dannon et al., 2004; Hayatbakhsh et al., 2007; Medina et al., 2007; Hasin et al., 2008; Zvolensky et al., 2010; Fairman and Anthony, 2012; Silins et al., 2014; Cougle et al., 2015; with some studies showing that correction for confounding variables lessens the association with anxiety and depression, while others report the effect remains. For a review see: Miller CL, The Impact of Marijuana on Mental Health in: Contemporary Health Issues on Marijuana (Winters KC and Sabet K, eds), Oxford University Press, in press.

3) **Risk for suicidal ideation is increased on average 7-fold:** Arendt et al., 2006; Silins et al., 2014; Kvitland et al., 2016 , **even after correcting for a prior history of depression:** Clarke et al., 2014.

In 2014 (the report specific for 2015 data is not yet available), the 2nd year after legalization of recreational use of marijuana, **Colorado experienced the highest suicide rate in state history:** "In 2014, there were 1,058 suicides among Colorado residents and the age-adjusted suicide rate was 19.4 per 100,000. This is the highest number of suicide deaths ever recorded in Colorado." Office of Suicide Prevention Annual Report 2014-2015, Colorado Department of Public Health and Environment.

Particularly alarming, the Colorado media has reported sudden onset suicidal ideation or completed suicide in consumers of commercial edibles: Levi Thamba Pongi, Denver, 2014; Richard Kirk, Denver, 2014; Luke Goodman, Keystone, 2015, but also reported following the smoking of potent marijuana: Brant Clark, Boulder, 2007; Daniel Juarez, Brighton, 2012. **These responses can happen so quickly in individuals who were not previously suicidal that intervention may be impossible.**

4) **Lack of educational achievement and decreases in motivation** - after covariate adjustment, the odds for marijuana users completing high school are reduced to about 0.37-fold that of controls (Silins et al., 2014); accounting for demographics and other factors, marijuana use adversely affected college academic outcomes, both directly and indirectly through poorer class attendance (Arria et al., 2015); decreases in motivation with marijuana use have been documented in clinical studies of humans (Bloomfield et al., 2014) and in animal models (Silveira et al., 2016).

5) **Negative impacts on IQ:** up to an approx. 7 point drop in IQ from childhood scores by age 38 in marijuana users who have been abstinent for 24 hours prior to testing; but only an approx. 5 point drop in those abstinent for a week prior to testing (Meier MH et al., 2012); a subsequent study of twins by Jackson et al., 2016, yielded mixed results, with an average decline of 4 points in marijuana users by late adolescence, however restricting the comparison to the matched twins (thereby controlling for genetics and a myriad of environmental factors), the effect of marijuana largely disappeared. The limitation of this later study is that brain development is not complete by late adolescence, particularly the wiring of the all-important cortex is still ongoing through the late twenties (see Figure below). There is no controversy, however, about the negative, real-time impact of marijuana use during tests of cognition and memory: Curran HV et al., 2002; Ranganathan and D'Souza, 2006; Morrison et al., 2009; Solowj et al., 2010; Pavisian et al., 2014.
From Lebel and Beaulieu, 2011:"Longitudinal Development of Human Brain Wiring Continues from Childhood into Adulthood"

"Pruning" of unnecessary grey matter..continues through late 20's..is thought to be important for proper brain function

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To Whom It May Concern:

My name is Beth Childs, and I am a fourth-year business honors, finance, and pre-medical student at The University of Texas in Austin. From a business standpoint, I used to sympathize with economic benefits of taxing marijuana and the safety benefits from its legal regulation. Now that my family has been traumatized by its effects, I can say confidently that the financial incentives and regulatory benefits are not worth the tragedies associated with making this drug any more accessible than it already is.

David was my little brother, my confidant, and my workout partner. I always thought David would become an architect; he was exceptionally gifted at math and art. His life spiraled down a dark path when he started smoking weed and, on December 5th, 2018, at the age of nineteen, he became the first member of my immediately family to die. He shot himself in the head while in the restroom; he did not leave a note or give any warning. If you told me five years ago that my brother would end his life in such a degrading state following marijuana-induced psychosis, I would have called you crazy. Unfortunately, this has become my reality.

Weed not only ruined David's life; weed devastated my entire family. I cannot convey how difficult it is to see my parents' sleep-deprived faces and increasingly frail frames. I cannot express how heartbroken I feel for my two 17-year-old brothers, who whole-heartedly looked up to their older brother. My 23-year-old sister struggles financially as she has taken off work for depression-related fatigue. I imagine each of my family members is experiencing trauma similar to my own.

Now, when I sit in class, I constantly fight images of David's brain exploding. I dread falling asleep each and every night because of the graphic, horrifying nightmares. It has been almost four months since David died, but the visions continue to haunt me. I wish I could say that my experience is unique; I wish I could say thousands of others have not experienced similar trauma. Unfortunately, marijuana-related suicides are on the rise.

Last summer, I studied for my medical school admissions exam and took a psychology class. Consequently, I learned a great deal about neurotransmitters and how they are modulated by drugs, which David and I discussed frequently. He told me that he *wanted* to find happiness outside of drugs, but could not imagine how. He told me that he felt incapable of giving up the high. He told me that the relapse was too hard. He told me his brain was *different*-- since using drugs, he felt utterly low and despondent when he was sober. Ultimately, this helplessness prompted him to end his life altogether.

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I spent my spring break in California, where marijuana is already legal. I saw and smelled it everywhere. My friend took me to a Sacramento Kings game, and the entire row sitting behind us looked stoned and reeked of weed while a six- or seven-year old boy sat in front of us. Throughout the entire game, I could not stop thinking about what open marijuana consumption might do to the child and all of the children placed in harm's way.

I do not want weed to become the new normal in *my* state. Unless we master the science behind a substance and ensure that it has NO psychotic effects (as we have observed with marijuana), we should NOT signal that it is acceptable in any way, shape, or form by legalizing or decriminalizing it.

Further, I am not trying to claim that my story is *always* the outcome of consuming weed. Rather, I am saying that it is *sometimes*, and arguably *not infrequently* the outcome. I would do anything to go back in time and plead on my knees for David to give up his marijuana addiction. Since I can no longer do that, advocating for higher barriers to use seems a next-best option. With that, I implore you not to decriminalize or legalize weed; I beg you to stay mindful of the individuals, families, and communities that might be demolished by its psychotic and traumatic effects. May Texas remain a state that is unwelcoming to the neurologically, emotionally, and morally destructive capabilities of marijuana.

Beth Childs

By **Christine L. Miller**

APRIL 18, 2019, 6:00 AM

As Maryland legislators appointed to the "Cannabis Workgroup" begin their study of the pros and cons of marijuana legalization, they should pay particular attention to the mental health risks of this drug. Unfortunately, they may not have heard much about the epidemiology of psychosis associated with marijuana use, since relevant U.S. expertise lags behind Western Europe, Canada and a couple of countries in the southern hemisphere.

Epidemiological studies are observational, not interventional, so our slow entry into the field has nothing to do with the illegal status of marijuana. Instead, I would point to our lack of centralized health care, which would otherwise facilitate collection of data on large populations — data pertaining to health status, history of health-related habits and key demographics. Another factor is how biomedical research here is tightly coupled to the pharmaceutical industry, a sector less interested in environmental factors that cause disease than in developing blockbuster drugs.

From the perspective of many of us who have researched the causes of psychosis in the laboratory or in clinical settings, the book by journalist Alex Berenson "Tell Your Children the Truth About Marijuana, Mental Illness, and Violence" provides an important wake-up call for America. The former New York Times business reporter wrote it after his psychiatrist wife suggested he learn more about the topic. But it's a lone voice of caution on the national stage. While Medical associations in the U.S. have issued position papers citing harms of marijuana, these documents are largely buried in their websites out of view.

Here's what you should know: Researchers looking for a dose-response correlation found that the heavier the marijuana use, and the more potent the product, the more likely a psychotic outcome like schizophrenia. Daily use of potencies considered moderate by current U.S. standards increases risk 4- to 5-fold.

Some will argue that individuals with psychosis who use marijuana are merely self-medicating pre-existing symptoms, despite research showing symptoms remit for many who quit using, and return if they use again. Studies in Europe and New Zealand of thousands of teens followed through young adulthood, demonstrated the marijuana habit *preceded* psychosis in the majority of marijuana users who developed it.

Yes, initial psychotic symptoms associated with marijuana are usually temporary, and only 12 percent to 15 percent of users reported these transient symptoms with lower strength marijuana common in the 1900s — symptoms like paranoia, delusions or auditory hallucinations. But 35 percent of those who experience such occasional symptoms can be expected to transition to a full psychotic break, a cluster of intense symptoms happening at once.

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As Maryland legislators look to the legalization of marijuana, I urge them to look at the impact and monitoring of "medical" cannabis, which theoretically has regulations to control the use of this potent drug. The Maryland Medical Cannabis Commission regulates providers and growers. There is no recourse to file a grievance against providers who do not abide by the regulations.

Christine Miller's warning comes too late for us ("Before Maryland legalizes marijuana it should consider this: Pot is linked to psychosis," Apr. 18). Our son had no genetic predisposition toward psychosis. A psychiatric evaluation when he was 40 showed no evidence of psychosis. Neither did he have one of the "qualifying conditions" for the use of medical marijuana. He had not explored other treatments before receiving the recommendation that allowed him access to unlimited amounts of this expensive and unmonitored drug. No qualified provider reviewed his medical history and, if they had, they would have seen he was diagnosed with a substance abuse disorder following a marijuana induced psychotic episode that put him in a locked psychiatric unit for seven weeks (at a cost to Medicare of $56,000) following a series of violent events.

Maryland's Civil Rights' laws protect him for involuntary treatment for his mental illness, even though he is completely delusional, paranoid and with no insight as to his condition. A grievance was filed with the Maryland Board of Physicians and the Maryland Medical Cannabis Commission. The dispensary that sold him the drugs and the qualified provider, who coincidentally worked at the dispensary, were put on notice as to the contraindications of providing cannabis to our son. There was no response. The grim reality is that our son will probably end up on the streets until he is arrested for a crime he will commit, which will most likely be the result of his paranoia. It is only when the criminal justice system is in charge that he can be compelled to seek treatment and then it will be too late.

While there was nothing we could have done to save our son — and we tried everything imaginable — the sobering lesson is that open access to marijuana places many unsuspecting adults at risk of psychotic breaks. As Ms. Miller states, the results are devastating. If this can happen with medical marijuana, imagine the impact of legalizing marijuana.

The next time you see an unkempt adult with vacant eyes panhandling on the streets of Baltimore, please be kind. It could be our son — or yours. Consider yourself informed.

Karen Shavin, Baltimore

The Pueblo Chieftain

Opinion

Marijuana could factor into suicide rate

Posted Apr 16, 2019 at 4:02 PM
Updated Apr 16, 2019 at 4:02 PM

The recent articles highlighting the significantly increasing problem we are seeing with suicide in Colorado, especially in teens and young adults, have been helpful in terms of educating the public.

However, I want to point out a glaring omission in all the articles that needs to be highlighted. That is the extremely high correlation between marijuana use and suicide. People frequently say that correlation does not mean causation. However, this is what research is about — looking at correlations to help determine causation. There is increasing information that indicates marijuana use may play a role in suicide.

Colorado has a significantly higher rate of suicide than the national average. In fact, one can graph the increases in suicides in Colorado from 2007 to 2015, directly correlating this with the increase in marijuana commercialization in our state. In Pueblo, the rate of suicide is documented to be higher than the state rate in every age category and nearly double the state rate in the 10-18 age group. In 2015 to 2017, the suicide rate in this age group jumped to 23 percent. In the Healthy Kids Survey of 2015, Pueblo had the highest prevalence of current marijuana use among high school students in Colorado, with 30.1 to 35 percent of kids acknowledging use of marijuana within the past month.

A large longitudinal study in 2014 in Australia and New Zealand of more than 2000 adolescents found an almost seven times increase in suicide attempts in daily marijuana users compared with non-users. A cross-sectional, multi-site study of 3233 veterans in the Veterans Administration in 2017 found that cannabis use disorder was significantly associated with both current suicidal ideas and a lifetime history of suicide attempts compared to veterans with no lifetime history of cannabis use disorder.

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This significant difference continued even after adjusting for sex, post traumatic stress disorder, depression, alcohol use disorder, non-cannabis drug use disorder, history of childhood sexual abuse and combat exposure. The Colorado Department of Public Health and Environment reported in 2014 that marijuana is the most common drug present in toxicology reports from adolescent, age 10-19, suicides in Colorado.

There are numerous root causes as to why someone might contemplate suicide, but marijuana use, especially the high potency THC marijuana currently available, has the capacity to significantly impair the executive functioning part of the brain resulting in impulse control problems, lack of insight and the potential for delusional/psychotic thinking that can result in violence toward self and others.

This is especially true in the developing brain of adolescence where the endocannabinoid receptors play a role in pruning in the prefrontal motor cortex, helping the brain determine what neurons we are keeping and what we are getting rid of. This is done by our natural chemicals we create in our brain called anandamides (a Sanskrit term for "supreme joy"). Anandamides are created in our brain locally, used immediately and then destroyed.

THC from marijuana on the other hand, fits into these receptors, blocking our own natural chemicals and it stays there for a long time, disrupting normal brain development. The prefrontal cortex or the seat of judgement and impulse control is not fully developed in humans until the mid-20s up to age 30. When someone is experiencing the stressors that can lead to thoughts of suicide, marijuana use can cause some delusional thinking about a person's situation and impair that person's ability to resist acting on the thought impulsively, risking suicide completion.

Sadly, we have normalized this drug so people think it is safe and healthy. There is more and more evidence emerging on the problems with marijuana use, especially the high potency THC marijuana and concentrates in relation to mental health. There are increasing problems with depression, anxiety, psychosis and suicide as a result of marijuana use.

Large reduction in psychiatric admissions after head-shop ban

Admissions fell nearly 20% in two years after strict laws introduced, research shows

In 2010, young people in Ireland were the biggest users of head shop drugs in Europe, with 7 per cent admitting to using the substances within the last year. Photograph: Bryan O'Brien

Conor Gallagher Crime Correspondent
Mon, Apr 8, 2019, 00:17

There was a significant and immediate reduction in admissions to psychiatric facilities after the strict laws banning head shop drugs were introduced, new research shows.

Head shop drugs, officially termed new psychoactive substances (NPS), started to become popular in Ireland in late 2009. By 2010 there were dozens of shops around the country selling the substances with little or no regulation.

The phenomenon was linked to increased reports of psychiatric issues among young people as well as more muggings by addicts to get money for drugs.

In 2010, young people in Ireland were the biggest users of head shop drugs in Europe, with 7 per cent admitting to using the substances within the last year. Young males were three times more likely to use NPSs compared to females.

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At one stage in 2010, 24 per cent of all adults using mental health services reported NPS use in the previous year.

Concern

In response, then minister for justice Dermot Ahern began implementing a series of laws which severely restricted the sale of the NPSs and led to the closure of 80 per cent of head shops.

At the time, experts expressed concern the laws would drive the sale of the drugs underground and do little to address increasingly use.

However, according to a paper just published by Irish academic and health researchers in the journal Early Intervention in Psychiatry, the laws were largely successful in reversing the impact of the NPS trade, at least from a psychiatric point of view.

During what the authors called "the head shop era", drug-related admissions to psychiatric facilities jumped by about 20 per cent (from 713 in 2009 to 857 in 2010).

Following the passage of the anti-NPS laws, the rate fell from 857 in 2010 to 729 in 2011. This number fell again the following year to 702.

Oppose SB0531 - Marijuana Control and Revenue Act of 2015

Testimony of: Christine L. Miller, Ph.D.
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Marijuana is significantly associated with psychotic disorders like schizophrenia in those who use regularly: reviewed by *Moore TH, Zammit S, Lingford-Hughes A, et al. Cannabis use and risk of psychotic or affective mental health outcomes: a systematic review. Lancet. 2007;370:319–328. Davis GP, Compton MT, Wang S, et al. Association between cannabis use, psychosis, and schizotypal personality disorder: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. Schizophr Res. 2013 Dec;151(1-3):197-202. Giordano GN, Ohlsson H, Sundquist K, et al. The association between cannabis abuse and subsequent schizophrenia: a Swedish national co-relative control study.*

The dose response between marijuana and psychosis has been documented in observational studies (pointing towards causality): *Di Forti M, Marconi A, Carra E, et al.. Proportion of patients in south London with first-episode psychosis attributable to use of high potency cannabis: a case-control study. Lancet Psychiatry, online February 15, 2015, in press. Zammit S, Allebeck P, Andreasson S, et al. Self reported cannabis use as a risk factor for schizophrenia in Swedish conscripts of 1969: historical cohort study. BMJ. 2002 Nov 23;325(7374):1199. van Os J, Bak M, Hanssen M, et al. Cannabis use and psychosis: a longitudinal population-based study. Am J Epidemiol. 2002 Aug 15;156(4):319-27.*

The age of onset of schizophrenia is reduced in marijuana users (pointing towards causality): *Large M, Sharma S, Compton MT, et al. Cannabis Use and Earlier Onset of Psychosis: A Systematic Meta-analysis. Arch Gen Psychiatry. 2011 68(6):555-61. De Hert M, Wampers M, Jendricko T, et al..Effects of cannabis use on age at onset in schizophrenia and bipolar disorder. Schizophr Res. 2011 Mar;126(1-3):270-6. Leeson VC, Harrison I, Ron MA,et al.. The Effect of Cannabis Use and Cognitive Reserve on Age at Onset and Psychosis Outcomes in First-Episode Schizophrenia. Schizophr Bull. 2011 Mar 9. [Epub ahead of print].*

The active ingredient in marijuana (Δ^9- THC) induces psychosis in clinical subjects (pointing towards causality): *D'Souza DC, Perry E, MacDougall L, et al. The psychotomimetic effects of intravenous delta-9-tetrahydrocannabinol in healthy individuals: implications for psychosis. Neuropsychopharmacology. 2004 Aug;29(8):1558-72. Morrison PD, Nottage J, Stone JM, et al. Disruption of frontal θ coherence by Δ9-tetrahydrocannabinol is associated with positive psychotic symptoms. Neuropsychopharmacology. 2011;;36(4):827-36. Freeman D, Dunn G, Murray RM, Eet al. How Cannabis Causes Paranoia: Using the Intravenous Administration of Δ9-Tetrahydrocannabinol (THC) to Identify Key Cognitive Mechanisms Leading to Paranoia. Schizophr Bull. 2014 Jul 15. pii: sbu098. [Epub ahead of print]*

Marijuana use generally precedes the schizophrenia, not the other way around (pointing towards causality): *Arseneault L, Cannon M, Poulton R, et al. Cannabis use in adolescence and risk for adult psychosis: longitudinal prospective study.BMJ. 2002 Nov 23;325(7374):1212-3. Henquet C, Krabbendam L, Spauwen J, et al. Prospective cohort study of cannabis use, predisposition for psychosis, and psychotic symptoms in young people. BMJ. 2005;330:11–15. Kuepper R, van Os J, Lieb R, et al. Continued cannabis use and risk of incidence and persistence of psychotic symptoms: 10 year follow-up cohort study.BMJ. 2011 Mar 1;342: d738.*

Of all drug-induced psychoses, marijuana is associated with a conversion to a chronic psychosis at the highest rate (46% versus 5% for alcoholics for e.g.): *Niemi-Pynttäri JA, Sund R, Putkonen H, Vorma H, Wahlbeck K, Pirkola SP. Substance-induced psychoses converting into schizophrenia: a register-based study of 18,478 Finnish inpatient cases. J Clin Psychiatry. 2013 74(1):e94-9.*

Anxiety, depression and panic are triggered or made worse by marijuana use: *Hayatbakhsh MR, Najman JM, Jamrozik K, et al. Cannabis and anxiety and depression in young adults: a large prospective study.J Am Acad Child Adolesc Psychiatry. 2007;46(3):408-17. Buckner JD, Leen-Feldner EW, Zvolensky MJ, Schmidt NB. The interactive effect of anxiety sensitivity and frequency of marijuana use in terms of anxious responding to bodily sensations among youth. Psychiatry Res. 2009;166(2-3):238-46. Zvolensky MJ, Cougle JR, Johnson KA, et al. Marijuana use and panic psychopathology among a representative sample of adults. Exp Clin Psychopharmacol. 2010;18(2):129-34.*

The risk for suicide is markedly increased (up to 7-times) by marijuana use, even after a history of depression is corrected for: *Clarke MC, Coughlan H, Harley M, et al. The impact of adolescent cannabis use, mood disorder and lack of education on attempted suicide in young adulthood. World Psychiatry. 2014;13(3):322-3. Kvitland LR, Melle I, Aminoff SR, et al.. Cannabis use in first-treatment bipolar I disorder: relations to clinical characteristics. Early Interv Psychiatry. 2014 Apr 17. doi: 10.1111/eip.12138. [Epub ahead of print]. Silins E, Horwood LJ, Patton GC, et al. Young adult sequelae of adolescent cannabis use: an integrative analysis. Lancet Psychiatry 2014; 1(4): 245-318.*

PTSD is made worse by marijuana use: *Wilkinson ST, Stefanovics E, Rosenheck RA. Marijuana Use is Associated with Worse Outcomes in Symptom Severity and Violent Behavior in Patients with PTSD. Proceedings of the American Academy of Addiction Psychiatry, December 4-7, 2014, p. 26. http://www.aaap.org/wp-content/uploads/2014/11/2014-AM-Program-Final.pdf.*

In those who are psychotic and using the drug, the risk for violence is up to 9-times greater than those who are psychotic but not using marijuana or another recreational drug: *Fazel S, Gulati G, Linsell L, et al. Schizophrenia and violence: systematic review and meta-analysis. PLoS Med. 2009 Aug;6(8):e1000120. Arseneault L, Moffitt TE, Caspi A, et al. Mental disorders and violence in a total birth cohort: results from the Dunedin Study. Arch Gen Psychiatry. 2009;57(10):979-86. Harris AW, Large MM, Redoblado-Hodge A, et al. Clinical and cognitive associations with aggression in the first episode of psychosis. Aust N Z J Psychiatry. 2010 Jan;44(1):85-93.*

*Note: Excellent documentaries for drug education: "The Downside of High" produced by Dreamfilms Canada (gold medal winner in the 2011 New York Festivals of Film); "The Other Side of Cannabis" produced by Jody Belcher, to be released in 2015.