



# MARIJUANA - PERMANENT DAMAGE TO THE BRAIN

***IF NOTHING ELSE SCARES YOU, THIS SHOULD!***

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For most of history, scientists believed that the human brain was fully developed by the time a child reached age 10. We now know **it isn't fully developed until the mid-twenties**, or later, and until it is it is much more vulnerable to harm and addiction. During adolescence and early adulthood, the toxic effects of drugs and alcohol **can do permanent, irreversible harm**. To compound the problem, the age groups with the highest percentage of alcohol and drug use are age 25 and under.

As far back as 1983, Dr. David Goodman published an excellent booklet called "10 STARTLING NEW FACTS about BRAIN DAMAGE and MARIJUANA."<sup>i</sup> Drawing on the wisdom of the best brain scientists of the day, what he and they predicted has now been largely confirmed. Marijuana adversely impacts numerous areas of the adolescent brain and can cause irreversible damage.

Dr. Goodman stated the urgency at that time was that marijuana had increased in potency from less than 1% to 4% to 6% THC. If that was cause for concern, today's pot selling in a normal range of 10 to 21% THC and ranging as high as 30% is cause for hysteria. Predictably, the impact on people young and old has already caused major problems throughout the world.

Dr. Goodman and those he cited pointed out the adverse impacts of marijuana on the brain, noting that the exact cause of marijuana brain damage may be far off, perhaps as long as 15 to 20 years. (It has now been 27) But even 27 years ago he stated "*Scientists cannot take too lightly that the hippocampus is involved in the regulation of puberty, mood, feelings, attention, concentration, learning and memory. Also, marijuana most probably damages it.*" Time has validated all of that, and as research has continued, we now have an even better idea of the damage, as indicated below:

- Our studies have shown that frequent marijuana use in adolescence is linked to poorer memory and attention, abnormal brain activation, and poorer integrity of white matter in the brain, **even after 28 days of abstinence**. (Susan Tapert, MD)<sup>ii</sup>
- Researchers used a novel form of brain imaging (diffusion tensor imaging (DTI)) to discover that white matter in the brains of adolescents at risk of developing schizophrenia does not develop at the same rate as healthy people. Research was focused on the brain's white matter because it is known that white matter is disrupted in people who already have schizophrenia, and there is increasing evidence that white matter connectivity may be highly relevant of the development of psychosis. (Tyrone D. Cannon of UCLA and Tara Niendan of UC Davis)<sup>iii</sup>
- Recent, high-quality, longer term, robust research involving thousands upon thousands of people over generations of time, in several populations and countries, has shown that **marijuana, especially in teen boys, leads to measureable increase in the future**

**development of schizophrenia** even when controlling for family and environment. .... risks are dose-related, and are higher the lower the age of first exposure. ....researchers have moved beyond looking for an association and now working to specifically identify the genes and neurotransmitters marijuana affects to induce schizophrenia.” (Dr. Gurley)<sup>iv</sup>

- The general perception that cannabis is a “soft” drug may not be true. **There is now evidence that cannabis may affect the adolescent brain (permanently altering) its developmental trajectory.** While this may not occur in everyone, some people may be particularly vulnerable. Until we can identify who is particularly vulnerable, using cannabis during adolescence may be like playing Russian roulette. **We need to warn young people about the risks they take when using cannabis.”** (Dr. McGrath after studying 228 pairs of siblings.)<sup>v</sup>

- Adolescents and young adults who are heavy users of marijuana are more likely than non-users to have disrupted brain development....researchers found abnormalities in areas of the brain that interconnect brain regions involved in memory, attention, decision-making, language and executive functioning skills. The findings are of particular concern because **adolescence is a critical period for brain development and maturation**.....Our results suggest that early-onset substance use may alter the development of white matter circuits, especially those connections among the front, parietal and temporal regions of the brain. Abnormal white matter development could slow information transfer in the brain and affect cognitive functions.....Our work reinforces the idea that the adolescent brain may be especially vulnerable to risky behavior such as substance abuse, because of crucial normal development that occurs during these years. (Manzar Ashtari, Ph.D.)<sup>vi</sup>

- **SCHIZOPHRENIA.COM** published an article called Cannabis / Marijuana (and other street drugs) Have Been Linked to Significant Increases in a Person’s Risk for Schizophrenia.<sup>vii</sup> Included therein:

- The risk is higher when drugs are used by people under the age of 21, a time when the human brain is developing rapidly and is particularly vulnerable.

- Researchers in New Zealand found the younger a person smokes/uses cannabis, the higher the risk for schizophrenia, and the worse the schizophrenia is when the person does develop it..... Psychiatrists in inner-city areas speak of cannabis being a factor in up to 80% of schizophrenia cases.

- In London and New Zealand a study of 750 adolescents concluded that people were 4.5 times more likely to be schizophrenic at 26 if they were regular cannabis smokers at 15, compared to 1.65 times for those who did not report regular use until age 18.

- Many researchers now believe that using the drug while the brain is still developing boosts levels of the chemical dopamine in the brain. This in turn can directly lead to schizophrenia.

- At the College of London, Professor John Henry said research has shown that people with a certain genetic makeup who use the drug face a ten times (1000%) higher risk of schizophrenia. If your risk was 6% due to family history prior to taking cannabis, it could be 60% - or more likely than not – after taking cannabis.

- A recent Dutch study showed that teenagers who indulge in cannabis **as few as five times in their life** significantly increase their risk of psychotic symptoms.

- The British Lung Association says cannabis on the streets today is 15 times more powerful than 3 decades ago, and could be tied to the increase in psychosis.

- In Melbourne a study revealed that regular use of cannabis by adolescent girls could trigger long-term depression, and for those vulnerable to a psychotic disorder, **even a small amount of cannabis could pose a threat.**

- Professor Castle, author of Marijuana Madness, said some people who are prone to psychosis can have a bad experience the first time they use cannabis, like being paranoid of hearing a voice calling their name. **People with such vulnerability should avoid cannabis like the plague.**

- Swedish study of 50,000 military conscripts found heavy use of cannabis increased the risk of suicide by four times (400%). A Victorian study of 2,332 adolescents found weekly use increased the risk of suicide attempts among females by five times. Weekly use by teenagers doubled the risk of depression and anxiety. Daily use at age 20 boosted the risk of depression and anxiety by five times (500%). Heavy consumers of cannabis at age 18 were over 600% more likely to be diagnosed with schizophrenia over the next 15 years than those who did not take it..... experts estimate that between 8% and 13% of all schizophrenia cases are linked to marijuana use during teen years.

• White matter growth accelerates in the teen years and continues into adulthood. The “growth” is actually the result of myelin encasing the brain’s connecting wires ..... while the white matter is being wrapped in its protective coating, the gray matter of the brain is undergoing its own changes. Inefficient or confusing connections between neurons, called synapses, are pruned and some cells die. **From ages 14 to 16, people lose about 20% of the synapses in the brain.**<sup>viii</sup>

• Harvard Medical School in March, 2010 confirmed that young people who smoke pot are 6 times more likely than others to develop psychosis; three times more likely to have hallucinations; four times more likely to have delusions..... side effects can appear years after you have quit. A study of 4,000 young Australian adults showed that those who first used pot before age 15 or younger were twice as likely to report psychotic symptoms when they were 21.....people who had “ever” used marijuana were 41% more likely to later develop psychotic symptoms. The risk for regular users was 50% to 200% more likely. The recommendation of Dr. Mary Pickett? **“If you smoke marijuana, my advice is to stop.”**<sup>ix</sup>

So there you have it. The highest level of use of marijuana is in the age group 25 and under, which is also the worst time to use pot because of its impact on the developing brain. Even a small amount of use as a teenager can trigger psychotic events years later, and the impact can have irreversible consequences. The age of **first use**, **frequency** of use and **potency** all factor in to the level of risk for psychosis and particularly schizophrenia, aside from the debilitating effects on memory, maturation, motivation, cognition, et al.

In the UK, Skunk, which averaged 16% THC, caused such a surge in mental illness and emergency room episodes that after downgrading pot in 2004, the government reclassified it three years later.. The “medical marijuana” being sold today is in the same range, so we should be right behind the UK in seeing the carnage. Indeed, are we seeing it now?

In 2010, it was John Patrick Beddell, the Pentagon Shooter. An avid pot smoker from adolescence, his altered schizophrenic and paranoid mind finally led him to drive from California to the Pentagon, shoot three guards, before they shot and killed him.

In January 2011, 22 year old Jared Loughner, a pothead, shot 19 people in Tucson, killed six, and critically wounding Representative Gabrielle Giffords. While the press has blamed everyone from Sarah Palin and the Tea Party to the NRA, there seems no question that his deranged, schizophrenic and paranoid mind is a result of extensive use of marijuana and other drugs.

How do we curtail the use of marijuana? It may not be possible with young adults, whether it is legal or not. But in the case of adolescents, we can control it much better with random drug testing, and educating parents and kids of the dangers of marijuana. It is no longer an option if we care about the kids, or their/our future.

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- <sup>i</sup> Goodman, David PhD. *Ten Startling New Facts About Brain Damage and Marijuana (1983)*
- <sup>ii</sup> Tapert, Susan Ph.D., Professor of Psychiatry, UCSD, Associate Chief, Psychology Service, VASDHS, Director, Substance Abuse Mental Illness. VASDHS [stapert@ucsd.edu](mailto:stapert@ucsd.edu)
- <sup>iii</sup> Cannon, Tyrone (UCLA) and Niendam, Tara A.(UC Davis) Research was carried out in the Clinical Neuroscience Lab of UCLA, with additional contribution from co-author Niendam of UC Davis.
- <sup>iv</sup> Gurley, Dr. Board-certified Internist Physician and Harvard Medical School graduate now serving at the San Francisco City Public Health Administrator.
- <sup>v</sup> McGrath, Dr. Ghose, Dr, University of Queensland. The study of 228 pairs of siblings which were drawn from a birth cohort of 3801 adults was published in the May issue of the //Archives of General Psychiatry.
- <sup>vi</sup> Ashtari, Manzar Ph.D., Director of Diffusion Image Analysis and Brain Morphometry Laboratory in the Radiology Department of the Children's Hospital of Philadelphia. Journal reference Manzar Ashtari, Kelly Cervellione, John Cottone, Babk A. Ardekani, Sanjiv Kumra, *Diffusion abnormalities in adolescents and young adults with a history of heavy cannabis use.* Journal of Psychiatric Research, 2009; 43(3): 189-204 DOI: 10.1016/j.jpsychires.2008.12.002.
- <sup>vii</sup> Schizophrenia.com article *Cannabis/ Marijuana (and other street drugs) Have Been Linked to Significant Increases in a Person's Risk for Schizophrenia*
- <sup>viii</sup> Nasrallah, Dr. Henry, ; Yungelun-Todd, Director of Cognitive Neuroimaging at the Brain Imaging Center of McLean Hospital and Harvard Medical School in Boston, and Rapaport, Dr. Judy at the National Institute of Mental Health. Available at schizophrenia.com.
- <sup>ix</sup> Pickett, Mary M.D. News Review from Harvard Medical School, (Mar 2, 2010) [www.intelihealth.com](http://www.intelihealth.com) website.