

Important Excerpts from Dr. Messamore presentation

@7:00

Glutamate is primarily involved in circuits that generate perceptions like sight, touch, sound. When you mess with glutamate in perception circuits, you have misperceptions which are the building blocks for *psychosis*”.

This is known to science, but not known to the general public, sadly.

@8:00

And glutamate is a strengthening connection signal. When you mess with glutamate, you mess with learning and memory.

Glutamate is also very much involved in helping the brain to wire itself and helping the brain cells to form the right circuits. A brain cell has to grow, find its targets and then form effective circuits.

Glutamate helps to direct that activity. If you mess with glutamate during fetal development, during childhood, during adolescence, *even during young adulthood* when the brain is still very actively wiring itself you have a set up for bad communication with the brain which will in effect has a potential to affect cognition, mood and everything else long term basis. And glutamate being the number one transmitter (neurotransmitter) when you mess with it you have a lot of potential downsides.

@9:00

GABA is the number two neurotransmitter which is extremely important. GABA is an inhibitory signal which makes cells quiet. It's like the brake. THC has the immediate effect to reduce glutamate output. THC also has the immediate action to suppress the output of GABA- taking the foot off the brake. If you can take the foot off the gas pedal on the anxiety circuit, that can relieve anxiety. But what if those anxiety circuits are governed by GABA? What if they are under brake control at the moment the person takes THC- take the foot off the brake, light up and rev up the anxiety circuits you will have a recipe for panic attacks and anxiety attacks which are extremely common side effects of cannabis.

@9:50

Dopamine (another neurotransmitter) is a signal for importance, for reward. It's involved with pleasure circuits. THC has a short term immediate effect to create surges of dopamine which create reward, create pleasure and maybe make it a pleasant experience. **However, when dopamine surges too high then people begin to experience paranoia and hallucinations which is the set up for psychosis.**

We also know with long-term cannabis use, dopamine levels fall. The brain becomes less active and less able to receive dopamine. And because dopamine is a signal for drive, concentration, ambition and reward, with long-term cannabis use and decrease dopamine output, you have a set up for decreased motivation, decreased energy and mood disturbances.

Dopamine being a reward molecule also is involved in addiction processes. Every drug that is known to be addictive releases dopamine in pleasure circuits. Cannabis has been shown to do this. The rate of addiction from cannabis use ranges from 8% to 20%. Those are the estimates from people who have cannabis-use-disorder. The higher 20% risk applies when cannabis use begins during teen use. If you as a teenager or early adult begin to use cannabis, your risk is closer to 20% with repeated exposure.

@11:50

Serotonin (another neurotransmitter) is linked to anxiety, depression and mood. We have very concerning animal studies that show that long-term exposure to THC makes the brain less able to make serotonin. And this can explain why study after study after study shows that an association between cannabis use during early life and later risk of depression diagnosis and increased risk of suicide.

@12:20

These are the fundamentals of how cannabis works so you can understand side effect risks. Real world data with actual cannabis consumers survey after survey after survey has been done asking people who use cannabis – what have you done, what's it do that's been nice, what's it do that has been not nice? These are some summaries of those surveys – looking at results of 3,000 consumers. We can say from these numbers, side effects are common: hallucinations, paranoia at 50%, concentration problems, mood disturbance. These are all in line with the neurochemical actions I've just explained to you.

@13:00

Here's another real world survey of cannabis consumers in New Zealand. The amazing statistic from this is again they didn't try to lead people, they didn't try to say they have an agenda and tell us bad things. They just asked to tell us if this ever happened to you? **22% (one in five) said cannabis use caused them at some point to have anxiety or panic. 15% said it caused them to have psychosis.**

@13:25

Another way to look at real world side effect risks is to simply look at clinical studies that have been reviewed by the FDA, maybe not a lot of people realize this but THC any doctor in America can prescribe it – it's an approved drug. As an approved pharmaceutical drug, it had to undergo rigorous clinical testing which gives us very good data about side effect risks. So, if you simply look up the prescribing info on the FDA website, you'll see: mood disturbance, psychosis, cognitive disturbance, coordination problems. A little known fact is that it raises blood pressure and pulse which can be dangerous for people who have fragile hearts or fragile blood vessels. Paradoxically, it can actually make seizures *more* likely that's related to the suppression of GABA (taking the foot off the brake). And also, an increasingly large problem because a teenager beginning cannabis use ultimately faces a 20% risk or likelihood of becoming a regular user and regular, long-term users of cannabis wind up getting this horrid condition called

cannabinoid hyperemesis syndrome where you vomit non-stop and it can actually be life threatening for electrolyte disturbances.

@14:35

And further, independent- in other words- not attached to the pharmaceutical industry, not attached to the cannabis industry, not attached to any kind of anti-cannabis lobby, independent scientific organization (like one of the best ones in the world) National Academy of Science, Engineering and Medicine surveyed 10,000 studies. They published the results of 2017 and you can read it for free. Here are the key points: these are side effects which are deemed to have *substantial* level of evidence to support them (means many findings from good quality studies with very few or no opposing findings)

-Addiction Risk (8-20%)

-Psychosis Risk (3 fold to 7 fold) = between 3% to 20% of psychosis from acute use/short term use; and risk of a diagnosis of schizophrenia later in life is about 3 times to 7 times higher than people who don't use cannabis

-It doubles the likelihood that a mother who is using cannabis during pregnancy will give birth to a kid that is 5 ½ lbs or less

-bad for the lungs if you smoke it

@15:43

Here are some other ones which are said to have *moderate* scientific evidence (defined as several supportive findings from good to fair quality studies with very few or no credible, opposing findings). Again you see:

-cognitive problems, mood problems, suicide risk (some estimate of suicide risks say it rises by 3 fold in people who have used cannabis)

-anxiety disorders

-negative impacts on schizophrenia

-higher risk that a person using cannabis ultimately will develop some other addiction during some point in their life

@16:20

I hope I've explained enough about how cannabis works so you can understand that all those side effects from scientifically credible methods are real. It's positioned as kind of a wonder drug, like a safe, natural medicine with no side effects. That's just not right. It does work for some people and they really like it. Others really hate it. And for some people, it is just disastrous, trust me because I see them in my practice. This is not surprising because this is a drug that has multiple sites of action in the body and brain. And it how it affects multiple, very

important neurotransmitters that the brain uses for communication doing its business of constructing mood and reality.

If we're on the progress to make cannabis as legal as cigarettes, we need to make its side effects and risks as widely known as those from cigarettes or alcohol. And for sure if states are going to say this is a legitimate medicine, then they need to treat it like a legitimate medicine and put all the scientifically credible side effects on their websites for the medical marijuana program and in the package so the consumers are fully aware of what they are getting into when they contemplate using it.

Or so that someone who uses cannabis if they develop mood disturbances or psychosis or anything else like this recognizes it for what it is as a well known side effect and has an opportunity to stop before it progresses into something else.

For more information about the psychosis and suicide risks of cannabis, please visit and subscribe to momsstrong.org

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