

Daily Life with Christ-77: Understanding brain addictions (16). Psychoactive drugs: how methamphetamine changes the brain.

How Does Meth Effect the Brain?

- ❑ Meth use significantly changes how the brain functions. Studies have shown alterations in the activity of the dopamine system that are associated with reduced motor skills and impaired verbal learning. (Volkow 377-382)
- ❑ Areas of the brain most effected are the self control tract, the pleasure center, motivational and motor centers, centers for emotional control, appetite and sleep cycle, judgment and cognitive processes, and memory. (Holley)

Brain damage from meth use



The image displays three 3D brain scans from left to right, illustrating the progression of brain damage from methamphetamine use. The first scan, labeled 'Normal', shows a smooth, rounded brain with uniform green and yellow colors, indicating normal brain activity. The second scan, labeled 'Frequent use', shows a brain with several small, dark holes, indicating possible damaged cells. The third scan, labeled 'Heavy use', shows a brain with many more and larger dark holes, indicating significant brain damage.

Normal: Three-dimensional model from a scan of a non-user's brain. Image shows normal brain activity in all areas.

Frequent use: Scan from the brain of a 36-year-old user who had been abusing meth for 10 years. The holes show lack of brain activity, indicating possible damaged cells.

Heavy use: Scan of the brain of a 28-year-old user who had been using meth heavily for eight years. There are more holes than the frequent user's brain.

We have noted the three key areas of the human brain: the prefrontal cortex where the human soul actualizes our thinking, our nucleus accumbens where the soul experiences pleasure, and the VTA where the soul actualizes the production of dopamine (our cravings)—for illustration, see Daily life with Christ-59.

When man lives rationally—has a healthy brain—his prefrontal cortex is the dominant center, and thus he is able to enjoy the life of the mind, a mind that brings healthy pleasure to the nucleus accumbens as well as proper governing of VTA—for proper desires.

However, in an abnormal brain, man lives more like an animal in that he is dominated by abnormal and irrational cravings produced by the VTA in order to feed a numbed nucleus accumbens. Moreover, these cravings inhibit activity in the prefrontal cortex. In other words, instead of the prefrontal cortex, the rational part of man, governing his life, his “thinking” becomes a slave to his desires. His brain has been hijacked by his cravings. In such a state he is no longer able to live and thrive as God intended, as a free human being. He lives as a slave to his cravings and increasingly loses the ability to enjoy life because his cravings increase while his ability to enjoy them are numbed. In sum, he is less free and driven by cravings that increasingly bring less pleasure—which only promotes a more vicious cycle of a frantic search for pleasure and happiness. Truly, this is no way to live.

Arguably, the most pernicious drug that hijacks the brain is methamphetamine. As we noted, in the late 1800s, chemists synthesized amphetamine from the ephedra plant. And about 30 years later, they synthesized methamphetamine. Both are potent and addictive psychostimulants, but methamphetamine has far stronger effects because of a slight change in the chemical structure. The methamphetamine molecule is an amphetamine molecule with an additional methyl group, consisting of a carbon atom and three hydrogen atoms. That change may seem minor, but the additional methyl group makes it extremely dangerous.

One reason is that the extra methyl group makes it easier for methamphetamine to get to the brain compared with standard amphetamine. More of it can reach the brain, and it can produce a larger effect that lasts much longer. Another reason methamphetamine has become popular among recreational drug users is that it's relatively easy to make using widely available chemicals, such as the pseudoephedrine found in decongestants.

In an attempt to slow down the illegal manufacture of methamphetamine, Congress passed an act called the Combat Methamphetamine Epidemic Act of 2005, which required that cold medicines containing pseudoephedrine be kept behind the counter. Anyone buying those medicines had to present a photo identification, and the amount they could buy was limited and tracked.

The most potent form of methamphetamine is crystal meth, which users often call glass or ice. Like crack cocaine, it's usually smoked and produces a very intense high. But that high typically lasts much longer than the high from other stimulants. Users, therefore, see it as a very cost-effective drug, because a small dose can go a long way.

As we have noted, psychostimulant drugs stimulate the nervous system. And that stimulation has some "positive" effects: It reduces fatigue, increases alertness, and produces feelings of excitement and euphoria. Unfortunately, the negative consequences of these drugs are disastrous. After taking an initial dose, they experience an intense high and euphoria, but as soon as that high starts to wear off, they administer another dose to try to keep the high going and avoid coming down. They might repeat this cycle for days without eating or sleeping, until they finally run out of the drug or crash from starvation. The repeated use of psychostimulants leads to changes in the brain that make it harder and harder to resist the drug. Repeated use of psychostimulants leads to tolerance; it takes more of the drug to produce the same effect.

In sum, the reason that psychostimulants like methamphetamines are so addictive is the same reason as other drugs. It produces a large release of dopamine that overstimulates the brain's reward circuit. While cocaine use doubles the amount of dopamine in the synapse, methamphetamine produces up to tenfold increase in dopamine levels, making it incredibly difficult to break the addiction. This is why 90% of methamphetamine addicts return to the drug, and even though they know that is literally destroying their brains and with it their life.

In conclusion, I would add that the only way to destroy bad cravings is by displacing them with proper desires. As creatures, we all have rational and sense appetites, and we always seek what we think is our good. The problem in addictions is that base sensual cravings hijack, inhibit, and bribe the mind and the conscious to excuse activity that one knows in his higher self is wrong. The key to all of these addictions and abnormalities comes down to two general principles in life:

life in God by proper knowledge and proper love. In other words, man is united to God only by proper knowledge and proper love. In proper knowledge and love, there is also dopamine release for pleasure, but that pleasure is from rationality and not base irrational desires.

It is a fact that the happiest people in the world are those who live in the love of God. Love ALWAYS brings happiness when one has what one desires, which is the case when one loves God. I will provide more details on these godly and even licit physical pleasures when I conclude these series.

Sharing in the happiness of God,

Pastor Don