

An Issue of Influence...

Volume 2, Issue 5
May 2010

May is Mental Health Awareness Month



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Mental Illness and Substance Abuse: The Chicken or the Egg?

In relation to substance abuse, mental illness is “book end” phenomenon. Is the substance use to combat depression or anxiety for example, or does the use of a substance leave the user depressed, anxious or with other signs of mental illness? This is an interesting question that is dependent on more questions: What drug? When did use start? How much and how often? Why are they using? Are there other issues and stressors contributing to symptoms of other mental illness? Is family history relevant?

The brain science, in very simplified terms, can be helpful to clarify the answer to this question. The human brain works by electrically and chemically stimulating neurons to communicate with each other and the rest of the body using electrically charged molecules and chemicals known as neurotransmitters. Substance use interferes with the normal production of some neurotransmitters. We will discuss four of them: Dopamine is the feel good hormone. It is increased when you experience pleasure. Norepinephrine is the stress hormone and along with epinephrine, is responsible for your fight or flight response. Its production increases when you are excited. GABA is the calming or peacemaker neurotransmitter. It works to “keep the other neurotransmitters in check” by turning off the ability of the neurons to communicate an increased production of the others. Serotonin is the mood stabilizer. It increases when your mood is good or elevated. It is also important in regulating appetite and sleep.

So what does that have to do with

substance use? Simply put alcohol and drugs act as sort of a key to turn on or off neurotransmitter production in your brain. When the feel good hormone is being overproduced, the drive to keep it up in our brain may lead to an addiction. When the stress hormone is in overdrive, we can become impulsive and stress our bodies to a dangerous level. When the mood hormone is out of whack, we can become depressed or angry and aggressive, even suicidal or homicidal. When the brain mediating chemical is not in check, it can turn down communication in the brain to a dangerous level.

The data suggest that symptoms of depression or other mental illness may be an alert to the potential of substance abuse. Similarly, substance users might benefit from screening for mental health issues such as depression. Keeping in mind, both taking drugs and the withdrawal process can produce symptoms of mental illness, so it is very difficult to know exactly what is going on. As a result, it is vital to sort out the drug use so it is possible to judge what actions or treatments are needed.

In the case of addiction, the substance use is a mental illness. Educate yourself and get the professional help you need to make the decision for yourself or another that is using. The bottom line is that mental illness requires treatment. But in many cases with substance use and addiction, the user does not want treatment, even when it is causing problems with their mental and physical health because of the brain chemical imbalance is present with substance use. Each of us has a choice to take the help we need or continue on in an illness the way it is. Treatment for any illness can not be forced upon someone. And treatment for physical or mental illness, even if chosen, is not always successful.

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Youth Event Calendar

Mondays at 5:30-7:00pm
at the Laporte School in the
FACS room.
Tuesdays at 4:00-5:30 pm
Rice Park for a cookout if
weather permits
at the HAPA/Taskforce office
322 Main Ave So Suite 2

**Alternative Highs
Laporte:
Black Light Dodge Ball
Saturdays May – September
The Laporte Town Hall
6-9 PM
Nevis and Park Rapids:
See website and
Rock Sober hcydatf Facebook page**

But that does not mean we give up. Sometimes it takes many approaches and treatments to find the right one. In the end, we value the person and understand their struggle with a brain held hostage by a chemical imbalance whether it is caused or worsened by substance use. Understanding the brain science can help give us the why we need to stay strong. So, to answer the question which comes first, the substance use or the mental illness? It can be clear as mud. *An Issue of Influence...*

The Effects of Substances on Neurotransmitters in the Brain

Dopamine production in the brain is increased by many substances including *stimulant* drugs such as **caffeine, nicotine and methamphetamine, opioid** drugs such as **heroin and prescription pain medications** like **Vicodin and Oxycontin, alcohol, and marijuana**. This increase brings dopamine to an abnormally high level in the brain, resulting in a feeling of pleasure or euphoria. Once the drug is removed from the system, the state of heightened pleasure goes away, but leaves a new marker, or memory, for dopamine level in the brain. Once this occurs, normal activities that bring pleasure such as eating something delicious or enjoying a fun activity are not enough to produce the same spike in dopamine. This may in turn cause craving. The brain's drive to achieve the high may develop into an addiction. Thus the substances linked to increased production in dopamine are considered to have great potential for addiction. Research demonstrates a phenomenon occurs in the brain that actually lowers the normal level of dopamine in the brain and therefore lowers the amount of pleasure that can be experienced without the drug present.

Methamphetamine is notorious for its ability to reset the dopamine level in the brain to be basically absent without presence of the drug. Many addicts can become suicidal when they are withdrawing due to the severe lack of ability to experience any kind of joy without using the drug.

Norepinephrine production is increased by *stimulants* such as **nicotine, caffeine, adderall, methamphetamine, and cocaine** to name a few. Norepinephrine increases the effects of the nervous system, both central and peripheral. In a normal situation, norepinephrine enhances alertness, awareness, wakefulness, endurance, productivity, and motivation, movement, heart rate, and blood pressure, and may cause the perception of a diminished requirement for food and sleep. Abusing stimulants can cause a dangerous over-stimulation resulting in anxiety, sometimes

associated with panic disorder, paranoia, impulsivity, sleep deprivation, malnutrition, compulsive behavior repetitive actions, racing thoughts and psychosis. After large amounts of stimulants are taken, the "crash" that occurs when the drug is out the body, includes physical mental and emotional exhaustion, anxiety, shakiness, as well as depression which can be temporary or persistent.

Serotonin production is elevated in the presence of **alcohol, ecstasy and stimulants** and to some degree in the presence of **amphetamines and opiates**. When serotonin levels fall after drug use, similar to dopamine levels, they can be reset at an abnormally low level. Symptoms associated with abnormally low serotonin levels including depression, anxiety, impulsivity and drug craving are most severe during the early stages of withdrawal. However, some symptoms, most notably drug craving, can last for months or years. It is now well accepted that **ecstasy** users can experience a depressed mood for up to three days after taking it, which may develop into an episode of severe depression. Long-term heavy use may lead psychiatric illnesses in the future. **Methamphetamine** users can become aggressive, violent and impulsive when withdrawing from the drug due to the serotonin depletion. The urge to use can be so great that any moral obligation is no match for doing what one needs to obtain the drug. According to one licensed alcohol and drug counselor I work with, methamphetamine addiction is the one addiction that over rides the maternal instinct.

GABA production is turned on by **alcohol and opiates**. It slows down the brain's ability to communicate. As a decrease in communication occurs, the brain and body becomes sedated. When the natural balance of brain chemicals is on shut down, it is easy to see how general system depression occurs. This can cause over sedation, coma and death due to a decreased drive to breathe. Pairing *sedative* medications, which act on GABA production as well, such as **Valium, Xanax and Klonopin**, with **opiates and alcohol**, can be lethal.

Inhalants are the exception to the rule due to the fact they are not a drug, they

are a toxin. Chronic exposure can lead to brain damage or nerve damage similar to multiple sclerosis; damage to the heart, lungs, liver and kidneys; and prolonged abuse can affect thinking, movement, vision and hearing.

Marijuana works on another brain chemical mimicking the drowsiness of sedatives like alcohol, the dulling of pain (like opiates) and in high doses, the perception-distorting effects of the psychedelics. There is evidence that some people who use a lot of marijuana over a long period may lose drive and motivation. It was previously believed that marijuana users did not suffer feelings of withdrawal. However, the recent studies indicate that heavy users of marijuana smoke not so much for the "high" but to calm their feelings of anxiety brought on by withdrawal from the drug. Since THC is absorbed primarily in the fat tissues and lingers in the bloodstream, withdrawal symptoms are not as evident as with fast-acting drugs like nicotine. Research shows that both **marijuana and inhalant** use is also associated with symptoms of depression. Between 2004 and 2006, an estimated 218,000 youths aged 12-17 used inhalants and also experienced depression in the past year. The same research showed that depressed teens were more than three times as likely to start using inhalants as teens with no symptoms of depression. The reverse is also true, showing that teens often started using inhalants before depression began. A number of studies have shown an association between chronic marijuana use and increased rates of anxiety, depression, suicidal ideation, and schizophrenia. However, at this time, it is not clear whether marijuana use causes mental problems, exposes problems already in existence by making them worse, or is used in attempt to self-medicate symptoms already in existence. Chronic marijuana use, especially in a very young person, can alter a developing brain to increase risk for mental illnesses, including depression and addiction. At the present time, the strongest evidence links marijuana use and schizophrenia and/or related disorders. High doses of marijuana can produce a psychotic reaction; especially in those individuals who have a genetic marker for schizophrenia or have had a previous psychotic episode.