



Physiologic Effects of Drugs on Juveniles

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Presented By: Sean Robinson, Sadie Robinson, Andrea Dattadeen, Grand Rapids Counseling Services

This session featured a variety of adolescent substance abuse-specific topics, including addiction onset, key developmental changes in the brain, the link between genetics and addiction, and impact of trauma on adolescents. The stigma of drug addiction and mental health was also discussed, with emphasis on the magnitude and abundance of drug addiction within the United States. Session topics focused on trauma-informed practice techniques and tools, parental roles, and how nutrition affects brain health and mood.

As a “brain disease,” narcotic use impacts the actions and production of dopamine, serotonin, the neuro-transmitter glutamate, and the GABA receptors in the brain. Regular use of narcotics changes and strengthens certain neuro pathways. Coupled with the human imperative to move away from pain and toward pleasure, the recipe for addiction is complete. Long-term use of narcotics lessens dopamine production, reduces serotonin receptor sites and efficacy, and causes cognitive impairment—the killing of brain cells. This is particularly destructive in adolescents since they are still in the process of full brain development, a process that is not completed until about age 25.

Genetics plays a role in an adolescent’s susceptibility to addictions, with 40-60% of addiction vulnerability attributed to genetics. Other related facts include:

- Co-morbid mental illness
- Naturally low levels of dopamine (reward/pleasure brain chemical) and serotonin
- Memory disorders
- Children of drug addicts are eight times more likely to get addicted themselves

At risk subsets for addiction potential include parenting and environmental factors:

- Limited parental supervision, particularly of children 12-14 years old
- Regular use of substances by a youth during the ages of 14-16
- Children living with a parent(s) that abuses drugs
- Children living with a parent(s) that binge drinks

In addition to parents that are present, engaged, and role modeling positive behavior for teens, the presentation stressed the crucial importance of *prevention* and networking with other professionals and community resources.

Adolescents that suffered childhood trauma, including abuse and neglect, experience even worse symptoms and greater likelihood of becoming addicted because of changes to portions of the brain that regulate responses to stress, painful feelings, and the organization of thoughts. If a person cannot regulate themselves naturally, they may enlist maladaptive strategies, such as substance use, to deal with sensory overload and to develop coping mechanisms.



An interesting and informative sidebar to this training segment dealt with food and nutrition. If a drug can be defined as a substance that has a physiological effect when introduced into the body, then some foods can be as addictive as drugs. Clinical studies have observed that some individuals meet the criteria for substance dependence when the “substance” is food.

Since most addiction treatment therapies put at least some emphasis on a holistic approach, it makes sense that nutrition, and a person’s propensity to overeat and/or eat unhealthily, could make recovery from addiction more difficult, or could help fuel an emerging addiction. Children, as most parents know, learn at an early age that certain food is pleasurable, and parents use those foods as rewards. In fact brain scans indicate the same level of stimulation occurs in the pleasure zones of the brain when sugar is ingested as occurs with cocaine intake, suggesting that sugar could be as addictive as cocaine.

The knowledge of what foods are addictive is not lost on the food industry, which has spent heavily in brain research to better flavor and market products to increase sales and keep customers coming back. Children ages 4-18 get the most sugar from soft drinks, cakes/pastries, fruit juice, candy, ice cream, and breakfast cereals. Foods that combine fat, sugar, and salt are the most addictive. One study listed pizza as the most addictive food.

Food can be an ally instead of an enemy however, if a few steps are taken:

- Reduce sugar by cutting out sugary beverages, including juice
- Use cinnamon and vanilla to sweeten things more naturally
- Replace “white” with wheat
- Reduce consumption of processed foods
- Increase consumption of vegetables and fruits
- Redefine “snack” by eating whole foods like nuts, berries, fruit, and dark chocolate, instead of chips, candy, ice cream, and (of course) pizza