

LESSON TOPIC:

The Impact of Drugs and Alcohol on the Adolescent Brain

INTRODUCTION OF TOPIC:

-“Throughout the nation, 10 Million young people (ages 12 to 29) need substance abuse treatment. This is because of the very negative effects that early drug and alcohol use had on their brains”

For adolescents, many think experimenting with drugs and alcohol is just a part of the teenage experience

-Our brain will not fully develop until around the age of 25. With the teenage years being a critical period of brain development, adolescents are highly susceptible to the harmful and negative effects that drugs and alcohol have on the body and mind.

-We need to start considering the damaging effects that this experimentation has on the developing brain of teenagers and discover how to help their developing mind flourish.

VIDEO:

<https://ninepbs.pbslearningmedia.org/resource/2fc454fd-d52f-4e07-9ecc-4297ddbfcf86/the-cycle-of-addiction-lesson-plan/>

I. Definition of Terminology

Drugs:

“Drugs are chemicals or substances that change the way our bodies work. Some are medicines that help people when doctors prescribe them. Many have no medical use or benefits.

When taken (usually by swallowing, inhaling, or injecting), abused drugs find their way into the bloodstream. From there, they move to the brain and other parts of the body. In the brain, drugs may intensify or dull the senses, change how alert or sluggish people feel, and sometimes decrease physical pain.”

Alcohol:

“Alcohol is created when grains, fruits, or vegetables are **fermented**. Fermentation is a process that uses yeast or bacteria to change the sugars in the food into alcohol. When people drink alcohol, it's absorbed into their bloodstream. From there, it affects the central nervous system (the brain and spinal cord), which controls virtually all body functions. Alcohol itself is a drug. It is known as a **depressant**, which means it slows the function of the central nervous system. Alcohol actually blocks some of the messages trying to get to the brain. This alters a person's perceptions, emotions, movement, vision, and hearing.”

Stimulants:

“Excite or speed up the brain and its functions. Use of stimulants can cause increased energy, faster breathing, more rapid heart rate, and higher body temperature”

EXAMPLES:

Amphetamines (Adderall) Street Names: Skippy, Speed, Uppers, Lighting

Methylphenidate (Ritalin)

Cocaine Street Names: Blow, Bump, Big C, Coke, Dust, Nose Candy, Rail, Snow, Sniff

Crack Cocaine Street Names: Candy, Rock

MDMA Street Names: Ecstasy, Molly, E, X

Meth/ Crystal Meth Street Names: Speed, Crank

Nicotine Street Names: Cigs, Snuff, Chew, Dip, Smokes

Depressants:

“Inhibit, or slow down the brain and body. Use of depressants can cause lowered energy, slowed breathing, slowed heart rate, and lower body temperature”

EXAMPLES:

Alcohol Street Names: Juice, Booze

Benzodiazepines (Xanax, Valium) Street Names: Xans, Xannies, Bars, Bricks, Benzos, Downers

Cannabis Street Names: Mary Jane, Pot, Bud, Reggie, Dope, Grass, Herb, Ganja, Hash

Ketamine Street Names: Special K, K, Vitamin K

Inhalants Street Names: Aimies, Bolt, Bullet

Opiates: Heroin Street Names: Brown Sugar, Dope

Codeine Street Names: Cody, Lean, Sizzurp, Purple Drank

Fentanyl Street Names: Fenny, Apache

Oxycodone/ OxyContin Street Names: Oxy, Oxycontin

Percocet Street Names: Percs

Hallucinogens:

“Impair the brain and the body’s perception of reality. Use of hallucinogens can cause delusional thoughts, bizarre physical motions, and the experience of sights, sounds, tastes, and sensations that are not there”

EXAMPLES:

DMT Street Names: Dimitri, The Rogan

Acid/ LSD Street Names: Cid, Tabs, Dots, Lucy

Peyote Street Names: Cactus, Buttons

Mushrooms Street Names: Shrooms, Magic Mushrooms

II. Concrete Examples

How Drug and Alcohol Use Effects the Adolescent Brain:

INTRO:

-Adolescence is an extremely critical time for brain development. During this, the brain is undergoing waves of major, dynamic changes. The brain is conditioning itself for future experiences, getting rid of the brain cells getting the least amount of use and strengthening the ones that are most engaged.

- “The key brain part that’s still developing is the prefrontal cortex and it’s the area you use in critical thinking, such as when you weigh pros and cons before making a decision. Because the prefrontal cortex is not yet fully developed, teens automatically rely more on the limbic system to make decisions. This system’s network of brain structures is linked to emotions and experiencing rewards rather than critical thinking. Because their prefrontal cortex is in development, teens are more likely to make decisions based on what provides instant gratification, such as a feeling of happiness.”

- "As you grow and learn, your body strengthens pathways between neurons (nerve cells) in the brain and gets rid of ones that aren't used. These connections, called synapses, determine how your brain processes information. The network of synapses is what supports everything from your memory to your ability to learn and feel emotions. Exposing the teen brain to drugs can change how these pathways are organized and how the brain functions"

- "The Frontal Lobe (the brain's thinking center) is responsible for decision making, problem solving, judgment, and self control- it is not fully matured in adolescence. In fact, this lobe is the last to mature and does not usually happen until age 25. That said, teenagers are neurologically more likely to engage in risky behaviors"

- "Due to hyper-rational thinking and lack of impulse control, teenagers seek thrilling experiences in the moment, but are not always able to weigh the consequences that may result"

- "When drugs enter the brain, they interfere with its normal processing, including the development of cells and the function of the brain's neurotransmitters, such as dopamine."

- "Dopamine is the chemical in our brains that allows us to experience pleasure or feel good. It reinforces reward. For example, when we eat food, dopamine is released – telling us that food makes us feel good, and that we must continue to eat to feel satisfied and to survive. But when drugs enter the brain, they release an *excessive* amount of dopamine and overload the body with pleasurable feelings. The human brain, at any stage of development, is wired so that we repeat activities associated with great pleasure and reward. It is wired to feel as though these pleasurable activities are life-sustaining. Because teenagers have a greater tendency to seek pleasurable activities already (and a reduced ability to measure the consequences), they are highly vulnerable to the temptations of drug and alcohol."

- "Drugs are chemicals that tap into the brain's communication system. Certain drugs can activate nerve cells improperly, damage brain connections, and send abnormal messages throughout our brain circuits. When drug use is introduced and repeated, the brain will send messages to the rest of the body saying that it needs the drugs to function. The body will feel this (through withdrawal symptoms, or intense cravings) and cause a user to seek out drugs once again. This is part of the addiction cycle, and this is why addiction is considered a brain disease. Users often cannot stop using drugs, even when they want to, because of the consequences that the brain and body experiences. You see, in response to an overload of dopamine, the brain will eventually send less "feel good" signals out to the body. This contributes to the low or down period after a drug wears off. And over time, as drug use is repeated and a user's dopamine levels are reduced, a tolerance will build. That person will need more of the drug, more often, to feel the same pleasurable effects. This is a tell-tale sign of drug addiction, but

the risks extend beyond that. Often, addicted teenagers will increase their drug dosages without thinking twice, and later overdose by taking too much.”

EFFECTS:

-“Long-term substance use can cause long-term issues with memory, learning, attention, coordination, and even IQ levels. According to one study, youth who drink heavily (20 drinks per month) or binge drink (more than 4-5 drinks in one occasion) show abnormalities in their brain structure volume, white matter quality, and activation of cognitive tasks involving attention, memory, spatial recognition, and executive functioning.”

-“Even occasional drug use during the teenage years can cause severe effects, in that it can put a teen at an increased risk for a substance use disorder (i.e. clinical addiction). Remember, addiction is a learned disease. Introducing drug use just a few times in adolescence can put a teenager on the path to using them again (and again) in the future, assuming their brain remembers the pleasure from it.”

-“Teenagers who begin using any addictive substance before age 18 are 6.5 times more likely to develop a substance use disorder. Those who start drinking before age 15 are 4 times more likely to become addicted than those who start at age 20 or later. 9 out of 10 people with substance addictions first begin using *before* they turned 18. The risk of substance addiction is highest for those who start using before their brain is fully developed. In addition to the lasting cognitive effects of drugs on the adolescent brain, teenagers who use drugs or alcohol are more likely to perform poorly in school, get in trouble with the law, and have health-related, family, or social issues.”

Bulleted List of Effects:

- Interfering with neurotransmitters and damaging connections within the brain.
- Reducing the ability to experience pleasure.
- Creating problems with memory.
- Causing missed opportunities during a period of heightened learning potential.
- Ingraining expectations of unhealthy habits into brain circuitry.
- Inhibiting development of perceptual abilities.
- Development of Substance Abuse Disorders
- Creating difficulties with learning and attention
- Lower IQ Levels

III. Symptom Awareness

-Symptoms of Drug/Alcohol Abuse in Teens

Physical/ Emotional Symptoms:

- Unexplained, extreme mood swings
- Fatigue/ Change in Sleep patterns
- Dilated Pupils/ Bloodshot Eyes
- Loss of Appetite/ Binge Eating
- Changes in Dress/ Appearance
- Threats or Attempts to Commit Suicide
- Frequent Nosebleeds/ Unexplained burns
- Frequent Euphoria
- Anxiety

Social/ Family Indicators

- Changes in Friends
- Lying about where you're going/ what you're doing
- Avoiding contact with family members
- Loss of Interest in Hobbies/ Activities
- Being Secretive
- Defensiveness when confronted about actions/ activities
- Reluctance to introduce new friends to your family

School Issues:

- Missing Excessive Time from School
- Failure to turn in assignments
- Sleeping during class
- Persistent Behavioral Problems
- Poor Grades
- Lack of Motivation
- Reduced interest in Extracurricular Activities

IV. Hacks/ Treatments:

- **Practicing Mindfulness**

“Studies have shown that mindfulness activities can actually reshape your brain in positive ways, improving physical and mental health and promoting overall well-being. It can help tame your anxiety, provide a greater self-awareness, and help you acknowledge and cope with emotions that may not be rooted in reality.

The brain is the only organ that’s shaped by experience and practice, much like a muscle gets bigger and stronger with exercise. In the past, when you repeatedly engaged in specific risky thoughts and behaviors, you unknowingly shaped your brain in ways that worked against you and prevented you from being mindful.

Meditation and other mindfulness exercises work much the same way, and empower you to intentionally reshape your brain in ways that bring greater control, awareness, and happiness to your life”

*Variety of Mindfulness Exercises:

- 1) **Body Scan:** Think deeply about your body and how you are feeling within. Close your eyes and begin to take deep breaths. Pay attention to any sensations you are feeling within your body, without attempting to change them. This allows you to listen, feel, and creates awareness in regards to the feelings you are experiencing
- 2) **Mindful Stretching:** Find a room with ample space and sit yourself on the ground in a seated position. Begin to perform a variety of stretches. While doing so, focus on your breathing and the way your body feels. Try your best to eliminate any distracting thoughts and solely focus your attention on the stretches
- 3) **Mindful Meditation:** You will want to enter a quiet, peaceful environment. You can meditate while in any position you would like, but many prefer to be seated or while laying down. It is recommended that this exercise last between 10-30 minutes. During this time, you will only focus on your

breathing. This will allow you to be present and clear your mind of any negative thoughts/ feelings

- **Have The Confidence to Walk Away**
- **Seek Friendships with Like Minded Peers who can help you resist Drugs and Alcohol**
- **Set Limits and Say No:** Make clear boundaries with yourself and know the consequences of your actions. Determine a clear point of what activities you will choose to walk away from. Pre-determining values with yourself can help you fight the urges of peer pressure, rather than being reactionary in the moment.
- **Talk to A Trusted Adult**
- **Get Involved:** Getting involved in a group/sport/activity is a great way for you to utilize your free time through a positive outlet. It can help you to create a sense of community and surround yourself with a supportive environment.

V. Peer Discussion

- 1) Before this lesson, what was your perspective on drug and alcohol use?
- 2) After reviewing the lesson, why do you think teens are at a heightened risk for becoming addicted to drugs and alcohol when compared to adults?
- 3) In what ways do you believe that your actions during your teen years could have a permanent effect on your life?
- 4) What actions would you take if you noticed someone showing the symptoms of drug and alcohol abuse? In what ways can you help?
- 5) Do you feel that you are provided ample resources to help combat drug and alcohol use? If not, what resources/ programs do you believe should be implemented?
- 6) Do you have any methods that you personally use to resist the social temptations of drug and alcohol use? If not, brainstorm methods that you think would be beneficial?
- 7) In what ways do you think mindfulness could help you avoid risky behaviors? What are some methods/ techniques that you can practice to become more mindful?
- 8) Out of all the hacks/ treatments we discussed, which do you think would be the most helpful in combating drug and alcohol use and why?

