

Chapter 10

Addiction and The Brain
The Great Disconnect II**Depiction Suggestions**

The following points for consideration on the portrayal of drug addiction and its impact on the brain were created as a resource for entertainment development and production. They are not intended to limit the creative process.

Correcting Misconceptions:

◆ Advances in science have created a “great disconnect” or gap between the scientific facts and the public’s perception of drug abuse and addiction. To bridge the great disconnect, science must replace ideology as the foundation for drug abuse and addiction prevention, treatment, and policy strategies. Try to depict the fact that:

1. Drug abuse is a preventable behavior.
2. Drug addiction is a treatable disease.
3. Drug addiction is fundamentally a disease of the brain that is expressed in behavioral ways and influenced by the social context in which it develops.
4. In contrast to popular belief, we can get a handle on drug abuse and addiction.
5. Treatment and prevention are both necessary and can work.
6. Teachers, law enforcement, health practitioners, journalists, clergy, and others can play a role in preventing drug use.

- ◆ Bear in mind that addiction is not just a lot of drug use – it is a chronic, relapsing, and treatable illness that begins with a preventable behavior.
- ◆ Fundamental changes can occur in the brains of drug abusers that propel them into addiction, a disease state. For all intents and purposes, drug addicts have lost their free will to decide whether or not to take drugs. They feel they have no more choice about using drugs than they do about eating or breathing.
- ◆ There are effective treatments for drug addiction. There are also new therapies and medications to treat drug addiction successfully and prevent drug abuse during treatment. These explorations can be woven into stories to keep them on the cutting edge of the science of addiction.
- ◆ Lines of dialogue regarding the benefits of prevention and treatment can contribute to a more accurate public perception about their effectiveness as ongoing tools in dealing with drug abuse and addiction.
- ◆ The use of educational posters in scenes in such places as police stations, hospitals, schools, buses, subways, and work places can send a subtle message about the importance of treatment. (For more information on posters or other materials, please call the Entertainment Industries Council, Inc., 800-783-3421.)

Semantics:

- ◆ Where possible, avoid using the terms "addiction" and "dependence" interchangeably as they are not the same. Being physically dependent on drugs means the individual would experience chemical withdrawal if he or she suddenly stopped using, but the drug is not the main focus of his or her existence – it is merely a tool for living what seems to be a normal life.
- ◆ Remember that drug addiction is a chronic disease with the potential for relapse. For that reason, a person is referred to as "recovering" rather than "recovered." The potential for relapse always exists and requires a continuing, life-long process of teaching the drug addict to live as a productive member of society without the substance.

Spotlight on Depiction of Health and Social Issues

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Addiction and The Brain

Fact Sheet

Overview

Drugs can change our moods and alter our perceptions. While some people are able to use some drugs in moderation, others lose control of their drug-taking behavior and become addicted.

Drug abuse and drug addiction are entirely different phenomena: drug abuse is a voluntary activity, but drug addiction is a compulsion. Drug addicts have, for all intents and purposes, lost their free will to decide whether or not to use drugs. The key lies in how drugs affect the brain and some of its networks of nerve cells.¹

The brainstem controls basic functions such as heart rate, breathing, eating, and sleeping. When one of these needs must be fulfilled, the brain stem directs the rest of the brain and body to work toward that end. The cerebral cortex is devoted to such functions as our senses, generating complex movements, speaking and understanding language, thinking, planning, and imagining. The limbic system connects the cerebral cortex (our link to the outside world) to the brain stem which deals with emotions and motivations that reflect our internal environment and survival needs, allowing us to experience feelings, influence those feelings through perceptions and actions, remember things, and use our cognitive abilities to survive.²

The feeling of pleasure is one of the most important emotions for our survival, so much

so that an entire circuit of nerve cells is devoted to producing and regulating pleasure. These nerve cells use a neurotransmitter (chemical messenger) to relay messages about pleasure to other nerve cells. The reason that pleasure is important to survival is that it rewards or reinforces any behavior that elicits it so that something pleasurable is done again and again, unconsciously as an automatic brain function. Life's sustaining activities such as eating, sleeping, or having sex activate this pleasure circuit.³

Drugs activate the brain's pleasure circuit much like survival activities do, reinforcing the drug-taking behavior. The more often one takes the drug, the more often the pleasure circuit reinforces the behavior as necessary to survive, teaching the brain to depend on the drug to evoke pleasure. Addiction is difficult to treat because addicts find that only drugs can give them pleasure; the drugs hijack one of the brain's most powerful learning mechanisms.⁴

Almost all drugs that change the way the brain works do so by "tinkering" with chemical neurotransmission, with a particular focus on the neurotransmitter known as dopamine. When drugs interfere with the delicate mechanisms through which nerve cells transmit, receive, and process information, changing the way the brain works, the user loses some of the ability to control his or her life. This is the biological basis of addiction.⁵

Effects of Individual Drugs of Abuse:

- ◆ Heroin and other opiates (opium, codeine, and morphine) come from the white, milky liquid exuded by the poppy flower. While the others are extracted directly from the fluid, heroin is synthesized in a laboratory. Injected heroin reaches the brain in 7 to 8 seconds. It binds to the opiate receptors found in the brain, mimics the effects of a natural neurotransmitter, and triggers intense euphoria followed by several hours of contented relaxation⁶ (see Heroin, Chapter 15).
- ◆ Marijuana and hallucinogens (LSD [lysergic acid diethylamide], mescaline) alter our perception of reality, distorting the way our senses work and our sense of time, space, and self. Hallucinogens can produce intense anxiety and even precipitate psychosis. LSD and other hallucinogens block receptors, preventing neuronal messages from getting through. Marijuana can make it easier for other drugs to turn on the pleasure circuit⁷ (see Club Drugs [Rave Drugs], Marijuana, Chapters 11 and 17).
- ◆ Cocaine comes from the leaves of the coca plant, which grows in the mountains of South America. One of the most highly addictive forms of cocaine is crack, a chemically altered form that can be smoked. Smoked cocaine enters the brain in seconds and produces a rush of euphoria and feelings of power and self-confidence. Like other stimulants, it increases alertness, makes one feel more energetic, and suppresses hunger⁸ (see Cocaine, Chapter 12).
- ◆ Another kind of stimulant, methamphetamine, can also be altered to a smokable form, "ice." Repeated exposure to stimulants can make a person feel anxious, hyperactive, irritable and sometimes psychotically paranoid⁹ (see Methamphetamine, Chapter 18).

- ◆ MDMA (methylenedioxymethamphetamine), called "Adam," "ecstasy," or "XTC" on the street, is a synthetic, psychoactive (mind-altering) drug with amphetamine-like and hallucinogenic properties. Recent research findings link MDMA use to long-term damage to those parts of the brain critical to thought and memory¹⁰ (see Club Drugs [Rave Drugs], Chapter 11).
- ◆ Depressants such as alcohol, Valium, and phenobarbital reduce anxiety and produce calmness, sedation and/or sleep, but sometimes first produce a brief period of euphoria. They can relax muscles and serve as antiseizure medications. However, chronic users will start to feel depressed and lose their coordination. Judgment becomes impaired, as well.¹¹
- ◆ PCP (phencyclidine) is a hallucinogen, a stimulant, and an anesthetic all in one. PCP exerts its effects by interfering with the way messages proceed from the surface receptors into the cell interior. It produces euphoria, alleviates pain, and leads to disorganized thinking. Depending on the person, it can cause drowsiness or aggressiveness and passivity or hostility, and these responses can vary from one use to the next¹² (see Club Drugs [Rave Drugs], Chapter 11).

Sources:

1. National Institute on Drug Abuse (NIDA), *NIDA Notes*, "Bridging the Great Disconnect," March/April 1996.
- 2-4. D. Friedman, *Drugs and the Brain*, National Institutes of Health, June 1991.
5. J.M. Nash, *Time*, "Addicted," May 5, 1997.
- 6-9. D. Friedman, *Drugs and the Brain*, National Institutes of Health, June 1991.
10. NIDA, *NIDA Infobox*, "Ecstasy," June 2000.
- 11-12. D. Friedman, *Drugs and the Brain*, National Institutes of Health, June 1991.

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