Opioids and the brain - Opioid addiction, part 3

The human brain is the most complicated part of the body. It is the center of all human activity. You need it to breathe, eat, drive a car, call a friend, and enjoy everyday activities.

Opioids affect many areas of the brain, especially those involved in feelings of pain and pleasure. They also affect areas that control important functions, such as blood pressure, arousal, and breathing. Opioids can change these areas of the brain, and this can drive the compulsive drug abuse that marks addiction.

These are some of the areas of the brain that are affected by drug use:

**The brain stem** controls basic functions needed for life, such as heart rate, breathing, and sleeping.

**The cerebral cortex** has an area that controls the senses that allow us to see, feel, hear, and taste. The cerebral cortex is the thinking center of the brain. It allows us to plan, solve problems, and make decisions.

**The limbic system** is the brain’s reward center. It links together parts of the brain that control the ability to feel pleasure. Feeling pleasure leads us to repeat behaviors. The limbic system is activated by healthy activities such as eating and talking. It is also activated by drugs that are abused.

**How do drugs work in the brain?**

Drugs are chemicals that affect the brain by changing the way nerves normally send, receive, and process information. Opioids affect nerves because they act like substances that are made by the body. But drugs don’t affect the brain in the same way as natural body chemicals. They lead to abnormal messages being sent through the nervous system.

**How do drugs work in the brain to produce pleasure?**

Most drugs of abuse target the brain’s reward system by greatly increasing dopamine. **Dopamine** is a natural substance that helps control movement, emotion, and feelings of pleasure. When activated at normal levels, this system rewards our natural behaviors. Too much stimulation of the dopamine system with drugs, however, produces a high. This pleasant effect strongly encourages the behavior of drug use. This teaches the user to repeat it.

**Why are opioids more addictive than the things that usually make us feel happy?**

Opioids can release 2 to 10 times the amount of dopamine that natural rewards do. This leads people to take them again and again.
What happens to your brain if you keep taking drugs?

For the brain, the difference between what usually makes us happy and drug rewards is like the difference between standing under a gentle rain and standing under a waterfall. The brain adjusts to the overload of dopamine by producing less of it. Changes to the brain may reduce the way it receives dopamine signals. For someone who misuses drugs, their brain’s response to dopamine is reduced. Their ability to enjoy any pleasure is decreased.

This is why a person who misuses drugs eventually feels flat, lifeless, and depressed. They are unable to enjoy things that used to be fun. A person who misuses drugs needs to bring their dopamine function back to normal. They keep taking drugs, and in larger amounts. But this only makes the problem worse.

People and their family members who are dealing with mental or substance use disorders, or both, can call the National Helpline at 1-800-662-4357. This is a confidential, free, 24-hour-a-day, 365-day-a-year, information service. It is available in English and Spanish. The National Helpline provides referrals to local treatment centers, support groups, and community-based organizations. Callers can also order free brochures and other information.