

Opiates Stop Pain

Did you know that some opiates can have important medical uses? They're powerful pain killers, and doctors sometimes prescribe them to control severe diarrhea. If you look on a cough medicine label, you might find that codeine is one of the ingredients.

When used properly for medical purposes, opiates don't produce an intense feeling of pleasure, and patients have very little chance of becoming addicted.

Surprising Facts

Your brain produces its own versions of opiates, called endogenous opioids. These chemicals act just like opiates, binding to opiate receptors.

Endogenous opioids are your body's way of controlling pain. If you've ever felt pleasantly relaxed after exercising a lot, that feeling was probably caused by the release of this natural chemical in your brain.

The Search Continues

There's still a lot that scientists don't know about the effects of opiates on the brain. Maybe someday you will make the next big discovery.

For more information, visit:
www.drugabuse.gov

National Clearinghouse for Alcohol and Drug Information,
P.O. Box 2345, Rockville, MD 20847
1-800-729-6686



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The Brain's Response to Opiates

Hi, my name's Sara Bellum. Welcome to my magazine series exploring the brain's response to drugs. In this issue, we'll investigate the fascinating facts about opiates. Some of this information was only recently discovered by leading scientists.

If you've ever seen "The Wizard of Oz," then you've seen the poppy plant -- the source of a type of drug called opiates. When Dorothy lies down in a field of poppies, she falls into a deep sleep. No wonder the Latin name of

this plant -- *Papaver somniferum* -- means "the poppy that makes you sleepy."

Opiates are made from opium, which comes from the poppy plant. They're also referred to as narcotics. Maybe you've heard of drugs called heroin, morphine or codeine. These are examples of opiates.

Opiates can produce a quick, intense feeling of pleasure followed by a sense of well-being and a calm drowsiness. But they can also become an addiction. If someone uses opiates again and again, his or her brain is likely to become dependent on them.



National Institute on Drug Abuse



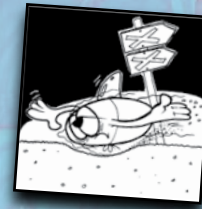
Nerve cells can become



dependent on opiates.



Opiate-dependent nerve cells can lose their ability to carry messages normally.



Nerve Cells Experience Addiction & Withdrawal

What happens to make a person and his or her brain become addicted to an opiate? Long term opiate use changes the way nerve cells in the brain work. These cells grow so used to having the opiates around that they actually need them to work normally.

If opiates are taken away from dependent nerve cells, many cells become overactive. Eventually, these cells will work normally

again, but in the meantime, they cause a wide range of symptoms in the brain and body. These are known as withdrawal symptoms.

Have you ever had the flu? You probably experienced symptoms such as aching, fever, sweating, shaking or chills. These are similar to withdrawal symptoms, but withdrawal symptoms are much worse. Yuck!

Drawing Away

Here's one way to illustrate how hard it is for brain cells to function without a drug they depend on: Grab a sheet of paper and

try drawing any picture in this magazine without using the hand you usually use.

How Nerve Cells Respond to Opiates

Within the limbic system, brainstem and spinal cord, there are places on certain nerve cells that recognize opiates. When stimulated by opiates, these sites -- called opiate receptors -- trigger responses in the brain and body.

Scientists have identified three types of opiate receptors: delta, mu and kappa (named after letters in the Greek alphabet). Each of these receptors is involved in different brain functions. For example, mu is responsible for the pain-relieving effects of the drug morphine.

Cloning Receptors

After years of experiments, scientists have discovered how to copy ("clone") the genes that control the production of opiate receptors. Now it will be easier for researchers to make opiate receptors and study how opiates affect nerve cells.

This discovery may lead to other exciting developments, such as better treatments for opiate addiction.

Opiates act on many places in the brain and nervous system.

1. The **limbic system** controls emotions. Opiates change the limbic system to produce increased feelings of pleasure, relaxation and contentment.
2. The **brainstem** controls things your body does automatically, like breathing or coughing. Opiates can act on the

brainstem to stop coughing and slow breathing.

3. The **spinal cord** transmits pain signals from the body. By acting here, opiates block pain messages and allow people to bear even serious injuries.

