

# TerranearPMC Safety Share

## Week of May 31, 2016– Opioids and Opiates

Opioids and opiates; these terms are often used interchangeably. However, there is a subtle difference between them. An opiate is a substance derived from the poppy plant (which contains opium). Opiates are sometimes called "natural" since the active component is made by nature, not manufactured by chemical synthesis. Common opiates include morphine and codeine, both made directly from poppy plants. Meanwhile, an opioid is a substance that is synthetic or partly synthetic, meaning the active ingredients are manufactured via chemical synthesis. Opioids may act just like opiates in the human body because of the similar molecules.

On the street, "heroin" may mean synthetic, natural, or semi-synthetic compounds. Manufactured opioids like Oxycontin are sometimes called "synthetic heroin", also adding to the confusion. Genuine "heroin" as originally formulated, is technically considered an opioid as it is chemically manufactured, even though the molecules from the opium plant are used in the process. At the same time, some of heroin's active ingredients are not found in nature (i.e. diacetylmorphine).

Opioids are medications that relieve pain. They reduce the intensity of pain signals reaching the brain and affect those brain areas controlling emotion, which diminishes the effects of a painful stimulus. Medications that fall within this class include hydrocodone (e.g., Vicodin), oxycodone (e.g., OxyContin, Percocet), morphine (e.g., Kadian, Avinza), codeine, and related drugs. Hydrocodone products are the most commonly prescribed for a variety of painful conditions, including dental and injury-related pain. Morphine is often used before and after surgical procedures to alleviate severe pain. Codeine, on the other hand, is often prescribed for mild pain. In addition to their pain relieving properties, some of these drugs—codeine and diphenoxylate (Lomotil) for example, can be used to relieve coughs and severe diarrhea.

Opioids act by attaching to specific proteins called opioid receptors, which are found in the brain, spinal cord, gastrointestinal tract, and other organs. When these drugs attach to their receptors, they reduce the perception of pain. Opioids can also produce drowsiness, mental confusion, nausea, constipation, and, depending upon the amount of drug taken, can depress respiration. Some people experience a euphoric response to opioid medications since these drugs also affect the brain regions involved in reward. Those who abuse opioids may seek to intensify their experience by taking the drug in ways other than those prescribed. For example, OxyContin is an oral medication used to treat moderate to severe pain through a slow, steady release of the opioid. People who abuse OxyContin may snort or inject it, thereby increasing their risk for overdose.

Physical dependence occurs because of normal adaptations to chronic exposure to a drug. This is NOT the same as addiction. Addiction, which can include physical dependence, is distinguished by compulsive drug seeking and use without regard to potentially devastating consequences. Someone who is physically dependent on a medication will experience withdrawal symptoms when use of the drug is abruptly reduced or stopped. These symptoms can be mild or severe (depending on the drug) and can usually be managed medically or avoided by using a slow drug taper.



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Dependence is often accompanied by tolerance, or the need to take higher doses of a medication to get the same effect. When tolerance occurs, it can be difficult for a physician to evaluate whether a patient is developing a drug problem, or has a real medical need for higher doses to control their symptoms.

While opioids can be used to manage pain safely, when abused, even a single large dose can cause severe respiratory depression, resulting in death. When used properly, short-term medical use rarely causes addiction. However, abuse of opioids can lead to physical dependence and, in some cases, addiction. And, although physical dependence is a *normal* adaptation to chronic exposure, withdrawal symptoms may occur when drug use is suddenly reduced or stopped. These symptoms can include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes with goose bumps ("cold turkey"), and involuntary leg movements.

While the relationship between opioid overdose and depressed respiration (slowed breathing) has been confirmed, researchers are also studying the long-term effects on brain function. Depressed respiration can affect the amount of oxygen that reaches the brain, a condition called hypoxia. Hypoxia can have short- and long term psychological and neurological effects, including coma and permanent brain damage.

Researchers are also investigating the long-term effects of opioid addiction on the brain. Studies have shown some deterioration of the brain's white matter due to heroin use, which may affect decision-making abilities as well as the ability to regulate behavior and respond to stressful situations. This is due to the function of white matter, which consists of nerve fibers and myelin. Nerve fibers form the connections between the nerve cells while myelin is a fatty sheath wrapped around nerve fibers. The myelin sheath has two functions: insulation and acceleration of impulse conduction. Obviously should these tissues get damaged, one can understand how the brain's function can be affected.

While it is widely known that opioids should only be administered under a physician's supervision, there has been a growing concern that prescription medications are being abused by, not only those for whom the medication has been prescribed for, but by family members who have access to the medicine cabinet. This is creating a national epidemic as more and more of our citizens are becoming dependent on these substances. In addition to their obvious addictive properties, opioids are being used with other substances, for which in many cases, the user is unaware of the possible effects. For instance, they should not be used with alcohol, antihistamines, barbiturates, benzodiazepines, or general anesthetics, as these depress the CNS. Such a combination of effects are additive and even synergistic, increasing the risk of life-threatening respiratory depression.

**Remember that consciousness is power. Tomorrow's world is yours to build - Yuri Kochiyama (American human rights activist)**

