Opiates

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Opiates are natural pain relievers that are derived from opium, found in poppy plants. The use of opiates dates back as far 5,000 years ago, during the time of Mesopotamia. It was thought to be of divine origin. Opium was originally used in herbal practices such as poppy tea and medical practices including the treatment of venomous bites, chronic headaches and melancholy. It was/is used to treat pain of varying degrees. However, beginning in late 18th century China it was being used as a recreational drug. In the early 1900’s it categorized as the world’s first antidepressant due to its stress and anxiety relieving properties.

The drug began being manufactured and altered beginning in the 1800’s when morphine was first isolated from raw opium in 1805 by German pharmacist, Wilhelm Sertturner.
**General Information**

- **Strong analgesic**: kill pain by preventing the transmission of pain impulses in the brain
  - Humans possess **opioid receptors** which is why these analgesic effects occur
  - The opioid binds to the receptors to block pain transmissions
- Considered a **narcotic** because the effects of the analgesic can cause changes in behavior and mood

**Interference with the Perception of Pain**
Opiates and Our Brain

- **Blood-Brain Barrier**: membrane-bound structure that protects the brain by restricting the chemicals that can enter from the blood
  - composed of non-polar lipids
- Analgesic properties of the opiates depend upon their ability to move from the blood into the brain and cross this barrier
Lynsey’s Article Review:

“Lingering” Opiate Deaths?
Concentration Of Opiates In Medulla And Femoral Blood

- Explanation of lingering deaths is investigated
- How their results support that one can overdose on acute amounts of opiates
- Using levels in brain and blood
  - Therapeutic vs. Recreational levels
VIDEO:

https://www.youtube.com/watch?v=BKMlHNq1QsM
Anatomy of Addiction: How Heroin and Opioids Hijack The Brain

- Opioids have aggressive addictive nature affecting the brain
  - Limbic Reward System
- Increase in dopamine levels causing intense feelings of pleasure
Derivatives of Opium

- Codeine
- Morphine
- Diamorphine (Heroin)
Codeine

- Arene
- Ether (2)
- Alkenyl
- Hydroxyl
- Tertiary Amino
**Therapeutic Uses**

- Strong analgesics
- Treatments for
  - mild to moderately severe pain
  - diarrhea
  - coughing

**Method of Administration**

- Oral (tablets, syrups)
- Intravenous
Morphine

- Arene
- Ether
- Alkenyl
- Hydroxyl (2)
- Tertiary Amino
Therapeutic Uses

- Treatment of moderate-severe pain
- High likelihood of addiction if not used appropriately

Method of Administration

- Oral (tablets, capsules, liquid medicine)
- Intravenous injection
DIAMORPHINE

- Arene
- Ether
- Alkenyl
- Ester (2)
- Tertiary Amino
**Therapeutic Uses**

- Treatment of severe pain because it is the most rapidly acting narcotic
  - Used before, during, and after surgery

**Method of Administration**

- Oral (tablets)
- Intravenous injection
The World Health Organization (WHO): Pain Management Ladder

1. Use mild analgesics
2. Add a weak opioid
3. In severe intractable pain, use strong opioids
OTHER EXAMPLES OF COMMON OPIATES (INCREASING IN STRENGTH)

- Codeine
- Viscodin, hycodan
- oxycontin
- dilaudid
- duragesic
Side-Effects

Short Term
- drowsiness
- Slowed breathing
- Constipation
- Unconsciousness
- Nausea
- Coma

Long Term
- Physical dependency and Addiction
- Muscle and Bone pain
- Insomnia
- Diarrhea
- Intense Vomiting
- Cold flashes
- Tolerance
Narcotic Effects & Addiction

- Opiates produce a sense of well being or euphoria that can be addictive to some people. They’re mainly used for treating pain and through this many people develop tolerance, meaning that they need more and more of the drug to get the same effect. Through this addiction is created.

- A high dose of opiates can lead to death from cardiac or respiratory arrest. Tolerance to the euphoric effect of Opiates develops faster than tolerance to the dangerous effects.
Opiates addiction triggered in the brain

1. Neuroscientists have made a remarkable new discovery revealing the underlying molecular process by which opiate addiction develops in the brain.

2. Opiate addiction is established by the reward memories formed when they are linked to the pleasurable effects of the opiate drug.

McKaylee’s Article Review:

Opiates, Overeating, and Obesity: A Psychogenetic Analysis

- Genetic variance in opioid receptors
- mu-receptor signals preference for higher fat
- can this genetic variance affect drug addiction like it does food addiction?
Social implications

- Loss of support of family and friends and other relationships
- Isolation that could possibly result in depression
- Education
- Employment
- Personality
- Financial issues
- Law and Order


Thompson, Paul Ivan; Pharmacology of morphine and the active metabolite morphine-6-glucuronide; University of Auckland; 1991. Feb 25, 2016.