Opioids Overview

Opioids are also referred to as narcotic analgesics and are indicated to reduce pain. They are also used for chronic pain and in palliation, but can be used to wean drug-dependant patients. Sometimes they can be indicated for persistent cough or diarrhea. Morphine and fentanyl are two examples of opioids which may be used during general anesthesia with other CNS depressants. They are able to reduce pain without loss of consciousness, but may induce tolerance or dependence. Opioid drugs include morphine, fentanyl, codeine, heroin, methadone, meperidine, dextromethorphan, and diphenoxylate. Opioids exert their action due to their agonist activity at mu (?), kappa (?), and delta (?) receptors. This receptor activity works to decrease synaptic transmission and inhibit release of acetylcholine, norepinephrine, 5-HT, glutamate and substance P. The side effects of opioid medications include respiratory depression, addiction, miosis and constipation.



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Indications

Pain
Pain-bolt
These drugs are indicated for pain and produce analgesia. Opioid medications have a very large role in palliation in cancer and chronic diseases. They are thought to have similar effects to opiopeptins, natural pain-relievers found in the body.

Weaning
Weaning off of Wieners
Because of opioid dependency, patients using opioids need to be weaned, or risk developing a withdrawal syndrome that occurs with abrupt medication cessation. Methadone can be used to wean addicts.

Cough
Coughing Coffee-pot
Opioids can be used for cough treatment, as they directly depress the cough center located in the medulla. Codeine may be used to treat severe cough at sub analgesic doses, when not controlled by non-narcotic cough suppressants.

Diarrhea
Toilet
Opioids like loperamide and diphenoxylate can be used to treat persistent diarrhea, as a common side effect of opioids is constipation.

Mechanism of Action

Agonists at Mu (?), Kappa (?), and Delta (?) Receptors
Dragonist at μΚδ Receptor
This class of drugs works by mimicking the effects of natural opioids in the body, interacting at the mu (μ), kappa (Κ), and delta (δ) receptors. Each receptor has distinct subtypes, and different drugs may have mixed properties, or partial agonist activity.

Decrease Synaptic Transmission
Down-arrow Synapse Cell-phone
Opioids work to open K+ channels and close Ca2+ channels, decreasing synaptic transmission. They inhibit release of acetylcholine, norepinephrine, 5-HT, glutamate and substance P. This can be remembered as decreased pain PANGS: substance P, acetylcholine, NE, glutamate and serotonin).

Side Effects

Respiratory Depression
Deflated Lungs
A possible adverse effect of opioids is respiratory depression, a result of direct inhibition of the brainstem respiratory center. The respiratory center becomes less sensitive to carbon dioxide, leading to decreased hypoxic drive, respiratory rate, tidal exchange, and minute volume.

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Addiction

Addict in Attic

Psychologic dependence can develop due to the pleasure produced by opioids, especially when self-administered. This may also coincide with physical dependence, as tolerance may build gradually with repeated use. Tolerance varies, and may lead to withdrawal with opioid cessation.

Miosis

Mice-eyes

Pinpoint pupils are a side effect, except in meperidine use (often abused by physicians). Opioids act on μ and Κ receptors to stimulate the oculomotor nucleus to constrict pupils.

Constipation

Corked Con-toilet

Opioids may produce constipation, as they decrease gastrointestinal motility and increase tone, specifically of the anal sphincter. There is minimal tolerance to this effect.

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