



Santa Clara County  
Behavioral Health Services



SANTA CLARA  
VALLEY  
HEALTH & HOSPITAL SYSTEM

# OPIOIDS 101

ANJANETTE DEVITO, BSN, PHN, RN: SUBSTANCE USE TREATMENT SERVICES: ADDICTION MEDICINE & THERAPY PROGRAM

# WORKSHOP GOALS

- Learning Objectives:
  - ~identify 3 drugs within the class of opioids
  - ~ identify ways dependence develops
  - ~identify signs and symptoms of overdose
  - ~identify how to treat potential overdose

# WHAT IS AN OPIOID?

## **opioid**

(ō'pē-oid')*n.* Any of various compounds that bind to specific receptors in the central nervous system and have analgesic and narcotic effects, including naturally occurring substances such as morphine; synthetic and semisynthetic drugs such as methadone and oxycodone; and certain peptides produced by the body, such as endorphins. Also called *opiate*.

# HISTORY OF OPIOIDS

- Latin name: *Papaver somniferum* or “the poppy that makes you sleep”
- Derived from the poppy plant or made in a lab
- Oldest known drugs~ dating back to the 19<sup>th</sup> century
- Synthetic opioids were discovered in the 20<sup>th</sup> century
- Used to treat depression and anxiety until mid-1950s
- Name opioid was derived from George H. Acheson to refer to any “chemical compound with morphine like activities”<sup>1</sup>

<sup>1</sup>Wikler, A; Martin, W. R.; Pescor, F.T.; Eades, C. G. “Factors regulating oral consumption of an opioid by morphine-addicted rats” *Psychopharmacologica* 5: 55-76 [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)

# WHERE DO OPIOIDS WORK?

- ~Opioids work on receptors in the brain
- ~ three types: *mu*, *delta* and *kappa*
- ~each type of receptor is responsible for a different body function

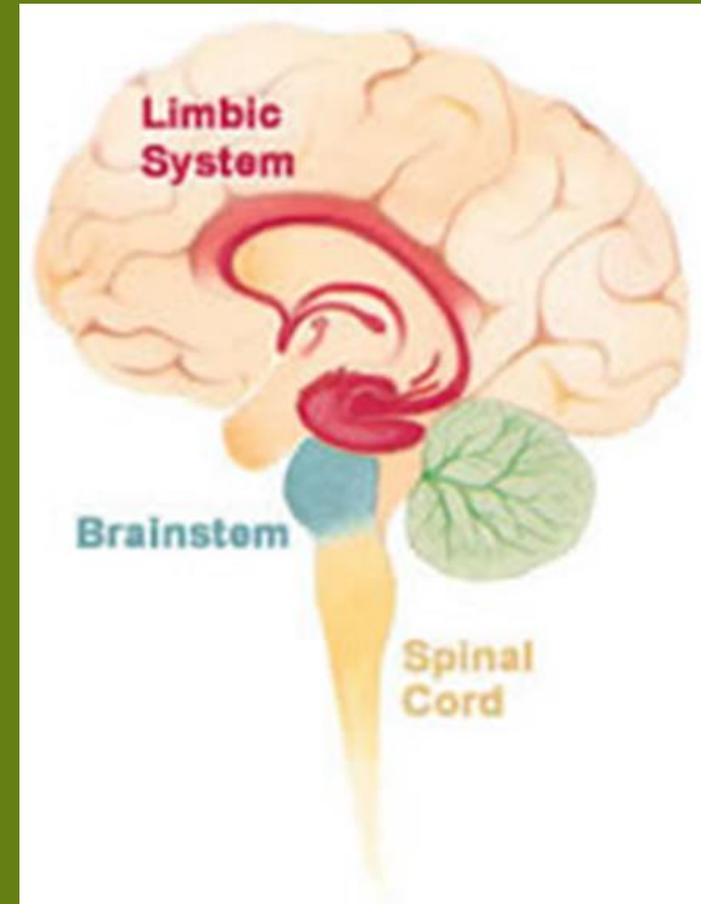
# RECEPTORS AND THEIR JOB

Opioids look like chemicals in your brain and body that attach to tiny parts on nerve cells called opioid receptors. Scientists have found three types of opioid receptors: mu, delta, and kappa (named after letters in the Greek alphabet). Each of these receptors plays a different role. For example, mu receptors are responsible for opioids' pleasurable effects and their ability to relieve pain.

Opioids act on many places in the brain and nervous system, including:

- the **limbic system**, which controls emotions. Here, opioids can create feelings of pleasure, relaxation, and contentment.
- the **brainstem**, which controls things your body does automatically, like breathing. Here, opioids can slow breathing, stop coughing, and reduce feelings of pain.
- The **spinal cord**, which receives sensations from the body before sending them to the brain. Here too, opioids decrease feelings of pain, even after serious injuries.

Whether it is a medication like Vicodin or a street drug like heroin, the effects of opioids (and many other drugs) depend on how much you take and how you take them. If they are injected, they act faster and more intensely. If opioids are swallowed as pills, they take longer to reach the brain and are much safer.



# WHAT ARE THEY USED FOR?

## MEDICAL USES:

- ~Primarily used for pain relief, including anesthesia
- ~Chronic, non cancer pain
- ~Suppression of diarrhea
- ~Treating addiction
- ~Reversing opioid overdose
- ~Suppressing cough
- ~Suppressing opioid induced constipation. Extremely strong opioids are approved only for veterinary use such as immobilizing large mammals.

# OPIOIDS EFFECT ON THE BODY

## **Mind:**

Heightened risk of anxiety, anger, mood swings, paranoia, difficulty thinking, slower responsiveness, mental depression

## **Lungs:**

Difficulty breathing, and if opioids are smoked, a build up of fluid in the lungs can lead to pneumonia

## **Kidneys:**

Chronic use of opioids can have be directly damaging to the kidneys, requiring dialysis or transplant. This is not necessarily the opioid that is responsible for the damage, but secondary agents like acetaminophen.

## **Eyes/Vision:**

Tightly constricted pupils impair vision, which can lead to a loss of vision and injury (such as falling since vision is impaired)

# OPIOIDS EFFECTS (CON'T)

## **Teeth:**

Chronic dry mouth leads to acid erosion of tooth enamel

## **Heart:**

Infection of heart lining; increase risk of sleep apnea which leads to low oxygen levels

## **Liver:**

Damage occurs from secondary agents like acetaminophen and the addition of alcohol

## **Blood:**

Crushed pill injections can cause veins to collapse and clog blood vessels throughout the body, causing organ damage. HCv and HIV are contracted through the sharing of needles

## **Digestive System:**

Opioids slow the intestines, causing constipation, nausea, vomiting and bloating

# ADVERSE EFFECTS

- Respiratory depression
- Tolerance, which will require higher doses of same medication to achieve the same effect
- Physical dependence
- Opioid addiction
- Nausea and vomiting
- Drowsiness
- Itching
- Constipation
- Opioid hyperalgesia~ experiencing more pain as a result of taking the opioid
- Hormone Imbalance
- There are others!

# ADDICTION AND PHYSICAL DEPENDENCE

## Addiction~ its all about the brain

- Is abnormal and classified as a disease.
- Primary condition manifesting as uncontrollable cravings, inability to control drug use, compulsive drug use, and use despite doing harm to oneself or others.
- Uncontrollable cravings prompt the destructive behaviors of addiction. There is no addiction without cravings.
- Strong cravings are common to all addictions. These cravings are rooted in altered brain biology. Recovery is the process of reversing, to the extent possible, these brain changes. This is accomplished through therapy and replacing the addictive behaviors with healthy alternative behaviors.
- **Addiction** is sometimes called; opioid dependence, substance dependence, and most recently *opioid use disorder*, but still too often simply *dependence*, which leads to confusion.\*

## Physical Dependence~ its all about the body

- Body relies on an external source of opioids to prevent withdrawal. Physical dependence is predictable, easily managed with medication, and is ultimately resolved with a slow taper off of the opioid.
- Normally, the body is able to produce enough endogenous opioids (example: endorphins) to prevent withdrawal. As tolerance increases, the body's ability to maintain this equilibrium is exceeded and the body becomes dependent on that external source.
- Many substances - such as caffeine, nicotine, sugar, anti-depressants, to name a few - can cause physical dependence, it is not a property unique to opioids. Physical dependence to opioids is normal and expected and a distraction from the real problem, addiction.
- **Physical dependence** is sometimes simply called *dependence*, but this can lead to confusion because addiction is sometimes called dependence as well.\*

\* National Alliance of Advocates for Buprenorphine Treatment

# SYMPTOMS OF ADDICTION

- Feeling that you have to use the drug regularly — this can be daily or even several times a day
- Having intense urges for the drug
- Over time, needing more of the drug to get the same effect
- Making certain that you maintain a supply of the drug
- Spending money on the drug, even though you can't afford it
- Not meeting obligations and work responsibilities, or cutting back on social or recreational activities because of drug use
- Doing things to get the drug that you normally wouldn't do, such as stealing
- Driving or doing other risky activities when you're under the influence of the drug
- Focusing more and more time and energy on getting and using the drug
- Failing in your attempts to stop using the drug
- Experiencing withdrawal symptoms when you attempt to stop taking the drug

# SYMPTOMS OF DEPENDENCE

- Increased heart rate and blood pressure
- Sweating
- Tremors/seizures
- Confusion
- Visual hallucinations
- Toxicity
- Cardiac arrhythmia
- Nausea, vomiting, diarrhea

# RESULTS

Physical dependence does not constitute addiction, but it often accompanies addiction. This distinction is difficult to discern, particularly with patients who have chronic pain and/or are prescribed pain medications.

In this type of patient, the need for increasing dosages can represent tolerance or a worsening underlying problem.

# CLASSES OF OPIOIDS

- Natural~ alkaloids contained in the resin of the poppy plant
- Esters of morphine~ slightly chemically altered but more natural than synthetics
- Semi synthetic~ created from either the natural opiate or morphine esters
- Fully synthetic~ lab created
- Endogenous~ produced naturally in the body

# COMMON OPIOIDS IN EACH CLASS

## **Natural:**

morphine  
codeine

## **Esters of Morphine:**

morphine diacetate or heroin  
methyldesorphine  
nicomorphine or Vilan

## **Semi~Synthetic:**

hydromorphone or Dilaudid  
hydrocodone or Norco  
oxycodone or Percodan  
oxymorphone or Opana  
buprenorphine or Suboxone

## **Fully Synthetic:**

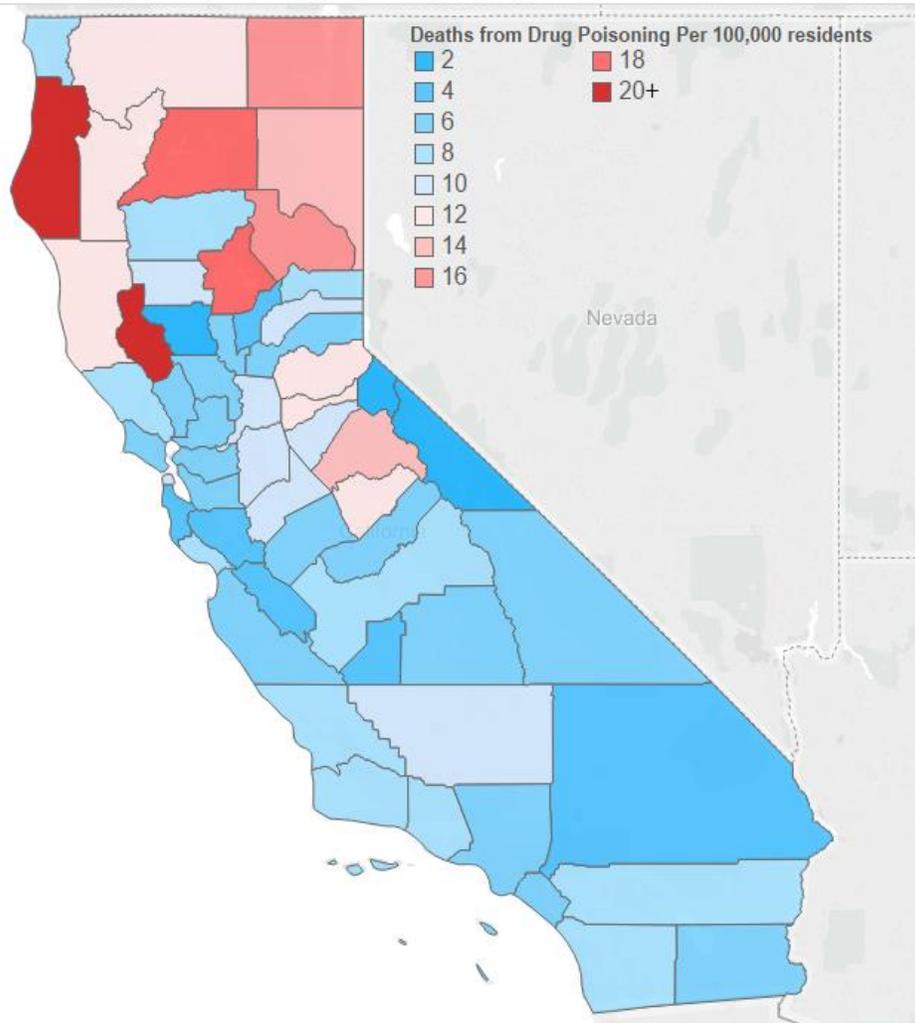
fentanyl  
methadone  
tramadol  
tapentadol  
loperamide

## **Endogenous:**

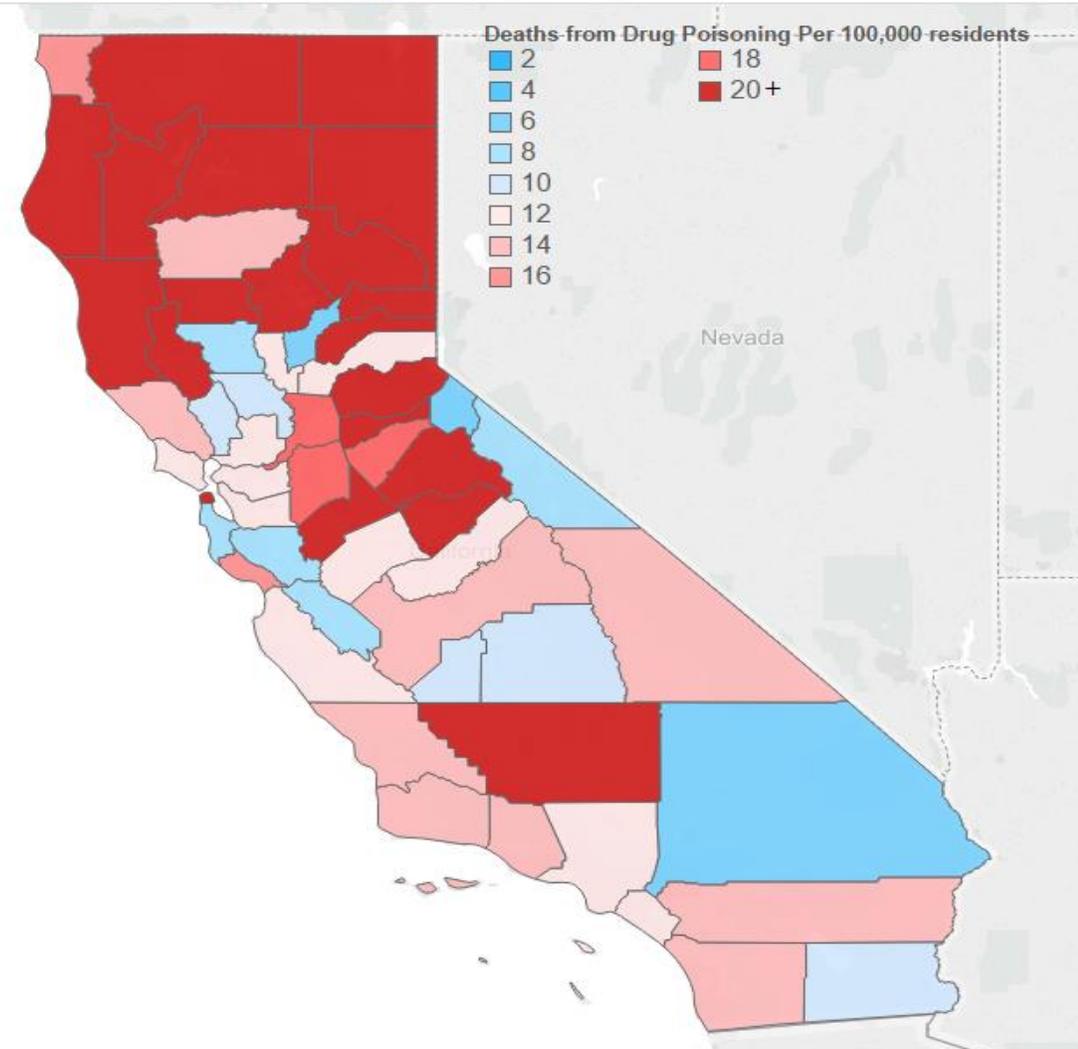
endorphins  
enkephalins  
dynorphins  
endomorphins

# CALIFORNIA STATISTICS

Drug Poisoning Deaths by County, 2002



Drug Poisoning Deaths by County, 2014



# NATIONWIDE STATISTICS (CONT)

- 65,000 people lost their lives to opioid deaths in 2016~ the last year statistics were made available.\*
- 33,000 involved an opioid such as fentanyl or heroin
- More than 259 million opioid prescriptions were written in 2012
- 1.9 million Americans are addicted to opioid painkillers
- The U.S. makes up 4.6 percent of the world's populations but consumes 81 percent of the world supply of oxycodone
- 4.3 million adolescents and adults reported non-medical use of prescription opioids in 2014
- 4 out of 5 heroin users started on prescription opioids

\*Centers for Disease Control~ December 2016 (cdc)

# THE FEDERAL GOVERNMENT'S RESPONSE

On August 11, 2017, the US Federal Government declared the US opioid crisis a “national state of emergency.

This should target much needed federal funding back to states to combat the opioid crisis, first identified by then President Barack Obama in 2011 by:

- Requiring and expanding prescriber education
- Develop and implement prescriber guidelines
- Increase access to naloxone, an overdose antidote
- Expand access to treatment

Together with The National Safety Council, all 50 states and the Federal Government, these agencies are committed to ending unintentional injuries and death.

# UNDERSTANDING THE LAW

- naloxone, while a prescription medication is NOT a scheduled drug. It is not included in the Controlled Substance Act.
- This can be prescribed by anyone who has prescription privileges
- New law co-sponsored by Drug Policy Alliance, AB 1535, Californians are now able to purchase naloxone directly from a participating local pharmacist, either with cash or in some cases, private insurance. Customers purchasing naloxone must also receive a brief training on its use
- Can be administered by anyone to a person who is in crisis
- CA has additional liability protections for prescribers and the users of this medication

# SIGNS AND SYMPTOMS OF OVERDOSE

- Is the person responsive? think CPR (shake and shout)
- Is the person breathing? Watch for chest rise and fall
- Can the person speak?
- How does their skin, lips and fingernails appear? (blue, grey, clammy etc)
- If you think someone is in danger of overdosing, DO NOT LEAVE THEM. See if there is someone in the area to help you call 911.

# RECOGNIZING AN OPIOID OVERDOSE

- Loss of consciousness
- Unresponsive to outside stimulus
- Awake, but unable to talk
- Breathing is very slow and shallow, erratic, or has stopped
- For lighter skinned people, the skin tone turns bluish purple, for darker skinned people, it turns grayish or ashen.
- Choking sounds, or a snore-like gurgling noise (sometimes called the “death rattle”)
- Vomiting
- Slack muscles, skin pale or clammy
- Fingernails and lips turn blue or purplish black
- Pulse (heartbeat) is slow, erratic, or not there at all

# OPIATE ANTAGONISTS

- naloxone or Narcan



- naltrexone or Vivitrol/Revia



- naloxegol or Movantik



# USE OF NALOXONE OR NARCAN

- Opioid antagonist or blocker, which reverses opioid overdose in people
- Can be administered IV, IM, SubQ or intranasally
- Is short acting~ works only for 20-90 minutes
- Causes sudden withdrawal in an opioid dependent person
- Does not get a person “high”, is not addictive and cannot harm a person who is not using opiates

# RECOVERY POSITION



# RESOURCES

Anjanette DeVito~ Substance Use Treatment Services (408) 272-6073

In SCC~ Gateway 1-800-488-9919

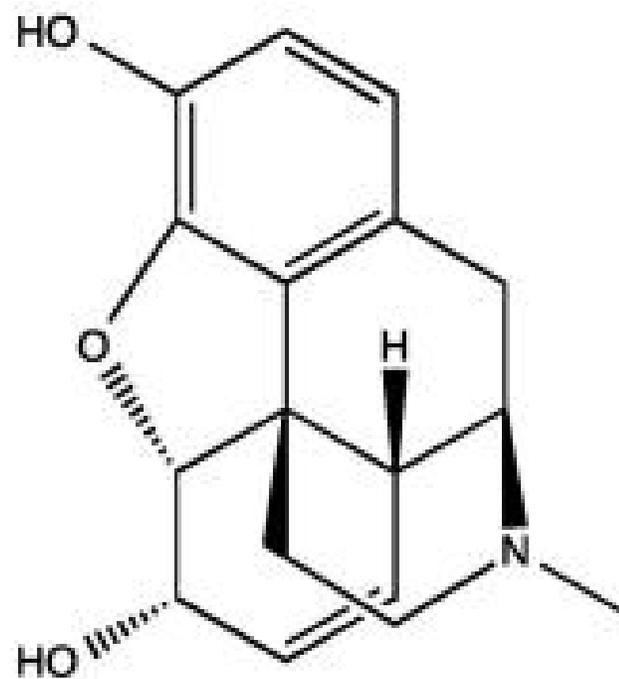
National Institute on Drug Abuse: [www.nida.nih.gov](http://www.nida.nih.gov)

Center for Disease Control: [www.cdc.gov](http://www.cdc.gov)

[combatheroin.ny.gov](http://combatheroin.ny.gov)

[www.samsha.org](http://www.samsha.org)

A ↓



B ↑

A: *Papaver somniferum* ~ the poppy from which opium is derived

B: chemical composition of morphine