

Opioids

Sergio Hernandez, MD

Disclosures

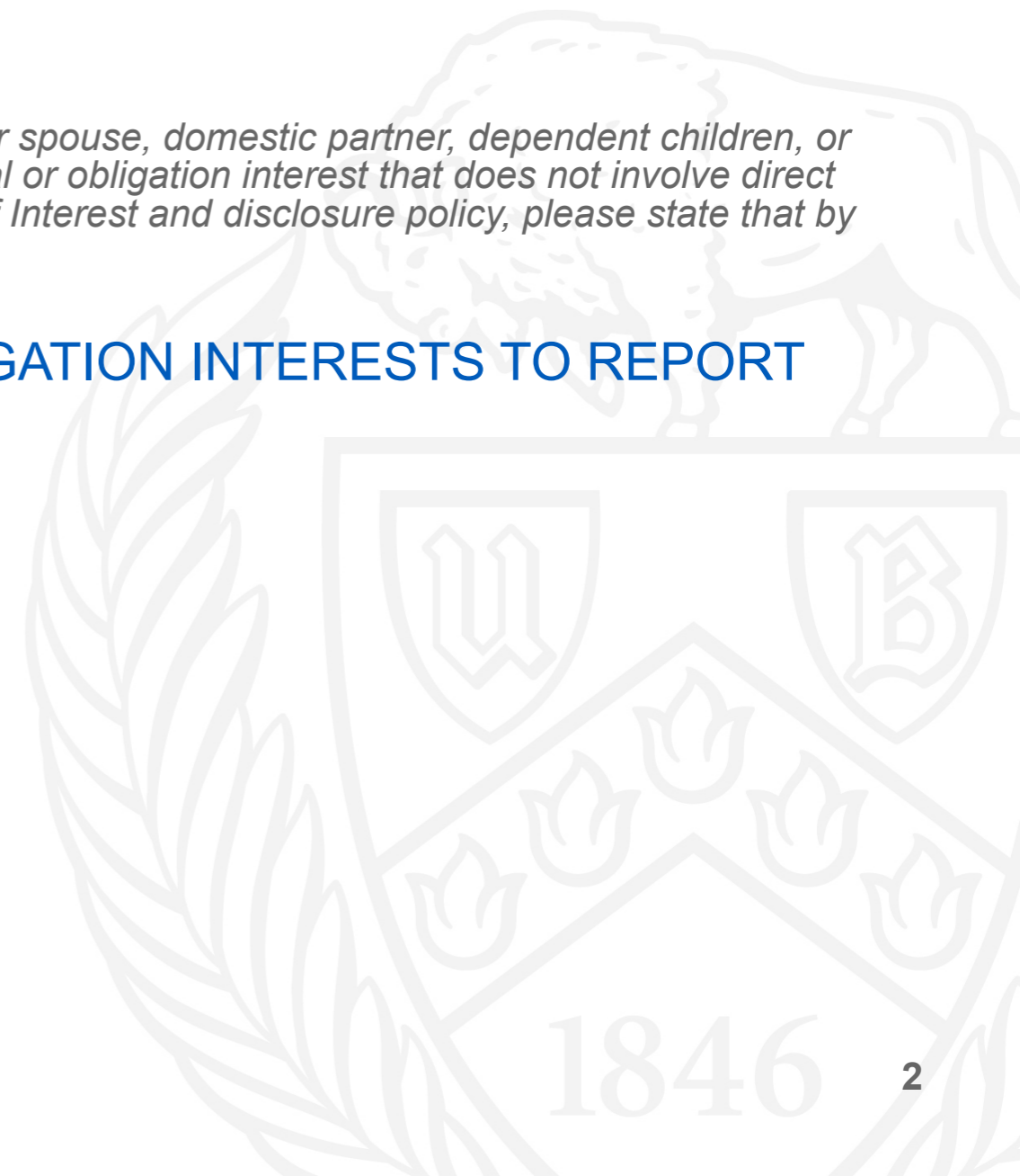
1. SIGNIFICANT FINANCIAL INTERESTS

NO SIGNIFICANT FINANCIAL, GENERAL, OR OBLIGATION INTERESTS TO REPORT

2. GENERAL AND OBLIGATION INTERESTS

All general and obligation interests are considered significant. If you, your spouse, domestic partner, dependent children, or any other family member residing in the same household HAVE a general or obligation interest that does not involve direct financial reward as cited in [Section 2.2.2](#) of the Jacobs School Conflict of Interest and disclosure policy, please state that by listing on this slide:

NO SIGNIFICANT FINANCIAL, GENERAL, OR OBLIGATION INTERESTS TO REPORT



Opioids

- **Naturally occurring:**
Morphine, Codeine
- **Semi-synthetic:**
 - Hydromorphone (Dilaudid)
 - Diacetylmorphine (Heroin)
 - Oxycodone (Percodan)
- **Synthetics:**
 - Methadone
 - Meperidine (Demerol)
 - Fentanyl (Sublimaze)



Opioid History

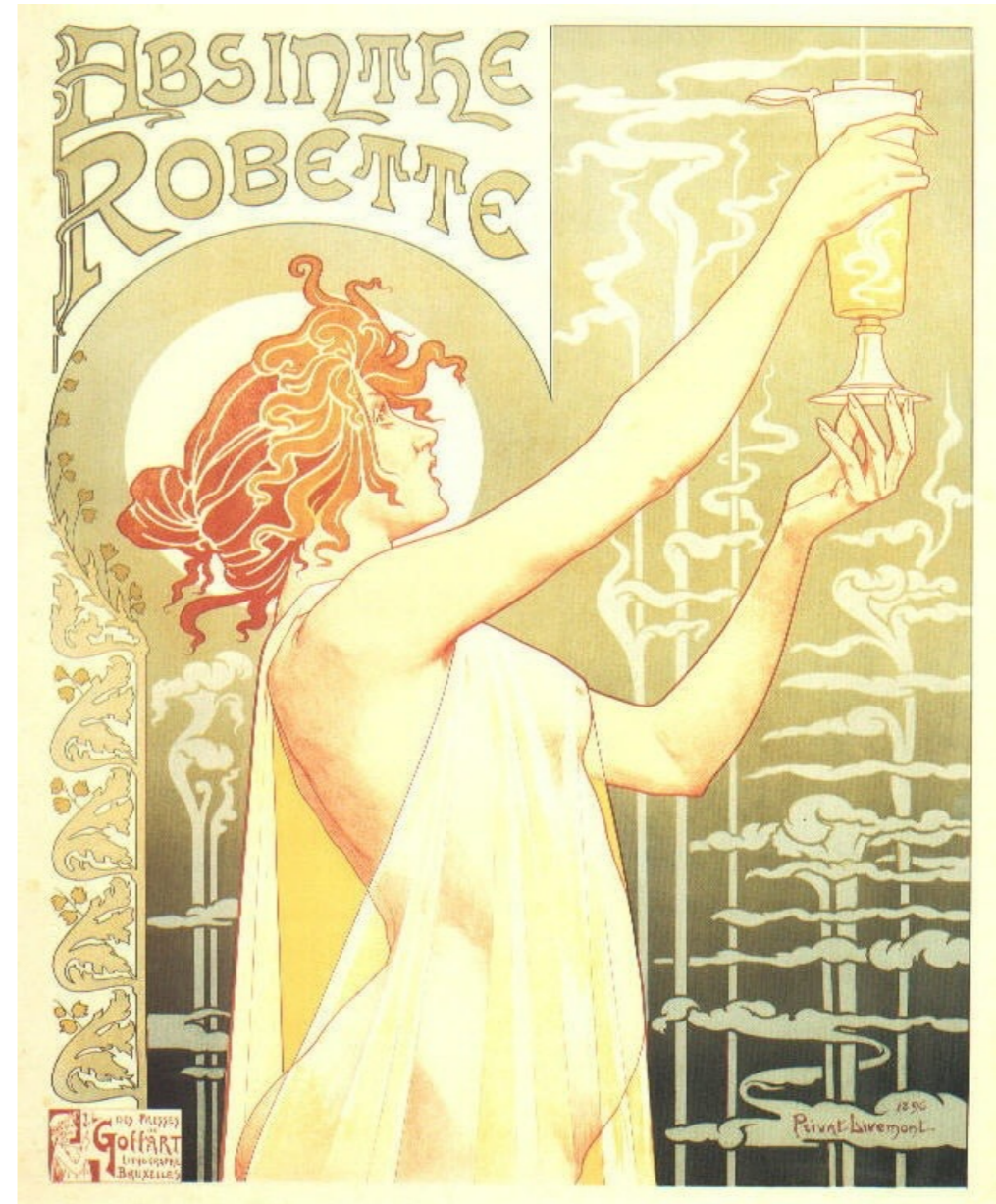
- 1300 B.C. Egyptians cultivate opium poppies.
- 330 B.C. Alexander the Great introduces opium to Persia and India.
- C. 1000 Opium is used medicinally throughout China and India.
- 1500 Opium is introduced to Europe by Paracelsus as Laudanum and used as a painkiller.

Opioid History

- 1700 Opium smoking begins in Asia.
- 1750 Britain assumes control of the opium trade.
- 1800s
 - Opium becomes widely available in medicinal preparations.
 - Laudanum cheaper than beer in England, addiction increases among working classes.

Opioid History

- 1800s
 - Some notable figures are known to use opium:
 - Byron, Shelley, Coleridge, Dickens
- 1803 Morphine is isolated from the poppy



Opioid History

- 1853 First hypodermic needle invented by Pravaz and Wood. Morphine is the first injected substance.
- 1897 Heroin is synthesized by Felix Hoffman at Bayer Pharmaceutical. Bayer immediately recognized its potential and began marketing it heavily for the treatment of a variety of respiratory ailments.
- 1913 Bayer stops making heroin.

Heroin for your cough

COUGH

The Suits of Clinical Experience Designate Glyco-Heroin (Smith) as a Respiratory Sedative Superior in All Respects to the Preparations of Opium, Morphine, Codeine and Other Narcotics and without devoid of the toxic or depressing effects which characterize the latter when given in doses sufficient to reduce the reflex irritability of the bronchial, tracheal and laryngeal mucous membranes.

THE PROBLEM
of abolishing cough is given done in such form as will give the maximum relief of the cough, and will not irritate the points of the mucous covering of the most sensitive parts.

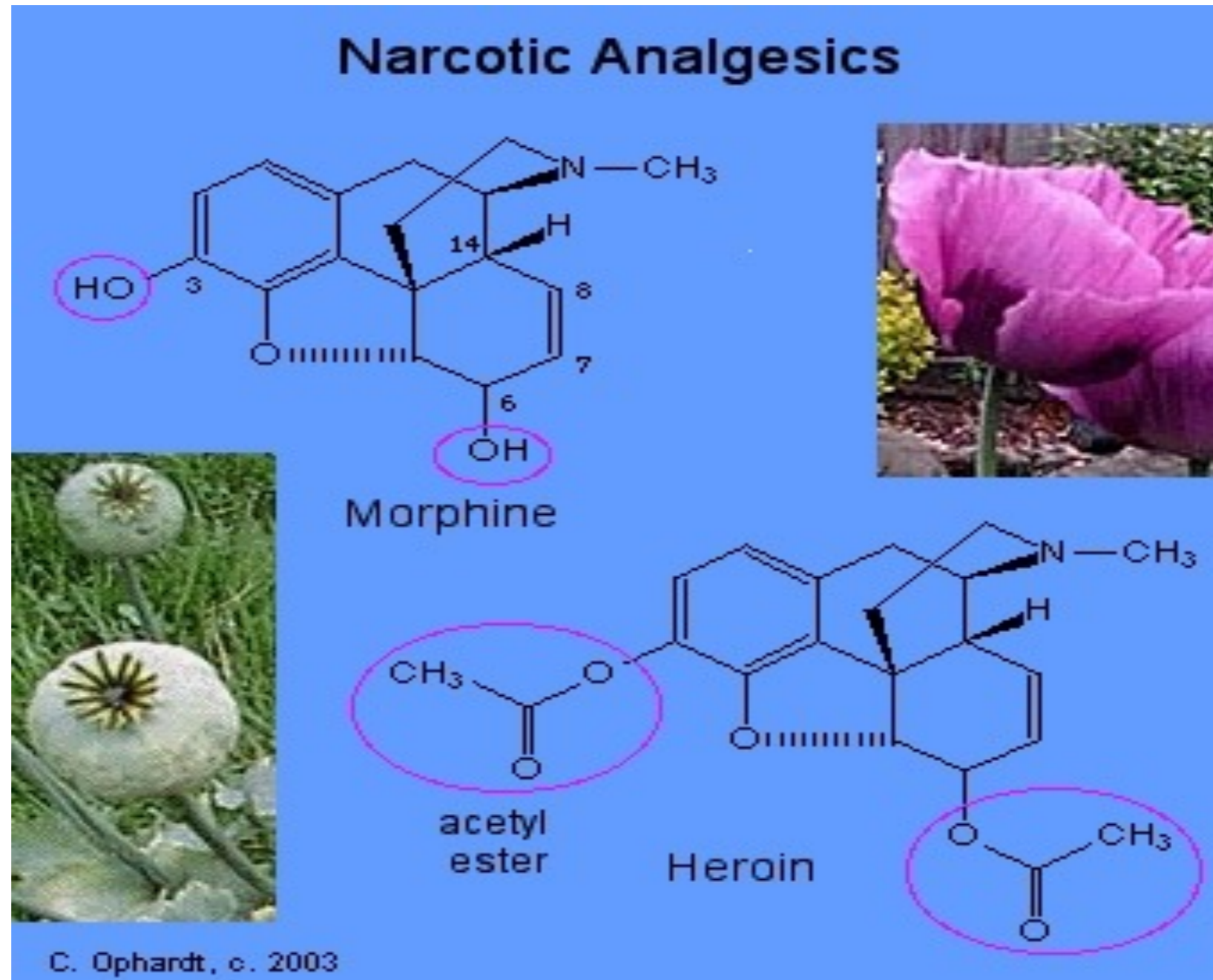
HAS BEEN SOLVED BY
the pharmaceutical compound known as

GLYCO-HEROIN (Smith)

The results attained with Glyco-Heroin (Smith) in the alleviation and cure of cough are attested by numerous clinical studies that have appeared in the medical journals within the past few years.

Scientifically Compounded, Scientifically Conceived, GLYCO-HEROIN (SMITH) simply stands upon its merits before the profession, ready to prove its efficacy to all who are interested in the progress in the art of

Morphine v. Heroin



Opioid Mechanism

- Opioids bind to the opioid receptor.
- Opioid receptors are found in the CNS and PNS.
- There are several receptor subtypes, but the Mu 1 and 2 are most important:
 - Mu1: moderates euphoria and analgesia of opioids.
 - Mu2: modulates respiratory depression.

The Mu Receptor

- Types of Mu binding
 - Full Agonist: highly reinforcing, common in abuse
 - Heroin, methadone, oxycodone
 - Partial Agonist: activates at lower levels, less reinforcing, less abused.
 - Buprenorphine
 - Antagonist: occupies without activating, not reinforcing, blocks and displaces.
 - Naloxone, naltrexone

Opioid Tolerance

- Tolerance to opioids develops quickly.
- Changes in the number and sensitivity of opioid receptors are suspected.
- Many of the side effects of opioids decrease with increased use of the drug, save one...

Opioid Effects

- "Heroin: imagine the best orgasm you have ever had and multiply it by a thousand and you're still nowhere near it"
'Mark Renton' in
TRAINSPOTTING



Opioid Effect

- All opioids cause the following to a certain extent:
 - Euphoria
 - Analgesia
 - Pupillary constriction
 - Apathy
 - Drowsiness
 - Respiratory Depression
 - Constipation, Nausea

Opioid Intoxication

DSM 5 Criteria

- A. Recent use of an opioid.
- B. Clinically significant problematic behavioral or psychological changes
- C. Pupillary constriction (or dilation in severe OD) and one + of the following:
 - Drowsiness or coma
 - Slurred speech
 - Impairment in attention or memory.
- D. Symptoms not due to a general medical condition or other mental disorder.

Opiate Withdrawal

DSM 5 Criteria

- **A. Either of the following:**
 - Cessation of or reduction in opioid use that has been heavy or prolonged (weeks)
 - Administration of an opioid antagonist after a period of opioid use.
- **B. Three or more of the following developing within minutes to days after A:**
 - Dysphoric mood
 - Nausea/Vomiting
 - Muscle aches
 - Lacrimation or rhinorrhea
 - Pupillary dilation, piloerection, sweating
 - Diarrhea
 - Yawning
 - Fever
 - Insomnia

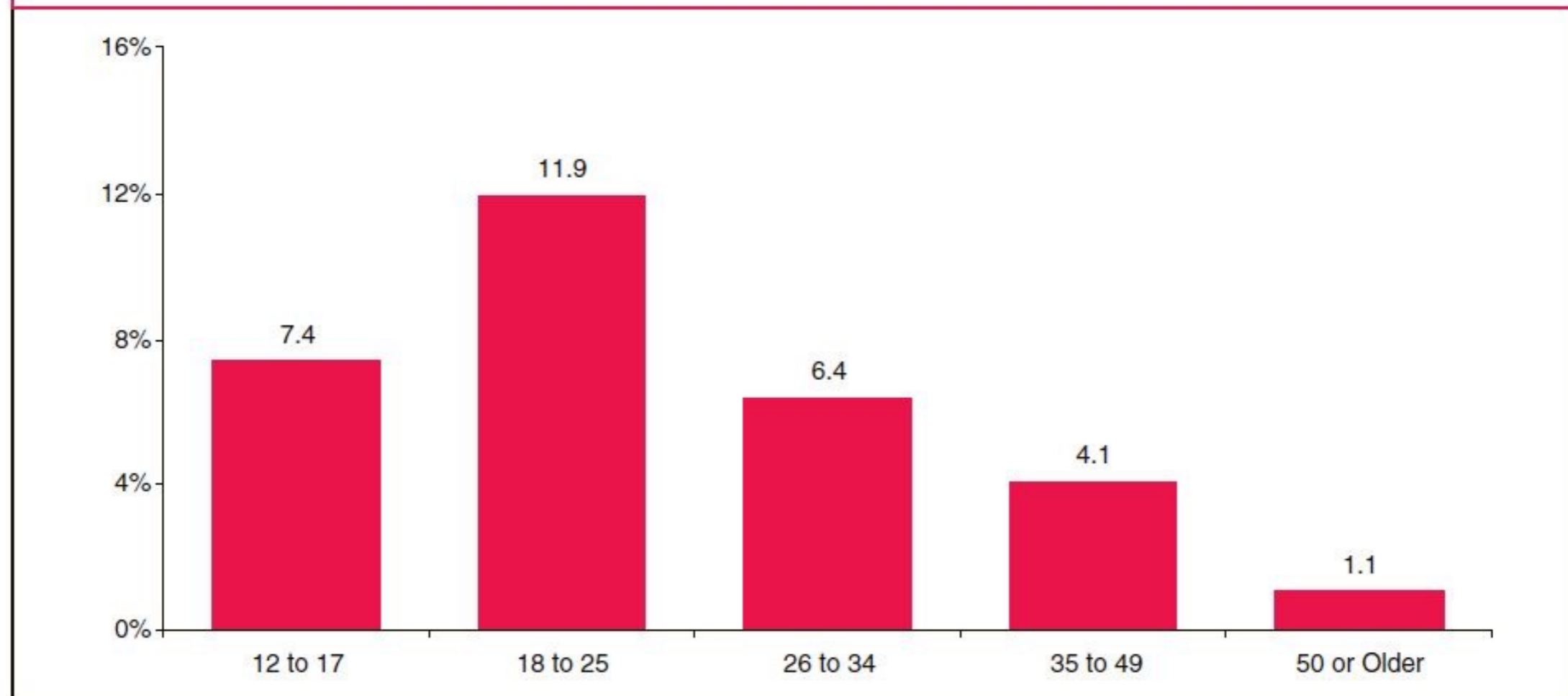
Opioid Withdrawal

DSM 5 Criteria (cont.)

- C. Symptoms in B cause distress or impairment in social, occupational, or other areas.**
- D. Symptoms are not due to a general medical condition and are not better accounted for by another mental disorder.**

Prescription opioid abuse is a problem of young people.

Figure 2. Percentages of Past Year Nonmedical Prescription Pain Reliever Use among Persons Aged 12 or Older, by Age Group: 2002-2005



Source: SAMHSA, 2002-2005 NSDUHs.

Opioid Withdrawal

- **General rule:**
 - Opioids with a short duration of action produce a short, intense withdrawal
 - Opioids with a long duration of action produce a prolonged withdrawal.
- **Treatment:**
- **IV Naloxone if patient in respiratory distress.**
- **Methadone, if objective symptoms are present.**

Methadone Maintenance

- What?
 - Use of a long acting medication in the same class as the abused drug. Dosed daily
 - Prevents withdrawal
- What it is not:
 - Substitution of “one addiction for another”
 - No longer an addict, but still dependent
- Who is appropriate?
 - >16 yo
 - 1 year hx of dependence
 - Medically compromised patients
 - Pregnant women

Methadone Maintenance

- Why?
 - Long half life (24-36 hours)
 - Regularly scheduled
 - Produces steady state
 - Alertness without craving
- Full agonist
- Steady state reached over weeks, 3-7 days on same dose.

Buprenorphine

- Mu partial agonist
- Pills
 - Suboxone: buprenorphine (4) + naloxone (1)
 - Subutex: buprenorphine only. Give in controlled settings
 - Long acting
- Wait until withdrawal starts
- 2-4mg first day, then increase over 3 days, avg 16-20mg

Tracing the Line of Control



