OPIOID ADDICTION

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Objectives

- Learn about the history of opiate use
- Learn the current epidemiology of opiate use, and appreciate the prescription opiate misuse epidemic
- Learn to recognize opioid tolerance, withdrawal, and overdose
- Learn the consequences of opiate misuse
Opioids: A Brief History
• Opioids are opium and opium derived substances, as well as synthetic and semi synthetic compounds that activate the opioid receptors in the brain
• Opioid receptors: mu, kappa, delta
• In addiction, mu receptors are particularly important
Opium

- Opium poppy: Papaver somniferum
- Sumerians called it Hul Gil, or “the flower of joy”
- Vast majority of opium poppies are grown in a narrow, 4,500-mile stretch of mountains extending across southern Asia from Turkey through Pakistan and Laos.
- Crude opium is the sap inside the seed pod
- Opium is extracted, then processed into morphine by boiling it with lime
- Morphine then combined with acetic anhydride to form heroin
Historical Perspective

- Opium poppy cultivated in mesopotamia in 3400 BC
- Civil War: Introduction of hypodermic needles and the use of morphine for analgesia
- High rates of morphine use leading to dependence among women of high SES. Most introduced to opioids by their physicians for menstrual pain and menopausal symptoms
- Diacetylmorphine [heroin] first synthesized by an English chemist in 1874
- Marketed by Bayer from 1898 to 1910 for cough suppression, and a cure for morphine addiction!
- Unfortunately, heroin is actually quicker acting than morphine!
- 20th century: US criminalizes addictions
- Harrison Act [1914]: Prohibits prescription of opioids to people with addictions
  - Physicians prosecuted for prescribing opioids, leading to fear of prescribing
  - Increased drug trafficking
BAYER PHARMACEUTICAL PRODUCTS

Send for samples and literature to

ASPIRIN
The substitute for the salicylates

PROTARGOL
The anti-parasitic

PIPERAZINE
The antihistamine

HEROIN
The sedative for coughs

LYCETOL
The uric acid solvent

FERRSOMATOS
The iron supplement

SULFONAL
The effective sulphoxide

HEMICRAMP
The kidney stimulant

SALOPHEN
The antirheumatic and antineuralgic

FARBENFABRIKEN OF
ELBERFELD CO.

40 STONE ST
NEW YORK.
Historical Perspective

- **1974**: 1st methadone clinics open
- **Late 1970s**: Expansion of methadone programs to treat returning Vietnam veterans
- **Late 1980s**: Methadone seen as an important tool in fight against AIDS
- **2000**: DATA: Office based treatment of opioid dependence, opening door for buprenorphine
Epidemiology
Epidemiology

- 48 million people [20% of US population] have used prescription medications non-medically in their lifetimes [NIDA, 2005]
- Between 1994-2002, ED visits related to hydrocodone increased by 170%, and those related to oxycodone increased by 450% [SAMHSA, 2003]
- Between 2004-2009, a further 101% increase overall, with doubling in the rates of fentanyl, hydrocodone, hydromorphone, morphine, and oxycodone [SAMHSA, 2011]
- Total of over 1 million ED visits related to non-medical use of prescription medications in 2009 [SAMHSA, 2011]
- Drugs used in suicide attempts in 2009: pain relievers 38.1% [hydrocodone, oxycodone], benzos 28.7% [clonazepam, alprazolam, zolpidem]
Epidemiology

- Abuse of these substances most prevalent in younger age groups [18-25, followed by 12-17]
- Between ages 12-17, vicodin second only to marijuana [not counting tobacco and alcohol] in past year illicit use rate
- Between ages 12-13, higher percentage reported past month use of prescription medications than marijuana [1.8 vs 1.0%] [NSDUH, 2006]
- Prescription drug misuse correlated with higher rates of cigarette smoking, alcohol use, marijuana use, other illicit drug use, and problem behaviors [McCabe, 2005]
Past Year Initiates, 12 and older, 2006
[NSDUH, 2006]
Prevalence of heroin

- 2009: 180,000 new users
- 900,000 addicted [NSDUH, 2010]
- 0.7-0.9% [125,000] 8th, 10th, 12th graders endorse trying heroin at least once in the year prior to interview (2005-2009) [Monitoring the Future, 2010]
Prevalence of prescription opioids

- 2009 Non-medical use of prescription pain medications:
  - Previous month misuse 5.2 million over age 12
  - 4.8% of those aged 18-25
  - 1.9 million prescription narcotic users meet diagnostic criteria for opioid abuse or dependence (second only to marijuana (4.3 million))
- In 2006, deaths involving opioid analgesics surpassed those for other illicit drugs:
  - 1.63 times number cocaine-associated deaths
  - 5.88 times the number heroin-related deaths

[Source: NSDUH, 2006, 2010]
ED visits

• **DAWN 2009**
  - Heroin 213,118 visits
  - Narcotic Pain Relievers: 397,160 visits
  - Oxycodone/combinations – 175,949 visits
  - Hydrocodone/combinations – 104,490 visits
  - Fentanyl/combinations – 22,143 visits
  - Buprenorphine/combinations – 12,544
  - Alcohol involvement: 32% of visits

*Source: Drug Abuse Warning Network, National Estimate, 2009*
Reasons for High Prevalence
Where do the medications come from-
From us!

- 47.3% obtain from friends for free
- 10.2% took from friend/relative without asking
- 10% bought from friend/relative
- 6.3% some other way
- 4.5% bought from dealer/stranger
- 2.6% from more than one doctor
- 0.1% internet
- 0.1% fake script
- 0.5% stole from doctor
- 18.3% from one doctor
- 1/3 ages 12-17 get them from own homes
- *Prescriptions for opioids increased from 45 million to 180 million between 1991-2009*
Misperceptions of safety

- 40% think prescription medications are safer than illicit drugs, even when not prescribed by a doctor
- 1/3 of teens think there is “nothing wrong” with using prescriptions non-medically once in a while
- 29% of teens do not think prescription opioids are addictive [Office of National Drug Control Policy, 2007]

- In fact, prescription drugs can be just as dangerous as illicit drugs
Opioids: Tolerance, Withdrawal, and Overdose
Tolerance

- Tolerance:
  - Need more for same effect
  - Less effect with same amount
  - Tolerance can lead to gradual escalations to high doses that would otherwise be fatal
Withdrawal

- Upon cessation or dose reduction of opioid
- Dysphoria, nausea/vomiting, muscle aches, lacrimation, goose bumps, rhinorrhea, insomnia, diarrhea, hypertension, tachycardia
- Measured by COWS
- Short acting opiates: Begins after 6-12 hours; peaks after 36-72 hours; Lasts about 5 days [protracted withdrawal can persist even longer]
- Long acting opiates: Begins after 36-72 hours; lasts for many days
Overdose

- Respiratory depression the usual cause of death
- Coma, hypotension, pinpoint pupils [May dilate with hypoxia]
- Noncardiogenic pulmonary edema
- Meperidine can lead to seizures
- Antidote: naloxone [may not work as well for long acting opioids]
Co-Morbidity
Co-Morbidity

- Addictive disorders show a strong co-morbidity with other psychiatric disorders
- Among mood disorders, Bipolar I disorder most strongly associated with prescription drug use disorders
- Among anxiety disorders: panic disorder with agoraphobia, PTSD
- Among Axis II: Antisocial Personality Disorder
Co-Morbidity

- Abuse or dependence on one prescription drug associated with abuse/dependence of another prescription drug, illicit drug, or alcohol
- One in three prescription drug abusers have an alcohol use disorder [McCabe, 2006]
- Sullivan, 2006: A person with a mental illness in 1998 [MDD, dysthymia, GAD, panic disorder] more likely to abuse opioid dependence in 2001 than those without an illness [OR 1.96]
- Thus, patient with mental illness may be particularly vulnerable to the development of prescription drug abuse
Differences between heroin and prescription opioid users

- Prescription opioid users
  - More likely to have concurrent benzodiazepine use
  - More likely to have concurrent depression
  - More likely to have chronic pain
  - Less likely to use other illicit drugs
  - Less likely to use IV drugs [12% vs 63%]
  - Less likely to have family and social problems
  - Less likely to have illegal sources of income
Consequences of Opioid Dependence
Medical risks

- Abscesses
- Sepsis
- Osteomyelitis
- Thrombophlebitis
- Endocarditis
Natural Course:

- **Medical risks:**
  - **HCV**
    - 70% IV users
    - 65% after 1 yr needle use; ~85% at 5 yrs
  - **HIV**
    - IV users ~75% of new HIV infections
    - HIV ~20%
Epidemiology

- Injection AND non-injection drug use associated with increased risk for contracting HIV and hepC
- Roughly 25% of patients with HIV/AIDS exposed through IVDU [CDC, 2006]
- HIV/AIDS through IVDU more prevalent in ethnic and racial minorities and in women
- IVDU is the most common cause of HepC infection
- Of drug users who have injected for five years, 60-80% infected with hepC and 30% with HIV
- Co-infection higher in IVDU acquired HIV patients [50-90% vs 30%] = more likely to develop end stage liver disease
Natural Course:

- **Death**
  - Overdose 1.5%/yr
  - 24 yr study – 28% sample deceased
  - 30 yr study in California: 49% sample deceased

- **Major causes of death**
  - Drug overdose, suicide, violence, accidents, infection, chronic diseases
Natural Course: Summary

- Medical risks
- High mortality
- Low employment
- Crime
- High cost to society
Conclusions

- Prescription opioid dependence is a growing public health concern
- This growing concern may in part be fueled by misperceptions of safety
- When untreated, opioid addiction can lead to a number of adverse consequences