

Opioid Pharmacology and Addiction

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1. Introduction and Background
 - a. Chemistry and nomenclature
 - b. History of use and abuse
 - c. Natural opioids – morphine, codeine, thebaine
 - d. Synthetic opioids
 - i. Strong agonists – morphine, heroin, fentanyl, oxycodone, others
 - ii. Moderate / Low agonists – codeine, propoxyphene
 - iii. Mixed agonists – buprenorphine, pentazocine, others
 - iv. Antagonists – naloxone, naltrexone, nalmefene
 - e. Illegal / designer analogs
 - i. Fentanyl-based
 - ii. U-####
 - iii. MT-45
 - iv. AH-7291
 - v. Others
2. Pharmacological Actions of Opioids
 - a. Types of actions
 - i. Analgesic
 - ii. Euphoria
 - iii. Respiration
 - iv. Depression of cough reflex
 - v. Miosis
 - vi. Emesis and gastrointestinal
 - vii. Hormonal and histamine effects
 - b. Therapeutic uses
 - i. Analgesia
 - ii. Treatment of diarrhea
 - iii. Relief of cough
 - iv. Treatment of pulmonary edema
3. Neurobiology of Opioid Action and Addiction
 - a. Endogenous opioids – endorphins, enkephalins, dynorphins, endomorphins
 - b. Sites of action in the brain
 - c. Overview of neuroplasticity
 - i. Changes in receptors

- ii. Change in signaling pathways
 - iii. Structural changes in the brain
 - iv. Timeline for development
 - v. Reversibility
 - d. Overview of brain “rewards” systems
 - i. Dopaminergic
 - ii. GABAergic
 - iii. Glutaminergic
 - e. Neural effects of opioids
 - i. Tolerance
 - ii. Dependence
 - iii. Withdrawal
 - iv. Addiction
 - f. Consequences of withdrawal
- 4. Pharmaceutical Treatment of Opioid Addiction
 - a. Detoxification
 - b. Substitution / maintenance therapy
 - i. Methadone
 - ii. Buprenorphine
 - iii. Heroin-assisted treatment (HAT)
 - c. Antagonist therapy
 - i. Naltrexone
 - ii. Naloxone

Title: A Public Health Perspective of the Opioid Epidemic

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1. Epidemiology and Statistics
 - a. Number of deaths due to opioid overdoses each day
 - b. Percentage of patients who misuse opioids
 - c. Number of opioid overdoses
 - d. Number of opioid prescriptions generated
 - e. Estimated total economic burden
 - i. Healthcare costs
 - ii. Lost productivity
 - iii. Addiction treatment
 - iv. Criminal justice involvement

2. Contributing factors
 - a. Patient expectations
 - b. Obesity rates
 - c. Denial of previous therapies
 - i. Role of pharmaceutical companies
 - d. Aging population
 - i. Musculoskeletal disorders
 - ii. Survival rates of cancer
 - iii. Frequency of surgical interventions

3. Public Health Crisis
 - a. Opioid misuse
 - b. Overdoses
 - c. Neonatal abstinence syndrome
 - d. Spread of infectious disease
 - i. HIV
 - ii. Hepatitis C

4. Initiatives to combat opioid crisis
 - a. Federal
 - i. U.S. Department of Health and Human Services (HHS)
 1. Five major priorities
 - a. Improve access to treatment/recovery services
 - b. Promote use of overdose-reversal drugs
 - c. Increase understanding of epidemic through surveillance
 - d. Promote research on pain and addiction

- ii. National Institutes of Health (NIH)
 - 1. Helping to End Addiction Long-Term (HEAL) Initiative
 - a. Successes of the program
 - i. Development of nasal for of naloxone
 - ii. Buprenorphine for opioid use disorder
 - iii. Nondrug techniques
 - b. Areas of focus
 - i. Support research to improve treatment of opioid misuse and addiction
 - ii. Understand the development of chronic pain and develop new pain therapies
 - iii. National Academy of Medicine
 - 1. Action Collaborative to Counter Opioid Epidemic
 - a. Partnership of 35 organizations to address opioid crisis from multiple dimensions
 - iv. Prescription Drug Monitoring Programs
 - 1. Controlled at the state level
 - v. Abuse Deterrent Medications
 - 1. Resistant to injection or snorting
 - vi. Risk Evaluation and Mitigation Strategies (REMS)
 - 1. Administered by the FDA on a national level
- b. State
- i. Opioid Action Plan
 - ii. Arizona Opioid Epidemic Act
 - iii. Arizona Opioid Prescribing Guidelines
 - iv. Arizona Pain and Addiction Curriculum

The Opioid Crisis and the Optometrist

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1. Hx of opioid of epidemic and their influences
 - a. 1800 Hippocrates
 - i. uses as a narcotic and sedative
 - ii. use after the Civil War
 - iii. 1898 Heroin is synthesized
 - b. Harrison Narcotics Act 1914
 - i. Oxycodone
 - c. 1950 Percodan
 - d. 1969 WHO
 - e. Controlled Substance Act 1970
 - f. 1986 Cancer pain monograph
 - g. 1991 wave 1 of the epidemic
 - i. Influence of the pharmaceutical companies and medical societies
 - h. 1999 Veterans Health adoption of pain
 - i. 2000 Joint Commission
 - j. 2010 Wave 2 of the epidemic
 - i. Opioid to heroin
 - ii. Other risks associated with heroin use
 - k. 2016 Wave 3 of the epidemic
 - i. Increased death due to synthetic opioids
 - ii. TJC standards
 - iii. CDC efforts
 1. Opposition to the efforts
2. Identification of addiction
 - a. Factors
 - i. Genetic
 - ii. Psychosocial
 1. Legal vs. Illegal drug use
 - iii. Environmental
 - b. Exposure to the drug
 - i. Acute or chronic pain
 - ii. Anxiety, ADHD
 - iii. Doctor prescribed
 - iv. Family member use
 - c. Behaviors
 - i. Impaired control over drug use
 - ii. Stealing, selling possessions, credit cards
 - iii. Compulsive use continues despite harm
 - d. Tools

- i. Opioid risk assessment tool
 - 3. Identification drug seeking behavior
 - a. 13 red flags
 - b. Drug seeking behavior in your office
 - i. Involving your team
 - ii. Recognizing suspicious behavior
 - iii. Obtaining a thorough hx of present illness
 - iv. Looking for consistency in the exam
 - v. Conducting appropriate testing
 - vi. Prescribing non pharm tx
 - 1. Non-opioid pain relievers
 - 2. Physical therapy and exercise
 - 3. Cognitive behavioral therapy
 - 4. Antidepressants and anticonvulsants
 - vii. Proceed cautiously
- 4. Role of optometrists in addressing the epidemic
 - a. Primary eye care
 - i. May be the primary point of entry into the healthcare system
 - ii. Judicious prescribing
 - 1. Immediate release instead of extended release
 - 2. Lowest effective dose
 - 3. Short durations for acute pain
 - iii. Advocacy
- 5. Resources for help
 - a. Doctor
 - i. Strategies to mitigate risk
 - ii. Reviewing the PDMP
 - iii. Urine Drug testing
 - iv. Avoiding benzodiazepine prescribing
 - v. Protecting your license
 - b. Patient
 - i. Treatment for the opioid use disorder
 - 1. Substance abuse treatment
 - 2. Medication assistant treatment
 - a. Buprenorphine
 - b. methadone
 - 3. Support for patients, families and friends