USE AND ABUSE OF OPIOIDS IN ATHLETICS

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DISCLAIMERS

- None

OBJECTIVES

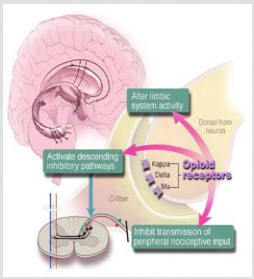
- Provide a general overview of opioids, their mechanism of action, and their physiologic effects
- Review the relevant terminology, signs, and symptoms related to opioid misuse
- Discuss the implications of opioid misuse and the current recommendations for prevention
- Discuss the role of opioids, NCAA regulations/testing, and the potential for misuse in the athlete

OPIOIDS

- **Substances that bind to opioid receptors**
  - Natural (Opiates)
  - Semi-synthetic
  - Synthetic
  - Endogenous
  - Antagonists

OPIOIDS

- **3 receptor types**
  - Mu
  - Kappa
  - Delta
- **Pre-synaptic and post-synaptic analgesia**
- **Spinal and supraspinal locations**



FORMULATIONS

- **Oral (PO)**
  - **Immediate-Release**
    - Hydrocodone
    - Oxycodone
    - Codeine
    - Morphine
    - Hydromorphone
    - Often combined with other meds (Acetaminophen, etc)
  - **Sustained/Extended Release**
    - Oxycontin
    - MS Contin
- **Intravenous (IV)**
  - Morphine
  - Hydromorphone
  - Fentanyl
- **Transdermal**
  - Fentanyl
- **Sublingual**
- **Rectal**
- **Epidural**
- **Intrathecal**

FORMULATIONS

Equianalgesic Opioid Dosing

	Equianalgesic Doses (mg)	
Drug	**Parenteral**	**Oral**
Morphine	10	30
Buprenorphine	0.3	0.4 (sl)
Codeine	100	200
Fentanyl	0.1	NA
Hydrocodone	NA	30
Hydromorphone	1.5	7.5
Meperidine	100	300
Oxycodone	10*	20
Oxymorphone	1	10
Tramadol	100*	120

*Not available in the US

McPherson ML, *Demystifying Opioid Conversion Calculations: A Guide For Effective Dosing*, Amer Soc of Health-Systems Pharm, Bethesda, MD, 2010. Copyright ASHP, 2010. Used with permission. NOTE: Learner is STRONGLY encouraged to access original work to review all caveats and explanations pertaining to this chart.

EFFECTS OF OPIOIDS

- **Central**
  - Analgesia
  - Euphoria
  - Sedation
  - Respiratory Depression
  - Cough Suppression
  - Miosis
  - Truncal Rigidity
  - Nausea, Vomiting
- **Peripheral**
  - Bradycardia
  - Constipation
  - Biliary Colic
  - Urinary Retention
  - Flushing
  - Pruritis
- **Tolerance, Dependence, Abuse**

DEFINITIONS

- **Tolerance**
  - The need for increasing doses to maintain an effect
- **Dependence**
  - The occurrence of withdrawal symptoms after abrupt discontinuation
- **Addiction**
  - Behavioral pattern of compulsive use resulting in physical, psychological, and social harm

DEPENDENCE: DSM-IV

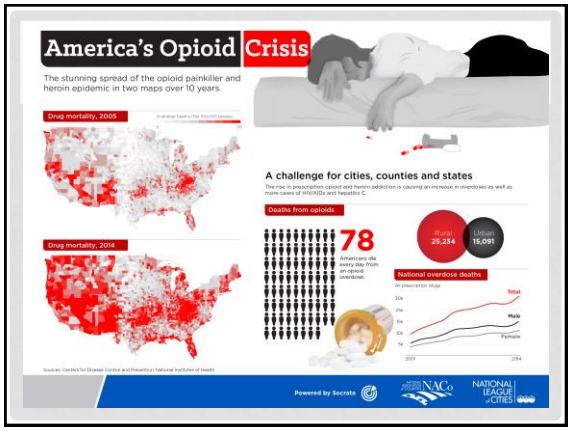
- Tolerance
- Withdrawal
- Unintentional overuse with regard to duration or amount
- Inability to reduce usage
- Inordinate amount of time dedicated to use, acquire, or recuperate from substance
- Other life activities sacrificed
- Continued use despite health or mental issues

ABUSE: DSM-IV

- Failure to fulfill major role obligations
- Frequent use in physically hazardous situations
- Frequent legal problems
- Continued use despite having persistent or recurrent social/interpersonal problems

DSM V: SUBSTANCE USE DISORDER

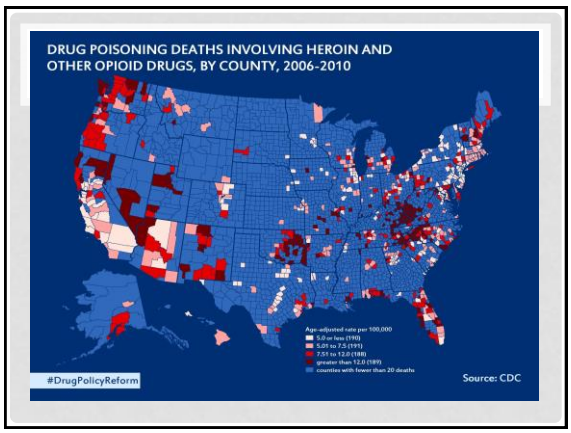
- Taking the opioid in larger amounts and for longer than intended
- Wanting to cut down or quit but not being able to do it
- Spending a lot of time obtaining the opioid
- Craving or a strong desire to use opioids
- Repeatedly unable to carry out major obligations at work, school, or home due to opioid use
- Continued use despite persistent or recurring social or interpersonal problems caused or made worse by opioid use
- Stopping or reducing important social, occupational, or recreational activities due to opioid use
- Recurrent use of opioids in physically hazardous situations
- Consistent use of opioids despite acknowledgment of persistent or recurrent physical or psychological difficulties from using opioids

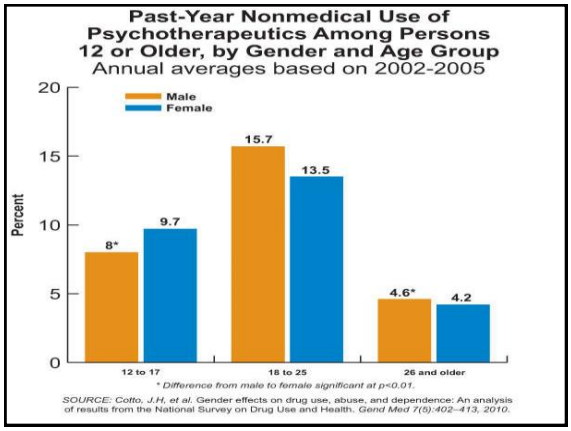


"THE OPIOID EPIDEMIC"

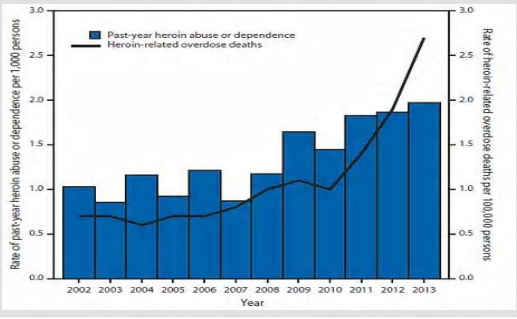
- 2012: 259 million opioid prescriptions written
- Opioid prescriptions increased per capita 7.3% from 2007 to 2012
- 165,000 opioid-related deaths from 1999-2014
- 2011: 420,000 opioid-related ER visits
- 2013: 1.9 million met DSM-IV criteria for abuse or dependence
- Prescribing rates and adverse outcomes vary from state to state

Centers for Disease Control and Prevention. Guidelines for Prescribing Opioids for Chronic Pain. 2016. Available online at http://www.cdc.gov/drugoverdose/prescribing/guideline.html





TRENDS IN OPIOID ABUSE



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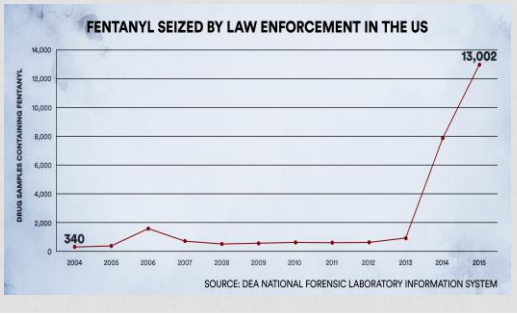

OPIOID USE IN ATHLETES

- Very limited data
- 2011: 8.7% of 12th graders used opioids without a doctor's order
- 2015: 122,000 adolescents addicted to painkillers, 21,000 had used heroin
- Organized Sports associated with decreased cigarette and illicit drug use
- NFSHA Report: 7,713,577 adolescents participated in interscholastic sports in 2012-13
- 20% sustained injury requiring medical attention
- "Prosocial behavior" vs Greater propensity for injury

Drug Alcohol Depend. 2011 July 1; 116(1-3): 188–194. doi:10.1016/j.drugalcdep.2010.12.003.

Injury, Pain, and Prescription Opioid Use Among Former National Football League (NFL) Players

Linda B. Cottler[1], Arbi Ben Abdallah[1], Simone M. Cummings[1], John Barr[2], Rayna Banks[2], and Ronnie Forchheimer[2]
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- Telephone survey of 644 retired NFL players
- Assessed demographics, types of injuries, current opioid use/misuse and "NFL" opioid use/misuse
- 52% used opioids during NFL career, 71% of them misused (37% overall)
- 7% current misuse (3x higher than general population)
- Strongest predictors of NFL use: undiagnosed concussions, 3 or more injuries, offensive lineman
- Strongest predictors of current misuse: undiagnosed concussions, significant pain, heavy EtOH use

Original article

Painfully Obvious: A Longitudinal Examination of Medical Use and Misuse of Opioid Medication Among Adolescent Sports Participants

Philip Veliz, Ph.D. [a,*], Quyen M. Epstein-Ngo, Ph.D. [a], Elizabeth Meier, Ph.D. [a], Paula Lynn Ross-Durow, Ph.D. [a], Sean Esteban McCabe, Ph.D. [a], and Carol J. Boyd, Ph.D. [b]
[a] *Institute for Research on Women and Gender, University of Michigan, Ann Arbor, Michigan*
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Article history: Received March 4, 2013; Accepted September 6, 2013
Keywords: Adolescents; Prescription medications; Opioid use; Opioid misuse; Sports participation

- 1,540 adolescents in three waves of surveys
- Assessed medical use, medical misuse, and non-medical use
- Male participants had higher rates of medical use and misuse compared to non-participants
- No differences in non-medical use
- Females had higher rates of use overall, but no difference between participants and non-participants

Res Q Exerc Sport. 2015 June ; 86(2): 205–211. doi:10.1080/02701367.2014.983219.

Opioid Use Among Interscholastic Sports Participants: An Exploratory Study From A Sample Of College Students

Philip Veliz, PhD,
Institute for Research on Women & Gender, University of Michigan

- Student Life Survey: 3,442 respondents included
- Assessed lifetime medical use, diversion, and non-medical use
- Participants had higher rates of repeated lifetime use, and were more likely to be approached to divert their medication
- No differences in non-medical use
- Participants in 3 or more sports had greater odds

OPIOID USE IN ATHLETES

- High-quality studies lacking
- Athletes more likely to be prescribed opioids
- Use can lead to misuse and long-term use
- Use/misuse possibly more prominent in males
- Recent evidence suggests lower prevalence of non-medical use

Nonmedical Prescription Opioid and Heroin Use Among Adolescents Who Engage in Sports and Exercise

Philip Veliz, PhD,[a] Carol J. Boyd, MSN, PhD,[a,b,c] Sean Esteban McCabe, PhD[a]

NCAA TESTING

- **Banned Substances**
  - Stimulants
  - Anabolic Agents
  - Alcohol and Beta-Blockers (Rifle competition)
  - Diuretics and other masking agents
  - Street/Illicit Drugs (THC, Cocaine, Heroin, etc)
  - Peptide Hormones and analogues
  - Anti-estrogens
  - Beta-2 agonists
- **Prescription Opioids are NOT banned**

URINE DRUG TESTING

- **Point of Care Testing (Immunoassay)**
  - Determine whether patient is taking prescribed med
  - Determine whether patient is using other drugs
  - Limited: High false-positive and false-negative rates
  - Primarily detect morphine and codeine
  - May not detect hydrocodone, oxycodone, fentanyl, etc
  - May not discern parent drug from its metabolite
- **All concerning results must be confirmed with advanced testing**

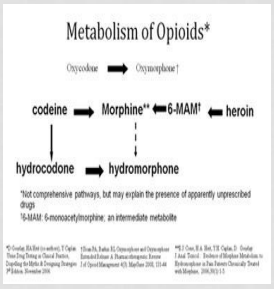
URINE DRUG TESTING

- **Gas Chromatography/Mass Spectrometry (GC/MS)**
  - Used by the NCAA
  - More detailed, used as confirmatory testing
  - More expensive and time-consuming
  - Expanded opiate panel can detect most opioids
  - Positive results reflect use within 1-3 days
  - High sensitivity and specificity
  - Can identify specific drugs, even in low concentrations

Drugs that May Cause False-Positive Results in Immunoassay Testing

TEST DRUG OR DRUG CATEGORY	*DRUGS THAT MAY CAUSE FALSE-POSITIVE RESULTS*	*DURATION OF DETECTABILITY*
Amphetamines	Amantadine (Symmetrel), bupropion (Wellbutrin), chlorpromazine, desipramine (Norpramin), fluoxetine (Prozac), *L*-methamphetamine (in nasal decongestants*), labetalol (Normodyne), methylphenidate (Ritalin), phentermine, phenylephrine, phenylpropanolamine, promethazine (Phenergan), pseudoephedrine, ranitidine (Zantac), thioridazine, trazodone (Desyrel)	Two to three days
Benzodiazepines	Oxaprozin (Daypro), sertraline (Zoloft)	Three days for short-acting agents (e.g., lorazepam [Ativan]) Up to 30 days for long-acting agents (e.g., diazepam [Valium])
Cocaine	Topical anesthetics containing cocaine	Two to three days with occasional use Up to eight days with heavy use
Opiates	Dextromethorphan, diphenhydramine (Benadryl), fluoroquinolones†, poppy seeds, quinine, rifampin, verapamil‡	One to three days

URINE DRUG TESTING



- **Oxycodone: Oxymorphone**
- **Hydrocodone: Hydromorphone (Dilaudid)**
- **Morphine**
  - Morphine
  - Codeine
  - Heroin

URINE DRUG TESTING

- **Heroin**
  - Illegal, semisynthetic opioid
  - Similar in structure to morphine
  - Extremely short half-life
  - UDT will test positive for morphine
- **How to distinguish heroin use from morphine/prescription opioid use?**
  - 6-monoacetylmorphine (6-MAM)
  - Presence of metabolite confirms heroin use
  - Extremely short window (6-8 hours)

URINE DRUG TESTING

- All prescription and non-prescription medications should be disclosed to team physician/trainer
- Caution with dietary supplements, vitamins, etc
- Stimulants
  - Caffeine >15µg/mL illegal
  - Pseudoephedrine and phenylephrine allowed
  - Exemption possible for ADHD
- Opioids are not banned by the NCAA
- Heroin??

NCAA PENALTIES

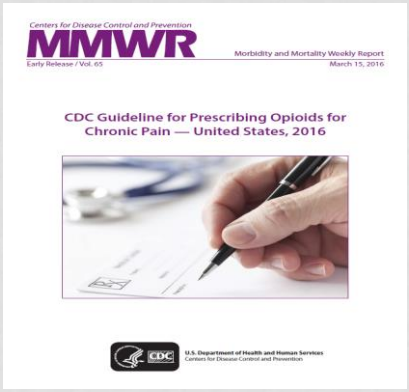
- **Performance-enhancing drugs**
  - First offense = loss of one year of eligibility and being withheld from competition for 365 days
  - Second offense = loss of all remaining eligibility
- **Street Drugs**
  - First offense = being withheld from 50% of the season in any sport that the athlete takes part in
  - Second offense = loss of one year of eligibility and being withheld from competition for 365 days
- **Tampering**
  - Ineligible for participation for two full calendar years
- **No-show = Positive test**

NCAA PENALTIES

- **Reinstatement**
  - "Exit Test"
  - Conducted no sooner than the 11th month of a one-year suspension, or as determined by the NCAA for shorter suspensions
  - Institution must request the exit test and allow 2-4 weeks for scheduling
  - Institution pays for the test

"THE OPIOID EPIDEMIC"

- **The Department of Health and Human Services Opioid Initiative**
- **Opioid Prescribing Practices**
  - Controversial
  - Various state and agency guidelines
  - 2016 CDC guidelines
- **Medication-Assisted Treatment**
  - Methadone
  - Buprenorphine
- **Naloxone and Good Samaritan Laws**



CDC GUIDELINES

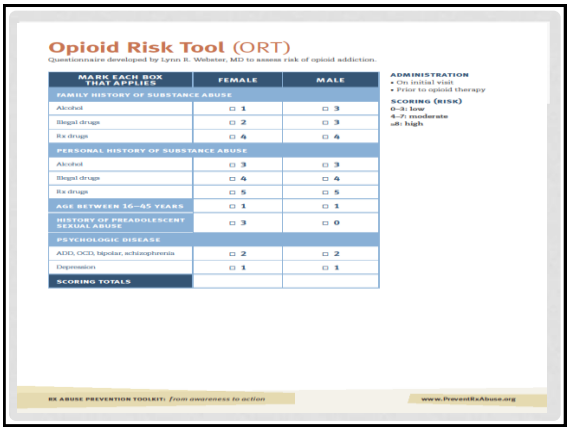
- **Utilize non-pharmacologic therapy and non-opioid medications**
  - Physical Therapy
  - Injections
  - Tylenol, NSAIDs, Neuropathic pain agents, etc
- **Establish treatment goals and expectations**
- **Discuss and document the risks and benefits of opioid use**
  - Focus on improvement in function

CDC GUIDELINES

- **Use Immediate-Release formulations, and lowest effective dose**
  - No more than 20-50 morphine milligram equivalents (MME) per day
- **Limited initial prescriptions and acute pain to 3-7 day supply**
- **When benefits do not outweigh risks, consider tapering/discontinuing opioids**

CDC GUIDELINES

- **Proper screening and review of opioid use**
  - Prescription Drug Monitoring Program
  - Risk Assessment Tools
    - Opioid Risk Tool
    - D.I.R.E. Score
    - SOAPP-R
  - Consider Urine Drug Testing and periodic re-testing
  - Avoid prescribing opioids in conjunction with benzodiazepines (Valium, Klonopin, Xanax, etc)



CONNECTICUT LAW

- **Public Act 16-43, May 27th, 2016**
  - No more than a 7-day supply of opioids when prescribing to a minor
  - Discussion of risks must be documented
  - Medical justification must be documented if providing more than a 7-day supply to adults
  - The Prescription Monitoring Program must be reviewed if providing more than a 72-hour supply of opioids
  - Provisions for the appropriate prescribing of opioid antagonists

MANAGING PAIN IN ATHLETES

- **Non-pharmacologic/non-opioid options first**
  - Bracing, Physical Therapy, Modalities, Injections
  - NSAIDs, oral steroids, etc
- **If opioids are needed, discuss risks/benefits and establish expectations up front**
- **Prescribe the lowest dose and shortest duration possible**
- **Review the PMP and consider screening tools**
- **Regularly re-assess the patient and consider risks/benefits before refilling**

NON-OPIOID ALTERNATIVES

- **Non-steroidal anti-inflammatories (NSAIDs)**
  - Ibuprofen, Diclofenac
- **Oral Steroids**
  - Medrol, Decadron
- **Neuropathic pain agents (Anticonvulsants)**
  - Topamax
  - Gabapentin
  - Lyrica
- **Antidepressants**
  - Amitriptyline
  - Cymbalta
  - Savella
- **Topical agents**
  - Lidoderm
  - Voltaren gel
- **Tramadol***
  - Opioid and non-opioid properties
  - Schedule IV

SUMMARY

- Opioids are commonly prescribed, highly-effective analgesics with significant risks and side effects, to include the risk of abuse/misuse
- Very limited data suggest that athletes are prescribed opioids at a higher rate that non-athletes, and this may contribute to long-term use
- The NCAA does not ban the use of opioids, but providers should be familiar with the urine testing process
- Opioid abuse is a national epidemic, requiring patients to be closely monitored and prescribers to be cautious with prescribing
- Non-pharmacologic and non-opioid treatment options should be exhausted before opioids become the mainstay of treatment

THANK YOU

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