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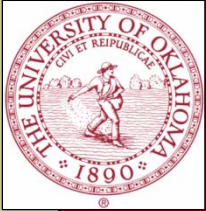
MEDICAL THERAPIES FOR ADDICTION

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School of Community Medicine

Medical Director of 12&12 Alcohol & Drug
Treatment Center, Tulsa, OK





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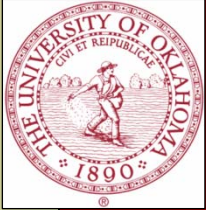
Treat Addiction

Save Lives



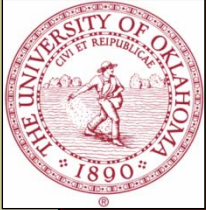
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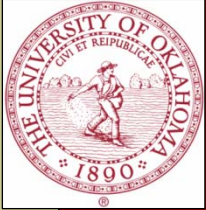
Addiction Medicine

The specialty of medicine devoted to diagnosis, treatment, prevention, education, epidemiology, research, and public policy advocacy regarding addiction and other substance-related health conditions



General Epidemiology

- “10% of adults have a lifetime prevalence of addiction to alcohol/drugs, excluding nicotine”
- “20% of primary care outpatients have a lifetime prevalence of SUD” (excl. nicotine)
- “30% of hospitalized inpatients have a lifetime prevalence of SUD” (excl. nicotine)



What are Opioids?

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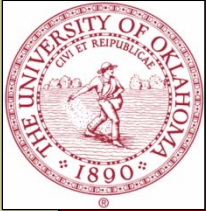
Opioids constitute a class of drugs found within opium as well as semi-synthetic and synthetic compounds that resemble the structure and/or function of these naturally occurring forms.

They are medically used for relief of pain and cough suppression and have an abuse potential.



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Commonly Misused Opioids

Diacetylmorphine (Heroin)

Morphine (MS Contin, Kadian)

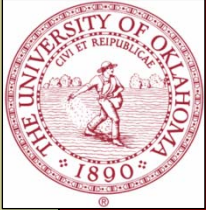
Oxycodone (OxyContin, Percodan, Percocet)

Hydrocodone (Lortab, Vicodin)

Hydromorphone (Dilaudid)

Codeine (Tylenol #3)

Meperidine (Demerol)



Other Commonly Misused Opioids

Opium

Methadone (Dolophine)

Fentanyl (Sublimaze)

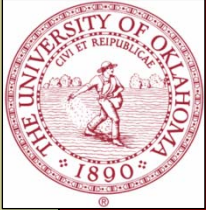
Propoxyphene (Darvon)

Levorphanol (Levodromeran)

Butorphanol (Stadol)

Nalbuphine (Nubain) * not scheduled

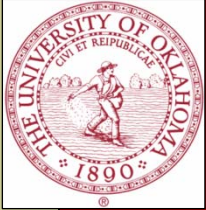
Tramadol (Ultram) * not scheduled



Routes of Administration

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- IV
- IM
- SubQ (skin popping)
- PN (snorting)
- Smoking
- PO
- SL
- Transdermal (patch)



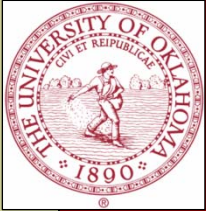
Where/How do Opioids Work? General Opioid Pharmacology

Opioid receptors

The functions of drugs at receptors

Affinity and dissociation

Repeated administration and
withdrawal of opioid drugs



Opioid Receptors

➤ Mu (μ)

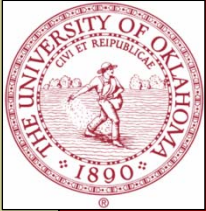
➤ μ_1

➤ - supraspinal mu receptors

➤ μ_2 spinal and GI distribution

➤ mediate respiratory depression and constipation





Opioid Receptors

Drugs and medications that activate mu receptors:

codeine

morphine

heroin

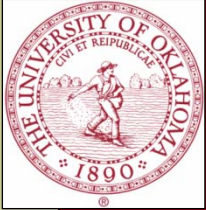
methadone

LAAM

hydromorphone

fentanyl

buprenorphine



General Opioid Pharmacology

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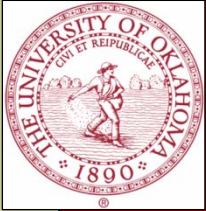
Opioid receptors

The functions of drugs at receptors

- full agonists
- partial agonists
- antagonists

Affinity and dissociation

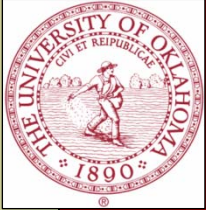
Repeated administration and withdrawal of opioid drugs



Opioid Pharmacology

- Opioids can exert their action as full agonists or as partial agonists (e.g., at the mu opioid receptor)





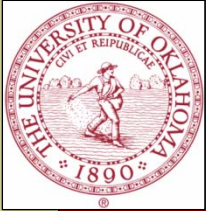
Full agonists:

Occupy the receptor and activate that receptor

Increasing doses of the drug produce increasing receptor-specific effects until a maximum effect achieved

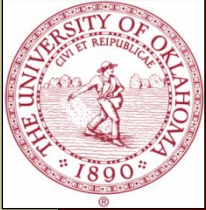
Most abused opioids are full agonists

Examples of full agonist opioids: heroin, LAAM, methadone, morphine



Partial agonists:

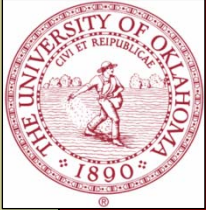
- Bind to and activate receptor
- Increasing dose does not produce as great an effect as does increasing the dose of a full agonist (less of a maximal effect is possible)
- Submaximal effect from maximally effective doses (“ceiling effect”)
- Examples: buprenorphine (mu partial agonist, kappa antagonist); other partial agonists include pentazocine (Talwin), butorphanol (Stadol), nalbuphine (Nubain)



Antagonists:

Functions of Drugs at Receptors

- Bind to but don't activate receptor (no intrinsic activity)
- Block the receptor from activation by full and partial agonists
- Examples: naloxone, naltrexone



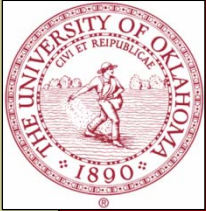
General Opioid Pharmacology

Opioid receptors

The functions of drugs at receptors

Affinity and dissociation

Repeated administration and
withdrawal of opioid drugs



Affinity and Dissociation

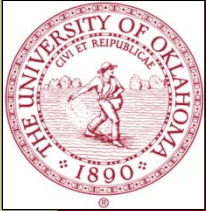
Affinity:

Strength with which a drug binds to its receptor

(Strength of binding is not related to activation or efficacy at the receptor)

Dissociation:

Speed (slow or fast) of disengagement or uncoupling of drug from the receptor



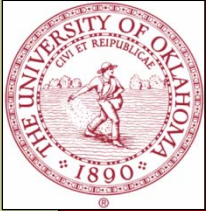
General Opioid Pharmacology

Opioid receptors

The functions of drugs at
receptors

Affinity and dissociation

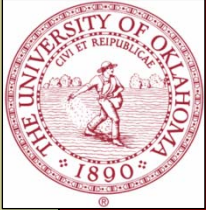
Repeated administration
and withdrawal of opioid
drugs



“Physical Dependence” = Tolerance and Withdrawal

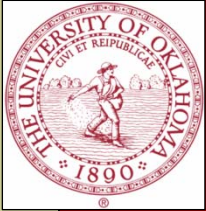
Repeated administration of opioids that activate the mu receptor results in dose-dependent physical dependence and *opioid tolerance*

Physical dependence and tolerance manifest as characteristic withdrawal signs and symptoms upon reduction or cessation of opioid use/administration (*the opioid withdrawal syndrome*)



What is opioid withdrawal?

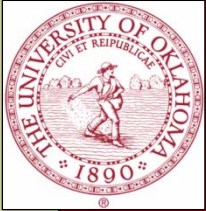
- What does it look like?
- The *opposite* of narcosis!
 - Agitation
 - Insomnia
 - Aches / hyperalgesia
 - Diarrhea
 - Midriasis (dilated pupils)



Keys to Withdrawal Management

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- Alcohol / Sedative Withdrawal is potentially life-threatening
- Opioid Withdrawal is uncomfortable, but not dangerous
- Opioid Addicts are exquisitely sensitive to subjective discomforts / don't tolerate them
- Cocaine Withdrawal is insignificant physiologically but can be significant psychiatrically
- Nicotine Withdrawal is common and treatable



Symptoms of Administration and Withdrawal

Opioid Administration

Lowered body temperature
Decreased blood pressure
Skin flushed & warm
Pupillary constriction
Constipation
Respiratory Depression
Decreased sex drive

Muscular relaxation

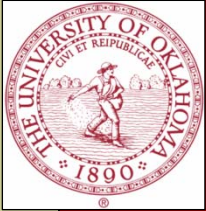
movements*
Nodding, stupor
Analgesia
Euphoria & calm

Opioid Withdrawal

Elevated body temperature
Increased blood pressure
Piloerection (“cold turkey”)
Tearing, runny nose
Diarrhea
Yawning, panting, sneezing
Spontaneous ejaculation & orgasms
Restlessness, involuntary twitching & kicking

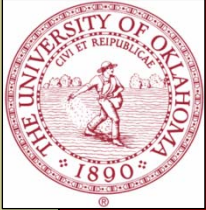
Insomnia
Pain & irritability
Depression & anxiety

*Probably the source of the expression, “kicking the habit”



Two Components to Opioid Withdrawal

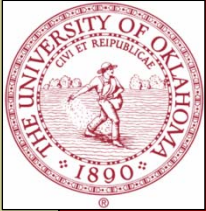
- *Affective Withdrawal:* tolerance in the DA-ergic mesolimbic reward system to cocaine (4+), stimulants (3+), and opioids (2+), cannabinoids (2+) and EtOH/sedatives (2+); nucleus accumbens is #1 site; withdrawal of agent leads to dysphoria and return to use
- *Autonomic Withdrawal:* tolerance in the NE-ergic locus coeruleus to opioids (4+), EtOH/sedatives (3+), and others (1+), leading to hi BP, HR, diaph, peristalsis, irritability when agent is withdrawn (rx with clonidine, B block)



Two types of opioid withdrawal associated with mu opioid agonists:

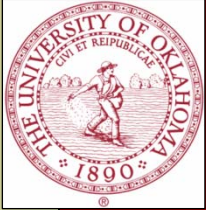
- Spontaneous withdrawal
- Precipitated withdrawal





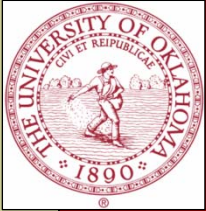
Addiction is only one of the Substance-Related Disorders

- Addiction (Substance Dependence)
- Problem Use (Substance Abuse)
- Intoxication States
- Withdrawal States
- Substance-Induced Medical Problems
- Substance-Induced Psychiatric Problems
- Health Problems linked to Secondary Use
- Codependency and ACOA Syndromes



Addiction is a bio-psycho-social-spiritual disease.

- Addiction affects biology, psychology, social functioning, and spirituality.
- Biology, psychology, socio-cultural variables, and spirituality affect addiction.

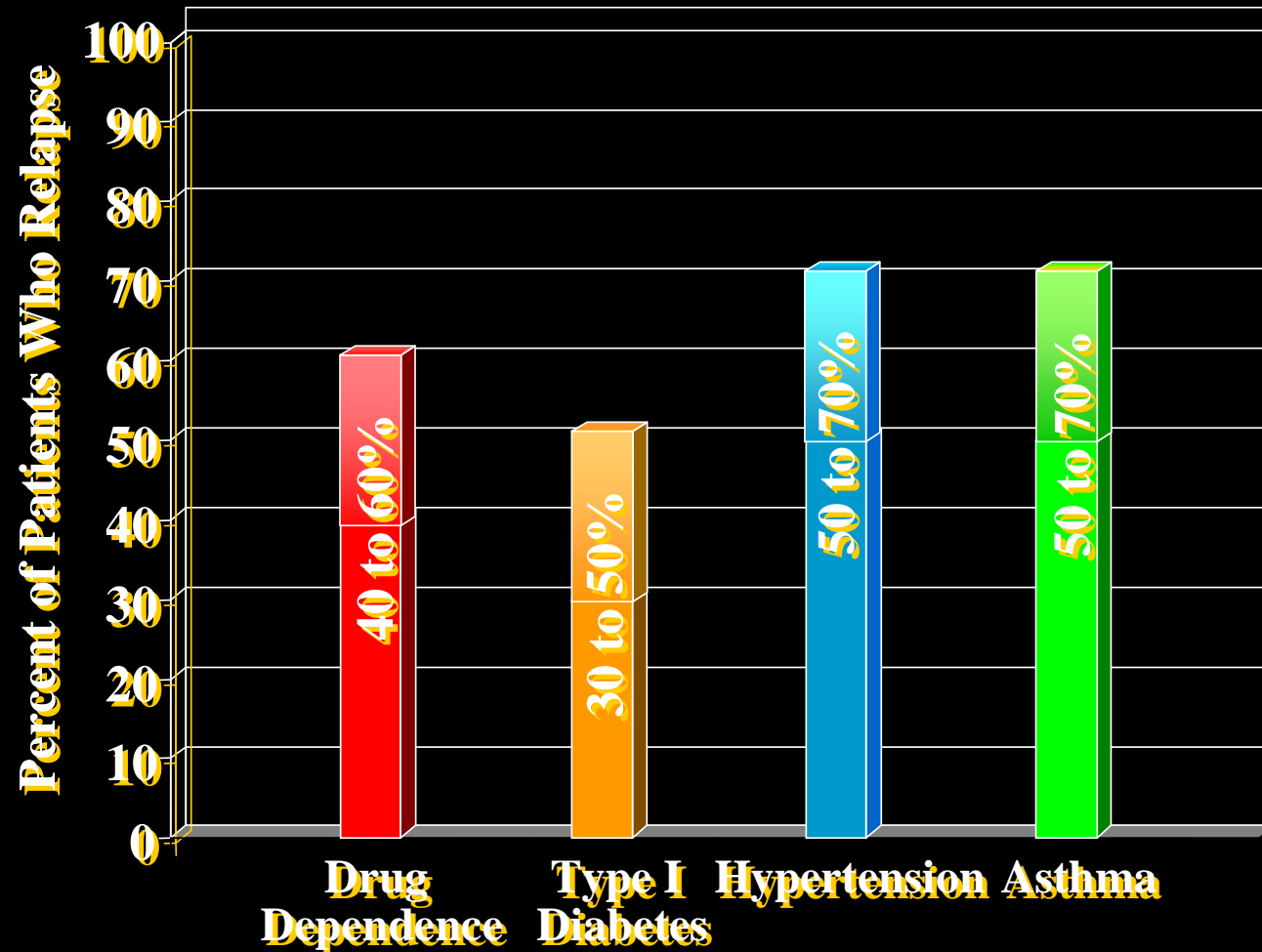


Addiction is a Chronic Disease

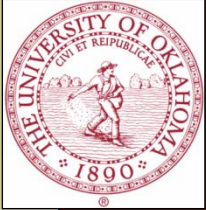
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Often Pediatric Onset
Usually Progressive,
Sometimes Fatal
Chronic Course:
Relapsing & Remitting

Relapse Rates Are Similar for Drug Dependence and Other Chronic Illnesses

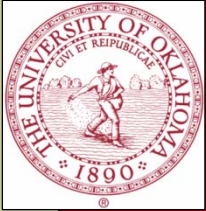


Source: McLellan, A.T. et al., JAMA, Vol 284(13), October 4, 2000.



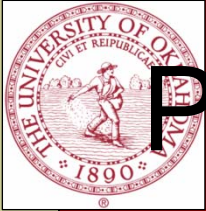
Loss of Control / Preoccupation

- **Impaired control means the inability to limit alcohol use or to consistently limit on any drinking occasion the duration of the episode, the quantity consumed, and/or the behavioral consequences of drinking.**
- **Preoccupation in association with alcohol use indicates excessive, focused attention given to the drug alcohol, its effects, and/or its use. The relative value thus assigned to alcohol by the individual often leads to a diversion of energies away from important life concerns.**



What does it feel like to be
opioid dependent?

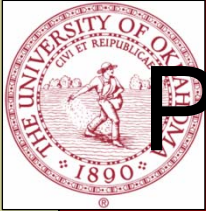
*...the daily roller-coaster of
occupied and un-occupied
opioid receptors*



PRESCRIPTION DRUG USE

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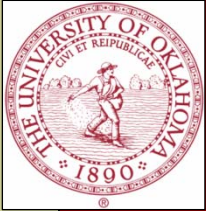




PRESCRIPTION DRUG USE

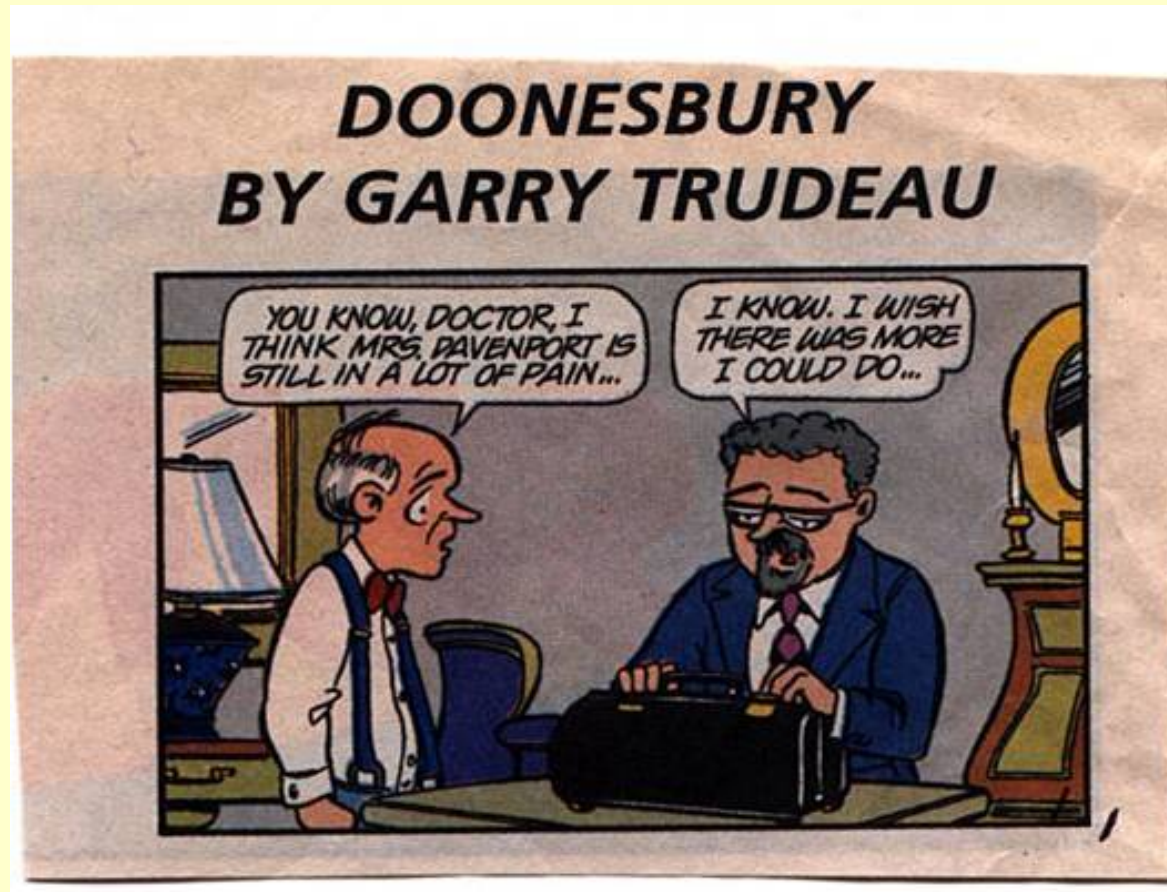
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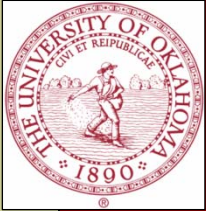




Prescription Drug Abuse

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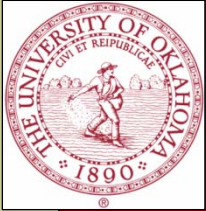




Prescription Drug Use

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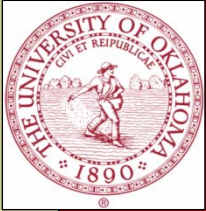




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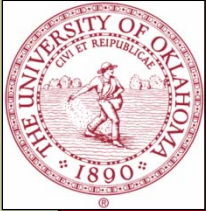




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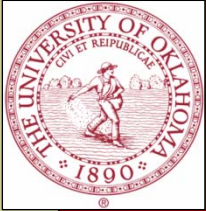




Prescription Drug Use

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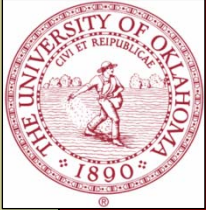




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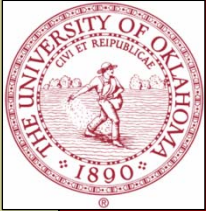
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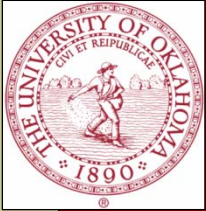
Prescription Drug Misuse/Addiction

- Vast majority of 'drug sources' are friends, *not* directly getting the drug from a 'medical source' or the Internet
- Physicians can be sources, if they are not disciplined in their prescription-writing
- No reason to give large supplies, multiple refills to anyone who is not a reliable, well-established patient.



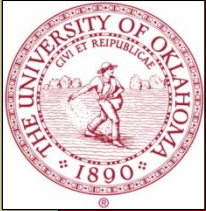
Emerging Trends in Substance Use and Addiction

- By 2002, half of cases of ‘drug abuse and dependence’ were cannabis-related, but ‘pain pills’ equaled cocaine as the #2 ‘drugs of abuse’, with 7 x as many persons having a substance-use disorder with prescription opioids (Schedule 2 & 3) vs. with heroin (Schedule I).



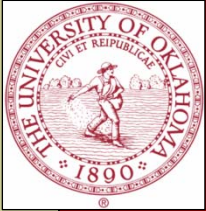
Prescription Opioids

- An estimated 4.7% of the US population misuse prescription opioid analgesics
- Non-medical use of these analgesics was associated with the largest number of new users than any other illicit drug category



Emerging Trends in Substance Use and Addiction

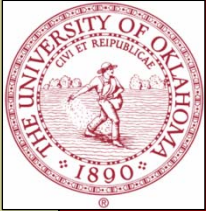
- Explosion in rates of ‘non-medical use’ of opioids: 3 x increase, 1995-2000.
- Opioid addiction had been relatively uncommon compared with alcohol and cocaine (heroin + Rx drugs among healthcare providers)—but prescription opioids have now outpaced heroin as the agents involved in opioid addiction.



Emerging Trends in Substance Use and Addiction

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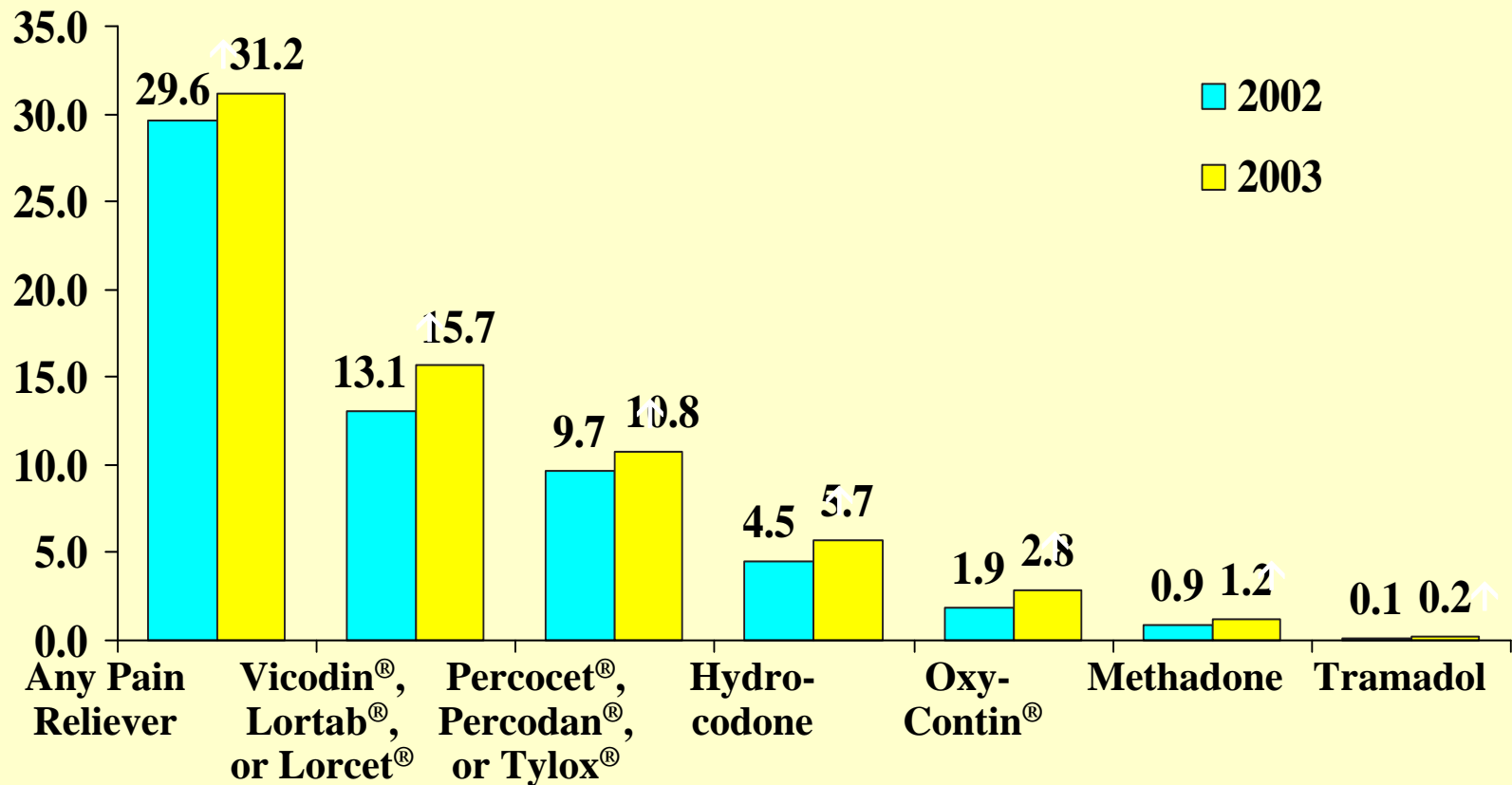
- Among 'prescription drugs' involved in 'non-medical use' (non-physician source or indication/dose/frequency different from what a physician intended), opioid far outpace sedative/hypnotics and stimulants.
- Among prescription opioids involved in opioid addiction, Vicodin far outpaces OxyContin—despite the media 'hype'.



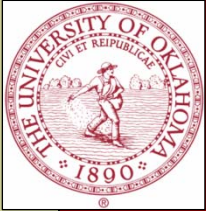
Lifetime Nonmedical Opiate Users Aged 12 or Older: 2002 and 2003

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Numbers of Lifetime Users (in Millions)



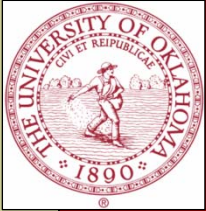
↑, ↓ = Significant change 2002 to 2003



DEATH RATES

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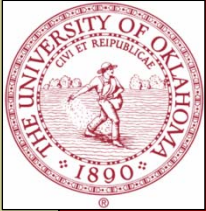
- Tobacco-----435,000
- Poor Diet-----365,000
- Alcohol-----85,000, this includes 22,000 toxic deaths
- Infection-----75,000
- MVA-----26,000
- Adverse reaction to Rx drugs—
32,000
- Suicide-----31,000



DEATH RATES

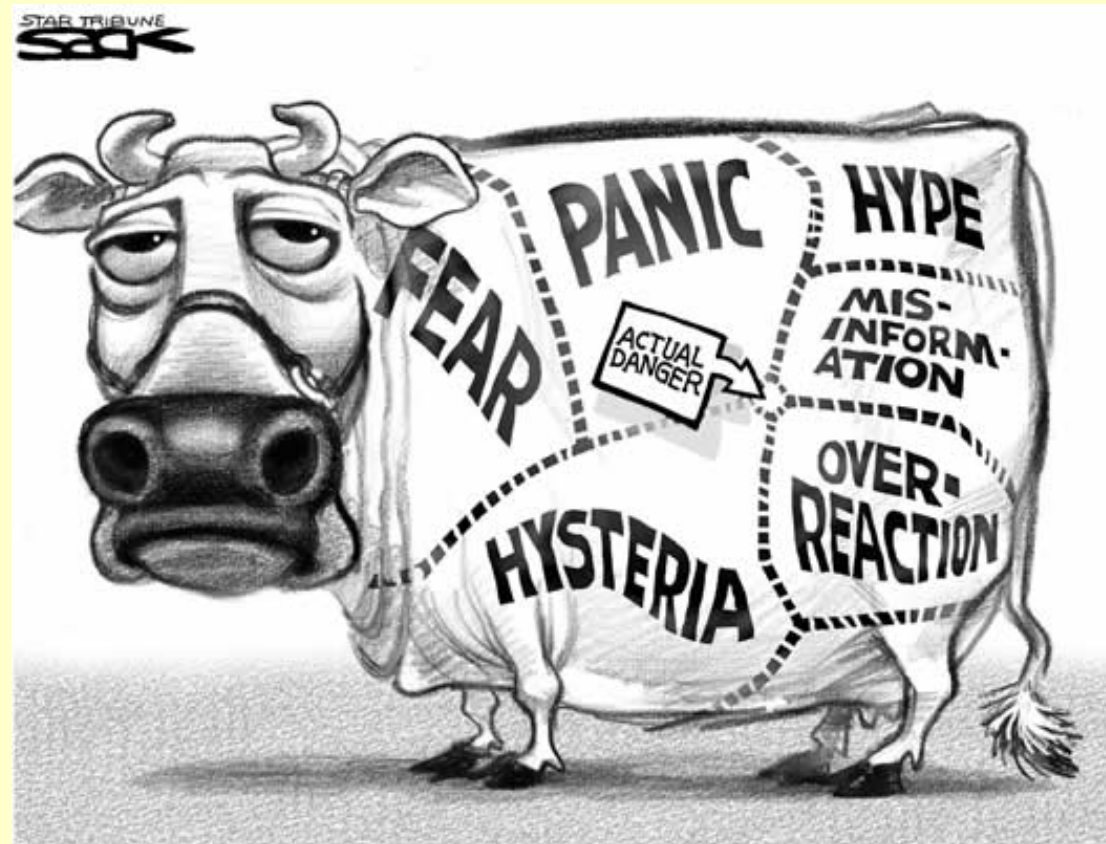
- Homicide-----20,300
- Sexual Behaviors-----20,000
- ALL ILICIT DRUG USE—17,000
- NSAIDS-----14,000
- Marijuana-----0????

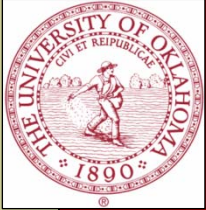




Prescription Drug Abuse

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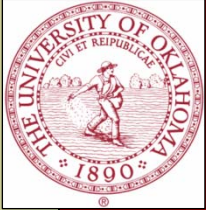




Addiction is Treatable

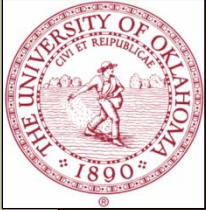
- But not via detox alone
- But not via acute interventions alone
- But not via treating psychiatric co-morbidities alone

- Compliance = for other chronic illnesses
- Outcomes = for other chronic illnesses



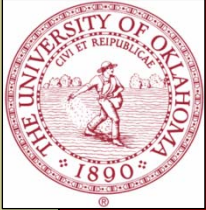
How is Opioid Addiction Treated?

- Behavioral Treatments (psychosocial rehab; individual counseling; CBT; office-based motivational enhancement or ‘brief interventions’)
- Pharmacological Treatments
 - Antagonist maintenance with naltrexone
 - Agonist maintenance with methadone or buprenorphine
- Non-professional (peer) Interventions (N.A.)



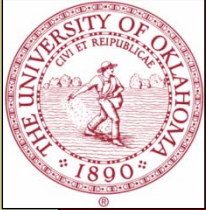
Standard Treatment Components

- Milieu therapy
- General alcoholism counseling
- Educational lectures and films
- Introduction to and Referral to Alcoholics Anonymous



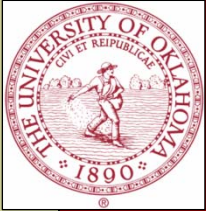
Outpatient Treatment

- Admission criteria:
 - Absence of serious health or psychiatric problems
 - Drug withdrawal completed
 - Social support system is available
 - Ability to abstain from mood altering drugs and alcohol



Treatment of Addiction

- **What are the treatment goals for a chronic disease?**
- Decrease frequency of relapses
- Decrease severity of relapses
- Increase duration of remission
- Optimize level of function during remissions

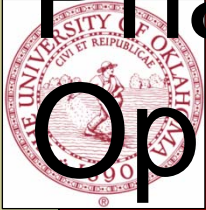


Motivational Interviewing

- Identify what the patient wants
- Identify what you want
- Try to get the patient's goals and the therapist's goals to align



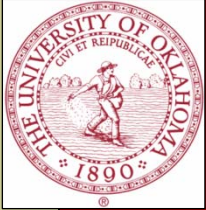
Pharmacotherapy for Opioid Addiction:



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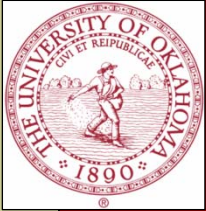
Maintenance Treatment with Methadone or Buprenorphine





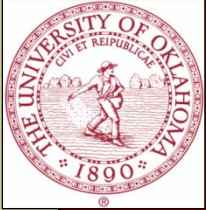
Opioid Dependence Treatment Goals

- Suppress withdrawal
- Minimize/eliminate craving for opioids
- Block or attenuate euphoric effect of exogenous opioids
- Improve functional status in all spheres of life



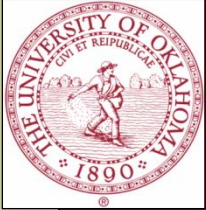
Opioid pharmacotherapy, summary:

- Methadone and buprenorphine are approved by the FDA for treatment of opiate dependence [LAAM is off the market]
- The best evidence so far supports maintenance; staying on maintenance gives better results than discontinuation
- Discontinuation attempts should have maintenance as a back-up in case of relapse.
- When detoxification is chosen (as a prelude to 'drug-free' rehab), maintenance should be considered as a back-up strategy in case abstinence cannot be established.



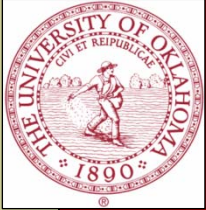
Opioid Agonist Treatment

- Rationale
 - Cross-tolerance
 - prevent withdrawal
 - relieve craving for opioids
 - Narcotic blockade
 - block or attenuate euphoric effect of exogenous opioids



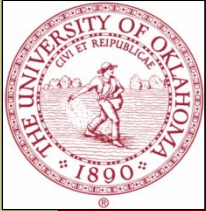
Methadone

- For maintenance or detoxification must be prescribed through a federally and state licensed facility
- Starting dose 30mg
 - May give an additional 10mg first 24 hours
 - Maintenance doses vary 40 – 200mg a rough range
- A physician may continue to administer methadone for a patient during a hospitalization



METHADONE

- Blocking effect on euphoria
- Blocking effect on withdrawal
- Relieves craving
- Relatively stabilizes brain function
- Decreases stress on HPA system
- Improves mood and behavior

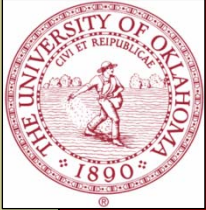


Efficacy of Methadone Maintenance

Results - given a population of 200
Heroin addicts who enter MMT

- 135 or 67% will reduce illicit use
- 122 or 61% will reduce HIV risk behaviors
- 170 or 85% will reduce their drug related criminal behaviors

Marsh, Addiction 93(4) 1998



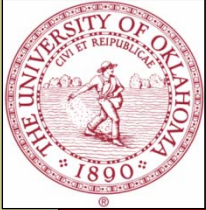
Efficacy of MMT

- Death rates reduced three times in comparison
- Reduction in HIV seroconversion from 50% to 2.5%
- Similar reduction in hepatitis C



Legislation: DATA 2000 Drug Addiction Treatment Act

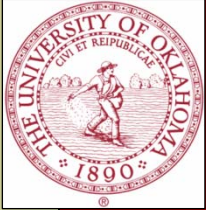
- Until this law was passed, the only exception to the Harrison Act of 1914 was federally-licensed methadone clinics (opioid treatment programs, OTP's)
- DATA 2000 permitted qualified physicians to obtain a waiver to treat opioid addiction with Schedule III, IV, and V narcotic drugs
 - Medications must be approved by the FDA for that indication
 - Medications may be prescribed or dispensed



Legislation: DATA 2000

- Medications Approved by FDA 10/8/02 for use in the treatment of opioid dependence:
- Subutex C-III 2mg, 8mg sublingual tablet
 - Buprenorphine HCl
- Suboxone C-III 2 / 0.5mg, 8 / 2mg sublingual tablet
 - Buprenorphine HCl and naloxone HCl dihydrate (4:1 ratio)

RBP 5/2006



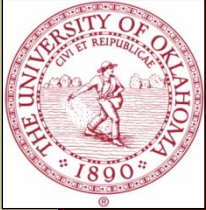
Overview

Buprenorphine a thebaine derivative

High potency

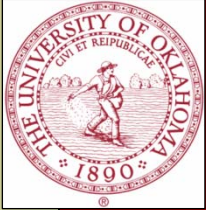
Available as a parenteral analgesic
(Buprenex ®)

Produces sufficient agonist effects to
be detected by the patient



Buprenorphine

- Partial mu agonist with high affinity
 - Will displace any other mu agonist precipitating withdrawal
- Buprenex[®] - injectable form - only indication is for analgesia
- Subutex[®] – 2 & 8mg sublingual tablets
- Suboxone[®] – Buprenorphine/naloxone combination 2/0.5mg & 8/2mg sublingual tablets

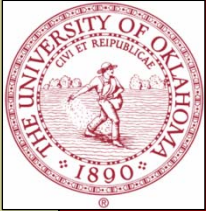


Summary

Buprenorphine is a partial mu agonist opioid

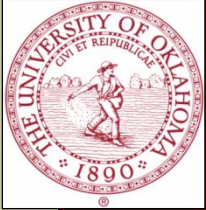
Profile of effects similar to other mu agonist opioids, but less risk of respiratory depression, lower level of physical dependence

Can be abused, but combination with naloxone decreases abuse potential



Buprenorphine

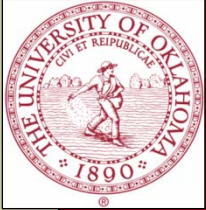
- S.L. products are Schedule III
- To prescribe Subutex® and Suboxone® for detoxification or opiate agonist maintenance a provider must have a waiver through the Drug Enforcement Agency and CSAT
 - Must complete an 8 hour training session then apply for the waiver – given a second DEA number



Intrinsic Activity

- Buprenorphine produces clinical effects similar to those of full agonists (e.g., analgesia, sedation, miosis)
- Maximal effect is lower than that of a full opioid agonist
- Buprenorphine can substitute for a full opioid agonist and alleviate symptoms of withdrawal

RBP 5/2006



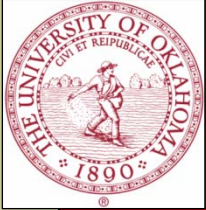
Affinity and Dissociation

Buprenorphine has:

high affinity for mu opioid receptor

–competes with other opioids and blocks their effects

slow dissociation from mu opioid receptor –prolonged therapeutic effect for opioid dependence treatment

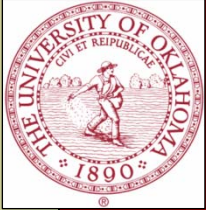


Bioavailability

Good parenteral
bioavailability

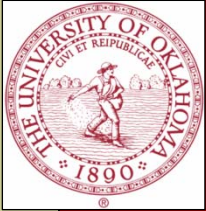
Poor oral bioavailability

Fair sublingual
bioavailability



Abuse Potential

- Buprenorphine is abusable
(epidemiological, human laboratory studies show)
- Diversions and illicit use of analgesic form (by injection)
- Relatively low abuse potential compared to other opioids

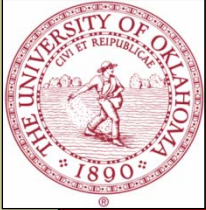


Attenuation of the potential for misuse: Combo of Buprenorphine plus Naloxone

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Combination tablet containing buprenorphine with naloxone – if taken under tongue, predominant buprenorphine effect

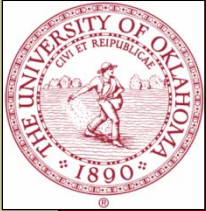
If ‘opioid dependent person’ (active case of physical dependence to opioids) dissolves and injects buprenorphine/naloxone tablet – predominant naloxone effect (and precipitated withdrawal)



Diversion and Misuse

The sublingual form of buprenorphine/naloxone combination can be diverted

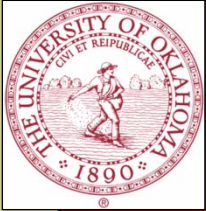
Naturalistic observation: diversion is to persons who want to self-medicate withdrawal and diminish/abort illicit opioid use comfortably, vs. who want to feel the effects of buprenorphine as a (partial) mu agonist



Most Common ($\geq 5\%$) Adverse Events in a 4-week Study

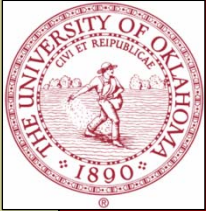
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	SUBOXONE 16 mg/day	SUBUTEX 16 mg/day	Placebo
Adverse Events	n = 107	n = 103	n = 107
Headache	39 (36.4%)	30 (29.1%)	24 (22.4%)
Withdrawal Syndrome	27 (25.2%)	19 (18.4%)	40 (37.4%)
Pain	24 (22.4%)	19 (18.4%)	20 (18.7%)
Nausea	16 (15.0%)	14 (13.6%)	12 (11.2%)
Insomnia	15 (15.0%)	22 (21.4%)	17 (15.9%)
Sweating	15 (14.0%)	13 (12.6%)	11 (10.3%)



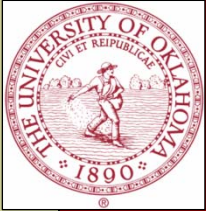
Safety

- Intravenous use, likely in combination with benzodiazepines or other CNS depressants, has been associated with significant respiratory depression and death
- Suboxone has potential for abuse and produces dependence of the opioid type with a milder withdrawal syndrome than full agonists
- Cytolytic hepatitis and hepatitis with jaundice have been observed in the addicted population receiving buprenorphine



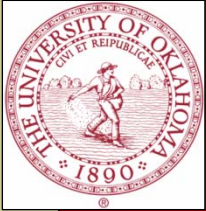
Overview

- Buprenorphine is a prescription drug
- In its sublingual (placed under the tongue) form—the trade names are Suboxone and Subutex—it is indicated for the treatment of opioid dependence and opioid withdrawal
- It is a maintenance treatment for opioid addiction akin to methadone
- Primary care physicians need to be familiar with this safe, effective evidence-based treatment of addiction



Suboxone

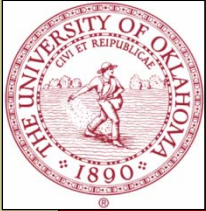
- Yes, this is a drug that is used to treat drug addiction!
- Yes, maintenance treatment using opioid agonists produces a state of tolerance (“physical dependence”)
- No, maintenance treatment using opioid agonists *does not produce addiction.*



Results of Suboxone treatment

- Patient is not in withdrawal
- Patient is not in pain
- Patient is not sedated
- Patient is no longer craving
- Patient is no longer seeking and using
- Many patients experience stabilization of mood and anxiety when on Suboxone
- *Most patients and family members spontaneously report they feel 'normal' again and that they have their lives back!*



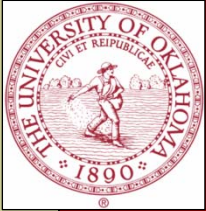


Factors in Tx Success

- Adequate dose of pharmacotherapy
- Adequate dose of psychosocial therapy

Psychosocial Services are essential!

‘Wrap-around Services’ are wonderful!



OU School of Community Medicine

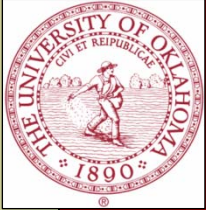
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- As of 12/31/10 had treated 142 unique patients at OU-Tulsa IMED clinic
- As of 12/31/10 there were still 91 active patients being treated.
- Of the 51 patients not retained, 12 patients were drug free off Suboxone. 6 patients were dismissed, 4 patients returned to pain management, 7 were known to have relapsed, and 22 were lost to follow up.



OU School of Community Medicine

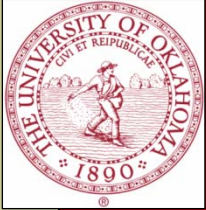
- Most were going to therapy or 12 step
- Over 85% were either employed or full time students
- If assumed that the 22 lost to follow up have relapsed, then with the 91 active, and the 12 off the medication, then 103 of 142 or 72.5% “positive” outcome
- Long term data to follow.



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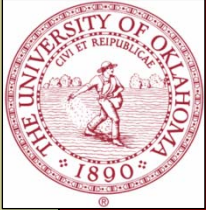
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- Of the 91 patients still in the program, the range of time in the program was between 4 weeks and 5 years.
- 6 reported “slips” while on Suboxone
- Over 80% reported high level of function
- Most common drugs of abuse was hydrocodone and/or oxycodone, but heroin on upswing.



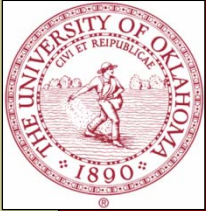
How is Opioid Addiction Treated?

- Behavioral Treatments (psychosocial rehab; individual counseling; CBT; office-based motivational enhancement or ‘brief interventions’)
- Pharmacological Treatments
 - Antagonist maintenance with naltrexone
 - Agonist maintenance with methadone or buprenorphine
- Non-professional (peer) Interventions (N.A.)



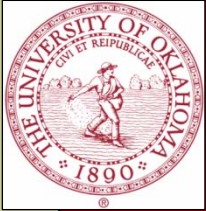
Treatment of Addiction

- **What are the treatment goals for a chronic disease?**
- Decrease frequency of relapses
- Decrease severity of relapses
- Increase duration of remission
- Optimize level of function during remissions



Benefits of Office-Based Treatment

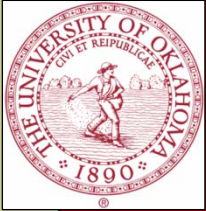
- Private, confidential, and safe treatment provided in a doctor's office
- Allows for continuity of care with primary physician
- Does not require daily visits to a clinic or out-of-town, costly residential treatment
- May allow more patient time for work, family and other activities



Buprenorphine as a response to emerging trends in opioid use/addiction

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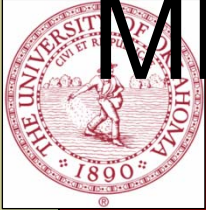
- Opioid addiction used to be heroin addiction (IVDU, 'street people'), treated with methadone maintenance + / - psychosocial rehab, or via 'drug-free' methods (with high relapse rates)
OR
- Health care professionals, treated with monitoring contracts and naltrexone
- When Suboxone was introduced, people spoke of treatment of 'middle class addicts'



Buprenorphine as a response to emerging trends in opioid use/addiction

Patients presenting for treatment with Suboxone do seem to be a 'new population':

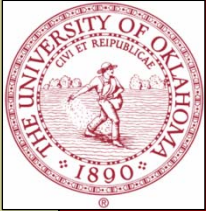
- Younger
- Prescription drug use
- If heroin, it's nasal use
- *Never in addiction treatment system before*



MEDICAL TREATMENTS FOR ALCOHOLISM

- Disulfiram(antabuse)
- Naltrexone(Revia, Vivitrol)
- Acamprosate(Campral)
- Toprimate(Topamax)

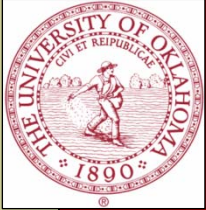




ANTABUSE

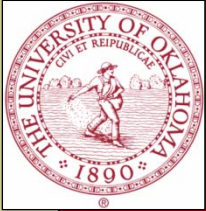
- Inhibits enzyme acetaldehyde DH, which can cause toxins to accumulate
- When used with alcohol, leads to nausea, dizziness, headache, flushing, and tachycardia
- Pavlovian negative reinforcement





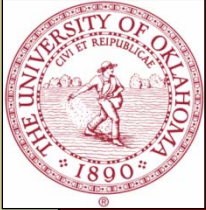
ANTABUSE

- Poorly tolerated
- Best used for motivated individuals after standard treatment
- No evidence that it increases abstinence, but may decrease drinking days.



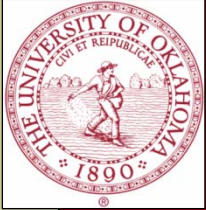
NALTREXONE

- Blocks alcohol reward pathways
- Once a month injectable form(Vivitrol) seems to work best. Costs around \$700 per month
- Increases probability of abstinence
- Decreases drinking and heavy drinking in non abstinent patients



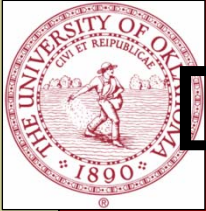
ACAMPROSATE

- Multiple sites of action in brain. Primarily in limbic NMDA receptor areas of lower brain
- European studies show efficacy, but US studies have been disappointing.
- Requires three times per day dosing
- Safe, except in renal failure.



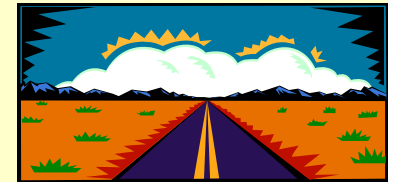
TOPAMAX

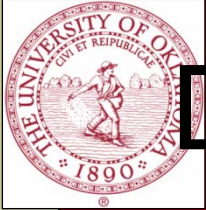
- Anti convulsant and mood stabilizer
- May reduce cravings
- Evidence shows fewer drinks per day, fewer drinking days, and some increased abstinence
- Once a day bedtime dosing
- Relatively well tolerated.



DRUGS ON THE HORIZON

- Baclofen, which is a GABA agonist, like alcohol has shown some promise in reducing alcohol craving and use.
- Ondansetron, an anti nausea drug, works through serotonin system, may have some potential in alcoholism and possibly opioid addictions.

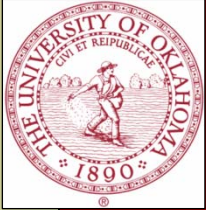




DRUGS ON THE HORIZON

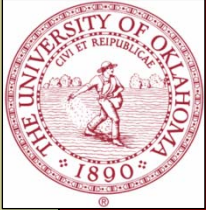
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- Modafinil, or Progovil, shows some promise in amphetamine addiction
- Another GABA agonist GVG shows some promise with alcohol
- Memantine a drug used for cataplexy and experimentally fibromyalgia, shows some promise with alcohol, opioid, and cocaine addiction



SUMMARY

- Chemical addiction can be viewed as a “chemical imbalance” much as we previously prescribed depression and other mental disorders.
- Given this neurochemical distortion that is either previously present in the addict brain or develops, chemical interventions make sense.



SUMMARY

- These medications can potentially decrease cravings, drug seeking, and improve mood, in those individuals that are motivated to change.
- The use of these medications will may require changes in our approach to treatments.