

MEDICATION ASSISTED TREATMENT FOR OPIOID ADDICTION

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Program Administrator

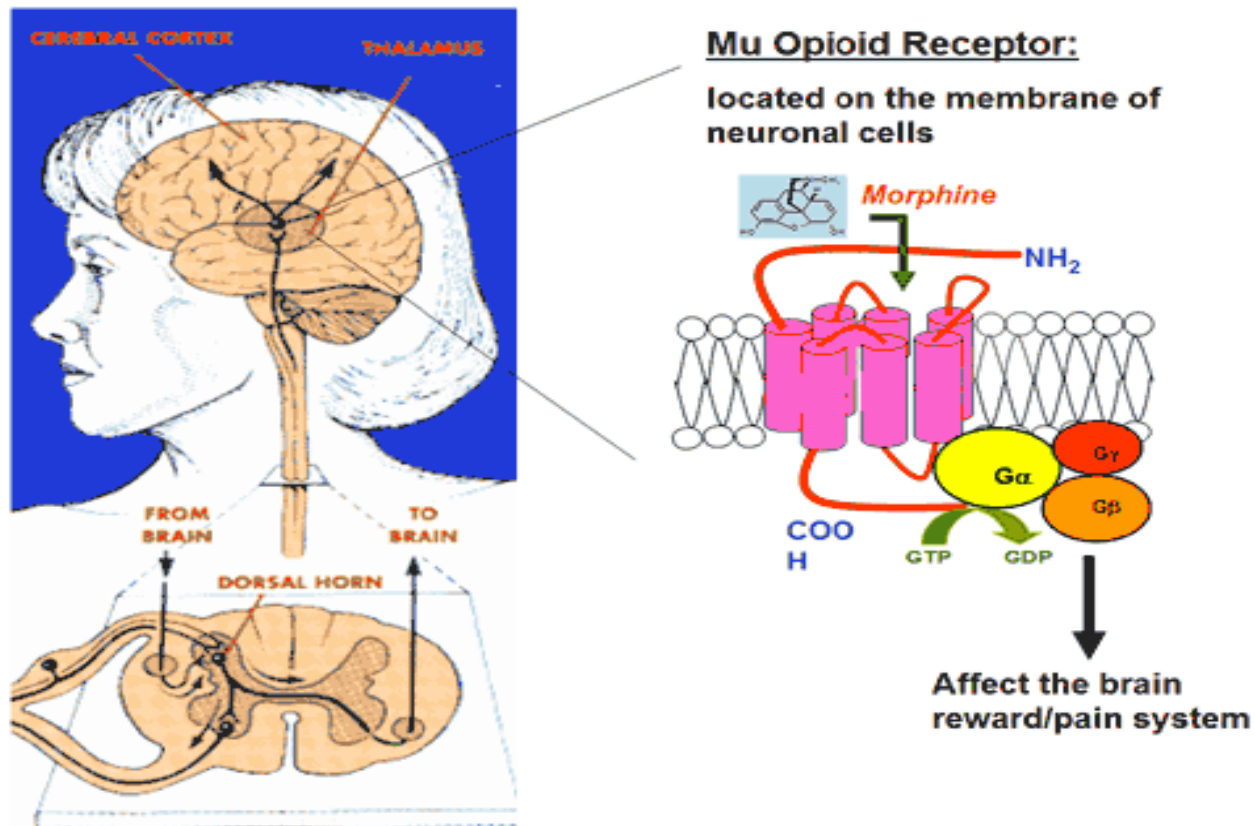
State Opioid Treatment Administrator

Kentucky Division of Behavioral Health

OBJECTIVES

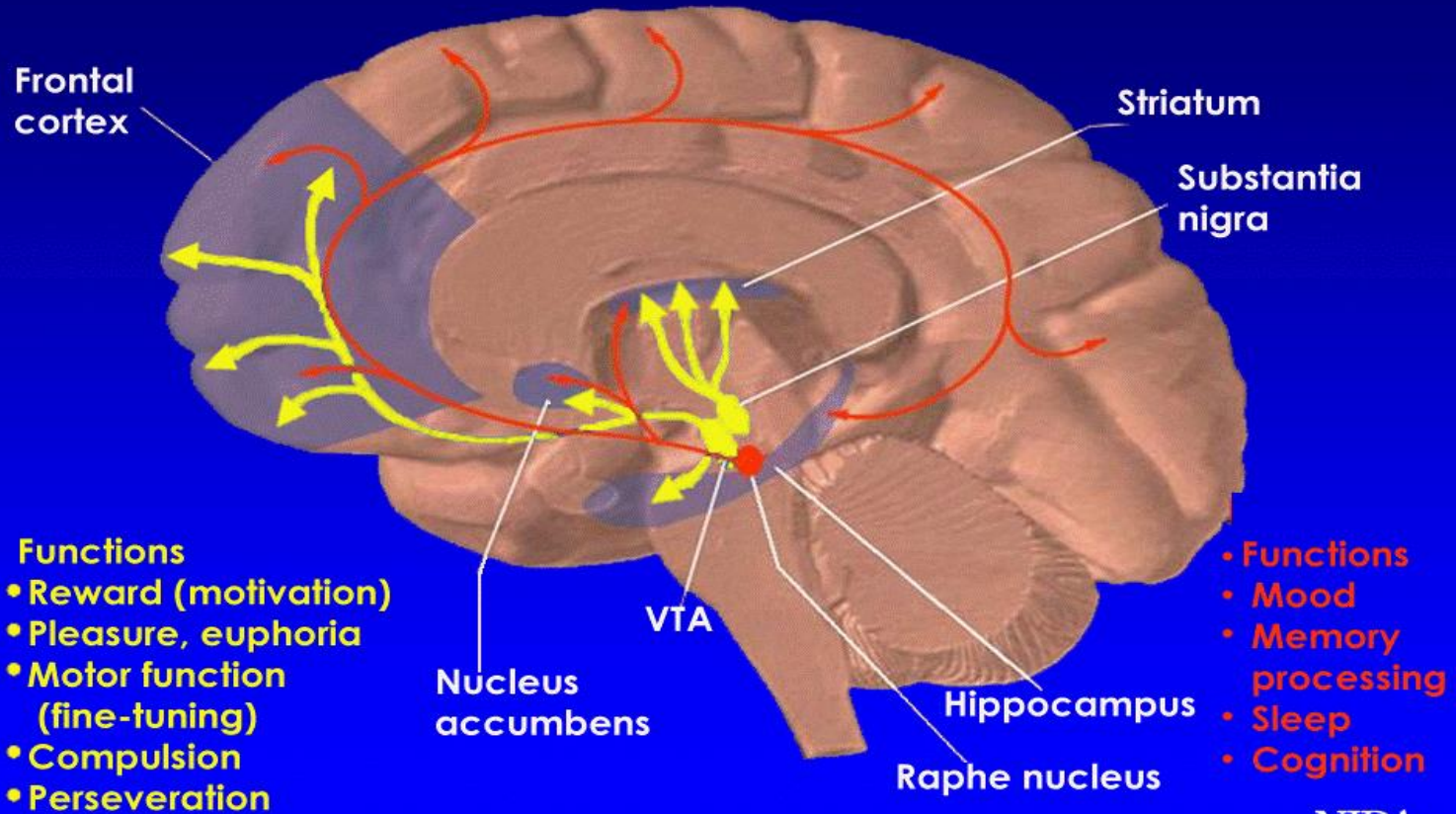
- ❖ Learn about types of opioids and associated withdrawal symptoms
- ❖ Learn what medications are available to treat opioid addiction
- ❖ Understand the pros and cons associated with each medication
- ❖ Understand the risks and benefits of utilizing these medications during pregnancy

Addiction – “ A brain disease, not a social dysfunction”. Green light, Red light responses.



Dopamine Pathways

Serotonin Pathways



Short Definition of Addiction

- Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is characteristic biological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.
- Addiction is characterized by inability to consistently abstain, impairment in behavioral control, craving, diminished recognition of significant problems with one's behaviors and interpersonal relationships. Without treatment or engagement in recovery activities, addiction is progressive and can result in disability or premature death.
- Source: American Society of Addiction Medicine (ASAM)

OPIOID ADDICTION AND TREATMENT

- ❖ Opioids-effects and withdrawals
- ❖ Methadone
- ❖ Buprenorphine-Suboxone and Subutex
- ❖ Naltrexone

OPIOIDS

- ❖ Naturally occurring from opium (opiate)-
 - morphine, codeine, and thebaine
- ❖ Semi-synthetics (opiate)-
 - Morphine-heroin, MS Contin
 - Codeine-Vicodin, Lortab, Oxycodone, Percoset, Tylox, Oxycontin
 - Thebaine-Not used therapeutically, but converted into Naloxone, Naltrexone, Buprenorphine
- ❖ Fully-synthetic (opioid)-
 - Methadone, Fentanyl, Darvon

IMPACT OF OPIOIDS ON PHYSICAL HEALTH

- ❖ Drowsiness
- ❖ Constipation
- ❖ Depression of CNS
- ❖ Physical dependence and addiction
- ❖ Infections and collapsed veins

PHYSICAL IMPACT CONT.

- ❖ Liver or kidney disease
- ❖ Damage to vital organs
- ❖ Hyperalgesia
- ❖ HIV and Hepatitis C
- ❖ Fatal overdose

IMPACT OF OPIOID ADDICTION ON EMOTIONAL, SOCIAL, AND FAMILY

- ❖ Decrease/cease self care and ADL's
- ❖ Increase in criminal behavior
- ❖ Loss of job, school difficulties
- ❖ Depression, anxiety
- ❖ Dishonesty, lack of trust

EMOTIONAL/SOCIAL IMPACT CONT.

- ❖ Less quality time with family
- ❖ Lose/harm relationships
- ❖ Compromise personal values
- ❖ Engage in high risk behaviors
- ❖ Financial burden to community

OPIOID WITHDRAWAL SYMPTOMS

- ❖ Abdominal pain
- ❖ Agitation
- ❖ Diarrhea
- ❖ Dilated pupils
- ❖ Goose flesh
- ❖ Nausea
- ❖ “The leaks”

WITHDRAWAL SYMPTOMS CONT.

- ❖ Involuntary leg movements
- ❖ Restlessness
- ❖ Runny nose
- ❖ Sweating
- ❖ Vomiting
- ❖ Bone and joint pain

OPIOID WITHDRAWAL

- ❖ Peak between 48 and 72 hours after last dose.
- ❖ Feels like terrible flu.
- ❖ Typically subsides after about 1-2 weeks.
- ❖ Can show persistent withdrawal symptoms for months.
- ❖ Less dangerous than alcohol, but for those in poor health can be fatal.

METHADONE

- ❖ Developed on the battlefield in WWII Germany for pain relief.
- ❖ Schedule II narcotic
- ❖ Long acting opioid analgesic (24-36 hours)
- ❖ Full mu opioid agonist-binds and activates creating a “Blocking Effect”.

METHADONE

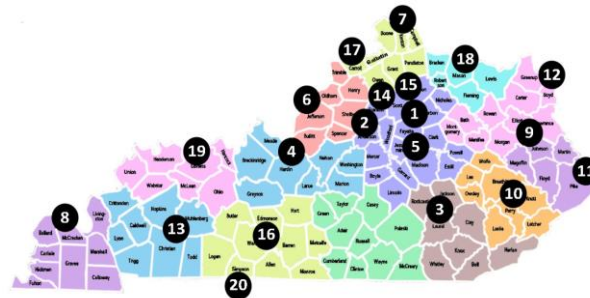
- ❖ Long half-life (12-59 hours)
- ❖ Administered orally- always in liquid form
- ❖ National average dose is 80 milligrams

METHADONE TREATMENT

- ❖ Medication is only one component (wrap around services)
- ❖ Detoxification v. Maintenance (MMT)
- ❖ Opiate Treatment Programs
 - Overview of average OTP
 - Federal and State regulations
 - Kentucky's programs

Kentucky Opioid Treatment Programs

Kentucky Opioid Treatment Programs



- | | | |
|---|---|---------------------|
| ① | Narcotics Addiction Program/bluegrass.org | Bus: (859) 977-6080 |
| ② | Center for Behavioral Health Kentucky Inc | Bus: (502) 894-0234 |
| ③ | Corbin Professional Associates | Bus: (606) 526-9348 |
| ④ | E-town Addiction Solutions, LLC | Bus: (270) 234-8180 |
| ⑤ | Associates, Lexington Professional | Bus: (859) 276-0533 |
| ⑥ | MORE Center/Methadone/Opiate Rehab. & Ed | Bus: (502) 574-6414 |
| ⑦ | Northern Kentucky Clinic, LLC | Bus: (859) 360-0250 |
| ⑧ | Paducah Professional Associates | Bus: (270) 443-0096 |
| ⑨ | Paintsville Professional Associates | Bus: (606) 789-6966 |
| ⑩ | Perry County Treatment Services | Bus: (606) 487-1646 |
| ⑪ | Center, Pikeville Treatment | Bus: (606) 437-0047 |
| ⑫ | Ultimate Treatment Center | Bus: (606) 393-4632 |
| ⑬ | Western Kentucky Medical | Bus: (270) 887-0130 |
| ⑭ | Center for Behavioral Health Inc. Frankfort | Bus: (502) 352-2111 |
| ⑮ | Georgetown Medical, LLC* | Bus: (502) 868-0664 |
| ⑯ | Center for Behavioral Health, Bowling Green | Bus: (270) 782-2100 |
| ⑰ | Carroll Counseling – Carrollton* | Bus: (502) 732-3070 |
| ⑱ | Maysville Medical LLC* | Bus: (606) 564-0303 |
| ⑲ | Daviess Treatment Services* | Bus: (270) 685-5029 |
| ⑳ | Simpson Treatment Center* | Bus: (270)-253-3078 |

* Indicates a Medication Station

Overdose deaths in Kentucky attributed to the use of heroin



Source: Kentucky Medical Examiner

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Drug overdose rate by county

Annual average rate of drug overdose deaths among Kentucky residents

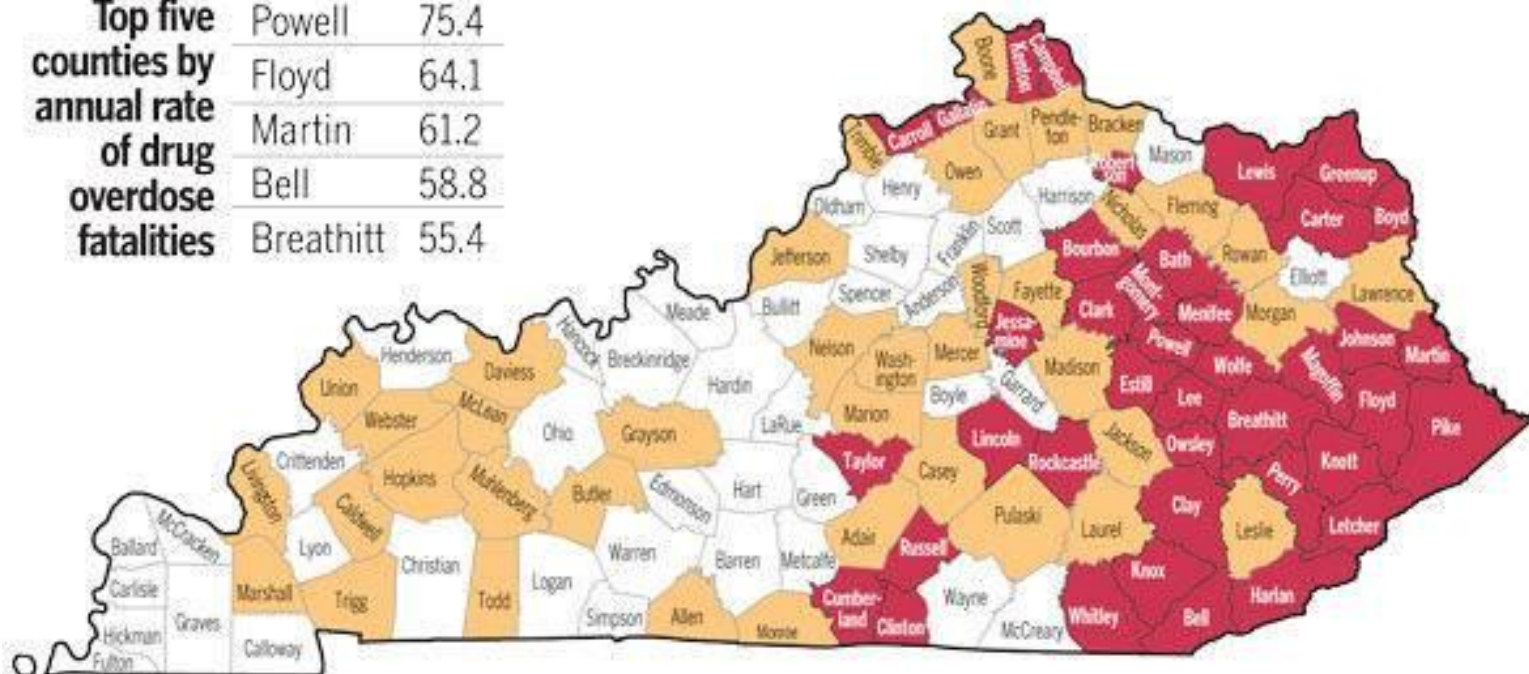
per 100,000 population

0.0 - 13.1

13.2 - 23.5

24.1 - 75.4

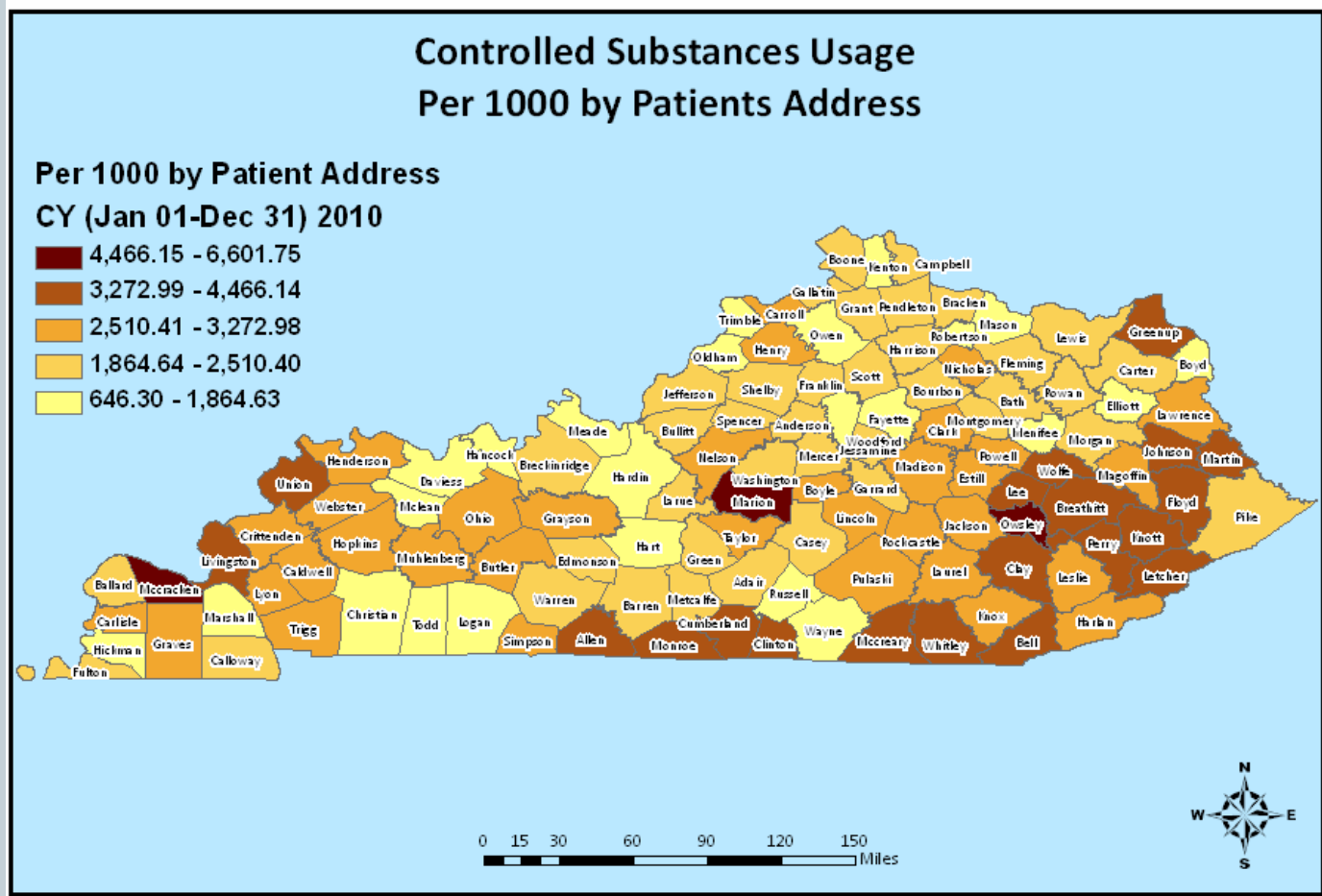
Top five counties by annual rate of drug overdose fatalities	County	Rate
	Powell	75.4
	Floyd	64.1
	Martin	61.2
	Bell	58.8
	Breathitt	55.4



Source: Drug Overdose Morbidity and Mortality in Kentucky, 2000-2010

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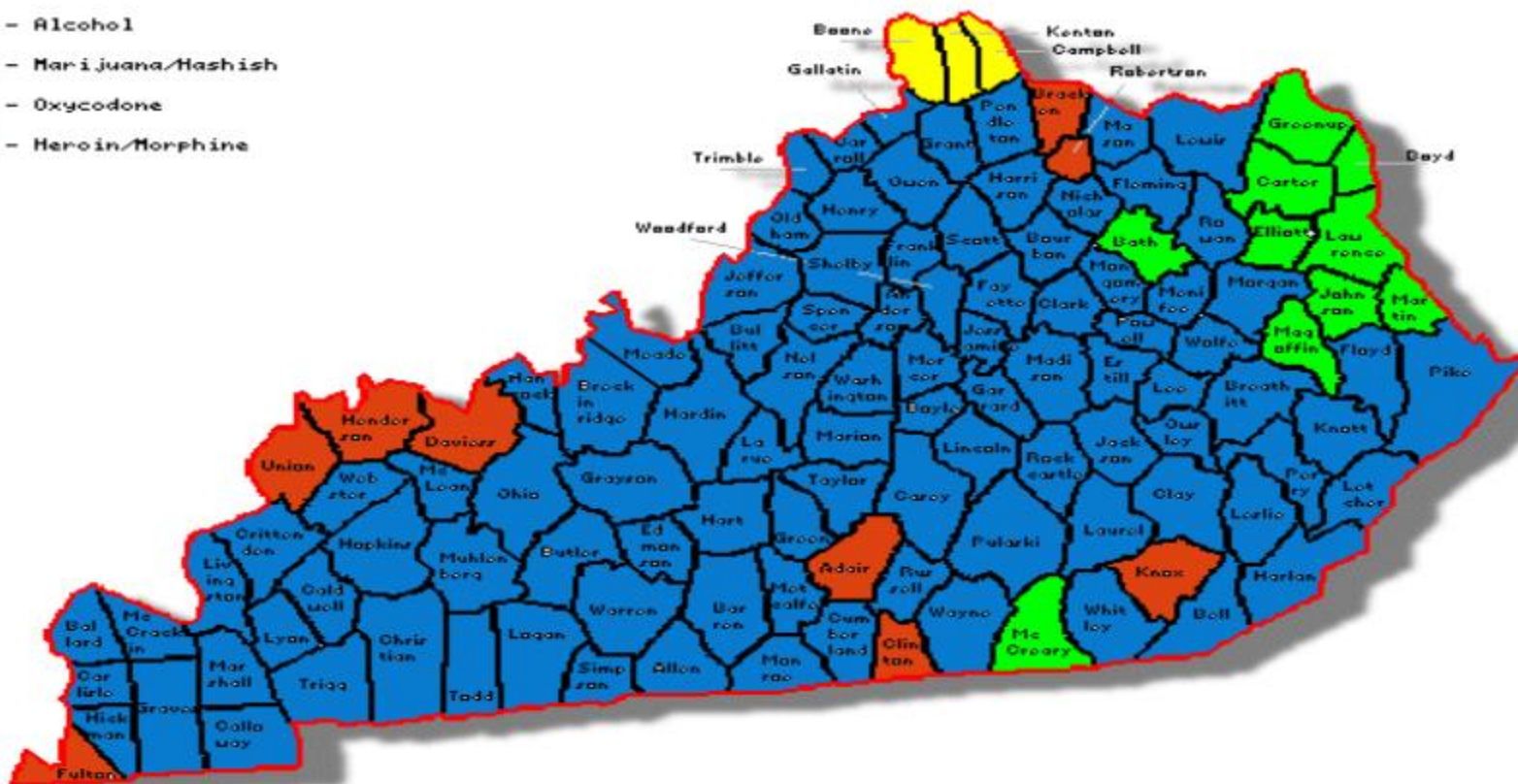
Kentucky Counties in Crisis



Map created by Phil Rosell, HSSMB

1/11/2011

- - Alcohol
- - Marijuana/Hashish
- - Oxycodone
- - Heroin/Morphine



METHADONE BENEFITS

- ❖ Right dose does not cause euphoric or tranquilizing effects.* This does not apply to opiate naïve individuals.
- ❖ Reduces/blocks effects of other opiates.
- ❖ Tolerance is slow to develop.

METHADONE BENEFITS

- ❖ Relieves cravings.
- ❖ Allows the individual to feel “normal”.
- ❖ Improved employment status and family relationships.

METHADONE BENEFITS

- ❖ Decrease in criminal activities.
- ❖ Decrease in high risk behaviors such as IVDU
= decrease in HIV and Hep. C.
- ❖ Improved health and health care.

METHADONE LIMITATIONS

- ❖ Increased risk when combined with other drugs. (Benzodiazapines)
- ❖ Can only be dispensed/administered through an OTP.
- ❖ Private can be expensive.
- ❖ Heavily regulated, lots of rules, can be time consuming.

METHADONE LIMITATIONS

- ❖ Abuse liability and diversion
 - Use by pain management programs
 - Opiate naïve users
- ❖ Associated health complications
 - torsade de pointes-QT prolongation, arrhythmia - ventricular tachycardia

BUPRENORPHINE (SUBOXONE)

“Overcoming Dependence”

BUPRENORPHINE

- ❖ Drug Addiction Treatment Act of 2000
- ❖ In 2002, two forms were FDA approved- Subutex and Suboxone, both made by Reckitt-Benckiser.
- ❖ Schedule III narcotic
- ❖ Opioid analgesic with effects up to 6 hours.

BUPRENORPHINE

- ❖ Partial mu opioid agonist (ceiling effect)
- ❖ Long half-life (24-60 hours)
- ❖ Administered as sublingual tablet
 - Subutex- 2 mg or 8 mg buprenorphine
 - Suboxone- 2 mg bup + .5 mg naloxone
8 mg bup + 2 mg naloxone

SUBUTEX

- ❖ Contains Buprenorphine only.
- ❖ Minimally used in U.S. today except with pregnant women.
- ❖ Higher rate of diversion, can be injected.

SUBOXONE

- ❖ Naloxone added as means to decrease diversion.
- ❖ Poor bioavailability sublingually, but if dissolved and injected, will precipitate withdrawal.
- ❖ High diversion potential with lack of regulatory oversight.

BUPRENORPHINE TREATMENT

- ❖ Medication is only one component
- ❖ Short-term v. long-term
- ❖ OTP v. OBOT (Office Based)
 - Overview
 - Federal and State guidelines
 - Kentucky's programs

BUPRENORPHINE BENEFITS

- ❖ Virtually no euphoric or tranquilizing effects.
- ❖ Blocks effects of other opiates.
- ❖ Relieves cravings to use other opiates.
- ❖ Allows “normal” function”.
- ❖ Lower abuse liability and diversion potential than Methadone.

BUPRENORPHINE BENEFITS

- ❖ Increased anonymity and less intrusive, vs. attending a MAT clinic daily.
- ❖ Increased treatment options/access to treatment.
- ❖ Decrease in high-risk behaviors.
- ❖ Good “step down” option for those tapering from Methadone.

BUPRENORPHINE LIMITATIONS

- ❖ Expensive.
- ❖ Cannot take if opiates still in your system.
- ❖ Counseling may not be available or affordable in the same area as doctor.
- ❖ Doctors limited to 30 patients the first year with a maximum of 100.

BUPRENORPHINE LIMITATIONS

- ❖ Kentucky Board of Medical Licensure regulation 201 KAR 9:270 (effective 7/1/2015)
- ❖ Cannot charge Medicaid clients above reimbursement rates
- ❖ Drug testing and counseling guidelines
- ❖ Abuse and diversion potential still exists.

NALTREXONE

- ❖ Long half-life (up to 72 hours)
- ❖ Opioid antagonist-binds, but blocks instead of activates
- ❖ Is NOT an opiate

NALTREXONE

- ❖ Used primarily to treat alcohol dependence due to blocking neurotransmitters believed to be involved with alcohol dependence.
- ❖ Oral- ReVia
- ❖ Injectable- Vivitrol
- ❖ Implant- not FDA approved

NALTREXONE TREATMENT

- ❖ Medication is only one component.
- ❖ Average length of treatment is 3 months.
- ❖ Works best with highly motivated patients.

NALTREXONE BENEFITS

- ❖ Any physician can prescribe in any setting.
- ❖ Relatively inexpensive when compared to Methadone or Buprenorphine.
- ❖ Non-addictive, does not produce dependence, and does not build tolerance.

BENEFITS CONT.

- ❖ More acceptance in abstinence-based programs.
- ❖ Less stigma than Methadone or Buprenorphine.
- ❖ In KY Medicaid covers, but only oral is 1st-tier; injectable is a 3rd-tier.

NALTREXONE LIMITATIONS

- ❖ Does not help with cravings.
- ❖ Poor compliance with oral version.
- ❖ Cannot have any opiates in system when starting treatment or will precipitate withdrawal.

LIMITATIONS CONT.

- ❖ Injection site reactions
- ❖ Risk of overdose in attempt to break through blockade.
- ❖ Cannot be used with pregnant clients.

MAT AND PREGNANCY

- ❖ No FDA approved medications.
- ❖ “Cold turkey” detox may trigger miscarriage, pre-term labor.
- ❖ Methadone is recommended and preferred mode of treatment. (Gold Standard)
- ❖ Buprnormorphine shows to be promising.

MAT AND PREGNANCY CONT.

- ❖ Individualized approach, informed choice.
- ❖ Decreases/ceases cycles of intoxication and withdrawal
- ❖ Decrease in high risk behaviors

MAT AND PREGNANCY CONT.

- ❖ Prenatal care
- ❖ Additional services-parenting, nutrition
- ❖ Opportunity to address other factors-
mental health, social supports, basic needs

KORTOS – Ky Opiate Replacement Treatment Outcome Study – FY 2014

Abstinence rates increased dramatically (6 month review)

- Rx opioid use decreased 92% from admission
- Non-Rx methadone decreased 82%
- Heroin use decreased 96%
- Alcohol intoxication down 67%
- Arrests down 63%
- Decrease in economic hardships down 34%
- Improved recovery supports up 138%

Three things to remember.....

- 900 % increase in people seeking treatment in the last decade.
- 25,428 Kentuckians were admitted to drug and alcohol treatment programs
- 90+ Kentuckians die EACH MONTH from drug overdoses.
- Prescription drug overdoses is #1 cause of accidental death- has overtaken MVA's

2013 Statistics

- Heroin arrests have increased 2,334 percent from 32 in 2008 to 779 in 2012 in Louisville – LMPD
 - Seizures of heroin are up 6,688 percent
 - LMPD blames 80 percent of burglaries and thefts on heroin addicts
 - Jadac (Jefferson Alcohol Drug Abuse Center)- 90 percent of its calls are heroin related
 - Kentucky State Police -heroin submissions; in 2010 were 451, in 2012 they were 1074
- Jefferson County courts “Rocket Docket” for heroin cases;
In 2011 = 190, in 2014 = 1500 (started July 2015)

KEY POINTS TO REMEMBER

- ❖ No “perfect” medication that is one size fits all.
- ❖ All 3 medications work significantly better when utilized in combination with counseling, drug screens, etc.
- ❖ MAT may be appropriate for pregnant women but must be closely monitored and have informed consent.
- ❖ Individuals receiving MAT are in recovery!

CONTACT INFORMATION

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MAT and Pregnancy



Substance Abuse lifestyle

Concern for mother - fetus - and - neonate

- High rates of smoking, other drug use, depression, anxiety, PTSD among mothers
- High rates of dysfunctional families, abusive partners
- Lack of social supports
- Often financially struggling
- Poor coping and parenting skills
- Legal problems
- Unemployment, lack of job skills

Medical complications in pregnant opioid positive using females and the fetus

- HIV, Hepatitis C, STDs, seizures
- Gestational diabetes, preeclampsia and eclampsia
- Spontaneous abortion
- Intrauterine Growth Retardation
- Placental abruption
- Premature rupture of membranes and labor
- Placental insufficiency
- Postpartum hemorrhage

Methadone & Pregnancy

- Methadone has been used to treat pregnant opiate addicts for nearly 40 years.
- While relatively safe, not completely without risk.
- Minimizing risk includes:
 - comprehensive assessment
 - education with family and patient regarding risks/benefits
 - providing medical supervision to decrease/eliminate illicit drugs of abuse.
- Well metabolized and well tolerated

BENEFITS OF MAT IN PREGNANCY IN A CLINICAL SETTING

- Assist women in remaining free of illicit drugs, by preventing opiate withdrawal and cravings.
- Assist in eliminating criminal activity and other high risk behaviors that may be harmful.
- Increase probability of access to prenatal care.
- Allow for substance abuse education and therapy in a structured setting
- Methadone's long half-life (24 to 36 hours) and how it is monitored and controlled

BENEFITS OF MAT IN PREGNANCY IN A CLINICAL SETTING, cont.

- Breastfeeding is possible and often preferable for most women on MAT (minimal amount of methadone found in breast milk)
- Decrease risk to fetus of infection of HIV, Hepatitis and Sexually Transmitted Diseases
- Decrease the possibility of fetal death by stabilizing the intrauterine environment from fluctuations associated with abstinence syndrome

Potential Risks

- Neonatal Methadone Abstinence Syndrome. Similar to that of heroin, often longer lasting
- In utero exposure to methadone may lead to low birth weight. (Many patients also smoke—uncertain which causes the low weight)
- Onset of withdraw can be delayed for several hours to two weeks.
- The maternal dose vs. NAS severity is the subject of some debate.
- Seizures can be seen in a minority of babies. Although some MDs attribute this to the use of benzodiazepines during pregnancy.

Potential Risks, cont.

- Thrombocytosis
- Hyperthyroid State elevation of T3 and T4 during the first week of life
- SIDS: when controlled for other high-risk variables SIDS is about 3-4 times higher in opiate exposed infants.
- Often, doses need to be increased.
- Pregnant women may feel they can stay on MMT regardless of other drug use just because they are pregnant.

Methadone draw-backs

- NAS
- Not always available
- Stigma
- Daily visits (difficult with rural populations)
- Treatment services often quite variable so outcomes can be quite variable

Neonatal complications

- Premature birth
- Low birth weight and small for gestational age
- Microcephaly
- Meconium aspiration syndrome
- Neonatal abstinence syndrome
- SIDS
- HIV infection

Methadone Dosing During Pregnancy

- Current consensus is 50-150 mg, with blood plasma levels \geq 200 ng/ml
- Same criteria for dose increases as with non-pregnant
- May need to adjust dose upwards during pregnancy
 - Greater plasma volume
 - Increased renal blood flow

Then what?



Infant/child development

- Difficult to control for just the effects of methadone vs. other drugs of abuse/genetic problems, etc
- Head circumference normalizes by preschool (Lifshitz, 1985)
- Neurological development assessed by Bayley Scales of Infant Development within normal limits (Patso, 1989)
- Poorer performance in fine and gross motor coordination, attention, language vs. controls (for review see: Chapt. 20 of Strain and Stitzer, The Treatment of Opioid Dependence, 2006 and Helmbrecht 2008)

Factors influencing long-term outcomes of methadone exposed children

- Effects of poverty
- Effects of other drugs of abuse (including nicotine and alcohol)
- Effects of environments (supports, opportunities)
- Caregiver quality and infant, child, young adult resilience

NARCOTIC ADDICTION PROGRAM'S TREATMENT PROTOCOL

- Pregnant woman contacts the clinic.
- She is assessed for appropriateness on the phone and then comes in for a face to face assessment.
- Once deemed appropriate, “client” is then set up to go to hospital for prenatal assessment and care and induction to methadone.
- She will stay in the hospital for 5-7 days and is typically discharged on 30 to 40mg of methadone
- Upon discharge from hospital, client will come to our MAT clinic and have a psychiatric assessment by our physician

NARCOTIC ADDICTION PROGRAM'S TREATMENT PROTOCOL

- Client will then go for 30 days of residential substance abuse treatment—she will get her methadone dose there.
- Upon completion of residential substance abuse treatment, client will begin daily dosing in our clinic, meet with her therapist once a week, and submit to random drug screens.
- It is recommended, when appropriate, the client continue residential long-term treatment.

Post Delivery Issues

- Neonatal Abstinence (Finnegan Scale)
- “Look what you’ve done to your baby” attitude by hospital staff and family members
- Pain Management issues
- Dose adjustment/regulation
- Confidentiality in the hospital: Drs. and nurses must not discuss methadone in the presence of anyone other than the patient
- Support Network: Often limited—needs to attend 12-step meetings, church, CD groups, etc.
- Increased risk of relapse
- Post-Partum Depression
- Now What?—work on parenting issues, relationship with baby’s father, family of origin, friendships, life issues...

Breastfeeding on Methadone

- American Academy of Pediatrics and WHO Working Group on Human Lactation approves breastfeeding among women on methadone
- Consider slow weaning from breastfeeding – two reports of infant opioid withdrawal among women who abruptly ceased breastfeeding (Malpas, 1999)

Vincent Dole:

“Some people became overly converted. They felt, without reading our reports carefully, that all they had to do was give methadone and then there was no more problem with the addict...I urged physicians should see that the problem was one of rehabilitating people with a very complicated problem and that they ought to tailor their programs to the kinds of problems they were dealing with. . .The stupidity of thinking that just giving methadone will solve a complicated social problem seems to me beyond comprehension (Courtwright, 1989, p 338)”

Other Options

- **Development of Subutex®/Suboxone®**
 - Suboxone (buprenorphine/naloxone)
 - Suboxone contains four parts buprenorphine and one part naloxone.
 - Naloxone was added to in an effort to dissuade patients from injecting the tablets.
 - Subutex (buprenorphine)
 - Subutex contains only buprenorphine.
- U.S. FDA approved Subutex® and Suboxone® *sublingual tablets* for opioid addiction treatment on October 8, 2002.
- Product launched in U.S. in March 2003
- Interim rule changes to federal regulation (42 CFR Part 8) on May 22, 2003 enabled Opioid Treatment Programs (specialist clinics) to offer buprenorphine.

Buprenorphine aka Subutex

- Initially used as an analgesic (but not in sublingual form)
 - Has been used in France for over a decade for opioid addiction
 - Use buprenorphine without naloxone in pregnancy
 - Schedule III pain medication (Buprenex)
 - Approved in 2002 for outpatient treatment of opiate addiction.
 - Partial opiate agonist (sublingual tablet)
 - Only approved M.D.'s can prescribe Subutex/Suboxone.
 - **Most have no affiliation with, or background in treating addiction.**
 - Still considered off-label in US for use during pregnancy.
 - Extensive studies and use in Europe are promising.
- ✓ Administered as sublingual tablet
- Subutex- 2 mg or 8 mg buprenorphine



BUPRENORPHINE (Subutex) BENEFITS

- ❖ Virtually no euphoric or tranquilizing effects.
- ❖ Blocks effects of other opiates.
- ❖ Relieves cravings to use other opiates.
- ❖ Allows “normal function”.
- ❖ Lower abuse liability and diversion potential than Methadone.
- ❖ Increased anonymity and less intrusive, vs. attending a MAT clinic daily.
- ❖ Increased treatment options/access to treatment.
- ❖ Decrease in high-risk behaviors.
- ❖ Good “step down” option for those tapering from Methadone.

BUPRENORPHINE (Subutex) LIMITATIONS

- ❖ Expensive.
- ❖ Cannot take if opiates still in your system.
- ❖ Counseling may not be available or affordable in the same area as doctor.
- ❖ Not enough certified doctors or doctors willing to treat.
- ❖ No regulations for clinics, only “practice guidelines”.
- ❖ Potential for overdose of other opiates due to ceiling effect.
- ❖ Abuse and diversion potential still exists

Buprenorphine/naloxone Suboxone

- ❖ Naloxone (Narcan) added as means to decrease diversion.
- ❖ Poor bioavailability sublingually, but if dissolved and injected, will precipitate withdrawal.
- ❖ Reduced abuse potential.
 - Suboxone- 2 mg bup + .5 mg naloxone
8 mg bup + 2 mg naloxone

Buprenorphine breastfeeding

- Does get into breast milk
- Poor oral bioavailability
- No reports of NAS when women acutely stop taking buprenorphine while breastfeeding
- One case report coming out with buprenorphine assoc with decreased oxytocin, but poorly controlled for effects of nutritional status and other possible contributing factors (oral communication with Michelle Lofwall, MD)

Summary

Opioid addiction and pregnancy

- Methadone maintenance is still the treatment of choice and standard of care in the US.
- Buprenorphine treatment is possible, evidence still lacking.
- Detoxification is relatively contraindicated unless done in hospital with monitoring.

Neonatal Abstinence Syndrome (NAS)

- CNS excitability (hyperactivity, irritability, sleep disturbance)
- Autonomic Nervous System (fever, sweating, nasal stuffiness)
- Gastrointestinal dysfunction
(uncoordinated sucking/swallowing, vomiting, loose stools)
- Respiratory Distress (increased respiratory rate, bluish color around the mouth, nasal flaring)

NAS Predictability

- Can happen with any opioid (heroin, oxycontin, methadone, etc.)
- Not clearly related to methadone dose in mother
- May occur less often with buprenorphine
- Contribution of genetics, other drugs
- Smoking and vagal tone have been associated with NAS



NEONATAL ABSTINENCE SCORING SYSTEM



Modified Finnegan Neonatal Abstinence Score Sheet¹

System	Signs and Symptoms	Score	AM				PM				Comments			
Central Nervous System Disturbances	Excessive high-pitched (or other) cry < 5 mins	2												
	Continuous high-pitched (or other) cry > 5 mins	3												
	Sleeps < 1 hour after feeding	3												
	Sleeps < 2 hours after feeding	2												
	Sleeps < 3 hours after feeding	1												
	Hyperactive Moro reflex	2												
	Markedly hyperactive Moro reflex	3												
	Mild tremors when disturbed	1												
	Moderate-severe tremors when disturbed	2												
	Mild tremors when undisturbed	3												
	Moderate-severe tremors when undisturbed	4												
	Increased muscle tone	1												
	Excoriation (chin, knees, elbow, toes, nose)	1												
Myoclonic jerks (twitching/jerking of limbs)	3													
Generalised convulsions	5													
Metabolic/ Vasomotor/ Respiratory Disturbances	Sweating	1												
	Hyperthermia 37.2-38.3C	1												
	Hyperthermia > 38.4C	2												
	Frequent yawning (> 3-4 times/ scoring interval)	1												
	Mottling	1												
	Nasal stuffiness	1												
	Sneezing (> 3-4 times/scoring interval)	1												
	Nasal flaring	2												
	Respiratory rate > 60/min	1												
	Respiratory rate > 60/min with retractions	2												
Gastrointestinal Disturbances	Excessive sucking	1												
	Poor feeding (infrequent/uncoordinated suck)	2												
	Regurgitation (≥ 2 times during/post feeding)	2												
	Projectile vomiting	3												
	Loose stools (curds/seedy appearance)	2												
	Watery stools (water ring on nappy around stool)	3												
	Total Score													
	Date/Time													
Initials of Scorer														

1. Finnegan LP. Neonatal abstinence syndrome: assessment and pharmacotherapy. In: Nelson N, editor. Current therapy in neonatal-perinatal medicine. 2 ed. Ontario: BC Decker, 1990.

NAS Treatment

- Pharmacotherapies used to reduce withdrawal symptoms include:
 - Phenobarbital
 - Morphine
 - Methadone
 - Tincture of Opium
- Non-pharmacologic supportive care
 - Decrease sensory inputs
 - Stabilize environment
 - Help parents have realistic expectations (babies are not addicted)