

# Medication Assisted Treatment

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## Objectives

-  Describe neuroscience of addiction and how substance use affects the brain.
-  Name three medications used to treat Opioid Use Disorder.
-  Define Medication Assisted Treatment.
-  Identify and explain misconceptions of MAT.
-  Identify benefits of MAT for pregnant women.

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## What is an Opioid?

- ▶ **Opiate:** Refers to drugs that are naturally found in the opium plant. They block pain signals sent to the brain.
- ▶ **Opioids** are man-made drugs that are chemically similar to opiates. Opioids can be semi-synthetic or synthetic.

**Semi-synthetic:**  
They are synthesized from a natural opiate and more potent than a natural opiate.

**Synthetic:**  
These drugs are man-made. They are very powerful drugs.

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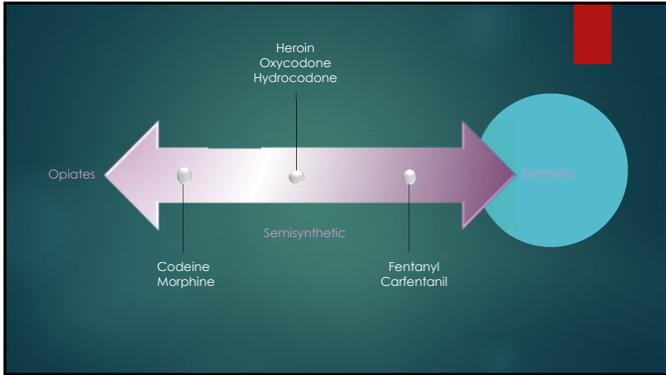
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### What is an Opioid?

- ▶ Intended to relieve pain when they are given in the prescription form.
- ▶ Human brain makes its own small levels of opioids which bind to the opioid receptors found in the brain, the spine and throughout the central nervous system. These are your endorphins.
- ▶ Endorphins are sometimes referred to as the body's natural opiate because of pain relieving property.
- ▶ The brain also releases endorphins in response to exercise and stress.



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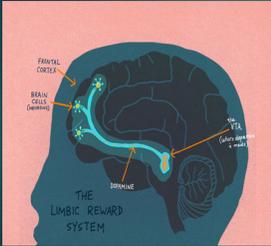
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## How Do Opioids Hijack the Brain



- ▶ The brain makes its own small levels of dopamine naturally and increases in response to natural rewards (food, music, etc.).
- ▶ Dopamine causes intense feelings of pleasure.
- ▶ When someone takes an opioid, they are flooded with a rush of dopamine.
- ▶ Increase in the amount of dopamine in the part of the brain called the limbic reward system.

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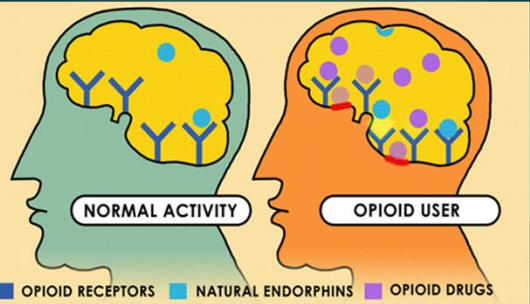
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## Long Term Affects on the Brain

- ▶ This change makes it harder for someone who's used opioids, particularly for a long period, to then feel pleasure or reward on their own without the use of the drug.
- ▶ Opioids also change the brain because the brain stops reacting to the drugs (tolerance).
- ▶ It's as if the presence of the opioids become the new normal to the brain.
- ▶ Studies have shown some deterioration of the brain's white matter due to heroin use, which may affect decision-making abilities, the ability to regulate behavior, and responses to stressful situations

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**When people have addiction, they will keep using despite negative consequences.**

Their brains are altered so that:

- rational thinking and decision-making are compromised
- cravings are intense
- reward systems are desensitized
- emotions are magnified

Tolerance happens when people's bodies adapt to a drug over time, and doses must keep increasing for people to continue to get high or to keep from getting sick.

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### What is withdrawal?

- ▶ Opiates ability to take over the body's chemical process . Withdrawal is a response to a sudden lack of opioids in a persons body.
- ▶ In actuality, the body can become dependent on opioids in as little as a week's time. The longer a person uses the more dependent the body becomes.
- ▶ It's important to remember that different drugs remain in your system for different lengths of time and this can affect withdrawal onset. The amount of time your symptoms last depends on the frequency of use and severity of the addiction, as well as individual factors like your overall health.

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### Symptoms of withdrawal

Early symptoms typically begin in the first 24 hours after you stop using the drug, and they include:

muscle aches	restlessness	anxiety	inability to sleep	runny nose	Excessive sweating	yawning very often
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Later symptoms, which can be more intense, begin after the first day or so. They include:

goose bumps on the skin	diarrhea	abdominal cramping	nausea and vomiting	high blood pressure	dilated pupils and possibly blurry vision	rapid heartbeat
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Some specialists point out that recovery requires a period of at least six months of total abstinence, during which the person may still experience symptoms of withdrawal. This is sometimes referred to as "protracted abstinence."

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## Medication Assisted Treatment



However there is no "one size fits all" when it comes to the treatment of a substance use disorder.

MAT is evidence-based and is the recommended course of treatment for opioid addiction. MAT is the first line of treatment for opioid addiction as determined by:

- The National Institute on Drug Abuse,
- Substance Abuse and Mental Health Services Administration,
- National Institute on Alcohol Abuse & Alcoholism
- Centers for Disease Control and Prevention

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## What is Medication Assisted Treatment?

The use of medication and behavioral therapy for opioid addiction.

FDA approved medications used in MAT:

- ▶ Methadone
- ▶ Buprenorphine
- ▶ Naltrexone

The combination of counseling with medications that block opioids' euphoric effects and relieve relapse inducing cravings.

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There are several advantages to using a medication in the treatment of opiate abuse. MAT can:

- ▶ Help the individual to remain safe and comfortable during detox
- ▶ Reduce or eliminate cravings for heroin or other opiates
- ▶ Minimize relapse since the individual is not experiencing uncomfortable withdrawal symptoms
- ▶ Allow the individual to focus on therapy without being distracted by withdrawal symptoms and cravings
- ▶ Reduce injection drug use risk behaviors.
  - ▶ Injection drug use is still a primary driver of the HIV/AIDS epidemic across the world. Medications for opioid use disorder treatment can reduce transmission of HIV and HCV

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## Categories of medications

- ▶ Agonist
- ▶ Partial Agonist
- ▶ Antagonist



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## AGONIST

- A substance which initiates a physiological response when combined with a receptor.
- Binds "tightly" to receptors.
- Eliminates withdrawal symptoms and relieves drug cravings by acting on opioid receptors in the brain—the same receptors that other opioids activate



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## PARTIAL AGONIST

- A substance that binds to the same opioid receptors as opioids, but activates them less strongly.
- Binds less tightly
- Can reduce cravings and withdrawal symptoms without producing euphoria



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### ANTAGONIST

- A substance that acts against and blocks the activation of opioid receptors.
- Prevents opioids from producing rewarding effects such as euphoria.
- Antagonist is the opposite of agonist.




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### What is Methadone?

- Methadone is a full agonist, it fully binds to the mu receptors in the brain alleviating symptoms of withdrawal and/or cravings, while blocking the effects of other opioids (when at blocking dose).
- Methadone is used as part of drug addiction detoxification or maintenance program (OTP).
- FDA Approved since 1947.
- Most used and studied pharmacotherapy for opioid use disorder.




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#### Methadone

Onset of Action	0.5-1 hr
Peak Effect	1-7.5 hrs
Steady State Peak Effect With Continuous Dosing	3-5 days
Duration of Action With Repeat Dosing	22-48 hrs

The effects of Methadone last, on average 24 hours. This can change depending on the patient.

Induction begins at a low dose and gradually increases over a period of a few weeks. Steady state takes about 5 days.

Pregnancy Category "C" Safe to use during pregnancy.

Formulations include: liquid, powder dissolved into liquid, dispersible tablets, tablets

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- ▶ Strict regulations
  - ▶ Counseling requirements
  - ▶ Toxicology screen requirements
- ▶ Prescribed only by waived doctors
- ▶ How to taper
  - ▶ Longer length of stay in treatment is associated with better treatment outcomes.
  - ▶ Patient s should consult counselor/ doctor prior to tapering.
- ▶ Physical dependence

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### Side Effects

- ▶ Constipation
- ▶ Nausea
- ▶ Sweating
- ▶ Sexual dysfunction or decreased libido
- ▶ Drowsiness
- ▶ Amenorrhea (absence of menstruation)
- ▶ Prolonged QTc Interval
- ▶ Edema

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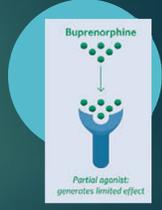
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### What is Buprenorphine?

- ▶ Buprenorphine is a partial agonist, it is a combination of an agonist and antagonist.
- ▶ It binds to the mu receptor in the brain and can alleviate withdrawal and or craving, but has the added antagonist properties of preventing other opioids from stimulating the receptor.
- ▶ Partial agonist are less likely to be abused.
- ▶ Buprenorphine's opioid effects increase with each dose until at moderate doses they level off, even with further dose increases. This "ceiling effect" lowers the risk of misuse, dependency, and side effects.
- ▶ Because of buprenorphine's long-acting agent, many patients may not have to take it every day.




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## Phases of Buprenorphine Treatment

The Induction Phase	The Stabilization Phase	The Maintenance Phase
<p>The medication is administered when a person with an opioid dependency has abstained from using opioids for 12 to 24 hours and is in the early stages of opioid withdrawal.</p> <p>It is important to note that buprenorphine can bring on acute withdrawal for patients who are not in the early stages of withdrawal and who have other opioids in their bloodstream.</p>	<p>The client no longer has cravings, and experiences few, if any, side effects.</p> <p>The buprenorphine dose may need to be adjusted during this phase.</p> <p>Because of the long-acting agent of buprenorphine, once patients have been stabilized, they can sometimes switch to alternate-day dosing instead of dosing every day.</p>	<p>This occurs when a patient is doing well on a steady dose of buprenorphine.</p> <p>The length of time of the maintenance phase is tailored to each patient and could be indefinite.</p> <p>People can engage in further treatment—with or without MAT—to prevent a possible relapse.</p>

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## Timeline

- ▶ 2002- Sublingual Buprenorphine/Naloxone tablets (Suboxone) Sublingual Buprenorphine Tablets (Subutex)
- ▶ 2010- Buprenorphine/Naloxone sublingual films.
- ▶ 2013- Buprenorphine/Naloxone sublingual tablets
- ▶ 2014- Buprenorphine/Naloxone buccal films
- ▶ 2016- Buprenorphine implants
- ▶ 2017- Buprenorphine extended release injection (Sublocade)

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## Summary

- ▶ FDA Approved for clinical use since 2002.
- ▶ Pregnancy Category "C" Safe to use during pregnancy.
- ▶ Ceiling effect.
- ▶ semi-synthetic opioid
- ▶ Half-life can range from 24-69 hours, however typically last 24-42 hours.
- ▶ The medically monitored startup of buprenorphine treatment performed in a qualified physician's office or certified OTP using approved buprenorphine products.

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## Side Effects of Buprenorphine

- ▶ Buprenorphine's side effects are similar to those of opioids and can include:
  - ▶ Nausea, vomiting, and constipation
  - ▶ Muscle aches and cramps
  - ▶ Cravings
  - ▶ Inability to sleep
  - ▶ Distress and irritability
  - ▶ Fever, headache, aches




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## Suboxone

- ▶ Suboxone contains a combination of buprenorphine and naloxone. Buprenorphine is an opioid medication. Naloxone blocks the effects of opioid medication, including pain relief or feelings of well-being that can lead to opioid abuse.
- ▶ The presence of Naloxone is what causes precipitated withdrawal if taken after an opioid.

**WHAT IS SUBOXONE?** SUBOXONE IS AN FDA APPROVED MEDICATION FOR THE TREATMENT OF OPIOID ADDICTION

IT CONSISTS OF 2 INGREDIENTS:

<b>NALOXONE</b> An opioid antagonist that blocks the effects of opioid drugs	<b>BUPRENORPHINE</b> Has the same effects as opioid drugs like heroin
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SUBOXONE IS A SUBLINGUAL FILM STRIP THAT IS PUT UNDER THE TONGUE

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## What is Naltrexone?

- ▶ Naltrexone is an antagonist, antagonists bind to the mu opioid receptors but don't stimulate the production of endorphins. Antagonists prevent other opioids from stimulating the mu receptors.
- ▶ Vivitrol is the first and only non-addictive, once-monthly medication. Vivitrol blocks opioid receptors in the brain while you work with the psychological aspects of counseling.
- ▶ Vivitrol injection is also used to treat alcoholism by reducing your urge to drink alcohol. This may help you drink less or stop drinking altogether.
- ▶ The effects of Naltrexone last for 28 days.




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- ▶ FDA approval:
  - ▶ 1984-Treatment of Opioid addiction.
  - ▶ 1995- Treatment of alcohol dependence .
  - ▶ 2010- Injectable version- Vivitrol
- ▶ Pregnancy Category "C" Safe to use during pregnancy.
- ▶ Comes in pill or injectable form :
  - ▶ The pill form of naltrexone (ReVia, Depade) can be taken at 50 mg once per day.
  - ▶ The injectable extended-release form of the drug (Vivitrol) is administered at 380 mg intramuscular once a month..




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## Naltrexone

### Advantages

- ▶ No Abuse Liability and diversion potential with naltrexone.
- ▶ No Regulatory Requirements
- ▶ Naltrexone can be prescribed by any health care provider who is licensed to prescribe medications.
- ▶ It does not cause withdrawal when stopped.

### Disadvantages

- ▶ Requirement of Abstinence prior to beginning medication (7-10 days).
- ▶ If switching from methadone to naltrexone, the patient has to be completely withdrawn from the opioids.
- ▶ It does not alleviate withdrawal symptoms.
- ▶ High Rates of Non Adherence
- ▶ If patients who are treated with naltrexone relapse after a period of abstinence, it is possible that the dosage of opioid that was previously used may have life-threatening consequences, including respiratory arrest and circulatory collapse.

\* Methadone or Buprenorphine may be used for medically supervised withdrawal prior to client taking Naltrexone

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## Side Effects of Naltrexone

- ▶ Upset stomach or vomiting
- ▶ Diarrhea
- ▶ Headache
- ▶ Nervousness
- ▶ Sleep problems/tiredness
- ▶ Joint or muscle pain




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## Substance Use During Pregnancy

- ▶ When a woman uses opiates while pregnant these substances transfer to the baby through the placenta and can negatively impact the fetus.
- ▶ Risks include:
  - ▶ Mother may expose fetus to opioid withdrawal
  - ▶ NAS
  - ▶ Preterm labor and/or premature birth
  - ▶ Malnutrition and poor prenatal care
  - ▶ Fetal death
  - ▶ Placental abruption

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## Neonatal Abstinence Syndrome (NAS)

- ▶ NAS occurs when an infant becomes dependent on opioids or other drugs used by the mother during pregnancy
- ▶ Symptoms include:
  - ▶ excessive crying
  - ▶ fever
  - ▶ irritability
  - ▶ seizures
  - ▶ slow weight gain
  - ▶ tremors
  - ▶ diarrhea
  - ▶ vomiting
  - ▶ possibly death.

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## MAT and Pregnancy

- ▶ Treatment with methadone or buprenorphine improves infant outcomes by:
  - ▶ stabilizing fetal levels of opioids, reducing repeated prenatal withdrawal
  - ▶ linking mothers to treatment for infectious diseases
  - ▶ providing opportunity for better prenatal care
  - ▶ improving long-term health outcomes for the mother and baby
- ▶ Compared to untreated pregnant women, women treated with methadone or buprenorphine had infants with:
  - ▶ Lower risk of / less severe NAS
  - ▶ Higher gestational age, weight, and head circumference at birth

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## MAT and Pregnancy

- ▶ Methadone is the treatment of choice for heroin and opioid dependency during pregnancy and is associated with higher treatment retention
- ▶ Used to treat pregnant women with opioid use disorder since the 1970s and was recognized as the standard of care by 1998.
- ▶ Taking methadone during pregnancy may prevent miscarriage, fetal distress, and premature labor.
- ▶ Decreasing the dose of methadone during the first trimester increases the risk of miscarriage.



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## MAT and Pregnancy

- ▶ Buprenorphine may result in:
  - ▶ lower incidence of NAS
  - ▶ decreased neonatal treatment time
  - ▶ less morphine needed for NAS treatment
- ▶ Breastfeeding During Treatment
  - ▶ Breastfeeding can reduce length of hospital stay and need for morphine treatment in infants. Unless there are specific medical concerns (e.g., maternal HIV infection), encouraging mothers to breastfeed and swaddle newborns may ease infant NAS symptoms and improve bonding.



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## Special Considerations

- ▶ HIV/AIDS:
  - ▶ Methadone interacts with several antiretroviral treatments for HIV
  - ▶ Buprenorphine causes fewer concerns
  - ▶ Extended-release injectable naltrexone causes almost none.
- ▶ Pain:
  - ▶ Both methadone and buprenorphine are good options due to pain relieving properties.
- ▶ Alcohol dependence:
  - ▶ Extended-release injectable naltrexone has dual activity for the prevention of relapse to both high-risk drinking and opioid use.



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## Common Misconceptions About MAT

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## MAT is a substitution of one drug for another.

- ▶ Why people think this-
  - ▶ Methadone and buprenorphine are opioids and are able to produce euphoria in people who are not dependent on opioids.
- ▶ Why is this false?
  - ▶ People who utilize MAT as a treatment for opioid dependence and addiction, are no more addicts than are people who take daily inhalers for chronic asthma, medication for controlling high blood pressure, or insulin for diabetes. These medications will allow you to get back to normal functioning, work and family life.

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## It is difficult "to get off" methadone

- ▶ The symptoms of methadone withdrawal come on more slowly than those of heroin withdrawal, but with methadone, the withdrawal process takes longer.
- ▶ Research shows that patients on MAT for at least 1-2 years have the greatest rates of long-term success. There is currently no evidence to support benefits from cessation.
- ▶ When you are ready to go off methadone, your dose will be "tapered," or gradually reduced, usually at a rate that you determine.

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## A Person utilizing Medication Assisted Treatment is not "clean".

- ▶ MAT (methadone, buprenorphine, or naloxone) has been proven to help patients recover from opioid addiction.
- ▶ These medications are:
  - ▶ Safe
  - ▶ Cost-effective
  - ▶ Reduce the risk of overdose
  - ▶ Increase treatment retention
  - ▶ Improve social functioning
  - ▶ Reduce the risks of infectious disease transmission
  - ▶ Reduce criminal activity

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## Utilizing MAT means the person is "weak"

- ▶ While some people are eventually able to quit using opioids on their own, the majority of patients go through many dangerous cycles of relapse and recovery.
- ▶ MAT can make the recovery process much safer, and has saved many lives by preventing death from overdose or dangerous behaviors associated with "street" drug use.
- ▶ In 2005, methadone and buprenorphine were added to the World Health Organization's list of essential medicines
  - ▶ defined as medicines that are "intended to be available within the context of functioning health care systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality, and at a price the individual and the community can afford."

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## Case Example 1:

- ▶ Jenny is a 42 year old who was prescribed Oxycodone for pain issues. She used these pills for 2 years, even after her doctor stopped prescribing them. Recently, a friend of hers told her about Heroin and how it is much cheaper and stronger than Oxycodone. Jenny has been using 25-30 bags of Heroin IV for 1 year. Jenny attended detox for a few days about 3 months ago but began using as soon as she got home.
- ▶ Based on this limited information, which medication would you think that Jenny would be prescribed?

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### Case Example 2

- ▶ Sam is 20. He was prescribed Oxycodone after surgery. His doctor stopped prescribing him the medication after two months. At that time Sam started buying Oxy from someone. He has been doing this for about 30- 45 days. He is taking a few pills " here and there" to alleviate withdrawals. He is trying not to take them everyday but feels sick when he does not.
- ▶ What medication might be best for Sam?

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### Case Example 3

- ▶ Alexa is 33 and has been using heroin for 8 months .She recently found out that she is pregnant. Alexa wants to stop using but does not know what to do. She tried to stop on her own as soon as he found out that she was pregnant but started using again due to withdrawals.
- ▶ What course of treatment would you recommend to Alexa?

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### Summary

MAT is safe and has several benefits:

**Opioid Use Disorder Untreated (No M.A.T.)**

People are at higher risk for:

- Crime & Recidivism
- Unemployment or Low Productivity
- HIV, Hepatitis C, & other Diseases
- Overdose & Hospitalization
- Fatal Overdose

People not on M.A.T. will experience withdrawal and cravings, especially when under stress.

Their tolerances are low, so they are twice as likely to fatally overdose.

**Opioid Use Disorder Treated (M.A.T.)**

People will be more likely to succeed with:

- Recovery
- Obtaining or Securing a Job
- A Healthy Lifestyle
- Obeying the Law
- Complying With Treatment

People on M.A.T. when stabilized on the right dose, will not experience withdrawals, cravings, or a high.

Their tolerances are stable, so they are 50-70% less likely to fatally overdose.

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## Resources

- ▶ <https://www.samhsa.gov>
- ▶ Available for download
  - ▶ <https://store.samhsa.gov/product/TIP-63-Medications-for-Opioid-Use-Disorder-Full-Documnet/PEP20-02-01-006>
- ▶ <https://www.drugabuse.gov/>
- ▶ Available for download
  - ▶ <https://store.samhsa.gov/product/The-Facts-about-Buprenorphine-for-Treatment-of-Opioid-Addiction/SMA15-4442>
- ▶ <https://www.cdc.gov/drugoverdose/opioids/index.html>



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