



Innovative Practices in Response to Opioid Overdose Calls

Matthew Hickman

Amy Naylor

Mandy D. Owens, PhD

April 19, 2024

Law enforcement and EMS are dispatched to a private residence for an adult female patient with reduced level of consciousness.

Upon arrival, they are greeted by boyfriend who says, "I think she's overdosed", and leads them to the back bedroom...



Scene Size Up

- You find one patient lying on her side in bed. Snoring respirations can be heard on approach.
- The patient has a strong radial pulse, but her breathing is slow at 6 per minute and shallow.
- Her skin appears ashen and blue, and her pupils are pinpoint.



Treatment

- EMS crews and law enforcement move the patient to the living room to a workable area.
- EMS crews begin assisting ventilation with a bag valve mask.
- 4 mg of Narcan is administered intranasally.
- After 6-8 minutes of assisted ventilations, skin color begins to improve and the patient starts to come around.



What now?

- We are well practiced in responding to opioid overdose and fixing the problem that day...
 - Do we feel as well prepared to have conversations about what comes after?



Objectives

1. Learn an overview of opioid use disorder and the three FDA-approved medications for opioid use disorder (methadone, buprenorphine, and naltrexone).
2. Identify innovative practices for addressing opioid use disorder in the field, including:

- Shared decision making for opioid use disorder
- EMS-Initiated medication for opioid use disorder program (CORES).



Introduction

- Grew up in Wenatchee, WA
- Trained as a clinical psychologist
- Assistant Professor, Addictions, Drug & Alcohol Institute



What Is Opioid Use Disorder?

What Are Opioids

Class of substances that are **analgesics** (blocks pain signals) with **depressant** (slows body functions down) and **euphoric** (releases dopamine) effects.

What Are Opioids

Class of substances that are **analgesics** (blocks pain signals) with **depressant** (slows body functions down) and **euphoric** (releases dopamine) effects.

Available legally by prescription:

Pain medications: codeine, morphine, oxycodone, hydrocodone, fentanyl

Medications for opioid use disorder: methadone and buprenorphine

Illicit:

Heroin

Illegally manufactured opioids

Opioid medications obtained and taken not as prescribed

Opioid Use Disorder

- Opioid use disorder (OUD) is chaotic and can be destructive socially, psychologically, and medically.
- OUD and substance use disorder is a bio-psycho-social disease that comes from the Diagnostic Statistical Manual for Mental Health Disorders (DSM-5).

What is Opioid Use Disorder?

- Eleven symptoms of OUD:

Biological

- Tolerance
- Withdrawal

(American Psychiatric Association, 2013)

What is Opioid Use Disorder?

- Eleven symptoms of OUD:

Biological

- Tolerance
- Withdrawal

Psychological

- Using more than intended
- Repeated attempts to cut down/quit
- Using despite psych or medical problems
- Cravings

(American Psychiatric Association, 2013)

What is Opioid Use Disorder?

- Eleven symptoms of OUD:

Biological

- Tolerance
- Withdrawal

Psychological

- Using more than intended
- Repeated attempts to cut down/quit
- Using despite psych or medical problems
- Cravings

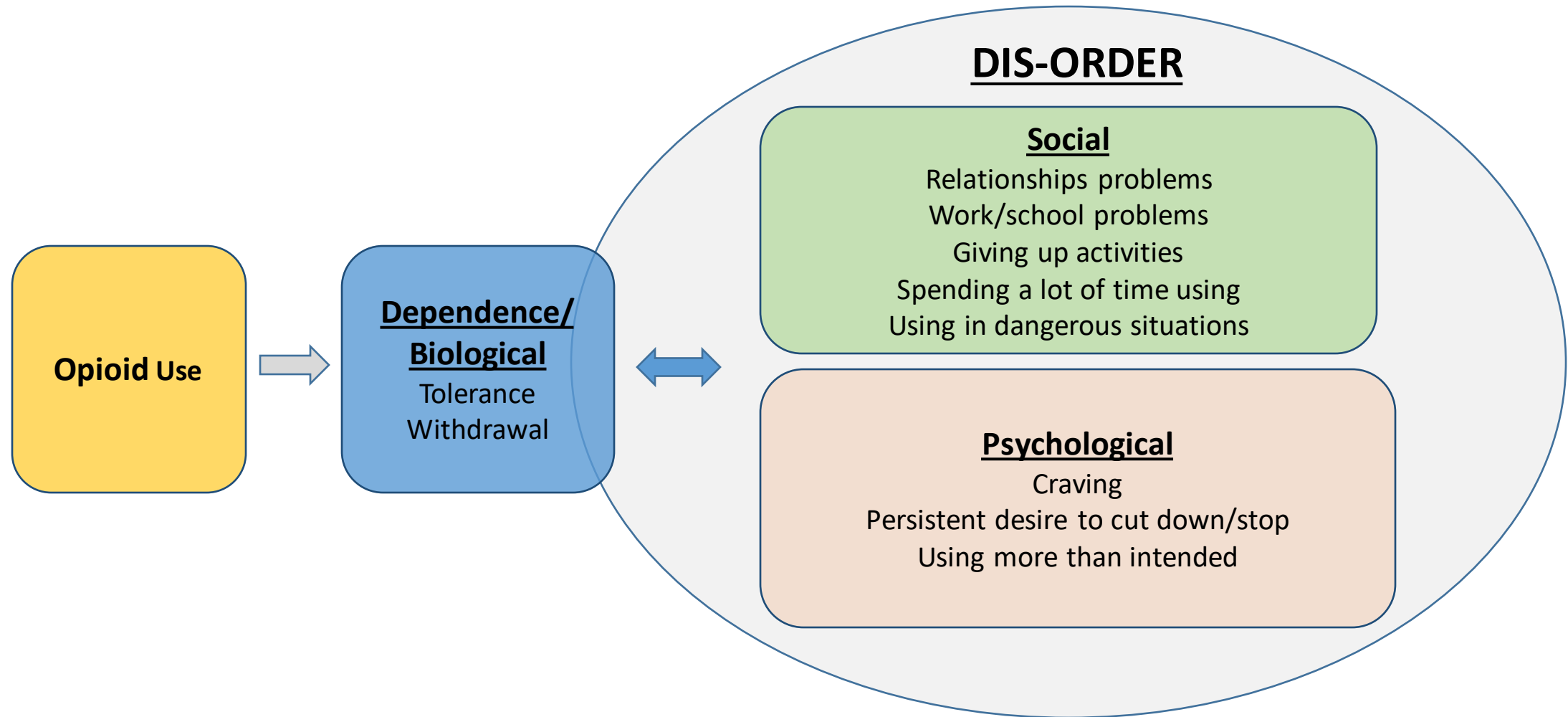
Social

- Problems with work/school
- Problems with relationships
- Giving up activities
- Spending a lot of time using
- Using in dangerous situations

- 2-3=mild; 4-5=moderate; >6=severe

(American Psychiatric Association, 2013)

What is Opioid Use Disorder?



Opioid Use Disorder

- Non-fatal overdoses happen to about 1 in 5 people with OUD each year (injuries, emotional & \$ costs).
- Overdose deaths occur in 1-2% of people with OUD annually.
- Deaths from all causes is ~6% annually for people with OUD who have received recent emergency medical care.



Medications for Opioid Use Disorder

Medications for Opioid Use Disorder

- Known as medication assisted treatment (MAT) and medications for opioid use disorder (MOUD).
- Includes three FDA-approved medications:
 - Methadone
 - Buprenorphine
 - Naltrexone (long-acting injectable formulation only)

Evidence for MOUD

- Methadone and buprenorphine can lead to:
 - Improved quality of life
 - Reduced costs
 - Reduced arrests
 - Improved health care utilization including infectious disease treatment
 - Decreased mortality
- Initial evidence for a long-acting-naltrexone (Vivitrol)
 - However, initiation and retention rates are significantly lower, which limit benefits

Evidence for MOUD References

Dolan, K.A., Shearer, J., White, B., Zhou, J., Kaldor, J., Wodak, A.D., 2005. Four-year follow-up of imprisoned male heroin users and methadone treatment: Mortality, re-incarceration and hepatitis C infection. *Addiction* 100, 820–828. doi:10.1111/j.1360-0443.2005.01050.x

Hser, Y.I., Evans, E., Huang, D., Weiss, R., Saxon, A., Carroll, K.M., Woody, G., Liu, D., Wakim, P., Matthews, A.G., Hatch-Maillette, M., Jelstrom, E., Wiest, K., Mclaughlin, P., Ling, W., 2016. Long-term outcomes after randomization to buprenorphine/naloxone versus methadone in a multi-site trial. *Addiction* 111, 695–705. doi:10.1111/add.13238

Johnson, R.E., Chutuape, M.A., Strain, E.C., Walsh, S.L., Stitzer, M.L., Bigelow, G.E., 2000. A comparison of levomethadyl acetate, buprenorphine, and methadone for opioid dependence. *N. Engl. J. Med.* 343, 1290–7. doi:10.1056/NEJM200011023431802

Larochelle, M.R., Bernson, D., Land, T., Stopka, T.J., Wang, N., Xuan, Z., Bagley, S.M., Liebschutz, J.M., Walley, A.Y., 2018. Medication for Opioid Use Disorder After Nonfatal Opioid Overdose and Association With Mortality. *Ann. Intern. Med.* doi:10.7326/M17-3107

Lee, J.D., McDonald, R., Grossman, E., McNeely, J., Laska, E., Rotrosen, J., Gourevitch, M.N., 2015. Opioid treatment at release from jail using extended-release naltrexone: a pilot proof-of-concept randomized effectiveness trial. *Addiction* 110, 1008–14. doi:10.1111/add.12894

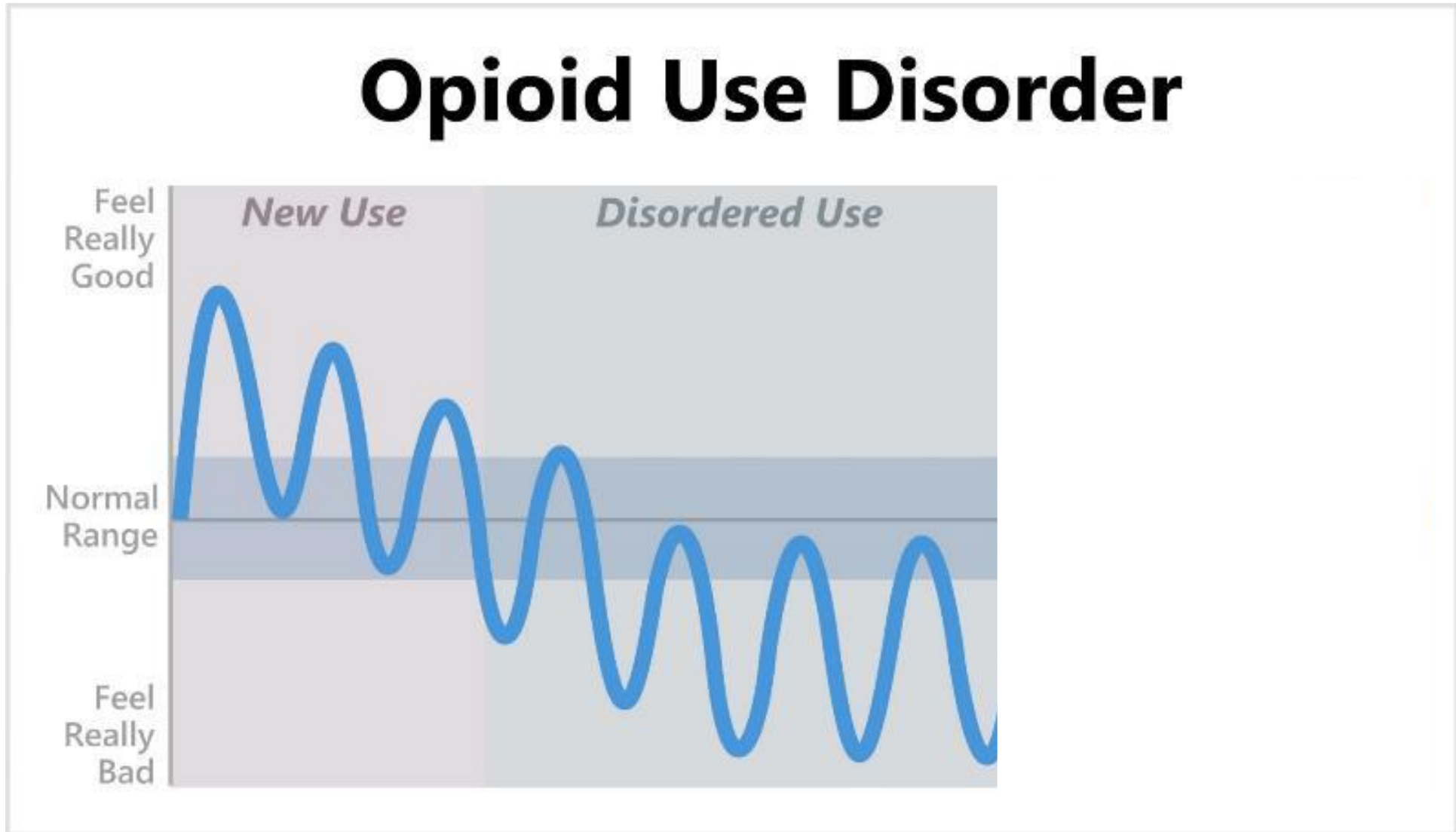
Lee, J.D., Nunes, E. V, Novo, P., Bachrach, K., Bailey, G.L., Bhatt, S., Farkas, S., Fishman, M., Gauthier, P., Hodgkins, C.C., King, J., Lindblad, R., Liu, D., Matthews, A.G., May, J., Peavy, K.M., Ross, S., Salazar, D., Schkolnik, P., Shmueli-Blumberg, D., Stablein, D., Subramaniam, G., Rotrosen, J., 2018. Comparative effectiveness of extended-release naltrexone versus buprenorphine-naloxone for opioid relapse prevention (X:BOT): a multicentre, open-label, randomised controlled trial. *Lancet (London, England)* 391, 309–318. doi:10.1016/S0140-6736(17)32812-X

Morgan, J.R., Schackman, B.R., Leff, J.A., Linas, B.P., Walley, A.Y., 2018. Injectable naltrexone, oral naltrexone, and buprenorphine utilization and discontinuation among individuals treated for opioid use disorder in a United States commercially insured population. *J. Subst. Abuse Treat.* 85, 90–96. doi:10.1016/j.jsat.2017.07.001

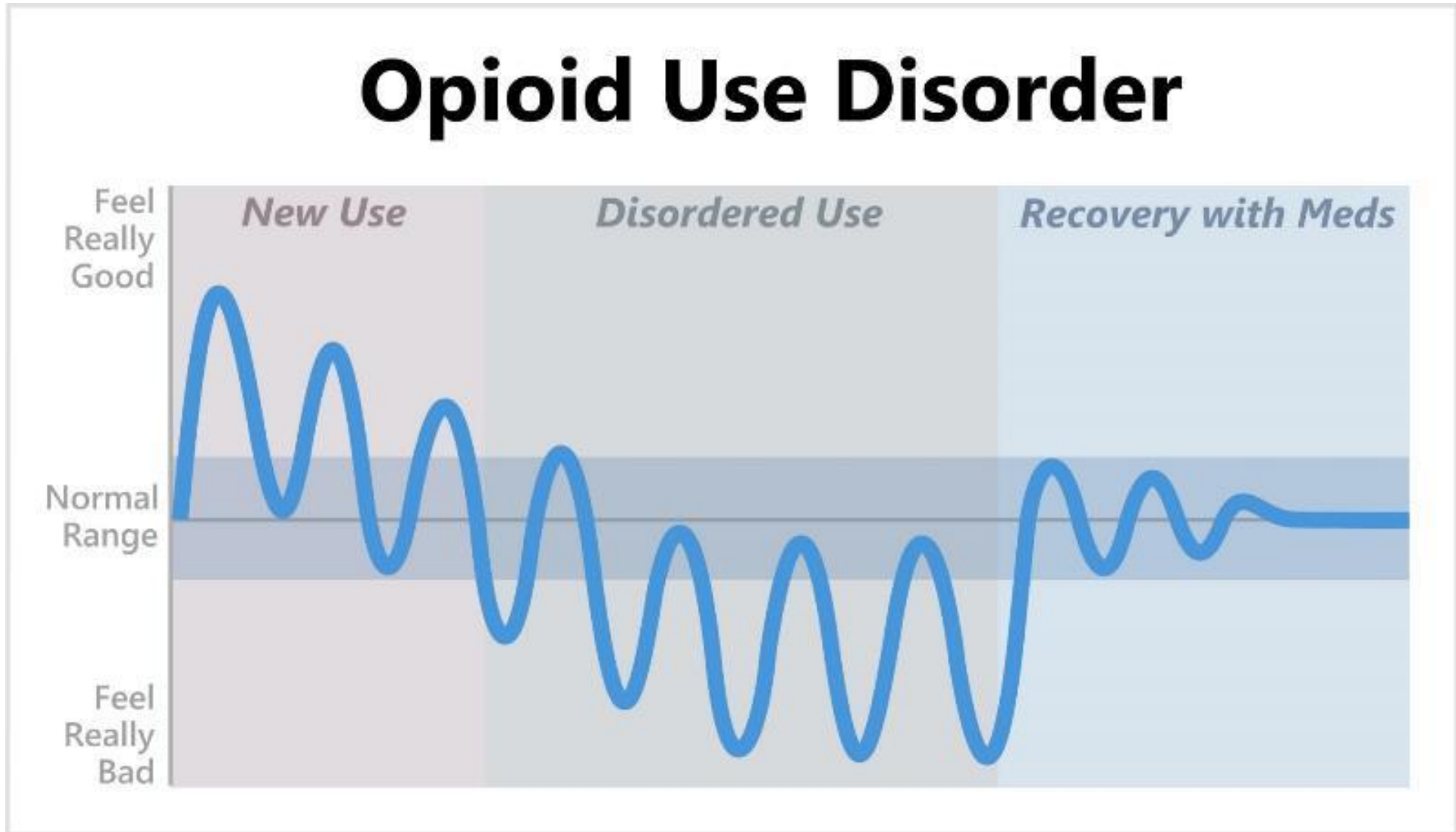
Saxon, A.J., Hser, Y.I., Woody, G., Ling, W., 2013. Medication-assisted treatment for opioid addiction: Methadone and buprenorphine, in: *Journal of Food and Drug Analysis*. doi:10.1016/j.jfda.2013.09.037

Tsui, J.I., Evans, J.L., Lum, P.J., Hahn, J.A., Page, K., 2014. Association of opioid agonist therapy with lower incidence of hepatitis C virus infection in young adult injection drug users. *JAMA Intern. Med.* 174, 1974–81. doi:10.1001/jamainternmed.2014.5416

Opioid Use Disorder



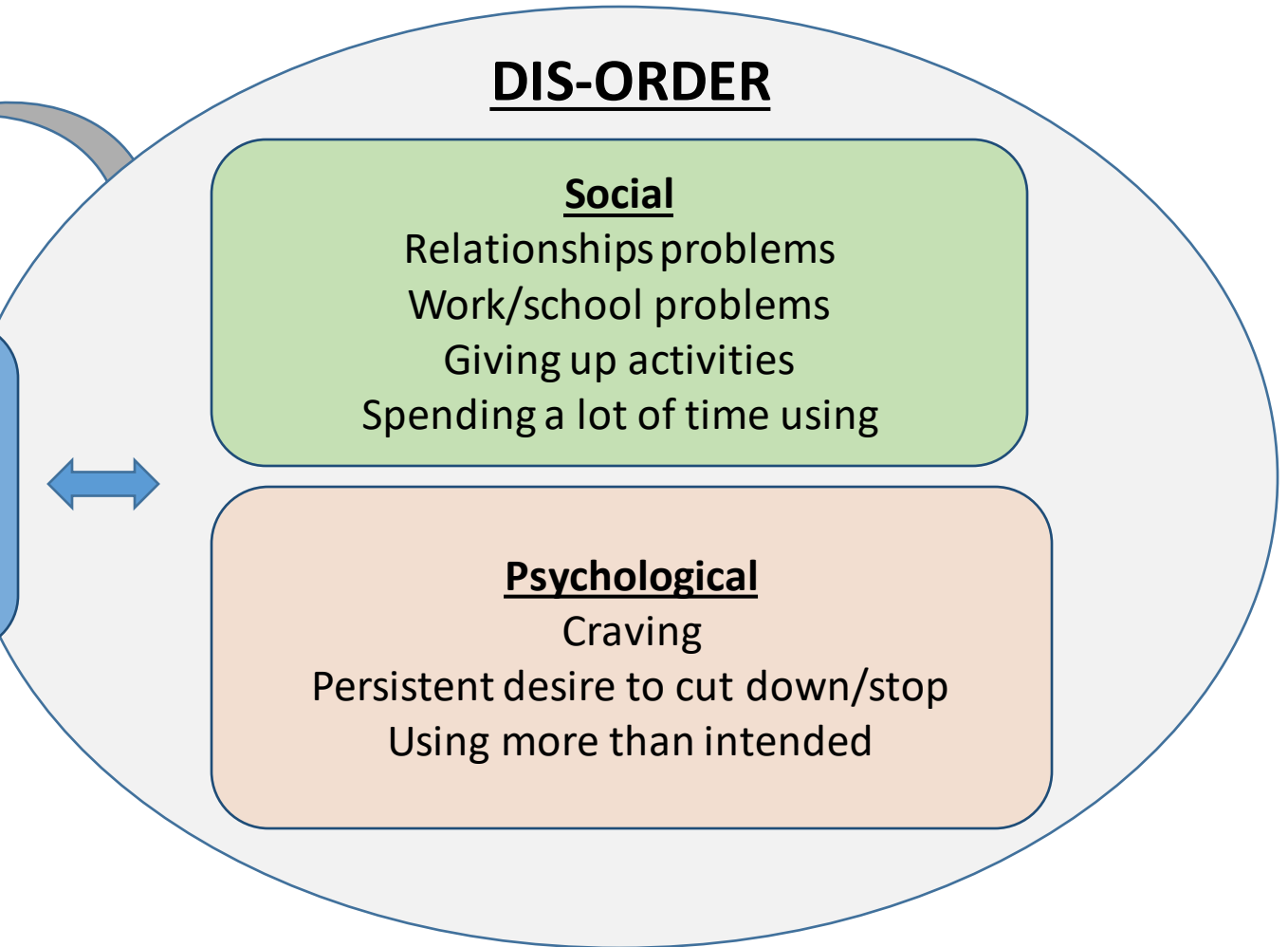
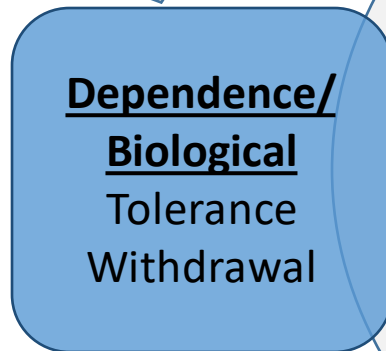
Opioid Use Disorder



Medications-buprenorphine/methadone

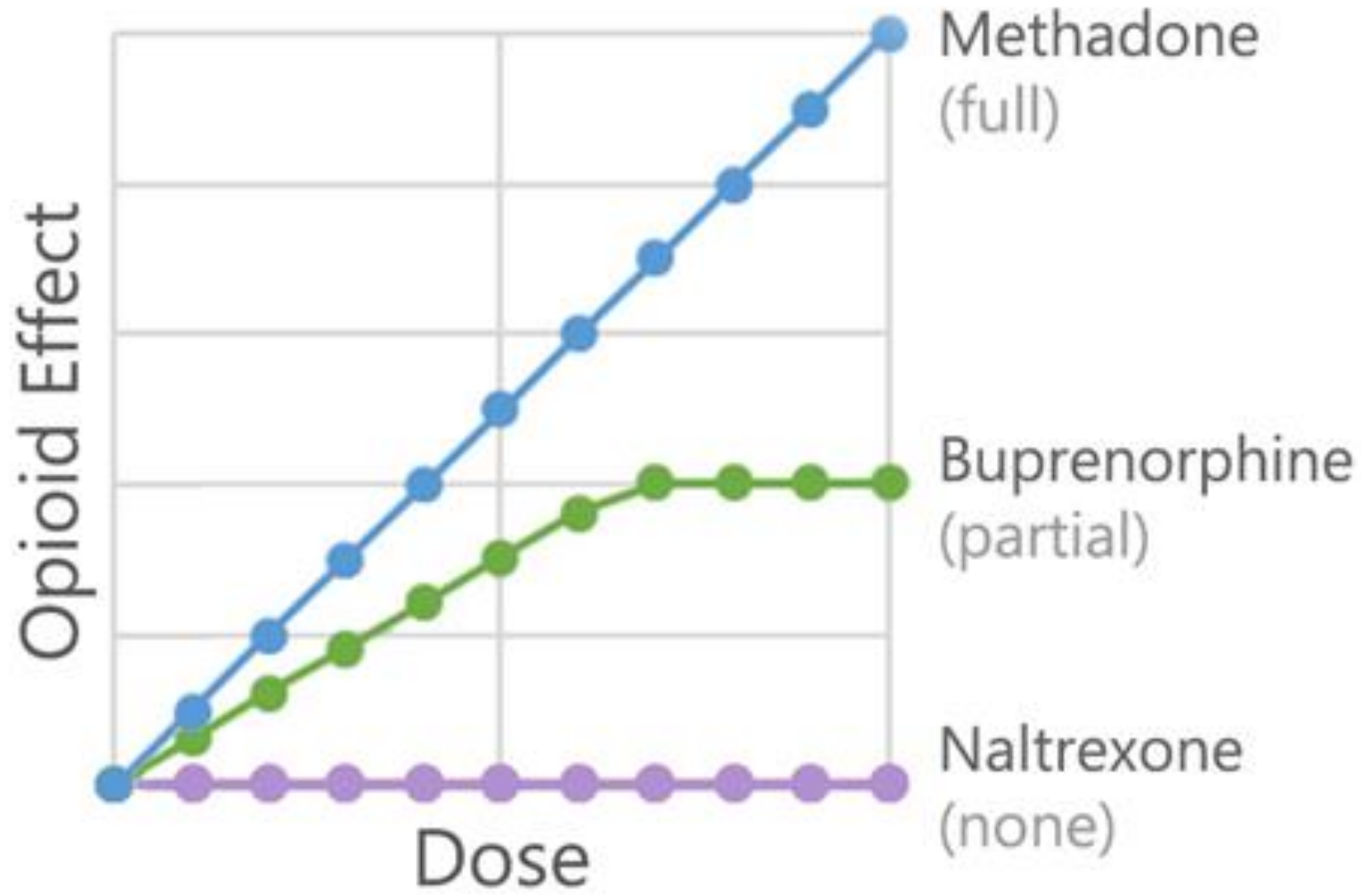
Social support

Counseling



YOU CAN BE DEPENDENT WITHOUT HAVING USE DISORDER

MOUD



Methadone

- A full opioid medication.
 - The more one takes the more one feels the effects.
- Manages cravings and withdrawal by binding to opioid receptors.
- Lasts about 24 hours and is taken by mouth.
- Provided only at opioid treatment programs.
 - It is generally given by daily observed dosing.
 - Requires regular urine drug testing and counseling.

Buprenorphine

- A partial opioid medication.
 - Above a certain dose you stop feeling more opioid effect.
- Manages cravings and withdrawal by binding to opioid receptors.
- Lasts about 24 hours, usually taken by mouth, or a monthly injection.
- Can be prescribed by a medical provider and picked up at a pharmacy.
 - Or dispensed at Opioid Treatment Program settings.

Naltrexone

- An opioid blocker. It is not an opioid.
- It can manage cravings for some people.
- An injection that lasts for about 28 days.
 - Individuals should not use any opioids for 7-10 days before taking naltrexone.
- Prescribed and administered by a medical provider who may require urine drug testing and counseling.

What concerns have you heard about methadone, buprenorphine, and naltrexone for OUD?

Common Concerns

- A common concern is that we are replacing one drug for another, perpetuating addiction.
 - Understandable concern
 - Difference between dependence and use disorder is essential
- A related question is “are we making it worse, reinforcing addiction somehow with medications?”
 - Need to address urgent, fatal medical condition
 - Helpful to see improvements when people start MOUD

Common Concerns

- Other common concerns:
 - “I don’t want to take a medication forever!”
 - “Now I’m addicted to [e.g., Suboxone]!”
 - “What about counseling/support groups instead?”
- Helpful frames:
 - Medications as long as they are helpful.
 - Sort out the difference between dependence and use disorder.
 - Medications do not exclude participation in any of these modalities.

Why Focus on MOUD?

...and not behavioral interventions?

Why Focus on MOUD?

REVIEWS AND OVERVIEWS

Evidence-Based Psychiatric Treatment

The Role of Behavioral Interventions in Buprenorphine Maintenance Treatment: A Review

Kathleen M. Carroll, Ph.D., Roger D. Weiss, M.D.

Objective: Although counseling is a required part of office-based buprenorphine treatment of opioid use disorders, the nature of what constitutes appropriate counseling is unclear and controversial. The authors review the literature on the role, nature, and intensity of behavioral interventions in office-based buprenorphine treatment.

Method: The authors conducted a review of randomized controlled studies testing the efficacy of adding a behavioral intervention to buprenorphine maintenance treatment.

Results: Four key studies showed no benefit from adding a behavioral intervention to buprenorphine plus medical management, and four studies indicated some benefit for specific behavioral interventions, primarily contingency management. The authors examined the findings from the negative trials in the context of six questions: 1) Is buprenorphine that effective? 2) Is medical management that effective? 3) Are behavioral interventions that ineffective in this

population? 4) How has research design affected the results of studies of buprenorphine plus behavioral treatment? 5) What do we know about subgroups of patients who do and those who do not seem to benefit from behavioral interventions? 6) What should clinicians aim for in terms of treatment outcome in buprenorphine maintenance?

Conclusions: High-quality medical management may suffice for some patients, but there are few data regarding the types of individuals for whom medical management is sufficient. Physicians should consider a stepped-care model in which patients may begin with relatively nonintensive treatment, with increased intensity for patients who struggle early in treatment. Finally, with 6-month retention rates seldom exceeding 50% and poor outcomes following dropout, we must explore innovative strategies for enhancing retention in buprenorphine treatment.

Am J Psychiatry 2017; 174:738–747; doi: 10.1176/appi.ajp.2016.16070792

Why Focus on MOUD?

REVIEWS AND OVERVIEWS

Evidence-Based Psychiatric Treatment

The Role of Behavioral Interventions in Buprenorphine Maintenance Treatment: A Review

Kathleen M. Carroll, Ph.D., Roger D. Weiss, M.D.

Objective: Although counseling is a required part of office-based buprenorphine treatment of opioid use disorders, the nature of what constitutes appropriate counseling is unclear and controversial. The authors review the literature on the role, nature, and intensity of behavioral interventions in office-based buprenorphine treatment.

Method: The authors conducted a review of randomized controlled studies testing the efficacy of adding a behavioral intervention to buprenorphine maintenance treatment.

Results: Four key studies showed no benefit from adding a behavioral intervention to buprenorphine plus medical management, and four studies indicated some benefit for specific behavioral interventions, primarily contingency management. The authors examined the findings from the negative trials in the context of six questions: 1) Is buprenorphine that effective? 2) Is medical management that effective? 3) Are behavioral interventions that ineffective in this

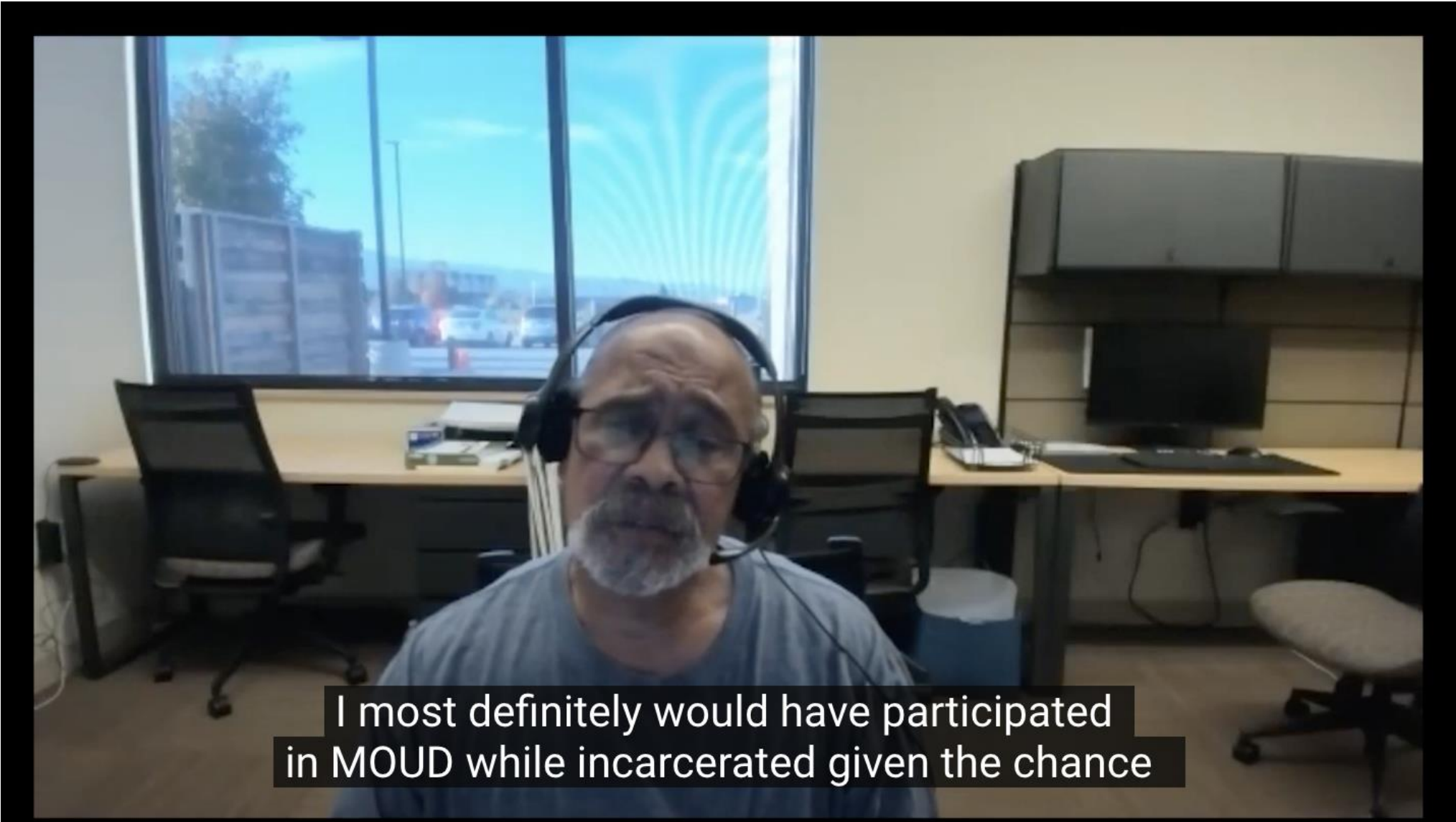
population? 4) How has research design affected the results of studies of buprenorphine plus behavioral treatment? 5) What do we know about subgroups of patients who do and those who do not seem to benefit from behavioral interventions? 6) What should clinicians aim for in terms of treatment outcome in buprenorphine maintenance?

Conclusions: High-quality medical management may suffice for some patients, but there are few data regarding the types of individuals for whom medical management is sufficient. Physicians should consider a stepped-care model in which patients may begin with relatively nonintensive management with increased intensity for patients who struggle with treatment. Finally, with 6-month retention rates exceeding 50% and poor outcomes following treatment, future studies must explore innovative strategies for enhancing buprenorphine treatment.

Am J Psychiatry 2017; 174:738–747; doi: 10.1176/appi.ajp.2017.174.738

- Mixed evidence of benefits of behavioral interventions on top of buprenorphine for OUD.
- Studies with added benefit of behavioral interventions were those on contingency management.

Victor's Story



What Questions/Barriers to MOUD?

What questions about or barriers to MOUD/ MAT have you heard from people/staff in the field?

BREAK – 10 minutes



Shared Decision Making

Mandy Owens, PhD

What Is Shared Decision Making?

Guide to Talking to Someone About Medications for Opioid Use Disorder

OPEN GUIDE

DETAILS ▾



<https://www.learnabouttreatment.org/guide/#/>

What Is Shared Decision Making?

- Involves person in decisions about their health
- Provides accurate information
- Explores options and follows person's plan

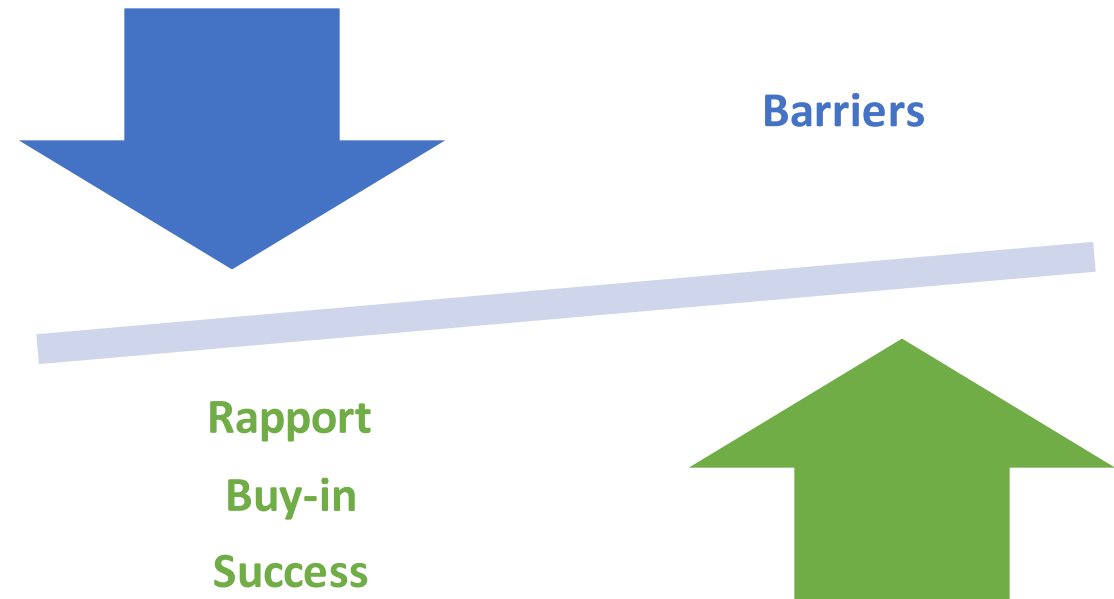
What is Treatment Decision Making?



All people deserve to be actively involved with decisions about their health. This includes people with opioid use disorder. They should be provided with accurate information about all possible options for treatment so they can make an informed decision about the kind of care *they* want.

What Is Shared Decision Making?

- Involves person in decisions about their health
- Provides accurate information
- Explores options and follows person's plan



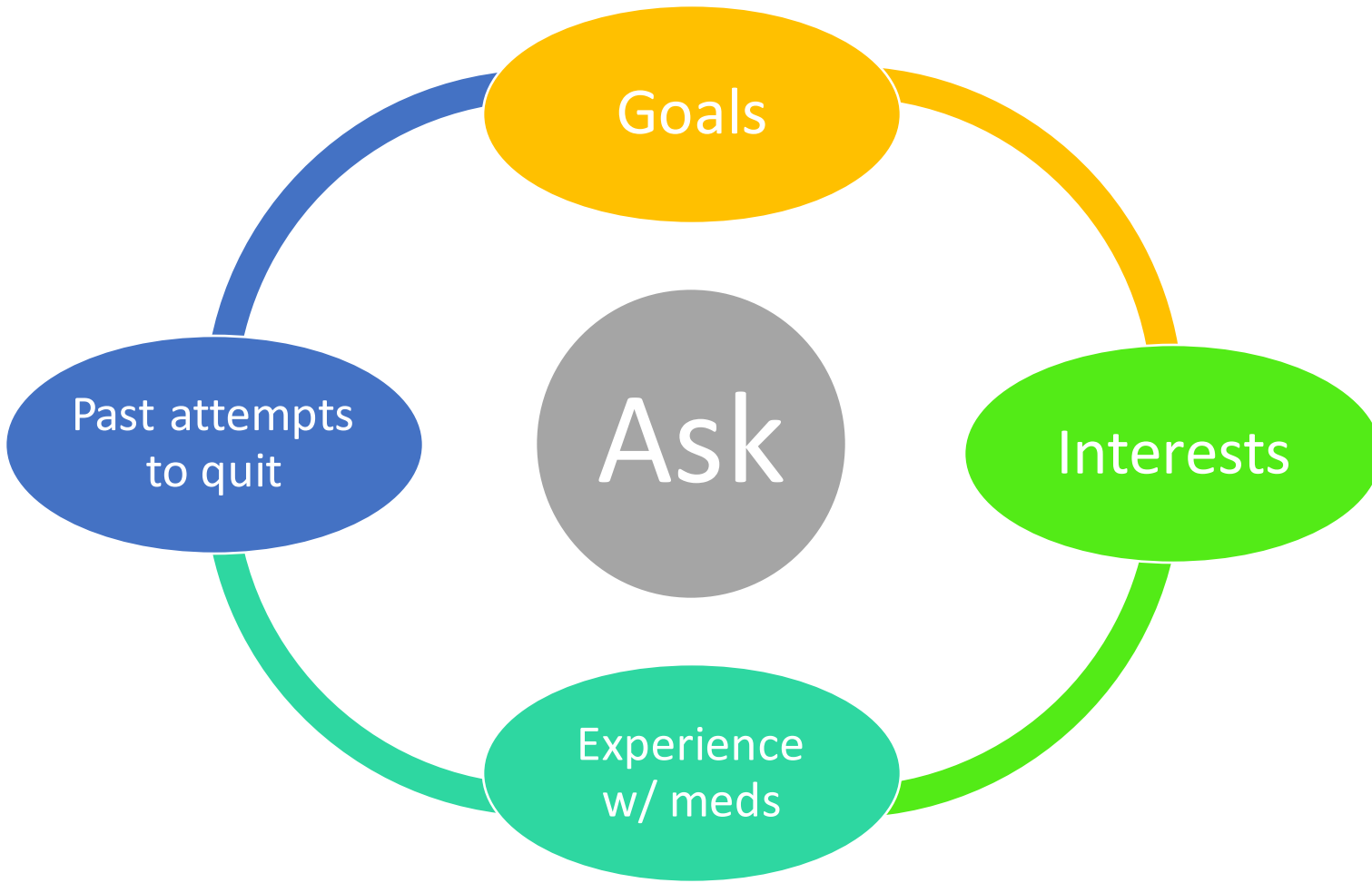
Shared Decision Making: 3 Steps

1. Ask

2. Explore
& Educate

3. Support
& Empower

Step 1: Ask



You said that you're sick and tired of being sick and tired – would it help to talk about what you want to do with your use?



Step 2: Explore & Educate

- Talk about past experiences
- Walk people through the brochure
- Let them know that this is just an introduction
- Help them organize follow-up questions with provider

Tell me more about your past experiences with bupe.

Can I share a little more about precipitated withdrawals?

1. Ask

2. Explore & Educate

Step 2: Explore & Educate

What's next?

Learn more about OUD and how to use this brochure:
learnaabouttreatment.org

Connect to medication options near you:
warecoveryhelpline.org



Find naloxone and overdose info:
stopoverdose.org

More info on medications:
samhsa.gov/medication-assisted-treatment



ADAI
ADDICTIONS, DRUG & ALCOHOL INSTITUTE

CENTER FOR COMMUNITY-ENGAGED DRUG EDUCATION, EPIDEMIOLOGY, AND RESEARCH



UNIVERSITY of WASHINGTON
PSYCHIATRY & BEHAVIORAL SCIENCES
School of Medicine

This brochure provides basic information for educational purposes. Speak with a health care professional to make an informed decision that best fits your needs including learning the risks and benefits of all treatment options.
Revised January 2023.

Your preferences

Setting: _____

Dosing frequency: _____

Clinic visit frequency: _____

Counseling: _____

Support group: _____

Medication options: _____

Other: _____

Call the **Washington Recovery Help Line** to talk about your options for medications, counseling and support groups, and connect to care.



Washington Recovery Help Line
24-Hour Help for Substance Abuse, Problem Gambling & Mental Health

1.866.789.1511
warecoveryhelpline.org

About OUD

What is opioid use disorder?

Opioid use disorder (OUD) is a long term medical condition. People with the condition are physically dependent on opioids and have brain changes that affect their thinking, priorities, and relationships.

OUD can come back if not treated properly. You may need to try more than one type of treatment to find what works best for you.

What can medications do for me?

Medications are proven to work the best at treating opioid use disorder.

They help:

- Manage craving and withdrawal.
- Reduce illicit opioid use.
- Decrease the risk of having an overdose.

Medications can provide stability, allowing people to address other things in their lives.

You can be in recovery and be on medications at the same time.




Medications for Opioid Use Disorder

1. Ask

2. Explore & Educate

Step 2: Explore & Educate

Treatment options



There are **three** places where you can get medications for opioid use disorder:

Opioid treatment program (OTP)

- **Methadone, buprenorphine, or naltrexone** available.
- Highly structured—counseling and supervised dosing may be required.

Medical office/Primary care

- **Buprenorphine** or **naltrexone** available.
- Familiar medical office setting.
- Less structure (often weekly or monthly visits, some don't require counseling).
- Appointment often needed.

Community program

- **Buprenorphine** or **naltrexone** available.
- Other services may be offered (syringe exchange, housing supports, etc.).
- May have drop-in visits

Methadone	Buprenorphine	Naltrexone
How does this medication work?		
<ul style="list-style-type: none"> • Methadone is a full opioid medication. • The more you take the more you will feel its effects. • Manages cravings and withdrawal by binding to opioid receptors. 	<ul style="list-style-type: none"> • Buprenorphine is a partial opioid medication. • Has a ceiling effect, so above a certain dose you stop feeling more of its effects. • Manages cravings and withdrawal by binding to opioid receptors. 	<ul style="list-style-type: none"> • Naltrexone is an opioid blocker. • It is not an opioid, so you won't feel an opioid effect. • Helps manage cravings for some people.
Does it lower my risk of dying? <i>Based on research that tracked outcomes in the real world.</i>		
<ul style="list-style-type: none"> • Lowers risk of death by about 50%. 	<ul style="list-style-type: none"> • Lowers risk of death by about 50%. 	<ul style="list-style-type: none"> • Has not been shown to lower the risk of death.
How long does it last, and how do I take it?		
<ul style="list-style-type: none"> • Lasts about 24 hours and is taken by mouth. 	<ul style="list-style-type: none"> • Oral form lasts about 24 hours. injectable form lasts 7-28 days. 	<ul style="list-style-type: none"> • An injection that lasts for 28 days. You can't use any opioids for 7-10 days before taking naltrexone.
Where can I get it, and how often do I need to go?		
<ul style="list-style-type: none"> • Dispensed only at opioid treatment programs. • Dosing can start up to 6 days a week, but usually becomes less often over time during treatment. 	<ul style="list-style-type: none"> • Prescribed by a medical provider and picked up at a pharmacy (<i>oral</i>) or given at an appointment (<i>injection</i>). Both are available at some opioid treatment programs. • Visits vary from near daily to monthly. 	<ul style="list-style-type: none"> • Prescribed and given by a medical provider, or provided at an opioid treatment program. • Visits vary from weekly to monthly.
Will I need to go to counseling?		
<ul style="list-style-type: none"> • Requires regular urine drug testing and counseling. 	<ul style="list-style-type: none"> • Most providers require urine drug testing and some require counseling. 	<ul style="list-style-type: none"> • Some providers require urine drug testing and counseling.

Screenshot

1. Ask

2. Explore & Educate

Step 3: Support & Empower

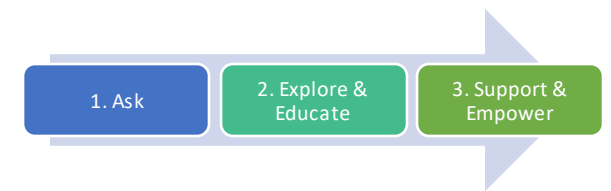
- Let them know that you are there to support **whatever decision they want to make.**



Step 3: Support & Empower

- Let them know that you are there to support **whatever decision they want to make.**

Why is it in our best interest to follow the individual's plan rather than our own/what we think is best?



Step 3: Support & Empower

- Let them know that you are there to support **whatever decision they want to make.**

If it's okay, I want to make sure I'm following – you've tried bupe before, but aren't sure you used it correctly. You're also really worried that you keep overdosing and the drug supply is inconsistent. What do you want to do next?

1. Ask

2. Explore & Educate

3. Support & Empower

Step 3: Support & Empower

- Let them know that you are there to support **whatever decision they want to make.**
- Make a plan with them, big or small – look for barriers that could come up.
- Encourage their success and follow-up if you see them again.





Using Shared Decision Making in the Field

Amy Naylor, BA





Manage the Environment

You often have the authority to manage the environment



Scenario 1: Not Ready for Conversation or MOUD



Ask

Maintain rapport
Likely not your first
interaction
Give naloxone +
referral information



Explore and
educate



Support and
empower

Scenario 2: Ready for a Conversation, but Not MOUD



Ask



Explore and
educate

Not always about
substance use

Often people are
ready for other
types of wellness



Support and
empower

Scenario 3: Conversation with Friends or Family



Ask



Explore and
educate

Evidence-based
information about
naloxone and
MOUD



Support and
empower

Refer to MOUD
Locator
Offer to follow up
if you can

Scenario 4: Ready for Conversation and MOUD



Ask



Explore and
educate

Prior experiences
with MOUD
Evidence-based
information about
MOUD



Support and
empower

Referral to clinic
you already know
Offer to follow up
if you can

We Are Losing the Battle

- Between 2017 and 2022, the number of opioid-related overdose deaths reported in Snohomish County more than doubled.
- These numbers continue to climb, with no end in sight.
- Although EMS providers encounter those suffering from Opioid Use Disorder frequently when responding to overdose, all our treatments are reactive.



Current Approach by EMS

- We wait for an overdose to occur.
- Attempt resuscitation by reversing the overdose with Narcan. Sometimes it works, sometimes it doesn't.
- Offer transport, which is most often refused.
- The patient is left alone, uncomfortable, and potentially in a withdrawal state, with no further help. The patient experience is mechanical and often lacks compassion.
- Expecting anything other than a recurrent overdose in this situation is insane.



Coordinated Opioid Response by EMS (CORE)

- Pilot program started by Dr. Joshua Corsa, our delegate physician at North County Fire.
- CORE is an extension of our version of Mobile Integrated Health/Co-Response, CARES.
- The goal is to intervene at this potentially crucial point – just after an overdose - to offer options and coordinate connections.



NORTH COUNTY
CARES
COMMUNITY ASSISTANCE
REFERRAL & EDUCATION SERVICES

Program Flow



EMS personnel respond to an opioid overdose and provide care. The CARES team is dispatched as well.



If the patient refuses transport, the CARES team will remain with the patient while others will clear the scene.



If the patient is willing, we'll have a conversation with them with a focus on shared decision making. Our providers will be well versed in the treatment options available in our area and ready to reduce friction points to accessing that treatment.

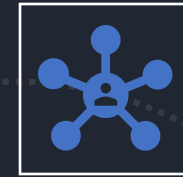
Program Flow



Based on that conversation, the patient may decide to pursue MOUD or other options. The key is flexibility.



If MOUD, the CARES team will perform a warm hand-off with one of three treatment partners in our area.



The patient is enrolled in the CARES program for continued connection.

Our Mission Statement:

The goal of the CORE program is to share evidence-based information and help dispel myths about MOUD.

It is imperative that we leverage the unique opportunity afforded to us as EMS providers to meet those suffering from OUD where they are.

Some patients will be ready to have a conversation about seeking treatment. Many won't. The bare minimum then should be leaving that patient with the feeling that someone cares about them and we're ready when they are.



NORTH COUNTY
CARES

MOUD

Buprenorphine Induction by EMS

- Reduces cravings and withdrawal symptoms.
- North County paramedics will use the COWS score as well as other inclusion criteria to determine eligibility.
- A 16 mg loading dose will be provided on scene with potential follow up dose.
 - Warm hand-off to treatment partner if available
 - Cold hand-off if off hours



Partner Spotlight: Ideal Option

- Provides outpatient MOUD using Suboxone, as well as in-house counseling services.
- The CORE program will have a direct line to intake and the CARES team can perform transport to the facility, coordination of prescription pick-up, and follow up to encourage a successful outcome.



Ideal Option

Partner Spotlight: Quelute Healing Center

- Offers comprehensive services:
 - MOUD
 - Transportation
 - Counseling
 - Primary care
 - Offers methadone and buprenorphine for MOUD
-



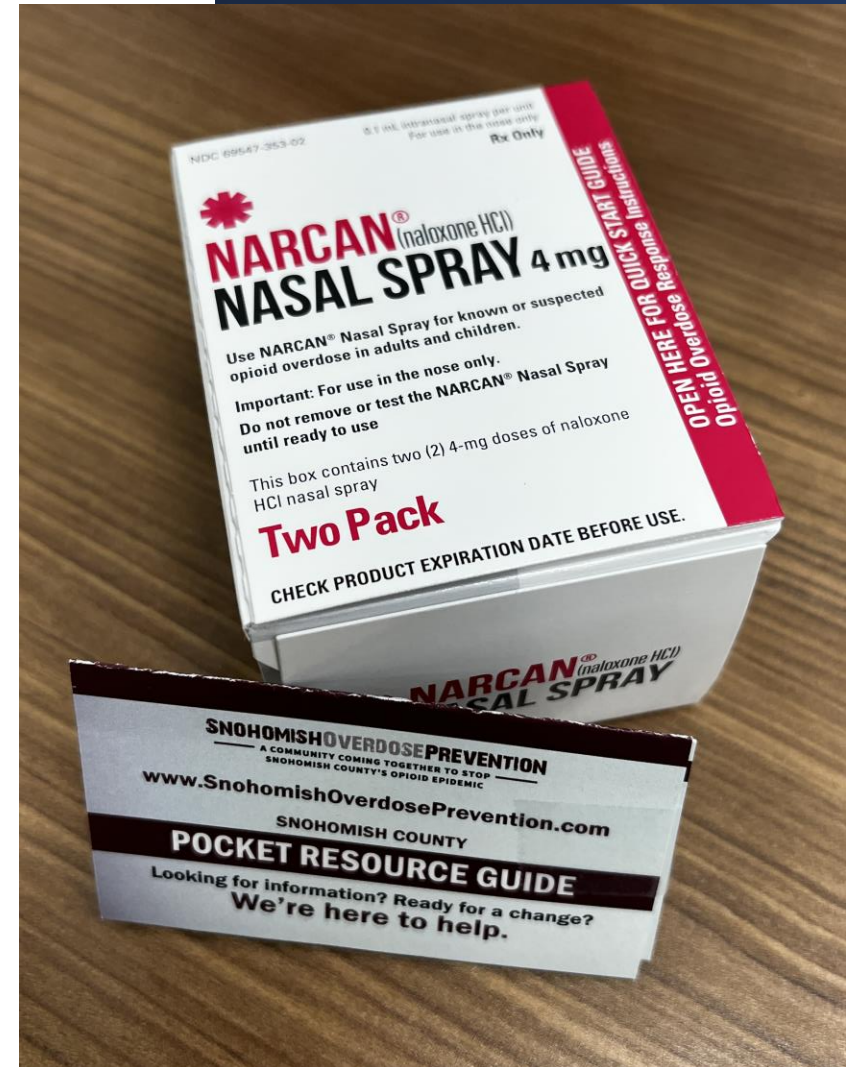
Partner Spotlight: Snohomish County Diversion Center

The Snohomish County Diversion Center is a 44-bed facility (32 men and 12 women) offering short-term placement and shelter to homeless adults with substance use disorder and other behavioral health issues, diverting them away from incarceration and toward treatment.



Connection is Key

- For those that are not ready to engage with us, we leave behind Narcan with the patient or family/friends.
 - We also leave contact info for the CARES program and ask if they'd be up for a follow up call in the coming days.



- This is largely uncharted territory for EMS, and the question remains – is this point (post overdose) the best time to engage?
 - Our stance is that every interaction with the medical community matters - "plant a seed".
- The bare minimum will be transitioning from our current practice in EMS to a more human approach.



Questions



Thank you!

Questions?

Mandy Owens – mandyo@uw.edu