

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

OPIOID USE DISORDERS, BRAIN CHEMISTRY, IDENTIFICATION OF SIGNS AND SYMPTOMS

Dr. William Morrone, MPH
Medical Director and MAT Provider, Recovery Pathways

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



1

DR. WILLIAM MORRONE

- Father & Recovery Advocate
- Village Medicine & Failed Farmer
- Toxicologist - UMKC
- Deputy Medical Director BCHD
- Chief Medical Examiner
- Armed Forces Institute of Pathology
- Public Health – Servant – Teacher
- Crypto-Historian
- Advocate Physician for social change

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



2

WHAT IS A DRUG?

- Any substance that alters mood, level of perception, and/or brain functioning

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



3

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

HOW DRUGS & ALCOHOL WORK

- They interact with nerve circuits, centers, and chemical messengers
- Results
 - I Feel Good – Euphoria & Reward
 - I Feel “Better” – Reduce negative feelings
 - This Feels “Normal”
 - I’m craving it, tolerating its effects, withdrawing and feeling sick

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



4

NATURAL REWARDS

- Food
- Water
- Sex
- Nurturing

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



5

PERCENTAGES OF DOPAMINE (DA) RELEASED

- Dopamine (DA) is the brain’s most powerful “pleasure” chemical.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



6

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

THE REWARD SYSTEM

- The reward system consists of a network of neurons that are responsible for releasing dopamine, which is a type of neurotransmitter. When these neurons release dopamine, it elicits a sense of pleasure in an individual.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



7

NEUROTRANSMISSION

- Neurotransmission encompasses a diverse range of chemical substances known as "neurotransmitters." Dopamine is one of these.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



8

NEUROTRANSMISSION

- Following the transmission of the signal to the adjacent neuron, dopamine is reabsorbed by the neuron from which it was initially released through the action of a specialized protein called the "dopamine transporter."

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



9

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

COCAINE AND NEUROTRANSMISSION

- Drugs of abuse are able to interfere with this normal communication process in the brain. Cocaine, for example, blocks the removal of dopamine from the synapse by binding to the dopamine transporters. As shown in this slide, this results in a buildup of dopamine in the synapse. In turn, this causes a continuous stimulation of receiving neurons, probably responsible for the euphoria reported by cocaine abusers.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



10

DEFINITION OF DISEASE

- A condition of the living animal or plant body or of one of its parts that impairs normal functioning and is typically manifested by distinguishing signs and symptoms : sickness

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



11

ADDICTION IS A BRAIN DISEASE

- Any use causes either or both acute and temporary changes. Prolong use changes the brain in fundamental, destructive and long lasting ways.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



12

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

ADDICTION IS A BRAIN DISEASE

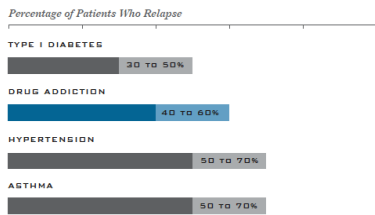
- Addiction is a chronic disease similar to other chronic diseases such as type II diabetes, cancer, and cardiovascular disease

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



13

RELAPSE HAPPENS



MEDICATIONS FOR OPIOID USE DISORDER TRAINING



14

YOUR BRAIN ON DRUGS

- Cocaine has other actions in the brain in addition to activating the brain's reward circuitry. Using brain imaging technologies, such as PET scans, scientists can see how cocaine actually affects brain function in people. PET allows scientists to see which areas of the brain are more or less active by measuring the amount of glucose that is used by different brain regions. Glucose is the main energy source for the brain. When brain regions are more active, they will use more glucose and when they are less active they will use less. The amount of glucose that is used by the brain can be measured with PET scans.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



15

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

YOUR BRAIN AFTER DRUGS

Dopamine D2 Receptors Are Lower in Addiction

Cocaine
Meth
Alcohol
Heroin

Control Addicted

DA D2 Receptor Availability

MEDICATIONS FOR OPIOID USE DISORDER TRAINING

Justice Speakers Institute

16

YOUR BRAIN AFTER DRUGS

- Any use causes either or both acute and temporary changes.
- Prolong use changes the brain in fundamental, destructive and long lasting ways.

Pre-Amphetamine/Control
Post-Chronic Amphetamine (10 days)
4 weeks
6 months
1 year
7 years

Superior → Inferior

MEDICATIONS FOR OPIOID USE DISORDER TRAINING

Justice Speakers Institute

17

OPIATES VERSUS OPIOIDS

OPIATES

- Directly refined or extracted from opium poppy, “natural”
- Morphine, codeine, opium

OPIOID

- Semisynthetic: heroin, hydrocodone, oxycodone
- Fully Synthetic: fentanyl, tramadol, methadone
- A class of drugs that act on specific receptors to neutralize or reduce pain

MEDICATIONS FOR OPIOID USE DISORDER TRAINING

Justice Speakers Institute

18

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

OPIATES VERSUS OPIOIDS

SIMILARITIES

- Both are effective at treating pain
- Both can lead to dependence, abuse, addiction, overdose, and death

DIFFERENCES

- Opioids are chemically altered, effects can be greatly magnified
- Some fentanyl analogues 10,000x stronger than morphine

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



19

EFFECTS OF OPIOIDS ON THE BRAIN

- Dopamine: associated with learning, motivation, and reward
- Dopamine production leads to pleasurable feelings
- Opioids trigger massive release of dopamine
- Brain starts to associate opioid use with neurochemical reward

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



20

EFFECTS OF OPIOIDS ON THE BRAIN

- Long-term heavy use– brain reduces or halts natural dopamine production
- Only feel good when they are using opioid
- Withdrawal symptoms reinforce

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



21

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

CDC 2014

- 75% of heroin users that started after 2000, said they first abused prescription opioids.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



22

OPIOID INTOXICATION

- Drowsy, sedated (“nodding”)
- Speech and movement may be slowed
- May appear confused or incoherent
- May appear euphoric (“high”)
- Pupils are constricted (“pinpoint”)

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



23

OPIOID WITHDRAWAL

- Digestive: diarrhea, vomiting, nausea
- Muscle aches, restless legs
- Eyes: dilated pupils, watery eyes

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



24

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

OPIOID WITHDRAWAL, CONT.

- Nose & Mouth: sniffles, runny nose, yawning
- Skin: sweating, goosebumps
- Mood: anxious, restless, irritable

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



25

WHAT MAJOR PROBLEMS DO OPIOIDS CAUSE?

- Overdose and death
- Infectious diseases
- Criminal activity, incarceration, and victims
- Injury, violence, and accidents
- Damaged relationships and Unemployment

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



26

NUMBER OF DRUG POISONING DEATHS BY CATEGORY – UNITED STATES, 2011-2014

	2011	2012	2013	2014 (% Change 2013-2014)	% Change 2012- 2013	% Change 2011- 2013	% Change 2011- 2014
All drug Total deaths	41,340	41,502	43,982	47,055 (+6.5%)	6.00	6.40	13.8
Heroin deaths	4,397	5,925	8,257	10,574 (+26.0)	39.40	87.80	140.48
Rx opioid deaths	16,917	16,007	16,235	18,073 (+11.3)	1.40	-4.00	6.83

Source: Modified Center for Disease Control and Prevention, (CDC Wonder) Available at <http://www.cdc.gov/>.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



27

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

HOW IS OPIOID USE DISORDER (OUD) DIAGNOSED?

- 2 or more criteria w/in 12-month period = OUD
- Using larger amounts/longer
- Much time spent using
- Activities given up in order to use
- Physical/psychological problems
- associated with use
- Social/interpersonal problems related to use

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



28

HOW IS OPIOID USE DISORDER (OUD) DIAGNOSED? CONT.

- Neglected major role in order to use
- Hazardous use
- Repeated attempts to quit/control use
- Withdrawal *
- Tolerance *
- Craving

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



29

REFERENCES

American Society of Addiction Medicine. (2011). Public Policy Statement: Definition of Addiction. Chevy Chase, MD: American Society of Addiction Medicine. Available at http://www.asam.org/docs/publicpolicy-statements/1definition_of_addiction_long_4-11.pdf?sfvrsn=2

Botticelli MA, Koh HK. Changing the language of addiction. JAMA October 4, 2016;316(13):1361

Broyles LM, Binswanger IA, Jenkins JA, et al. *Confronting inadvertent stigma and pejorative language in addiction scholarship: a recognition and response.* Subst Abus. 2014;35(3):217-21

Campbell G¹, Nielsen S¹, Laranca B¹, et al. Pharmaceutical Opioid Use and Dependence among People Living with Chronic Pain: Associations Observed within the Pain and Opioids in Treatment (POINT) Cohort. *Pain Med.* 2015 Sep;16(9):1745-58. doi: 10.1111/pme.12773. Epub 2015 May 22.

CDC Guidelines for prescribing opioids for chronic pain: United States 2016. <https://www.cdc.gov/mmwr/volumes/65/rr/m6501e1.htm>

CDC Opioid Overdose Information <https://www.cdc.gov/drugoverdose/epidemic/>

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



30

JUSTICE SPEAKERS INSTITUTE TRAINING HANDOUT

REFERENCES

Compton WM, Jones CM, Baldwin GT. Relationship between Nonmedical Prescription-Opioid Use and Heroin Use. *N Engl J Med*. 2016 Jan 14;374(2):154-63. doi: 10.1056/NEJMra1508490.

Dart RC, Surratt HL, Cicero TJ, et al. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med*. 2015 Jan 15;372(3):241-8. doi: 10.1056/NEJMs1406143.

Degenhardt L, Bruno R, Lintzeris N, et al. Agreement between definitions of pharmaceutical opioid use disorders and dependence in people taking opioids for chronic non-cancer pain (POINT): a cohort study. *Lancet Psychiatry*. 2015 Apr;2(4):314-22. doi: 10.1016/S2215-0366(15)00005-X. Epub 2015 Mar 31.

Staton LJ, Panda M, Chen I, et al. When race matters: Disagreement in pain perception between patients and their physicians in primary care. *J Natl Med Assoc* 2007;99(5):532-8

Rollnick, S, Miller, W, & Butler, C. (2007). *Motivational interviewing in health care: Helping patients change behavior*. New York, NY: The Guilford Press. ISBN: 978-1593856120

US Department of Health and Human Services (HHS) Office of the Surgeon General, Facing Addiction in America: the Surgeon General's Report on Alcohol, Drugs, and Health. Washington, DC, HHS, November 2016.

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



31

THANK YOU

DR. WILLIAM MORRONE, MPH

Consultant–Justice
Speakers Institute

DrMorrone@JusticeSpeakersInstitute.com



Justice Speakers Institute
PROMOTING JUSTICE WORLDWIDE

MEDICATIONS FOR OPIOID USE DISORDER TRAINING



32
