



SWK 3805: Module 11- Opioids

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Contents

Module 11: Preface	vii
Module 11: Introduction	viii
Ch. 1: The Opioid Epidemic	1
Ch. 2: Introduction to Opioids	5
Ch. 3: Heroin	7
Ch. 4: Neonatal Abstinence Syndrome (NAS)	9
Ch. 5: Alcohol versus Opioid Deaths	11
Ch. 6: Summary	12
Module 11: Key Terms	13
Module 11: References	14

Module 11: Preface

Welcome to the online coursebook for Module 11 of our Theories and Biological Basis of Addiction course. The material is designed to be read interactively or after downloading; while the embedded interactive exercises require internet connectivity, each can also be downloaded for offline work. These exercises are presented to help you test and apply what you are reading, challenge yourself, prepare for quizzes, and have a little fun along the way. The list of key terms at the end explains text ***highlighted in bold italics*** throughout the book—in the interactive mode you can click on a highlighted word to jump to its explanation in the key terms section. Use the back arrow to return to where you were reading.

Module 11: Introduction

The reading for Module 11 introduces concepts essential for understanding the nature of opiates, opioids, and narcotics, as well as understanding the problem of opioid abuse and the “opioid epidemic” reported across the United States. This online coursebook includes content prepared by the book’s author, as well as several readings from the published literature.

Module 11 Reading Objectives

After engaging with the assigned reading materials and learning resources, you should be able to:

- Explain the similarities and differences between opiates, opioids, narcotics, heroin, and other substances in this category
- Explain features of the nation’s opioid epidemic;
- Identify the opioid substances commonly misused and their effects;
- Identify the role of tolerance in the overdose cycle;
- Explain basic principles of Neonatal Abstinence Syndrome (NAS);
- Define key terms related to opioid misuse.

Ch. 1: The Opioid Epidemic

In recent months, news about an opioid *epidemic* has shaped a large portion of the national discourse and policy at the local, state, and federal levels. Before delving into details about these substances, we will first look at the context presented by the “epidemic narrative.” The first reading for Module 11 is a fact sheet prepared by the American Society of Addiction Medicine, *Opioid addiction: 2016 facts & figures*. The second reading is from the National Institute on Drug Abuse (NIDA, 2017) and addresses the nation’s opioid crisis.

In this first chapter you will read about:

- the class of opioid drugs;
- epidemiology and economic burden related to opioid addiction;
- the relationship between opioid and heroin misuse;
- the role of *fentanyl* and *carfentanyl* in opioid overdose rates;
- a brief summary of how this problem came to be¹;
- possible strategies for addressing the problem; and,
- key terms related to opioid misuse and addiction.

As you are doing the readings for Chapter 1, keep several points in mind. First, the purpose of these drugs, initially, was pain control—they were originally prescribed because of their *analgesic* properties. They reduced or eliminated many types of pain from many parts of the body. They work on pain through the endorphin systems that we studied earlier in our coursework. Because of their



side effects (and addictive potential) they are usually reserved for treating severe pain or maybe moderate pain of a short duration. Many physicians were trained to believe that these pain medications were not addictive for patients truly experiencing pain. This mistaken belief, combined with being trained to believe that failing to adequately manage pain was unethical, led to much over-prescribing of these medications. This was only part of the opioid problem spiraling out of control.

Second, while a great deal of attention related to the opioid epidemic is directed toward death statistics, it is also important to remember that death is not the only worrisome outcome. According to Ohio's Franklin County Opiate Action Plan (2017) and other sources:

- The number of deaths due to accidental drug overdose increased by 71% between 2012 and 2016—only a 4 year span;
- This increase is largely driven by deaths due to fentanyl, the highest rate occurring among 25-34 year olds, 70.5% of whom were men;
- At least 3 out of 4 persons who use heroin report first misusing prescription opiates;
- The number of persons infected with Hepatitis C increased by 68% between 2012 and 2016 (from 950 to 1600)
- Neonatal abstinence syndrome (NAS) rates climbed precipitously [from 20 babies per 10,000 live births to 155 babies per 10,000 live births between 2006 and 2015, according to state records described in the news <http://wcbe.org/post/rate-ohio-babies-born-addicted-drugs-increasing>];
- Children's services report that 70% of children under the age of one year who are in custody have opiate-involved parents and 28% of all children taken into custody had parents using opiates at the time of removal from the home;
- In 2011, first responders administered an average of 6.55 doses of naloxone per day; in 2016 this rate was up to 10.3 doses per day—largely accounted for by the ever-stronger strains of opiates being used needing

more naloxone per person to combat overdose (the average number of incidents requiring naloxone administration increased from 5.2 per day in 2011 to 6.5 per day in 2016);

- Law enforcement seizure of fentanyl events increased from 110 during 2013 to 3,882 in 2015;
- For every overdose death, there were 32 emergency department visits;
- Efforts to obtain heroin and other opioid substances often involves criminal activity (over and above the distribution being illegal), especially property crimes and robbery (stealing from a person);
- Violent crime and weapons are often involved in the illegal distribution of these substances.

Third, the opioid picture is seriously compounded by the emergence of fentanyl and carfentanil (or carfentanyl) onto the scene. Accidental overdose involving these more powerful synthetic opioid substances is all too easy. Fentanyl has 50-100 times the potency of street heroin. Carfentanil has 100 times the potency of fentanyl. Carfentanil was originally formulated to sedate elephants, not for human use. These two drugs are showing up as additives to a variety of “street” drugs—heroin, reconstructed opioid pills, cocaine, and marijuana.

Recently, first responders and drug-detection dogs have experienced overdose events as a result of accidentally coming into contact with even very small quantities of these substances. The photo in Figure 1 comes from the New Hampshire State Police Forensic Lab (see <https://www.statnews.com/2016/09/29/fentanyl-heroin-photo-fatal-doses/>). The DEA has issued a nationwide law enforcement alert that breathing in or touching even small specks of fentanyl can cause a fatal overdose—amounts similar to a few grains of table salt (<https://ndews.umd.edu/sites/ndews.umd.edu/files/DEA%20Fentanyl.pdf>). Now, imagine the small amount of carfentanil exposure that could be fatal. Finally, think about the implications of these substances being loose in the community—present on discarded drug paraphernalia or contaminating household or auto furnishings. This is similar to an issue we explored when we looked at the community impact of illegal methamphetamine production—these substances represent environmental hazards to others who may not be aware of their presence.

Figure 1. Comparing lethal doses of heroin and fentanyl

“On the left, a lethal dose of heroin; on the right, a lethal dose of fentanyl.”



¹ Additionally, you may be interested in reading Sam Quinones' book, *Dreamland: The True Tale of America's Opiate Epidemic*, if you are interested in an analysis of how the nation got from heroin being a back alley drug during the 1970s to "now it's your neighbor's child," and the role of pharmaceutical companies in the developing opioid tidal wave (2015).



[Click here for a link to our Carmen course](#) where you can locate the assigned pdf file(s) for this chapter. You will need to be logged into our Carmen course, select Module 1, and proceed to the Coursework area. Under the Readings heading you will find a box with links to the readings for relevant coursebook chapters. Don't forget to return here in your coursebook to complete the remaining chapters and interactive activities.

Ch. 2: Introduction to Opioids

This chapter briefly introduces the opioid substances. The contents specifically about opioids come from a longer document published by the National Institute on Drug Abuse (NIDA, 2016) called *Misuse of Prescription Drugs*.

In this chapter you will read about:

- opioid drugs and how they affect the brain/body;
- dependence, addiction, and tolerance;
- opioid misuse and chronic pain;
- the problem of tolerance and overdose;
- injection drug use as a health problem; and,
- key terms used in the field of substance use disorders and addiction.

You might ask, “Why are we reading about tolerance again at this point in the course?” There is a special situation related to opioids and tolerance that warrants attention. This segment written about heroin gets to the point:

During a period of abstinence (for example, in treatment or in custody), tolerance diminishes quickly so that an individual can easily overdose by taking their usual dose. Overdose occurs as a result of depression of the respiratory centre [sic] in the brain, which leads to respiratory and cardiac arrest and death unless immediate medical attention is received (Rassool, 2011, p. 73).

In other words, a person who stops taking heroin or other opioid drugs quickly loses the tolerance that may have built up over time. Resuming use at the previous amount of the drug becomes an overdose.

The symptoms of heroin overdose presented in a table by Rassool (2011, p. 73) are:

- shallow breathing or difficulty breathing
- weak pulse and/or low blood pressure
- delirium
- drowsiness
- muscle spasms
- disorientation

- bluish-color of lips and fingernails (from low oxygen levels)
- dry mouth
- pinpoint (small) pupils
- coma.

Rassool (2011) also addressed an additional important issue related to opioid misuse, particularly related to heroin: injection as a common mechanism of heroin administration. Injecting drugs is accompanied by a host of potential health problems, including infection at the injection sites, vein collapse at the injection sites, and contracting or transmitting infectious diseases through “dirty” needle sharing (HIV, hepatitis B and hepatitis C).



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Ch. 3: Heroin

This chapter is focused on one opioid drug: heroin. The reading material is from the National Institute on Drug Abuse (NIDA, 2017) *Drug Facts* report.

In this chapter, you will read about:

- What heroin is and its effects
- How people use heroin, and
- The relationship between prescription opioids and heroin¹.

As you read this piece, consider the conclusion that making the prescription drug OxyContin (oxycodone) more difficult to abuse (harder to dissolve or crush for injection or “snorting”) in 2010 may have contributed to a significant uptick in heroin use, therefore an increase in heroin deaths (Evans, Lieber, & Power, 2017).

¹Hopefully, you notice that this reading presents a different picture of the relationship between prescription opioid use and heroin misuse. Earlier you saw that as many as 80% of people using heroin started with prescription opioids. In this reading you see that very few people who use prescription opioids end up using heroin. How do we resolve this apparent contradiction? The first is talking about prescription abuse/misuse: people who have developed an addiction to the opioids and their movement into using heroin. The second is talking about people who use opioid medications as prescribed (and for only a short course of treatment).



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Ch. 4: Neonatal Abstinence Syndrome (NAS)

Many psychotropic (and other) substances have the potential to wreak havoc on fetal development if used by a pregnant woman. This is true across the entire pregnancy period, though the specific nature and intensity of risks might vary as a function of which of the fetal organ systems are developing at the point of exposure, as well as the dose/duration of exposure. We have discussed this topic of prenatal exposure in each of our modules, and are paying special attention to it in this module because of the importance of knowing about [Neonatal Abstinence Syndrome \(NAS\)](#). The piece that you are assigned is presented by the March of Dimes—an organization dedicated to preventing birth defects (March of Dimes, 2017). This is a non-technical piece that can be easily shared with clients or family members.

In this brief chapter you will read about:

- What NAS is and how it is assessed
- Substances that might cause NAS
- Prevention and treatment of NAS

When you read the list of substances presented in this piece, it is important to also consider the fact that some medications used to treat opioid addiction are, themselves, opioid drugs. For example, methadone maintenance therapy (MMT) during pregnancy may be an improvement over “street” opioids (heroin and prescription abuse) for the baby’s birth outcomes, but babies exposed in utero to methadone may very well still have to be treated for NAS. Buprenorphine is another form of medication used to treat opioid addiction and has less severe NAS outcomes than methadone (Jones et al., 2012).



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Ch. 5: Alcohol versus Opioid Deaths

Alcohol versus Opioid Deaths

There is one more important point to make as we conclude this topic of opioid problems. While opioid misuse is a critically important issue in the United States, the topic should not be allowed to totally eclipse attention to other substance use problems. For example, alcohol continues to be the cause of illness, injury, and death at a remarkably high rate. As the next article notes, “more than 33,000 Americans died due to alcohol-induced causes in 2015” (Lopez, 2016). The number of opioid-related deaths has been rising fast over the past 15 years, but has yet to surpass the rate of alcohol-related deaths. Here is the weblink information for the story (and a link is provided in your Carmen coursesite, as well):

<https://www.vox.com/policy-and-politics/2016/12/9/13898956/alcohol-deaths-2015>

Ch. 6: Summary

In this Module 11 online coursebook, you learned about the class of substances known as opioids. You read about the various prescription drugs in this class and about heroin, as well. You were also introduced to some of the medications that might be used to help treat opioid addiction. This is a topic we will cover in greater detail in Module 13 when we explore pharmacotherapy and medication assisted treatment (MAT). Much of our attention in Module 11 addressed the nation's encounter with an opioid epidemic—some theories about its origins and ideas for addressing the problem. Then we looked specifically at heroin as one of the opioid substances misused in this country. Tied into these discussions was information about the dangers arising from the introduction of fentanyl (and carfentanil) into the equation. We also directed attention to the problem of Neonatal Abstinence Syndrome (NAS). Finally, we tried to find some balance and context about the problems by reading an opinion piece concerning the relative magnitude of the opioid problem and problems with alcohol.

You are now ready to review some of the key terms related to substance use disorders that were introduced in this book.

Module 11: Key Terms

analgesic: pain relief property of certain medications (aspirin, acetaminophen, ibuprofen, morphine, oxycodone, fentanyl, tramadol, and others).

carfentanil: a derivative of fentanyl, synthesized from morphine; many times more potent by mass than fentanyl; high addictive potential.

epidemic: a widespread disease, disorder, or problem affecting a disproportionately large number of individuals within a population or community at the same time.

fentanyl: synthetic opioid, intended for pain relief; misuse occurs as it is combined with other substances, markedly increasing risk of overdose; high addictive potential.

heroin: opioid drug derived from morphine, illegal in the United States; high addictive potential.

hyperalgesia: abnormally enhanced pain sensitivity.

Neonatal Abstinence Syndrome (NAS): a cluster of problems present in newborn infants who have a history of being exposed to opiate/opioid drugs while in utero; acute withdrawal from the addictive drugs as the placental connection to mother's system is broken at birth.

opiate: substances derived from opium (opium poppy).

opioid: substances synthetically constructed to interact with opioid receptors in the human body; term currently may also apply to substances derived from opium (opiates).

tolerance: when a person's body adapts to use of a specific substance to the point where increased doses are necessary to provoke the same level of response or the response is lessened when the dose remains constant; one criteria used to diagnose substance use disorders (addiction).

Module 11: References

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