

2018

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### Recommended Citation

Brown, Jerrod and Krasowski, Matthew D. (2018) "Opioids: A Brief Review," *Forensic Scholars Today*. Vol. 4: Iss. 2, Article 1.

Available at: [https://digitalcommons.csp.edu/forensic\\_scholars\\_today/vol4/iss2/1](https://digitalcommons.csp.edu/forensic_scholars_today/vol4/iss2/1)

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## Opioids: A Brief Review

By Jerrod Brown, Ph.D. and Matthew D. Krasowski, M.D., Ph.D.

Opioids are a type of drug that relieve pain by influencing opioid receptors throughout the neurological system. The first opioids used medically were chemical components of the opium poppy, a class of compounds known specifically as opiates. Opiates are often classified into those found naturally in opium poppy (e.g., morphine and codeine) and their semi-synthetic derivatives (e.g., heroin, oxycodone, and hydrocodone). The list of opioids expanded with the discovery in the twentieth century of synthetic compounds that also acted as opioid receptors. The synthetic opioids include fentanyl, meperidine, and methadone. Opioids can be administered in a variety of formats, including by pill, powder, or liquid. Many of these opioids are commonly prescribed or administered by medical professionals for pain management. For example, morphine is commonly utilized to manage pain during recovery from surgery, whereas pills like oxycodone and hydrocodone are frequently prescribed to manage milder pain issues.

Despite these beneficial uses, opioids can have a wide range of side effects including sedation, nausea, dizziness, respiratory depression, constipation, cognitive confusion, and birth defects. When opioids are used over an extended period of time, Opioid Use Disorder can result (American Psychiatric Association, 2013). This disorder is characterized

by physical dependence, increased tolerance, and withdrawal symptoms. In such cases, opioid use persists despite the presence of negative consequences, including the failure to meet the everyday responsibilities of life. As this illicit use persists and tolerance increases, the dose necessitated to achieve the same high and prevent withdrawal symptoms will increase. This increases the dangerous possibility of an opioid overdose, which may be life-threatening especially with the risk of respiratory arrest or injuries related to intoxication. Abuse of opioids with other drugs (including ethanol) increases risk of harm.

The United States is currently in the throes of a national opioid epidemic (CDC, 2012; Kolodny & Frieden, 2017). For instance, approximately 28.6 million Americans over the age of 12 are addicted to prescription pain relievers (American Society of Addiction Medicine, 2016). Jones, Mack, and Paulozzi (2013) estimate that about 70 percent of fatal drug overdoses on prescription medications are the result of opioid use. This translates to the opioid-related deaths of approximately 116 people each day in America (U.S. Department of Health and Human Services, 2018).

This opioid crisis has devastating public health, social welfare, and economic consequences on the United States. In particular, the utilization of intravenous forms of opioids has contributed to the transmission of blood-borne infectious diseases such as hepatitis C, human immunodeficiency virus (HIV), and acquired immunodeficiency syndrome (AIDS; National Institute on Drug Abuse, 2018). Beyond this, there are also increasing rates of opioid-related neonatal abstinence syndrome, which occurs when a baby suffers prenatal exposure to a drug and is subsequently born addicted to the drug. The resulting cost of these public health-related issues along with healthcare, substance use treatment, crime, and other consequences is an estimated \$78.5 billion (Florence, Luo, Xu, & Zhou, 2016) to \$92 billion (Murphy & Polsky, 2016) each year. As reported by Murphy and Polsky (2016), this cost has increased an estimated 67 percent over the last 10 years. In light of these costs, there is an urgent need to address to the increasing utilization of opioids in America.

## Author Biographies

Jerrod Brown, Ph.D., is an Assistant Professor and Program Director for the Master of Arts degree in Human Services with an emphasis in Forensic Behavioral Health for Concordia University, St. Paul, Minnesota. Jerrod has also been employed with Pathways Counseling Center in St. Paul, Minnesota for the past fifteen years. Pathways provides programs and services benefiting individuals impacted by mental illness and addictions. Jerrod is also the founder and CEO of the American Institute for the Advancement of Forensic Studies (AIAFS), and the Editor-in-Chief of Forensic Scholars Today (FST) and the Journal of Special Populations (JSP). Jerrod has completed four separate master's degree programs and holds graduate certificates in Autism Spectrum Disorder (ASD), Other Health Disabilities (OHD), and Traumatic-Brain Injuries (TBI).

Matthew D. Krasowski, MD, Ph.D., is a pathologist and Director of Clinical Laboratories in the Department of Pathology at the University of Iowa Hospitals and Clinics. He has interest in the pharmacology and analytical toxicology of drugs of abuse. He has published multiple articles and book chapters on pharmacology and drugs of abuse.

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