The Opioid Epidemic in the United States

Richard Gentry Wilkerson, MD*, Hong K. Kim, MD, MPH,
Thomas Andrew Windsor, MD, RDMS, Darren P. Mareiniss, MD, JD

KEYWORDS

• Opioids • Opioid epidemic • Heroin • Prescription drugs • Overdose • Legal liability

KEY POINTS

- There is an epidemic of opioid abuse in the United States.
- The risk of heroin abuse has been appreciated for more than a century with it now being considered to have no justifiable medical use.
- Opioids commonly prescribed to treat painful conditions have had a dramatic increase in the rate of abuse, addiction, overdose, and death.
- The increase in complications corresponds with a dramatic increase in the rate of opioid prescriptions that resulted from pressures placed on practitioners to avoid undertreatment of pain.
- Naloxone is a competitive opioid antagonist that is used to reverse the adverse effects of opioid intoxication. It is increasingly being prescribed for emergent outpatient administration.

Pain is a more terrible lord of mankind than even death itself.
—Dr Albert Schweitzer, 1931.

INTRODUCTION

The United States is currently experiencing an epidemic of opioid abuse. This article discusses the history of opioid use for pain management and how epidemiologic data demonstrate a convincing degree of association between the increasing rate of opioid prescriptions and the increasing rate of adverse effects, aberrant use, and unintentional death from opioids. There is a clear but not complete overlap between prescription opioid abuse and heroin use. Regardless of drug of choice, abusers of opioids are at great risk of harm. There have been increasing legislative

Disclosures: None.
Department of Emergency Medicine, University of Maryland School of Medicine, 110 South Paca Street, 6th Floor, Suite 200, Baltimore, MD 21201, USA
* Corresponding author.
E-mail address: gwilkerson@em.umaryland.edu

Emerg Med Clin N Am 34 (2016) e1–e23
http://dx.doi.org/10.1016/j.emc.2015.11.002 **emed.theclinics.com**
0733-8627/16/$ – see front matter

efforts to curb this abuse and we present a review of the current state of these laws. Naloxone, an opioid antagonist, has made a profound impact in the care of opioid overdose patients who present for medical care early enough. This paper discusses naloxone pharmacodynamics, its use in the medical setting and how its use is now being expanded to include nontraditional providers with take home naloxone (THN) programs.

Opioid is the term used to describe a substance that is able to bind the opioid receptors. The more specific term, *opiate*, refers to a class of agents that are directly derived from naturally occurring opium. The opiate class includes morphine and codeine. The term *narcotic* is less informative, has a negative connotation, and tends to be reserved for law enforcement and the lay public when referring to an opioid that is used illicitly.

The use of opiates dates back to the Sumerians of Mesopotamia who first cultivated the opium poppy around 3400 BC. The plant was known as *Hul gil* or "joy plant."[1] Opium use, both recreationally and for the treatment of various medical ailments, spread along routes of trade and conquest. Its use was abandoned in most of Europe during the Medieval Inquisition. Philippus von Hohenheim (1493–1541), known as Paracelsus and sometimes called the "father" of toxicology, is credited with the reintroduction and promotion of laudanum, a tincture of opium, for medical treatment in Europe.[2] Thomas Sydenham (1624–1689) further popularized the medical use of laudanum and related products. Friedrich Sertürner (1783–1855) first isolated morphine in 1804.[3] In an effort to find a nonaddictive alternative to morphine, Charles R. A. Wright first synthesized diacetylmorphine, or heroin, in 1874. Bayer Pharmaceutical Products later marketed heroin as an analgesic and cough suppressant.[4] It was also touted a medication to help those addicted to morphine.[5]

In modern times, there have been multiple swings in prevailing attitudes regarding the use of opioids for analgesia. For example, the first edition of the classic text, *Cope's Early Diagnosis of the Acute Abdomen*, in 1921 directed the provider to withhold opioid analgesics until a diagnosis was certain in patients with undifferentiated abdominal pain. This practice persisted to some degree until recent times, despite numerous studies that demonstrated that the use of opioid analgesics does not interfere with the diagnostic process in these patients.[6–9] The use of opioids for acute traumatic injuries or other acute painful conditions is less controversial.

Opioid use for patients with chronic pain owing to cancer has long been a mainstay of therapy. The goal of this therapy is to maintain pain relief to tolerable levels to allow for improved quality of life. The risk of addiction or overdose is ethically justified through application of the principle of double effect. This principle dates back to St. Thomas Aquinas (1225–1274) and states that it is moral to perform an action in the pursuit of a good outcome with the knowledge that a foreseeable harm may occur. The action must fulfill the following conditions: the action cannot of itself be morally wrong, the good outcome cannot be directly caused by the harm, the potential harm cannot be the intention of the action, and the harm cannot be disproportionate to the good outcome.[10,11]

Chronic pain has been estimated by the World Health Organization to be present in up to 22% of patients attending primary care clinics.[12] Through most of the 20th century, physicians avoided the use of opioids in treating chronic noncancer pain. This practice was owing to fear of addiction, overdose, and lack of effectiveness. The concern over addiction started to wane in 1980 with the publication of a 1-paragraph letter in which the authors stated there were only 4 instances of addiction in review of more than 11,000 cases of patients receiving at least one opioid prescription.[13] In 1986, Portenoy and Foley[14] published a retrospective review showing addiction in