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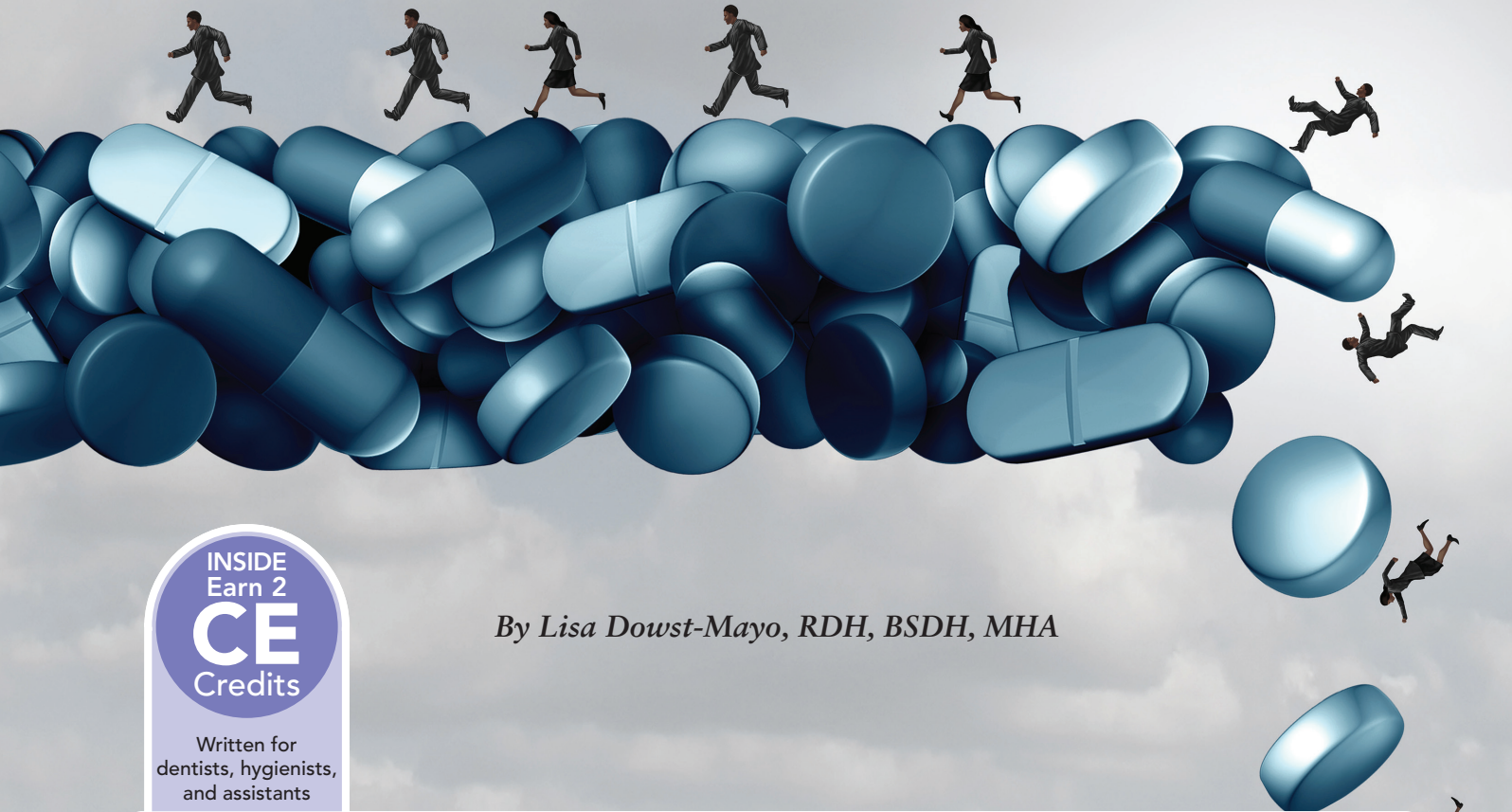
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Dental Providers' Drug Reference for the **U.S. Opioid Epidemic**



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By Lisa Dowst-Mayo, RDH, BSDH, MHA

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ABSTRACT

Opioid abuse and deaths from overdose have reached epidemic levels in the United States. These drug classes cause significant systemic changes and carry a high risk for tolerance, dependence, and addiction. Dental providers who have the authority to prescribe opioids have a responsibility to the public to ensure appropriate pain management protocols are followed so patients do not run the risk of developing a substance abuse disorder. This course will present information and statistics about commonly misused opioids, pharmacodynamics of non-narcotic and opioid analgesics, and dental pain origin and management.

EDUCATIONAL OBJECTIVES

After completing this course, the reader should be able to:

- Discuss the origin of orofacial pain and appropriate pain management practices.
- Describe the pharmacodynamics (effects and mechanism of action) of non-narcotic and opioid analgesic classes of drugs.
- Recognize their responsibility and contribution to opioid use disorders and apply proper pain management techniques to help decrease the opioid epidemic in America.

ABOUT THE AUTHOR



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Dental Providers' Drug Reference for the U.S. Opioid Epidemic



Introduction

Tens of thousands of Americans lose their lives due to opioid overdose each year. The Centers for Disease Control and Prevention (CDC) reports that nearly 70% of drug overdose deaths in 2018 involved opioids, which is four times the rate reported in 1999.¹ From 1999 to 2018, almost 450,000 Americans died from an overdose involving an opioid (almost 130 deaths each day).^{1,2} The annual economic burden of prescription opioid use disorder is estimated to be \$78.5 billion lost in productivity, treatment, criminal justice involvement, and healthcare costs.³ Because opioid use disorder and death rates are now at epidemic levels, healthcare providers who are authorized to write prescriptions for opioids must do so in a manner consistent with current research and recommendations.

Nonmedical use of prescription medications is the second most prevalent illicit first-time drug use for people over age 12 in the United States.⁴ From 2006 to 2012, there was a steady annual increase in the number of prescriptions written for opioids; in 2012, a peak of 255 million prescriptions (or 81.3 per 100 persons) were dispensed.⁵ Since then, there has been a steady decline in prescriptions written for opioids each year with 168 million prescriptions (or 51.4 per 100 persons) reported in 2018.⁵ Unfortunately, that same year 11% of counties reported a six-times higher rate of opioid prescriptions than the national average.^{5,6} Enough prescriptions were written in those counties that each person living there would have one, which is not in line with current pain management strategies.^{5,6} These counties were generally small with a higher percentage of white residents, more dentists and primary care physicians per capita, and a higher number of uninsured individuals and those living with diabetes, arthritis and/or a disability.⁶

Emergency departments (EDs) frequently prescribe opioids for nontraumatic acute dental pain. Nationally, the number of ED visits for orofacial pain has doubled in the last 10 years to 2.2 million (1.65%); it is estimated that 12% of all ED visits for dental pain are patients who are “doctor

shopping” for an opioid.^{7,8} Opioid prescribing by dentists is estimated to be 11% of the overall annual number of opioid prescriptions in the United States.⁸ Dentists were the second-leading opioid prescribers for children and adolescents in 2012, and they were the leading source of opioid prescribers in 2009 for children between 10 and 19 years old, accounting for 31% of all prescriptions written for this age group.^{9,10} Dentists are responsible for nearly one-quarter of first-time opioid prescriptions (frequently for third molar extractions) for children ages 10 to 19.

A 2019 article in the *Journal of the American Medical Association* found that a substantial amount of opioid exposure in children and adolescents came from dental clinicians and correlated to higher rates of opioid abuse and misuse 90 to 365 days post-procedure in this opioid-naïve population.¹⁰ In this era of opioid epidemic, dental providers must recognize their role and responsibility to keep the public safe. This course will outline pain origin and control choices that may assist providers in choosing more appropriate pain management techniques and alter their traditional prescribing habits.

History of Opioids

Natural opium originally was extracted from the opium poppy plant (*Papaver somniferum*) and has been in recorded existence since the third millennium B.C.E.¹¹ Reports of drug abuse and tolerance to opium appear as early as the 6th or 8th century C.E.¹¹ In 1806, the active ingredient of opium was isolated and named morphine after Morpheus, the god of dreams. Synthetic opioids (meperidine, fentanyl, and methadone) are entirely lab-made; semi-synthetic opioids (morphine, codeine, heroin, oxycodone, hydrocodone, and hydromorphone) are synthesized from naturally occurring opium products.^{11,12}

In 1898, morphine was chemically converted into heroin with the intention of producing a substance less addicting than morphine.¹² Unfortunately, heroin was



found to be three times more potent than morphine and more addictive.^{11,12} In 1946, methadone was synthesized and is now used to treat people with opioid use disorder. Methadone is less intense than morphine, has a slower onset of action, and a longer duration.¹¹ Patients are stair-stepped off opioids with methadone being prescribed in larger doses at first, and then titrated down to smaller doses over a specific period of time. In 1942, the first opioid antagonists were discovered and have saved the lives of many patients who have overdosed on opioid drugs. Naloxone and methylnaloxone are pure opioid antagonists that bind to receptors to prevent the opioid from attaching and producing systemic effects.¹²

Commonly Abused Opioids

The physiologic effects of commonly abused opioids in the United States include euphoria, analgesia, xerostomia, itching (heroin), nausea, vomiting, drowsiness, constipation, bradycardia (slowed heart rate), and bradypnea (slowed breathing).¹³ (Table 1)

Pain

The sensation of pain occurs when a local irritant stimulates nociceptors (peripheral free nerve endings). Nociceptors send signals to the spinal cord that alert the brain to the intensity of the pain. Pain signals arrive to the spinal cord through A-delta or C-nociceptor fibers. If the originating injury is transmitted through A-delta, then the pain elicited will be sharp; transmission through C-fibers results in dull, achy pain.¹²

Orofacial pain is classified as nociceptive or neuropathic pain.

- Nociceptive pain occurs in a properly functioning nervous system and can be chronic or acute.¹² Examples of oral nociceptive pain include pulpitis, pericoronitis, dentinal hypersensitivity, maxillary sinusitis, and post-surgery pain.¹⁴

- Neuropathic pain results when abnormal signals or nerves are damaged by entrapment, infection (herpes zoster, HIV), amputation, or diabetes.¹² Neuropathic pain is chronic but can be intermittent.

No matter the type of pain, the therapeutic goal is analgesic relief. Medication can be directed at several targets to interrupt pain transmission. Pain management depends on the type and duration of pain present. Drug options are non-narcotic and narcotic.

Non-narcotic Medications

Non-narcotic medications such as nonsteroidal anti-inflammatory drugs (NSAIDs), salicylates (aspirin), and acetaminophen target pain receptors at the site of injury in the peripheral nerves. NSAIDs and aspirin inhibit cyclooxygenase (COX) enzymes, thereby changing the levels of prostaglandins and thromboxanes in the body.¹⁵ Prostaglandins are inflammatory mediators formed in cell membranes of most organs; they stimulate peripheral pain receptors, causing erythema, edema, and pain. When NSAIDs and aspirin inhibit COX-1 and COX-2, prostaglandin release and the resulting inflammatory response decreases.¹⁶ Aspirin also inhibits the thromboxane pathway, making it a useful anticoagulant.¹²

NSAIDs and aspirin provide analgesic (pain relief), anti-inflammatory (reduce inflammation), antipyretic (reduce fever), and antiplatelet (reduce platelet formation, release or aggregation) actions in the body.^{12,14} NSAIDs are approved to relieve mild to moderate pain as would be experienced with headaches, dental extractions, nonsurgical periodontal therapies, or musculoskeletal strain.^{16,17} They are useful for short periods to treat acute pain.^{12,16}

Opioids

Opioid analgesics decrease pain perception in times of moderate to severe acute and chronic pain (for example, to treat pain associated with myocardial infarction, burns,

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cancer treatment, appendicitis, or post-trauma injury).¹²
They are a proper drug choice to treat acute severe dental postoperative pain and eliminate the risk of excessive

bleeding, which can occur with NSAIDs and aspirin.⁸

Morphine is known as the prototype (standard) drug upon which all other opioid strengths are measured. The

TABLE 1. Commonly Abused Opioids¹³

Commercial Name	Street Name	Common Route of Administration
Heroin	• Brown sugar, China white, Chiva dope, H, Horse, Junk, Skag, Skunk, Smack, White horse • With OTC nighttime cold medicine: Cheese • With marijuana: A-Bomb	• Inject • Smoke • Snort
Codeine	• Captain Cody, Coties, Schoolboy • With soft drinks/candy: Lean, Sizzurp, Purple drank • With hypnotics/sedatives: Doors & fours, Loads, Pancakes, Syrup	• Inject • Swallow (often mixed with soda and flavorings)
Fentanyl (Actiq, Duragesic, Sublimaze)	• Apache, Blonde, Blue diamond, China buffet, China white, Snowflake, Humid, Jackpot, Murder 8, Tango & cash, TNT, White ladies • With heroin: Birria • With heroin pills: Facebook	• Inject • Smoke • Snort
Hydrocodone or dihydrocodeinone (Vicodin, Norco, Zohydro)	• Vikes, Weeks, Idiot pills, Scratch, 357s, Lemonade, Bananas, Dones, Droco, Lorries • With Valium and vodka: Triple V	• Inject • Swallow • Snort
Hydromorphone (Dilaudid)	• D, Dillies, K4, Needle candy	• Inject • Rectal suppository
Meperidine (Demerol)	• Demmies, Pain killer	• Inject • Swallow • Snort
Methadone (Dolophine, Methadose)	• Amidone, Biscuits, Fizzies, Jungle juice, Maria, Wafer • With MDMA: Chocolate chip cookies	• Inject • Swallow
Morphine (Duramorph, MS Contin)	• Dreamer, First line, Joy juice, Morpho, Miss Emma, Monkey, White stuff, Mister, Blue, Unkie	• Inject • Swallow • Smoke
Oxycodone (OxyContin, Percodan, Percocet, Roxicodone)	• 30s, 40s, 512s, Oxy, Beans, Blues, Buttons, Cotton, Hillbilly heroin kickers, Killers, Percs, Roxy	• Inject • Swallow • Snort
Oxymorphone (Opana, Numorphan)	• Biscuits, Blue heaven, Blues, Mrs. O, O bomb, Octagons, Stop signs	• Inject • Swallow • Snort



term opioid is used to describe any natural or synthetic molecule that acts on opioid receptors (mu, kappa) found throughout the body. As a drug class, opioids can modify pain perception and mood, as well as regulate the cardiovascular, endocrine, and respiratory systems.¹²

Mechanism of Action

Opioids have multiple mechanisms of action.

1. Opioids bind to mu, kappa, and delta receptors, which are located throughout the body, inside and outside the central nervous system (CNS). When opioids bind to mu and kappa receptors, they mimic the action of the body's natural endogenous analgesic peptides (endorphin, enkephalin, dynorphin, nociception, nocistatin), which provide pain relief and euphoria when released.^{8,12} These actions increase the abuse potential of opioids.
2. Opioids reduce the release of the excitatory neurotransmitter glutamate.¹² When glutamate is suppressed, pain signals along the nerve will stop, resulting in reduced pain.
3. Opioids allow neurons to remain in hyperpolarized states, which decreases the firing of action potentials when an injury or insult occurs.¹² When action potentials are suppressed, pain transmission to the brain ceases.
4. Opioids inhibit the release of gamma aminobutyric acid (GABA), a principal inhibitory neurotransmitter in the brain, allowing dopamine levels to increase and creating a sense of euphoria.¹² This action also contributes to the high abuse potential of these drugs.

Physiologic Effects

Classic physiologic side effects of opioids stem from their nonselective binding of mu, kappa, and delta receptors. Opioids also can cause sedation (mu, kappa), euphoria (mu), and dysphoria (kappa) effects, and decrease mental alertness.^{12,15} (Table 2)

Drug Scheduling and Tolerance

Opioids are federally restricted/controlled substances due to their high abuse potential. The U.S. Drug Enforcement Administration (DEA) is a part of the Department of Justice and is charged with drug scheduling. (Table 3)

Several opioids have black box warnings, which are the sternest warnings issued by the U.S. Food and Drug Administration for a medication to remain on the market in the United States. Fentanyl, hydromorphone, methadone, morphine, oxycodone, and oxymorphone all have black box warnings for abuse potential and respiratory depression.¹² Patients should not consume alcohol while taking these drugs due to a combined CNS depression risk.

Tolerance and physical dependence are risks for patients who chronically take opioids. Repeated opioid use eventually produces cellular changes that result in the need for increased doses to produce the same desired euphoria, analgesia, and sedation CNS effects.¹² When dependence has occurred, patients will experience unpleasant withdrawal symptoms if the drug is stopped.⁸ Patients also may experience intense cravings (psychological dependence) for the drug's euphoric effects, which leads to abuse.⁸ Abuse and dependence are more likely to occur with long-term daily use of Schedule I and II opioids. Using methadone therapy to wean patients off opioids can minimize physical dependence and withdrawal symptoms but does not address the underlying psychological dependence.

Opioids with the least abuse potential are over-the-counter (OTC) Schedule V drugs and are used as antidiarrheals, cough suppressants, and pain relievers. Dextromethorphan, an active ingredient in hundreds of OTC cold medications, cough suppressants, and expectorants, is the only opioid that is not a scheduled drug and is exempt from the Controlled Substances Act.¹² Dextromethorphan is an antitussive (suppresses the cough reflex) and if taken in too a high dose can cause dissociative effects.²¹ Many

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states have enacted legislation that restricts the sale of dextromethorphan to minors.²²

Dental Pain Management

Opioids are CNS depressants at any dose, and dental providers should closely monitor the vital signs of patients' (especially older adults) taking these medications at each visit. Watch for decreased blood pressure, decreased respiration rate, and postural hypotension.

For pain management of postoperative surgical and nonsurgical dental procedures, systematic reviews support the first-line clinical recommendation of NSAIDs because of their dual anti-inflammatory and analgesic actions for

patients who do not have contraindications for its use.^{8,17} NSAID doses of 200 to 800 mg are effective for orofacial pain because most dental problems are inflammatory in nature and these drugs moderately suppress edema after a procedure.⁸ NSAIDs result in clinically significant analgesia for periodontal surgical and nonsurgical procedures, endodontic procedures, orthodontic movement, and tooth extraction.^{8,17}

A multimodal approach to dental pain management with non-narcotic medications that target the inflammatory etiology of pain has been shown to be very effective and avoids facilitating opioid misuse and abuse. Adjunctive acetaminophen or a long-acting local anesthetic can further

TABLE 2. Opioids' Physiologic Effects

Respiratory depression	All doses of opioids can depress the respiratory system when they attach to mu receptors, which is the most serious and dangerous side effect of this class of analgesics. Negative effects on the respiratory system increase as the dose increases. Respiratory rate and volume are reduced, and carbon dioxide is retained in the blood. Opioids also cause histamine release, which constricts bronchioles and narrows the passageways, making breathing difficult. ¹²
Cardiac function	Hypotension and orthostatic hypotension can occur when opioids cause the release of histamine. ¹⁵ At therapeutic doses, opioids do not depress cardiac function; however, bradycardia (slow heart rate) can result from mu receptor binding. ¹²
Nausea/vomiting	In low doses, nausea and vomiting occur when drugs bind to kappa and delta receptors. In higher doses the drugs exert more depressant actions on the vomiting centers of the brain by binding to mu receptors. ¹⁸
Gastrointestinal	About a third of patients taking long-term opioids experience gastrointestinal (GI) disturbance. ¹⁹ When these drugs bind to mu receptors they can reduce propulsive motility and lead to bowel dysfunction, infrequent stools, constipation, hard stools, bloating, gastroesophageal reflux, and abdominal cramping. ^{12,19} An opioid antagonist (drug that opposes the action of opioids) can be administered to combat GI distress. Some drugs in this group of analgesics are prescribed for chronic diarrhea because they can decrease peristalsis and increase GI time. ¹²
Urinary retention	Urination decreases because opioids promote antidiuretic hormone release, which causes water to flow water out of the kidneys and back into circulation, leading to urinary retention. ^{12,15} Opioids also bind to mu receptors located in the ureters and sphincter muscles and decrease the ability of urine to flow out of the bladder. ¹²
Miosis	Miosis (pupil constriction) occurs when opioids bind to mu receptors in the brain. ¹²
Xerostomia	Opioids enhance the absorption of fluids and inhibit the secretion of saliva. ¹⁹



TABLE 3. Drug Schedules (Controlled Drugs)^{12,20}

Schedule	Abuse Potential	Definition	Examples
Schedule I	Highest	• Drugs with no currently accepted medical use.	• Heroin • Lysergic acid diethylamide (LSD) • Marijuana (cannabis) • 3,4-methylenedioxymethamphetamine (ecstasy) • methaqualone (Quaalude, Sopor)
Schedule II	High	• Safe medical use. • Drugs with a high potential for abuse leading to severe psychological or physical dependence. • Drugs considered dangerous.	Combination products with less than 15 mg of hydrocodone per dosage unit: • Methamphetamine (stimulants used to treat AD/HD) • Hydromorphone (Dilaudid) • Morphine (Duramorph, MS Contin) • Oxycodone (Roxicodone, OxyContin, Percodan, Percocet) • Oxymorphone (Numorphan, Opana) • Fentanyl (Actiq, Duragesic, Sublimaze) • Fentanyl transdermal and transmucosal • Meperidine (Demerol) • Methadone (Dolophine, Methadose)
Schedule III	Moderate	• Drugs with moderate to low potential for physical and psychological dependence.	Products containing less than 90 mg of codeine per dosage unit: • Buprenorphine (Buprenex, Suboxone) • Butorphanol (Stadol) • Acetaminophen/codeine phosphate (Tylenol #3 and #4) • Acetaminophen/hydrocodone bitartrate (Vicodin)
Schedule IV	Low	• Drugs with low potential for abuse and low risk of dependence.	• Propoxyphene (Darvon, Dolene)
Schedule V	Lowest	• Drugs with lower potential for abuse than Schedule IV. Used for antidiarrheal, antitussive (suppression of cough reflex), and analgesic purposes.	Cough preparations with less than 200 mg of codeine or per 100 mL: • Dextromethorphan (DayQuil, Robitussin, Theraflu, Delsym) • Loperamide (Imodium)

manage the physiologic effects of postoperative pain and avoid the use of opioid analgesics.

Opioids should always be considered an adjunctive analgesic to the first-line drug of NSAIDs in cases of severe dental pain or when a pre-existing infection or inflammation has sensitized nociceptive processes and post-procedural pain is anticipated.^{8,12} It is important to note that opioids do not treat the underlying disease process, they simply temporarily

block pain sensations.¹⁷ When considering the risk-to-benefit ratio, opioids should never be considered a first-line medication because of their abuse potential and high incidence of side effects. Tramadol (Ultram) is a central analgesic with a low affinity for opioid mu receptors and is less likely to contribute to opioid abuse.²³ Tramadol's binding action is 6000 times lower than that of morphine and is considered a "safer" alternative to using Schedule II opioids.²³



Hydrocodone/acetaminophen combinations are the most widely prescribed analgesics in the United States, but no data exists that compares their analgesia ability to NSAIDs.^{23,24} The American Dental Association recently mandated an opioid prescribing limit of 7 days or less in cases of severe postoperative pain, and many best practice systematic reviews recommend a 2- to 4-day supply.^{8,17}

Conclusion

Dental providers who prescribe opioid analgesics must do so prudently and within the guidelines provided by leading authorities so as not to contribute to the U.S. opioid epidemic. No drugs come without side effects, and some are more serious than others. Through increased awareness of the pharmacodynamics of non-narcotic and opioid analgesics, dental providers should consider opioid use as an adjunct for pain management until the origin of pain can be resolved.

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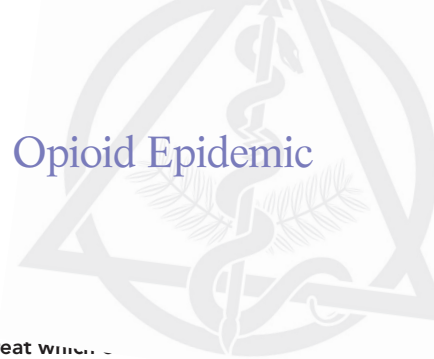


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1. What percentage of drug overdose deaths in the United States in 2018 involved an opioid?
 - a. 20%
 - b. 50%
 - c. 70%
 - d. 90%
2. How many opioid prescriptions were dispensed in the United States in 2012?
 - a. 100 million
 - b. 225 million
 - c. 500 million
 - d. 900 million
3. What percentage of counties in the United States reported a six-times higher rate of opioid prescription than the national average?
 - a. 2%
 - b. 6%
 - c. 11%
 - d. 22%
4. What percentage of emergency department visits for dental pain are from patients "doctor shopping" for an opioid prescription?
 - a. 12%
 - b. 20%
 - c. 30%
 - d. 50%
5. What percentage of opioid prescriptions are prescribed nationally by dentists?
 - a. 70%
 - b. 50%
 - c. 20%
 - d. 11%
6. Which opioid is made entirely in a lab?
 - a. Fentanyl
 - b. Morphine
 - c. Oxycodone
 - d. Codeine
7. Which opioid is used to wean people off opioid addiction?
 - a. Morphine
 - b. Meperidine
 - c. Methadone
 - d. Codeine
8. Which drug is an opioid antagonist?
 - a. Naloxone
 - b. Fentanyl
 - c. Meperidine
 - d. Morphine
9. What does the term "bradycardia" mean?
 - a. Decreased breathing
 - b. Low blood pressure
 - c. Slowed heart rate
 - d. High blood pressure
10. Which of the following is NOT a physiological effect of opioids?
 - a. Xerostomia
 - b. Diarrhea
 - c. Nausea
 - d. Constipation
11. Which opioid has the street name facebook when it is mixed with heroin pills?
 - a. Fentanyl
 - b. Hydrocodone
 - c. Heroin
 - d. Hydromorphone
12. Which of the following can result in neuropathic pain?
 - a. Herpes zoster virus
 - b. Amputation
 - c. Diabetes
 - d. All of the above
13. Which of the following chemicals is found in cell membranes of multiple organs and can stimulate pain receptors causing erythema, edema, and pain?
 - a. COX-1
 - b. Thromboxane
 - c. Prostaglandins
 - d. Platelets
14. Which drug class should be recommended for relief of mild to moderate pain as would be experienced with headaches, dental extractions, nonsurgical periodontal therapy, and musculoskeletal strains?
 - a. NSAIDs
 - b. Opioids
 - c. Heroin
 - d. Hydrocodone
15. What does the term "analgesia" mean?
 - a. Pain relief
 - b. Reduced inflammation
 - c. Reduced platelet formation
 - d. Reduced fever

Dental Providers' Drug Reference for the U.S. Opioid Epidemic



16. What does the term antipyretic mean?
- Pain relief
 - Reduced inflammation
 - Reduced platelet formation
 - Reduced fever
17. Which opioid is known as the prototype (standard) drug upon which all other opioid strengths are measured?
- Methadone
 - Morphine
 - Meperidine
 - Oxycodone
18. Which of the following is a mechanism of action of opioids in the body?
- Opioids bind to mu, kappa, and delta receptors
 - Opioids reduced the release of glutamate
 - Opioids inhibit the release of GABA
 - All of the above
19. Which receptor do opioids bind with that depresses the respiratory system and reduces gastrointestinal system function causing hard and infrequent stools?
- Mu
 - Kappa
 - Delta
 - Glutamate
20. Which opioid side effect is considered the most serious and dangerous to life?
- Urinary retention
 - Nausea
 - Respiratory depression
 - Vomiting
21. What drug schedule is more likely to lead to abuse, tolerance, and dependence?
- II
 - IV
 - V
 - VI
22. What drug schedule is heroin?
- I
 - II
 - III
 - IV
23. What drug schedule is hydromorphone (Dilaudid)?
- I
 - II
 - III
 - IV
24. Schedule V opioids are used to treat which conditions?
- Diarrhea
 - Cough
 - Pain relief
 - All of the above
25. Which opioid has an FDA black box warning?
- Loperamide (Imodium)
 - Dextromethorphan (DayQuil)
 - Propoxyphene (Darvon, Dolene)
 - Hydromorphone (Dilaudid)
26. Many states have legislation that restricts the sale of which of the following OTC drugs to minors?
- Dextromethorphan (DayQuil)
 - Loperamide (Imodium)
 - Propoxyphene (Darvon, Dolene)
 - Morphine
27. What does the term "antitussive" mean?
- Suppression of gag reflex
 - Suppression of cough reflex
 - Suppression of diarrhea
 - Pain relief
28. Which drug class is considered the first line to manage postoperative surgical and nonsurgical dental procedures because of its dual anti-inflammatory and analgesic actions?
- NSAIDs
 - Acetaminophen
 - Aspirin
 - Opioids
29. Which of the following is considered a safe and prudent multimodal approach to manage dental pain to avoid opioid administration?
- Administration of a long-acting local anesthetic
 - Administration of NSAIDs to reduce the inflammatory response
 - Adjunctive acetaminophen
 - All of the above
30. Which opioid is a central analgesic with a low affinity for opioid mu receptors, is less likely to contribute to opioid abuse, and is considered a "safer" alternative to other Schedule II opioids?
- Morphine
 - Oxycodone
 - Tramadol
 - Hydromorphone

DENTAL PROVIDERS' DRUG REFERENCE FOR THE U.S. OPIOID EPIDEMIC

CE ANSWER FORM (E-mail address required for processing)

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EDUCATIONAL OBJECTIVES

- Discuss the origin of orofacial pain and appropriate pain management practices.
- Describe the pharmacodynamics (effects and mechanism of action) of non-narcotic and opioid analgesic classes of drugs.
- Recognize their responsibility and contribution to opioid use disorder and apply proper pain management techniques to help decrease the opioid epidemic in America.

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Please evaluate this course using a scale of 1 to 5, where 1 is poor and 5 is excellent.

- Clarity of objectives ① ② ③ ④ ⑤
- Usefulness of content ① ② ③ ④ ⑤
- Benefit to your clinical practice ① ② ③ ④ ⑤
- Usefulness of the references ① ② ③ ④ ⑤
- Quality of written presentation ① ② ③ ④ ⑤
- Quality of illustrations ① ② ③ ④ ⑤
- Clarity of quiz questions ① ② ③ ④ ⑤
- Relevance of quiz questions ① ② ③ ④ ⑤
- Rate your overall satisfaction with this course ① ② ③ ④ ⑤
- Did this lesson achieve its educational objectives? ☐ Yes ☐ No
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- Overall administration of the program ① ② ③ ④ ⑤

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Fill in the circle of the appropriate answer that corresponds to the question on previous pages.

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| 5. (A) (B) (C) (D) (E) | 20. (A) (B) (C) (D) (E) |
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