OPIOID CRISIS: THE USE OF NALOXONE IN PREVENTING OPIOID OVERDOSE-RELATED DEATHS

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Topic Overview:

Data from 2021 show that, over a 12-month period, approximately 75% of overdose deaths in the United States involved opioids. If these numbers are to be reduced, efforts must be made to rescue victims of opioid overdoses. Naloxone has been used for decades in patients experiencing an opioid overdose. Naloxone reverses life-threatening respiratory depression, hypotension, sedation, and analgesia caused by the ingestion of an excess opioid dose. This can save an overdose victim's life. Pharmacy teams are an important part of the efforts to combat the current opioid crisis. Pharmacy staff should familiarize themselves with administration techniques for the nasal spray and auto-injector to help educate patients and caregivers on the proper use of naloxone.

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Target Audience: This educational activity is for pharmacists.

How to Earn Credit: From December 20, 2022, through December 20, 2025, participants must:

1) Read the "learning objectives" and "author and planning team disclosures;"
2) Study the section entitled "educational activity;" and
3) Complete the Course Test and Evaluation form. The Course Test will be graded automatically. Following successful completion of the Course Test with a score of 70% or higher, a statement of participation will be made available immediately. (No partial credit will be given.)

Learning Objectives: Upon completion of this educational activity, participants should be able to:

1. **Identify** risk factors for opioid overdose
2. **Discuss** patient counseling points
3. **Describe** administration for naloxone dispensing in a community setting
4. **Identify** advantages to different naloxone formulations

Disclosures

The following individuals were involved in the development of this activity: Amanda Mayer, PharmD, Jeff Goldberg, PharmD, BCPP, and Susan DePasquale, MSN, PMHNP-BC. There are no financial relationships relevant to this activity to report or disclose by any of the individuals involved in the development of this activity.

Introduction

Opioid-related overdose deaths make up three-fourths of all overdose deaths in the United States. In order to reduce the number of deaths, efforts must be made to save patients who overdose on opioids. Naloxone, an opioid receptor antagonist, is the most effective medication to reverse the effects of an opioid overdose. Naloxone is available in a number of different formulations to make administration efficient and timely. Increasing access to naloxone, so it is readily available when needed, is vital to combating the opioid crisis.

Short History of the Opioid Crisis

In 2017 the Centers for Disease Control (CDC) reported that more than 70,200 Americans died from drug overdoses.[1] Approximately 68% of these deaths involved opioids.[1] This percentage has continued to grow each year. In 2020, opioid-related deaths comprised 56,064 of the total US overdose deaths.[2]

The year 2021 was even worse. A CDC news release dated November 17, 2021, reported on the 12-month period ending April 2021.[2] It revealed that drug overdose deaths continue to climb, with annual deaths now topping 100,000.[2] Of these overdose deaths, approximately 75% (75,673) were opioid-related deaths.[2] That is a significant increase from the 68% reported for 2017. What is driving this increase in opioid-related deaths? They are rising, in part, because of increased deaths from synthetic opioids, especially fentanyl.[2]

The increases in deaths are not limited to a specific population group. From 2019 to 2020, the rate of drug overdose deaths increased for all sexes, ages, and races.[3]

Overdose deaths are driven in large part by substance use disorder.[4] In the 2020 National Survey on Drug Use and Health (NSDUH), approximately 2.7 million individuals ages 12 and older had an opioid use disorder which included heroin and prescription opioid pain relievers.[4] According to the 2020

NSDUH, 3.3% (or 9.3 million people) of individuals ages 12 and older misused prescription pain relievers in the last year.[4] Opioids include prescription medications that are used to treat pain, such as morphine, codeine, methadone, oxycodone, hydrocodone, fentanyl, hydromorphone, and buprenorphine, as well as illegal drugs such as heroin and illicit potent opioids such as fentanyl analogs.[5] The 2020 NSDUH found that hydrocodone products were the most commonly misused subtype of prescription pain relievers, followed by oxycodone products.[4]

The 2020 NSDUH surveyed respondents that misused prescription pain relievers to learn the reason they misused their last medication. The top responses included relieving physical pain, feeling good or getting high, and relaxing and relieving tension. Less common reasons for misuse were because they were "hooked," to help with feelings and emotions, to help with sleep, to experiment to see what the drug was like, and to either increase or decrease the effects of other drugs. Aside from being prescribed the pain relievers, 47.2% of individuals who misused pain relievers obtained them from a friend or relative, and about 6.2% bought them from a drug dealer or other stranger.[4]

A Brief Overview of Appropriate Opiate Use Indications

Opioids have analgesic and sedative effects and are most commonly used for the management of acute pain, *e.g.*, post-operative pain, cancer pain, and chronic non-cancer pain, usually in the context of palliative care.[6,7] Opioids such as methadone and buprenorphine may also be used for the maintenance treatment of opioid use disorder.[6,8] Therapy should be individualized for each patient, with the lowest dose and frequency being used to treat conditions. When prescribers are dispensing opioids, several factors, including tolerance to opioids, degree of analgesia desired, environment, risk factors for addiction, misuse, and the physical and medical status of the patient, should be assessed.[6,8]

Opioid Use Dependence and Addiction

Physical dependence does not necessarily mean addiction.[7,9-11] In 2013, the American Psychiatric Association's DSM-5 committee changed the diagnostic terms for opioid addiction to "opioid use disorder."[10,11] An opioid use disorder can be moderate to severe depending on the criteria that are present.[10,11] The DSM-5 committee also removed the diagnosis of "opioid abuse," and replace it with "opioid use disorder, mild."[10] The term "opioid dependence" is used by the World Health Organization, and the ICD-10.[6,9] This is similar to an opioid use disorder, but the criteria differ from the DSM-5.[6,9] It is also important to distinguish a physical opioid dependence that often presents an opioid withdrawal syndrome but is not necessarily an opioid use disorder or opioid dependency.[6,7,9-11]

Risk Factors for Opioid Overdose

Any patient on an opioid is at risk of overdose. Not all opioid overdoses are fatal, with non-fatal overdoses being several times more common than fatal overdoses.[6,8,9] There are identified risk factors for an opioid overdose.[12,13] Tseregounis, *et al.* (2021) state that risk factors for an opioid-related overdose fall into six general categories: "patient demographics, mental health comorbidities, substance use disorders, physical health comorbidities, characteristics of opioids prescribed, and non-opioid medications prescribed."[12] Other factors to consider include a patient's type of insurance, reduced drug tolerance, and the manner of drug administration.[6,13]

Patient Demographics

Weiner, *et al.* (2022) reported that patients who were at the highest risk of an overdose were ≥75 years of age or 18-24 years of age, compared to patients aged 35-44 years.[13] Hedegaard, *et al.* (2020) reported the opposite, as national data showed that in 2019, individuals 65 years or older had the lowest rates of drug overdose deaths compared with other age groups.[3] For younger patients, heroin and fentanyl were more prominent.[13]

Race and ethnicity are also relevant. Black patients were at a significantly higher risk of an opioid overdose.[13] Asian or Pacific Islander patients had a significantly lower risk of opioid overdose compared with White patients. Hispanic patients also had a lower risk for an opioid overdose; however, there are studies showing that opioid prescriptions are less likely to be prescribed to Asian or Pacific Islander, and Hispanic groups.[13]

Mental Health Diagnoses

Mental health diagnoses, especially mood and thought disorders, are associated with an increased risk of overdose.[12] A psychiatric diagnosis of depression is also associated with a greater risk.[13]

Substance Use Disorders

A previous substance use disorder is a risk factor for an opioid overdose.[12,13] This includes substance use disorders such as opioid use disorders, non-opioid drug use disorders, alcohol use disorders, and tobacco use disorders.[12]

Medical Comorbidities

Medical health comorbidities increase the risk of an opioid overdose, especially those with three or more comorbidities.[12,13] They include chronic pain, lung disease, cardiovascular disease, diabetes, and cancer.[12,13]

Opioid Prescription Characteristics

Pharmacists should know that patients prescribed higher doses, on longer treatment durations, and who are prescribed long-acting or extended-release opioid formulations, are at greater risk of an opioid overdose.[12] Prescriptions for codeine, oxycodone, and tramadol were associated with an increased risk when compared to hydrocodone and morphine.[13]

Patients may also be at greater risk of an overdose if they have no tolerance to opioids, receive overlapping prescriptions, receive opioids from multiple prescribers or pharmacies, and if they live with a person taking prescription opioids.[12] Concurrent use of benzodiazepines, or other non-opioid controlled substances, is also a confirmed risk factor for opioid-related overdose. Other controlled substances may include muscle relaxants or non-benzodiazepine sedatives.[12]

Insurance

A patient's insurance type may also be associated with an opioid overdose risk.[13] Patients eligible for Medicaid and Medicare Advantage had the highest risk. Patients on Medicaid had a 4-times greater risk of an opioid overdose, compared to patients on private insurance.[13]

Reduced Tolerance and Administration Routes

When tolerance is reduced after a period of abstinence, this increases the risk of an opioid overdose. Common situations where reduced tolerance may be seen are after release from incarceration, discharge from a facility, or cessation of drug dependence treatment. Impaired hepatic opioid metabolism, caused by liver disease, may lower overdose thresholds. The risk of overdose is significantly higher when doses are prescribed equal to or greater than 100 mg morphine equivalents per day. Overdose risk factors also include those taking higher prescribed dosages, male gender, older age, multiple prescriptions, mental health disorders, lower socioeconomic status, and household members of people in possession of strong opioids. Extended-release opioids carry a higher risk of overdose compared to immediate-release opioids.[6] Individuals taking opioids by injection, combining alcohol and/or other substances such as benzodiazepines, and who are using opioids without medical supervision are also at an increased risk of opioid overdose.[6,14]

Mechanisms and Symptoms of Opioid Overdose

During an opioid overdose, respiration is depressed through a number of mechanisms and neuronal sites of action.[14] Opioids act at mu, delta, and kappa receptors throughout the body. The activation of mu-opioid receptors in specific sites in the central nervous system that controls the respiratory rhythm generation area in the pons induces respiratory depression.[15] Opioids depress both rate and depth of breathing with the most pronounced effect in individuals with chronic cardio-pulmonary and renal disease as these individuals may already have diminished respiratory response. Along with reducing respiratory drive, opioids reduce upper-airway tone and chest-wall rigidity.

Opioid overdose requires immediate emergency attention, and everyone, including the public, should be aware of the signs of opioid overdose. These signs include combinations of the following symptoms: pinpoint pupils, body going limp, face extremely pale, feeling clammy to the touch, lips or fingernails having a purple or blue color, vomiting, or making gurgling noises, the person cannot be awakened, unable to speak, breathing slows or stops, or heartbeat slows or stops. In the case of opioid overdose, 911 should be called immediately, and if naloxone is available, it should be administered to reverse opioid overdose. If the person has stopped breathing, CPR should also be performed.[5,16] Most opioid overdoses occur in private homes and are sometimes witnessed by friends, a partner, family members, or coworkers. Ensuring individuals are educated and equipped with the tools and knowledge to recognize and prevent overdose death is a critical life-saving measure.

Prevention of Opioid Overdose

To decrease the risk of opioid overdose, medication should always be taken as prescribed by the practitioner. Overdose may happen if a patient takes higher doses than prescribed or takes the medication more frequently than instructed. An overdose can occur if a patient takes the amount prescribed by the provider, but the dose has been miscalculated. Mixing pain

medication with alcohol, sleep medication, or illicit substances is also a common cause of opioid overdose. Pharmacists and pharmacy technicians should take extra caution when dispensing opioid medications to be certain that the correct drug, dose, and instructions are being dispensed to the patient. Pharmacists should also be sure to check the drug registries available to them to be sure there are not multiple opioid prescriptions for an individual that may increase the risk of overdose.[17]

Many opioid overdoses are preventable. Caution should be taken when storing these medications as it is easy for children or pets to unintentionally ingest medication out of curiosity which may lead to overdose. Many accidental overdoses have been reported due to improper medication storage, which is something both pharmacists and pharmacy technicians should be aware of when a patient asks about proper medication storage. When medications are no longer needed, disposing of medications safely can help prevent overdose situations. The U.S. Food and Drug Administration (FDA) website provides a list of permanent collection locations as well as periodic take-back events that pharmacists and pharmacy technicians should familiarize themselves with to assist patients with the disposal of unused medication.[18] This website may also be provided to patients to use at their convenience.

Medication-Assisted Treatment

Medication-Assisted Treatment (MAT) is a "whole-patient" approach to the treatment of substance use disorders that includes medications in combination with counseling and other therapeutic techniques.[19] According to the Substance Abuse and Mental Health Services Administration, MAT has been proven to be clinically effective and significantly reduces the need for inpatient detoxification services. The prescribed medication operates to normalize brain chemistry, block the euphoric effects of alcohol and opioids, relieve physiological cravings, and normalize body functions without the negative and euphoric effects of the abused substance. FDA-approved medications for opioid use disorder used in MAT include buprenorphine, methadone, and naltrexone.[20] When a person is using naltrexone for MAT,

they have a reduced tolerance to opioids, making the same or even lower doses of opioids that they had used in the past fatal.[16]

Responsible Prescribing of Opioids

Responsible prescribing of opioids includes prescribing immediate-release opioids instead of extended-release or long-acting opioids upon initiation of opioid therapy for chronic pain. The lowest effective dosage, frequency and duration should always be prescribed as well as carefully reassessing evidence of individual risks and benefits of medications. When treating acute pain, three or fewer days of medication is often sufficient, and more than 7 days of therapy will rarely be needed. When starting therapy for chronic pain or dose escalation, clinicians should evaluate benefits and harms with patients within 1 to 4 weeks of dose changes and should continue to assess the patient every three months if not more frequently.[5] A thorough review of a patient's history should also be done to ensure safe treatment with opioids. Naloxone prescription availability, overdose prevention education, and basic risk reduction messaging (may include information about other medications a patient is taking and letting the patient know that mixing medications can be fatal) can all be lifesaving interventions available through the prescribers. Prescribers may also suggest the patients create an "overdose plan" that includes signs of overdose, how to administer naloxone and to call 911 and share that information with friends, partners, and/or caregivers.[17]

Treating Opioid Overdose with Naloxone

Naloxone History

Naloxone has been used for decades to reverse an overdose and resuscitate individuals who have overdosed on opioids. Naloxone is very safe, and if given to an individual who is not having an opioid overdose, it produces no clinical effects. Forty-six states and the District of Columbia had enacted statutes by mid-2017 that provide civil liability protections to laypersons or first responders who administer naloxone.[5] Individuals who are candidates for naloxone availability have a history of overdose and/or they have a substance

use disorder. Patients who are taking benzodiazepines with opioids, individuals who are at risk for returning to a high dose of opioids that they can no longer tolerate (including former inmates recently released from prison or patients leaving detoxification facilities), and patients who are taking higher doses of opioids (more than 50 MME/day) are also candidates.[17]

Readily available naloxone for people who are likely to witness an overdose (family members, partners, close friends, *etc.*) can significantly reduce the high number of opioid overdoses as they usually do not happen immediately and are commonly witnessed. An opioid overdose patient has a greater chance of receiving emergency care and surviving an overdose when naloxone is available, and individuals trained in administration techniques are present. It is important to stress that naloxone is not a substitute for emergency care. All patients prescribed opioids should have the option to have naloxone readily available as they all have a risk for opioid overdose. Both pharmacists and providers can open the topic of discussion with patients on the risks of opioid therapy as well as the benefits of readily available naloxone.[5,21]

Naloxone Mechanism of Action

The timely administration of naloxone can help prevent opioid overdose-related deaths. Naloxone displaces opioids from receptor sites in the brain and reverses respiratory depression, hypotension, sedation, and analgesia. Naloxone is thought to antagonize mu-, kappa, and delta receptors, inhibiting both the toxic and clinical effects of opiates. The antagonistic effect of naloxone is competitive and short-lived, sometimes necessitating repeat doses when long-acting opiates are involved. Naloxone is only effective when treating opioid overdose and is not effective in treating overdoses of benzodiazepines, barbiturates, clonidine, GHB, ketamine, and stimulants.[5] If a patient has not recently received opioid drugs, administration of naloxone shows little or no pharmacological effects and will not worsen respiratory depression if administered for non-opiate overdose. Naloxone itself produces no physical or psychological dependence.

Naloxone is not a replacement for emergency care, and 911 should always be called when naloxone is administered. Multiple doses of naloxone may need to be administered during an opioid overdose. Monitoring is necessary to ensure that the respiratory depressant effects of the opiate do not outlast the beneficial effects of naloxone. Outside of opioid overdose, naloxone has been used to treat opioid-induced constipation and pruritus. Naloxone products are effective in reversing opioid overdose, which includes fentanyl-involved overdose, although this may require a higher dose of naloxone.[5,21]

Naloxone Formulations

The FDA-approved routes of administration of naloxone for treating opioid overdose include intravenous, intranasal, intramuscular, subcutaneous, and intraosseous endotracheal use.[5,21] Intranasal naloxone and naloxone auto-injector that delivers a therapeutic dose of naloxone in an overdose situation are specifically useful for overdose in the community setting, *i.e.*, outside of a medical setting. The administration information for the formulations available for community use will be discussed below.

Naloxone Administration Information

When administered correctly, the response to naloxone is returning to spontaneous breathing and mild opioid withdrawal symptoms. The response generally occurs within 2 to 3 minutes of naloxone administration but may take up to 15 to 20 minutes for maximal effects on breathing.[5] More than one dose may be required, especially in those who have taken longer-acting opioids or opioid partial agonists. Patients should be monitored for at least 4 hours, longer if using long-acting opioids, following the last dose of naloxone for reemerging signs and symptoms of opioid toxicity. Effect times for naloxone are variable, lasting anywhere from a few to 90 minutes. Most opioids have longer-lasting effects than naloxone, potentially necessitating multiple doses of naloxone as well as emergency medical care.[5,22] It is important to remember that naloxone is not effective for overdose caused by benzodiazepines, barbiturates, cocaine, amphetamines, and other

stimulants.[5] Naloxone can be used on patients even if it has been used before as tolerance cannot be developed to the effects of naloxone.[23,24]

Naloxone nasal spray is a convenient administration form for caregivers and family members.[25] Naloxone nasal spray should be administered as quickly as possible in a patient with a suspected opioid overdose. To administer the nasal spray, you need to hold the device with your thumb on the bottom of the plunger and your first and middle fingers on either side of the nozzle. The patient should be placed in the supine position, and the nozzle needs to be inserted into one of the patient's nostrils, providing support to the back and neck to allow the head to tilt back. The caregiver's fingers should be on the sides of the nozzle, and the nozzle should be against the bottom of the patient's nose. Press firmly on the device plunger to administer the dose. No priming or testing is necessary and can be detrimental as that would waste a dose. After administering the dose, the patient should be turned on their side, and immediate medical assistance should be called after the first dose has been administered. Each device only holds a single dose, and a new nasal spray device can be re-administered every 2 to 3 minutes if the patient does not respond or responds and then relapses into respiratory depression while waiting for emergency medical services. If more than one dose is administered, the doses should be given in alternate nostrils. The brand name of Narcan is a 4 mg dose, and the brand name of Kloxxado is an 8 mg dose, both available in a volume of 0.1 mL in single-use administration nasal spray bottles. Although Kloxxado has a higher dose, there is limited evidence suggesting any superiority and more concern about severe withdrawal symptoms. The 4 mg Narcan (and generic 4 mg) are more readily available at most retail pharmacies.[25]

Naloxone kits for intranasal use can also be an option if insurance will not cover the premade nasal formulations. In this case, the pharmacy would dispense two naloxone, 2mg/2mL Luer-Lock prefilled syringes, and two mucosal atomization devices (MAD 300) that fit into the Luer-Lock opening of the naloxone syringe. Unfortunately, most insurance companies do not cover the atomization device, and that may be an out-of-pocket cost.[22]

Intramuscular injection with auto-injectors is another administration option for caregivers and families. These products should be inspected periodically to ensure they do not need replacing - the solution should be clear and needs to be replaced if discolored. To administer auto-injector products, the needle cap must be removed, and medication should be administered intramuscularly into the anterolateral aspect of the thigh. This may be done through clothing if necessary. The needle should be completely embedded before pushing the plunger. Once embedded in the patient, the caregiver needs to push the plunger firmly all the way down until it clicks and then hold it in place for 2 seconds. Immediately after injection, the safety guard should be slid over the needle using one hand as the needle will be exposed until the safety guard is deployed. The used syringe should then be put into the blue case. It is normal for most of the medication to appear to remain in the syringe. As long as the plunger has been pushed all the way down during delivery, the correct dose has been injected. Each device contains a single dose of naloxone and doses may be repeated every 2 to 3 minutes as needed to achieve desired response until emergency medical assistance arrives.

The typical shelf life of naloxone products is 12 to 18 months. Risk factors for decreased potency include too much heat exposure, cold, or sunlight. Like most medications, naloxone should be stored in a cool, dry place at room temperature and away from direct sunlight. The medication's potency may decrease if it has not been stored properly. When deciding where to store naloxone, it is important to remember that naloxone should always be readily available in case it is needed, so it should be stored properly but in a way that it can be quickly accessed when an emergency arises. Expired naloxone should be replaced because it may have a lowered potency.[22]

Naloxone in Pregnancy

Treatment with naloxone for opioid overdose should not be withheld because of potential concerns regarding the effects of naloxone on the fetus. There is currently no data suggesting any drug-associated risk of major birth defects, miscarriages, or other maternal or fetal adverse outcomes. Opioid overdose is a medical emergency and can be fatal for the pregnant woman

and fetus if left untreated. Studies in breast-feeding mothers have shown that naloxone does not affect prolactin or oxytocin hormone levels. The developmental and health benefits of breastfeeding, along with the mother's clinical need for naloxone and any potential adverse effects on the breastfed infant from naloxone should be considered.

Adverse Effects Associated with Naloxone Rescue Therapy

Naloxone has minimal adverse effects beyond the induction of opioid withdrawal symptoms and has essentially no pharmacological activity if opioids are not present in the system. The most commonly reported adverse reactions associated with intranasal naloxone include increased blood pressure, musculoskeletal pain, abdominal pain, constipation, dizziness, and headache. Individuals may also experience nasal symptoms such as dryness, swelling, congestion, and inflammation. Agitation was reported during post-marketing use of the naloxone auto-injector, as well as mild injection site reactions.[5]

Signs of opioid withdrawal that can be triggered by naloxone rescue therapy can feel unpleasant and may include agitation or confusion, body aches, diarrhea, tachycardia, fever, runny nose, sneezing, piloerection, sweating, yawning, nausea or vomiting, nervousness, restlessness or irritability, shivering, trembling, abdominal cramps, weakness, tearing, insomnia, opioid craving, dilated pupils and increased blood pressure.

What can Pharmacy Teams do to Reduce Prescription Opioid Overdose?

Pharmacists and pharmacy technicians are on the frontline when it comes to providing care for patients at risk of opioid overdose and may identify situations that could benefit from naloxone availability. As mentioned earlier, utilizing prescription drug monitoring programs is a valuable way to aid in decreasing opioid overdose and aid in assessing if a patient is using multiple pharmacies or providers. Counseling on opioid prescriptions, as well as providing MedGuides to patients, may be helpful, especially in cases where

patients may be unaware of the risks of opioids or upon initiation of a new medication or increased dosages of either opioids or other concomitant high-risk medications. Monitoring medication therapy regimens for high-risk combinations, such as benzodiazepines or muscle relaxants, as well as identifying other medical conditions, such as lung disease, is very important for pharmacists, especially when patients may be using multiple prescribers. If a patient is on a treatment agreement or "pain contract", it is important to follow and maintain all guidelines of agreements. The safe storage and disposal of opioids are also important, especially in the case of children in the home. Pharmacists may also keep an open dialog with providers and alert them to potential prescription misuse and interactions that may increase overdose risk.[26]

Prescriptions for naloxone can be written by a prescriber. In addition, in most states, naloxone may be provided directly to the patient or a third party (family member, friend, *etc.*) with or without a prescription from a prescriber through protocols, legislation, and standing orders. Pharmacists should check their state laws as they vary in how naloxone can be provided. Several states have standing orders that allow pharmacists to dispense naloxone to any or most patients.[22] State access rules and valuable resources about naloxone may be found at www.safeproject.us, as well as accessing individual state law handbooks.[27] There are three categories that support naloxone access fall under that include good samaritan, liability protection/third-party administration, and collaborative practice agreement. The good samaritan law protects individuals that call for help at the scene of an overdose from being arrested for drug possession. The liability protection/third party administration protects the bystander and prescriber that administer the naloxone and allows for bystanders to obtain a prescription for naloxone to use on others. Collaborative practice agreements can be done with individual physicians or on a statewide basis allowing pharmacists to prescribe naloxone to at-risk individuals.

Pharmacists and pharmacy technicians should stay up to date and keep educated on addiction and substance abuse education as training in this area can be minimal. Barriers to naloxone dispensing that pharmacists have

expressed in the past include lack of education and training, workflow and management support. Although technicians cannot counsel patients on naloxone, they should be aware of its properties, use, and benefits. Pharmacists and technicians should also be well versed on disposal sites for medications as patients may call or stop in to inquire about proper disposal of medication.[26]

Summary

For the 12-month period ending in April 2021, the opioid-related overdose deaths in the US represented approximately 75% of all overdose deaths. These numbers are being driven by an increase in deaths from synthetic opioid overdoses, especially from fentanyl.

Any patient on an opioid is at risk of overdose. However, there are risk factors related to a patient's demographics, mental health, substance use disorder, physical health comorbidities, opioid and non-opioid prescriptions, type of insurance, reduced drug tolerance, and the manner of drug administration.

During an opioid overdose, respiration is depressed through a number of mechanisms and neuronal sites of action. Naloxone can reverse these mechanisms if it is administered properly and timely.

Pharmacy teams play a crucial role in the current opioid crisis. They should familiarize themselves with administration techniques for the nasal spray and auto-injector to help educate patients and caregivers on the proper use of naloxone.

Course Test

1. **Which of the following is not classified as an opioid?**

    a. Morphine
    b. Codeine
    c. Citalopram
    d. Oxycodone

2. **When prescribing and dispensing opioids what factors should be assessed?**

    a. Tolerance to opioids
    b. Physical and medical status of the patient
    c. Risk factors for addiction and misuse
    d. All of the above

3. **Which of the following statements is NOT true?**

    a. Patients prescribed long-acting or extended-release opioid formulations are at greater risk of an opioid overdose.
    b. Patients on longer treatment durations of opioids are at greater risk of an opioid overdose.
    c. Patients prescribed lower doses of opioids are at greater risk of an opioid overdose.
    d. Patients prescribed higher doses of opioids are at greater risk of opioid overdose.

4. **Which of the following is true about the effects of opioids on the respiratory system?**

    a. Opioids increase upper-airway tone.
    b. Opioids reduce a patient's tolerance to naloxone.
    c. Opioids increase chest-wall rigidity
    d. Opioids depress the rate and depth of breathing

5. **Naloxone nasal spray can be re-administered every _____ if the patient does not respond or relapses into respiratory depression.**

    a. 2 to 3 minutes
    b. 5 to 7 minutes
    c. 15 minutes
    d. 90 minutes

6. **True or False: Naloxone may be used in place of emergency care in a patient who experiences an opioid overdose.**

    a. True
    b. False

7. **Which of the following is a naloxone formulation a caregiver or family member can give to an opioid overdose victim?**

    a. Intravenous
    b. Transdermal patch
    c. Intramuscular injection with auto-injectors
    d. Sublingual tablet

8. **Which statement is true regarding the adverse effects of naloxone rescue therapy?**

    a. After intranasal naloxone administration, patients may experience nasal symptoms such as dryness, swelling, congestion, and inflammation.
    b. Agitation has been reported during post-marketing use of the naloxone auto-injector.
    c. Signs of opioid withdrawal can be triggered by naloxone rescue therapy.
    d. All of the above

9. **True or False: Naloxone is effective at treating overdoses from benzodiazepines, barbiturates, clonidine, and stimulants.**

    a. True
    b. False

10. **Which of the following is true regarding naloxone dispensing in a pharmacy?**

    a. Pharmacies typically have an overabundance of staff available to aid in naloxone dispensing.
    b. Pharmacy staff members have expressed that barriers to naloxone dispensing include a lack of education and training, workflow, and management support.
    c. Technicians may counsel patients on naloxone.
    d. Prescription drug registry databases are not helpful for opioid dispensing and assessing the potential need for naloxone availability.

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