

Fentanyl: Scourge of the Opioids

Author: Tracey Long, RN, PhD, APRN

Contact hours: 2

Course price: \$19

Instructions

1. To print everything you need, including the test, evaluation, and registration, click Print & Go PDF link to the right of the online course link. Study the course, pass the test, and fill out the forms.
2. Make out your check or money order to ATrain Education, Inc. Or enter your credit card information on the form provided.
3. Mail the completed forms with your payment to:
ATrain Education, Inc
5171 Ridgewood Rd
Willits, CA 95490

When we receive your order, we will grade your test, process your payment, and email a copy of your certificate. For a paper copy of your certificate (suitable for framing), please add \$8.50 to your payment.

Questions? Call 707 459-1315 (Pacific Time) or email (contact-us@atrainceu.com).

Course Summary

The opioid epidemic, labeled the most serious national issue of our time, has worsened with fentanyl. As a healthcare professional, you have a role in our nation's fatal opioid epidemic. From those who prescribe to those who administer fentanyl, everyone plays a part in helping or hurting those seeking opioids for pain relief. This course will discuss the causes, definitions of use and abuse, pharmacodynamics, and prevention and treatment strategies for this serious issue in healthcare.

COI Support

Accredited status does not imply endorsement by ATrain Education Inc. or any accrediting agency of any products discussed or displayed in this course. The planners and authors of this course have declared no conflict of interest and all information is provided fairly and without bias.

Commercial Support

No commercial support was received for this activity.

Criteria for Successful Completions

80% or higher on the post test, a completed evaluation form, and payment where required. No partial credit will be awarded.

Course Objectives

When you finish this course you will be able to:

1. Explain the issues of fentanyl use and abuse.
2. Explain the proper clinical use for fentanyl for pain relief.
3. Identify clinical symptoms of fentanyl overdose.
4. Describe risk factors, prevalence, and incidence of fentanyl misuse.
5. Describe the emergency care of fentanyl overdose.
6. Explain treatment strategies for effective use of fentanyl and for recovery from abuse.

The Fentanyl Folly

Deadly Drug Fentanyl Spikes the Opioid Epidemic.

NY Attorney General Eric Schneiderman
Press Conference, New York, 2016

Prescription opioid overdoses drop, as fentanyl deaths skyrocket.

USA Today
July 19, 2019

Tom, a 64-year-old male real estate appraiser liked to do home renovation projects after work. He was proud that he saved money by doing his own repairs. Tom adhered to a healthy lifestyle and lifted weights twice a week to try to build muscle for his tall and lean body. After a summer of building a block wall and a brick patio, he twisted to lift another 2x4 of wood and felt a sudden sharp pain down his left leg. Crawling to his bed, he lay motionless for 2 days—hoping it was just a simple muscle pull.

No over-the-counter NSAID medications eased the pain and he finally went to the emergency department, where he received a prescription for muscle relaxants and oxycodone. Without relief days later, he returned to the ED, was given a fentanyl patch from another physician, and was put on a 2-month waiting list for his primary doctor.

For 8 weeks, Tom writhed in pain with any lateral motion and began to lose the feeling in his left leg. Finally, after seeing his primary doctor and an orthopedic surgeon following 2 more months' awaiting insurance approval, he received back surgery; his collapsed disc and multiple compressed nerves were likely due to the delay in repair. In the meantime, he had become dependent on fentanyl for pain relief.

The Opioid Epidemic

Fentanyl is a **synthetic opioid** that represents 64% of all illegal cases of drug abuse (DEA, 2017). Whereas morphine is derived from the poppy plant, fentanyl is completely synthetic and can be manufactured anywhere, including in home laboratories. This synthetic opioid analgesic is 50 times more potent than heroin and 100 times more potent than morphine. It is a schedule II drug often used to manage post-operative pain (USDJ, 2016).

Healthcare professionals who prescribe or administer an opioid need to be aware of appropriate use—and potential for misuse and abuse—of any opioid analgesic. Not only do healthcare professionals need to be well informed about the appropriate use and cautions for opioid misuse but they also need to be able to recognize effectiveness, side effects, overdose symptoms, and abuse in patients as well as in other healthcare professionals.

Opioids are a class of drugs with opium-like qualities that interact with receptors in the brain and spinal cord to block pain and produce a sense of euphoria. Opioids include codeine, fentanyl, hydrocodone, meperidine, hydromorphone, methadone, morphine, oxycodone, and heroin (USDJ, 2016).

Names of Fentanyl	
Prescription	Street names
Abstral	Apache
Actiq	Cash
Duragesic	China Girl
Fentora	China White
Instanyl	Dance Fever
Lazandal	Friend
Sublimaze	Goodfella
	Great Bear
	He-Man
	Jackpot
	King Ivory
	Murder 8
	Tangox
	TNT
	Per-a-Pop (berry-flavored Fentanyl lozenge)

Sources: NIH, NIDA, 2018.

Opioid drugs are powerful analgesics used for pain management. Because they are powerful, and powerfully addicting, millions of people use them and can become physically and psychologically dependent or addicted to them. From 2000 to 2015, more than half a million people in the United States alone died from opioid drug overdoses (CDC, 2017).

Opioids are categorized as schedule I or II drugs by the Drug Enforcement Agency (DEA). A **schedule II drug** (eg, morphine, fentanyl) has been approved for medical treatment as an analgesic but has high potential for strong psychological and physiologic dependence. It has been used for over 100 years as an analgesic. Heroin, which is made by adding a chemical reagent to morphine (from the opium plant) that makes it more potent and potentially dangerous, is a schedule II drug and is not approved for any medical use because it is highly addictive.

So, how did we get to this point of millions of Americans using and abusing opioids?

The documented use of opioids began as early as 3400 B.C. in Mesopotamia with the discovery of the opium plant, which was known as the “joy plant.” Opium was used for every medical malady, including diarrhea, cholera, rheumatism, fatigue, and even diabetes, by early Egyptians. Opium was then regularly traded by Turkish and Arab traders in the sixth century. Opioid use became much more common in the early 1700s after the British refined production of the Asian poppy plant, which they grew in India and sold in China.

What became helpful as analgesia quickly became popular for treating every malady, and it was even used as entertainment—as seen in historical records of opium parties. The Opium Wars began in the mid-nineteenth century as Chinese government officials refused entry to British ships filled with the addictive drug. As we all know, the war against narcotics continues to the present in the United States.

Sadly, the drug culture got a boost from the medical profession’s legitimate interest in addressing pain for patients. Pain was added as the fifth vital sign in 1996 and a movement to minimize all pain increased prescriptions for opioids. Campaigns by pharmaceutical companies, boasting the effectiveness of their drug and claiming they had no side effects, added to the growth of prescriptions for opiates. Pharmaceutical companies even created organizations with persuasive lobbyists to decrease barriers and regulation of opiate use.

Another cause for the increase in the opioid epidemic has been the creation of **semi-synthetic and fully synthetic** in their laboratories by pharmaceutical companies. Creating heroin from morphine can even be done in a home laboratory, which has increased the availability of street drugs. The demand for heroin by Americans continues to support the illegal supply coming from Central and South America, and now China, into the United States. The desire to make heroin more potent has led to home laboratories creating mixtures of heroin with fentanyl that become unpredictable and lethal.

The Centers of Disease Control (CDC) has estimated that over 20,000 Americans died from fentanyl overdose in 2016, and that rate continues to climb in the United States. Fentanyl production in China has surged due to the high demand for it in the United States, and it has been called the new “nuclear” narcotic in the “Opium War Against America” (*Tribune News*, 2018).

What You Need to Know

Healthcare professionals need to know the correct and incorrect uses of fentanyl in order to be part of the solution when addressing chronic pain and analgesia. When used as prescribed by someone authorized and medically trained (eg, physician, nurse practitioner, physician assistant) opioids can be a blessing to someone in chronic pain; however, the patient needs to be monitored closely for adverse side effects and correct education.

Although national news appropriately focuses on issues of abuse, opioids—both natural and synthetic—still have a place in pain relief. Fentanyl becomes dangerous when it is mixed with street drugs such as heroin and users are unaware of what they are receiving. The quantity of fentanyl in street products varies widely and can become quickly fatal as doses exceed what would have been carefully prescribed. Illegal street use without guidance, monitoring, and education have created the dangerous opioid epidemic.

Did You Know . . .

Opium comes from the natural Asian poppy plant and is 10 times as potent as cocaine. Heroin is 10 times as potent as morphine, or opium. When we say fentanyl is 100 times more potent than morphine, it is equivalent to saying one pound of fentanyl is the same as 100 pounds of morphine. On the spectrum of potency is cocaine (not an opioid), opium, morphine, heroin, fentanyl and carfentanil, and W-18 (10,000 times stronger than heroin).

Test Your Knowledge

Which one of the following is not a cause of the US fentanyl overdose issue?

- A. Access to more prescriptions.
- B. Emphasis on treating pain aggressively.
- C. Difficulty of producing the drug.
- D. Its mixture with other drugs that hide its presence.

Answer: C

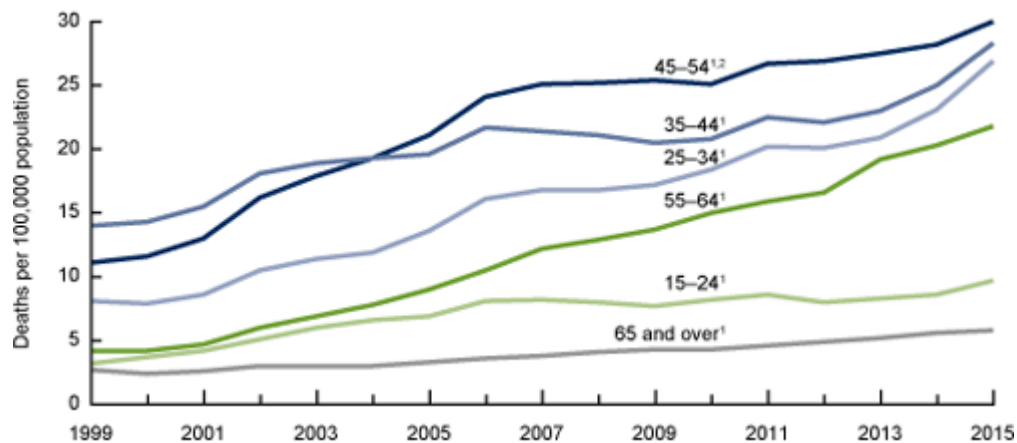
The Painful Numbers of Opioids

The CDC has declared the overuse and abuse of opioids an epidemic (Hedegaard, 2014; Rudd et al., 2016). Ninety-one Americans die every day from an opioid overdose (CDC, 2017, NCHS, 2017). Drug-related deaths have more than tripled from 6 people per 100,000 in 1999 to 16 per 10,000 in 2015 (NCHS, 2017). The United States consumes 99% of all the world's hydrocodone, 80% of the world's oxycodone, and 65% of the world's hydromorphone prescription opiate supply. Twenty-five percent of all workers' compensation costs relate to opioids and \$56 billion per year is spent on opioid abuse costs.

Trends of opioid overdose-related deaths in the United States have increased 5.5% annually from 6 deaths per 100,000 people in 1999 to 16.3 in 2015. In adults aged 45 to 54 the death rate from drug overdose was the highest of all age populations, showing a constant trend upward of 10% annual increase in abuse and deaths (NCHS, 2017). Clearly, America has an opioid epidemic that is claiming lives and lifestyles. Additional statistics, not as easily identified but very real, are the lost productivity in work hours and loss of meaningful lives, families, and marriages due to opioid abuse (ASAM, 2016).

A study examined deaths in 27 states from 2013 to 2014 and fentanyl-laced drug products increased by 426% (Gladden et al., 2016). It is estimated that the true numbers of synthetic opioid-related deaths are much higher because mixtures of fentanyl with heroin or cocaine are not always tested. The Drug Enforcement Agency (DEA) reports that fentanyl chemicals (illicitly manufactured fentanyl products) are mostly coming from Asian laboratories, mainly China; fentanyl was not a controlled substance until 2017 (Prekupec et al., 2017).

Deaths from Overdose by Year (1999–2015)



¹Significant increasing trend, $p < 0.005$.

²Rate for age group 45–54 in 2015 was significantly higher than for any other age group, $p < 0.001$.

NOTES: Deaths are classified using the International Classification of Diseases, Tenth Revision. Drug overdose deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Access data table for this figure at:

https://www.cdc.gov/nchs/data/databriefs/db273_table.pdf#2. Figure is available at:

<https://www.cdc.gov/nchs/products/databriefs/db273.htm>.

SOURCE: NCHS, National Vital Statistics System, Mortality.

Opioid drugs include:

Natural opioids

- Morphine
- Codeine (only available in generic form)
- Thebaine

Semi-synthetic opioids

- Hydrocodone (Hysingla ER, Zohydro ER)
- Hydrocodone/acetaminophen (Lorcet, Lortab, Norco, Vicodin)
- Hydromorphone (Dilaudid, Exalgo)
- Oxycodone (OxyContin)
- Heroin

Fully synthetic/manmade opioids

- Fentanyl (Actiq, Duragesic, Fentora, Sublimaze)
- Meperidine (Demerol)
- Methadone (Dolophine, Methadose)
- Tramadol
- Levorphanol

- Pethidine
- Dextropropoxyphone

Whereas natural opiates come from the opium plant and the active ingredient is morphine, semi-synthetic opioids are those created in laboratories and include hydromorphone, hydrocodone, and oxycodone, plus the illegal drug heroin. All of these are called narcotics and are schedule II drugs, except for heroin, which is an illegal schedule I drug and has not been approved for any medical use.

The fully synthetic drugs such as fentanyl are much more potent and have higher potential for abuse and death (Prekupec et al., 2017). Deaths caused by **illicitly manufactured fentanyl (IMF)** related overdoses have increased from 550 in 2013 to more than 2,000 deaths in 2015 (USDJ, 2016). National estimates of illegal fentanyl use come from the state and local forensic laboratories and drug seizure incidents. Trends reveal that the states reporting more fentanyl use are in the South or Midwest. States reported no more than 14 incidences in 2001, whereas, by 2015 all but one state had 100 or more reports (DEA, 2017). Cities that ranked highest for incidences include Cincinnati, Pittsburgh, Baltimore, and South Charleston.

Ohio forensic testing in 2017 revealed 99% of their narcotic overdose deaths were fentanyl-related and often due to combinations of IMFs, including 25 fentanyl analogs such as acryl fentanyl, nor fentanyl and furanyl fentanyl. The state also determined that males accounted for 64% of overdose deaths and 92% were white (CDC, 2017). Over half of the deaths in Ohio were in persons aged 25 to 44 years (Carlson, 2015; Peterson, 2016).

There were over 65,000 deaths due to fentanyl in 2016, which was up from 52,000 in 2015. The death rate due to fentanyl is much higher than the peak deaths due to fatal car crashes of 60,000 in 1972, HIV of 50,000 in 1995, and gun deaths of 40,000 in 1993. Trends continue to rise and causes point to the increased prescriptions of opioids for chronic pain and the availability of these drugs in non-prescription form.

Test Your Knowledge

Which of the following is **not** an opioid?

- A. Morphine
- B. Cocaine
- C. Hydrocodone
- D. Fentanyl

Apply Your Knowledge

You are a medical/surgical nurse and your patient is complaining of pain rated at 7/10 who has orders for hydrocodone. What nonpharmacologic options do you have to help with pain reduction? How often do you try to offer those to your patients? Is your health care facility supportive of your efforts to offer nonpharmacologic options for pain control?

Online Resource

Your Brain on Fentanyl (3:44)



<https://www.youtube.com/watch?v=C0tW8FWBm1g>

Answer: B

Definitions of Use and Abuse

Clarifying the difference between dependence and addiction is important to better understand the issues in opioid use and abuse. **Dependence** is the physical tolerance of the drug that requires increased amounts of the drug to achieve the desired response. Withdrawal of the drug will result in physical symptoms such as shaking, tremors, nausea and vomiting.

Addiction is a behavioral disorder that refers to the emotional desire for the drug and the desired effects it brings, which often creates strong drug-seeking behaviors. Generally, those who are dependent on opioids will vary between feeling sick without the drug and the desired high after taking the drug. Being addicted to the drug will motivate a person to do whatever it takes to get and take the drug to avoid the **withdrawal symptoms**.

Withdrawal symptoms include the following:

- Intense drug cravings
- Depression, withdrawal fears, anxiety
- Sweating, watery eyes, runny nose
- Restlessness, yawning
- Diarrhea
- Fever and chills
- Muscle spasms
- Tremors and joint pain
- Stomach cramps
- Nausea and vomiting
- Elevated heart rate and blood pressure (NIDA, 2018; Kosten, 2013).

Populations at Risk

People at risk for opioid dependence and addiction are seen in every age, gender, ethnicity, and culture. The physical dependence varies as a genetic component has been identified, which influences how quickly a person may slide from occasional use to physical need and addiction to the drug (Kreek et al., 2005). Susceptible populations include those who are taking prescription opiates for pain relief. Having been given initially for acute pain, some people may become quickly dependent on opioids due to their unique chemical makeup or addictive personality.

Others who have typically been at risk for overdose included the homeless, alcoholics, and those with personality or mental health disorders who look for opiates to block the emotional pain of life stressors. People who use street drugs such as marijuana or cocaine for entertainment or social pleasure are at risk to develop a stair-step increase to more potent drugs in order to gain the same effect after they reach dependence and tolerance.

Overdose is often seen in those who use street drugs such as marijuana, Oxycontin, and cocaine that are laced with fentanyl to reach more potency. Drug dealers and manufacturers add fentanyl to help their customers reach a better high, thus ensuring they become a return customer. Because of the potency of fentanyl and difficulty in measuring, there may be large variations in their products that cannot be identified by either the dealer or user.

Healthcare professionals who also experience great work stress have a higher risk of becoming dependent or addicted to opiates due to back injuries and easier access to narcotics in their work setting (Kenna & Lewis, 2008).

The Cost of Fentanyl

The true cost of fentanyl abuse is in the thousands of lost lives and millions more of destroyed families and the devastating effect upon family members left behind. The 2016 street cost of the drug for 1 kilogram was \$3,500 in the United States and 1 kilogram can make about 1 million tablets, so the cost is less than 0.3 cents/tablet to manufacture, which make the illegal market attractive. One million pills can sell for up to \$20 million, according to the DEA (Saul, 2016).

Test Your Knowledge

What is the definition of dependence?

- A. A drug user wants the drug for a party.
- B. The drug user depends on his dealer for a steady supply.
- C. A person who uses the drug regularly now physically depends on an increase of the drug to avoid withdrawal symptoms.
- D. The person takes opioids occasionally for entertainment and to feel pleasure.

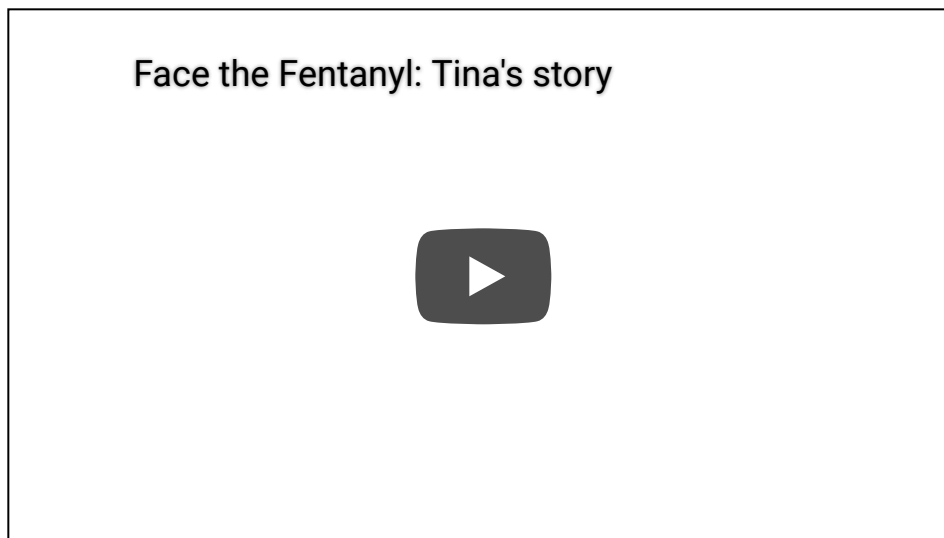
Apply Your Knowledge

Q: What are the first symptoms you see when a patient has had too much oxycodone?

A: Changes in level of consciousness and pinpoint pupils.

Online Resource

Face the Fentanyl: Tina's Story (2:33)



<https://www.youtube.com/watch?v=m74ntU9NaP0>

Answer: C

Pharmacokinetics and Pharmacodynamics of Opioids



Source: Wikimedia by Alcibiades.

Fentanyl is within the category of drugs called opioid analgesics. **Analgesics** are a drug class that help relieve the body from the sensation of pain by blocking chemicals in the brain neurons that sense pain. Neurons send messages from the body to the brain; different types of neurons sense different things (eg, temperature, pressure, pH).

Nociceptors, nerve receptors for pain, send messages from noxious stimuli to the brain from the skin, organs, and muscles that something is potentially hurting the body. Nociceptors send messages about pressure, sharp objects, noxious smells, tastes, and pain and the brain interprets those for immediate response to protect the body.

Several neurotransmitters send pain signals, but the main ones are glutamine and substance P. When noxious stimuli trigger the primary neuron through the skin or muscle, for example, the message is relayed by a secondary neuron to the spinal cord's dorsal root ganglion and on to the brain for interpretation.

The neurotransmitter chemicals are relayed to the thalamus in the brain and then onto the limbic system for an emotional response. Ideally the message to the limbic area of the brain promotes learning to avoid the cause of the noxious substance in the future. Opioids inhibit pain signals at multiple areas in this pathway. Opioids affect the brain, the spinal cord, and even the peripheral nervous system.

Opioids work on both directions in the nervous system, including (1) the **ascending pathways** in the spinal cord, which are inhibited; and (2) the **descending pathways**, which block inflammatory responses to noxious stimuli. In the brain, opioids cause sedation and decrease the emotional response to pain. Heroin, like morphine, passes through the liver and then is released back into the blood, where it passes the blood-brain barriers. Heroin is then converted to morphine where it connects with mu receptors and heroin is 3 times more potent than morphine.

Did You Know . . .

Morphine is the standard to which all opioids are compared.

The three major opiate receptors are mu, delta, and kappa, all of which act on the dorsal horn of the spinal cord and cerebral cortex. Although morphine and opiates block the pain sensory pathways to the cerebral cortex and limbic system, they also act on respiration, mood, and emotion. Opioid receptors are found on both the primary and secondary neurons, and when opium-like drugs bind to these receptors, no other pain signals are sent to the brain, making opioids very effective against pain.

Endogenous analgesic receptors include human endorphins. Our bodies' three receptors can be activated by opioid agonists like morphine, hydrocodone, or heroin. When mu receptors are activated, dopamine, a natural chemical associated with pleasure, is also increased. Pleasurable feelings are inherently worth repeating, which drives the user to repeat the drug use.

Morphine and opioids are easily absorbed by the gastrointestinal tract, nasal mucosa, and lungs. When fentanyl crosses the cellular membranes into the brain, altered cognition makes it difficult to recognize rising carbon dioxide levels in the lungs, which can lead to respiratory acidosis or even complete respiratory cessation. For drugs to work, they must pass the high lipid blood–brain barrier. Fentanyl is fat soluble, which means it can pass into brain tissues extremely fast—more rapidly than morphine.

Novel synthetic opioids (NSOs) are the next generation of opioid drugs and are more potent. A lethal dose of fentanyl can look like two grains of salt (approximately 2 mg), making it difficult to dose correctly. In 2015 the Drug Enforcement Agency (DEA) and CDC issued nationwide alerts that fentanyl is a threat to public safety (Peterson et al., 2016). The NSOs do have a place in clinical usage due to their high potency, low cardiovascular effect, rapid onset, and short duration of action (Vucković et al., 2009).

Additional variations and analogs are being produced both legally and illegally with even stronger potency, such as **carfentanil** (also spelled *carfentanyl*), which is 100 times as potent as the same amount of fentanyl and 10,000 times stronger than regular morphine (*Boston Globe*, 2018). Carfentanil is being explored for chemical warfare and has been used as an elephant tranquilizer because of its potency. It is now creating human deaths due to its powerful effect (Baumann, 2018).

Because of the potency of fentanyl, the withdrawal symptoms are equally as strong, lasting up to a week, making cessation of the habit difficult for users and abusers. Carfentanil was not a controlled substance in China until 2017, although it was first synthesized in 1974. It is a classified Schedule II drug in the United States (Shoff et al., 2017).

Short-term sensations of opioids include the following:

- Warmth sensation through skin and body

- A feeling of heaviness in arms and legs
- Pain relief
- Euphoria
- Itchiness
- Possible dry mouth
- Drowsiness
- Slowed heart functioning
- Slowed breathing
- Relaxation
- Sense of well being

Opioid agonists come with additional noxious side effects. When a kappa receptor is stimulated it can also produce hallucinations, anxiety, and restlessness. Delta and mu receptors can cause respiratory depression because, as the midbrain is stimulated, it suppresses the body's ability to detect carbon dioxide levels, which is the main stimulus for breathing. Other negative side effects include constipation, sedation, nausea, dizziness, urinary retention, and tolerance. **Tolerance** is the requirement of the body for increased amounts of the drug to reach its desired effects, which is why opioids can become addictive; the person continues taking more and more of the drug to achieve the desired pain relieving and sedating effects (Dunphy, 2016).

The key ingredient in opium is morphine, which began to be produced formally by the pharmaceutical company Merck. It was discovered that when administered by IV, morphine is 3 times more potent than when administered by other methods such as smoking or snorting.

Long-term use of opioids has been shown to cause the deterioration of the brain's white matter and includes effects of insomnia, chronic constipation, sexual dysfunction, irregular menstrual cycles in women, kidney disease, and physical damage resulting from administration by snorting, smoking, or IV drug use.

Although cocaine and morphine both affect the neurotransmitter dopamine, they work in different ways. Whereas the opioids increase dopamine stimulation, cocaine blocks the reuptake of existing dopamine and makes it last longer, producing a longer state of pleasure. Both opioids and cocaine drugs do influence the brain's interpretation of the pleasure drive, reinforcing the urge for repeated behavior to get the drug.

In addition to the short-term withdrawal symptoms, **long-term opioid use causes:**

- Decreased ability in decision making
- Decreased ability for self-reflection and discipline
- Decreased ability to effectively respond to stress

Route and Administration of Fentanyl

Opioids can be administered by FDA approval through the subcutaneous, intramuscular, intravenous, and oral routes but due to variations in first-pass liver metabolism there are variations of response by users. Non-prescription drug users often speed the delivery by nasal and intravenous administration. The potency of fentanyl and carfentanil have been demonstrated by the rapid deleterious effects on police officers who have come in contact with the powder through their skin during drug investigations and raids. One police officer overdosed just by brushing powder off of his uniform with his hand (Moshtagian, 2016). Subcutaneous fentanyl is commonly used to address chronic local pain; there is a transdermal fentanyl patch that has a slow release action. When fentanyl is delivered through more rapid routes such as IV or intranasal, the response is much quicker and therefore potentially fatal. Street products include variations of many of these routes of administration but also include lozenges laced with fentanyl.

Appropriate Use of Fentanyl

As a potent opioid narcotic, fentanyl is a powerful analgesic to treat chronic pain. It is not intended or appropriate for occasional, short-term, or light pain. Fentanyl is usually administered by injection or topical patch in the hospital setting. It may be prescribed through the intradermal route for chronic pain and is classically used for chronic lower back pain. Brand names also offer fentanyl in other routes, including

- Abstral (sublingual)
- Actiq (lozenge or “lollipop”)
- Duragesic (transdermal patch)
- Fentora (buccal tablet)
- lonsys (transdermal device)

Transdermal Patch



Source: Wikimedia by Daniel Tahr. Transdermal fentanyl.

Fentanyl Lollipops



Source: Wikimedia by Crohnie.

- Lazanda (nasal spray)
- Subsys (sublingual spray)

Dosage varies based on the route and is in Mcg, not mg, and can be seen at this URL: https://www.drugs.com/dosage/fentanyl.html#Dose_Adjustments

Clearly there are appropriate roles for this medication as a treatment for millions of people suffering from chronic pain. In the hospital setting it is often used post operatively. Because it is a narcotic, it is important that it be monitored closely for respiratory suppression and adverse reactions. Of course, it should not be used by someone who is allergic to the drug, has any type of breathing problem, a history of head or brain injury, liver or kidney disease, slow heart rhythms, concomitant use of sedatives like Valium, or if a MAO inhibitor has been used in the past 14 days or the client is already taking another narcotic. There are no adequate studies to confirm safety or danger in pregnancy or breastfeeding so providers must be notified and careful clinical consideration given to weigh benefits from any possible damage to infants and mothers because it is a Category C and risk cannot be ruled out (Drugs.com, 2018).

Patient Education and Support

Online and face-to-face support groups are available to help with effective and appropriate use of fentanyl. Often the only information provided is about the serious opioid epidemic and potential risk for addiction and abuse; however, when used properly and within the clear instructions given by a medical provider who is monitoring for adverse reactions, it can be a helpful option for people in very real chronic pain.

Using all medications as directed is important because the route has been chosen for specific reason. Unfortunately, a dangerous practice of chewing on a transdermal patch can speed up the delivery of the drug and create addiction and possibly respiratory depression and even death. Mental and physical dependence can still occur even at prescribed doses so patients must be carefully monitored.

Supporting patients in their quest for relief from pain and judgment is extremely helpful. In the national conversation about opioid abuse, patients who have very real chronic pain continue to suffer as physicians are attempting to prescribe less and pharmacies are blocking repetitive refilling of narcotics. The dialog for effective pain management and effective systems to prevent opioid abuse must continue in creative, nonjudgmental, and respectful ways. Clinicians should support groups who can speak freely about issues and concerns. Not all people who use fentanyl are drug addicts and they should not be treated as such.

The onset of pain-blocking effects of intradermal fentanyl takes from 12 to 48 hours, and even up to 72 hours, and may require a breakthrough alternative until the full effect is achieved. Titrating carefully for pain relief is required based on individualized patient needs. Variations in the need for higher dosages depends on the location of a transdermal patch, the quantity of fat on the body area and the dryness of the skin it is applied to.

Did You Know . . .

All patients should be taught to avoid alcohol consumption if using fentanyl.

Patients also need to be aware that the narcotic may remain in the bloodstream for up to 3 days and can be residual in hair and urine. Drug testing for abuse or employer use is mostly commonly done this way.

Patient education should include instructions on careful timing and use of the drug, adverse reactions and side effects, and drug interactions and contraindications. When a patient follows instructions given by a provider, overdosing is generally not expected due to careful guidelines and timing instructions. Other drugs however, may interact with fentanyl and change the effectiveness, onset, peak, duration, and half-life of the drug. Drugs such as other narcotics, including even cough medicine, sedatives, tranquilizers, antipsychotic medicine, and drugs that affect breathing and serotonin levels may all negatively interact with fentanyl.

According to drugs.com, 945 drugs have known interactions with fentanyl including 4977 brand and generic names. A database of medications that may interact with fentanyl is available at this URL:

<https://www.drugs.com/drug-interactions/fentanyl-index.html>

The respiratory system is the most critical to monitor for adverse effects because it may cause respiratory suppression and respiratory arrest.

Common Side Effects of Fentanyl (in alphabetical order)

- Black, tarry stools
- Blurred vision
- Chest pain
- Confusion
- Constipation
- Convulsions
- Cough
- Decreased urine
- Difficult or labored breathing
- Dizziness
- Fainting
- Fever or chills
- Headache
- Increased thirst
- Irregular heartbeat
- Lightheadedness
- Loss of appetite
- Lower back or side pain
- Mood changes
- Muscle pain or cramps
- Nausea or vomiting
- Nervousness
- Numbness or tingling in the hands, feet, or lip
- Painful or difficult urination
- Pale skin
- Pounding in the ears
- Rapid breathing
- Skin irritations from transdermal route
- Sneezing
- Sore throat
- Sunken eyes
- Swelling of the hands, ankles, feet, or lower legs
- Tightness in the chest
- Troubled breathing with exertion
- Ulcers, sores, or white spots in the mouth
- Unusual bleeding or bruising
- Unusual tiredness or weakness
- Wrinkled skin

Withdrawal Symptoms of Fentanyl

It is important for patients to recognize the symptoms of withdrawal, which may mean it is time for another dose of medication, that their dose is not correct, or that they are developing dependence.

- Nausea
- Diarrhea
- Coughing
- Tearing
- Nasal discharge
- Profuse sweating
- Twitching muscles
- Yawning

Alternatives for Pain Relief

Pain relief becomes the primary focus for anyone in pain and the quickest way to relief generally comes from narcotics. Because of the serious risk of adverse effects, caution must guide the provider in choosing methods for pain relief. Most people prefer medications for pain relief because it is quicker than the longer time require for alternatives. Research is promising in many of these modalities and a special division of the Department of Health and Human Services has been created to collect research data and recommendations for the use of non-pharmacologic interventions for pain and illnesses; it can be accessed here.

<https://nccih.nih.gov/health/integrative-health>

Complementary and alternative therapies (CAT) should be considered and at least discussed as options with a medical provider for chronic pain. These therapies are classified as either (1) natural products, or (2) mind and body practices. Natural products include herbs, probiotics, dietary supplements, essential oils, homeopathy, and special diets. Mind and body practices includes deep breathing, yoga, chiropractic or osteopathic manipulation, meditation, massage, progressive relaxation, guided imagery, and prayer.

Studies reveal that almost 40% of the U.S. population is using complementary or alternative medical practices. It is considered complementary or integrative if a practice is used *along with* a standard medical treatment and alternative if it is being used *instead of* a prescribed therapy. An alternative therapy is one that is not an approved as official standard of care in American medical schools, therefore modalities such as prayer or physical touch are actually considered alternative. Research is now encouraged by the National Center for Complementary and Integrative Health in hope for adjunct therapies for Veterans and alternatives for pain treatments to help curb the opioid crisis.

Nonpharmacologic Modalities for Pain Relief

- Acupuncture
- Acupressure
- Art therapy
- Biofeedback
- Chigong (Qigong)
- Chinese medicine w/herbs and teas
- Chiropractics
- Dance therapy
- Distraction therapies
- Eliminating environmental toxins
- Exercise
- Feldenkrais
- Guided imagery
- Laughter therapy
- Music therapy
- Nutrition and herbal remedies
- Osteopathy
- Pet therapy
- Physical therapy
- Psychosocial support, support groups
- Relaxation strategies
- Reiki
- Sleep hygiene
- Tai chi
- TENS therapy
- Yoga

Fentanyl is only one of many pharmacologic medications for pain relief. Because it is a synthetic and so potent, others may be substituted effectively when combined with an alternative pain management method.

Narcotic Pain Relief Categories

Opioid Agonists

- Codeine
- Heroin
- Hydrocodone (Lortab, Vicodin, Percocet)
- Hydromorphone and Oxymorphone
- Meperidine
- Morphine
- Oxycodone (Oxycotin, Percodan)

Partial Opioid Agonists

- Buprenorphine (Subutex)
- Tramadol

Pure Opioid Antagonists

- Narcan
- Naltrexone
- Nalmefene

Test Your Knowledge

How does fentanyl work?

- A. It blocks pain receptors within the spinal cord.
- B. It blocks the production of dopamine.
- C. It enhances the production of epigastric juices.
- D. It increases all natural hormones in the body.

Apply Your Knowledge

Q: What is the fastest acting opioid that is used in medicine for pain relief? How is it administered?

A: IV fentanyl

Answer: A

Prevention and Screening Strategies

The best treatment for any drug overdose is prevention. Because of the national attention to the opioid epidemic and harsh statistics of deaths caused by fentanyl overdose, political, federal, state and even pharmaceutical companies have made efforts to address the problem. One strategy is to decrease the availability of prescriptions for opioids and fentanyl.

Prevention

The Food and Drug administration (FDA) has produced guidelines for effective pharmacologic use of opiates, which include the identification of persons at risk, assessing a patient's benefit vs. risk, developing and using tools to decrease risks of opiate prescription use (such as contracts for pain management and standards of required 30-day physician visits before new prescriptions can be refilled).

Prevention strategies include:

- Patient education regarding use of opiates
- Pain contract signed by patient to agree to terms of drug use
- Prescription monitoring programs to detect multiple use of pharmacies and physicians for opiates
- Detection of inappropriate prescribing of opioids

- Photo identification to pick up opioid prescriptions
- Urine toxicology screening for employees
- Safe disposal of unused opioids
- Referrals to pain and addiction specialists
- Use of semi-synthetic opioid alternatives

Patient education regarding the use of opiates—and, actually all prescription medications—is essential for them to understand the need for the drug, its side effects, and adverse effects. An additional pain contract should be included with the patient education materials, that outlines the parameters for the use of the drug. Especially when used for chronic pain management, patients should be partners with the prescriber to outline when the drug will be used and for how long.

Prescription monitoring programs include detection systems in pharmacies and the local district that identify patients who have filled a narcotic prescription. In many states, photo ID is already required for the purchase of cigarettes or alcohol and could become a beginning point to dissuade unauthorized and high-frequency prescription use.

According to the National Alliance for Model State Drug Laws, currently 85% of states require ID for narcotic prescription use. Some drugstores even run the name of a client picking up a narcotic prescription through a drug monitoring data system for alerts. The challenge is for busy pharmacists to take the time to use the monitoring system and for patients to be patient while the process is completed.

Possible “red flags” that could lead to prescription denial:

- A pain medication not previously filled the pharmacy
- A new doctor writing a prescription for the same pain medication
- A doctor writing a prescription who is not in a “reasonable geographic location” near the pharmacy
- A patient paying for a prescription in cash
- A patient seeking an early refill of a prescription
- A patient seeking an “excessive” number of pills
- A patient taking the same pain medication for more than 6 months

Another strategy includes getting prior authorization before opiates can be filled. In 2007 the FDA passed an amendment to create a patient registry for opioids. In 2012 Blue Cross Blue Shield began to require prior authorization for more than a one-month supply of opioids in a two-month period. By this simple process alone, in the state of Massachusetts the number of opioid prescriptions was decreased by more than 6,500,000 pills in one year (*Boston Globe*, 2016).

Disposal

Safe disposal of opioids is a challenging issue because many people believe that flushing them down the toilet is appropriate, which it is not. Public education and awareness programs should include safe medication disposal such as mixing with used coffee grounds, dirt, or kitty litter and placing in a sealed container to then dispose of in the garbage. Used opioid patches should be folded in half on the sticky sides and disposed of in a sealed container in the garbage.

Screening Tools

Several screening tools are available to help clinicians identify when a patient taking opioids may be experiencing dependence or addiction.

SBIRT Tool

Screening, Brief Intervention, and Referral to Treatment (SBIRT) is an evidence-based practice used to identify, reduce, and prevent problematic use, abuse, and dependence on alcohol and illicit drugs” (SAMHSA, HRSA, 2016). The SBIRT model was inspired by a recommendation from the Institute of Medicine to increase community-based screening for health risk behaviors, including substance use.

SBIRT is an early and brief intervention of 15 to 30 minutes and billable to Medicare/Medicaid. The screening and referral to treatment includes a patient encounter, history, physical examination, clinical diagnosis, and plan for care specific to the concern of substance abuse other than for those patients already identified with severe substance abuse. The SBIRT screening tool can be as simple as asking several key questions of patients receiving narcotics and opioids at every doctor’s office visit.

Opioid Risk Tool

The Opioid Risk tool is another brief screening tool consisting of questions to help identify a patient at increased risk for dependence and abuse. Currently no one tool has been identified to be better than any others, nor is any one tool sufficient to identify drug behaviors of chronic pain patients using opioids (Turk et al., 2008).

Additional Strategies

Additional strategies to prevent overdose and overuse of fentanyl is to create systems of notification of awareness when a patient is using the drug inappropriately. Pharmacy notifications, Prescriber education and even identification of use during pickup are measures being implemented with varying levels of success.

The biggest problem still stems from those users of fentanyl-laced products that do not come from legal channels. Federal regulations against China have begun but with little success as manufacturers and dealers outsmart the current systems. It is alleged that most of the fentanyl arrives through legal small packages via private shipments into the U.S. mail (Herald, 2018). Tracking postal systems is costly and ineffective at present. The U.S. government announced that the DEA scheduled all fentanyl-related substances, which makes possession, manufacturing, and use of these products illegal and subject to federal prosecution (Thomas, 2017). Police forces are being trained to identify such products but training and practice take time in the ever-increasing war against even newer types of opioids.

Legal sentencing for illegal drug use of fentanyl was increased in 2016 and includes a mandatory 5-year sentence for possession of 2 grams, which is also a fatal dose. Fentanyl is odorless and colorless and generally can't be identified within street drugs. Mandatory sentencing for heroin and other opioids has existed for more than 30 years, however legal deterrents haven't decreased the incidence of illegal fentanyl production, delivery, or use.

Test Your Knowledge

What is the SBIRT screening tool?

- A. A form that assesses for risk for drug abuse.
- B. Screening, brief intervention, and referral to treatment.
- C. The intake process for admitting a patient to a rehabilitation facility.
- D. The history and physical assessment of patients for drug abuse.

Apply Your Knowledge

Q: In our case scenario, what steps could have been done to help the patient with safe pain relief, education, and more rapid diagnosis and treatment?

A: The answers are within the question itself: safe pain relief, education, and more rapid diagnosis and treatment. Unfortunately, there are sometimes roadblocks. Systems of health care delivery are slow at best as insurance companies largely control the speed a patient can be seen, and by whom, and which procedures will be authorized.

Answer: B

Acute Treatment for Overdose

Celebrity overdose from drugs raises public awareness of opioid overdose; for example, the celebrity Prince died of a self-administered opioid overdose, which later was identified by autopsy as fentanyl. He had allegedly been using fentanyl for chronic back pain and had also earlier reversed an overdose by the use of Narcan. Investigators revealed that Prince did not have a valid prescription for opioid medications.

Treatment for opioid abuse generally starts with treatment of withdrawal in the acute phase. Managing symptoms of overdose and preventing death are the first objective. Securing an airway and supporting the patient during the tremors, seizures, hypertension, nausea, vomiting and pain are often handled in an ED medical/surgical setting.

Naloxone (Narcan)

Narcan can be used for *reversal* of opioid overdose and is available in IV, SQ, IM, and nasal routes. If a patient is unconscious, follow the ABC's of emergency response such as calling 911, checking for a pulse, securing an open airway, and providing rescue breaths. Give the first full dose of naloxone and continue rescue breaths. If the patient doesn't respond give the second full dose of naloxone. Patients will often respond quickly and be confused and possibly combative. Monitor the patient after recovery with naloxone to prevent another dose of an opioid requiring followup medical attention.

Methadone

Pharmacologic blocking agents are helpful in stopping the opioid overdose. Antagonist medications block opioid receptors so that the desired effect is no longer active. Two opiate substitution medications are currently available in the United States: methadone and levomethadyl acetate. They are only available in strictly regulated environments under clinical observation and for limited out-patient use (Dowell, 2016). Patients who are abusing opioids must be sober for at least 5 days before they can begin a naloxone treatment plan.

Did You Know . . .

Methadone and buprenorphine are synthetic opioid agonists and act on the same mu receptors as opioids. Therefore they have been a popular treatment for addiction, known as **Opioid Substitution Therapy (OST)**.

Methadone has a slow onset of action and long elimination half-life of about 24 hours. A longer acting opioid receptor agonist is buprenorphine, which is a partial opioid agonist and can reduce cravings and symptoms of withdrawals. These drugs can be taken less frequently and can help wean a patient from the more fatal opioids. Control trials show that methadone is more effective than a placebo and can help decrease fatalities from opioids. Access to these drugs is still dependent upon physician-controlled programs (Schuckit, 2016).

Getting into approved treatment programs, where these drugs can be given and monitored closely in combination with behavioral therapy, is often difficult, expensive, and not approved by insurance companies. The strict control of these opiate-substitution drugs is necessary because they do produce a euphoric sensation like the opiates; the tight regulation is due to the fear of creating a market of illicit use. These medications can be given in sublingual, oral, and even intranasal forms. These opioid antagonist drugs act as competition for the mu receptors and ideally block the effectiveness of other opiates.

Ten states, however, allow family members and friends to be trained in giving naloxone for a suspected drug overdose. The following states offer training for naloxone use:

- California
- Connecticut
- District of Columbia
- Illinois
- Massachusetts
- New Mexico
- New York
- North Carolina
- Rhode Island
- Virginia
- Washington State

Test Your Knowledge

What is the antidote for a fentanyl overdose?

- A. Narcan/naloxone
- B. Flumazenil
- C. Mucomyst
- D. Atropine

Apply Your Knowledge

What is your facility's process for treatment of an opioid overdose? Do you know how to use Narcan? Do you know how to teach its administration?

Online Resource

Using Nasal Naloxone to Reverse Opiate Overdose (8:02)



https://www.youtube.com/watch?v=FZpgjRBby_M

Answer: A

Treatment Strategies for Long Term Recovery

The Problem

The big challenge with fentanyl is its very effectiveness against pain. Long-term treatment of fentanyl dependence relies on pharmacologic management and behavioral therapy. The objective of treatment is to reduce dependence and addiction on opioid drugs, with the goal to decrease fentanyl-related deaths and mortality. Clinical studies show behavioral modification isn't effective on its own because the body has physical dependence that must be addressed. Fentanyl abuse is not just an ethical or moral addiction, but rather a physiological response to the need for opioid receptor activation.

Physical withdrawal is painful and difficult and those with opioid addiction will do anything to avoid it. With careful management, a person can successfully overcome the physical withdrawal; however, the psychological withdrawal is often more difficult than morphine withdrawal and requires continuous emotional support. Programs such as Alcoholics Anonymous can help guide the person through a series of steps toward independence from opioids and from pain.

Pain clinics are a newly developed specialty that allow patients suffering from chronic pain to work with a pain specialist for more effective management using a variety of modalities. It is estimated that at least 100 million Americans live with chronic pain. Pain clinics are adept at focusing on procedures that deal with specific pain, such as neck and lower back. They can also approach pain through an interdisciplinary approach involving psychologists, physical therapists, nutritionists, and occupational and vocational therapists, in addition to physicians and nurses.

Other modalities such as acupuncture, biofeedback, cognitive behavioral therapy, water therapy, massage, and meditation can be options for chronic pain in lieu of relying solely on opioids. Both patient and prescriber education need to include these alternative treatment strategies.

Recognition of opioid use among healthcare professionals has been addressed by the National Council of State Boards of Nursing. A free educational webinar for understanding substance use disorder in nursing is available to nurses and managers to help identify signs of opioid use and abuse. It also outlines the system of helping professionals into therapy and recovery. It can be accessed here: <https://www.ncsbn.org/5127.htm>

The Solutions

It is estimated that the high incidence of illicitly manufactured fentanyl is due to mixtures of drugs from multiple illegal sources. Solutions include better access to evidence-based treatments for fentanyl abuse, which may help the fentanyl-related overdoses (Peterson, 2016). Such treatment programs have not seen great success because compliance from the users is generally low, and cost, supplies, and training for the healthcare professionals is high. Because the problem is multifactorial in that physical and emotional stressors lead to the use of fentanyl, the solutions must also be multifactorial.

Early identification of those who may have addictive behaviors, or even a genetic predisposition to addiction, should be identified early. Ideally, a prescriber could identify a patient who may be prone to an opioid addiction and prescribe them non-opioid medications instead. A variant of the mu opioid receptor has been identified and patients with this gene experience higher pain levels, which may require higher doses of opioid and resultant tolerance and addiction. Testing for the gene (A118G) is now possible through several companies, which may give providers valuable information to know who may not experience adequate pain relief from opioids and who may be at an increased risk for addiction (Mistry et al., 2014). Knowing that a patient may have a higher probability of addiction to opioids than the average patient may help provider seek alternatives for pain management.

Alternative strategies for both acute and chronic pain relief include physical therapy; distraction; nonpharmacologic comfort measures such as temperature manipulation, massage therapy acupressure, and acupuncture; and even nutrition therapy. A standard for pain control based on research demonstrating its effectiveness for both acute and chronic pain includes electrical stimulation such as a **TENS unit** (transcutaneous electrical nerve stimulation) that attaches to the skin and produces small electrical signals to distract the deeper pain receptors. A **spinal cord stimulator (SCS)** is also an electrode implanted near the spinal cord that sends mild and safe electrical signals to the skin and can help relax nerves blocking pain messages.

Additional nonpharmacologic techniques for pain control include aromatherapy, deep breathing, exercise and meditation, guided imagery, music, biofeedback, self-hypnosis, and yoga. Unfortunately, human nature is such that people would rather take a pill for quick pain relief than try an alternative modality. Healthcare professionals need to be better educated on these modalities so they can offer them to patients. Guided imagery by a tranquil nurse does take longer than a quick injection of morphine by a busy nurse. The lack of evidence-based research on nonpharmacologic modalities is an issue because much pain relief research is provided by pharmaceutical companies who have a profit motive. Until credible research is produced on the value of nonpharmacologic modalities, healthcare professionals and users will continue to reach for the pills.

Some states and federal agencies have begun to offer state-sponsored heroin, cocaine or fentanyl delivery programs. The high rate of fatalities is often due to tainted products wherein heroin has been laced with unknown amounts of fentanyl, which can be lethal. Regardless of the public awareness programs against use of opioids, addicts will continue to use them because they are physically unable to stop by themselves.

Programs that invite users to obtain “clean” drugs end up costing the state less by keeping users out of emergency rooms, the criminal justice system, and even morgues (Ostroff, 2017). Controversy arises, however because taxpayers don’t like to know their hard-earned tax dollars are being spent on narcotics for addicts. The challenge continues to find financially responsible and morally ethical solutions.

Test Your Knowledge

Which of the following are strategies to help with chronic pain and fentanyl use?

- A. Extra sleep
- B. Alka Selzer
- C. “Clean drugs”
- D. Nutritional Smoothies

Apply Your Knowledge

How can you be an advocate to improve pain control without the use of opioids?

Answer: D

Summary

Fentanyl is a powerful opiate and the cause of thousands of fatalities in the United States. These lives are lost needlessly due to opioid addiction and overdose. Prescribers and patients need education. Legislators need to spell out how to regulate opioid use. States must decide on the training and availability for the use of naloxone and opioid agonists for overdose and weaning. Healthcare professionals must learn to collaborate with pharmacists, nutritionists, and behaviorists who work with those in chronic pain to offer them more options for pain management. Schools and public officials (eg, police workers) must be able to improve security and dissuade illegal street drug sales.

Each of these proposed strategies to fight our national war on drugs is at some stage of development and implementation but they take time. The cost to implement programs, educate healthcare workers and law enforcement officers, and evaluate any negative consequences to appropriate treatment plans for pain is high. In the meantime, small efforts can save lives. Your efforts to learn more about fentanyl and its effects is a valuable part of the solution.

Resources and References

Resources

Addiction Center

Fentanyl Addiction, Abuse and Treatment

<https://www.addictioncenter.com/opiates/fentanyl/>

Centers for Disease Control and Prevention Fentanyl: Preventing Occupational Exposure to Emergency Responders

<https://www.cdc.gov/niosh/topics/fentanyl/resources.html>

National Institute on Drug Abuse

<https://addictionresource.com/drugs/fentanyl/fentanyl-use/>

National Institute for Occupational Safety and Health: Fentanyl: Preventing Occupational Exposure to Emergency Responders

<https://www.interagencyboard.org/articles/new-niosh-resource-fentanyl-preventing-occupational-exposure-emergency-responders>

References

American Society of Addiction Medicine (**ASAM**). (2016). Opioid Addiction 2016 Facts & Figures. Retrieved March 13, 2018 from <http://www.asam.org/docs/default-source/advocacy/opioid-addiction-disease-facts-figures.pdf>.

Baumann M. (2018). Pasternak G. Novel Synthetic Opioids and Overdose Deaths: Tip of the Iceberg? *Neuropsychopharmacology*. 2018; 43:216-17. Retrieved March 13, 2018 from <https://www.nature.com/articles/npp2017211>.

Boston Globe. (2018). Comparing the lethality and potency of opioid drugs 2017. Retrieved March 13, 2018 from <http://www.bostonglobe.com/Error/Generic;jsessionid=344097A00A0FFAF68A4D33500BB3940E>.

Boston Globe. (2016). Strict opioids laws hit chronic pain sufferers hard 2016. Retrieved March 13, 2018 from <https://www.bostonglobe.com/metro/2016/06/18/the-other-side-america-war-opioids/i9YYLR0bGWFdP9z1T1pwjI/story.html>.

- Carlson, Rudd RA, Seth P, et al. (2015). Increases in drug and opioid-involved overdose deaths—United States, 2010–2015. *MMWR* 2016; 65:1445–52.
- Centers of Disease Control (**CDC**). (2017). Overdose Deaths Related to Fentanyl and Its Analogs, Ohio 2017. Retrieved March 8, 2018 from https://www.cdc.gov/mmwr/volumes/66/wr/mm6634a3.htm?s_cid=mm6634a3_w.
- Dowell D, Haegerich T, Chou R. (2016). **CDC** Guideline for Prescribing Opioids for Chronic Pain, United States, 2016. *MMWR Recommendations Rep* 2016;65(No. RR-1):1–49. DOI: <http://dx.doi.org/10.15585/mmwr.rr6501e1>.
- Drug Enforcement Administration (**DEA**). (2017). *Emerging Threat Report*, Third Quarter 2017. Retrieved March 8, 2018 from <https://ndews.umd.edu/resources/dea-emerging-threat-reports>.
- Drugs.com. (2018). Fentanyl Injection. Retrieved April 6, 2018 from <https://www.drugs.com/fentanyl.html>.
- Dunphy L, Winland-Brown J. (2015). *Primary Care: The Art and Science of Advanced Practice Nursing*, 5th ed. Philadelphia: F.A. Davis Company.
- Gladden RM, Martinez P, Seth P. (2016). Fentanyl law enforcement submissions and increases in synthetic opioid-involved overdose deaths: 27 States, 2013–2014. *MMWR* 2016; 65:837–843. Retrieved March 13, retrieved from https://journals.lww.com/journaladdictionmedicine/fulltext/2017/08000/Misuse_of_Novel_Synthetic_Opioids_A_Deadly_New.5.aspx#R32-5.
- Hedegaard H, Chen LH, Warner M. (2014). Drug-poisoning deaths involving heroin: United States, 2000–2013. NCHS data brief, no 190.
- Herald, The*. (2018). Government must step up fight against fentanyl. Retrieved March 13, 2018 from http://www.sharonherald.com/opinion/editorials/government-must-step-up-fight-against-fentanyl/article_0a05ffed-36ee-5d7b-9f34-3ec0bd37a40c.html.
- Kenna G, Lewis D. (2008). Risk factors for alcohol and other drug use by healthcare professionals. Substance Abuse Treatment Prevention Policy 2008. Retrieved 4 September 2017 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2265282/>.
- Kosten T and O'Connor P. (2013). Management of drug and alcohol withdrawal. *NEJM* 2003; 348:1786-1795.

Kreek M, Nielsen D, Butelman E, LaForge K. (2005). Genetic influences on impulsivity, risk taking, stress responsibility and vulnerability to drug abuse and addiction. *Neurobiology of Addiction. Nature Neuroscience 2005*; Retrieved March 13, 2018 from https://www.researchgate.net/profile/David_Nielsen/publication/7514762_Genetic_Influences_on_Impulsivity_Risk_Taking_Stress_Responsivity_and_Vulnerability_to_Drug_Abuse_and_Addiction/links/09e41513114210281a000000/Genetic-Influences-on-Impulsivity-Risk-Taking-Stress-Responsivity-and-Vulnerability-to-Drug-Abuse-and-Addiction.pdf.

Mistry CJ, Bawor M, Desai D, et al. (2014). Genetics of opioid dependence: A review of the genetic contribution to opioid dependence. *Curr Psychiatry Rev.* 10(2):156-67. Retrieved March 13, 2018 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4155832/>.

Moshtagian A. (2016). Police Officer overdoses after brushing fentanyl powder off his uniform. *CNN* 2017. Retrieved March 13, 2018 from <https://www.cnn.com/2017/05/16/health/police-fentanyl-overdose-trnd/index.html>.

National Institute on Drug Abuse (**NIDA**). (2018). Fentanyl. Retrieved March 8, 2018 from <https://www.drugabuse.gov/drugs-abuse/fentanyl>.

National Center for Health Statistics (**NCHS**). (2017). NCHS Fact Sheet 2017. Data on Drug-poisoning Deaths. Retrieved March 13, 2018 from https://www.cdc.gov/nchs/data/factsheets/factsheet_drug_poisoning.htm.

National Center for Complementary and Integrative Health (2018). Complementary, Alternative, or Integrative Health: What's in a Name? Retrieved April 8, 2018 from <https://nccih.nih.gov/health/integrative-health>.

Ostroff J. (2017). There is a solution to Canada's fentanyl overdose crisis: End drug prohibition. *Huff Post* 2017; Retrieved March 13, 2018 from http://www.huffingtonpost.ca/2017/02/28/fentanyl-crisis-drugs-prohibition_n_14916126.html.

Peterson AB, Gladden RM, Delcher C, et al. (2016). Increases in fentanyl-related overdose deaths—Florida and Ohio, 2013–2015. *MMWR* 2016;65:844–9.

Prekupec MP, Mansky PA, Baumann MH. (2017). Misuse of novel synthetic opioids: A deadly new trend. *J Addict Med* 2017; 11: 256–265. Retrieved March 13, 2018 from https://journals.lww.com/journaladdictionmedicine/fulltext/2017/08000/Misuse_of_Novel_Synthetic_Opioids___A_Deadly_New.5.aspx.

U.S. Department of Justice (**USDJ**), Drug Enforcement Administration, Diversion Control Division, Drug & Chemical Evaluation Section. (2016, December). Fentanyl. Retrieved March 8, 2018 from https://www.deadiversion.usdoj.gov/drug_chem_info/fentanyl.pdf.

Rudd RA, Seth P, David F, Scholl L. (2016). Increases in drug and opioid- involved overdose deaths—United States, 2010–2015. *MMWR* 65:1445–52. 2016. Available from <https://www.cdc.gov/mmwr/volumes/65/wr/mm655051e1.htm>.

Saul J. Deadly Drug Fentanyl Spikes Opioid Epidemic. (2016). *Newsweek*. Retrieved March 13, 2018 from <http://www.newsweek.com/2016/10/21/fentanyl-floods-us-opioid-epidemic-508972.html>.

Schuckit M. (2016). Treatment of Opioid Use Disorders. *NEJM* 375(4)357. March 13, 2018 from <http://www.nejm.org/doi/full/10.1056/NEJMra1604339#t=article>.

Shoff EN, Zaney ME, Kahl JH, et al. (2017). Qualitative identification of fentanyl analogs and other opioids in postmortem cases by UHPLC-Ion Trap-MSn. *J Anal Toxicol* 201; 41: 484–492.

Substance Abuse and Mental Health Services Administration (**SAMHSA**), and U.S Department of Health and Human Services Health Resources and Services Administration (**HRSA**) (2016). SBIRT: Screening, Brief Intervention, and Referral to Treatment. Retrieved March 13, 2018 from <http://www.integration.samhsa.gov/clinical-practice/sbirt>.

Thomas R. (2017). **DEA** adds fentanyl variants to schedule along with other illegal drugs. WAFB. Retrieved March 13, 2018 from <http://www.wafb.com/story/36808771/dea-adds-fentanyl-variants-to-schedule-along-with-other-illegal-drugs>.

Tribune News. (2018). Markos Koulanakis: China Uses Fentanyl in Opium War Against America. Retrieved April 8, 2018 from <http://www.mcall.com/opinion/national/mc-fentanyl-china-trump-1104-20171103-story.html>.

Turk D, Swanson K, Gatchel R. (2008). Predicting opioid misuse by chronic pain patients: A systematic review and literature synthesis. *Clinical Journal of Pain* 24(6):497–508. Retrieved March 13, 2018 from http://journals.lww.com/clinicalpain/Abstract/2008/07000/Predicting_Opioid_Misuse_by_Chronic_Pain_Patients_.4.aspx.

Vucković S, Prostran M, Ivanović M, et al. (2009). Fentanyl analogs: Structure-activity-relationship study. *Curr Med Chem* 2009; 16:2468–2474.

Post Test

Use the answer sheet following the test to record your answers.

1. Which one of the following is **not** a cause of the U.S. fentanyl overdose issue:
 - a. Access to more prescriptions.
 - b. Emphasis on treating pain aggressively.
 - c. Difficulty of producing the drug.
 - d. Its mixture with other drugs that hide its presence.
2. Which of the following is **not** an opioid:
 - a. Morphine
 - b. Cocaine
 - c. Hydrocodone
 - d. Fentanyl
3. What is the definition of dependence:
 - a. A drug user wants the drug for a party.
 - b. The drug user depends on his dealer for a steady supply.
 - c. A person who uses the drug regularly now physically depends on an increase of the drug to avoid withdrawal symptoms.
 - d. The person takes opioids occasionally for entertainment and to feel pleasure.
4. How does fentanyl work:
 - a. It blocks pain receptors within the spinal cord.
 - b. It blocks the production of dopamine.
 - c. It enhances the production of epigastric juices.
 - d. It increases all natural hormones in the body.
5. What is the SBIRT screening tool:
 - a. A form that assesses for risk for drug abuse.
 - b. Screening, brief intervention, and referral to treatment.
 - c. The intake process for admitting a patient to a rehabilitation facility.
 - d. The history and physical assessment of patients for drug abuse.

6. What is the antidote for a fentanyl overdose:

- a. Narcan/naloxone
- b. Flumazenil
- c. Mucomyst
- d. Atropine

7. Which of the following are strategies to help with chronic pain and fentanyl use:

- a. Extra sleep
- b. Alka Selzer
- c. "Clean drugs"
- d. Nutritional Smoothies

Answer Sheet

Fentanyl: Scourge of the Opioids

Name (Please print your name): _____

Date: _____

Passing score is 80%

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

Course Evaluation

Please use this scale for your course evaluation. Items with asterisks * are required.

- 5 = Strongly agree
- 4 = Agree
- 3 = Neutral
- 2 = Disagree
- 1 = Strongly disagree

* Upon completion of the course, I was able to:

a. Explain the issues of fentanyl use and abuse.

5 4 3 2 1

b. Explain the proper clinical use for fentanyl for pain relief.

5 4 3 2 1

c. Identify clinical symptoms of fentanyl overdose.

5 4 3 2 1

d. Describe risk factors, prevalence, and incidence of fentanyl misuse.

5 4 3 2 1

e. Describe the emergency care of fentanyl overdose.

5 4 3 2 1

f. Explain treatment strategies for effective use of fentanyl and for recovery from abuse.

5 4 3 2 1

* The author(s) are knowledgeable about the subject matter.

5 4 3 2 1

* The author(s) cited evidence that supported the material presented.

5 4 3 2 1

* This course contained no discriminatory or prejudicial language.

Yes No

* The course was free of commercial bias and product promotion.

Yes No

* As a result of what you have learned, do you intend to make any changes in your practice?

Yes No

If you answered Yes above, what changes do you intend to make? If you answered No, please explain why.

* Do you intend to return to ATrain for your ongoing CE needs?

- Yes, within the next 30 days.
- Yes, during my next renewal cycle.
- Maybe, not sure.
- No, I only needed this one course.

* Would you recommend ATrain Education to a friend, co-worker, or colleague?

- Yes, definitely.
- Possibly.
- No, not at this time.

* What is your overall satisfaction with this learning activity?

5 4 3 2 1

* Navigating the ATrain Education website was:

- Easy.
- Somewhat easy.

Not at all easy.

* How long did it take you to complete this course, posttest, and course evaluation?

60 minutes (or more) per contact hour

50-59 minutes per contact hour

40-49 minutes per contact hour

30-39 minutes per contact hour

Less than 30 minutes per contact hour

I heard about ATrain Education from:

Government or Department of Health website.

State board or professional association.

Searching the Internet.

A friend.

An advertisement.

I am a returning customer.

My employer.

Other

Social Media (FB, Twitter, LinkedIn, etc)

Please let us know your age group to help us meet your professional needs.

18 to 30

31 to 45

46+

I completed this course on:

- My own or a friend's computer.
- A computer at work.
- A library computer.
- A tablet.
- A cellphone.
- A paper copy of the course.

Please enter your comments or suggestions here: _____

Registration Form

Please print and answer all of the following questions (* required).

* Name: _____

* Email: _____

* Address: _____

* City: _____ * State: _____ * Zip: _____

* Country: _____

* Phone: _____

* Professional Credentials/Designations:

Your name and credentials/designations will appear on your certificate.

* License Number and State: _____

* Please email my certificate:

Yes No

(If you request an email certificate we will not send a copy of the certificate by US Mail.)

Payment Options

You may pay by credit card or by check.

Fill out this section only if you are **paying by credit card**.

2 contact hours: \$19

Credit card information

* Name: _____

Address (if different from above): _____

* City: _____ * State: _____ * Zip: _____

* Card type:

Visa Master Card American Express Discover

* Card number: _____

* CVS#: _____

* Expiration date: _____