

**Dose of
Knowledge**

Middle and High School

Opioid Use and Misuse



Educator Guide

Background

Prescription opioids are used to treat moderate to severe pain and are generally prescribed for a short period of time. Adolescents may be prescribed these after surgery, dental work, or even after a sports injury. Prescription opioids are effective in treating short term moderate to severe pain, but they are to be taken under the careful supervision of a healthcare provider. A few of the most commonly used prescription opioids are oxycodone (OxyContin®), hydrocodone (Vicodin®), morphine, and codeine. Fentanyl is a powerful synthetic opioid that is similar to morphine but is 50-100 times more potent. It is a prescription drug used to treat patients with severe pain, but more recently fentanyl is showing up in illegal street drugs, like heroin or fake prescription pain pills. Heroin is an opioid, but it is an illicit drug not a prescription medication. It is chemically similar to most prescription pain relievers and can produce similar effects. Some slang terms for these opioids are Oxy, Vikes, Big H, Smack, and Percs.

Opioids attach to and activate opioid receptors on brain cells, the spinal cord and other organs in the body, especially the ones involved in pain and/or pleasure. When this attachment occurs, they block the pain signals from the brain to the body and release endorphins throughout the body. Endorphins are neurotransmitters that transmit electrical signals within the nervous system. Endorphins interact with opioid receptors in the brain to reduce the perception of pain. Endorphins naturally block pain by binding to opioid receptors, causing many of the same “euphoric” effects as opioid drugs, such as decreased feelings of pain and increased feelings of pleasure. The release of endorphins can reinforce the act of taking the drug, making the person want to repeat this experience.¹ Endorphins prompt the release of dopamine, which also causes pleasure. Opioid drugs cause a larger flood of dopamine to be released than non-drug things, and the brain remembers this “high” and can start to crave the intensity produced by the opioid drug.

The teenage brain is not fully developed until around age 25. Because of this, teenage brain cells send a “louder” message than those of adults. This intensity

results in teens experiencing sensations of pleasure in a more intense manner than do adults. Along with this, negative emotions such as stress, depression, or anxiety can be heightened as well. Therefore, when teens engage in risky behavior such as drug use, their brains are highly sensitive to the effects of the substance. This can lead to greater risk for substance misuse and ultimately a substance use disorder.

The idea that misusing prescription drugs is safer than abusing illegal or illicit drugs like heroin might come up throughout the activity and is dangerously misguided. Illicit drugs act on the same brain receptor sites as prescription medications. Misusing prescription drugs and/or sharing prescription drugs with others is not only risky, it is illegal. It should be reinforced throughout that when prescription medications are used as prescribed, they can be safe and effective.

Misusing any drug can be harmful to the brain. Substance use disorder, or addiction, is a chronic, relapsing brain disease with symptoms that include craving the object of addiction, losing control over its use, and continuing to be involved with it despite unfavorable consequences². Addiction or substance use disorder is considered a brain disease because drugs change the brain; they change its structure and how it works. This is especially true for teenagers whose brains are still developing

Turning away from the peer pressure to try drugs and following a doctor’s orders if prescription medications are necessary are paramount to a young person’s physical well-being.

Overview

Students will learn about opioids, the effects of these drugs on the human brain, and the endorphin-like effects on the human body. Students will compare the differences between prescription medications and illicit drugs.

1 <https://www.hopkinsmedicine.org/opioids/what-are-opioids.html>

2 https://www.health.harvard.edu/newsletter_article/how-addiction-hijacks-the-brain

Use of Presentation

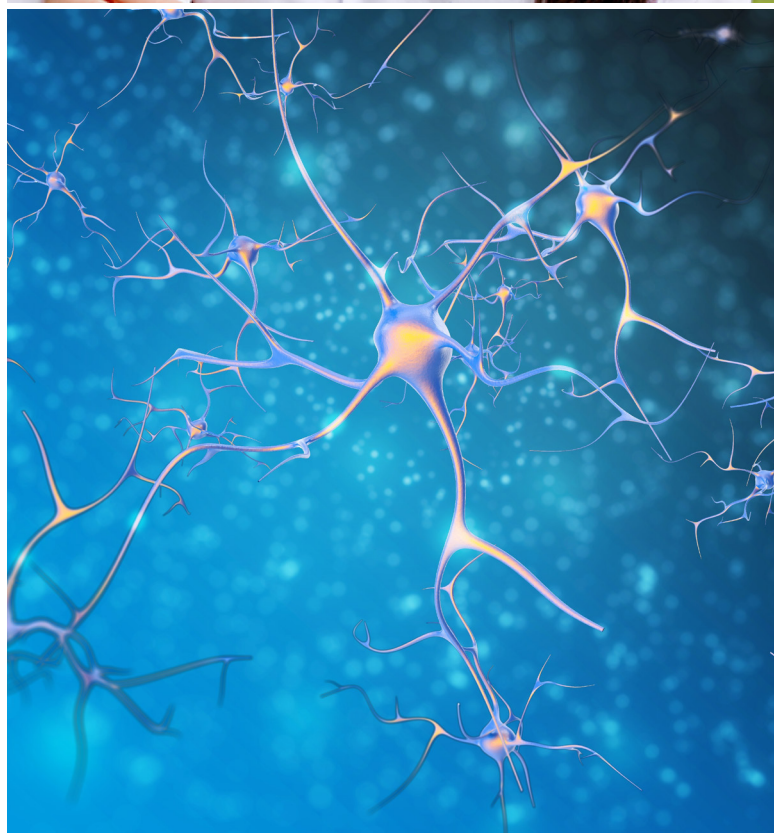
The accompanying presentation was created with PowerPoint so that it can be used in a variety of classrooms. If you are using a laptop with an LCD projector, simply progress through the PowerPoint by clicking to advance. All of the interactive aspects of the presentation are set to occur on click. This includes images, text boxes, and links which will appear in a web browser upon clicking. If you are using an interactive whiteboard, tap on each slide with your finger or stylus to activate the interactive aspects of the presentation. In the notes for each slide, there will be information on how to proceed.

This guide provides slide-by-slide instructions to ensure educators are prepared to explain, discuss, and facilitate the hands-on content in the accompanying presentation. Note that timing guidance is provided as a recommendation, but each situation will be unique.

Session Structure

The Health Information: Our Community, Our Responsibility sessions provide the following information to guide the educator through their implementation and to teach the necessary skills and content.

- **Learning Objectives:** Each session includes its overall goals as well as specific learning objectives for students.
- **Materials:** Any materials necessary for the session are clearly outlined and included when possible to facilitate easy implementation of the session.
- **Key Terms:** Any words that can be used as vocabulary words will be defined for the teachers.
- **Key Talking Points:** To help the teacher guide discussion and reinforce key concepts, key points are listed next to the corresponding slides.



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- **Anticipated Student Responses:** Where relevant, anticipated student responses for activities and questions are provided next to corresponding slides. Reflections: A learning summary is provided at the end of each session for the educator to provide reinforcement of the key concepts and objectives of each session.

Content Areas

Health, Physical Education

Activity Duration

45–60 minutes

Grade Band

6–12*

***Note:** While appropriate for any audience grades 6–12, “Opioid Use and Misuse” is specifically geared towards grades 6–8. More in depth information for advanced learners can be found in the “Opioid and the Brain” presentation.

Objectives

Students will

- Identify what an endorphin is and its role in our bodies
- Examine how the effects of opioids mimic the feeling of endorphins
- Compare the difference between use and misuse of prescription medications
- Identify the difference between prescription and illicit drugs

Materials Needed

- Pencils, one per student
- Scratch paper
- **Resources for Teens** student handout, one per student

Educator Prep

1. Read through the instructions to familiarize yourself with the content. Note that timing guidance is provided as a recommendation, but each situation will be unique. Use the Lesson At-a-Glance below to determine how long you plan to spend on each section.
2. Prepare all materials before your session.

Key Terms

- **Addiction:** a psychological and physical inability to stop consuming a substance or an activity even though it is causing harm
- **Dopamine:** a neurotransmitter that plays a role in pleasure
- **Endorphin:** natural pain blockers produced by the central nervous system that relieve pain and stress
- **Euphoria:** feelings of intense happiness or excitement
- **Illegal drug:** a drug that a person is not allowed to own or use; forbidden by law
- **Illicit drugs:** substances that either stimulate or inhibit the central nervous system or produce hallucinogenic effects; can be addictive; universally prohibited
- **Misuse:** to use incorrectly

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- **Naloxone:** brand name Narcan®; a potentially life-saving medication that can rapidly stop or reverse the effects of an opioid overdose
- **Neurotransmitter:** a substance that transmits nerve impulses across a synapse of a neuron
- **Opioid:** Opioids are substances that act on receptors in your brain for pain relief. They are a class of drugs that includes the illegal drug heroin, synthetic opioids such as fentanyl, and pain relievers available legally by prescription
- **Prescription:** an instruction written by a medical practitioner that authorizes a patient to be provided a medicine or treatment
- **Prescription drug:** a drug that can be obtained only by means of a physician's prescription
- **Substance Misuse:** starting to use a substance, like drugs or alcohol, for non-medical purposes in a manner that's harmful to oneself or others
- **Substance Use Disorder:** a disease that affects a person's brain and behavior and leads to an inability to control the use of a legal or illegal drug or medication.

Lesson At-a-Glance

Section	Activity	Approximate Time in a 45-Minute Session	Approximate Time in a 60-Minute Session
Engage	Discussion	6–8 minutes	6–8 minutes
Learn	What is an opioid and how do opioids work	3–4 minutes	3–4 minutes
	Endorphins and dopamine	3–4 minutes	7–8 minutes
	Tolerance and dependence	3–4 minutes	3–4 minutes
	Use and misuse	3–4 minutes	7–8 minutes
	Substance use disorder and the adolescent brain	7–9 minutes	12–15 minutes
	Resources for Teens	3–4 minutes	3–4 minutes
	Naloxone	2–3 minutes	2–3 minutes
Reflect	Summary of key points in lesson	3–5 minutes	3–5 minutes
Apply*	Public service announcements	15–20 minutes	20–25 minutes

***Note:** Apply section is optional during session if time allows. Educator can choose to provide students with the opportunity to apply what they learned by completing the activity at a later time if they are not able to do it during the session.

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Procedure

Engage

1. Lead a discussion with students by asking the following questions:
 - What are some activities that make you happy or feel good about yourself?
 - How do you think your body is able to feel pain?
 - Do you believe misusing or abusing prescription drugs is a safer alternative to using illegal street drugs? Why?

Learn

Slide 1

2. Inform students that opioids are substances that act on receptors in your brain for pain relief.
3. Click to explain to them that the legal opioids are only available with a prescription (i.e., Hydrocodone, Oxycodone, Morphine and Codeine). You may recognize their brand names as Vicodin®, OxyContin®, or Percocet®. Other opioids, like heroin, are illegal/illicit.
4. Click again to discuss the opioid fentanyl, which is a powerful synthetic opioid that is similar to morphine but is 50–100 times more potent. It is a prescription drug used to treat patients with severe pain. More recently fentanyl is showing up in illegal street drugs, like heroin or fake prescription pain pills.
5. Ask for 1–2 volunteers to offer examples of any other medications they're familiar with to treat pain that are *not* opioids. Reinforce to students that there are many common over the counter (OTC) pain medications available. Explain that nonsteroidal anti-inflammatory drugs, referred to as NSAIDs (like aspirin or ibuprofen/Motrin®), help reduce pain and swelling from ailments such as minor sports injuries, headaches, and arthritis. Acetaminophen (Tylenol®) is often

used to treat minor aches and pains and reduce fevers. Emphasize that an OTC medication, like ibuprofen or acetaminophen, may be sufficient to control mild or short-term pain.

KEY TALKING POINTS:

- **Opioids can be both legal (e.g. prescription opioids) and illegal (e.g. heroin).**
- **Fentanyl is an FDA approved opioid pain medication to treat severe pain, but is often dangerously used to lace illicit/illegal drugs.**
- **NSAIDs (like aspirin or ibuprofen) help reduce minor pain and swelling.**
- **Acetaminophen is often used to treat minor aches and pains and reduce fevers.**

Slide 2

6. Opioids work by affecting the nerve cells in the brain and body.
7. Opioids bind to opioid receptors in the brain and can produce three main effects: 1) decreased feelings of pain, 2) increased feelings of pleasure, and 3) slowed body processes that are usually automatic, like breathing.

KEY TALKING POINTS:

- **Opioids bind to receptors in the brain.**
- **Opioids can decrease pain, increase pleasure, and affect automatic body processes.**

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Slide 3

8. Read or ask for a volunteer to read the information about endorphins.
9. Click to reveal that the presence of endorphins leads to the release of dopamine.
10. Click again and explain the effects of the release of dopamine.
11. Ask 1 or 2 volunteers to share why it might be problematic for the body to crave the intensity produced by opioids over natural dopamine release. Reinforce that this craving is what can lead to misuse, tolerance, dependence, and ultimately substance use disorder, overdose, or death.

KEY TALKING POINTS:

- **Endorphins are the body's natural pain relievers.**
- **Opioids mimic endorphins.**
- **Endorphins prompt the release of dopamine, which produces pleasure.**
- **Opioid drugs cause a larger flood of dopamine than endorphins do (euphoria=intense feelings of pleasure)**
- **Misuse of opioids can lead to substance use disorder, overdose, or death.**

Slide 4³

12. Review the gold star analogy with students.
13. Click to reinforce that the body's response to dopamine rushes can result in tolerance and dependence.
14. Click again to review the information in the table. Tolerance is when the body requires higher or more frequent dosages to gain the same effect—like needing more gold stars to feel as happy as

you did before. Dependence is when the parts of the brain responsible for releasing dopamine only function normally when the drug is taken.

KEY TALKING POINTS:

- **Tolerance is when one requires higher or more frequent dosages to experience the same effects of a drug.**
- **Opioid dependence is when the brain can only release dopamine if the drug is present.**

Slide 5

15. Substance misuse is when people start to use a substance, like drugs or alcohol, for non-medical purposes in a manner that's harmful to themselves or others.
16. Click to reveal the ways in which a person can misuse prescription drugs. Ask 2–3 volunteers to share what they think would happen to themselves or someone they know if they misused a prescription medication. Anticipated responses might include: it can lead to substance use disorder or addiction, it can cause overdose or death, etc.
17. Reinforce that not all opioids contain the same potency or strength, and only a doctor can prescribe the correct form. Therefore, the dosage prescribed for someone else can be wrong for you, can be risky, and ultimately can lead to overdose or death. It is also important that students understand that buying drugs anywhere other than a pharmacy can run the risk of being laced with ultra-potent synthetic drugs, such as Fentanyl or Carfentanyl.

3 <https://www.thetruth.com/o/articles/opioid-addiction>

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18. Click to reinforce that when a person takes medication as prescribed, it can be safe and effective.

KEY TALKING POINTS:

- **When prescription medications are used as prescribed, they can be safe and effective.**
- **When a drug is used in a manner other than how it was prescribed, it is referred to as misuse.**

Slide 6

19. Now that students have explored opioids' effects on the body and substance misuse, they will learn other common signs and symptoms of an individual misusing substances, like opioids.
20. Click to reveal some of the physical signs/symptoms of substance misuse.
21. Click again and explain the behavioral signs/symptoms of substance misuse.
22. Lastly, click to reveal other common signs and symptoms of misusing opioids.

KEY TALKING POINT:

- **Common signs and symptoms of substance misuse can be physical, behavioral, or be displayed in new habits or preoccupations.**

Slide 7

23. Define substance use disorder (SUD) as a disease that affects a person's brain and behavior and leads to an inability to control the use of legal or illegal drugs. Explain this is a disease with repeated actions that will cause parts of the brain to communicate differently—a cycle.
24. Click and invite volunteers to read the bullets. Explain that substance use disorder makes the brain want to recreate the feelings it experiences when the drug is present.
25. As substance use increases, tolerance develops as the brain adjusts to its "new normal" state of being. As a result, the user will increase the amount of the substance they take in an effort to achieve the high they are used to. When they're not taking the substance, people will experience withdrawal, causing them to feel severe physical and emotional distress. Eventually, the person no longer takes the substance to get high, but to avoid feeling low. The person may become extremely preoccupied or obsessed with thinking about how they will get their next fix so that they can avoid withdrawal and just be able to function. Regardless of the consequences, a person with substance use disorder will continue to seek a drug.

KEY TALKING POINTS:

- **Substance use disorder is a disease that affects a person's brain and behavior.**
- **This disease creates a cycle, often referred to as the "cycle of addiction."**
- **One needs more of a substance to obtain the same dopamine "high" because his/her brain has adapted, known as tolerance.**

Slide 8

26. Guide students' attention to the blue part of the brain on the image and identify this as the prefrontal cortex. Point to your own head to show the general location of this part of the brain and ask students to point to their own heads.
27. Ask students to consider if a peer or adult has ever said something like, "did you even think before you did that?" or "what were you thinking?" Click to explain that the prefrontal cortex is what controls that decision-making and the subsequent behaviors. This part of the brain is concerned with short-term benefits rather than delayed satisfaction.
28. Click to reveal that the prefrontal cortex is not fully developed until around age 25. Reinforce that because of this, a teen is typically at a greater risk for substance misuse due to an incompletely formed prefrontal cortex. This means that teens engage in more impulsive, risk-taking behavior. This means they are less likely to think before they act or consider the consequences of their actions.⁴
29. Ask 1–2 volunteers to share what connections they can make between what they have learned about the teenage brain and drug misuse. Anticipated response includes: teens are at an increased risk of misuse and substance use disorder/addiction. Click to reinforce.

KEY TALKING POINTS:

- **The prefrontal cortex regulates behavior and decision-making and isn't fully formed until around age 25.**
- **Teens are less likely than adults to think before they act or consider the consequences of their actions**
- **Adolescents are at an increased risk for addiction due to the fact the brain is still developing.**

Slide 9

30. Use this slide to make the connection with students that the combination of increased impulsivity and a susceptible brain put them at an increased risk for addictive behaviors.
31. Reinforce that introducing substances, like drugs or alcohol, that change the chemistry of their brains while their brains are still developing can cause lifelong effects.
32. The earlier a person begins misusing a substance, the greater risk they are at for substance use disorder, overdose, or death. Inform students that 90% of those suffering from SUD report starting use during their teens.⁴

KEY TALKING POINTS:

- **The combination of impulsive decisions and a susceptible brain makes teens prime targets for addictive behaviors.**
- **Introducing substances that change the chemistry of the brain at this stage of development may have lifelong impact.**

⁴ <https://www.centeronaddiction.org/addiction-research/reports/adolescent-substance-use-america%E2%80%99s-1-public-health-problem>

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Slide 10

33. Substance misuse can cause changes in the brain that can lead to substance use disorder.
34. Click to play video. Reinforce to students that there are many resources available if they or someone they know is struggling with substance misuse or substance use disorder. “Human resources” like a parent, teacher, coach, or other trusted adult can be the first resource they consult.
35. Reinforce to students that the words we use matter. No one likes to feel judged or devalued. Instead of using a stigmatizing term, like addict or junkie, that reinforces stereotypes, use person-first language like, “a person with a substance use disorder,” and language that positions addiction as a treatable disease.
36. Distribute one **Resources for Teens** handout to each student and review other resources available to them.

KEY TALKING POINTS:

- **Opioid use in teens can affect brain development.**
- **If you know someone who is misusing drugs, be a friend and support them to get help.**
- **“Human Resources” are important resources as well. These can include parents, teachers, doctors, coaches, etc.**
- **The words we use matter. No one likes to feel judged or devalued. Instead of using a stigmatizing term, like addict or junkie, use person-first language like “a person with a substance use disorder.”**

Slide 11

37. Direct students’ attention to the bottom of the **Resources for Teens** handout and define Naloxone. Naloxone, also known by the brand name Narcan®, is a potentially life-saving medication that can rapidly stop or reverse the effects of an opioid overdose.
38. Click to reveal that Naloxone works by knocking opioids off the receptors in the brain, allowing for normal breathing to be restored. Naloxone is available at many pharmacies nationwide, available to patients without an individual prescription from their doctor, and oftentimes schools have it on hand in case of an emergency.
 - **Teacher note:** This content is for educational purposes only and is not intended to provide medical advice. Refer to applicable school, district and medical policies and the instructions of a qualified physician when determining how and when to administer Naloxone or any other medication.
39. Reinforce that they should always call 911 if they suspect someone is experiencing an overdose.
40. Explain that in most states there are laws (Good Samaritan Laws) that protect people who call 911 to get help for a friend. Even if you've also been drinking or using drugs, you should always call 911 for help and never leave a friend alone.

KEY TALKING POINTS:

- **Naloxone can rapidly stop or reverse the effects of an opioid overdose.**
- **If you find a person unresponsive, not breathing, or struggling to breathe, you should always call 911.**
- **Good Samaritan Laws protect people who call 911 to get help for a friend, even if they have also been misusing substances.**

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Slide 12

41. Ask a student volunteer to explain what a “human resource” is in the context of the use and misuse of opioids.”
42. If not provided by volunteer, explain that human resources like a parent, teacher, coach, or other trusted adult can be the first resource they consult, both to safely use prescription opioids and for help if they or someone they know is struggling with substance misuse or substance use disorder.
43. Reinforce that a reliance on human resources can help them make healthy choices and achieve their dreams.
44. Direct students to turn to another student near them and identify a person whom they could rely on as a human resource.

KEY TALKING POINTS:

- **Opioid misuse is illegal and can negatively affect your health and future.**
- **If you know someone who is misusing drugs, be a friend and support them to get help.**
- **“Human Resources” are important resources as well. These can include parents, teachers, doctors, coaches, etc.**
- **Making healthy decision can help you achieve your dreams and goals!**

Reflect

Slide 13

45. Facilitate students’ reflection on their learning by reviewing the following points:
 - When prescription medications are used as prescribed, they can be safe and effective.
 - Opioids mimic endorphins and can provide a feeling of euphoria.
 - Misusing prescription medications is illegal.
 - Common symptoms of substance misuse can be physical, behavioral, or be displayed in new habits or preoccupations.
 - Substance misuse can alter brain function. Teen brains are even more at risk since they’re still developing.
 - Misusing substances, like prescription opioids, can lead to addiction or a substance use disorder.
 - Naloxone is a potentially life-saving medication that can stop or reverse the effects of an opioid overdose.
 - The words we use matter! No one likes to feel devalued or judged.
 - Seek guidance from a trusted adult if you have questions or need help.

Apply (Optional—If Time Allows)

Slide 14

46. Have the students count off by fives. Students will count one at a time “1-2-3-4-5” and repeat until every student has stated a number. Direct students to sit with their group mates by number.
47. Explain that public service announcements (PSAs) provide information to the public about social issues. The goal of a PSA is to raise awareness, change attitudes, and change behaviors.
48. Click and inform students that they will be creating and presenting a 45–60 second public service announcement about opioid misuse, substance use disorder, and resources available.
49. Allow each group approximately **15–20 minutes** to work on development and to practice before presenting.
50. As students work, rotate throughout the classroom and provide each group with brief feedback on their work.

Extension Ideas for Educators

- Encourage students to learn more about prescription medications and other drugs by exploring <https://www.drugabuse.gov/>.
- Challenge students to create a social media post that lists local and relevant resources they can provide to their community.

National School Standards

UNITED STATES

[National Health Standards](#)

- Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks.
- Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health.

[Common Core State Standards for English Language Arts](#)

- Writing
 - CCSS.ELA-LITERACY.CCRA.W.4
Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- Speaking and Listening
 - CCSS.ELA-LITERACY.CCRA.SL.1
Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
 - CCSS.ELA-LITERACY.CCRA.SL.2
Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

DrugFree.org

Audience: Parents and Families

- Help line: **1-855-378-4373** and live chat
- Information about the opioid epidemic
- Learn about warning signs of addiction, prevention, and treatment
- **Medicine Abuse Project:** Prescription drug abuse information, **Parent Talk Kit**, drug disposal guide

Shatterproof.org

Audience: Parents, Families, Educators, Healthcare Professionals

- Information about substance use disorders, addiction, and stigma
- Prevention, treatment, and recovery resources
- Learn about federal and state initiatives

BeMedWise.org

Audience: General Public

- Learn about the safe use of medication and the dangers of medicine abuse
- Prevention, treatment, and recovery resources

AwareRx.org

Audience: General Public

- Information about prescription drug abuse
- Learn about safe use, storage, and disposal of medication
- Drug disposal locator tool

AbovethelInfluence.com

Audience: Teens

- Drug facts and FAQ
- Crisis text line and hotline
- How to help a parent or friend

JustThinkTwice.com

Audience: Teens

- Drug information and statistics
- Current news and media
- True stories about teens

DrugAbuse.gov

Audience: Adults, Caregivers, Educators, Healthcare

- Classroom materials for educators
- Drug facts and informational videos
- Learn about prevention and treatment
- For teens: videos, games, & blogs

GetSmartaboutDrugs.gov

Audience: Parents, Caregivers, and Educators

- Information about drugs and drug paraphernalia
- Current news headlines, trends and statistics

Naloxone: Naloxone, also known by the brand name Narcan®, is a potentially life-saving medication that can rapidly reverse the effects of an opioid overdose. Available in all states, without an individual prescription. Talk to your pharmacist about naloxone.

Find a medicine take-back location near you:

www.nabp.pharmacy/drug-disposal

Information about prescription drug misuse and CVS Health Initiatives:

www.cvs.com/content/prescription-drug-abuse