

Vaping and E-Cigarettes: Health Care's Response to a New Epidemic in Teens and Young Adults

2 contact hours

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Purpose statement

This course provides nurses with information about the vaping and e-cigarette epidemic. It includes steps that have been taken to curb this

epidemic, and strategies the health care community can implement to safeguard against vaping.

Learning objectives

Upon completion of the course, the learner should be able to:

- Describe vaping.
- Identify substances that are being used in vaping.
- Evaluate the pros and cons of vaping.

- Discuss reasons children and adolescents give for vaping.
- Discuss the incidence and prevalence of vaping.
- Describe health-related issues associated with vaping.
- Evaluate strategies that safeguard against vaping.

How to receive credit

- Read the entire course online or in print which requires a 2-hour commitment of time.
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 - An affirmation that you have completed the educational activity.

- A mandatory test (a passing score of 70 percent is required). Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
- Provide required personal information and payment information.
- Complete the MANDATORY Self-Assessment and Course Evaluation.
- Print your Certificate of Completion.

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Activity director

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Introduction

The National Institute on Drug Abuse's 2017 survey, Monitoring the Future, indicated that opioid misuse among teens is at a historic low, and the use of regular cigarettes and hookahs (oriental tobacco pipe with a long, flexible tube that pulls smoke through water contained in a bowl) is declining. However, the use of some type of vaping device in this population is skyrocketing (National Institute on Drug Abuse, 2017). In fact, the United States surgeon general, Vice Admiral Jerome

M. Adams, has issued an advisory declaring the use of e-cigarettes among youth a national epidemic (HHS.gov., 2018).

What makes vaping so popular among American youth? What reasons do teens and young adults give for participating in vaping? What are the health risks associated with vaping? This education program provides nurses with information about the vaping and e-cigarette epidemic, steps that have been taken to curb this epidemic, and strategies the health care community can implement to safeguard against vaping.

WHAT IS VAPING?

"Vaping is the act of inhaling and exhaling (flavored) aerosol or vapor produced by a vape device" (Partnership for Drug-Free Kids, 2018a, p. 3). The aerosol or vapor is created from a liquid that is heated inside a vaping device. Such devices have many names: vape pens, pod mods, tanks, electronic nicotine delivery devices (ENDS), e-hookahs, e-cigarettes, tank systems, JUULs (Partnership for Drug-Free Kids; Raven, 2018).

Unfortunately, the JUUL device is so popular that many teens and young adults use the term JUULing instead of vaping (Partnership for Drug-Free Kids, 2018a). In fact, the JUUL device is so popular that it now accounts for about 68% of the \$2 billion e-cigarette market (Fraga, 2019).

Vaping has risen dramatically among teenagers in the past several years. Among high school students surveyed, 20.8% said they had used e-cigarettes at least once in the last 30 days in 2018, compared with 11.7% in 2017, an increase of 78% (Cunningham, 2018).

Why are JUULs so popular? This device is particularly popular with children and young adults because its design is sleek and discreet (it resembles a USB stick), can be recharged on a laptop or wall charger within an hour, and the liquid inside its cartridges comes in popular flavors such as mint, menthol, and tobacco (Fraga, 2019).

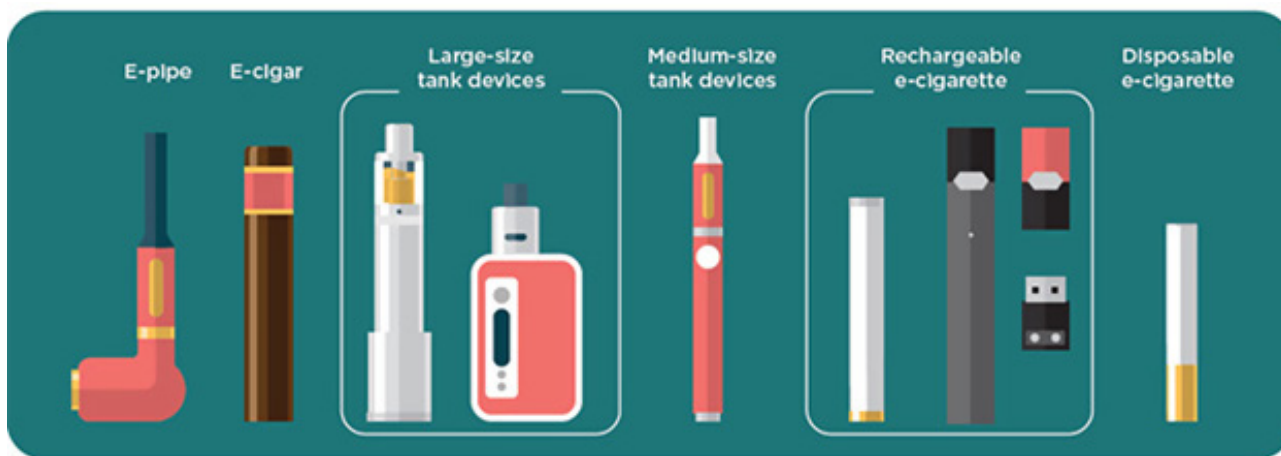
Before the Food and Drug Administration (FDA) announced proposed sales restrictions on flavored e-cigarettes, the maker of JUUL stopped selling some of the sweet and fruity flavors (mango, cucumber, crème brûlée, fruit medley). However, the company has continued selling mint, which is one of the most popular flavors among young people. In addition to the mint flavor, the manufacturer sells menthol and tobacco flavors because they "mirror what is currently available for combustible cigarettes" (Truth Initiative, 2018a). However, mint is not among flavors traditionally associated with menthol and tobacco flavors. Yet it continues to be sold (Truth Initiative).

Nursing consideration: JUULing is common in teen-age hangouts and at schools. Health care professionals are especially concerned about vaping via the JUUL device because it delivers higher concentrations of nicotine than other e-cigarettes do. The addictive effects of nicotine are well known. It is also important for nurses and other health care professionals to know that nicotine is toxic to fetuses and has been found to impair brain and lung development if used during adolescence (Truth Initiative, 2018a). Also of significant note is the fact that each JUUL pod contains 59 mg/ml of nicotine, which is equivalent to one pack of cigarettes (Partnership for Drug-Free Kids, 2018a).

How does vaping work?

As already noted, there are a variety of vaping devices. Figure 1 shows some of the most commonly used devices. Some of these devices can be discarded; others can be reused by charging them on the USB port of a computer and replacing the e-liquid (Partnership for Drug-Free Kids, 2018a).

Figure 1: Types of Vaping Devices



Source: Centers for Disease Control and Prevention. (2018). About electronic cigarettes. Retrieved from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html

Each vaping device generally has four basic components (See Figure 2) (Partnership for Drug-Free Kids, 2018a):

1. A cartridge or tank to hold e-liquid.
2. A heating element or atomizer.
3. A battery.
4. A mouthpiece used to inhale.

A sensor detects the user's attempts to inhale. This prompts the battery to send electricity to the coil of wire or the atomizer. Heat is transferred from the coil to the e-liquid, which can stand only so much energy before it vaporizes. This vapor is what the user inhales. The user then exhales what looks like smoke, but in reality it is vapor (Partnership for Drug-Free Kids, 2018a).

Figure 2: Components of a Vaping Device



A cartridge or a tank

Source: Food and Drug Administration (FDA). (2019). Vaporizers, e-cigarettes, and other electronic nicotine delivery systems (ENDS). Retrieved from <https://www.fda.gov/TobaccoProducts/Labeling/ProductsIngredientsComponents/ucm456610.htm>

What substances are vaped?

The liquid used in vaping is referred to by many names: e-juice, e-liquid, cartridges, pods, oil. The majority of liquids being vaped are a combination of propylene glycol or glycerol as a base and nicotine, marijuana, or flavoring chemicals. Flavoring chemicals' names can be common (such as mint) or bizarre (such as unicorn puke) (Raven, 2018).

Nicotine's negative consequences are well documented. Does that mean nicotine-free e-cigarettes are free from harmful effects? Research findings have made the answer to this question a resounding no.

Chemicals other than nicotine, flavorings, and aerosols are not safe. Findings from research have shown the following (Center on Addiction, 2018a):

- Chemicals used in e-cigarettes can produce cancer-causing toxins.
- Chemicals used in e-cigarettes can have adverse effects on the respiratory and cardiovascular systems.
- Some e-cigarettes release formaldehyde, a possible carcinogen, when heated and inhaled.

The manufacturers of a vaping device called a pod mod sell vape liquid made from nicotine salts, which are found in loose-leaf tobacco instead of the free-based nicotine found in most vaping liquids. These types of liquids may give the user a higher and more addictive concentration of nicotine. JUUL is an example of a pod mod, and it is the vaping device of choice among youth (Raven, 2018).

The most dangerous form of vaping is the removal of vaping liquid and replacing it with synthetic street drugs such as spice, flakka, and bath salts (Behavioral Wellness & Recovery, 2019). The Clear Recovery Center (n.d.) pointed out that vaping is "a new way drug users are hiding their habit out in public."

The Clear Recovery Center (n.d.) provided the following list of known drugs that have been smoked from electronic cigarettes:

- Liquid THC (the main active ingredient in marijuana).
- Bath salts (synthetic stimulants).
- Flakka (also known as zombie drug or gravel, a psychoactive substance that produces a catatonic-like state in some people).
- Hash oil or cannabis oil (the extracted oil from cannabis).
- Synthetic marijuana (spice or K2).
- Psychedelics (DMT) (a hallucinogenic tryptamine drug).

Electronic cigarettes are increasingly used by teens and young adults to get high without detection by parents, teachers, or law enforcement officials. If this type of substance abuse remains undetected, these young people will not receive the help needed to recover from drug abuse (Clear Recovery Center, n.d.). Research has shown that the high that is experienced via electronic cigarettes is frequently immediate and intense. Thus vaping drugs is an exceptionally dangerous way to achieve a high (Clear Recovery Center).

WARNING SIGNS AND SYMPTOMS OF DRUG USE

Because it is difficult to detect drug use in electronic cigarettes, it is imperative that parents, teachers, and health care professionals know about the signs and symptoms of drug use among young people. The Partnership for Drug-Free Kids (2018b) identified the following warning signs of drug use/abuse:

Behavioral changes

- Change in relationships with family or friends.
- Uses chewing gum or mints to cover breath.
- Excessive use of over-the-counter preparations to reduce reddened eyes or nasal irritation.
- Frequently breaks curfew and goes out every night.
- Avoids eye contact.
- Drives recklessly or has car accidents.
- Locks doors.
- Makes secretive telephone calls.
- Has sudden appetite increases.
- Laughs for no apparent reason.
- Has become unusually clumsy.
- Disappears for long periods.
- Has periods of sleeplessness or high energy that alternate with long periods of sleep.

Mood and personality changes

- Displays mood changes or emotional instability.
- Has become sullen and withdrawn, hostile, angry, or uncooperative.
- Is depressed.
- Has become secretive or deceitful.
- Has trouble concentrating and is less motivated.
- Is unusually elated and hyperactive.

Hygiene and appearance issues

- Smells of smoke or other unusual odors on breath or on clothes.
- Poor hygiene and unkempt appearance.
- Red, flushed cheeks or face.
- Track marks on arms or legs; wears long sleeves in warm weather to hide marks.
- Burns or soot on fingers or lips.

Health issues

- Unusual tiredness.
- Lethargy.
- Slurred or rapid-fire speech.
- Nosebleeds.
- Runny nose not related to allergies or a cold.
- Sores, spots around mouth.

- Seizures.
- Vomiting.
- Abrupt weight loss or weight gain.
- Excessive thirst.
- Skin abrasions or bruising.
- Depression.
- Headaches.
- Diaphoresis.

School and work issues

- Absenteeism.
- Loss of interest in work or school.
- Failure to fulfill school or work responsibilities.
- Complaints from teachers or supervisors.
- Reports of intoxication at school or at work.

At home and in the car

- Disappearance of prescription or over-the-counter pills.
- Disappearance of money or valuables.
- Missing alcohol or cigarettes.

To search or not to search

Should a child or teen's room be searched if drug use is suspected? If parents or other loved ones are concerned about signs and symptoms of drug use, it is important that they find out what may be going on behind closed doors (Partnership for Drug-Free Kids, 2018c).

After deciding to search the room, parents or other loved ones must be prepared to explain that the search was conducted out of concern for the child or teen's health and safety. They must also be prepared to discuss concerns and search results with their children. They must not be put off by arguments of invaded privacy (Partnership for Drug-Free Kids).

Here are some common places where drugs, alcohol, or drug paraphernalia are hidden (Partnership for Drug-Free Kids, 2018c):

- Dresser drawers beneath or between clothes.
- In or taped under desk drawers.
- CD/DVDE/tape/video cases.
- Small boxes such as jewelry or pencil boxes.
- Backpacks or duffle bags.

- Receiving unusual packages in the mail.
- Unusual smells in the car.
- Bottles, pipes, or bongs on the floor of the car or in the car's glove box.
- Appearance of unusual drug apparatuses such as pipes, rolling papers, bongs, e-cigarettes.
- Hidden stashes of alcohol or other drugs.
- Erratic driving.
- Repeated accidents or traffic violations.

Nursing consideration: Changes in the eyes are often a significant warning sign of drug use. Marijuana causes the eyes to become red and heavy lidded, and pupils are constricted. Drinking alcohol can cause the pupils to dilate, and difficulty concentrating can occur. The face may be flushed as well (Partnership for Drug-Free Kids, 2018c). Pinpoint/constricted pupils are also caused by the use of opioids such as codeine, morphine, methadone, and heroin (Healthline, 2019). Dilated pupils can be caused by the use of amphetamines, LSD, ecstasy, and cocaine (The Recovery Village, n.d.).

- Under a bed.
- In a plant, buried in the dirt.
- Between books on a bookshelf.
- Inside books with pages cut out.
- Makeup cases inside fake lipstick tubes or compacts.
- Under a loose plank in floorboards.
- Inside over-the-counter medicine containers such as Tylenol.
- Inside empty candy bags such as M&Ms.
- Inside shoes.
- Inside Tampax tubes or in sanitary napkin boxes.
- Taped behind pictures or inside curtains.
- In the lining of coats or jackets.

Nursing consideration: Teen's cell phones or other digital devices may provide clues of drug use. Are frequent contacts not recognized? Do text or social media messages hint at drug use (Partnership for Drug-Free Kids, 2018c)?

THE PROS AND CONS OF VAPING

History of e-cigarette development

Tobacco use in the United States

The development of e-cigarettes is closely linked to the history of tobacco use in the United States. As long ago as the 1880s and early 20th century, manufacturers promoted products that supposedly blocked nicotine and other components of conventional cigarettes that were believed to be poisonous. For example, in 1887 a cotton filter was added to some cigarettes to eliminate injurious qualities from cigarette smoke. In 1913, the Camel brand of cigarettes added casings of sugars and licorice to enable high-nicotine content to be inhaled (Centers for Disease Control and Prevention, 2016).

As the cigarette market grew, manufacturers added health-related statements and testimonials from physicians about the health benefits of smoking cigarettes. Manufacturers responded by claiming that they removed harmful components of tobacco, but nicotine delivery and uptake were increased (Centers for Disease Control and Prevention, 2016).

In 1964, the U.S. surgeon general's report on smoking and health contained information that correlated cigarette smoking with specific diseases, including lung cancer. In 1966, the surgeon general convened another group of experts to review evidence on the role played by tar and nicotine content in health. The members of the group concluded, "The preponderance of scientific evidence strongly suggests that the lower the 'tar' and nicotine content of cigarette smoke the less harmful are the effects" (Centers for Disease Control and Prevention, 2016, p. 8).

Invention of the e-cigarette

CDC (2019a) reported that an early approximation of the current e-cigarette was patented in 1965 for offering a smokeless nontobacco cigarette as a "safe and harmless means for and method of smoking"

The tobacco industry responded with various interventions designed to lower the machine-tested yields of tar and nicotine in their cigarettes. These interventions included adding filters and developing light and low-tar cigarettes (Centers for Disease Control and Prevention, 2016).

In the 1980s, the addictive nature of nicotine began to receive significant attention. As more and more research showed the adverse health consequences of smoking, the tobacco industry continued its search for ways to develop and market "less harmful" tobacco products. These efforts were combatted with the health care community's aggressive efforts to reduce the number of Americans who smoked. CDC (2019a) reported that current smoking incidence has declined from 20.9% (nearly 21 of every 100 adults) in 2005 to 14% (14 of every 100 adults in 2017).

Although these statistics are encouraging, they still indicate the following (Centers for Disease Control and Prevention, 2019a):

- Cigarette smoking is the leading cause of preventable disease and death in the United States, accounting for more than 480,000 deaths every year, or about 1 in 5 deaths.
- More than 16 million Americans live with a smoking-related disease.
- Currently, an estimated 34.3 million adults in the United States smoke cigarettes.

As quit smoking programs continued to flourish in the United States, the search for alternatives to traditional tobacco products flourished as well.

(Centers for Disease Control and Prevention, 2019a, p. 10). The first e-cigarette in recent years was developed in 2003 by the Chinese pharmacist Hon Lik. The device gained attention among Chinese

smokers as an alternative cigarette or a means to stop smoking traditional cigarettes (Centers for Disease Control and Prevention).

By the mid-2000s, the e-cigarette was part of the U. S. market. By 2010, additional brands began to surface in the marketplace. The use of e-cigarettes exploded in 2007 and has continued to increase ever

Pros and cons

Vaping is often advertised as a means of smoking cessation or as an alternative to traditional cigarettes for persons who want to smoke but do not want to experience the adverse health effects associated with smoking (Partnership for Drug-Free Kids, 2018a).

Can e-cigarettes really help people to stop smoking? Are they really harmless? Johns Hopkins Medicine (Blaha, n.d.) has published 5 Truths You Need to Know about Vaping in an attempt to clarify the issue of using vaping to stop smoking:

1. **Vaping is less harmful than traditional smoking.** Vaping generally exposes users to fewer toxic chemicals than traditional cigarettes.
2. **Vaping is still bad for your health.** Nicotine is the primary ingredient in both traditional cigarettes and e-cigarettes. Nicotine is an addictive and toxic substance. Nicotine elevates blood pressure and heart rate, spikes adrenaline release, and increase the chances of having a heart attack.
3. **Electronic cigarettes are just as addictive as traditional ones.** Both traditional and e-cigarettes contain nicotine, which is highly addictive. Some e-cigarette devices such as JUUL deliver very high concentrations of nicotine.
4. **Electronic cigarettes are not the best smoking cessation tool.** E-cigarettes have not received FDA approval as smoking cessation devices. Recent research findings have shown that people who smoke e-cigarettes to stop smoking traditional cigarettes usually end up smoking both e-cigarettes and traditional cigarettes.
5. **A new generation is getting hooked on nicotine.** In 2015, the U.S. surgeon general reported that e-cigarette use among high school

Product component risks

A critical feature of vaping devices recently manufactured is that they contain larger batteries and are capable of heating the vaping liquid to a higher temperature, which can release more nicotine and form additional toxins. These devices can also create larger clouds of particulate matter (Centers for Disease and Control and Prevention, 2016).

Teens and young adults may believe that vaping around younger children carries no risk because there is no secondhand smoke associated with vaping. This is not true.

Several risks are associated with the vaped “cloud” (Gavin, 2015):

- The vapor from e-cigarettes contains chemicals that can be harmful to children.
- Children can get poisoned if they drink the liquid in nicotine delivery devices or refills. Flavored vaping solutions may be especially appealing to children. They might drink enough of the liquid to become seriously ill.
- Children may become sick if vaping liquid gets onto their skin.

Nursing consideration: Vaping should not be done in the presence of children. E-cigarettes and vaping devices should be locked away, out of the reach of children. If a child is exposed to e-cigarettes or liquid nicotine, the local poison center should be called at 1-800-222-1222. Signs of nicotine poisoning include vomiting, pallor, diaphoresis, drooling, and jittery behaviors such as shaking and restlessness. Fainting or seizures may occur if nicotine liquid is ingested in large amounts (Gavin, 2015).

Hidden drug use

Nicotine is certainly not the only substance of concern when it comes to vaping. Vaping devices are becoming smaller, more portable, and harder to identify. This makes these devices prime tools for the use of illicit drugs (Michael’s House, 2017).

since thanks, in part, to advertising in television commercials and print advertisements that often featured celebrities as well as via social media (Centers for Disease Control and Prevention, 2019a). By 2013, more than a quarter of a million youths who had never smoked before began using e-cigarettes. Use among middle and high school youth tripled between 2013 and 2014 (Chalos, 2019).

students had increased by 900%; 40% of these e-cigarette users had never smoked regular tobacco.

Although e-cigarettes generally expose users to fewer toxins than traditional cigarettes, e-cigarettes with nicotine can have adverse health consequences as well as risk of addiction. In fact, many persons who vape often progress to traditional products (Blaha, n.d.).

According to the Center on Addiction (2018b), when e-cigarettes are used as a complete replacement for, rather than in addition to, traditional cigarettes, they are a preferable alternative for smokers who have not had success with medically proven strategies.

Are e-cigarettes an appropriate option for smokers who want to decrease the number of traditional cigarettes that they smoke or who want to quit smoking completely? Although some studies have found that e-cigarettes can help people to reduce the number of cigarettes that they smoke, the majority of research has shown that people who use e-cigarettes may actually be less likely to successfully quit smoking. This may be because the use of e-cigarettes can prolong nicotine addiction. Research has shown that addiction to smoking involves the social and environmental behaviors that are associated with smoking. Vaping mimics these behaviors (Center on Addiction, 2018b).

Nursing consideration: E-cigarettes have not been FDA approved as a smoking cessation strategy. There are a number of FDA-approved smoking cessation products (Food and Drug Administration, 2017). For detailed information about FDA-approved smoking cessation products, access <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm198176.htm>

Adults can experience nicotine poisoning as well. They should avoid coming into skin contact with nicotine liquid when refilling vaping devices. When a device or solution cartridge is discarded, the disposal instructions on the product label must be followed. Proper disposal helps to ensure that nicotine solutions will not be accessible to children, pets, or unsuspecting adults (Gavin, 2015).

Another potential risk of vaping devices, although rare, is the possibility of explosion. The exact cause of such explosions is not known, but evidence suggests that battery-related issues may lead to vape explosions (Food and Drug Administration, 2018a).

The FDA (2018a) offered the following safety tips to avoid a vape battery explosion:

- Consider using vape devices with safety features.
- Keep loose batteries in a case to prevent contact with metal objects.
- Never charge a vape device with a phone or tablet charger.
- Do not charge a vape device overnight.
- Replace batteries if they get damaged or wet.
- Read and understand the manufacturer’s recommendations for use and care of the device.
- Do not remove or disable safety features.
- Use only batteries recommended for the device.
- Charge the vape on a clean, flat surface away from anything that can easily catch fire and someplace where it is clearly visible.
- Protect the vape device from extreme temperatures. Do not leave it in direct sunlight or nearby during freezing cold night.

Social media, YouTube, and Vine are sources of discussions among children and young adults about the vaping of illegal drugs. Searching the hashtags #THCvape, #marijuanavape, #mjVape, and #methvape has shown just how prevalent this problem has become (Michael’s House, 2017).

The phrase “hiding drug use in plain sight” is being used with increasing frequency to describe how persons who vape use their devices for drug use. Because there is a lack of smoke and odor emitted from the device, it is almost impossible to tell what substance is being used (Clear Recovery Center, n.d.).

Nursing consideration: Whether legal or illegal by state, vaping pens have made marijuana usage more accessible because these pens mask or eliminate the telltale smell. The so-called “new marijuana” consists of wax and concentrates and carries an average THC level of 60% to 80% compared to 15% THC levels in leaf marijuana. Vaping marijuana concentrates is referred to as “dabbing,” and this action can cause potentially life-threatening symptoms, including hallucinations, fainting, extreme highs, and high levels of impairment (Michael’s House, 2017).

WHY DO CHILDREN AND YOUNG ADULTS VAPE?

Steven is an 18-year-old college freshman. He smoked traditional cigarettes when he was a high school sophomore but did not really enjoy it. He quit the following year. The only thing he misses about smoking is the social aspect of being with others to relax and hang out while having a cigarette. He decides to try vaping because, he believes, vaping is harmless.

Monica is a managerial assistant at an exclusive women’s boutique in a large urban area. At 21 years of age, Monica is the youngest member of the managerial team. She sees this job as the first step toward her career goal of fashion buyer for a major high-end boutique. Her colleagues often vape. They tell her it is relaxing and basically harmless. Monica is curious about vaping and wants to do what the rest of her colleagues are doing to be accepted. She decides that she will try vaping a mint-flavored liquid because her colleagues tell her it tastes great.

Abby and her friends are planning a party to try out each other’s vapes to see what new flavors taste like and to have “cloud competitions” during which they will compete to perform the best vaping tricks. Several of them plan to enter a “cloud” competition at their local vape shop. First prize is \$1,500!

Why do young people vape? The use of e-cigarettes as a way to quit using traditional cigarettes has not been reported as a primary reason among either youth or young adults, although the effectiveness of this approach has not been supported by research. According to a CDC (2016) report, the most commonly cited reasons for using e-cigarettes among youth and young adults are curiosity, flavoring/taste, and low perceived harm compared to other tobacco products.

Partnership for Drug-Free Kids (2018a) published its own response to the question “What is vaping’s appeal?”

- **Curiosity:** The primary reason for starting to vape is a sense of curiosity. Children and young adults hear friends talking about vaping and see on social media and print advertisements celebrities praising the act of vaping. This can trigger the need to find out what vaping is like. Teens are also enticed to challenge authority by experimenting with vaping.
- **Flavors:** Many of the vaping liquid flavors are especially appealing to children and young adults. Flavors such as German chocolate cake or banana split are popular. Users may vape as a social activity to try out different flavors.
- **Cloud competitions:** Teens especially seem to be interested in the phenomenon known as “cloud competitions.” Participants compete to perform the best vaping tricks for various prizes. Such competitions are featured on social media and are becoming a regular event at vape shops, some of which offer thousands of dollars in prize money.
- **Boredom:** Many teens cite boredom as a reason for vaping. Vaping out of boredom can be as common as continually checking their cell phones.

Youth and young adults may choose to vape because they believe that vaping is not associated with adverse health effects. Those who use e-cigarettes believe that because they are not “smoking,” vaping is not harmful (Cronin, 2019; Partnership for Drug-Free Kids, 2018a). Peer pressure and a drive for belonging are strong motivators, so youth are much more susceptible to conforming to others. Helping them explore their motivations can help to encourage independent decision making and better choices.

ADVERTISING AS A MEANS OF ENCOURAGING VAPING

Regulations

Advertising has always been an effective way to sell tobacco products. Many people remember endless television and print advertisements showing handsome men and beautiful women smoking cigarettes and extolling their virtues.

In 1971, President Richard Nixon signed the Public Health Cigarette Smoking Act, which banned cigarette ads from airing on television and radio (Glass, 2018). However, e-cigarettes are not included in this ban. The FDA, however, has developed new rules for advertising that include e-cigarettes and other electronic nicotine delivery systems, including e-hookah, vape pens, advanced refillable personal vaporizers, and electric pipes. Specifically, advertisements for these products cannot contain representations that the product presents a lower risk of tobacco-related disease or is less harmful than other commercially marketed tobacco products. Additionally, advertisements for e-cigarettes and other tobacco products cannot be targeted at persons under the age

of 18. After May 10, 2018, advertisements for e-cigarettes and other electronic delivery systems must contain the statement “WARNING: This product contains nicotine. Nicotine is an addictive chemical” (Dickerson & Kirby, 2016).

This warning applies to all forms of advertising: television, radio, Internet web pages, social media, e-mail, apps, and “other communication tools.” Television, social media, and other advertisements with a visual component must ensure that the warning appears on at least 20% of the area of the advertisement and that it is printed in 12-point or larger font in either Helvetica or Arial typeface. The warning statement must be in English unless the advertisement appears in a non-English language publication, in which case, the warning should appear in the primary language used in the publication (Dickerson & Kirby, 2016).

Vaping target audience

Most of the marketing campaigns for vaping aggressively target young people. E-cigarette companies not only use television and radio to market their products but also take advantage of other marketing options popular today (especially among youth and young adults), such as the Internet, retail environments, and social events (Truth Initiative, 2018b). Vaping stores and bars are often located close to high schools to attract teenagers.

Thanks to marketing, youth and young adults are greatly aware of e-cigarettes, which are the most popular tobacco product in these populations. By 2016, almost four out of five middle and high school

students (more than 20 million youth) saw at least one e-cigarette advertisement (Truth Initiative, 2018b).

The Truth Initiative, Inspiring Tobacco-Free Lives (2018b) has identified four ways that companies target young people with their marketing strategies:

1. **Offering scholarships:** According to the Associated Press, some e-cigarette companies are offering scholarships, ranging in amounts from \$250 to \$5,000. To earn these scholarships, young people are asked to write essays on such topics as whether vaping e-cigarettes minimizes smoking’s negative impact. Some of these scholarships

are limited to students 18 years of age and older, which is the legal age in the United States to buy vaping products. Others, however, have no age limit.

2. **Creating a social media buzz:** Social media is the way most youth and young adults acquire and share information. E-cigarettes are heavily marketed on all types of social media. For example, for its launch in 2015, JUUL spent more than \$1 million to market its product on the Internet. JUUL has paid for ad campaigns on Twitter, Instagram, and YouTube. These ads link JUUL to having fun, relaxation, freedom, and sex appeal. Research has shown that social media growth “highly correlated” with JUUL retail sales, which increased from a monthly average of 765 in 2015 to a monthly average of 30,565 in 2017. By the end of 2017, JUUL accounted for more than half of the entire e-cigarette market share.
3. **Sponsoring music festivals and other social events:** In 2013, blu eCigs sponsored the Sasquatch! Music Festival in Washington. It featured a vape lounge, device charging stations, an interactive social media booth, and samples of blu eCigs. During the 2018 Sundance Film Festival in Utah, JUUL sponsored a music-in-film summit. Cigarette and smokeless tobacco companies are prohibited by law from using these types of marketing tactics. However, e-cigarettes are not bound by these restrictions.
4. **Introducing appealing flavors:** Youth who use e-cigarettes list flavors as a main reason that they start vaping. Research findings from a study that included middle and high-school students showed that 43% of young people who had ever used e-cigarettes tried them because of the appealing flavors.

In May 2018, the FDA and the Federal Trade Commission took joint action against several e-liquid companies. These companies marketed their products to look like candy or other foods that attract children and young adults. See Figure 3 for examples of such marketing (Truth Initiative, 2018b).

Figure 3. Examples of E-cigarette Packaging



On August 27, 2018, the New York Times published an article regarding the marketing practices of the JUUL company. The company’s original campaign in 2015 featured models that were at least 21 years of age. Federal law in the United States prohibits sales of e-cigarettes to anyone under the age of 18. However, it was quickly apparent, thanks to selfies on social media, that high numbers of younger teenagers and youth were using the JUUL device to vape (Richtel & Kaplan, 2018).

In late 2016 or January 2017, the company decided that all models in JUUL ads should be over the age of 35 to focus on adult smokers. In June of 2018, the company again changed its marketing policy to use only real people who had switched from cigarettes to JUUL (Richtel & Kaplan, 2018).

The sales campaigns for JUULs are being investigated by the FDA as well as retailers of JUULs. To date, the FDA has issued warning letters to 40 retailers that violated the law by selling vaping devices to persons who were underage (Zernike, 2018).

The attorney general of Massachusetts, Maura Healey, is also investigating the JUUL company, contending that JUUL has been enticing teenagers to try the product and has introduced many young people to nicotine. Healey commented, “From our perspective, this is not about getting adults to stop smoking. This is about getting kids to start vaping, and make money and have them as customers for life” (Richtel & Kaplan, 2018).

INCIDENCE AND PREVALENCE

When discussing incidence and prevalence of vaping, it is important to also look at the incidence of traditional tobacco products among youth and young adults.

Traditional tobacco products

Cigarettes are the leading cause of preventable death in the United States, killing more than 480,000 people annually (Richtel & Kaplan, 2018). Even though the use of traditional tobacco products among youth and young adults is declining (National Institute on Drug Abuse, 2017), if cigarette smoking continues at the current rate among youth, 5.6 million Americans under the age of 18 will die early from a smoking-related illness. This is about 1 of every 13 Americans aged 17 years or younger who are alive today (Centers for Disease Control and Prevention, 2019b).

Nicotine is the most addictive substance in tobacco. Any product, including e-cigarettes, that contains nicotine has the potential to become addicting and to cause adverse health effects (Huey & Granitto, 2017).

CDC has published the following information about tobacco use among youth (Centers for Disease Control and Prevention, 2019b):

- Tobacco use is started and established primarily during adolescence.
- Nearly 9 out of 10 cigarette smokers first try cigarette smoking by age 18.

- Every day in the United States about 2,000 youth under the age of 18 smoke their first cigarette. More than 300 youth under the age of 18 become daily cigarette smokers.
- Flavorings in tobacco products can make them more tempting to youth.
- In 2014, 73% of high school students and 56% of middle school students who used tobacco products in the past 30 days reported using a flavored tobacco product during that time.
- In 2018, about 7 of every 100 middle school students (7.2%) and about 27 of every 100 high school students (27.1%) reported current use of a tobacco product.
- In 2018, about 2 of every 100 middle school students (2.4%) and about 11 of every 100 high school students (11.3%) reported current use of two or more tobacco products in the past 30 days.

Nursing consideration: Youth who use multiple tobacco products are at higher risk for developing nicotine dependence and might be more likely to continue using tobacco into adulthood (Centers for Disease Control and Prevention, 2019b).

Factors associated with tobacco use among youth

A number of factors are associated with tobacco use among youth in the United States (Centers for Disease Control and Development, 2019b):

- **Social and environmental factors:** These types of factors include the way mass media glamorize and normalize tobacco use; the desire to do what peers are doing; and imitating this behavior if a parent uses tobacco products. Additionally, high school athletes are more likely to use smokeless tobacco than high school students who are not athletes.
- **Biological and genetic factors:** These factors include sensitivity to nicotine. Youth can become dependent on nicotine more quickly than adults can. Genetic factors make it harder for young people

to quit smoking. Smoking during pregnancy may increase the possibility that a woman's children will become regular smokers.

- **Mental health:** Research has shown a strong relationship between youth smoking and depression, anxiety, and stress. Emotional instability heightens the need for belonging and increases the susceptibility to peer pressure.
- **Additional influences:** Other factors that may affect youth tobacco use include low income or education; not knowing how to say no to tobacco product use; accessibility, availability, and price of tobacco products; doing poorly in school; low self-esteem or self-image; and seeing tobacco product advertisements in stores, on television, on the Internet, in movies, or in magazines or newspapers.

Health effects of secondhand smoke

Exposure to secondhand smoke can have serious health consequences. Secondhand smoke causes more than 41,000 deaths every year. It can cause or make worse a number of adverse health effects in both children and adults, including lung cancer, respiratory infections, and asthma (American Lung Association, 2019).

Here are some important facts about secondhand smoke (American Lung Association, 2019):

- Secondhand smoke causes about 7,330 deaths from lung cancer and 33,950 deaths from heart disease every year.
- Between 1964 and 2014, 2.5 million people died from exposure to secondhand smoke.

- Secondhand smoke is a definite cause of stroke.
- There is no risk-free level of exposure to secondhand smoke. Even short-term exposure can increase the risk of heart attack.
- Secondhand smoke contains hundreds of chemicals known to be toxic or carcinogenic.
- Secondhand smoke is especially harmful to young children and is responsible for between 150,000 and 300,000 lower respiratory tract infections in infants and children younger than 18 months. This leads to between 7,500 and 15,000 hospitalizations each year and causes 430 sudden infant death syndrome (SIDS) deaths in the United States every year.

E-cigarette use

The use of e-cigarettes has increased so dramatically that the Oxford English Dictionary named vape the word of the year in 2014 (Huey & Granitto, 2017).

E-cigarette aerosols generally contain fewer toxic chemicals than regular cigarettes. However, e-cigarette aerosol is not harmless and can contain potentially dangerous substances such as nicotine and heavy metals like lead and volatile organic compounds (Centers for Disease Control and Prevention, 2019c).

Can e-cigarettes help adults to stop smoking? To date, the few research studies pertaining to the issue of using e-cigarettes to stop smoking show mixed results. Data from two randomized controlled trials found that e-cigarettes with nicotine can help smokers stop smoking in the long term compared with non-nicotine cigarettes. Time and additional research are necessary to make any significant conclusions (Centers for Disease Control and Prevention, 2019c).

What group most often uses e-cigarettes? Not adults, but youth! Data show the following (Centers for Disease Control and Prevention, 2019b; Centers for Disease Control and Prevention, 2019c):

- The number of middle and high school students using e-cigarettes increased from 2.1 million in 2017 to 3.6 million in 2018.
- In 2018, 1 of every 20 middle school students said that they had used electronic cigarettes in the past 30 days.
- In 2018, nearly one of every five high school students reported that they had used electronic cigarettes in the past 30 days.

On September 18, 2018, the surgeon general made a statement regarding the “epidemic” of the use of e-cigarettes among youth and the FDA’s youth e-cigarette prevention program. The statement read in part: Though we’ve made tremendous progress since the first Surgeon General’s Report on Smoking and Health in 1964, recent data on youth e-cigarette use are alarming. In 2017, 2.1 million middle and high school students currently used e-cigarettes, making them the most commonly used tobacco product among youth. These numbers highlight the urgent need for a targeted campaign to educate youth about the dangers of e-cigarette use, and stop the flood of youth initiation. Today’s launch of the FDA’s new “The Real Cost” Youth E-Cigarette Prevention Campaign is a critically important effort coming at a pivotal time. Simply put, no youth should EVER use e-cigarettes. (Surgeon General, 2018)

HEALTH-RELATED ISSUES ASSOCIATED WITH VAPING

Effects of nicotine

Nicotine is a component of many vaping liquids. Nicotine is a stimulant that activates the nervous system and prepares the body for physical and mental activity. The amount of nicotine varies, depending upon the contents of the e-liquid, the type of vaping device being used, and how the device is operated (Partnership for Drug-Free Kids, 2018a).

Nursing consideration: It is important that nurses become aware of the amount of nicotine and other chemicals in e-liquids. For example, one JUUL pod contains 20 cigarettes (roughly equivalent to a pack of cigarettes, or about 200 puffs) worth of nicotine. JUUL generally contains more nicotine than many other brands of e-cigarettes (Truth Initiative, 2019a).

The nicotine in e-liquids is quickly absorbed from the lungs into the bloodstream. As nicotine enters the bloodstream, it stimulates the adrenal glands to release epinephrine. Epinephrine stimulates the central nervous system (CNS), which increases blood pressure, heart rate, and respiratory rate (National Institute on Drug Abuse, 2018).

Nicotine, as with the majority of addictive substances, triggers the brain’s reward circuits and increases dopamine levels. The increased dopamine levels reinforce rewarding behaviors, which the brain now associates with nicotine use. Pleasurable responses encourage people to increase their use of nicotine even though they may know nicotine use is linked to adverse health effects (National Institute on Drug Abuse, 2018).

Nicotine use can be particularly detrimental to youth and young adults. Brain development undergoes massive changes during adolescence through the mid-to-late 20s. Nicotine affects the development of the brain’s reward system, making it easier to become addicted to it. Continued vaping of e-cigarettes not only can lead to nicotine addiction but also can make other drugs such as cocaine more pleasurable to a young person’s brain (National Institute on Drug Abuse, 2018). The risks include not only nicotine addiction but also mood disorders and permanent lowering of impulse control. Nicotine also changes the way synapses are formed, which can harm the parts of the brain that control attention and learning (Surgeon General, 2018). Unborn children of pregnant young adults are also at particular risk from nicotine hazards.

E-cigarette aerosol

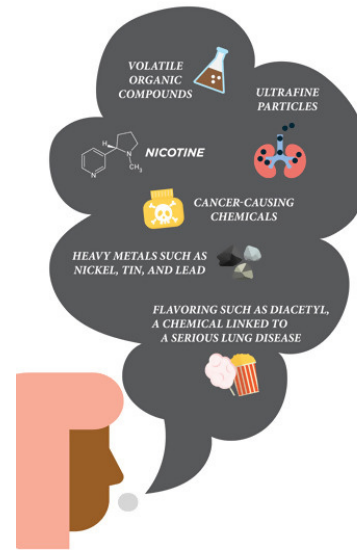
Many youth and young adults (and some adults) believe that e-cigarette aerosol is harmless water vapor. The aerosol is definitely not harmless (Centers for Disease Control and Prevention, 2018).

The aerosol that is breathed in and exhaled may contain harmful and potentially dangerous substances in addition to nicotine:

- Ultrafine particles that can be inhaled deep into the lungs.
- Flavorings such as diacetyl, which is a chemical associated with serious respiratory diseases.
- Volatile organic compounds.
- Carcinogenic chemicals.
- Heavy metals such as nickel, tin, and lead.

Figure 4 illustrates the potentially harmful substances that may be found in e-liquids.

Figure 4. Substances that May Be Found in E-Liquids



Source: Centers for Disease Control and Prevention (CDC). (2018). *Quick facts on the risks of e-cigarettes for kids, teens, and young adults*. Retrieved from https://www.cdc.gov/tobacco/basic_information/e-cigarettes/Quick-Facts-on-the-Risks-of-E-cigarettes-for-Kids-Teens-and-Young-Adults.html

Dripping

Research has shown that one in four teens uses e-cigarettes for dripping. Dripping involves placing e-liquid drops directly onto heated atomizer coils and inhaling the vapors that are produced (National Institute on Drug Abuse, 2018).

Research is needed to identify the risks of dripping. In the meantime, here are some reasons teens give for dripping (National Institute on Drug Abuse, 2018):

- To create thicker vapor.
- To improve flavors.
- To produce a stronger throat hit (a pleasurable feeling created by the vapor as it causes the throat to contract).

Introductory product for other tobacco products

Early research findings have suggested that e-cigarettes act as an introduction product for preteens and teens who then progress to smoking traditional cigarettes. Some findings include the following (National Institute on Drug Abuse, 2018):

- Young people who had used e-cigarettes by the time they started ninth grade were more likely than others to start smoking cigarettes and other smokeable tobacco products within the next year.

- High school students who used e-cigarettes within the last month were about 7 times more likely to report that they smoked traditional cigarettes when asked six months later compared to students who did not use e-cigarettes.
- Early data show an association between e-cigarette smoking and progression to smoking traditional cigarettes.

Popcorn lung

Popcorn lung is a rare medical condition characterized by bronchiole damage. Over time, because of inflammation associated with the condition, lung tissues and airways become narrowed and scarred, which leads to respiratory distress. There is no cure for popcorn lung, and it is considered a life-threatening condition. Popcorn lung is also known as obliterative bronchiolitis, bronchiolitis obliterans, and constrictive bronchiolitis (Huizen, 2018).

The name popcorn lung comes from the chemical diacetyl, which was once routinely used to give food products (such as popcorn) a rich,

buttery flavor. It was first identified in factory workers who inhaled the chemical in the work setting (Huizen, 2018).

The American Lung Association (2018) noted that diacetyl is found in many e-cigarette flavors in order to complement flavorings. This chemical is now directly inhaled by e-cigarette users. Harvard researchers found that 39 of 51 e-cigarette brands contained diacetyl. The Harvard study results showed that two similarly harmful chemicals—2,3-pentanedione and acetoin—were present in 23 and 46 of the 51 flavors tested. About 92% of the e-cigarettes had one of the three dangerous chemicals present.

Vaping marijuana

Selling equipment to vape marijuana in dab (concentrated wax-like substance) or oil or leaf form is a new booming business. Companies are selling a variety of products for marijuana vaping, such as a free Android or iOS app to control temperature, play free games, manage firmware, and lock the device. Other marketing strategies include selling all-in-one marijuana vape pens and cartridges (Partnership for Drug-Free Kids, 2018a).

CDC has noted that marijuana may have long-lasting or permanent effects on the developing adolescent brain, including these (Partnership for Drug-Free Kids, 2018a):

- Difficulty with critical thinking skills such as attention, memory, and problem solving.
- Impaired reaction time and coordination, especially as it relates to driving.
- Decline in school performance.
- Increased risk of mental health issues such as depression and anxiety.

Research also has shown that about one in six teens who repeatedly uses marijuana can become addicted, compared to one in nine adults (Partnership for Drug-Free Kids, 2018a).

STRATEGIES TO SAFEGUARD AGAINST OR TO STOP VAPING

What can be done to reduce or prevent youth and young adult vaping?
The FDA and health care community have responded in a variety of ways.

FDA action

In May 2016, the FDA extended its authority regarding regulation of tobacco and nicotine products, including e-cigarettes. It was implemented to allow the FDA to “evaluate important factors such as ingredients, product design, and health risks, as well as products’ appeal to youth and non-users” (Food and Drug Administration, 2016).

Key provisions of the rule include that manufacturers adhere to the following (Food and Drug Administration, 2016; Huey & Granitto, 2017):

- List ingredients in all e-cigarette products.
- Put health warning labels on all product packaging and ads.
- Register manufacturing establishments.
- Prohibit the sale of modified-risk tobacco products, including e-cigarettes, cigars, hookahs, pipe tobacco, nicotine gels, and dissolvable products that did not previously fall under FDA authority.
- Prohibit sales to persons under the age of 18, sales in vending machines except in adult-only venues, and distribution of free samples.

Parental strategies

Several major tactics are available to help prevent teen vaping or to help teens stop vaping (Truth Initiative, 2019b):

- Acquire knowledge regarding the vaping process and the dangers associated with e-cigarettes.
- After getting necessary education, educate young people about dangers associated with the vaping process.
- Provide knowledge about resources to quit vaping. For example, the Truth Initiative launched a first-of-its kind text message e-cigarette quit program, <https://truthinitiative.org/quitte-cigarettes>
- Be positive and supportive. Quitting nicotine products is difficult and often takes several tries.

The Partnership for Drug-Free Kids (2018a) offered the following suggestions to help safeguard youth and young adults against vaping:

Conclusion

The Centers for Disease Control (2018) proclaimed the bottom line regarding the risks of e-cigarettes:

- The use of e-cigarettes is unsafe for kids, teens, and young adults.
- Most e-cigarettes contain nicotine, which is highly addictive and can harm adolescent brain development. Brain development continues into the early to mid-20s.
- E-cigarettes can contain harmful substances besides nicotine.

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Vaping and E-Cigarettes: Health Care’s Response to a New Epidemic in Teens and Young Adults

Self-Evaluation Exercises

Select the best answer for each question and check your answers at the bottom of the page.

You do not need to submit this self-evaluation exercise with your participant sheet.

- Which of the following statements about vaping is accurate?
 - Vaping is the act of inhaling and exhaling aerosol or vapor produced by a vape device.
 - The JUUL device is popular, in part, because it resembles a tobacco cigarette.
 - The manufacturer of JUUL continues to sell such flavors as crème brulee, mango, and fruit medley.
 - No vaping device currently on the market delivers more than 50 mg/ml of nicotine.
- When vaping, the user:
 - Exhales smoke.
 - Chooses to use the JUUL device if a lesser concentration of nicotine is desired.
 - Can be confident that if there is no tobacco in the vaping device, no nicotine enters the body.
 - Who chooses a “pod mod” is vaping liquid made from nicotine salts.
- Parents believe that their teen-age daughter is smoking large amounts of marijuana. One of the reasons they suspect this is that:
 - She seems to have unusual focus and concentration.
 - Her pupils are dilated.
 - Her eyes are red and heavy lidded.
 - None of the above.
- A nurse is offering a community-based course on vaping to parents and other loved ones of children and young adults. The nurse will include information about which of the following in the course?
 - Vaping is less harmful than traditional smoking.
 - Electronic cigarettes are not as addictive as traditional cigarettes.
 - The FDA has approved electronic cigarettes as smoking cessation devices.
 - Research has shown that electronic cigarettes are not harmful to the user’s health.
- It is important to know how to avoid experiencing a vape battery explosion. Users should:
 - Charge vaping devices with a phone or tablet charger.
 - Not charge vape devices overnight.
 - Disable safety features if they interfere with the amount of vaping liquid being heated.
 - Keep loose batteries in a plastic bag.
- Which of the following statements pertaining to vaping advertising is correct?
 - E-cigarettes are included in the Public Health Cigarette Smoking Act that bans cigarette ads from airing on television and radio.
 - Advertisements for e-cigarettes may include statements explaining that such products present a lower risk of tobacco-related disease than other tobacco products.
 - Advertisements for e-cigarettes and other electronic delivery systems must contain the statement “WARNING: This product contains nicotine. Nicotine is an addictive chemical.”
 - E-cigarettes must be printed in at least an 8-point font.
- Which of the following statements about the use of e-cigarettes is accurate?
 - E-cigarettes generally have the same amount of toxic chemicals as regular cigarettes.
 - Data from two randomized controlled trials found that e-cigarettes with nicotine can help smokers stop smoking.
 - The aerosols from e-cigarettes are usually not harmful.
 - From 2017 to 2018, there was an increase of about 15,000 children who vape e-cigarettes.
- E-cigarette users need to know that nicotine:
 - Increases blood pressure, heart rate, and respiratory rate.
 - Affects the brain’s reward system, making it easier to become addicted to nicotine.
 - Is a stimulant.
 - All of the above.
- The inhalation of diacetyl, which is found in many e-cigarettes:
 - May lead to a rare medical condition characterized by bronchiole damage.
 - Is harmful only if used in JUUL devices.
 - Is a component of marijuana.
 - All of the above.
- Some highlights of the FDA’s ad campaign to scare teenagers away from vaping include:
 - Placing posters in bathrooms.
 - Placing ads on social media channels.
 - Placing ads on websites used by students to see their grades or get assignments.
 - All of the above.

Answers:	1.A 2.D 3.C 4.A 5.B 6.C 7.B 8.D 9.A 10.D
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Vaping and E-Cigarettes: Health Care's Response to a New Epidemic in Teens and Young Adults

Final Examination Questions

Select the best answer for questions 1 through 10 and mark you answers on the Final Examination Answer Sheet found on page XX or complete your test online at www.elitecme.com/nursing

1. JUULs are very popular with children and young adults because:
 - a. The design is sleek and discreet.
 - b. They can be recharged on a laptop.
 - c. The liquid inside JUUL cartridges comes in popular flavors.
 - d. All of the above.
2. The most dangerous form of vaping is replacing vaping liquid with street drugs. Keeping this in mind, the nurse knows that:
 - a. The use of e-cigarettes to get high is easily detected by parents and other authority figures.
 - b. The only drug that can be smoked from e-cigarettes is liquid THC.
 - c. The high that is experienced via e-cigarettes is frequently immediate and intense.
 - d. All of the above.
3. Stacey is a college freshman. She enjoys vaping nicotine-based liquids. Stacey frequently babysits for young children. She is thinking about vaping while babysitting. What does Stacey need to know about vaping in the presence of young children?
 - a. The vapor from e-cigarettes is not harmful to children because it does not contain smoke.
 - b. Children may become sick if vaping liquid gets onto their skin.
 - c. The concentration of nicotine in e-cigarettes is too small to cause nicotine poisoning in children.
 - d. Adults cannot experience nicotine poisoning.
4. Phyllis and Mark are worried that their son is vaping marijuana. They are not sure if this is serious or not because the use of recreational marijuana is legal in their state. What do they need to know about vaping marijuana?
 - a. Vaping pens have actually made marijuana usage less accessible.
 - b. The "new marijuana" carries an average THC level of 45% to 50%.
 - c. Vaping pens mask or eliminate marijuana's telltale smell.
 - d. Vaping marijuana concentrates is referred to as JUULing.
5. Which of the following teenagers is exhibiting the primary reason young people give for starting to vape?
 - a. Jennifer, a 15 year-old high-school student who was curious about vaping because her friends talked about it constantly.
 - b. Jason, a 22-year old law student who started vaping to try to stop smoking traditional cigarettes.
 - c. Michael, an 18-year old construction worker's apprentice who is bored with his life.
 - d. Victoria, a middle school student who has heard that the flavors in vaping liquid taste great.
6. All of the following teenagers are at higher risk for using tobacco products EXCEPT:
 - a. Jennifer, who sees her parents smoke every day.
 - b. Andy, whose mother smoked during her pregnancy.
 - c. Nicole, who has been accepted to Harvard because of her excellent high school academic record.
 - d. Mike, who walks by a popular vaping shop every day on his way to school.
7. When discussing secondhand smoke with teenagers, the nurse should tell them that:
 - a. Secondhand smoke is a definite cause of stroke.
 - b. There is no risk-free level of exposure to secondhand smoke.
 - c. Secondhand smoke is especially harmful to young children.
 - d. All of the above.
8. Which of the following statements about the adverse effects of vaping is accurate?
 - a. The only substance that can be found in e-cigarettes aerosols is nicotine.
 - b. Teens engage in dripping to get a stronger throat hit.
 - c. Early research findings indicate that e-cigarette use does not lead to preteens and teens smoking of traditional cigarettes.
 - d. Dripping involves the ingestion of e-liquids by mouth.
9. Key provisions of the 2016 FDA rule include a requirement that manufacturers:
 - a. List ingredients in all e-cigarette products.
 - b. Put health warnings only on JUUL devices.
 - c. Prohibit sales to persons under the age of 16.
 - d. None of the above.
10. Which of the following actions helps safeguard youth and young adults against vaping according to the Partnership for Drug-Free Kids?
 - a. Asking teens, "Do you know that you should not be vaping??"
 - b. Parents continue to smoke while advising their children not to smoke or vape.
 - c. Attending a community health care program to learn about vaping.
 - d. Avoiding setting expectations with young people to avoid upsetting them.