Prevention of Tobacco Use

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Smoking is one of the leading causes of statistics. — Fletcher Knebel

Learning Objectives:
1. Understand the role of the primary care provider in the prevention of tobacco use.
2. Identify and counsel families of children exposed to passive smoking.
3. Discuss the changing epidemiology of electronic cigarettes.

Primary Reference:

CASE ONE:

Tom Bako is a 14-year-old scheduled to see you for a school physical. As you have done in the past few years, you ask his mother if she has any issues or concerns regarding Tom, and then have her return to the waiting room to conduct the rest of your visit with him. As usual, you explain to Tom that your conversation is confidential and encourage him to be open and honest so that you can care for him most effectively. In your conversation with Tom, he discloses that since he has started high school, life has become increasingly stressful and his grades have slipped from Bs to Cs. To “blow off steam” he has been spending more time with his friends. They mostly hang out in an older brother’s apartment listening to music. One of his friends has started to smoke cigarettes but Tom and his other friends do not. “My mom smokes and it really smells up the house.”

1. How large a problem is tobacco use in adolescents?

Cigarette use is the leading cause of preventable death in the United States, and generates over $150 billion of annual healthcare expenditures. Approximately 90% of adults who smoke began smoking prior to age 19. Each day, thousands of American teenagers try their first cigarette, and, currently, more than 4.8 million US adolescents under the age of 18 have used some tobacco product in the last 30 days. 80% of youth who smoke will continue to smoke into adulthood and of these, half will die earlier than their nonsmoking peers. Youth are particularly vulnerable to becoming dependent on nicotine when compared with adults. Nicotine dependence can occur after as few as 100 cigarettes. The 2018 National Youth Tobacco Survey found that 27% of high school students reported tobacco use in the prior 30 days; this figure was 7.2% for middle school students. Among high school users of tobacco products, approximately 40% use more than one type of tobacco product, typically e-cigarettes and a smoke-producing variety.

Short-term direct effects of tobacco use include increased risk of upper respiratory infections and sore throat as well as worsening of asthma symptoms in patients with asthma. Furthermore, in adolescence, tobacco serves as an important gateway drug. Tobacco is usually the first drug used by adolescents who subsequently experiment with and use other substances. Adolescents who smoke are 3 times more likely to drink alcohol, 8 times more likely to smoke marijuana, and 22 times more likely to use cocaine than nonsmoking adolescents.

Long-term effects include increased risk for malignancies, cardiovascular disease, pulmonary disease, peptic ulcer disease, osteoporosis in both men and women, and reproductive disorders (i.e., infertility, premature menopause, spontaneous abortion, and ectopic pregnancy). Tobacco related malignancies not only involve the expected locations where tobacco contacts mucous membranes (oral cavity and lungs), but also the liver, pancreas, kidneys, stomach, bladder, and cervix.
Population-based efforts to reduce adolescent smoking have been effective in the past, and rates among adolescents have declined sharply since peaking in the mid-1990s, when greater than 70% of high school students reported having tried cigarettes. The dramatic decline was likely initially related to the 1998 Tobacco Master Settlement Agreement between states and tobacco manufacturers, which limited tobacco advertising targeted at teenagers, increased funding for anti-smoking campaigns, and indirectly increased cigarette prices. In 2009, the Senate passed a bill giving the FDA the authority to oversee tobacco products. The FDA is now able to regulate the amount of nicotine in a cigarette as well as how that cigarette is packaged and marketed. Additionally, some states have increased the legal age to buy tobacco products; an intervention that the Institute of Medicine suggests will reduce smoking rates and tobacco-related morbidity and mortality. Unfortunately, a recent increase in rates of tobacco use in adolescents may be related to a rapid rise in e-cigarette use (addressed further below).

2. What are some predictors of adolescent smoking?

The most significant predictor of smoking during childhood is parental tobacco use. Forty percent of children of smokers become smokers themselves. In addition, children with older siblings who smoke are twice as likely to smoke themselves.

Although gender does not appear to exert an influence, in the US, Caucasian adolescents smoke more than Hispanic and African-American adolescents. Poor academic achievement is associated with smoking; a study of high school students in Pennsylvania showed that only 19% of those with A or B averages smoked whereas 56% of those with C or below averages smoked. Other risk factors for adolescent smoking include low self-esteem, being a “risk-taker,” increased stress and psychiatric disorders, exposure to media advertising, pressure from peers, low levels of parental monitoring, ease of access to cigarettes, and beliefs about the positive and negative effects of smoking. Most school-based smoking prevention programs emphasize the negative consequences of smoking but do not attempt to address the aspects of smoking which are conceived of as being more positive, such as helping with boredom, dealing with stress, staying thin, more comfort at parties, relaxing, and appearing more mature. However, studies have shown that adolescents who do not disagree with these positive effects of smoking are much more susceptible to smoking, ranging on the order of four to 30 times more likely than their peers who do disagree with the positive effects of smoking.

Tom has many risk factors to predispose him to smoke including increased stress, parental smoking, peer pressure, and falling grades.

3. Since Tom is not yet smoking, how will talking with him about smoking make a difference?

In a 2013 statement, the USPSTF recommends that clinicians provide education or brief counseling to prevent initiation of smoking in youth (Grade B recommendation), and the AAP is in agreement. Keeping in mind the burden of tobacco-related illness in the US, and that the overwhelming majority of adult smokers began smoking as adolescents, the AAP recommends asking about tobacco use “at all clinical encounters including prenatal visits, nursery visits, and well- and sick child visits, whether inpatient or outpatient.” It has been shown that adolescents often heed the medical advice of health care providers more so than they do from their parents and other adults.

4. How would you begin your conversation regarding Tom’s risk of using tobacco?

The United States Public Health Service, in conjunction with the CDC, outlines the 5-As (ask, advise, assess, assist, and arrange) as a brief patient-centered approach to counseling about smoking prevention (see Resources). The model utilizes concepts of motivational interviewing to help maintain targeted behaviors. The conversation could play out as described here.

Ask: Inquire about whether or not any friends or relatives use tobacco products. Ask if the patient has ever thought about trying and what has prevented him from experimenting thus far. Use this opportunity to reinforce those tools. Inquire about what the patient would do if someone offered him tobacco and whether or not he views smoking to be harmful. Specifically ask if the patient has any intention of smoking in the future.
Advise: Offer congratulations to the adolescent who has abstained from smoking. Inquire about perceived risks of smoking and emphasize these.

Assess: For the patient who has contemplated or is contemplating smoking, ask him to reconsider his decision and discuss the relevant risks, rewards, and roadblocks. Identify any perceived positive effects of smoking held by the adolescent. Inquire about what he feels the consequences of a decision to smoke may be. Perhaps relate the conversation to a particular relative or friend who smokes.

Assist: Assist patients in remaining a nonsmoker. Role play situations for the patient where he may encounter tobacco. Help him formulate a plan for continued abstinence.

Arrange: Continue to discuss tobacco use at future visits.

CASE continued:
After wrapping up your conversation with Tom, you invite his mother back into the room. Her 3-year-old son, Nick O’Teene, is also your patient. Nick is here for follow up after recent evaluation in the Emergency Department for an asthma exacerbation. In inquiring about his asthma, you ask his mother if he is exposed to any environmental tobacco smoke. Nick’s mother admits that she smokes “but never in the same room as Nick.” She eagerly announces “I’m going to quit because I just found out that I’m pregnant!”

5. Is it in the scope of practice for a pediatric health care provider to help parents formulate treatment plans to quit smoking, and why? What counseling will you provide?

Surveys reveal that over half of parents agree that it is the pediatrician’s obligation to advise parents to quit smoking, and that they would welcome such advice. However, parents report being asked about their smoking status only half of the time and fewer than half of smoking parents were advised to quit. Healthy 18- to 35-year-olds have more contact with pediatricians than with any other type of health care provider. Discussing the importance of smoking cessation with parents is in the best interest of the child’s health, and is considered part of family-centered care. Any time is a good time to discuss smoking cessation with parents, but there are some “teachable moments” that may make for a more effective conversation. These opportunities may occur during pregnancy, after the birth of a child, in early childhood (when a child may begin to imitate smoking behaviors), during an acute illness of a child that is related to smoking (e.g., respiratory infections or otitis media), and during health care visits centered upon asthma, as in this case.

It is important to discuss the effects of smoking on the parent’s health as well as their child’s health at various stages of development. Exposure to nicotine in utero increases the number of nicotine receptors in the fetus and studies suggest that such children have an increased propensity to develop attention problems and addictions, including nicotine addiction, as young adults. Infants born to women who smoke are more likely to be premature and underweight when compared to infants of nonsmoking mothers. Tobacco use during pregnancy may also harm the developing lung, resulting in an increased risk of lower respiratory illnesses after birth as well as an increased risk for developing asthma. Infants whose mothers smoked during pregnancy have increased airway responsiveness shortly after birth compared with infants of non-smoking mothers. Maternal smoking during pregnancy has been associated with SIDS; compared to children of nonsmokers, children exposed to tobacco in utero have more than three times the risk of SIDS. Exposure to environmental smoke after birth is also associated with SIDS.

Children of smokers have a greater frequency of respiratory symptoms such as cough, sputum production, and wheeze. There is a significant increase in the incidence of bronchiolitis and pneumonia in the first year of life for children of smoking parents when compared with children of nonsmoking parents. Exposure to environmental tobacco is associated with an increase in asthma prevalence and severity in children as a result of increased respiratory infections, increased inflammation of respiratory epithelium, and an increase in airway hyperresponsiveness. Other associations with parental smoking include increased middle ear disease, dental caries, atherogenesis, and long-term risk of malignancies in adulthood (e.g., lung cancer, leukemia, lymphoma).
Once again, utilizing the 5-As approach can be helpful in advising parents to quit smoking. The moderator can have learners run through the 5-As for parental smoking. Additionally, the separate module on Tobacco Cessation outlines various behavioral and pharmacologic treatment options to consider in both adolescents and adult caregivers.

CASE continued:

| Tom returns a year later. He seems better adjusted to the increased workload of high school and is proud that he now has a B average. None of his friends smoke and he has not even tried. “I heard what you said to my mom last year and with Nick and the baby at home, I don’t want to make things worse.” However, when asked about the use of e-cigarettes, Tom reports that most of his friends are regular users and he has tried e-cigarettes on multiple occasions. He replies, “What’s the big deal, Doc? They’re better than smoking cigarettes.” |

6. What is the impact of e-cigarettes on youth?

Electronic cigarettes (known as e-cigarettes) are part of a broader category of Electronic Nicotine Delivery Systems (ENDS) and encompass a wide variety of devices known as vapes, mods (because they have the ability to be modified), tanks, and pod systems, including the popular brand, JUUL, which the CDC specifically points to as a probable danger especially for teenagers. They are diverse in design resembling common items such as flash drives, pens, and flashlights. These devices vaporize a solution to deliver an aerosol containing nicotine, flavorings (such as peach schnapps and bubble gum that may appeal to adolescents and lead to the perception that they are less harmful), and propylene glycol, among other chemicals. ENDS reportedly do not contain all of the carcinogens found in conventional cigarettes, so many users perceive them to be a safer alternative. However, studies have shown that they do, in fact, contain numerous toxins and carcinogens harmful to those who use ENDS as well as those who are exposed to emissions secondhand. Additionally, reported nicotine concentrations of ENDS have ranged from 0 to 36 mg/mL vs. 10 to 30 mg of nicotine in a conventional cigarette. The liquid used to refill ENDS can be accidentally ingested by toddlers, and the refillable cartridges of ENDS also allow the user to deliver other psychoactive substances, such as marijuana.

ENDS have an impact on current tobacco control efforts and societal views of smoking by creating a renormalization effect. Because ENDS are smokeless, they are allowed in some smoke-free environments. This may potentially undermine smoke-free policies, emplaced not only to protect non-smokers, but also to provide incentives to quit smoking and to “denormalize” smoking.

ENDS use is on the rise and now represents the most common form of tobacco use among youth. This is a rapid rise from near-zero prevalence of ENDS use in 2011. The 2018 National Youth Tobacco Survey revealed that 20.8% of high school students and 4.9% of middle school students currently use e-cigarettes, up from 11.7% and 3.3% in 2017. According to the 2017 Youth Risk Behavior Surveillance Survey, 42.2% of high school students reported having ever used electronic vapor products. E-cigarette use is associated with progression to regular tobacco use and decreased rates of smoking cessation. Among adolescents ages 12-17 years in the Population Assessment of Tobacco and Health survey, having ever used e-cigarettes was positively associated with progression to cigarette smoking (19.3%) compared with e-cigarette never use (9.7%). At least two large longitudinal studies of adults have shown that e-cigarette use is not associated with greater rates of quitting cigarette smoking at 1 year.

However, many adolescents who use ENDS have never used conventional cigarettes; ENDS are attracting youth who may not have otherwise used tobacco products.

In 2016, the FDA extended its regulation on tobacco products to include ENDS. The FDA is now able to review new tobacco products not yet on the market, help prevent misleading claims by tobacco manufacturers, evaluate the ingredients of tobacco products and how they are made, and communicate the risk of these tobacco products. With these regulations, people under the age of 18 are unable to purchase these products and they now come in childproof packages. Manufacturers are required to register with the FDA and put health risk warnings on their packaging and in their advertisements. Further regulatory strategies such as increasing cost of ENDS or prohibiting ENDS use in public places may be important in preventing continued use in adolescents. Other interventions
enacted in some states include raising the minimum legal sales age to 21 years, applying taxes to the purchase price of e-cigarettes, and incorporating e-cigarettes in smoke-free air laws.

Additional References:

Resources:
2. Clearinghouse of smoking cession resources from CDC. http://www.cdc.gov/Tobacco/quit_smoking/how_to_quit/index.htm
3. Summary of “5-A’s” for behavior change. https://www.ahrq.gov/professionals/clinicians-providers/guidelines-recommendations/tobacco/5steps.html

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