POLICY STATEMENT Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

American Academy of Pediatrics

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Protecting Children and Adolescents From Tobacco and Nicotine

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Tobacco use remains the leading preventable cause of disease and death for adults in the United States. Significant strides have been made in reducing rates of cigarette smoking among adolescents in the United States. However, rates of e-cigarette and similar device use among youth are high, and rates of other tobacco product use, such as cigars and hookahs, have not declined. Public policy actions to protect children and adolescents from tobacco and nicotine use, as well as tobacco smoke and aerosol exposure, have proven effective in reducing harm. Effective public health approaches need to be both extended to include e-cigarettes, similar devices, and other and emerging tobacco products and expanded to reduce the toll that the tobacco epidemic takes on children and adolescents.

DEFINITIONS

Tobacco product: Any product or device that can deliver nicotine to the human brain, whether derived from tobacco or another source, except for safe and effective nicotine replacement therapies approved by the US Food and Drug Administration (FDA) for tobacco cessation. Tobacco products include, but are not limited to, e-cigarettes, cigarettes, cigars, smokeless tobacco, hookahs, pipe tobacco, heated tobacco products, and nicotine "tobacco-free" pouches.

Secondhand smoke: Smoke emitted from a tobacco product or exhaled from a person who smokes that is inhaled by a person who does not smoke.

Thirdhand smoke: Tobacco smoke that is absorbed onto surfaces and exposes a person who does not use tobacco to its components by direct contact and dermal absorption, ingestion, and/or off-gassing and inhalation. Thirdhand smoke may react with oxidants and other compounds in the environment to yield secondary pollutants.

abstract

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Tobacco smoke exposure: Tobacco smoke exposure among people who do not use tobacco, which includes both secondhand and thirdhand exposure.

E-cigarettes: Handheld devices that come in a variety of shapes and sizes. Most have a battery, a heating element, and a container to hold a solution that can contain nicotine, flavorings, and other chemicals. E-cigarettes are known by many different names. They are sometimes called e-cigs, e-hookahs, mods, pods, vapes, vape pens, tank systems, and electronic nicotine delivery systems or referred to by brand name, including Juul or Puff Bar.

Aerosol exposure: The emissions from e-cigarettes to which people who do not use e-cigarettes are exposed, including secondhand and thirdhand exposure.

Tobacco use disorder: A clinical diagnosis for which treatment is within the scope of practice of pediatric providers. Moderate or severe tobacco use disorder is defined as having 4 or more symptoms that arise from tobacco use (eg, craving; withdrawal; tolerance; increasing use over time; social, occupational, or health consequences from nicotine use).

INTRODUCTION

This policy statement accompanies the clinical report and technical report on protecting children and adolescents from tobacco and nicotine.[1,2] It builds on, strengthens, and expands American Academy of Pediatrics (AAP) recommendations from the 2015 policy statement.[3] Although many evidence-based recommendations from the 2015 policy statement remain relevant, this revision expands on and adds policy recommendations on the basis of new evidence since the last summative review. The approach to the evidence review and grading evidence quality are described in the accompanying technical report.[2] Policy recommendations were developed using the evidence-based approach as detailed by the AAP.[4,5] In addition to a "quality of evidence" summary,[2] a brief "strength of recommendation" summary is provided, using the "strong recommendation," "recommendation," "option," or "no recommendation" classification system.[4,5] For a summary of AAP clinical reports, policy statements, and other resources for tobacco and e-cigarettes, see Table 1.

PUBLIC POLICY RECOMMENDATIONS

1. The FDA Should Regulate all Tobacco and Nicotine Products to Protect Public Health

Strength of Recommendation: Strong

The FDA is charged with protecting consumers and enhancing public health by maximizing compliance of FDA-regulated products and minimizing risks associated with those products. The FDA Center for Tobacco Products is responsible for enforcing the Family Smoking Prevention and Tobacco Control Act, passed in 2009 in an effort to protect the public and create a healthier future for all Americans.[6] Tobacco products include, but are not limited to, e-cigarettes, cigarettes, cigars, smokeless tobacco, hookahs, pipe tobacco, and heated tobacco products. The Family Smoking Prevention and Tobacco Control Act put in place restrictions on marketing tobacco products to children and adolescents, and gave the FDA the authority to further regulate tobacco products to protect public health. Some of the agency's responsibilities under the law include establishing product standards, reviewing premarketing applications for new and modified-risk tobacco products, and requiring new warning labels for tobacco products.[7] The FDA is required by law to conduct reviews of e-cigarettes and other new tobacco products to ensure that products are not marketed unless they are "appropriate for the protection of the public health."[6] The AAP and other public health organizations initiated a successful legal challenge to the long FDA delays in conducting these public health reviews for e-cigarettes. A resulting federal court order required the FDA to act in 2021. As of 2022, the FDA has authorized several tobacco-flavored e-cigarette products for marketing and has denied marketing authorization to thousands of flavored e-cigarette products. At the time of publication, the legal status of a market-leading product, JUUL, remains in limbo. However, the FDA has yet to render decisions on many market-leading products and has deferred action on a number of applications for menthol-flavored products. Products with pending applications remain on the market because the FDA has declined to take enforcement action against them during application review. The FDA must monitor postmarketing data from any authorized tobacco products to ensure that these products are not used by youth.

2. Tobacco Use Prevention, Screening, and Treatment Should be Adequately Funded and Specifically Designated for Pediatric Populations

Quality of Evidence: High

Strength of Recommendation: Strong

Tobacco use treatment should be available to all individuals who use tobacco products, including adolescents and, specifically, youth from communities that have historically experienced high levels of discrimination and stigma. The Centers for Disease Control and Prevention (CDC) Community Preventive Services Task Force evidence review found strong

TABLE 1 AAP Policy Statements and Other Resources for Tobacco and E-Cigarettes

Resources for Decreasing Tobacco Exposure at the Individual Practice Level	Evidence Base for Tobacco Control	E-Cigarette and Vaping Resources	Advocacy and Policy Resources
"Protecting Children and Adolescents From Tobacco and Nicotine" (AAP clinical report) CEASE Resources (Massachusetts General Hospital Web site; www.massgeneral.org/children/cease-tobacco) *Pediatric Environmental Health* (AAP policy manual) "Substance Use Screening, Brief Intervention, and Referral to Treatment" (AAP clinical report) Tobacco Use: Considerations for Clinicians resource (www.aap.org/cessation)	"Protecting Children and Adolescents From Tobacco and Nicotine" (AAP technical report)	"E-Cigarettes and Similar Devices" (AAP policy statement) Vaping, JUUL, and E-Cigarettes Presentation Toolkit (Julius B. Richmond Center of Excellence; www.aap.org/en/patient-care/tobacco-control-and-prevention/e-cigarettes-and-vaping/vaping-juul-and-e-cigarettes-presentation-toolkit)	"Health Disparities in Tobacco Use and Exposure: A Structural Competency Approach" (AAP clinical report) Tobacco Prevention Policy Tool (Julius B. Richmond Center of Excellence; www.aap.org/en/patient-care/tobacco-control-and-prevention/policy-and-advocacy/tobacco-prevention-policy-tool) Tobacco Education Resources for Kids & Teens (HealthyChildren.org)

support for the effectiveness of comprehensive tobacco control prevention and treatment programs in reducing tobacco use and secondhand smoke (SHS) exposure, independent of increases in tobacco product prices or adoption of smoke-free policies.[8] These programs reduce the prevalence of tobacco use among adults and young people, reduce tobacco product consumption, increase quitting, and contribute to reductions in tobacco-related diseases and deaths. The CDC outlines optimal funding levels for these programs, as well as evidence that program effectiveness increases with adequate funding.[9] States do not fund these programs at anywhere near the level suggested by the CDC.[10] Further, despite receiving billions of dollars each year (estimated at approximately $27 billion in 2021) through tobacco settlement money and tobacco taxes, most states only use a small percentage of these funds to support tobacco prevention and treatment programs.[11] Rather than support efforts to reduce the enormous public health toll caused by tobacco use as promised in the 1998 Master Settlement Agreement between 46 states and several US territories and major tobacco companies, these funds are often used for unrelated efforts, including balancing state budgets.

Given the important benefits to society of reducing tobacco use, cost should not be a barrier to receiving tobacco cessation services. The Affordable Care Act requires most private health plans to cover, without cost-sharing, tobacco cessation services.[12] The Departments of Health and Human Services, Labor, and the Treasury define adequate insurance coverage for cessation services as those which include, without cost-sharing or previous authorization, both counseling and medication for up to 2 quit attempts a year.[13] Although many Medicaid and Children's Health Insurance Program plans cover tobacco use treatment, they are not required to do so by law, so comprehensive coverage is not universal.[14] Further, many insurers do not cover tobacco treatment of people younger than 18. The AAP policy statement, "Improving Substance Use Prevention, Assessment, and Treatment Financing to Enhance Equity and Improve Outcomes Among Children, Adolescents, and Young Adults," recommends appropriate insurance coverage and payment for provider time spent counseling and prescribing tobacco cessation services to facilitate greater availability of tobacco cessation treatment of all, including adolescents and young adults.[15]

3. Tobacco Control Research Should be Considered a High Priority and Funded Accordingly From Both Government and Private Sources

Quality of Evidence: High

Strength of Recommendation: Strong

Tobacco use remains one of the leading preventable causes of disease and death in the United States.[16] Use of any tobacco product by youth is unsafe, regardless of the form of use.[17] Tobacco use is a pediatric epidemic, because tobacco use disorder almost always starts in childhood or adolescence.[18] Tobacco control research funding should be specifically designated for clinical and policy interventions for pediatric populations, including those who

are from communities that have historically experienced high levels of discrimination and stigma or have been traditionally underrepresented in research but highly impacted by tobacco use. Research is needed, in particular, to identify effective behavioral and/or pharmacotherapy interventions for tobacco cessation for youth[19] and pregnant persons.[20] Tobacco industry funding should not be used for this purpose. The tobacco industry has a long and well-documented history of using industry-funded programs to divert attention away from effective tobacco control programs and research, as well as misusing health care providers and academia to thwart attempts at tobacco control.[17]

4. Tobacco and Nicotine Product Prices Should be Increased to Reduce Child and Adolescent Tobacco use Initiation

Quality of Evidence: High

Strength of Recommendation: Strong

According to the 2014 Surgeon General's report, "the evidence is sufficient to conclude that increases in the prices of tobacco products, including those resulting from excise tax increases, prevent initiation of tobacco use, promote cessation, and reduce the prevalence and intensity of tobacco use among youth and adults."[17] As such, increasing the price of all tobacco products is one of the most effective methods to prevent or reduce tobacco use.[17] Youth are particularly sensitive to tobacco product price increases, with research suggesting that youth and young adults are 2 to 3 times as responsive to changes in price compared with adults.[17] Increasing excise taxes on tobacco products is especially effective in discouraging initiation among young people who have not developed tobacco use disorder, thus protecting their health and increasing their likelihood of remaining tobacco-free.[21] Increasing the tobacco tax has the benefit of both raising the price and providing a source of funds that can be used for tobacco control programs, helping states capture health care–related cost savings from reductions in associated financial costs from death and disease because of tobacco use.[9] As of January 2023, e-cigarettes are not currently taxed at the federal level and other types of tobacco products are taxed at different levels. Taxes should be instituted for e-cigarettes and all tobacco products should be taxed at comparable levels to prevent substitution.

5. Enforce the Tobacco Product Sales Age of 21 Years

Quality of Evidence: High

Strength of Recommendation: Strong

In December 2019, Congress passed a federal law to raise the sales age for all tobacco products to 21 years.[22] The new federal minimum age of sale applies to all retail establishments and persons, with no exceptions. The law penalizes retailers for selling tobacco products to youth. The law does not penalize youth who purchase, possess, or use tobacco products. The law was the culmination of research identifying these laws as effective with high levels of public support. A 2015 Institute of Medicine report summarized the evidence of effectiveness and provided evidence from two different simulation models that increasing the minimum age to 21 years would lead to a 12% reduction in smoking prevalence.[23] Survey data identified that the vast majority of Americans supported the adoption of a federal "Tobacco 21" law, with support extending across sociodemographic groups, including age, gender, race, ethnicity, and socioeconomic status, as well as political affiliation and smoking status.[24]

Enforcement activities are important for age-of-purchase laws to be effective. A Cochrane review on interventions for preventing tobacco sales to minors found that active enforcement, including media coverage of that enforcement, was much more effective than educational programs alone.[25] A 2011 review found that enforcement programs that disrupted the sale of tobacco to minors reduced smoking among youth, whereas merely enacting a law without sufficient enforcement had minimal, if any, impact on youth tobacco use.[26]

6. All Flavor Ingredients, Including Menthol, Should be Prohibited in all Tobacco and Nicotine Products

Quality of Evidence: High

Strength of Recommendation: Strong

Across a range of tobacco products, flavorings are one of the main reasons that youth initiate tobacco use. More than 80% of adolescents and young adults who have tried tobacco report that their first product was flavored.[27] When asked why they use tobacco, young people consistently say it is because they like the flavors.[28] E-cigarette solutions are often flavored, with thousands of unique flavors advertised.[29] The 2016 Surgeon General's report on e-cigarettes concluded that flavors are among the most commonly cited reasons for using e-cigarettes among youth and young adults.[30] In 2021, flavored e-liquids were used by 84.7% of youth who reported current e-cigarette use.[31] Cigars and little cigars are also flavored, and it has been hypothesized that the flavors in these products mask the harshness of the cigar smoke, making the smoking experience

more tolerable and enjoyable for young people.

Flavorings (other than menthol) have been banned in conventional cigarettes since the Family Smoking Prevention and Tobacco Control Act of 2009 because flavorings encourage cigarette experimentation and regular use, which can lead to tobacco use disorder.[18,32,33] The cigarette flavor ban appears to be working, as it has been associated with a 58% decrease in the number of cigarettes smoked among youth and a 17% decrease in the likelihood of smoking cigarettes overall in this age group.[33] However, these effects are likely diminished by the continued availability of menthol cigarettes and other flavored tobacco and nicotine products. Small cigars, e-cigarettes, and similar devices often contain flavors but are not subject to the same regulations as cigarettes. To fully protect youth from the harms of tobacco, it is necessary to prohibit all flavor ingredients, including menthol, in all tobacco and nicotine products. Emerging evidence suggests that focusing on "characterizing" flavors rather than any flavor ingredient creates potential policy loopholes that are exploited by tobacco companies to circumvent tobacco flavor bans.[34] Tobacco companies have historically used flavored products to target youth and, in particular, youth from communities that have experienced high levels of discrimination and stigma; for example, the targeting of Black communities with menthol cigarette advertising and promotions.[18,35] Thus, prohibiting all flavors in all tobacco and nicotine products is a policy approach that promotes social justice and racial equity, in support of the AAP Equity Agenda.

7. Comprehensive Tobacco-Free Laws that Prohibit use of all Tobacco and Nicotine Products (Including Cigarettes, E-Cigarettes, and Similar Devices) Should be Enacted in all Places Where Children and Adolescents Live, Learn, Play, Work, and Visit

Quality of Evidence: High

Strength of Recommendation: Strong

Enhanced and equitable implementation of comprehensive smoke-free laws and policies for indoor public places, workplaces, cars, and multiunit housing can dramatically reduce SHS exposure. The 2006 Surgeon General's report concluded that smoking bans in workplaces, hospitals, restaurants, bars, and offices substantially reduce SHS exposure. Further, the report highlighted that "evidence from multiple peer-reviewed studies shows that smoke-free policies and regulations do not have an adverse economic impact on the hospitality industry."[36] The 2020 Surgeon General's report on smoking cessation also found that there is sufficient evidence "to infer that smoke-free policies reduce smoking prevalence, reduce cigarette consumption, and increase smoking cessation."[37]

Smoke-free laws are associated with improved child health outcomes. For example, implementation of smoke-free laws in England, Canada, and Scotland was associated with decreases in childhood asthma hospitalizations.[38,39] Similar laws in Kentucky were associated with decreased emergency department visits for asthma.[40] Implementation of smoke-free laws in Belgium, Scotland, and England have been associated with decreased rates of preterm births.[41,42] A study in England also found a significantly decreased risk of infants being of low birth weight and small for gestational age after implementation of smoke-free legislation.[43]

Smoke-free policies for cars can also reduce SHS exposure and should be promoted in an equitable manner. Studies of tobacco smoking in automobiles found that a significant amount of tobacco smoke remains in the vehicle, even with the windows open.[44] Studies have found that nonsmoking passengers have substantially elevated levels of cotinine (a nicotine metabolite and measure of nicotine exposure), other tobacco-related toxicants, and carcinogens after sitting in a parked car with an open window while a person smoked 3 cigarettes over 1 hour.[45,46] A 2021 systematic review and meta-analysis found smoke-free car policies were associated with reductions in reported child tobacco smoke exposure in cars (risk ratio, 0.69; 95% confidence interval [CI], 0.55–0.87; $n = 161\,466$ participants in 4 studies).[47]

Multi-unit housing represents another potential source of SHS exposure for a large portion of US children and adults. Smoking in one unit involuntarily exposes those in nearby units.[48–50] Among multiunit housing residents, surveys suggest a majority of respondents support smoking bans in common areas and within individual units, with increased support among individuals who reside with children.[51,52] In 2016, the US Department of Housing and Urban Development announced regulations to require public housing agencies across the country to implement smoke-free policies.[53] Evaluation of the effectiveness of this regulation is ongoing.[54,55] Smoke-free policies for homes should be promoted in an equitable manner.

Evidence also supports the inclusion of e-cigarettes and similar devices in comprehensive smoke-free laws and policies.

E-cigarette aerosol contains known harmful toxicants and carcinogens that can be discharged directly into the surrounding environment and deposited on surface areas.[30,56] Bystanders are exposed to this secondhand and thirdhand aerosol in a manner similar to that of secondhand and thirdhand cigarette smoke. Lessons learned from existing smoke-free policies, which include combustible cigarettes, along with available e-cigarette research, supports the inclusion of e-cigarettes into tobacco-free laws and ordinances where children and adolescents live, learn, play, work, and visit.[29]

8. All Tobacco and Nicotine Product Advertising and Promotion in Forms That Are Accessible to Children and Adolescents Should be Prohibited

Quality of Evidence: Moderate

Strength of Recommendation: Strong

The 2012 Surgeon General's report concluded, "Advertising and promotional activities by tobacco companies have been shown to cause the onset and continuation of smoking among adolescents and young adults."[18,30] Further, the report concluded that "evidence is suggestive but not sufficient, to conclude that tobacco companies have changed the packaging and design of their products in ways that have increased these products' appeal to adolescents and young adults."[18] Studies also suggest exposure to e-cigarette advertising on social media sites is associated with e-cigarette use among adolescents[57,58] and young adults.[59] Recently, e-cigarette and other tobacco product advertisements have increased dramatically on social media platforms.[60,61] Exposure to TV advertisements is associated with increased intentions to use e-cigarettes,[62] and exposure to a range of advertisement modalities (including Internet, print, retail, and TV/movies) is associated with current e-cigarette use,[63] with increasing exposure being associated with increased odds of use.[64,65] Therefore, reducing exposure to pro-tobacco advertising is an important component of comprehensive tobacco control strategies to prevent tobacco and nicotine initiation among youth.[18] For example, social media companies should create policies to limit children's exposure to tobacco content online, including prohibiting tobacco/e-cigarette companies from advertising on their platforms to children younger than 21 years.

9. Point-of-Sale Tobacco and Nicotine Product Advertising and Product Placement That Can be Viewed by Children and Adolescents Should be Prohibited

Quality of Evidence: Moderate

Strength of Recommendation: Strong

Point-of-sale (POS) advertising increases tobacco initiation and tobacco product use among youth. POS advertising refers to a variety of marketing and promotion activities, including signs on the interior and exterior of retail stores, functional items like counter mats and change cups, shelving displays, and coupons and other price discounts that reduce the price for the consumer. It also includes promotional payments to retailers by tobacco companies to have their products placed in specific store locations, making it more likely that consumers will see them.[66] Tobacco companies spend the vast majority of their total marketing expenditures on price-related strategies at the POS.[67] Evidence suggests POS display bans reduce youth smoking susceptibility and denormalize smoking.[68–70] According to a 2016 meta-analysis, the odds of having tried smoking are around 1.6 times higher for children and youth who are frequently exposed to POS tobacco promotion, compared with those who are less frequently exposed.[71] A virtual store experiment found that youth 13 to 17 years of age were substantially less likely to try purchasing tobacco products when tobacco products were not displayed (odds ratio, 0.30; 95% CI, 0.13–0.67).[35,72]

E-cigarette companies, the vast majority of which are owned by tobacco companies, use a wide variety of product placement strategies. The AAP policy statement "E-Cigarettes and Similar Devices" outlined e-cigarette POS advertising at various retail outlets, as well as the ability for youth to purchase these products through online vendors.[29] E-cigarette advertisements are also placed within music, entertainment, and sport venues, and on social media and streaming media.[73] Additionally, e-cigarettes have been marketed through celebrity endorsements and sponsorships and free samples at youth-oriented events.[74] These product placement strategies are illegal for conventional cigarettes, because they promote youth initiation and progression to traditional tobacco product use.[18,30]

Venues for unsupervised purchase of tobacco and nicotine products, such as vending machines and online merchants, should be eliminated. All tobacco and nicotine products should be placed behind sales counters to reduce shoplifting. Sales of tobacco and nicotine products should be eliminated from schools, health care facilities, military bases, pharmacies, and other sites that serve youth. The promotional distribution of tobacco and nicotine products should be prohibited.

10. Depictions of Tobacco and Nicotine Products in Movies and Other Media, such as Content Through Streaming Platforms, That Can be viewed by Children and Adolescents Should be Restricted

Quality of Evidence: High

Strength of Recommendation: Strong

Depictions of smoking in movies have been repeatedly shown to

increase rates of smoking initiation among adolescents both in the United States and globally. The 2012 Surgeon General's report concluded, "The evidence is sufficient to conclude that there is a causal relationship between depictions of smoking in the movies and the initiation of smoking among young people."[18] Numerous prospective studies of adolescents across the world have shown that exposure to depictions of smoking in movies is associated with smoking initiation.[75–77] One estimate suggests that reducing adolescent exposure to smoking depictions in movies from a current median of about 275 annual exposures per adolescent from PG-13 movies down to approximately 10 or less would reduce the prevalence of adolescent smoking by 18% (95% CI, 14%–21%).[78] According to the 2014 Surgeon General's report, "actions that would eliminate depiction of tobacco use in movies that are produced and rated as appropriate for children and adolescents could have a significant effect toward preventing youth from becoming tobacco users."[17] With the rise of depictions of e-cigarettes in movies and episodic programs (defined as programs aired as a series on streaming platforms or broadcast or cable TV) and preliminary evidence suggesting a dose-response relationship between depictions and e-cigarette initiation among youth,[79] it is reasonable to have these recommendations apply to all depictions of tobacco and nicotine products.

11. Tobacco Industry-Sponsored Mass Media and School-Based Tobacco Control Programs Should be Prohibited

Quality of Evidence: High

Strength of Recommendation: Strong

Mass media and school-based tobacco control programs are often funded by federal, state, and nonprofit entities. These programs have been shown to reduce the initiation of tobacco use and increase cessation by denormalizing tobacco and nicotine product use.[9,18,80] Tobacco industry-sponsored programs do not use the same strategies, are not effective in preventing tobacco use among youth, and are counterproductive, potentially undermining effective tobacco control efforts.[18] This recommendation remains relevant with the recent efforts by JUUL Laboratories to target school-aged children with youth prevention programs. A 2018 study found that the JUUL curriculum was not evidence-based and failed to adequately address the harms of e-cigarettes, youth susceptibility to the addictive nature of nicotine, or the role that targeted tobacco industry marketing plays in youth use of e-cigarettes.[81]

12. Child and Adolescent Tobacco Control Programs Should Incorporate Antitobacco Themes of Health Effects and Industry Manipulation

Quality of Evidence: Moderate

Strength of Recommendation: Strong

Mass-reach health communication interventions can be powerful tools for preventing the initiation of tobacco use, promoting and facilitating cessation, and shaping social norms related to tobacco use.[9] The Community Preventive Services Task Force recommends mass-reach health communication interventions based on strong evidence of effectiveness in decreasing the prevalence and initiation of tobacco use among young people and increasing cessation and use of available services such as quitlines.[8] According to a 2017 Cochrane review of mass media campaigns directed at youth, there is some evidence that certain types of media campaigns can be effective in preventing the uptake of smoking in young people.[82] Adolescents and young adults are very sensitive to perceived social norms and media presentations of smoking behavior. Campaigns, such as those organized by the Truth Initiative, which focus on raising awareness of tobacco companies' targeting and manipulating of youth, has been estimated to help significant portions of youth reject tobacco, including more than 450 000 adolescents in one 4-year span.[83,84] The Florida Tobacco Pilot Program, the major component of which was a youth-oriented, counter-marketing media campaign developed to reduce the allure of smoking, was associated with a significant decline (approximately 2% to 3%) in smoking among middle and high school students.[85]

Pictorial health warnings improve adolescents' awareness of the harms of smoking and decrease their perceptions of the social appeal of smoking.[86,87] According to the 2020 Surgeon General's report on smoking cessation, "The evidence is sufficient to infer that large, pictorial (also known as graphic) health warnings increase smokers' knowledge about the health harms of smoking, interest in quitting, and quit attempts, and decrease smoking prevalence."[37]

13. Children and Adolescents Should be Legally Prohibited From Working on Tobacco Farms and in Tobacco Production

Quality of Evidence: Moderate

Strength of Recommendation: Strong

Children and adolescents can be harmed from absorption of tobacco toxins when they participate in tobacco production.[88,89] Green tobacco sickness, or nicotine poisoning that occurs while handling tobacco plants, is well described. Dermal absorption of nicotine from moist tobacco plants can lead to symptoms of severe nicotine poisoning, including weakness, headache, nausea, vomiting, dizziness, abdominal cramps, breathing difficulty, pallor, diarrhea, chills, fluctuations in blood pressure or heart rate, seizures, and increased perspiration and excessive salivation.[89–91]

14. Any Tobacco or Nicotine Products Legally sold to Adults Aged 21 Years and Above, Including E-Cigarettes, Cigarettes, and Other Tobacco Products, Should Meet a Product Standard That Makes the Product Both Minimally Addictive for Adults and Highly Unlikely to Promote Initiation and Continued use Among Children and Adolescents

Quality of Evidence: Low

Strength of Recommendation: Recommendation

Reducing nicotine content in cigarettes has been suggested as a potential strategy to make them less addictive[92] or less reinforcing (eg, at a dose least likely to increase or maintain nicotine self-administration behaviors).[93] This strategy has been linked to cigarette smoking reduction and cessation in adults, both of which can substantially reduce tobacco-related morbidity and mortality.[94] For example, studies have shown that, when adults switch from cigarettes with regular nicotine content to cigarettes with very low nicotine content ($\leq$0.4 mg/g), they experience reductions in biomarkers of nicotine exposure, cigarettes smoked/day, and symptoms of tobacco use disorder.[95,96] No clinical studies have assessed how nicotine reduction affects adolescents' experiences with cigarette smoking or intentions to smoke; however, preclinical studies have shown that adolescent rats are more sensitive to lower doses of nicotine than adults.[95] In 2018, the FDA announced its intent to develop a tobacco product standard to set the maximum nicotine level for cigarettes.[97] At the time of this publication, however, the FDA has not put forth specific regulations.

The United Kingdom and Europe have adopted nicotine limits for nicotine-containing e-liquids at 20 mg/mL.[98] With the emergence of e-cigarettes, some have argued that enough nicotine needs to be available in these noncombusted products to facilitate adults' transition from combusted to noncombusted forms of nicotine and mitigate the emergence of an illicit market of tobacco products with high nicotine content. In the United States, e-cigarettes have evolved over the past decade to have high levels of nicotine content, as well as salt-based nicotine solutions, which are more palatable than the free-based nicotine used in earlier generations of e-cigarettes.[99] These features are marketed to assist with the transition from cigarette smoking to noncombusted tobacco products; however, data show that these features may sustain long-term e-cigarette use among adults (rather than cessation) and also appeal to adolescents who do not smoke cigarettes.[95] To best minimize health harms to children when formulating a comprehensive regulatory framework for the nicotine content of cigarettes in the United States, policymakers must also create a standard that minimizes long-term use of e-cigarettes and other tobacco products by adults (which adversely impacts children through the mechanisms listed above), as well as initiation of nicotine and maintenance of tobacco use among youth.

15. Tobacco Control Research and Advocacy Priorities Should be Grounded in "Tobacco Endgame" Strategies, a Framework to Prevent new Addiction and End the Tobacco Epidemic

Quality of Evidence: Low

Strength of Recommendation: Recommendation

The "tobacco endgame" reorients tobacco policy and guidelines toward plans for ending the tobacco epidemic and envisions a tobacco-free future. A variety of policy approaches have been outlined, including product-focused, user-focused, market-supply focused, and institutional structure-focused proposals.[100] The tobacco endgame has been discussed by the CDC and the Surgeon General.[37] In 2021, California formally adopted an endgame policy initiative, with a commitment toward ending the commercial tobacco epidemic in the state by 2035.[101] The National Institutes of Health and the FDA, as well as the whole of government, should endorse and support tobacco endgame goals, and tobacco control researchers should consistently recognize and frame our research findings in alignment with endgame policies to prevent new addiction and to end the tobacco epidemic. Finally, considering how tobacco use disproportionately affects youth from communities that have historically experienced high levels of discrimination and stigma, endgame strategies should incorporate policies targeted at reducing these disparities; for example, through special outreach to these populations.

CONCLUSIONS

Tobacco use almost always starts in childhood or adolescence. The tobacco epidemic takes a substantial toll on the health of all pediatric populations. Public policy actions to protect infants, children, adolescents, and young adults from tobacco have proven effective in reducing harm. Effective public health approaches need to be both extended to include e-cigarettes, similar devices, and other and emerging tobacco and nicotine products, and expanded to reduce the toll that the tobacco epidemic takes on our children.

For further reading and a summary of AAP clinical reports, policy statements, and other resources for tobacco and e-cigarettes, see Table 1.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
CDC: Centers for Disease Control and Prevention
CI: confidence interval
FDA: US Food and Drug Administration
POS: point of sale
SHS: secondhand smoke

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REFERENCES

1. Jenssen BP, Walley SC, Boykan R, Little Caldwell A, Camenga D. American Academy of Pediatrics, Section on Nicotine and Tobacco Prevention and Treatment, Committee on Substance Use Prevention. Clinical report. Protecting children and adolescents from tobacco and nicotine. *Pediatrics*. 2023;151(5):e2023061805
2. Jenssen BP, Walley SC, Boykan R, Little Caldwell A, Camenga D. American Academy of Pediatrics, Section on Nicotine and Tobacco Prevention and Treatment, Committee on Substance Use Prevention. Technical report. Protecting children and adolescents from tobacco and nicotine. *Pediatrics*. 2023;151(5):e2023061806
3. Farber HJ, Nelson KE, Groner JA, Walley SC. Section on Tobacco Control. Public policy to protect children from tobacco, nicotine, and tobacco smoke. *Pediatrics*. 2015;136(5):998–1007
4. American Academy of Pediatrics Steering Committee on Quality Improvement and Management. Classifying recommendations for clinical practice guidelines. *Pediatrics*. 2004;114(3):874–877
5. Shiffman RN, Marcuse EK, Moyer VA, et al. American Academy of Pediatrics Steering Committee on Quality Improvement and Management. Toward transparent clinical policies. *Pediatrics*. 2008;121(3):643–646
6. U.S. Government Publishing Office. Family smoking prevention and tobacco control and federal retirement reform. Available at: https://www.govinfo.gov/content/pkg/PLAW-111publ31/pdf/PLAW-111publ31.pdf. Accessed February 2, 2023
7. US Food and Drug Administration. Center for Tobacco Products. Available at: https://www.fda.gov/about-fda/fda-organization/center-tobacco-products. Accessed February 2, 2023
8. Community Preventive Services Task Force. The guide to community preventive services. Reducing tobacco use and secondhand smoke exposure: comprehensive tobacco control programs. Task force finding and rationale statement. Available at: https://www.thecommunityguide.org/findings/tobacco-use-comprehensive-tobacco-control-programs.html. Accessed February 2, 2023
9. Centers for Disease Control and Prevention. Smoking and tobacco use. Best practices for comprehensive tobacco control programs–2014. Available at: https://www.cdc.gov/tobacco/stateandcommunity/guides/pdfs/2014/comprehensive.pdf. Accessed February 2, 2023
10. American Lung Association. State of tobacco control 2023. Available at: https://www.lung.org/research/sotc. Accessed February 2, 2023
11. Campaign for Tobacco-Free Kids. Broken promises to our children. A state-by-state look at the 1998 tobacco settlement 23 years later. Available at: https://www.tobaccofreekids.org/what-we-do/us/statereport/. Accessed February 2, 2023
12. Krist AH, Davidson KW, Mangione CM, et al. US Preventive Services Task Force. Interventions for tobacco smoking cessation in adults, including

pregnant persons: US Preventive Services Task Force recommendation statement. *JAMA*. 2021;325(3):265–279

13. McAfee T, Babb S, McNabb S, Fiore MC. Helping smokers quit–opportunities created by the Affordable Care Act. *N Engl J Med*. 2015;372(1):5–7
14. DiGiulio A, Jump Z, Babb S, et al. State Medicaid coverage for tobacco cessation treatments and barriers to accessing treatments–United States, 2008–2018. *MMWR Morb Mortal Wkly Rep*. 2020;69(6):155–160
15. Camenga DR, Hammer LD. Committee on Substance Use and Prevention, and Committee on Child Health Financing. Improving substance use prevention, assessment, and treatment financing to enhance equity and improve outcomes among children, adolescents, and young adults. *Pediatrics*. 2022;150(1):e2022057992
16. Mokdad AH, Ballestros K, Echko M, et al. US Burden of Disease Collaborators. The state of US health, 1990–2016: burden of diseases, injuries, and risk factors among US states. *JAMA*. 2018;319(14):1444–1472
17. US Department of Health and Human Services; Centers for Disease Control and Prevention; National Center for Chronic Disease Prevention and Health Promotion; Office on Smoking and Health. The health consequences of smoking–50 years of progress: a report of the surgeon general, 2014. Available at: https://www.ncbi.nlm.nih.gov/books/NBK179276/. Accessed February 2, 2023
18. US Department of Health and Human Services; Centers for Disease Control and Prevention, Office on Smoking and Health. Preventing tobacco use among youth and young adults: a report of the surgeon general. Atlanta, GA: Centers for Disease Control and Prevention; 2012
19. Selph S, Patnode C, Bailey SR, Pappas M, Stoner R, Chou R. Primary care-relevant interventions for tobacco and nicotine use prevention and cessation in children and adolescents: updated evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. 2020;323(16):1599–1608
20. Patnode CD, Henderson JT, Coppola EL, Melnikow J, Durbin S, Thomas RG. Interventions for tobacco cessation in adults, including pregnant persons: updated evidence report and systematic review for the US Preventive Services Task Force. *JAMA*. 2021;325(3):280–298
21. Centers for Disease Control and Prevention. STATE system excise tax fact sheet. Available at: https://www.cdc.gov/statesystem/factsheets/excisetax/ExciseTax.html. Accessed February 2, 2023
22. US Food and Drug Administration. Tobacco 21. Available at: https://www.fda.gov/tobacco-products/retail-sales-tobacco-products/tobacco-21. Accessed February 2, 2023
23. Institute of Medicine. *Public Health Implications of Raising the Minimum Age of Legal Access to Tobacco Products*. Washington, DC: National Academies Press; 2015
24. Morain SR, Winickoff JP, Mello MM. Have tobacco 21 laws come of age? *N Engl J Med*. 2016;374(17):1601–1604
25. Stead LF, Lancaster T. Interventions for preventing tobacco sales to minors. *Cochrane Database Syst Rev*. 2005;(1):CD001497
26. DiFranza JR. Which interventions against the sale of tobacco to minors can be expected to reduce smoking? *Tob Control*. 2012;21(4):436–442
27. Villanti AC, Johnson AL, Ambrose BK, et al. Flavored tobacco product use in youth and adults: findings from the first wave of the PATH Study (2013–2014). *Am J Prev Med*. 2017;53(2):139–151
28. Ambrose BK, Day HR, Rostron B, et al. Flavored tobacco product use among US Youth aged 12–17 years, 2013–2014. *JAMA*. 2015;314(17):1871–1873
29. Jenssen BP, Walley SC. Section on Tobacco Control. E-cigarettes and similar devices. *Pediatrics*. 2019;143(2):e20183652
30. US Department of Health and Human Services. *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2016
31. Park-Lee E, Ren C, Sawdey MD, et al. Notes from the field: e-cigarette use among middle and high school students–National Youth Tobacco Survey, United States, 2021. *MMWR Morb Mortal Wkly Rep*. 2021;70(39):1387–1389
32. Deyton L, Sharfstein J, Hamburg M. Tobacco product regulation–a public health approach. *N Engl J Med*. 2010;362(19):1753–1756
33. Courtemanche CJ, Palmer MK, Pesko MF. Influence of the flavored cigarette ban on adolescent tobacco use. *Am J Prev Med*. 2017;52(5):e139–e146
34. Brink AL, Glahn AS, Kjaer NT. Tobacco companies' exploitation of loopholes in the EU ban on menthol cigarettes: a case study from Denmark [Published online ahead of print March 21, 2022]. *Tob Control*. 2022. 10.1136/tobaccocontrol-2021-057213
35. Dauphinee AL, Doxey JR, Schleicher NC, Fortmann SP, Henriksen L. Racial differences in cigarette brand recognition and impact on youth smoking. *BMC Public Health*. 2013;13:170
36. Centers for Disease Control and Prevention, Office on Smoking and Health. The health consequences of involuntary exposure to tobacco smoke: a report of the surgeon general. Available at: www.ncbi.nlm.nih.gov/books/NBK44324/. Accessed February 2, 2023
37. US Department of Health and Human Services. *Smoking Cessation: A Report of the Surgeon General*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2020
38. Mackay D, Haw S, Ayres JG, Fischbacher C, Pell JP. Smoke-free legislation and hospitalizations for childhood asthma. *N Engl J Med*. 2010;363(12):1139–1145
39. Naiman A, Glazier RH, Moineddin R. Association of anti-smoking legislation with rates of hospital admission for cardiovascular and respiratory conditions. *CMAJ*. 2010;182(8):761–767
40. Rayens MK, Burkhart PV, Zhang M, et al. Reduction in asthma-related emergency department visits after implementation of a smoke-free law.

J Allergy Clin Immunol. 2008;122(3):537–41.e3

41. Cox B, Martens E, Nemery B, Vangronsveld J, Nawrot TS. Impact of a stepwise introduction of smoke-free legislation on the rate of preterm births: analysis of routinely collected birth data. *BMJ*. 2013;346:f441
42. Mackay DF, Nelson SM, Haw SJ, Pell JP. Impact of Scotland's smoke-free legislation on pregnancy complications: retrospective cohort study. *PLoS Med*. 2012;9(3):e1001175
43. Bakolis I, Kelly R, Fecht D, et al. Protective effects of smoke-free legislation on birth outcomes in England: a regression discontinuity design. *Epidemiology*. 2016;27(6):810–818
44. Ott W, Klepeis N, Switzer P. Air change rates of motor vehicles and in-vehicle pollutant concentrations from secondhand smoke. *J Expo Sci Environ Epidemiol*. 2008;18(3):312–325
45. St Helen G, Jacob P III, Peng M, Dempsey DA, Hammond SK, Benowitz NL. Intake of toxic and carcinogenic volatile organic compounds from secondhand smoke in motor vehicles. *Cancer Epidemiol Biomarkers Prev*. 2014;23(12):2774–2782
46. Jones IA, St Helen G, Meyers MJ, et al. Biomarkers of secondhand smoke exposure in automobiles. *Tob Control*. 2014;23(1):51–57
47. Radó MK, Mölenberg FJM, Westenberg LEH, et al. Effect of smoke-free policies in outdoor areas and private places on children's tobacco smoke exposure and respiratory health: a systematic review and meta-analysis. *Lancet Public Health*. 2021;6(8):e566–e578
48. Hewett MJ, Ortland WH, Brock BE, Heim CJ. Secondhand smoke and smokefree policies in owner-occupied multi-unit housing. *Am J Prev Med*. 2012;43(5 Suppl 3):S187–S196
49. Kraev TA, Adamkiewicz G, Hammond SK, Spengler JD. Indoor concentrations of nicotine in low-income, multi-unit housing: associations with smoking behaviors and housing characteristics. *Tob Control*. 2009;18(6):438–444
50. Wilson KM, Klein JD, Blumkin AK, Gottlieb M, Winickoff JP. Tobacco-smoke exposure in children who live in multiunit housing. *Pediatrics*. 2011;127(1):85–92
51. King BA, Cummings KM, Mahoney MC, Juster HR, Hyland AJ. Multiunit housing residents' experiences and attitudes toward smoke-free policies. *Nicotine Tob Res*. 2010;12(6):598–605
52. Hood NE, Ferketich AK, Klein EG, Wewers ME, Pirie P. Individual, social, and environmental factors associated with support for smoke-free housing policies among subsidized multiunit housing tenants. *Nicotine Tob Res*. 2013;15(6):1075–1083
53. US Department of Housing and Urban Development. HUD Secretary Castro announces new rule making public housing smoke-free. Available at: https://archives.hud.gov/news/2016/pr16-184.cfm. Accessed February 2, 2023
54. Anastasiou E, Feinberg A, Tovar A, et al. Secondhand smoke exposure in public and private high-rise multiunit housing serving low-income residents in New York City prior to federal smoking ban in public housing, 2018. *Sci Total Environ*. 2020;704:135322
55. Thorpe LE, Anastasiou E, Wyka K, et al. Evaluation of secondhand smoke exposure in New York City public housing after implementation of the 2018 Federal Smoke-Free Housing Policy. *JAMA Netw Open*. 2020;3(11):e2024385
56. *National Academies of Sciences, Engineering, and Medicine. Public Health Consequences of E-Cigarettes*. Washington, DC: National Academies Press; 2018
57. Camenga D, Gutierrez KM, Kong G, Cavallo D, Simon P, Krishnan-Sarin S. E-cigarette advertising exposure in e-cigarette naïve adolescents and subsequent e-cigarette use: a longitudinal cohort study. *Addict Behav*. 2018;81:78–83
58. Vogel EA, Ramo DE, Rubinstein ML, et al. Effects of social media on adolescents' willingness and intention to use e-cigarettes: an experimental investigation. *Nicotine Tob Res*. 2021;23(4):694–701
59. Pokhrel P, Fagan P, Herzog TA, et al. Social media e-cigarette exposure and e-cigarette expectancies and use among young adults. *Addict Behav*. 2018;78:51–58
60. Czaplicki L, Kostygina G, Kim Y, et al. Characterizing JUUL-related posts on Instagram. *Tob Control*. 2020;29(6):612–617
61. O'Brien EK, Hoffman L, Navarro MA, Ganz O. Social media use by leading US e-cigarette, cigarette, smokeless tobacco, cigar, and hookah brands. *Tob Control*. 2020;29(e1):e87–e97
62. Farrelly MC, Duke JC, Crankshaw EC, et al. A randomized trial of the effect of e-cigarette TV advertisements on intentions to use e-cigarettes. *Am J Prev Med*. 2015;49(5):686–693
63. Hammig B, Daniel-Dobbs P, Blunt-Vinti H. Electronic cigarette initiation among minority youth in the United States. *Am J Drug Alcohol Abuse*. 2017;43(3):306–310
64. Singh T, Agaku IT, Arrazola RA, et al. Exposure to advertisements and electronic cigarette use among us middle and high school students. *Pediatrics*. 2016;137(5):e20154155
65. Mantey DS, Cooper MR, Clendennen SL, Pasch KE, Perry CL. E-cigarette marketing exposure is associated with e-cigarette use among us youth. *J Adolesc Health*. 2016;58(6):686–690
66. Campaign for Tobacco-Free Kids. Fact sheets. Available at: https://www.tobaccofreekids.org/fact-sheets/tobaccos-toll-health-harms-and-cost/tobacco-and-kids-marketing. Accessed February 2, 2023
67. US Federal Trade Commission. Federal Trade Commission cigarette report for 2019. Available at: https://www.ftc.gov/system/files/documents/reports/federal-trade-commission-cigarette-report-2019-smokeless-tobacco-report-2019/cigarette_report_for_2019.pdf. Accessed February 2, 2023
68. Dunlop S, Kite J, Grunseit AC, et al. Out of sight and out of mind? Evaluating the impact of point-of-sale tobacco display bans on smoking-related beliefs and behaviors in a sample of Australian adolescents and young adults. *Nicotine Tob Res*. 2015;17(7):761–768
69. McNeill A, Lewis S, Quinn C, et al. Evaluation of the removal of point-of-sale

tobacco displays in Ireland. *Tob Control.* 2011;20(2):137–143

70. Ford A, MacKintosh AM, Moodie C, Kuipers MAG, Hastings GB, Bauld L. Impact of a ban on the open display of tobacco products in retail outlets on never smoking youth in the UK: findings from a repeat cross-sectional survey before, during, and after implementation. *Tob Control.* 2020; 29(3):282–288
71. Robertson L, Cameron C, McGee R, Marsh L, Hoek J. Point-of-sale tobacco promotion and youth smoking: a meta-analysis. *Tob Control.* 2016;25(e2): e83–e89
72. Kim AE, Nonnemaker JM, Loomis BR, et al. Influence of tobacco displays and ads on youth: a virtual store experiment. *Pediatrics.* 2013;131(1):e88–e95
73. McCausland K, Maycock B, Leaver T, Jancey J. The messages presented in electronic cigarette–related social media promotions and discussion: scoping review. *J Med Internet Res.* 2019;21(2):e11953
74. Truth Initiative. E-cigarettes industry marketing and youth targeting. Available at: https://truthinitiative.org/sites/default/files/media/files/2021/06/Truth_E-Cigarette%20Factsheet_MARKETING_FINAL.pdf. Accessed February 2, 2023
75. Tanski SE, Stoolmiller M, Dal Cin S, Worth K, Gibson J, Sargent JD. Movie character smoking and adolescent smoking: who matters more, good guys or bad guys? *Pediatrics.* 2009;124(1):135–143
76. Morgenstern M, Sargent JD, Engels RCME, et al. Smoking in movies and adolescent smoking initiation: longitudinal study in six European countries. *Am J Prev Med.* 2013;44(4):339–344
77. Arora M, Mathur N, Gupta VK, Nazar GP, Reddy KS, Sargent JD. Tobacco use in Bollywood movies, tobacco promotional activities and their association with tobacco use among Indian adolescents. *Tob Control.* 2012;21(5):482–487
78. Sargent JD, Tanski S, Stoolmiller M. Influence of motion picture rating on adolescent response to movie smoking. *Pediatrics.* 2012;130(2):228–236
79. Bennett M, Hair EC, Liu M, Pitzer L, Rath JM, Vallone DM. Exposure to tobacco content in episodic programs and tobacco and E-cigarette initiation. *Prev Med.* 2020;139:106169
80. Stevens EM, Hébert ET, Keller-Hamilton B, et al. Associations between exposure to the real cost campaign, pro-tobacco advertisements, and tobacco use among youth in the United States. *Am J Prev Med.* 2021;60(5):706–710
81. Liu J, Halpern-Felsher B. The Juul curriculum is not the jewel of tobacco prevention education. *J Adolesc Health.* 2018;63(5):527–528
82. Carson KV, Ameer F, Sayehmiri K, et al. Mass media interventions for preventing smoking in young people. *Cochrane Database Syst Rev.* 2017;6(6):CD001006
83. Farrelly MC, Nonnemaker J, Davis KC, Hussin A. The Influence of the National truth campaign on smoking initiation. *Am J Prev Med.* 2009;36(5):379–384
84. Vallone D, Cantrell J, Bennett M, et al. Evidence of the impact of the truth FinishIt campaign. *Nicotine Tob Res.* 2018;20(5):543–551
85. Centers for Disease Control and Prevention (CDC). Tobacco use among middle and high school students—Florida, 1998 and 1999. *MMWR Morb Mortal Wkly Rep.* 1999;48(12):248–253
86. Hammond D. Health warning messages on tobacco products: a review. *Tob Control.* 2011;20(5):327–337
87. Drovandi A, Teague PA, Glass B, Malau-Aduli B. A systematic review of the perceptions of adolescents on graphic health warnings and plain packaging of cigarettes. *Syst Rev.* 2019;8(1):25
88. Lando HA, Hipple BJ, Muramoto M, et al. Tobacco control and children: an international perspective. *Pediatr Allergy Immunol Pulmonol.* 2010;23(2):99–103
89. McKnight RH, Spiller HA. Green tobacco sickness in children and adolescents. *Public Health Rep.* 2005;120(6): 602–605
90. McBride JS, Altman DG, Klein M, White W. Green tobacco sickness. *Tob Control.* 1998;7(3):294–298
91. McKnight RH, Levine EJ, Rodgers GC Jr. Detection of green tobacco sickness by a regional poison center. *Vet Hum Toxicol.* 1994;36(6):505–510
92. Benowitz NL, Henningfield JE. Establishing a nicotine threshold for addiction. The implications for tobacco regulation. *N Engl J Med.* 1994;331(2):123–125
93. Sofuoglu M, LeSage MG. The reinforcement threshold for nicotine as a target for tobacco control. *Drug Alcohol Depend.* 2012;125(1-2):1–7
94. Apelberg BJ, Feirman SP, Salazar E, et al. Potential public health effects of reducing nicotine levels in cigarettes in the United States. *N Engl J Med.* 2018;378(18):1725–1733
95. Donny EC, White CM. A review of the evidence on cigarettes with reduced addictiveness potential. *Int J Drug Policy.* 2022;99:103436
96. Berman ML, Glasser AM. Nicotine reduction in cigarettes: literature review and gap analysis. *Nicotine Tob Res.* 2019;21(Suppl 1):S133–S144
97. Regulations.gov. Tobacco product standard for nicotine level of combusted cigarettes. Available at: https://www.regulations.gov/document/FDA-2017-N-6189-0001. Accessed February 2, 2023
98. EUR-Lex. Directive 2014/40/EU of the European Parliament and of the Council of April 3, 2014, on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation, and sale of tobacco and related products and repealing Directive 2001/37/EC-Text with EEA relevance. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32014L0040. Accessed February 2, 2023
99. Jackler RK, Ramamurthi D. Nicotine arms race: JUUL and the high-nicotine product market. *Tob Control.* 2019;28(6):623–628
100. McDaniel PA, Smith EA, Malone RE. The tobacco endgame: a qualitative review and synthesis. *Tob Control.* 2016;25(5):594–604
101. Tobacco-Related Disease Research Program. California endgame resources. Available at: https://www.trdrp.org/about/ca-endgame-resources.html. Accessed February 2, 2023