



Alcohol Use by Youth

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Alcohol use continues to be problematic for youth and young adults in the United States. Understanding of neurobiology and neuroplasticity continues to highlight the potential adverse impact of underage drinking on the developing brain. This policy statement provides the position of the American Academy of Pediatrics on the issue of alcohol and is supported by an accompanying technical report.

Data from the 2018 Monitoring the Future study (national annual survey of eighth-, 10th-, and 12th-grade students regarding health behaviors and attitudes) indicate that overall alcohol use had been in decline for several years until 2017, when there were no significant changes found in any prevalence measures in any grade, but in 2018, the trend of declining rates resumed.¹ According to the 2018 Monitoring the Future data, by the end of 12th grade, 59% of students had “consumed more than a few sips” of alcohol, and 42.9% of 12th-graders “reported having been drunk at least once in their life.”¹ The 2017 National Survey on Drug Use and Health revealed that 9.9% of those aged 12 to 17 years and 55.9% of those aged 18 to 25 years reported drinking alcohol during the past month.² This policy statement serves as an update to the previously published American Academy of Pediatrics (AAP) policy statement on alcohol use by adolescents³ and is accompanied in this issue of *Pediatrics* by a technical report.⁴

Occasional or weekend use of alcohol is often dismissed as typical teenage behavior by adults, and its biological and functional implications are not recognized as being significant. Adolescent substance use frequently co-occurs with other psychiatric diagnoses, including anxiety, mood, psychotic, and disruptive disorders, and can increase the risk of behaviors such as suicide attempts and unplanned sexual encounters.⁵⁻⁷ The younger youth initiate alcohol use, the greater their risk of developing an alcohol use disorder (AUD) later in life.^{8,9} Pediatricians are uniquely positioned to reduce adolescent alcohol use and intervene with those at high risk.

Alcohol use among adolescents frequently involves binge drinking rather than more frequent consumption of fewer drinks on each occasion. Binge

abstract

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drinking is defined as 4 drinks for women and 5 drinks for men within a 2-hour period.¹⁰ However, this criterion is thought to be too high, particularly for younger adolescents.¹¹ A detailed clinical report discussing binge drinking was published by the AAP in 2015.¹² The 2017 National Survey on Drug Use and Health data indicate that 5.3% of adolescents aged 12 to 17 years engaged in binge drinking, and 36.9% of those aged 18 to 25 years had engaged in binge drinking during the past month.² The 2017 national Youth Risk Behavior Surveillance study revealed that 13.5% of students in grades 9 through 12 reported binge drinking on at least 1 day during the 30 days before survey administration.¹³ The financial and societal costs of binge drinking are significant.¹⁴

ALCOHOL USE AND AUDs

Accurately eliciting the frequency and consequences of alcohol use can be difficult for practitioners. Alcohol use among youth ranges from nondrinkers to those who meet criteria for severe AUD. Determining which youth may be at risk for the development of an AUD in the future can also be challenging. The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* was published in May 2013 and presents a new diagnostic categorization and labeling of substance use disorders and AUDs.¹⁵ The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* describes substance-related disorders on a severity continuum (substance use disorder and substance-induced disorders). Discussion continues as to the applicability of these diagnostic criteria to youth.¹⁶ Concern exists that use by a youth at risk may not hit threshold criteria for a diagnosable disorder, and the youth may not receive appropriate interventions, although that use may be problematic

and pose significant consequences, medically and psychosocially.

HAZARDS ASSOCIATED WITH USE OF ALCOHOL

Despite legislation such as setting a minimum age for purchase of alcohol at 21 years, youth continue to access and consume alcohol readily. Because alcohol could impact ongoing brain development, the National Institute on Alcohol Abuse and Alcoholism recommends no alcohol use before the age of 21 years.¹⁷ The majority of those diagnosed with an AUD began drinking by the age of 18 years.¹⁸ Heavy drinking during adolescence is associated with heavy drinking during young adulthood.¹⁹ Underage drinking is also associated with an increased risk of depression, anxiety, sleep disturbance, self-injuries, and suicidal behavior and greater involvement in other risky behaviors such as high-risk sexual behavior and criminal behavior.^{14,18}

Use of alcohol during adolescence can have a negative impact on school attendance and performance.²⁰

Motor vehicle crashes remain the leading cause of death for youth 16 to 20 years of age.²¹ In 2016, 39% of alcohol-impaired drivers involved in fatal motor vehicle collisions were 16 to 24 years of age.²² Data from the 2017 national Youth Risk Behavior Surveillance of youth in grades 9 through 12 reveal that during the 30 days before survey administration, 16.5% of students had ridden in a vehicle at least once with a driver who had been drinking alcohol; of those students who drove a vehicle during the 30 days before survey administration, 5.5% drove when they had been consuming alcohol.¹³

Legislation targeting the legal age for the purchase of alcohol and graduated driving laws have had a positive impact on the morbidity associated with youth alcohol consumption. Since the establishment of 21 years as the minimum purchase

age for alcohol in the United States, there has been a significant reduction in highway deaths.²³ Graduated driver licensing laws in the United States have resulted in reduced crash rates for those 16 to 17 years of age.²¹ Examination of data from New Zealand after its 1999 decision to decrease the minimum purchase age for alcohol from 20 to 18 years reveals concerning shifts. These shifts include higher rates of drinking in 16- to 19-year-olds, increased quantities of alcohol consumption among 16- to 17-year-olds, and an increase in alcohol-related problems among 16- to 19-year-olds.²⁴ Examination of alcohol policy in the United States highlights an association between stricter policy and a reduction in alcohol-related motor vehicle crash mortality in youth.²⁵

NEUROBIOLOGY OF ADOLESCENT DEVELOPMENT AND THE IMPACT OF ALCOHOL

The neurobiological and developmental hazards of alcohol use are significant. It is well established that brain development continues well into early adulthood.²⁶ The prefrontal cortex, which is important in executive decision-making and impulse control, is not fully developed until 21 to 25 years of age.²⁷ In comparison, the areas of the brain involved in reward and sensation seeking develop earlier. Of note, adolescents who display traits of novelty seeking and poor impulse control are at greater risk of developing substance use disorders.²⁸ The neuroadaptation associated with addiction also affects the developing prefrontal cortex and executive functioning processes.²⁸ Several studies suggest that exposure to alcohol may impair synaptic maturation in the adolescent brain.²⁹ Hippocampal volumes have been found to be smaller in teenagers reporting heavy alcohol use.³⁰ Neurocognitive deficits in the domains of attention, information

processing, memory, and executive functioning have been identified in those adolescents using alcohol compared with controls not using substances.^{31,32} Furthermore, adolescence is a time when signs and symptoms of mental illness may first emerge. It is important to note that many of these studies are correlational and that true causal relationships between alcohol and observed brain effects have not been fully established.

FACTORS THAT CONTRIBUTE TO HAZARDOUS USE

Genetics, epigenetics, and environmental and social factors are each cited as influencing an individual's behaviors concerning alcohol use. Early onset of drinking and heavy drinking in adolescence increase the risk of problematic drinking in adulthood; reasons for this vulnerability include genetic and neurobiological factors.³³ A study by Chorlian et al³⁴ revealed that variants in the cholinergic M2 receptor gene appear to increase the risk of developing an AUD 2 years after initiation of regular alcohol use (before the age of 16 years).

A youth's environment, particularly parental and peer modeling, can affect his or her alcohol use.^{35,36} Alcohol use among vulnerable populations is of particular concern. Homeless youth are at higher risk for substance use.³⁷ Lesbian, gay, bisexual, and transgender adolescents, a population at greater risk of depression and suicidality,³⁸ are at increased risk for alcohol use.³⁹ Adolescents report drinking more when they are exposed to parents who appear tolerant of underage drinking.⁴⁰ However, environment can play a protective role for youth; for example, clear parental disapproval of underage alcohol consumption⁴¹ and a teenager's close alliance to parents and family can be protective factors against adolescent alcohol use.⁴²

The youth's environment also includes his or her exposure to passive and active alcohol marketing on a variety of social media platforms, such as YouTube, Twitter, Instagram, and Facebook.^{43,44} It is difficult to capture exact demographic data from social media platforms, and the presence of alcohol brand marketing has increased in these settings over the past several years.⁴⁵ These newer venues fall outside the purview of regulation by the Federal Trade Commission. Advertisement of alcohol products can significantly influence first use of alcohol and consumption patterns in adolescents.⁴⁶ Researchers have identified associations between ownership of alcohol-branded merchandise and alcohol use by adolescents.⁴⁶

Newer types and formulations of alcohol-containing products are constantly being introduced into consumer markets. These products include but are not limited to alcoholic gelatin shots and pops; fruit-flavored alcohol beverages, such as fruit-flavored beers; caffeinated alcohol drinks; devices to vape alcohol; and powdered alcohol. Devices that allow for the vaping of alcohol can be ordered online, and do-it-yourself online video instructions are available as well. Alcohol is also contained in some of the e-liquids in e-cigarettes; some of these liquid products have contents modified to increase the amount of alcohol.⁴⁷ In March 2015, the Alcohol and Tobacco Tax and Trade Bureau approved the sale of powdered alcohol (eg, marketed by the brand name Palcohol). One packet of freeze-dried alcohol is designed to be added to 6 oz of liquid, making a drink that is 10% alcohol by volume.⁴⁸ State legislation has responded to the approval of powdered alcohol for sale. More than half of the states have preemptively banned the sale of powdered alcohol. Federal legislation has also been proposed to prohibit

powdered alcohol nationwide (Senate bill S. 728, 114th Congress).

These newer forms of alcohol products are highly appealing to younger consumers and may lead to greater amounts of alcohol consumption. Studies have revealed that underage drinkers who consumed flavored alcoholic beverages, as well as those who consumed caffeinated alcoholic beverages, consumed more alcohol in one sitting, drank on more days each month, and were more likely to binge drink.^{49,50}

ROLE OF THE PEDIATRICIAN

The pediatrician can play an important role in reducing the morbidity and mortality associated with adolescent alcohol use. Anticipatory guidance with regard to alcohol use is recommended as a routine part of care for youth and their families, as outlined in the AAP's *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents*.⁵¹

The AAP published a policy statement and clinical report on the practice of substance use screening, brief intervention, and referral to treatment.^{52,53} In addition, the AAP published a clinical report on binge drinking.¹² The Substance Abuse and Mental Health Services Administration devotes considerable resources to the promotion of screening, brief intervention, and referral to treatment as a standard for universal screening in the primary care setting.⁵⁴ Although the availability of treatment facilities for adolescents is limited, it is nonetheless vital to refer adolescents to treatment services for early intervention and treatment.

Pediatricians can continue to support advocacy efforts to strengthen policy that protects youth from both individual and societal impacts of alcohol use. It would be prudent for pediatricians to support continued

research into the understanding of adolescent and brain developmental, the impact of alcohol use on adolescent health, and the role of comorbid mental illness and risk-taking behaviors. This research includes important national efforts such as the Longitudinal Study of Adolescent Brain and Cognitive Development, supported by the National Institutes of Health.⁵⁵

RECOMMENDATIONS

The AAP supports the following:

1. Sending a clear message against the use of alcohol by adolescents and young adults under the age of 21 years.
2. Existing state laws that dictate a minimum purchase age of 21 years for alcohol.
3. Existing state laws granting graduated driver licensing over the course of adolescence, in addition to best practices for screening and intervention when there is concern for potential alcohol use by teenage drivers.
4. Advocacy for continued research on the impact of alcohol use on the developing brain.
5. Continued work for evidence-based policy to target social media in addition to traditional marketing of alcohol to youth.
6. Advocacy for taxes on alcohol products.
7. Continued support for the role of schools in providing general health education, community programming, and focused screening and education regarding alcohol use.
8. State legislation to ban the sale and distribution of powdered alcohol and upholding existing state legislation.
9. Continued awareness, knowledge, and skill development so that pediatricians screen for alcohol use, implement brief

interventions targeting use, and provide education to adolescents and their families about hazards, consequences, and interventions around alcohol use.

10. Pediatricians' support for increased investment in treatment services for adolescents and young adults that target substance use disorders.

RESOURCES

Bright Futures: Guidelines for health supervision of infants, children, and adolescents. Available at: brightfutures.aap.org.

National Institute on Alcohol Abuse and Alcoholism. Alcohol screening and brief intervention for youth: a practitioner's guide. Available at: www.niaaa.nih.gov/YouthGuide.

Substance Abuse and Mental Health Service Administration. Talk. They hear you. Available at: www.samhsa.gov/underage-drinking.

American Academy of Pediatrics. Brief intervention to address substance use. Available at: www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Mental-Health/Pages/substance-use.aspx.

The Guide to Community Preventive Services. Preventing excessive alcohol consumption. Available at: www.thecommunityguide.org/alcohol.

US Preventive Services Task Force. Alcohol misuse: screening and behavioral counseling interventions in primary care. Available at: www.uspreventiveservicestaskforce.org/uspstf/uspdrin.htm.

National Institute on Alcohol Abuse and Alcoholism. Make a difference: talk to your child about alcohol. Available at: https://pubs.niaaa.nih.gov/publications/MakeADiff_HTML/makediff.htm.

HealthyChildren.org. Official consumer web site of the AAP. Substance use. Available at: www.healthychildren.org/English/ages-stages/teen/substance-abuse.

www.healthychildren.org/English/ages-stages/teen/substance-abuse.

Substance Abuse and Mental Health Service Administration. National registry of evidence-based programs and practices. Available at: <https://www.samhsa.gov/nrepp>.

Substance Abuse and Mental Health Services Administration. Talking with your college-bound young adult about alcohol. Available at: <https://store.samhsa.gov/shin/content/SMA15-4897/SMA15-4897.pdf>.

American Academy of Pediatrics. Substance use coding fact sheet for primary care pediatrics. Available at: https://www.aap.org/en-us/Documents/coding_factsheet_substance_use.pdf.

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ABBREVIATIONS

AAP: American Academy of Pediatrics
AUD: alcohol use disorder

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