

# FRONTLINES

linking alcohol services research & practice

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## Young People and Alcohol Disorders: Prevention and Treatment

By Mark Willenbring, M.D., National Institute of Alcohol Abuse and Alcoholism, Division of Treatment and Recovery Research

Only recently have we begun to realize that heavy drinking and alcohol use disorders start early in life. Although the age of first drink has decreased some in recent decades, for most people, heavy drinking starts in adolescence and early adulthood. Early research and clinical work have focused on alcohol dependence in middle age.

### A Developmental Context

Several recent trends have increased recognition of the developmental context for alcohol use disorders. First, large epidemiologic studies such as the National Epidemiological Study on Alcohol and Related Conditions (NESARC), have confirmed that most alcohol use disorders start in adolescence, with prevalence of alcohol dependence peaking between the ages of 18 and 20 years.<sup>1</sup> An important, unexpected finding from the NESARC study was that many young people who develop alcohol-related symptoms are able to resolve them without accessing either specialty alcohol treatment or mutual help groups such as Alcoholics Anonymous.

Second, the pathways to various substance use disorders and to mental disorders have much in common. Mental disorders in childhood are among the strongest predictors of developing substance use disorders in adolescence.<sup>2</sup> Environmental factors that increase the risk of both substance use and mental disorders are similar and include childhood trauma and deprivation,

parental ineffectiveness, deviance of peer groups, and low religious involvement.<sup>3</sup>

A third trend has been a policy focus on reducing alcohol-related harms among youth. Community groups have formed important coalitions with alcohol researchers to advocate successfully for an increase in the legal drinking age, increased penalties for drunk driving in underage drinkers, graduated driving licenses, and better enforcement of laws regulating sales to minors. Current efforts to reduce episodic heavy drinking among youth have not yielded significant change, but change may take more time than these efforts allotted. One effect of these efforts has been increased study and understanding of alcohol use in young adults.

### Implications for Prevention and Treatment

What are the implications of this new understanding of heavy drinking and alcohol use disorders? One implication for prevention is that more attention might be paid to targeted interventions for high-risk children. Given the substantial elevations in risk associated with family history of alcohol dependence and with mental disorders in childhood, development and implementation of targeted strategies to reduce risk in these groups may be effective as well as cost-effective. Treatment of mental disorders in children is a potentially effective strategy to prevent substance use disorders in adolescence.

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There are important implications for treatment as well. The goals of treatment interventions in youth who have developed alcohol-related problems are to reduce the severity and number of problems, reduce the time to remission in those who relapse, decrease the proportion of youth who develop chronic alcohol dependence, and provide intensive services and disease management for those who do develop chronic dependence.

Large numbers of adolescents and young adults who develop alcohol-related problems have milder, self-limiting forms of this illness and are unlikely to seek help in specialty alcohol programs. Widespread deployment of inexpensive, accessible interventions designed to educate young drinkers would raise awareness of at-risk drinking and alcohol-related problems, provide support and assistance in self-change, and might provide substantial benefit at relatively low cost. Recent research investigating

brief motivational and Internet-based interventions aimed at college students provides initial support for their effectiveness.<sup>4</sup>

The specific type and intensity of services should ideally be matched to type and severity of problems in the individuals and families needing them. Brief intervention and short-term counseling should be widely available and reasonably priced. For youth with severe dependence, serious co-existing disorders, or poor social support, services need to be comprehensive, coordinated, and accessible. A particularly pressing need is for identification of effective interventions for youth involved with the criminal justice system, large numbers of whom have mental and substance use disorders.

Recent progress in understanding the natural history of alcohol use disorders provides an opportunity to develop more effective and cost-effective systems of prevention

and care. The research, policy, and clinical communities must now work to develop, implement, refine, and evaluate a new system built upon this empirical base. ■

#### References

- 1 Grant, B.F. et al. "The 12-Month Prevalence and Trends in DSM-IV Alcohol Abuse and Dependence: United States, 1991-1992 and 2001-2002," *Drug and Alcohol Dependence*, Vol. 74, No. 3, pp. 223-34.
- 2 Clark, D.B. "The Natural History of Adolescent Alcohol Use Disorders," *Addiction*, Vol. 99, No. s2, November 2004, pp. 5-22.
- 3 Belcher, H.M.E. and H.E. Shinitzky. "Substance Abuse in Children: Prediction, Protection, and Prevention," *Archives of Pediatrics and Adolescent Medicine*, Vol. 152, No. 10, 1998, pp. 952-60.
- 4 Monti, P.M. et al. "Drinking Among Young Adults: Screening, Brief Intervention, and Outcome," *Alcohol Research & Health*, Vol. 28, No. 4, 2004/2005, pp. 236-44.

## Editor's Note

Drinking by youth and young adults is a serious and far-reaching problem. Yet only recently have researchers focused attention on prevention and treatment aimed specifically at adolescence and early adulthood. In this issue of *Frontlines*, our authors take a close look at trends in underage drinking, the environmental and genetic factors that contribute to this phenomenon, and examples of community and policy strategies to address this growing crisis.

Mark Willenbring of the National Institute of Alcohol Abuse and Alcoholism (NIAAA) sets the stage by describing growing research evidence that provides a developmental framework for early alcohol use disorders. As he points out, only recently has awareness grown that these disorders start early in life. This new understanding offers an important opportunity to develop more effective treatment and prevention efforts, especially for high-risk children. In her article, Jamie Chiqui provides an overview of community and environmental strategies designed to prevent underage drinking. She reminds us that drinking by youth and young adults takes place within a community system. Prevention efforts must target not only alcohol vendors, but also involve schools and community organizations, and, of course, families.

Laura Burney Nissen describes the efforts of Reclaiming Futures, a new approach to helping teenagers caught in the cycle of drugs, alcohol, and crime. Reclaiming Futures promotes new opportunities and standards of care in juvenile justice by bringing communities together to improve alcohol and other drug treatment. In his article, Duncan Clark explains the role that genetic and environmental factors play in susceptibility to underage drinking. And, Sandra Brown makes an important link between pre-treatment characteristics of young adults, and clinical treatment and outcomes.

Finally, Vivian Faden reports that the majority of 12th and 10th graders, and more than two-fifths of eighth graders have consumed alcohol at some point. This recent data from the 2005 Monitoring the Future survey sounds the alarm and further encourages a developmental approach to preventing and treating underage drinking.

We hope you find this issue of *Frontlines* to be a valuable source of information on the latest research and thinking about drinking among youth and young adults.

## Response to Commentary

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# Community and Environmental Strategies to Prevent Underage Drinking

By Jamie F. Chiqui, M.H.S., Ph.D., Center for Health Policy and Legislative Analysis, The MayaTech Corporation

A number of environmental strategies have been developed to prevent drinking by youth and young adults, including community-based and policy approaches. The common thread among these strategies is the goal of changing the *environment* within which youth and young adults consume alcohol as opposed to changing their individual drinking behaviors. Environmental strategies approach underage drinking from the perspective that the consequences of such drinking are far-reaching and affect not just family and friends, but also the neighborhood, school environment, and broader community.

### Community-Based Approaches

A community is, essentially, part of a broader ecological system that includes the individual; alcohol vendors; social events where alcohol may be sold or served; state, local, and institutional policies and their enforcement; schools; extracurricular and social organizations; and the family. Coordinated and comprehensive community strategies that mobilize participants to make both structural and systemic changes often focus on reducing the supply of alcohol rather than on individual behavior changes.<sup>1</sup>

NIAAA's Governors' spouses' initiative, Leadership to Keep Children Alcohol-Free, reflects one community-based approach designed to prevent alcohol initiation and use by children. The initiative aims to: educate the public about the incidence and impact of early alcohol use by children ages nine to 15; mobilize the public to address these issues within their families, schools, and communities; focus state and national policy makers' attention on the seriousness of early onset alcohol use; and make the prevention of alcohol use by children a national priority.

Other proven community-based approaches include responsible beverage service (RBS) programs and compliance check programs. RBS programs seek to hold merchants accountable for violating state and local laws that prohibit sale of alcoholic beverages to persons under age 21. Compliance check programs attempt to have a minor purchase alcohol under law enforcement supervision. If a minor is sold or served alcohol during the compliance check, the seller and/or license holder may be subject to penalties.

### Policy Approaches

Public and institutional policies also influence youth and young adults' drinking behaviors. Relevant policies have been enacted at the Federal, state, and local levels and, more recently, on college campuses. For example, numerous studies have documented the effectiveness of *minimum legal drinking age* (MLDA) laws in reducing alcohol consumption, traffic crashes, and fatalities among youth under age 21; however, without proper enforcement the effects of these laws may be limited. As a possible MLDA law enforcement strategy, some states and communities have enacted "use or lose" laws whereby minors' drivers' licenses will be suspended or revoked if the minor possesses, consumes, or purchases alcohol.

Raising the price of alcohol also has been well-documented as an effective strategy for reducing underage alcohol consumption. Research has demonstrated youths' and young adults' price sensitivity and, as a result, their consumption of alcohol decreases as the price of alcohol increases.<sup>2</sup>

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“Environmental strategies approach underage drinking from the perspective that the consequences of such drinking are far-reaching and affect not just family and friends, but also the neighborhood, school environment, and broader community.”

## Perspective

# Helping Teens in Trouble with Alcohol and Other Drugs, and Crime

by Laura Burney Nissen, Ph.D., M.S.W., *Reclaiming Futures*

There are more than two million teens in the juvenile justice system in the United States, and as many as two-thirds have alcohol and other drug use problems. Yet most juvenile justice systems do not have effective ways to help these young people. In many cases, when teens are arrested, their alcohol and other drug issues go undetected.

Even if a problem is discovered, fewer than half the detention facilities in the U.S. offer drug and alcohol treatment—in spite of research that shows teens with substance abuse problems are more likely to get in trouble with the law. The treatment services that do exist often are not designed to address the unique challenges teenagers face. In the end, many young people end up back on the street, still using alcohol and other drugs and still committing crimes, only to end up in the system again.

This is a serious and costly problem. Putting a young person in jail costs more than \$40,000 a year. Giving a teen treatment for alcohol and other drugs, however, costs as little as \$3,000 per year.

### A Six-Step Solution

The Robert Wood Johnson Foundation has provided grants to 10 communities across the nation to help teenagers break the cycle of crime and drug abuse by implementing the “Reclaiming Futures” model. This model, a combination of system reforms, treatment improvement, and community engagement, involves six steps.

First, teens entering the justice system are *screened* for substance abuse problems. If the screening indicates a problem, the teen goes on to the second step in the process—

a *full assessment*. A validated, strength-based assessment tool measures use of alcohol and other drugs and examines individual and family strengths and risk factors.

Third, a *care plan* is developed by a team that links the juvenile justice system with the provider community. The team typically includes the youth, family members, justice and treatment professionals, and a community member. The family-driven plan combines evidence-based alcohol and other drug treatment with community support such as mentors, school, employment, and recreational activities.

Fourth, drug and alcohol treatment *service begins*—at least within 14 days of assessment, according to best practices. The team then makes certain that the youth and family enter into the fifth step of the program which is to become engaged in services within 30 days of assessment.

The final and sixth step is *completion*. As the care team ensures the plan is fully in place, agency-based services are gradually withdrawn. The teen and family become more engaged in community-based relationships and activities that support the teen in a clean and sober lifestyle.

Before Reclaiming Futures implemented these six steps in the 10 communities around the nation, the majority of treatment offered was oriented to adults. Reclaiming Futures has established adolescent-oriented treatment methods. While all 10 Reclaiming Futures sites follow the six steps, they are implementing the model in unique ways. The New Hampshire site provides teens with comprehensive care plans and monitors them weekly. Dayton, Ohio provides special training to mentors who work with Reclaiming

Futures teens. Marquette, Michigan, and rural Kentucky have teens helping others find positive alternatives to drug and alcohol use.

As important as it is for kids to get treated, involvement in community activities is equally important. While treatment and justice are short-term solutions, enhancing these youths’ sense of community is the long term solution.

### Early Results

Every six months, the Urban Institute surveys individuals involved in the juvenile justice system in the 10 Reclaiming Futures communities. The surveys measure 13 indices of system effectiveness. Over the past two years, performance has increased in all 10 communities for 12 of the 13 indices, ranging from family involvement and agency collaboration, to alcohol and drug assessment and cultural integration.

Teens around the nation are turning their lives around with the help of Reclaiming Futures. Cheyenne, 15, of Dayton, Ohio says when she started with Reclaiming Futures, she smoked marijuana “all day, every day” and skipped school. Now, after working with her mentor, she says “I look at myself and like who I am. I don’t use drugs anymore. I feel smarter. I respect myself.”

Keenan, 14, landed in juvenile detention in Portland, Oregon on multiple theft and motor vehicle-related charges. Reclaiming Futures Multnomah Embrace got help for his entire family. His mother, Lori, says, “We got a second chance to be stable again.”

Any community can help teens reclaim their lives, reduce crime, increase public safety, and build healthier neighborhoods. The Robert Wood Johnson Foundation is committed to sharing the Reclaiming Futures approach and lessons learned from this model. To learn more, please visit [www.reclaimingfutures.org](http://www.reclaimingfutures.org). ■

## Research Highlight

### NIAAA/CSAT Joint Research & Dissemination Program

In 1998, the Center for Substance Abuse Treatment (CSAT) in the Substance Abuse and Mental Health Services Administration (SAMHSA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) signed an Inter-Agency Agreement to fund jointly a research program on "Treatment for Adolescent Alcohol Abuse and Alcoholism." These agencies then issued a joint Request for Applications (RFA) to invite applications on adolescent substance abuse treatment research. At the time, little efficacy or effectiveness research was available to guide treatment of adolescent alcohol problems. The RFA sought to develop a knowledge base on the efficacy of adolescent treatments for substance abuse problems. The joint program funded 14 grants. Ten of these grants were clinical studies and four were questionnaire and model development projects.

These projects provided opportunities to identify potentially effective approaches for treating adolescent alcohol and drug abuse and dependence. The projects examined the effectiveness of a range of approaches, including family therapy, cognitive behavioral therapy, brief motivational enhancement therapy, and guided self-change. These therapies targeted a diverse group of adolescents, including high school students, juvenile delinquents, street youth, and Hispanic, African American, and Native American youth.

Under their Inter-Agency Agreement, NIAAA and CSAT are currently working together to develop dissemination strategies that would foster interactions and collaborations between adolescent treatment researchers and practitioners. One project will conduct a meta-analysis of the substance abuse adolescent treatment research literature. Once completed, effectiveness of the NIAAA/CSAT jointly funded clinical trials will be evaluated in this broader context.

## Children at High Risk for Underage Drinking and Alcohol Use Disorders

By Duncan B. Clark, M.D., Ph.D., University of Pittsburgh

Understanding developmentally specific risks for underage drinking and alcohol use disorders (AUDs) provides an important foundation for improving prevention efforts among at-risk children. Alcohol use is a complex, dynamic, and multifaceted behavior influenced by a wide range of genetic and environmental factors. In the past, researchers have defined high-risk children as those with a family history of alcohol use disorders (i.e., "children of alcoholics"). Today, advances in etiology research have led to a more refined understanding of risks, particularly among pre-adolescent school age children. These risks include genetic or heritable characteristics, environmental influences, and predictive phenotypes.

### Genetic Risk Plays Role

Heritable or genetic risk accounts for a substantial proportion of the variation in AUDs. Multiple genes influence alcohol initiation, metabolism, and reinforcing properties in different ways:

- Researchers have documented genetic variations in the enzymes involved in alcohol metabolism; these variations influence individual susceptibility to AUDs;
- Childhood psychopathology dimensions that predict later development of AUDs likely have a component of heritable transmission; and
- Insights into the neurochemical effects of alcohol consumption have led to searches for genes that influence functional variation in neurotransmitter systems.

Researchers also believe that dopamine, serotonin, GABA, and glutamine are particularly relevant.<sup>1</sup> These and other neuro-

transmitter systems are thought to be the neurobiological substrate of psychopathology, influencing an individual's responses to alcohol and other drugs. The identification of specific molecular-level genetic risks has not yet reached the point where targeted prevention and treatment methods are feasible. At this time, family history of AUDs still provides the foundation for estimating genetic risks in individuals.

### Environmental Factors Hold Influence

While research has shown that genetic variation has a major role in susceptibility to AUDs, in fact, environmental factors may have a greater influence on the onset age of underage drinking. In addition to representing a heritable risk, on-going parental AUDs contribute to environmental risk. Parental AUDs have been found to influence several important environmental factors during childhood. Parents with AUDs model problematic alcohol use.

Global family functioning, the parent-child relationship, and parenting practices are among the most important influences on child development; all these factors are adversely affected by the presence of parental AUDs. The mistreatment of children, including sexual abuse, physical abuse, and neglect, may also lead to childhood psychopathology and later to AUDs.

Childhood forms of psychopathology found predictive of underage drinking and AUDs include conduct disorder, attention deficit hyperactivity disorder, mood disorders, and some anxiety disorders. These characteristics cluster in high-risk children and indi-

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## Research Highlight

# Treated Adolescents' Trajectories of Substance Involvement Through Young Adulthood

By Sandra A. Brown, Ph.D., University of California, San Diego, and the Veterans Affairs San Diego Healthcare System, Tammy Chung, Ph.D. and Christopher S. Martin, Ph.D., University of Pittsburgh Medical Center, and Ken C. Winters, Ph.D., University of Minnesota

Addictions treatment for adolescents commonly promotes the goal of abstinence from substance use. From this perspective, treatment outcomes have traditionally been evaluated by rates of relapse or percent days abstinent. These indicators of treatment outcome have limitations, however, because they tell us little about the severity or pattern of substance use following treatment. Fluctuations across adolescents over time and variability in substance use following treatment suggest that identifying common longitudinal patterns or trajectories will clarify the influence of developmental transitions (e.g., high school graduation) and environmental changes (e.g., peer substance use) on substance involvement.

### Identifying Post-Treatment Trajectories

An increasingly popular method of identifying prototypical post-treatment trajectories of substance use involves applying statistical clustering methods to longitudinal data. These analyses can identify the most common, distinct trajectories and determine predictors and psychosocial outcomes associated with longitudinal patterns of substance use. Once the prevalent trajectories have been identified, youths are assigned to the trajectory most similar to their own pattern of substance use. By identifying distinct post-treatment trajectories, researchers can examine the influence of developmental factors and environmental changes on substance use over time.

Longitudinal studies of adolescents have identified a remarkable degree of similarity in the trajectories of substance use follow-

ing treatment, particularly as teens transition into young adulthood.<sup>1,2</sup> These cross-study similarities emerged despite regional differences in study location, type of substance examined (e.g., alcohol, marijuana, other drugs), and nature of substance involvement. The post-treatment trajectories most commonly identified include stable abstinence, infrequent use, gradually decreasing substance involvement (slow improvers), and persistent high substance involvement. Some studies identified another trajectory, delayed deterioration. This trajectory is characterized by initial post treatment improvement followed by a delayed return to substance involvement.

The trajectories illustrate common substance use pathways of treated adolescents, and the rates and patterns of changes in substance use over time. The trajectories also offer a framework from which pre-treatment characteristics, developmental transitions, and differences in other young adult outcomes can be explored. Pre-treatment characteristics associated with distinct trajectories have implications for the type and timing of interventions that may be most effective for certain adolescents. For example, behavior problems and Attention Deficit Hyperactivity Disorder consistently predicted a trajectory of persistent high substance involvement. This finding highlights the need to address both substance use and co-occurring psychopathology in these high-risk adolescents.

### Linking Trajectories With Interventions

Readiness to change substance use behavior during treatment was associated with

the most improvement (e.g., abstainer and infrequent use trajectories). This finding underscores the importance of motivational interventions in fostering long term treatment gains. For adolescents in a delayed deterioration trajectory, certain developmental transitions (e.g., move to independent living) appear to trigger a return to problematic substance involvement. This finding highlights the potential benefit of preventive interventions that prepare youth to manage these challenging life changes.

As may be expected, teens in stable abstinence and infrequent substance use trajectories had better emotional, interpersonal, and family functioning in young adulthood compared to those with chronic heavy substance involvement. Trajectory analyses also revealed that the largest shifts in post-treatment substance involvement occurred between ages 17 and 19, when most teens negotiate major role and environmental shifts in the transition to young adulthood.

Treated adolescents' substance use trajectories capture diverse patterns of change from mid-to late adolescence and into young adulthood. The trajectories link clinical course with pre-treatment characteristics and young adult outcomes, and can be used to tailor interventions to meet youth needs. Most importantly, trajectory patterns provide a framework for researchers and practitioners to understand the influences of developmental transitions and social and environmental changes on substance use as youth grow into young adults. ■

### References

- 1 Brown, S.A. et al. "Four-Year Outcomes from Adolescent Alcohol and Drug Treatment," *Journal of Studies on Alcohol*, Vol. 62, 2001, pp. 381-8.
- 2 Chung, T. et al. "Course of Alcohol Problems in Treated Adolescents," *Alcoholism: Clinical and Experimental Research*, Vol. 27, No. 2, 2003, pp. 253-61.

Other policy approaches include reducing underage access to alcohol. Such strategies include laws aimed at holding adult *social hosts* criminally liable for underage drinking on any property that they own, lease, or otherwise control. *Keg registration* policies enable law enforcement to hold adult purchasers liable for underage drinking by tracking the keg to the identification information obtained at the time of sale. The effectiveness of these strategies, however, has not been well documented.

In recent years, a number of college campuses have adopted and implemented policies to prevent underage access to alcohol. Many of these strategies reflect recommen-

dations presented in the 2002 report prepared by the NIAAA-supported Task Force on College Drinking. These policies include requiring alcohol-free campuses and dormitories, requiring clerk intervention and/or prohibiting self-service to alcohol while at campus events, prohibiting alcohol marketing and sales on campus, and banning kegs on campus. Additional longitudinal research is needed to determine how changes in college policies affect students' drinking behaviors and alcohol-related problems.<sup>3</sup>

While not a comprehensive review of all known environmental strategies targeted at youth and young adults, this article highlights some strategies that have been

employed to date. Readers are encouraged to consult the references for more information about the success of these strategies. ■

### References

- 1 Treno A.J. and J.P. Lee. "Approaching Alcohol Problems Through Local Environmental Interventions," *Alcohol Research & Health*, Vol. 26, No. 1, 2002, pp. 35-40.
- 2 Chaloupka F.J. et al. "The Effects of Price on Alcohol Consumption and Alcohol-Related Problems," *Alcohol Research & Health*, Vol. 26, No. 1, 2002, pp. 22-34.
- 3 Wagenaar A.C. et al. "Environmental Influences on Young Adult Drinking," *Alcohol Research & Health*, Vol. 28, No. 4, 2004/2005, pp. 230-35.

## Underage Drinking

By Vivian B. Faden, Ph.D., Division of Epidemiology and Prevention Research, National Institute on Alcohol Abuse and Alcoholism

### A Serious and Widespread Problem

Alcohol is the drug of choice among youth. Data from the 2005 Monitoring the Future (MTF), an annual survey of U.S. youth, show that more than three-fourths of 12th graders, nearly two-thirds of 10th graders, and more than two-fifths of eighth-graders have consumed alcohol at some point in their lives. And when young people drink, they tend to drink heavily. Underage drinkers consume on average four to five drinks per occasion about five times a month. By comparison, adult drinkers ages 26 and older consume on average two-to-three drinks per occasion about nine times a month.

A particularly worrisome aspect of underage drinking is the high prevalence of heavy episodic drinking, defined as drinking five or more drinks in a row in the past two weeks. MTF data show that more than 10 percent of eighth-graders, 20 percent of 10th graders, and 25 percent of 12th graders engage in heavy episodic drinking. Underage drinking can result in a range of adverse consequences, including academic and social problems; physical problems such as hangovers or illnesses; unwanted, unintended, and unprotected sexual activity; physical and sexual assault; memory problems; increased risk of suicide and homicide; and alcohol-related car crashes and other unintentional injuries.

### Underage Drinking and Development

Pervasive drinking by youth and the emergence of alcohol misuse and dependence in late adolescence are inextricably connected with developmental processes. Significant changes occur in the body during adolescence, including rapid hormonal alterations and the formation

of new neural networks in the brain. Adolescence is also a time for trying new experiences and activities that emphasize socializing with peers and conforming to peer-group standards. These new activities may place young people at particular risk for initiating and continuing alcohol consumption. Exposing the brain to alcohol during this period may interfere with important developmental processes and possibly result in short- and/or long-term cognitive impairment.

In NIAAA's National Longitudinal Alcohol Epidemiologic Survey, a nationally representative general population survey, people who reported starting to drink before the age of 15 were four times more likely also to report meeting the DSM criteria for dependence at some point in their lives. Furthermore, information from NIAAA's National Epidemiologic Survey of Alcohol Related Conditions indicates that the prevalence of alcohol dependence peaks between the ages of 18 and 25.

### Genetic and Environmental Factors

It is not clear whether starting to drink at an early age actually causes alcohol dependence or whether it simply indicates an existing vulnerability to alcohol use disorders. Some evidence indicates that genetic, physiologic, and psychological factors may contribute to the relationship between early drinking and subsequent alcoholism. Environmental factors may also be involved, especially in alcoholic families, where children may start drinking earlier because of easier access to alcohol at home, family acceptance of drinking, and lack of parental monitoring.

A developmental approach will be necessary to understand better the scientific basis of these phenomena, and to prevent and treat successfully the causes, problems, and consequences associated with underage drinking. As the lead Federal agency supporting and conducting basic and applied research on alcohol problems, NIAAA is therefore spearheading a developmentally focused program, the Initiative on Underage Drinking.

cate difficulties with psychological regulation. Deficiencies in behavioral, emotional, and cognitive regulation are transmitted from parent to child, result in childhood psychopathology, and contribute to AUDs.<sup>2</sup>

Compared with reference children, children at high risk for AUDs have been shown to have reduced amplitude of the P<sub>3</sub> component of the electrocortical response to stimuli presented in a laboratory context.<sup>3</sup> P<sub>3</sub> amplitude is thought to reflect novelty perception and ability to focus attention. Characteristics reflective of psychological dysregulation correlate with P<sub>3</sub> amplitude. Researchers have hypothesized that this neurophysiological phenotype results from genetic factors that predispose individuals to neurobiological deficits leading to psychological dysregulation and AUDs.

While alcohol use in children rarely progresses to AUDs prior to adolescence, the extent of, and developmental timing and context for, alcohol use in late childhood provide predictive information. Consuming small quantities of alcohol under parental supervision is culturally normative and does not predict problematic drinking outcomes. On the other hand, regularly consuming whole standard drink alcohol quantities in late childhood typically occurs in an unsupervised context and predicts adolescent-onset AUDs.

### Preventive Interventions Needed

By analyzing the full spectrum of childhood risks, researchers can quantify the risk of AUDs in children. Preventive interventions may target specific risk factors, such as treating AUDs in parents, promoting optimal parenting practices, preventing child maltreatment, improving psychological regulation, and limiting access to alcohol during childhood. Risk factors tend to cluster and classifying children by their overall risk levels has become feasible.<sup>4</sup> Prevention and treatment approaches are needed that take advantage of this knowledge base by targeting children according to specific risk characteristics and overall risk level. ■

### References

- 1 NIAAA, "Alcohol and Development in Youth: A Multidisciplinary Overview," *Alcohol Research & Health*, Vol. 28, No. 3, 2004/2005, pp. 105-76.
- 2 Clark D.B. and K.C. Winters, "Measuring Risks and Outcomes in Substance Use Disorders Prevention Research," *Journal of Consulting and Clinical Psychology*, Vol. 70, No. 6, 2002, pp. 1207-23.
- 3 NIAAA, 2005.
- 4 Clark D.B. et al. "Childhood Risk Categories for Adolescent Substance Involvement: A General Liability Typology," *Drug and Alcohol Dependence*, Vol. 77, 2005, pp. 13-21.

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