Strengthening the Role of Two Key Institutions in the Prevention of Adolescent Substance Abuse

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Adolescent substance use and its resulting harms are major concerns of parents, youth-serving professionals, policymakers, private philanthropies, and public health officials. Numerous prevention initiatives have been launched, yet use rates for cigarettes, marijuana, and other illicit drugs have risen during the last decade [1]. This paper argues that current prevention approaches could be improved by enlisting and providing tools to institutions that regularly serve children and youth. The role of these institutions would be to systematically identify children at high risk and to provide them with, or refer them to, appropriate prevention services. Institutions selected for consideration in this discussion include primary health care facilities and schools.

Early identification of at-risk youth is not a new concept, but it is one that has proven extraordinarily difficult to implement in institutional settings [2]. For scientists and practitioners, the goal of alcohol, tobacco, and other drug (ATOD) prevention is the avoidance of short- and long-term consequences related to substance abuse and addiction. To achieve this goal, programs can use a “universal” prevention approach, targeting the general population; a “selective” approach, targeting subgroups at risk; or an “indicated” approach, targeting persons who are already experimenting with drugs or who exhibit other risk-related behaviors [3–5]. Universal prevention approaches are most commonly used and include public awareness campaigns and school health curricula about substance abuse. This article, however, focuses on selective and indicated approaches to systematically identify and target more intensive ATOD prevention services for children and youth at highest risk of harm.

Recent research provides detailed information about risk indicators and their use in identifying at-risk children and preventing future problems from ATOD use [6,7]. This review begins with evidence about specific risk factors that predict substance abuse and addiction and how these risks or behaviors might be detected by institutions. Next, we will review how each system currently participates in early identification and prevention activities, the barriers that have limited the development of effective substance abuse screening and prevention programs, and examples of promising and effective programs. Finally, the authors provide recommendations for strengthening the role of health care systems and schools in prevention.

Identifying Children at Risk

Early Use

The strongest link to substance abuse in adolescence and dependence in adulthood is early initiation of
substance use [8–10]. Rates of lifetime alcohol dependence decline from more than 40% among individuals who started drinking at age 14 years or younger to about 10% among those who started drinking at age 20 years or older [11]. Rates of lifetime abuse decline from just over 11% among those who initiated use of alcohol at age 16 years or younger to approximately 4% among those whose onset of use was at age 20 years or older. Younger drinking also predicts alcohol misuse (binge drinking, drunk driving, and other related problems) at ages 17–18 years, with the youngest initiators experiencing the greatest number of problems [7]. Likewise, in studies of drug use, an earlier age of initiation is related to a greater level of later drug-related problems [8,10,12]. For example, children who progressed to the use of cocaine or crack had started using cigarettes, marijuana, or alcohol an average of 2 years earlier than peers who did not progress beyond these substances [13].

Tobacco Use

Tobacco has been defined as a “gateway drug” in that it is often the first substance used prior to initiation of drinking or illegal drug use. Among females, cigarette use precedes experimentation with marijuana, whereas among males, alcohol consistently precedes the use of marijuana [13]. Cigarette use among males is important, however, in progressing to other illegal substances. Among all youth, regardless of gender or race, use of cigarettes is highly correlated with concurrent use of other drugs [14]. This correlation is dose-dependent: high school students who reported smoking 1 or 2 days during the last month were 5 times as likely to report marijuana use as nonsmokers. Students who reported smoking cigarettes on all 30 days were 25 times as likely to report marijuana use [14].

Gender, Race, and Family

Male gender is a strong predictor of both early use and later abuse of alcohol. Other predictors of early use are: white race, poor family management practices, family conflict, low family and school bonding, parental drinking, and positive peer attitudes toward alcohol use [7]. Poor family management, family conflict, and low bonding to family and school are linked to psychosocial distress as well as to early substance use [15–17].

Mental Health and Behavior Problems

There is a clear association between substance use and mental health problems, although there is some controversy about the direction of this relationship. Retrospective epidemiologic research from the National Comorbidity Study found that mental health conditions preceded addictive disorders in 86% of cases and that both disorders usually occur first in adolescence [18]. A longitudinal study by Brook et al. [19], however, found no evidence that childhood mental disorders preceded substance abuse disorders. Rather, early substance use preceded adult psychiatric disorders. They noted, however, that mental health disorders and substance use may have a reciprocal relationship over time. Vulnerable adolescents with multiple risk factors (e.g., weak parent–child attachment, positive attitudes toward drinking, parental drinking) could have early mental health symptoms and distress that, although not severe enough to meet rigorous diagnostic criteria, could lead to substance use at an early age. As their substance use progresses, so too does their mental health impairment.

The 1996 National Household Surveys on Drug Abuse, which included questions on mental health, found that approximately 18% of males and 22% of females had evidence of clinically significant emotional (e.g., depression and anxiety) and behavioral (e.g., aggression and delinquency) problems [20]. Adolescents with high problem scores were more likely to have used cigarettes and marijuana or engaged in binge drinking than those with low problem scores. Rates of use were much higher (2 to 4 times) for those with behavioral problems. Among children without mental health problems, boys were more likely than girls to binge drink, smoke cigarettes, or use illicit drugs. However, girls with behavior problems were just as likely as boys with behavior problems to binge drink, smoke cigarettes, or use illicit drugs.

School Problems

Two other detectable characteristics closely linked both to psychosocial distress and to substance abuse are poor academic performance and truancy [15,17]. Recent school survey data showed that students who reported being truant or getting grades of mostly C’s or lower were as much as 5 times more likely to report marijuana use and were also much more likely to use tobacco and other drugs [21]. Truancy, in particular, is a strong predictor of substance use.
Professionals and staff in medical and school settings have a unique opportunity to identify children with risk factors. This can be done in several ways. First, they can systematically query children about their substance use behavior and risk factors. Second, they can assess parenting skills in families who present for pediatric care. Finally, they can identify students who are truant or who are poor academic achievers by regularly analyzing these data. In the following sections, each institution will be considered more specifically, including obstacles to effective substance abuse screening and examples of prevention programs that have been tested and found to be promising or effective.

**Primary Health Care Providers**

**Screening and Prevention Practice Patterns**

Regular checkups with a primary health care provider can be an important contact point for identifying and referring high-risk youth. All major medical professional societies recommend that clinicians include questions about substance abuse as a part of routine adolescent visits and that they discuss the dangers of drug use [22]; yet such screenings are uncommon. Only 28% of pediatricians and 23% of family practitioners report inquiring about drug use; 29% and 39%, respectively, report asking about alcohol use [23]. An exception was found in a sample of California physicians, who self-reported much higher rates (>65%) of ATOD and sexual activity screening [24]. These physicians, however, reported that they were more likely to screen for high blood pressure, a low prevalence condition, compared with ATOD use or sexual activity. Physicians were also significantly more likely to report screening older (ages 15–18 years) than younger (ages 11–14 years) adolescents, despite the fact that many risk factors are present during the younger age period [25,26].

Even when physicians ask about use, they are not likely to provide guidance. Fewer than 15% of all adolescent visits to office-based physician providers are for health supervision or preventive care. As many as 69% of visits do not include health counseling or guidance [27]. On average, clinicians spend less than 3 min counseling adolescents during preventive visits [28] and when psychosocial concerns are elicited, only a minority of physicians respond with helpful guidance [29].

There are several major barriers inhibiting the practice of effective screening and prevention services in primary care practice:

**Barrier #1: Lack of Tested Screening Tools**

Professional organizations have attempted to provide practitioners with a framework to thoroughly and effectively assess youth. For example, the Guidelines for Adolescent Preventive Services (GAPS) published 24 recommendations on adolescent health. The GAPS aim to improve “health care delivery to adolescents using primary and secondary interventions to prevent and reduce adolescent morbidity and mortality” [30]. Although the GAPS serve as guidelines to enhance screening for specific adolescent health risks, the manner in which screening is implemented is left to the physician’s discretion.

Two recent reviews have focused on the GAPS and its potential for effective screening and delivery of services [30,31]. Both reports indicate, although there is much room for improvement, the GAPS provide practitioners with a framework to competently and regularly assess youth. Montalto [30] recommends using the GAPS Health Service Record but states that for effective screenings to occur, there ought to be a concentrated effort in developing or utilizing a systematic screening protocol. Reviews of other available tools have found that they are not appropriate for primary care settings because of their length and their sole focus on alcohol, not drug, use [32].

One of the inherent problems of screening is instrument reliability and validity. A potential solution is the use of “multiple gating” [33,34]. Multiple gating is a stepwise screening process that increases screening resources and attention as a youth demonstrates increasing levels of risk. The first stage, or gate, is the least expensive and least intensive screening process. Early screens have broader criteria so as not to lose true positives; successive screens are more sensitive and comprehensive so as not to hold true negatives. As a result, youth at highest risk for abuse and addiction are most likely to receive prevention or intervention services [35]. Services can thus become more targeted and high levels of accountability in expenditures and resources are introduced.

In the medical setting, multiple gating is feasible when there is training and all members in the office share the responsibilities for preventive screening. Shared responsibilities for screening and multiple gating are crucial as physicians may not have time to screen all their patients; more intensive screenings could be undertaken with those who pass through the first or second gate. For youth at greatest risk, as indicated by the stepwise screening process, a referral to appropriate programs and clinics would be...
more plausible, given the attention to focused screening and the specialization of staff. Because many adolescents do not make routine visits to primary care physicians, initial screenings could also be done in emergency rooms, reproductive health centers, family planning clinics, and school-based health centers with indicated referrals to more intensive services.

A related issue to accurate identification and referral is patient confidentiality. Confidentiality is extremely important to adolescents in reporting risky behavior, and physicians are concerned about their ability to provide confidential services to youth [30,31]. Even with additional training, physicians are more apt to tell adolescents about the limits of confidentiality (i.e., information that would be disclosed to parents if necessary) than to assure them that they can discuss sensitive behavior confidentially [36].

Barrier #2: Lack of Knowledge, Skills, and Confidence

Many primary care clinicians avoid screening of adolescents because they lack the knowledge, skills, and confidence to respond appropriately. A Public Health Service policy report [37] concluded that substance abuse education and training for all levels of medical education is markedly deficient. Primary care providers who see adolescent patients have reported insufficient training as the greatest barrier to delivering preventive health care to adolescents [25].

Traditional training methods, however, are rarely sufficient to change physician practice patterns. Davis et al. [38] found that the least effective technique is the most common: the formal continuing medical education conference or lecture. The most effective strategies are clinician reminders, patient-mediated interventions (e.g., patient educational materials and patient reminders), outreach visits to clinicians by peers (academic detailing), use of local opinion leaders, and use of multifaceted strategies (combining two or more of these effective strategies) [38]. Similarly, Yano et al. [39] found that computer-generated reminders, audits with personal feedback to clinicians, academic detailing, and shifting specific activities to multidisciplinary team members are the most effective ways to improve primary care practice performance.

One promising innovation is the computerized reminder system used in some large staff-model health maintenance organizations (HMOs) [40,41]. Before each patient visit, the computer generates an individualized, updated health screen report that is placed on the front of the chart. The report lists several health screen procedures, the frequency with which they should be performed (based on medical research, HMO leadership decisions, and medical guidelines), and the last date of patient screening. Screening for mental health or substance abuse problems could be part of such a protocol.

Lustig et al. [36] have shown that physicians can be persuaded to conduct screening of adolescents for other health behaviors (e.g., seat belt use) but that they resist counseling about substance use. They evaluated a skills-based training workshop for primary care providers in a managed health care system. Two 4-hour workshops included the following components: didactic, discussion, demonstration role plays, and interactive role plays. According to adolescents’ reports, screening increased significantly on the five targeted behaviors (e.g., bicycle helmet use, seat belt use, tobacco use, alcohol use, and postponing sex) after training. Counseling, however, increased significantly for only three of the behaviors, excepting alcohol and tobacco use.

Professional groups and physician guidelines generally advocate face-to-face interviews for health screening. Such interviews expose less than 5% of self-reported drug use and have been found to give less information than standard pencil-and-paper questionnaires [42,43]. A more promising screening approach is the use of computers for eliciting information about substance use. In a randomized, controlled trial, adolescents reported regular use of marijuana, alcohol, and tobacco at much higher rates when using a computer than when using an identical written questionnaire [44]. The computer-based screening was particularly useful in identifying males who were heavy marijuana users.

Barrier #3: Financial Disincentives

Perhaps the most serious barrier limiting physicians’ screening and prevention practice is financial [45]. Third-party payment coverage of substance abuse services varies according to overall benefit policy, practice type and setting, and coding efficiency and accuracy. Prevention services often lack a billing procedure code. From a provider’s viewpoint, detecting a chemical dependency problem can turn into a 45-min visit, although the payment remains the same.

One response to the issue of costs is to extend the responsibility for screening to others in the doctor’s office [30]. Multiple gating appears to be an appropriate mechanism for the shared responsibilities of
screening, with more intensive screenings undertaken with those who pass through the first or second gate.

Research on cost-effectiveness is becoming increasingly important in persuading third-party payers and managed care plans to extend coverage. If investments in prevention offset more expensive services later, a stronger case can be made for regular inclusion. This is particularly true for managed care companies who are at risk for all member service costs. The U.S. Preventive Services Task Force developed a Guide to Clinical Preventive Services [22] that rates prevention activities based on effectiveness and cost-effectiveness research findings. The guide has been influential; for example, the Agency for Health Care Research and Quality incorporated its findings into the “Put Prevention Into Practice” initiative promoting prevention at every health care visit [46].

Because of the limited research, the guide does not include any strong screening or prevention recommendations. They do recommend that primary care providers ask youth about problem drinking during regular health examinations and counsel youth to avoid tobacco use, drug use, underage drinking, and high-risk sexual behavior. Of these, the guide gave antitobacco counseling the highest rating (“A”) because of the strength of risk-reduction evidence. Other substance abuse prevention activities received either a “B” or “C” rating. Screening for mental health problems was not even mentioned, except for depression, which received a “C” rating. Activities with “A” ratings are more likely to be incorporated into managed care policies, especially given the brief time allotted to routine patient visits [47].

The cost offset of prevention can be demonstrated only if services can reduce the probability that a likely and expensive event will occur. One study found that an increase in episodic care for youth may herald an impending crisis resulting in trauma or mental health care services [48]. The authors suggest that repeat episodic visits should be a flag prompting psychosocial and drug abuse screening and prevention services.

Another difficulty is when health plans “carve out” mental health and substance abuse care from regular medical care, a trend in Medicaid programs. Carve-outs, resulting in dual systems of care, preclude the opportunity to look at potential medical cost offsets with ATOD prevention or mental health promotion. The biggest difficulty is that medical data cannot easily be linked to mental health or substance use data to assess the cost offsets of early identification and intervention services.

An additional problem for HMOs is frequent disenrollment of members. Investing in prevention means that costs are incurred today with the expectation of a subsequent benefit sometime in the future. If members are likely to disenroll, the HMO will not reap the benefit; rather, a competitor will reap the benefit. Thus, staff-model HMOs with a historically loyal client base, such as Kaiser Permanente, have shown more interest in developing prevention models.

One of the advantages of managed care organizations is the ability to standardize and monitor practice. A potential tool for influencing medical practice change is managed care quality standards. For example, regulators have developed “report card” ratings to monitor quality and help consumers and payers compare managed care organizations. By far the most influential report card system is the Health Plan Employer Data and Information Set (HEDIS) sponsored by the National Committee for Quality Assurance [49,50]. HEDIS has been criticized, however, for its paucity of overall behavioral health indicators including substance abuse [51]. HEDIS plans to include testing for effectiveness of care, such as substance counseling for adolescents, screening for chemical dependency, and the appropriate use of psychotherapeutic medications [52]. The newest version of HEDIS [53], although making advances with regard to prevention and chronic care [54], still has come under scrutiny for its lack of attention to children at risk for maladaptive behaviors and chronic conditions [55,56]. Quality standards may be one way to bring about institutional change that promotes effective screening and prevention of youth substance abuse and its sequela.

**Barrier #4: Lack of Follow-Up Services and Resource Information**

A final obstacle to medical screening for substance use is the lack of follow-up services and resources [57]. Screening is a questionable exercise unless followed by an appropriate intervention. There exists a widespread shortage of effective and comprehensive follow-up prevention services for adolescents [2]. Recent research, however, has demonstrated that high levels of referral completion are possible when services are available and referral completion is prioritized [58].

No studies were found that tested a combination of screening and referrals based in primary care for high-risk adolescents. However, there are a number of well-evaluated programs that could be appropriate in this context. For example, Olds et al.’s nurse
home visitation program [59] has demonstrated long-term effectiveness in reducing substance use and conduct problems. Obstetricians and primary care practitioners can use this targeted prevention program for expectant mothers who are indicated to be at risk via a screening protocol. Eligible mothers are often teens themselves, and the program has been found to reduce maternal alcohol and other drug-related problems [60]. Longitudinal research has shown long-term positive effects on the children of participating mothers, demonstrating its effectiveness as an early prevention program.

The Center for Mental Health Services has reviewed and recommended programs that are effective in preventing mental health disorders among school-aged children [61]. Research demonstrating the use of these programs in primary care settings and as referral sources could be an important next step for making the program relevant to health care practitioners. For example, Big Brothers/Big Sisters is a well-known and widely available mentoring program, which has been found to prevent early substance use and to reduce aggressive behaviors [62]. The Penn Prevention Program has been shown to be effective in reducing depression and oppositional home behavior among 10- to 13-year-olds, through cognitive behavioral techniques in a 12-week after-school program [63,64]. Other programs are available to address childhood and adolescent stress-related problems, internalizing problems, and mood disorders, all of which have been linked to the development of substance abuse and conduct problems.

The Center for Substance Abuse Prevention has also reviewed the research evidence to make recommendations on effective school- and community-based programs. One example from their list of model prevention programs, Strengthening Families [65], originally targeted children of substance-abusing parents and has now also been successfully tested with non–substance-abusing parents to reduce substance abuse and other conduct problems among preadolescents. The program includes three components (parent training, children’s skills training, and family skills training) as well as support services.

## Schools

Schools are a second critical contact point for identification and prevention efforts. Traditional school settings serve most children and youth, except those who have dropped out, are home schooled, or suffer from severe behavioral or functional disorders. Because an estimated 20% of children and youth have a diagnosable form of mental health disorder [66] and all but the most severely impaired of these are served in traditional schools, using this criterion alone indicates that a sizable proportion of students are at increased risk of substance use.

### School-based Health Centers

School-based health centers (SBHCs) are an obvious link between primary medical care systems and the schools and an important venue for prevention [27,67–69]. Nearly half of all SBHCs are located in high schools, with the rest equally distributed between middle and elementary schools [67]. Their primary goal is to coordinate and deliver accessible primary physical and mental health services to students [67,70]. One analysis found that the most common major diagnostic categories for high school students enrolled in SBHCs were: emotional problems (29%), health supervision (13%), respiratory problems (11%), and substance abuse problems (8%) [71]. Studies indicate that despite a number of challenges, many SBHCs are able to provide continuous, comprehensive, and coordinated care [70] and that the referrals generated by SBHCs are completed [58].

Although SBHCs appear to be an appropriate and essential mechanism for the screening and referral of children and youth at risk, they are not necessarily ideal as sole source providers for adolescents. First, the vast majority of schools in this country don’t have SBHCs and the ones that exist vary greatly in the resources they offer. Second, access to services is often limited to school hours and the school calendar. SBHCs can serve only students enrolled in school; dropouts and expelled students are often ineligible for services. Of most concern for prevention, centers often omit reproductive health care and sometimes mental health and substance abuse services because of community or state opposition to providing these services on school grounds [68]. Finally, there is some indication that SBHCs increase students’ health knowledge and access to health-related services but have only a limited impact on reducing risk status and deleterious social behavior [72].

### Prevention in the Classroom

Aside from SBHCs, considerable prevention activity is conducted in the nation’s schools. The U.S. Department of Education is the single largest prevention funding source, spending over $500 million/year in
the Safe and Drug Free Schools (SDFS) program [73]. Individual school districts may use many different curricula in different schools, most common among which are: DARE, Here’s Looking at You 2000, and the McGruff Drug Prevention and Child Protection Program [74]. In addition, most schools develop their own prevention curricula and modify commercial prevention curricula for use in the classroom and participate in noncurriculum activities, such as Red Ribbon Week [74].

Unfortunately, the programs that schools most frequently choose are not those that have been found to be effective in rigorous scientific testing. A 5-year study commissioned by the Department of Education reported that prevention programs rarely improved student health outcomes and, if they did, effects were small [75]. Extensive meta-analyses of school-based prevention evaluation studies have shown that the most effective programs are highly interactive (e.g., peer group discussion and skill development through role play) and stress comprehensive life skills or refusal skills [76,77]. In reality, however, schools rarely use these effective strategies [78,79].

In an attempt to respond to criticisms that school prevention programs are ineffective, the Department of Education has established a new policy requiring schools to use rational planning in their selection of prevention programs [80]. School districts are now required to adopt the “Principles of Effectiveness” as a condition of funding. These principles include conducting a needs assessment, setting measurable objectives, choosing a tested and effective prevention program, and evaluating success in meeting specified objectives.

Early evaluation of the policy, however, indicates that implementation of effective programs is generally poor [81]. One problem is the relatively low amount of funding provided through the SDFS program, approximately $5/student per year, inadequate for necessary staffing [74].

### Selective and Indicated Programs

A 1995 evaluation of the SDFS program [75] found that although many schools intend to provide programs for high-risk students, this kind of support is very limited. In most schools, these services relied primarily on counselors and some teachers. Most elementary schools did not have full-time counselors; some had no counselors at all. Several junior and senior high school counselors reported having time for crisis management only, with student-to-counselor ratios approaching 500:1.

Many schools have adopted student assistance programs (SAPs) to help high-risk youth. Modeled after employee assistance programs, students can receive help for problems such as personal or family alcohol and drug problems, academic and school behavior problems, emotional and peer relationship problems, sexual problems, and eating disorders [82]. Programs consist primarily of student support groups that meet in the school during or after school hours. Often the peers of student clients are involved as crisis managers, group facilitators, and referral agents.

A recent survey of 81 school districts in 11 states found that 69% had SAPs in some or all middle schools; 72% had SAPs in some or all high schools [74]. Despite the widespread diffusion of SAPs, few studies have attempted to document the proportion of high-risk children reached or the outcomes achieved. A rigorous study on group school counseling, however, yielded cautionary findings. Specifically, results showed that group counseling did not produce a reduction in delinquent behavior but in fact led to increased drug use [83]. This and other study findings have led researchers to caution against bringing delinquent youth together in group settings because they may actually promote antisocial behavior [84,85]. More study on SAP services offered and their effects is needed.

Although schools routinely identify students with learning disabilities or behavioral problems, they rarely identify youth at high risk for use of substances. Reconnecting Youth [17,86] is one of the few examples of a rigorously tested indicated program for high school youth that includes a protocol for case finding, based on incidence of truancy and low academic achievement. In ethnographic studies, Eggert et al. [17] found high coincidence of drug involvement, depression, and suicide potential among youth who were repeatedly truant and who had failing or dropping grades. The 5-month curriculum she developed significantly improved participants’ high school performance while reducing emotional distress and drug involvement. Because many schools currently maintain automated records of truancy and student grades, this research suggests a feasible method for identifying students at risk for substance use, dropout, and other social problems.

A number of studies have tested selective prevention programs for younger students. Among these, classroom interventions focusing on aggressive behavior have reported success [87–90]. Research suggests that aggressive or disruptive behavioral responses to first grade’s social demands predict later aggressive behavior, conduct disorder, and drug
abuse, particularly among shy or socially isolated males [91–93]. School tracking, which groups low achieving students together, can exacerbate this problem. Children in lower track classrooms display more aggressive and disruptive behavior than their counterparts in higher track classrooms [94–96].

Kellam and Anthony [97] tested a classroom behavior management intervention, called the Good Behavior Game (GBG), in a randomized controlled trial. A longitudinal assessment showed that the GBG reduced boys’ risk for smoking. Less aggressive boys benefited more on smoking risk and more aggressive boys showed reduced aggression as teenagers. GBG did not have an impact on girls. This and similar studies suggest that the school context can shape some students’ behavior in ways that may be directly related to behavioral and substance use disorders. Classroom management interventions have particular relevance in high-risk communities in which poverty, crime, and social disruption increase the numbers of children at risk. If children can be exposed to an orderly school environment that rewards positive behavior and provides them with early academic success, then they have a better chance to attach to school and avoid the use of substances.

Teaching cognitive problem-solving skills is a promising intervention for older elementary school children identified as aggressive [85]. For example, Lochman [98] provided training to fourth- to sixth-grade boys on inhibiting impulsive behavior, identifying social cues, generating prosocial responses to different kinds of social circumstances, evaluating each response, and enacting problem-solving strategies. Three years later boys in the treatment condition differed positively from those in the control condition in problem solving, self-esteem (both in the home and at school), and drug and alcohol involvement. The findings suggest that general cognitive problem-solving training, which is not specifically focused on a target behavior (such as drug use), may function as a moderating variable for various antisocial behaviors. At the same time, however, this study failed to find long-term effects on delinquency and classroom behavior.

As in the medical sector, several barriers have inhibited schools from identifying and assisting students at high risk of substance use:

**Barrier #1: Prevention Is Peripheral to the Mission**

Schools have always perceived their primary mission as providing academic education, and they and teachers are increasingly held accountable for student competency in basic subjects as evaluated by standardized tests. Understandably, teachers and administrators balk at using time to address topics peripheral to academic achievement. Moreover, sensitive topics such as substance use and sex education attract controversy, which may further dampen schools’ willingness to take on these issues.

Schools have been more likely to adopt a “zero tolerance” approach to drug use. With zero tolerance policies, students found to possess, use, or sell ATOD are subject to suspension or expulsion. Although most schools espouse such policies, they tend to be somewhat more lenient with tobacco products and less lenient with alcohol and illicit drugs [74]. Although expelling problem students may result in a more orderly school environment, it is not likely to prevent further drug involvement among high-risk youth. Initially, SDFS officials strongly encouraged zero tolerance policies, but more recently they have offered funding initiatives for schools to develop alternatives to suspension for these infractions [99]. Schools have also found that it is not fiscally to their advantage to suspend or expel students because it reduces per-pupil education payments.

**Barrier #2: Lack of a Prevention Infrastructure**

Although almost every school district in the country is funded through the SDFS program, most receive less than $10,000/year for prevention [100]. In one study of predominantly large school districts, more than half of prevention coordinators reported spending an average of 10 h or less per week on substance use [74]. Individual schools have considerable latitude in choosing prevention programs and enforcing policies. Not surprisingly, higher-quality prevention programs have been associated with at least one full-time person assigned to prevention [75]. Ideally, the coordinator’s role would be to coordinate a district-wide needs assessment; assess and nominate programs most likely to be effective and to meet district goals; coordinate teacher training and ensure that programs are implemented according to protocol; and collect, analyze, and report data to evaluate effects. This role is implied in the Department of Education’s Principles of Effectiveness policy. Given the current infrastructure, however, this type of coordination rarely occurs. Rather, the amount and content of prevention programming has repeatedly been found to vary greatly from classroom to classroom and school to school, even within districts attempting to deliver consistent programs [75,78,81].
Conclusion and Recommendations

This article has argued that medical and educational institutions could be essential contributors to substance abuse prevention, with the role of identifying high-risk youth and families and initiating appropriate services. Readily assessable indicators of risk include: age of initiation of substance use, use (particularly heavy use) of tobacco products, poor family management practices and family conflict, mental health and behavioral problems, and truancy or low school achievement. However, there is little evidence that these indicators are regularly used in either schools or health care to identify high-risk youth and to deliver selective or indicated services that work.

To change policies and practice, we suggest that prevention be tailored to the mission, culture, and perceived incentives of the institution. For the institution of primary health care, the mission and culture are focused on physical health, even though professional standards and quality mechanisms guide clinicians to anticipate the importance of emerging adolescent risk behaviors. Despite professional guidelines, good intentions, and training programs, clinicians have found it extraordinarily difficult to add ATOD prevention to their care of adolescents.

A better opportunity may be found in linking prevention to the strong financial incentives related to costs and reimbursements. As cost pressures grow, it becomes increasingly important to conduct research that demonstrates the cost effectiveness of proposed interventions. We advocate testing a multiple gating approach, with selective use of medical and ancillary staff for screening and interventions. Research should focus on developing appropriate screening tools for health care settings, and using the most appropriate personnel to optimize quality and cost savings. Equally important will be to develop and test effective prevention programs in the health care setting. Research should also demonstrate innovative links to community-based programs that can engage youth and their families and address the underlying problems that lead to substance abuse.

Funding agencies can actively support this line of research. Several have already shown interest in bringing effective school-based programs into practice, but there has been much less attention on linking effective prevention and intervention services to medical care. Clinicians can play a role by documenting the extent of substance use and the presence of risk factors among their adolescent clients, and by advocating for effective prevention services within their agencies, professional societies, and communities (e.g., schools). They can also access electronic information about effective programs and ask sponsors about the current availability of such programs in their area; sponsors often keep records of the agencies that have purchased program materials or received technical assistance to set up local programs.

A research agenda for HMOs and health services researchers might include the following priority areas: (a) testing of multiple gating screening tools for optimal selectivity and specificity, with attention to the types of personnel best suited (and most cost effective) to screen at each level; (b) testing internal and contractual arrangements between effective programs and health systems so that health providers can seamlessly refer high-risk youth; and (c) finding ways to examine and document the costs and benefits of substance abuse prevention activities, particularly in terms of offsetting related costs (e.g., hospitalization because of trauma or emotional and behavioral disorders).

If the research shows that prevention provides the expected benefits, this information can then be disseminated through the U.S. Prevention Task Force and other appropriate mechanisms. The priority at this juncture is to raise the salience of the proposed research agenda. Because children and adolescents are considered less costly than other age groups to insure, it is important to use quality mechanisms to heighten such research on the national agenda. We suggest partnerships among advocates for children’s health, the National Commission for Quality Assurance, U.S. Prevention Task Force, Centers for Disease Control and Prevention, National Institute on Drug Abuse, National Institute on Alcohol and Alcoholism, National Institute on Child Health and Human Development, National Institute on Cancer (tobacco use), and National Institute of Mental Health to help develop and fund the research agenda, and to disseminate findings.

If cost savings can be demonstrated, managed care companies will be more willing to set up the incentives and supports needed to routinize screening and intervention practice. If cost and quality drive the medical system, then the way to demonstrate and diffuse innovative practice is to include these constructs and involve the appropriate players in the research. Model testing must include the different structural arrangements of primary care (e.g., staff- and contract-model HMOs) because each has its unique set of challenges and opportunities.

School-based health clinics are a natural bridge between the schools and primary care practice. SB-HCs can be an important way to promote continued
access to health professionals. The mission and culture of SBHCs are more likely to match with prevention goals because staff have daily contact with in-school youth and thus gain confidence and competency in attending to this population. Referrals to school-based programs will also make it more likely that students will follow through on the referral and that clinicians can evaluate how well the program is working.

Apart from SBHCs, educational institutions have very different missions, cultures, and incentives from health care systems. The mission of schools is academic education; the school culture prizes achievement. Although financial incentives are powerful in both, schools are held accountable through student achievement scores on state and national tests. Linking ATOD prevention to achievement of academic goals should be a powerful strategy in co-opting this institution. One way to do this would be to use truancy and slipping grades as one of the “gates” for identifying students for intervention and then demonstrate programs that explicitly meet both academic and behavioral goals.

School-based prevention coordinators can support improved prevention by accessing information about effective prevention programs for high-risk youth and advocating their adoption in schools. They can also open institutional doors (barriers) to research with prevention scientists. For their part, prevention scientists must recognize school priorities and pressures and show flexibility and respect for school needs, timelines, and scarce resources. Teachers can support prevention by documenting truancy and allowing evaluation activities, such as school surveys, to be conducted in their classrooms. They can also be actively involved in the faithful implementation of effective prevention programs and should communicate their advice to prevention scientists about how these programs can be improved.

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References


99. Notice of grant competition to reduce student suspensions and expulsions and ensure educational progress of students who are suspended or expelled. (February 14) 2000 Fed Reg 65:7420–1.