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Adolescent substance use is a big, difficult issue. Alcohol, cigarettes, and marijuana – and to a lesser extent, cocaine – are endemic to most high schools. It's not at all unusual for high school

juniors and seniors to drink or even to binge drink. In addition, about 15%-20% of them smoke cigarettes, depending on the community, and probably more than that try or intermittently smoke marijuana.

One approach is to educate parents about which children may be at higher risk for substance use.

For example, most teenagers are at some risk and need to be watched for any

high-risk activities, especially drinking and driving or riding in a car with a friend who has been drinking. If parents begin to see a serious problem – such as binge drinking every weekend, obvious use of marijuana on a regular basis, or obvious use of cocaine – take it very seriously. Talk with patients and parents, and provide a referral for services as indicated.

Other kids might be at slightly higher

risk in high school, based on their achievements. A good athlete who joins the varsity team in 9th or 10th grade, or the talented 9th-grader who lands the lead in the high school play, tend to spend more time with juniors and seniors. They get invited to parties and events outside their peer groups. Without the judgment of an older child and while trying to “keep up,” they might be more vulnerable to problematic substance use. The difference between a 14-year-old and a 17-year-old is enormous, and the peer pressure of being with seniors is considerable.

Recognize that some kids start high school already predisposed and at quite high risk for substance use problems: A patient with biologic or genetic risk factors; a patient with untreated depression or anxiety; and/or an adolescent with attention-deficit/hyperactivity disorder (ADHD) are examples.

Left unaddressed, these kids are predisposed to earlier and more serious substance use. Some children with genetic and/or biological risk factors begin drinking heavily before their 14th birthday. In contrast, the typical age of onset for alcohol use includes some experimentation at 15 or 16 years that becomes binge drinking for some a year or two later.

Biology predisposes some adolescents to nicotine addiction or heavy use of marijuana or alcohol. While adolescent brains are in development and experience the expected stress of puberty and building an identity, some teenagers' brains may be more susceptible to addiction than others. In addition, genetics and environment can play a role, evidenced by the higher risks for children whose parents have a personal or family history of substance use problems. If there is a strong history of alcoholism in the family or if a parent is a recovering alcoholic, discuss with parents how their past might influence how they treat their teenager. Advise them what information should be shared to alert the teenager to the potential risks. It might help a child at age 12 or 13 to know that he or she may be especially vulnerable to the dangers of substance use, and this may well open up an avenue of communication and trust that could be helpful later.

Anxiety and depression also have genetic roots in some patients. Asking parents about their family history of substance abuse, depression, or serious mental health disorder should be a routine part of pediatric practice.

In addition, implementing screening tests makes sense in adolescence. Such screening tests are publicly available and reviewed by the American Academy of Pediatrics Bright Futures: Mental Health effort (http://brightfutures.aap.org/3rd_Edition_Guidelines_and_Pocket_Guide.html) or the new AAP mental health primary care toolkit (www.aap.org/pcorss/demos/mht.html). For example, a general screen of psychosocial functioning

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Substance Use in Teens

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- The safety and effectiveness of Deflux in the treatment of children under 1 year of age have not been established.

Adverse Events

List of treatment-related adverse events for 39 patients from a randomized study and 170 patients from nonrandomized studies. (Follow-up for studies was 12 months).

Adverse Event Category	Randomized Study (n=39 DEFLUX patients)	Nonrandomized Studies (n=170 DEFLUX patients)
UTI(i)	6 (15.4%) (ii, iii)	13 (7.6%) (ii, iii)
Ureteral dilation (iv)	1 (2.6%)	6 (3.5%)
Nausea/Vomiting/ Abdominal pain (v)	0 (0%)	2 (1.2%)

- (i) Cases of UTI typically occurred in patients with persistent reflux.
 (ii) Patients in the nonrandomized studies received antibiotic prophylaxis until the 3-month VCUG. After that only those patients whose treatment had failed received further antibiotic prophylaxis. The patients in the randomized study received antibiotic prophylaxis 1 month post-treatment.
 (iii) All UTI cases were successfully treated with antibiotics.
 (iv) No case of ureteral dilation required intervention and most cases resolved spontaneously.
 (v) Both cases of nausea/vomiting/abdominal pain were resolved.

Although vascular occlusion, ureteral obstruction, dysuria, hematuria/bleeding, urgency and urinary frequency have not been observed in any of the clinical studies, they are potential adverse events associated with subureteral injection procedures. Following approval, rare cases of post-operative dilation of the upper urinary tract with or without hydronephrosis leading to temporary placement of a ureteric stent have been reported.

References: 1. American Academy of Pediatrics. Committee on Quality Improvement, Subcommittee on Urinary Tract Infection. Practice parameter. The diagnosis, treatment, and evaluation of the initial urinary tract infection in febrile infants and young children. *Pediatrics*. 1999;103(4):843-852. 2. Elder JS, Shah MB, Batiste LR, Eaddy M. Part 3: endoscopic injection versus antibiotic prophylaxis in the reduction of urinary tract infections in patients with vesicoureteral reflux. In: Hensle TW. Challenges surrounding vesicoureteral reflux: fuel for a paradigm shift in treatment. *Curr Med Res Opin*. 2007;23(suppl 4):S15-S20. 3. Chi A, Gupta A, Snodgrass W. Urinary tract infection following successful dextranomer/hyaluronic acid injection for vesicoureteral reflux. *J Urol*. 2008;179:1966-1969. 4. Elmore JM, Kirsch AJ, Heiss EA, Gilchrist A, Scherz HC. Incidence of urinary tract infections in children after successful ureteral reimplantation versus endoscopic dextranomer/hyaluronic acid implantation. *J Urol*. 2008;179:2364-2368. 5. Cerwinka WH, Scherz HC, Kirsch AJ. Endoscopic treatment of vesicoureteral reflux with dextranomer/hyaluronic acid in children. *Adv Urol*. Published Online: May 14, 2008 (doi:10.1155/2008/513854). 6. DEFLUX[®] [Package Insert]. Edison, NJ: Oceana Therapeutics (US), Inc; 2009. 7. Data on file. Oceana Therapeutics (US), Inc.

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such as the Pediatric Symptom Checklist, or a specific screen for depression or substance use, could be built into the annual visit beginning at age 12 or 13 years.

Children with ADHD make up another high-risk group. They also seem to be more vulnerable to cigarettes, alcohol, and marijuana. These teenagers can be driven to find relief in these substances because of brain biology and/or secondary to the stress of living with their ADHD symptoms.

On the plus side, ADHD kids treated appropriately with stimulants and support services have lower levels of substance use and probably higher self-esteem. Ensure they have the best treatment possible for their ADHD to minimize their substance use risk as much as possible.

As they become young teenagers, they should have a full review of all their

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ADHD treatment and how their typical day plays out at school and at home. Consider some additional preventative counseling to help these children face their substance use challenges throughout adolescence.

Offer such guidance to all children and parents, but especially to those in one of these high-risk groups. Suggest strategies that support and reinforce their resiliency. A warm, positive relationship with an adult is a protective factor. Also, kids who feel connected to a school, church, or sports team tend to be a little more resilient to some of these influences.

Facilitate open, honest communication between the parent and adolescent. Many parents might not realize that this is more effective than are attempts to control their teen's behavior 24/7. Over-control is impossible given the lifestyle of most 15-, 16- or 17-year-olds. Between cell phones, cars, and the amount of time they are out of the house, parents cannot control them to a level of stopping all substance use.

Even if more control is possible, the effort works against the adolescent's developmental trajectory toward increasing autonomy. The real goal of adolescence in our culture is to learn how to live in the real world and to prepare for autonomy as young adults. High school is a preparation for college life and adulthood where good judgment, safety, and socialization are important learned behaviors. Teaching adolescents how to navigate all this is an essential role for physicians and parents.

Part of growing autonomy is privacy. While it is tempting to invade that privacy to learn about substance use or to clarify other concerns, it is not clear

that such efforts support the long-term goals of raising a teenager. Such efforts at control and investigation, including blood or urine testing, are best reserved when the benefits outweigh the risks, when there is a substance abuse problem that needs to be addressed. ■

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References: 1. Data on file, Wyeth Consumer Healthcare. 2. Kauffman RE, Sawyer LA, Scheinbaum ML. Antipyretic efficacy of ibuprofen vs acetaminophen. *Am J Dis Child.* 1992;146(5):622-625. 3. Kelley MT, Watson PD, Edge JH, Cox S, Mortensen ME. Pharmacokinetics and pharmacodynamics of ibuprofen isomers and acetaminophen in febrile children. *Clin Pharmacol Ther.* 1992;52(2):181-189.

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