Substance use by adolescents is a critical problem in modern Western society due to the common use of psychoactive substances by youth. Understanding the consequences that result, the development of pathology related to substance use (substance use disorders; SUDs), and the persistence of such problems into adulthood is critical to delivering effective interventions. Among the issues that clinicians need to consider are risk factors for the development and the persistence of SUDs and obstacles to optimal intervention. Foremost among these issues is psychiatric comorbidity. In this article, the authors discuss the importance of comorbidity in clinical populations of adolescents with SUDs and other psychiatric disorders (including considerations to be taken in the assessment and treatment of psychiatric-SUD comorbidity), conduct a review of evidenced-based interventions and recommendations, and provide suggestions for the direction of future research.

Comorbidity refers to the coexistence of two or more diagnosable mental health disorders and in this case, two diagnosable entities in the realm of substance abuse and mental illness with each meeting Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition, Text Revision) (DSM-IV-TR) criteria.¹ For children and adolescents, comorbidity has been used interchangeably with the term dual diagnosis.
diagnosis, although in many cases there are more than two diagnoses. For a detailed review of specific disorders and program development, please refer to a recent book by Kaminer and Bukstein.  

THE IMPORTANCE OF COMORBIDITY

In both community surveys of adolescents with SUDs and samples of adolescents in addictions treatment, the majority have a co-occurring nonsubstance-related psychiatric disorder. More than half of adolescents in addictions treatment with co-occurring mental illness have three or more co-occurring psychiatric disorders. The most commonly comorbid psychiatric disorders among youth in addictions treatment include conduct problems, attention deficit/hyperactivity disorder (ADHD), mood disorders (eg, depression), and trauma-related symptoms. In a study examining the prevalence of self-reported substance use and mental health problems, the pattern of comorbidity from 4930 adolescents admitted to substance abuse treatment in multisite studies was about one-third of adolescents endorsing depressive symptoms in the year before entering substance abuse treatment. Approximately half of adolescents younger than 15 years of age had ADHD and half met criteria for conduct disorder (CD). The co-occurrence of manifesting both internalizing and externalizing behaviors was more than 40% of adolescents. Among substance dependent adolescents younger than 15, about 90% had at least one mental health problem in the past year, with 69.2% having at least one internalizing problem and 81.3% having at least one externalizing problem. Adolescents with substance dependence had a fivefold elevated likelihood of having an internalizing problem compared with those who were not dependent. The most prevalent comorbid disorders in adolescents younger than 15 were CD (74.2%; odds ratio [OR] = 3.4), ADHD (63.6%, OR = 3.0), depression (52.7%, OR = 5.6), anxiety (24.6%, OR = 4.6), and traumatic distress (50.6%, OR = 2.9).

Comorbid psychopathology may precede, exacerbate, or follow the onset of heavy substance use. A review of adolescent community surveys found that childhood mental illness generally predicted earlier initiation of substance use and SUD onset, particularly in relation to CD. The early symptoms of most psychiatric disorders, excluding depression, generally had an onset prior to the onset of substance use; full criteria for a nonsubstance psychiatric disorder was typically met prior to SUD onset in adolescence. Among treated adolescents, comorbid psychopathology generally predicted early return to substance use, particularly conduct problems and major depression. Co-occurring psychopathology also generally predicted a more persistent course of substance involvement over one year of follow-up. Rather than type of diagnosis, the total number of psychiatric symptoms may predict relapse risk. A four-year study of treated youth found that the majority (61%) of adolescents with CD at the time of treatment met criteria for antisocial personality disorder at follow-up, and that these individuals had higher levels of drug involvement over follow-up compared with those without antisocial personality disorder. In one study of adolescents in substance abuse treatment, youth without co-occurring disorders showed the best long-term outcomes and those with co-occurring externalizing disorders recovered more slowly; those with co-occurring externalizing and internalizing disorders had the worst outcomes. Youth with co-occurring disorders are more likely to relapse after treatment, and relapse usually occurs more quickly than for youth with SUDs only.

As comorbidity has an influence on the development and persistence of SUDs and related behaviors, clinicians should recognize the importance of identifying comorbid
disorders in assessment and targeting them for intervention as part of a comprehensive and preferably integrated treatment plan.

ASSESSMENT

In the face of problems in one or more domains of adolescent functioning, clinicians and educational professionals who work with youth often need to screen for multiple problems and the need for more comprehensive evaluation of those problems with a positive screen. At the very least, screening during a psychiatric evaluation involves determination that there is a reasonable possibility that problems with substance use exist and that the adolescents may meet criteria for a SUD. A positive screen for a SUD subsequently requires more detailed, extensive questions including asking about substance use, quantity and frequency, the presence of adverse consequences of use, and the adolescent’s attitude toward use. Substance use is one of several domains of adolescent functioning. These domains include substance use and related behaviors, psychiatric/behavioral, family, social/peer, school/vocational, recreational/leisure, and medical. Assessment of each domain is necessary to determine overall functioning as well as the effects of impairments in each domain on functioning in other domains (e.g., the effect of substance use on the impairment of behavioral and emotional symptoms, and vice versa).

To supplement interview information, clinicians may use a variety of structured interviews and rating scales with established psychometric properties for screening and more comprehensive assessments. Several screening and assessment instruments include both substance use–related and psychiatric symptom items, thus providing a more comprehensive examination of symptoms and functioning (see Winters and Kaminer15). The result of this assessment is a diagnostic summary that identifies the adolescent’s treatment needs and potentially, targets for intervention. An integrative treatment plan is developed to target multidimensional areas of dysfunction, which includes psychiatric comorbidity.

CAN SUBSTANCE USE DISORDERS AND PSYCHIATRIC TREATMENTS COEXIST?

The integrative treatment of SUDs and psychiatric disorders offers significant challenges (see Libby and Riggs16). Traditional behavioral health treatment in the United States revolves around separate and often disconnected systems of treatment for SUDs and other psychiatric disorders. In the past, conceptualizations of illness and corresponding treatment philosophies were profoundly different. The educational backgrounds, training experiences, and licensing requirements often varied widely between mental health and substance abuse treatment communities. Only recently have significant cross-training opportunities emerged in training programs,17 as well as incentives and resources for seeking them out once students have become practitioners. There are no widely accepted models for specialist certification regarding co-occurring disorders, and becoming dually certified or licensed in each system may be a burden beyond the feasibility of most clinicians. As a result, few providers at the local level are knowledgeable in the treating co-occurring disorders.

Differences in training and philosophy have historically contributed to a lack of consensus with treatment planning, creating difficulties with coordination and collaboration across systems. Unfortunately, this parallels the frequent poor communication and coordination between behavioral health care systems and other child-serving agencies, such as education, child welfare, juvenile justice, and medical health care. This situation is especially problematic for youth with co-occurring disorders because of the multiple systems served by these youths. Having different funding
streams and administrative requirements further impedes cross-system collaboration and the development of integrated treatment services.

There is often debate surrounding which disorder to treat first in adolescents with co-occurring disorders. Mental health systems may be unwilling to provide services until substance use has stopped or is controlled. Similarly, the substance abuse system may resist treating clients with active psychiatric symptoms or those who are on psychotropic medications. Neither system traditionally has the knowledge, experience, or capacity to provide integrated treatment. Previously “dual treatment” involved either serial treatment episodes or parallel interventions in each of the two systems.

To develop a more integrated conceptual framework for intervention with comorbid disorders to aid in understanding co-occurring conditions and the level of coordination needed between service systems poised to address them, the basis of treatment should be the severity of impairments rather than diagnosis. The model recommends moving toward integration as the severity of the co-occurring disorder increases, and it delineates a continuum of care based on provider behavior that spans minimal coordination, consultation, collaboration, and integration. Levels along this continuum include (1) minimal coordination, (2) consultation: an informal exchange of clinical information, (3) collaboration: a more structured arrangement involving regular, planned communication, often based on contractual agreements between systems or providers, and (4) integration. The final, and perhaps most desirable level of care, is integration. Integration refers to the development of a single treatment plan that addresses both mental health and SUDs. Both disorders should be considered primary and treated as such. Because many adolescents with co-occurring disorders do not recognize their substance use as a problem, integrated services may offer an opportunity to engage and motivate youth in treatment while offering additional supportive services.

According to the Substance Abuse and Mental Health Services Administration (SAMHSA), integrated care includes at a minimum providing integrated screening, assessment, treatment planning, treatment delivery, and continuing care. An examination of these various evidence-based practices reveals a paucity of interventions developed to concurrently treat mental health and substance abuse disorders in adolescents. The existing integrated practices consist of two general approaches. The first is treatment planning and care coordination, which helps create a system of care in which individual services are provided to best meet the needs of each adolescent and his or her family. The second approach includes evidenced-based interventions that concurrently address both psychiatric and substance abuse disorders.

The numerous needs of youth with comorbid disorders often extend beyond the treatment of SUDs, behavioral, and emotional problems to include school and other environmental obstacles as well as services directly targeting the comorbid disorders. The use of intensive case management and wraparound services that help facilitate a more coordinated treatment approach with or without more integrated intervention programs is often warranted. In intensive case management, specially trained professionals assess and coordinate the supports and services necessary to help individuals with serious mental illness live in the community. For adolescents with co-occurring disorders, this may include developing and monitoring a comprehensive service plan, providing support services to the client and his or her family, and providing crisis intervention and advocacy services as needed. Wraparound is a model of care coordination for children and youth with mental health problems who are also involved with one or more other systems (eg, child welfare, juvenile justice, special education).
Wraparound requires a team-based planning process through which families, formal supports, and natural supports combine to develop, monitor, and evaluate an individualized plan. While this can improve coordination of SUDs and psychiatric treatment, it does not necessitate integrated treatment.

ARE THERE TREATMENTS FOR COMORBID DISORDERS?

Adolescents with co-occurring disorders often fail to receive effective treatment, if any. Although both mental health disorders and SUDs are considered psychiatric conditions and are contained in the DSM-IV, there has been a divergence in how SUDs are assessed and treated. Many of the obstacles to treatment for either psychiatric disorders or SUDs such as stigma, resistance, family stressors, or familial psychopathology are often compounded in cases of comorbidity.

SPECIFIC INTERVENTION MODELS

Despite the current focus on evidence-based practices, very few psychosocial interventions have been developed and evaluated specifically for adolescents with co-occurring disorders. Clinical trials often suffer from difficulties engaging youth in treatment, poor attendance and compliance with treatment, and high rates of early termination. While this is true for adolescents with SUDs or psychiatric disorders, it is especially true for the multiply-impaired comorbid patient. Despite these difficulties, a few effective and promising outpatient treatment models have emerged that, while directed at either SUDs or psychiatric disorders, could be considered integrated models as they often target problems shared by youth with either SUDs or psychiatric disorders. These interventions include cognitive-behavioral therapy (CBT), motivational interviewing and enhancement, and family therapies. Several attributes characterize these interventions as appropriate for SUD-psychiatric comorbidity, including targeting multiple behaviors across the spectrum of comorbid problems. For example, CBT incorporates a variety of interventions aimed at present-focused, goal-directed behavior change. Core strategies include identifying and challenging irrational and maladaptive thoughts and patterns, cognitive restructuring, and learning more functional skills through modeling and role-play exercises. From a cognitive-behavioral point of view, substance use is a learned behavior that is initiated and maintained by an interplay of cognitive processes, environmental factors, and behavioral reinforcement. Treatment often involves a focus on self-monitoring, identifying and changing reinforcement contingencies, coping skills training, and relapse prevention. Cognitive-behavioral interventions are well supported in the treatment of both adolescent psychiatric disorders and SUDs. Although few studies have examined the effectiveness of CBT for the treatment of adolescent co-occurring disorders, it is believed that they would likely be helpful, especially for youth with comorbid depression and substance abuse.

A form of CBT, dialectic behavior therapy (DBT), has been adapted and used with a variety of adolescent treatment populations including inpatient and outpatient suicidal youth, young adolescents with oppositional defiant disorder, and incarcerated juvenile offenders. DBT’s focus on emotional validation and acceptance coupled with skills training makes it applicable to adolescents with co-occurring conditions who often have mood dysregulation. The many successful adaptations of DBT to various treatment settings and populations demonstrate that it may be an effective intervention for youth with complicated and severe emotional and behavioral problems.
Similarly, motivational enhancement therapy interventions are often coupled with CBT, especially with adolescents. Motivational interviewing (MI) is a nonconfrontational, client-directed intervention that emphasizes an empathetic nonjudgmental stance, developing discrepancy, avoiding argumentation, rolling with resistance, and supporting self-efficacy for change. MI-based interventions have been found to be effective in reducing substance use among adolescents presenting to an emergency department and among college students. For youth with co-occurring disorders, MI/motivational enhancement treatment (MET) alone is likely insufficient to effect change. However, it has been suggested that motivational enhancement interventions may be helpful with this population in increasing treatment engagement and retention, motivation to change, and goal setting, and may be very useful when combined with other interventions such as CBT. The nonconfrontational stance of MI and its ability to be used with individuals in a wide range of readiness-to-change states may make MI particularly attractive to adolescents in their desire for autonomy. The five-session MET/cognitive-behavioral therapy (MET/CBT), developed for use in the Cannabis Youth Treatment Study (CYTS), consists of two individual MET sessions followed by three sessions of group CBT. Although there was little difference in clinical outcomes based on treatment condition in the CYTS, when treatment costs were combined with clinical outcomes, MET/CBT was found to be one of the most cost-effective interventions studied.

Although various family-based therapies for adolescent co-occurring disorders may differ in terms of strategies and techniques, they share certain common elements. All emphasize the systemic and contextual nature of adolescent problem behavior, focus on the important role parents and caregivers play in youth treatment and outcomes, and use engagement, communication, and various behavioral techniques for achieving change in both the index adolescents and his or her family. Research shows that compared with control conditions, family-based therapies often have better success than individual-targeted interventions in engaging and retaining families in treatment, reducing youth substance use, increasing school attendance and performance, and improving family functioning.

Several types of family therapy deserve mention, as they target problems across the SUD-psychiatric divide and have received recognition from several organizations recognizing evidence-based practice. Family behavior therapy (FBT) has demonstrated increases in treatment retention and reductions in suicidal behavior, psychiatric hospitalization, substance abuse, anger, serious adolescent substance use, and associated behavioral problems. FBT is recognized as a scientifically based approach to drug treatment by the National Institute on Drug Abuse (NIDA). The theory underlying FBT draws heavily on the community reinforcement approach, and the model employs multiple evidence-based techniques such as behavioral contracting, stimulus control, urge control, and communication skills training.

Multidimensional family therapy (MDFT) was developed as a family-based treatment for adolescents with substance use and related emotional and behavioral problems. MDFT is a comprehensive approach that targets multiple domains of risk, protection, and functioning within the youth, his or her family, and community. Interventions concentrate on the individual problems, strengths, and goals of the adolescent, as well as focusing on parent issues, parenting and family relationships, and extrafamilial influences. See the article by Cynthia L. Rowe elsewhere in this issue for further exploration of this topic.

Multisystemic therapy (MST) was developed as a family- and community-based treatment approach for youth with co-occurring substance abuse and antisocial behavior. MST is based on a social ecology theory that suggests adolescent
antisocial behavior is multidetermined and linked to variables of the individual and his or her family, peer group, school, and community. Interventions are developed in conjunction with the family with the explicit goal of structuring the youth’s environment to promote healthier, less risky behavior. MST services are usually intense, short term (average of 4–6 months), and offered in the youth’s natural environment, such as at home or school. MST draws heavily on strategies and techniques found in cognitive-behavioral, behavioral, and family therapies and often uses other specific interventions under the umbrella of MST. However, it differs by offering more intensive and direct interactions with the youth and his or her environment and by providing services outside of traditional care settings.\textsuperscript{52} MST was related to posttreatment reductions in self-report of alcohol and drug use.\textsuperscript{53} Follow-up studies show improvements in family and peer relations and a decrease in out-of-home placements,\textsuperscript{53,54} decreases in psychiatric symptomatology and substance-related arrests at four-year follow-up,\textsuperscript{53} and a decrease in rearrests and days incarcerated at the 14-year follow-up.\textsuperscript{55} In a subsequent randomized trial of MST with substance-abusing and delinquent youth, adolescents in the MST condition had decreased alcohol and drug use, criminal activity, and number of out-of-home placement days post treatment,\textsuperscript{54} although these results were not maintained at the six-month or four-year follow-up, and outcomes regarding criminal activity, substance use, and mental health functioning were not as good as earlier studies.\textsuperscript{55}

Recently, several attempts at developing integrated treatments for adolescents with SUDs and depression, posttraumatic stress disorder, bipolar disorder, and suicidal behavior have provided models for both investigators and clinicians.\textsuperscript{56–59} Among the challenges faced in the development and delivery of these interventions are choosing a group versus individual or family format, the use of urine drug screens and the level of confidentiality, minimal motivation, and selection of target-specific behaviors and cognitions. Adolescents with comorbid SUDs and psychopathology are among the most difficult youth to work with due to their combination of internalizing and externalizing symptoms and higher impairment, multiple risk factors across family, individual, social/peer, and community domains, and poor insight and motivation. Attempts to integrate these needs and targets under a single paradigm that simplifies treatment focus on the following: (1) psychoeducation, (2) problem solving, (3) decrease avoidance/increase positive social involvement, (4) motivation, and (5) family (communication and problem solving). There is an increased emphasis on motivational enhancement as key element of intervention (both with parents and adolescents) and on the development and enhancement of coping skills, relapse prevention, self-efficacy expectations, and awareness of high risk situations. The use of urine drug screens assures monitoring and discussion of substance use.

In addition, attention to training and supervision is mandatory in the administration of integrated treatments. Interventions that are developed should be practical in terms of the time and level of training involved, the possibility of adequate supervision, and the realistic expectations regarding the amount of time the adolescent and his or her family can devote to treatment.

**PHARMACOTHERAPY**

Although several family-based, behavioral, and cognitive-behavioral interventions have been shown to have efficacy in the treatment of adolescent SUDs, there is a paucity of controlled treatment outcome research evaluating the effectiveness of pharmacotherapies in the combined or integrated treatment of psychiatric comorbidity and SUDs.\textsuperscript{60} The limited pharmacotherapy research using well-controlled studies is
confined to two areas: mood disorders (including major depressive disorder/bipolar disorder), and ADHD. Surprisingly, despite high present and lifetime rates of anxiety disorders, at present, there are no published large scale controlled trials treating comorbid anxiety disorders and SUDs in adolescents.

One small study (n = 22) supported the safety and efficacy of lithium carbonate for bipolar disorder in adolescents with concurrent SUD.61 Another controlled trial evaluated the safety and efficacy of fluoxetine versus placebo in 126 adolescents with DSM-IV diagnoses of major depressive disorder (MDD), CD, and SUD.62 Adolescents in both medication groups received weekly, individual, manualized CBT for their SUD during the 16-week trial. The study also evaluated the impact of pharmacotherapy for depression on change in drug use, substance treatment compliance, and retention. Results showed that fluoxetine had a good safety profile and demonstrated superior efficacy (0.78 effect size) to placebo for depression, despite nonabstinence in the majority of study participants. Most adolescents also decreased their drug use, about five to seven days per month on average. However, only about 10% of the sample achieved sustained abstinence of at least one month, and there was no difference between fluoxetine and placebo treatment in change in drug use. Because rates of depression remission were unexpectedly high in both the fluoxetine + CBT (75%) and the placebo + CBT (64%) treatment groups, but rates of abstinence were relatively low, researchers concluded that most cases of depression did not remit due to abstinence. However, the limitations of the study design did not allow more definitive conclusions to be drawn about the temporal relationships or directionality of change in depression and change in substance use. Researchers also speculated that CBT most likely contributed to the higher than expected depression response rates despite its primary focus on the treatment of SUD. More definitive conclusions about the contribution of CBT to depression response rates cannot be made because all study participants received the manualized CBT as outpatient treatment for SUD during the medication trial, and there was no comparison group without CBT. Post hoc analyses indicated that remission of depression was a stronger predictor of change in drug use than medication treatment. Those whose depression remitted, regardless of medication assignment, significantly decreased their drug use, whereas nonremitters' drug use did not decrease from baseline levels of use despite similar rates of treatment compliance and retention.

In two other placebo-controlled studies of fluoxetine in adolescents with MDD with alcohol use disorders and SUDs, respectively,63,64 no differences were noted between the fluoxetine and placebo groups either on depression or drug use outcomes. Thirty-four subjects ages 12 to 17 years (mean age 16.5 years) with either a current MDD or a depressive disorder and a comorbid SUD were randomized to receive either fluoxetine or placebo in a single-site, 8-week double-blind, placebo-controlled study.64 The primary outcome analysis was a random effects mixed model for repeated measurements of Children’s Depression Rating Scale—Revised (CDRS-R) scores compared between treatment groups across time. Based on the results of an interim futility analysis performed after 34 patients were randomized, study enrollment was halted. Overall, both patients who received fluoxetine or placebo had a reduction in CDRS-R scores. However, there was no significant difference in mean change in CDRS-R total score in those subjects treated with fluoxetine versus those who received placebo, and no significant difference in rates of positive urine drug toxicology results between treatment groups at any post-randomization visit. In this study, subjects did not receive concurrent psychotherapy. Cornelius and colleagues,63 examined the depressive symptoms and the drinking habits of 50 subjects ages 15–20 years old with comorbid major depression (MDD) and alcohol use disorder (AUD) in an acute phase
(12-week) randomized efficacy study of fluoxetine versus placebo. All participants in both treatment groups also received intensive manual-based CBT and MET. Although fluoxetine was well tolerated in this treatment population, no significant group-by-time interactions were noted for any depression-related or drinking-related outcome variables. Subjects in both the fluoxetine group and the placebo group showed significant within-group improvement in both depressive symptoms and level of alcohol consumption. End-of-study levels of depression and drinking were low in both treatment groups.

In summary, comorbid depression with SUDs in adolescents may remit without antidepressant pharmacotherapy or abstinence, in the context of individual outpatient CBT for SUDs (but not precluding the use of CBT for depression). However, if depression does not remit, their drug use may not decrease even if they continue with substance treatment. Thus, in dually diagnosed adolescents, if depression does not seem to be improving early in the course of substance treatment (e.g., within the first several weeks of treatment) it appears to be safe, efficacious, and reasonable to initiate a serotonin reuptake inhibitor (fluoxetine), with careful monitoring, even if not yet abstinent, because ongoing depression may prevent further improvements in substance use.

For ADHD, three controlled trials have been published, including two by Riggs and colleagues. In the first study, the authors evaluated the safety and efficacy of pemoline (a schedule-IV psychostimulant) for ADHD in 69 out-of-treatment adolescents with active SUD. Results showed that pemoline had a good safety profile and a comparable effect size to that reported for ADHD in adolescents without a SUD, despite nonabstinence in most study participants. However, in the absence of specific behavioral treatment for SUD, pharmacotherapy for ADHD had no impact on drug use, which did not significantly decrease in either treatment group. Another study followed 16 male adolescents (mean age 17.5 years) with ADHD for six weeks using a crossover design in which half of the sample received active medication for three weeks while the other half received placebo. After three weeks, the groups were switched. The main outcome measures for ADHD were the parent report of ADHD symptoms and the Clinician Global Impression of Severity (CGI-S). The main outcome measure for substance use was the number of days of drug or alcohol use in the past week. Results showed a greater improvement in SNAP-IV scores (the primary ADHD outcome) and in CGI-S scores with active medication, compared with placebo. There was no between-group difference in substance use change. In a recently completed double-blind placebo-controlled study of OROS methylphenidate (MPH) in youth with ADHD and a nonopiate SUD, Riggs administered CBT treatment for SUD to all subjects. Results showed that both groups improved on ADHD and SUD measures, although there were no differences in adolescent reports of ADHD symptoms or substance use (number of days used in past month). However, the OROS MPH group had lower ADHD scores than the placebo group on parent report. There were few significant adverse events.

Overall, these results suggest that pharmacologic treatment in comorbid adolescents (e.g., with SUDs and MDD or ADHD) may result in improvements in the psychiatric target but will have little, if any, effect on the substance use, especially without concurrent and specific therapy for the SUD. However, there appears to be little medical risk or increase in adverse effects to treatment, and no evidence of abuse or diversion.

SAFETY AND DIVERSION ISSUES

None of the aforementioned controlled studies have identified significant safety issues. Despite few of the subjects showing abstinence for substance use, there
were few serious adverse events. Some commonly used pharmacologic agents, such as stimulants, have inherent abuse potential. The risk of diversion or misuse of a therapeutic agent by the adolescent, his or her peer group, or family members should prompt a thorough assessment of the risk of this outcome (eg, history of abuse of the specific or other potentially abusable agents, family/parental history of substance abuse or antisocial behavior). Often, parental or adult supervision of medication administration can alleviate concerns about potential abuse. The clinician should also consider alternative agents to psychostimulants, such as atomoxetine or bupropion, which do not have abuse potential. The long-acting stimulant preparations (eg, OROS methylphenidate, mixed amphetamine salts extended release, or lisdexamfetamine dimesylate) may offer less potential for abuse or diversion due to their form of administration, reduced level of reinforcement due to more gradual and longer time to maximum plasma concentration, and the ability to more easily monitor and supervise once-a-day dosing. Many anxiety symptoms or disorders in adolescents can be treated successfully with psychosocial methods such as behavior therapy. If pharmacotherapy is required, the use of selective serotonin reuptake inhibitors, tricyclic antidepressants, or buspirone is preferred over the use of benzodiazepines.

RECOMMENDATIONS

The Practice Parameter for the Assessment and Treatment of Children and Adolescents with Substance Use Disorders from the American Academy of Child and Adolescent Psychiatry set consideration of SUD-psychiatric comorbidity as a minimum standard. Adolescents with SUDs should receive a thorough evaluation for comorbid psychiatric disorders and, conversely, adolescents with psychiatric disorders should receive assessment for possible SUDs. Furthermore, comorbid disorders should be appropriately treated. As previously discussed, for severe presentations this involves integration of treatment modalities rather than merely serial or concurrent treatment. However, acute stabilization of moderate to severe substance use problems or more severe psychiatric presentations involving suicidal behavior and/or psychosis may need to precede integrated treatment approaches.

Critical elements of integrated treatment appear to be attention to motivation, family involvement, and the development of cognitive/behavioral skills. Recent emerging research and experience suggest that pharmacotherapy can be used safely and effectively in adolescents with SUDs, although not all studies have been consistently positive. However, pharmacotherapy has its limits, and all adolescents will need treatment targeting their substance use and related behaviors.

FUTURE RESEARCH

There are many more questions about assessment and intervention with adolescents having SUD-psychiatric comorbidity. Given the prevalence and presumed importance of SUD-psychiatric comorbidity, a rigorous research agenda is suggested. This agenda includes: (1) clinical trials of both pharmacologic agents and psychosocial interventions, alone and in concert, to enhance our understanding of the separate and combined effects of behavioral interventions and pharmacotherapy; (2) developing and testing medications that have the potential to directly target both SUDs and psychiatric comorbidity through amelioration of the presumed underlying neurobiological (eg, brain reward) dysfunction; (3) evaluation of the neurobiological/HPA axis, neuroimaging, or other relevant biomarker responses to both pharmacotherapy and behavioral/psychotherapy treatment modalities; and (4) effectiveness studies and...
efforts at evaluating and improving technology transfer of efficacious intervention to community treatment providers. These efforts will involve the further testing of existing agents and psychosocial interventions as well as development of novel agents. Finally, longer follow-up periods will be needed to identify the potential long-term effects of interventions.

REFERENCES

