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# Treating Mental Health and Substance Use Disorders in Adolescents: What Is on the Menu?

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**Abstract** Specific treatments targeting adolescents with substance use disorders (SUDs) have been developed over the last couple of decades. Despite these developmentally tailored treatments, long-term abstinence rates remain relatively low among adolescents receiving care. Research over the last decade has increasingly focused on adolescents with comorbid substance use and psychiatric disorders, in recognition of the barriers caused by inadequate treatment of co-occurring psychiatric disorders. Treatments targeting dually diagnosed youth are now regarded as essential to improving SUD treatment outcomes, but remain underutilized. A variety of treatment modalities such as behavioral therapy, family therapy, 12-step groups, motivational interviewing, contingency management, and combinations of these interventions have been modified for adolescents. In this article, we review the research on these treatments, as they apply to dually diagnosed youth. Furthermore, we explore the evidence for various treatments targeting comorbid SUD, specific to the presence of externalizing or internalizing disorders. The current evidence base supports the importance of integrated treatment targeting both SUD and psychiatric disorders simultaneously. High-quality treatment programs offering combinations of behavioral and family therapy, particularly with motivational interviewing and contingency management, are particularly well supported. In addition, we review various psychotropic medication treatments that have also been studied in conjunction with adolescent SUD treatment. Finally, we review research on post-treatment, supportive care that has been shown to improve long-term SUD outcomes. Recently conceptualized modular treatments, which offer personalized combinations of evidence-based treatments for specific disorders, have been proposed as a means of improving outcomes. Future research on modular programs must test the efficacy of individualized treatments when applied to combinations of psychiatric and SUDs in adolescents.

**Keywords** Adolescents · Substance use disorders · Evidence-based treatments · Dual diagnosis

## Introduction

Much attention has been devoted to treating substance use disorders (SUDs) in youth, with more recent efforts beginning to address co-occurring psychiatric disorders. Prevalence studies clearly demonstrate that psychiatric and SUD comorbidity is the rule rather than the exception. Studies in a variety of settings demonstrate that 64–88% of adolescents with SUDs have at least one, and often more than one, comorbid psychiatric problems [1–5]. Comorbidity is associated with earlier drug use, heavier use, and higher likelihood of dependence [3, 4], especially with opioid use disorders [6]. Even after treatment, psychiatric comorbidities are associated with worse withdrawal, earlier relapse, and receiving additional outpatient or inpatient treatment [7]. Additionally, youth with dual diagnoses (DD) have greater familial dysfunction (including parent substance abuse), worse school engagement, and more legal problems [8, 9]. Adolescents with SUDs in the absence of psychiatric disorders have better family cohesion, start using substances later,

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and respond better to treatment [3]. Younger adolescents with SUDs (<12 years old) are even more likely to have a comorbid psychiatric disorder (up to 95%), while adults with SUDs have less comorbidity [1]. Additionally, psychiatric diagnoses are less likely to respond to treatment when SUDs are present and vice versa [10]. Thus, co-occurring psychopathology is a necessary focus during SUD treatment, particularly in adolescents.

Rather than distinct mental health and SUD treatment, integrated care is recommended for dually diagnosed youth. Patients receiving both psychiatric and SUD treatment had better substance use outcomes and significantly better overall outcomes if they were treated "under one roof" [11]. However, mental health outcomes did not improve as clearly, indicating that simply offering mental health services may not be enough for comorbid disorders, but that high-quality, targeted care may be needed [12•].

Unfortunately, many treatment centers do not fully address dual diagnoses, limiting treatment outcomes. A recent study found that just over 60% of adolescent addiction programs offer concurrent mental health treatment [13]. While 92% of programs took adolescents with comorbid disorders, only 50% offered specific programming to address both substance and mental health disorders [14]. Only one third of adolescents in SUD treatment reported receiving mental health treatment in the previous year [2]. These treatment models may, in fact, be coordination or consultation services, but truly integrated care targeting both diagnoses under a single treatment plan [15] is far less common. Furthermore, several widely used dual diagnosis treatment models do not distinguish between externalizing and internalizing disorders, despite evidence that treatment may differ based on this dichotomy [16•]. For example, adolescents with internalizing disorders have been shown to be more engaged in treatment and less likely to relapse [7, 17]. Thus, integrated treatment targeting SUDs and psychiatric disorders at the same time (i.e., dual diagnosis treatment) is considered the gold standard [18], but is frequently unavailable [19]. This is likely due to a combination of reasons including (a) the specialized expertise needed on the treatment teams, (b) increased operating expense; and (c) the unavailability or newness of evidence-supported treatments.

In sum, existing SUD treatments that address co-occurring mental health disorders in adolescents are underutilized. We suggest that additional efforts are needed to increase awareness and implementation of these models, particularly among clinicians and policy makers. A review focused on DD treatments is lacking. Thus, this review summarizes current models used to treat SUDs, concentrating on findings specific to youth with co-occurring disorders, whenever possible. We then synthesize the evidence base supporting their effectiveness in specific populations, subdivided according to the presence of internalizing (i.e., mood and anxiety disorders) and externalizing disorders (i.e., conduct disorder, oppositional defiant disorder, and attention-deficit/hyperactivity disorder (ADHD)). Finally, we highlight the importance of comprehensive, yet individualized dual diagnosis treatment to maximize outcomes in adolescents with SUDs.

## General Approaches to Adolescent SUD

The most commonly studied treatments in adolescents with SUDs include cognitive behavioral therapy (CBT)-based programs, family therapy-based programs, motivational interviewing (MI) and motivational enhancement therapy (MET), and combinations of these programs [20]. Contingency management (CM) and continuing care have also been studied as important aspects of SUD treatment. While 12-step programs have also been studied, there are few comparisons to other common treatment modalities or randomized trials. There have been multiple reviews of the various SUD treatments, though relatively few randomized controlled trials [21]. A large meta-analysis showed that most types of treatment are beneficial, but the research base best supports the use of family therapies, CBT, and to a lesser extent MET. These interventions have been shown to have significantly better outcomes when compared directly to a variety of other treatment types. While group CBT and combined therapies had the largest effect sizes in terms of substance use outcomes, family therapy was statistically more robust because of less variance in outcomes [22].

## Behavioral Therapies

There are a variety of behavioral therapies primarily based on a CBT approach. In reviews, CBT-based therapies have average or moderate effects on substance use reduction [22]. Groups are less costly, but may not be as effective as other treatment modalities [21]. In meta-analysis, both individual and group CBT modalities are well-established approaches [22, 23]. CBT-based group and individual programs were associated with better outcomes than interactional or psychoeducational groups, at least initially, among dually diagnosed youth [24]. CBT is frequently combined with motivational interviewing (CBT/MI) and this approach has shown promise in dual diagnosis treatment, though most studies are primarily focused on outcomes related to pharmacotherapy [19]. In one non-pharmacologic study, CBT/MI improved SUD and comorbid internalizing symptoms [25]. CBT is an important component of SUD treatment and provides the foundation for many evidence-based combined treatments.

## Family Therapy

There are a variety of well-studied treatment modalities based on family therapy including functional family therapy (FFT), multidimensional family therapy (MDFT), brief strategic family therapy (BSFT), and multi-systemic therapy (MST) [26]. Meta-analyses indicate that these treatments show modest, but significant effect compared to control conditions [27], but efficacy is similar to CBT-based interventions [24]. However,

the American Academy of Child and Adolescent Psychiatry (AACAP) practice parameters note stronger evidence for family therapies [28•]. In a Waldron and Turner [23] analysis, MDFT and FFT are classified as well-established therapies (in addition to group CBT). MDFT reduced both externalizing and internalizing symptoms and performed better than individual therapy for reducing externalizing behavior. Additionally, MDFT was particularly helpful for youth from high conflict homes [16•].

However, differing effects were observed based on severity of SUD and psychiatric comorbidity. For example, MDFT was superior to standard treatment for youth with severe SUDs and comorbid psychiatric diagnosis, but had similar effectiveness for low acuity patients, most with less psychopathology [26, 29]. Other studies have shown no difference between MDFT and CBT-based treatments in youth with internalizing, externalizing, or mixed comorbid disorders [3, 24]. This may indicate that high quality interventions are equally as effective, particularly in low acuity youth, but treatments may need to be carefully tailored for youth with more severe co-occurring psychopathology.

### 12-Step Programs

In a review of studies incorporating 12-step programs, there was a 30–60% abstinence rate at 1 year follow-up [30], which was similar to rates achieved by other treatment modalities. With long-term follow-up, youth with internalizing disorders used fewer substances and had fewer dependence symptoms at 1, 4, and 5.5 years. Improvement rates declined over time, indicating increased substance use the further the patients were from treatment discharge, as would be expected. Youth with internalizing disorders were more likely to complete treatment, but when this variable was factored out, they still improved more than youth with externalizing disorders [17]. In a separate study, continued involvement in 12-step programs (10 or more meetings in the last 6 months) was associated with increased abstinence in youth with and without comorbid psychiatric problems [31, 32]. Importantly, comorbid youth were more likely to have participated more fully 12-step meetings in the first few years after treatment (vs. youth without comorbid psychiatric disorders).

These findings and others [33, 34] highlight the importance of continued treatment and/or meeting attendance after discharge from a formal treatment program. Attending 12-step meetings as a continuing care recovery pathway is important because they are free and patients can attend indefinitely. However, it appears to be utilized by a limited segment of youth suggesting the need for additional continuing care approaches.

### Motivational Interviewing

Motivational interviewing (MI) is a well-studied treatment and is often used for brief stand-alone interventions, such as in primary care offices or emergency rooms [21]. In youth admitted for psychiatric disorders, brief MI has been shown to be effective for youth with low or no desire to change, though effects were modest [35]. Two sessions for dually diagnosed youth decreased SUD, but internalizing and externalizing symptoms did not change significantly compared to controls [36]. While stand-alone MI may be insufficient for dual diagnosis treatment, it may help increase motivation for treatment, and it has been shown to be helpful in conjunction with other therapies, particularly CBT [19]. In the Cannabis Youth Treatment study, CBT + MI was a cost-effective treatment for reducing substance use [37].

### Contingency Management

Contingency management (CM) approaches are behavioral incentive techniques mostly used in combination with other interventions to increase outcomes such as retention and participation, prosocial activities, and abstinence. They are based on operant conditioning and primarily use positive reinforcement, often in the form of rewards (i.e., vouchers, payments, and/or random drawings for prizes of different monetary value). Multiple studies show improvement when CM is added to other therapies such as CBT. In a randomized trial comparing CM to CBT + parent education, the CM arm was more likely to achieve early abstinence, an important predictor of long-term abstinence. Of note, internalizing and externalizing symptoms were improved in both groups [38•]. More recently, combination treatment involving CM has been shown to be beneficial for youth with behavior disorders [39]. Payments as low as $0.39 per patient per day (using a prize drawing approach) can be effective at decreasing substance use [40].

However, high quality CM, adhering to key operant reinforcement principles, is essential to achieve these gains. To this point, a recent review highlighted a study that did not show improvement using CM; however, rewards were not immediate, were low magnitude, and could be taken away [38•].

Proponents of the CM method recommend dual reinforcement tracks; one run in clinic and another at home by parents based on a mutually developed contract [41]. Additionally, a third track could provide rewards for parent participation [38•]. In these models, parent training and recurrent parent–child contract reevaluation are important components.

### Combined Therapies

Many studies have employed combination therapies. For example, the Cannabis Youth Treatment Study compared motivational enhancement therapies (MET) with group CBT (5 or 10 sessions), family support network (MET, CBT plus parent education sessions and home visits), the Adolescent-Community Reinforcement Approach (A-CRA) (10 individual session plus 4 family sessions and case management), and

multidimensional family therapy (6 individual, 3 parents, and 6 whole family sessions). All of these had comparable effectiveness in terms of abstinence from substance use and recovery at 12 months in randomized trials. As outcomes were similar, cost was compared and MET/CBT-5 and A-CRA were found to be the most cost effective [37]. In a review of several family therapies, A-CRA was also found to be more cost effective [21].

The A-CRA is a system that combines many of the strategies thought to be most effective in treating SUDs (e.g., CBT, family therapy, medication management) with an emphasis on encouraging individualized prosocial activities and positive reinforcement. It has built in flexibility that allows for therapists to use procedures that include treatments empirically supported in the treatment of co-occurring disorders [42] and has demonstrated effectiveness across gender and ethnic groups [43].

When used in a multi-site study for adolescents, A-CRA had better SUD improvement for combined and externalizing disorders compared to internalizing or SUD only groups. This study also found significant decreases in "days of emotional symptoms" for all DD patients. These patterns continued out to 12 months follow-up [44]. A-CRA has also been used with homeless youth and in an open randomized controlled trial showing improvement in substance use, depression/internalizing symptoms, and social stability compared to treatment as usual [45].

Another common combination of treatment modalities targeting youth with DD is CBT/MI. Multiple studies have demonstrated the effectiveness of this combined approach, particularly in DD youth [46, 47].

Recent studies have also included CM and pharmacotherapy targeting individual psychiatric comorbidities. This approach has particularly been used in pharmacotherapy trials for SUD and comorbid psychiatric disorder including ADHD [48, 49•] and depression [50]. In fact, the effectiveness of combined CBT + MI in youth with dual diagnosis has been thought to obscure the changes due to pharmacology [51]. Furthermore, this approach has also been found to be cost effective, comparable to A-CRA [37].

### Continued Care

Despite high quality care, relapse is common in SUD treatment, particularly with comorbid psychiatric disorders. Continued recovery support after formal treatment has been shown to improve outcomes. For example, continued participation in 12-step programming after initial treatment was associated with improved abstinence at 7-year follow-up for a segment of youth who continued attendance [31, 52]. For more severe comorbid mental health symptoms, also receiving mental health services later in treatment improved abstinence at 3 years.

Together, these findings highlight the need for ongoing treatment to achieve abstinence [53]. Recent studies on intensive continued care have shown promising improvement in long-term outcomes. Assertive Continuing Care (ACC) is a newer program studied as an adjunct to A-CRA. In this program, a case manager comes to the home weekly for 90 days post discharge, regardless of whether the teens completed the program or not. Case managers not only meet with patients, but are also involved in helping patients establish care with outpatient services, make it to appointments, and communicate with service providers. Case managers also continue to encourage prosocial activities and provide caregiver training using the A-CRA model. Compared to usual post-treatment care, ACC had better linkage to continued services and abstinence [54, 55]. Evidence suggested that sustainment of longer-term abstinence was predicted by both high quality implementation and achievement of early abstinence during the first 3 months of continuing care [54]. Additional evidence suggested that post-treatment improvement from CM was more effective with continuing care [55]. Similarly, McGarvey et al.[56] studied A-CRA + ACC in both urban and rural youth and demonstrated an impressive 70% abstinence rate at 1 year. More robust continued care programs can be an important method of improving outcomes in youth with SUD, though more studies are needed to evaluate effectiveness for adolescents with DD.

## Outcomes Specific to Psychiatric Comorbidities

The most common externalizing disorders in adolescents with SUDs are conduct disorder (69%) and attention-deficit/hyperactivity disorder ADHD (28%), and the most common internalizing disorders are depression (30%) and anxiety (38%) [3]. While recent attention has been paid to internalizing disorders which includes depressive and anxiety disorders [18], externalizing disorders such as conduct disorder or ADHD are actually more common in adolescents with SUDs (5% compared to 24–35%, respectively). However, having both an internalizing disorder and an externalizing disorder is even more common (48–77%) [3, 4, 7]. Interactions between combined internalizing and externalizing disorders can further complicate substance use [57–59]. Patients with mixed internalizing and externalizing disorders often have more substance use, worse treatment response, and greater relapse rates [3, 4, 7, 60]. Despite the recent development of several treatment modalities that have been found to concurrently treat dually diagnosed youth, there are few reports of comprehensive models incorporating full doses of various modalities, though this has been proposed in the literature [18].

## Externalizing Disorders

As detailed above, externalizing disorder comorbidity is correlated with worse substance abuse at baseline, worse family and social relations, and poorer treatment engagement, hence the need to address in treatment.

### Conduct Disorder

Multiple treatment modalities have been shown to decrease behavioral disturbances and criminal activities in substance-abusing youth. MST is a well-established treatment for conduct disorder and criminal activity, but has also been shown to be helpful for SUDs and substance use [19]. Spas and Ramsey [61] argue that MST has the most robust evidence supporting its use in SUD and CD, but did not review other family therapies or combined programs. Long-term (4 year) follow-up of MST shows continued reductions in criminal activity and better marijuana abstinence, but no change in cocaine abstinence [62]. Other studies show that behavioral treatments and family treatments are equally as effective for youth with both SUD and conduct disorder [46].

Among SUD treatments, MDFT decreased delinquent associations and behavior, including arrests [26, 63]. Preliminary data indicates that these effects may extend to 48 months in follow-up. Studies have also shown improved educational outcomes (e.g., more passing classes, fewer behavior problems) at 12 months compared to family education or group therapy [63]. MDFT has been adapted to specific populations, such as HIV positive youth and been shown to decrease risky sexual activity when compared to high quality standard prevention [64]. And, as noted above, MDFT has been shown to be particularly helpful for high acuity SUDs [29].

A-CRA has been shown to decrease criminal activity out to 12 month follow-up by reducing substance use during and following 3–6 months of outpatient treatment [65]. In a sample of youth with disruptive behavior disorder, Ryan et al. [39] showed that adding CM and parent management training (including making and implementing a parent–child contract) to CBT/MI treatment improved substance use outcomes compared to CBT/MI and parent education. However, behavior improved in both conditions similarly. These findings highlight the efficacy of combined treatment.

Typically, medications are not considered the primary treatment modality for conduct disorder. As such, there are no medication trials for SUD and comorbid CD. However, medications have been used in patients with CD and SUD targeting other comorbid disorders such as ADHD and depression, as outlined below.

### ADHD

Most dual diagnosis trials in ADHD have focused on pharmacotherapy. A randomized placebo-controlled trial of atomoxetine with CBT/MI vs. placebo and CBT/MI showed no difference in ADHD symptoms or substance use over 12 weeks [48]. Similarly, in another placebo-controlled trial, long-acting methylphenidate (again with CBT/MI) did not significantly decrease ADHD or days of substance use over 16 weeks; however, there was some benefit in parent ratings of ADHD symptoms and there were fewer positive drug screens [49•]. Post hoc analysis showed significant decreases in substance use, but not ADHD for patients with comorbid conduct disorder. Similarly, worse substance use severity at onset was associated with worse ADHD and SUD outcomes. Conversely, worse ADHD at baseline was associated with improved ADHD symptoms and substance use with methylphenidate treatment [66]. Pemoline had been previously studied and found more effective than placebo for ADHD, but had no effect on substance use [67]. Pemoline, however, is no longer available due to concerns about hepatic toxicity. A small naturalistic chart review study showed that bupropion sustained release was safe and reduced substance use, depression, and ADHD symptoms [68]. Interestingly, both the pemoline study and the bupropion study did not include a SUD treatment similar to CBT/MI in other studies. Similarly, an open-label trial of bupropion in adolescents with ADHD, SUD, and CD showed improvement in ADHD symptoms after 5 weeks. These patients received SUD treatment in a residential facility, but the treatment modality was not described. CD and SUD outcomes were not tested [69].

Overall, the evidence for combined treatments, particularly CBT/MI has been confirmed in many trials in youth with externalizing disorders and SUDs. The literature suggests that pharmacotherapy for co-occurring ADHD can be beneficial for individual adolescents, but careful consideration of risks of psychostimulant use (i.e., diversion, misuse) must be weighed, case-by-case. Parental supervision and storage of medication is recommended in this population.

## Internalizing Disorders

### Depression

Proposed models for the treatment of comorbid depression and substance use have existed since at least the early 2000s [70]. While high-quality trials in adolescents are sparse, there is evidence supporting several psychotherapies.

Combined CBT and MI has been shown to decrease alcohol use and depression symptoms compared to a control condition, at least initially [25]. CBT with MI and mindfulness skills have been shown to improve depression, anxiety, and substance use [71]. A recent study of SUD treatment (BSFT compared to treatment as usual) showed similar improvements in anxiety and depression for both interventions. However, both arms also received outside treatment, though the amount of treatment was not correlated with a significant difference [9]. Rohde et al. [72] found a more complicated relationship between depression treatment and SUD treatment. They compared FFT and coping with depression (CWD) as sequenced or combined treatments. FFT then CWD was most effective for SUDs. Conversely, if the patient met full criteria for MDD, then CWD followed by FTT was

most effective. However, this was confounded by the fact that this group also had more adjunctive treatment outside the study. In fact, adjunctive treatment *during* the study led to greater substance use reduction and adjunctive treatment *after* the study decreased depression at follow-up. The combined treatment was a modified program unique to the study and did have better compliance and completion [72]. As few studies have investigated treatment order effects, additional research with this type of design is needed.

Similar to ADHD, SUD outcomes for pharmacotherapies in adolescents with comorbid depression and SUD have been mixed. Most studies have used fluoxetine [47, 50] and sertraline [73]. Early, small open-label studies improved depression, substance use, and education outcomes [74]. However, a meta-analysis of more rigorous randomized placebo-controlled studies showed that antidepressants (particularly in studies with $n > 50$) showed a significant effect on depression but minimal to no effect on substance use. The authors note that adult studies reporting a greater effect on depression also had some effect on substance use [75]. In individual trials, small sample size and concurrent behavioral treatment may have confounded the results [47, 50]. Similarly, in their systematic analysis, Deady, Teesson, and Kay-Lambkin [76] found no difference in alcohol use, but additionally found no difference in depression between antidepressants and placebo. While this may lead one to conclude that antidepressants are not helpful for SUD treatment, several researchers point out that substance use is unlikely to improve if depression is not treated properly [19, 77]. Additionally, the relationship between substance use and depression may be more complicated. Cornelius et al. [78] found that effects on depression and substance use in their fluoxetine trial were related to the efficacy of the behavioral treatment concurrently provided. In a post hoc analysis of their 8-week trial, authors found that fluoxetine improved depression only in patients with chronic depression or moderate alcohol use [51]. These findings highlight the importance of high quality behavioral therapy (i.e., CBT/MI used in most studies) and accurate diagnosis, including attention to severity and chronicity.

Relatively few studies have focused on bipolar depression. In an open-label feasibility study, an established bipolar therapy, Family-Focused Therapy for adolescents, was modified for treatment of SUDs. This showed improvement in depression, but not in marijuana use [79]. In a study of interactions between borderline personality disorder, depression, and SUD, substance use reduction was found only in youth with major depression who received a combined DBT/family therapy program targeting borderline personality disorder versus individual drug counseling [80]. In this population, very few studies have focused on pharmacotherapy. A small randomized controlled study showed lithium benefited both bipolar disorder and substance use [81]. Thus, more research is needed on adolescent bipolar disorder and SUD treatment, although this is complicated by the relatively low prevalence of this disorder.

### Anxiety

There is relatively less research into comorbid anxiety disorder and SUD treatment. This may be related to the anecdotal notion that anxiety is thought of as protective, though research demonstrates that it is still a significant contributor to SUD. Differences in the effects of anxiety disorders on SUD may be based on age and gender [82, 83]. There are, however, a few small studies of targeted therapeutic treatments for specific disorders.

In a secondary analysis of a randomized controlled trial of behavioral family systems therapy (BFST), reductions in both anxiety and depression were seen [9]. Similarly, combined treatment (CBT, MI, mindfulness) improved anxiety and substance use [71]. Post-traumatic stress disorder (PTSD) has also been studied. A randomized trial of Seeking Safety for adolescent girls with PTSD and SUD showed benefits for substance use and trauma-related symptom outcomes, compared to treatment as usual [84]. Mixed trauma-focused CBT and MST also has preliminary evidence in a small, randomized pilot study of sexually assaulted adolescents. Patients randomized to the modified family therapy had less substance use as well as PTSD, depression, and internalizing symptoms; though baseline differences between groups may confound results [85]. For social anxiety, a prospective study found benefit for risk of relapse from the peer-helping component of 12-step programs [86]. Peer-helping is typically defined as service and may represent a positive social activity encouraged in other treatment modalities.

## Conclusion

Components of high quality adolescent DD treatment were enumerated over a decade ago [77, 87]. These components are best supported in the current evolving adolescent DD literature with integrated programs using combined modalities (e.g., CBT, medication management) that also incorporate motivational enhancement, family therapies and continued care. Differences in outcomes were based on severity and types of disorders, as well as gender and age differences. This point emphasizes the importance of using standardized [88] diagnostic tools for both SUD and psychiatric disorders to more accurately diagnose comorbid psychiatric conditions and then determine the appropriate level of care for individual patients based on symptom severity. This approach would enroll patients in appropriate and most cost effective levels of care [89] by targeting dual diagnosis treatment to clearly diagnosed conditions. These differences highlight the importance of tailoring evidence-based treatments to DD youth.

Overall, there are a variety of outcomes in dual diagnosis treatment emphasizing the difficulties of treating these youth [90]. However, there are several key findings that can be gleaned from the literature that can improve care in DD youth. The importance of integrated care (e.g., concurrent treatment

of mental health and SUDs) is consistent across the literature. Ideally, programs should aim to operate within a system where multiple levels of treatment (i.e., inpatient, residential, intensive outpatient) utilizing empirically validated models are truly integrated "under one roof" [18]. Second, a range of interventions have been shown to have comparative effectiveness, if delivered with fidelity. CBT and family therapies are the most studied. However, the treatments with the most promising evidence (i.e., A-CRA, CBT/MI, and several family therapies) offer integrated care with components of CBT, family therapy, and MI [91]. Adding quality behavioral interventions such as CM can increase effectiveness as well [38•]. Similarly, continued care after the initial treatment phase supports recovery, particularly when added to courses of evidence-based therapies [54, 55].

Recently, multimodal care with the flexibility to use modules targeted to specific diagnosis has been proposed for adolescents with DD. This builds on current combined treatment approaches by offering "menu based CBT," which would allow one treatment team to offer truly "individualized and flexible treatment" [42] in modules with therapies and pharmacotherapy targeting individual internalizing or externalizing disorders. For example, Hulvershorn et al. [18] describe modularized treatment of internalizing disorders in three phases. The first phase involves comprehensive psychiatric and substance use evaluation and diagnosis using standardized assessments. In the second phase, established multimodal (including CBT, family therapy, MI, and CM) treatment is provided in an integrated setting. During this phase, functional analysis of substance use and psychiatric symptoms continue to be monitored through established instruments such as the time-line follow-back, urine drug screens, and symptom rating scales. In the third phase, diagnostic information from phase one and functional analysis from phase two are used to enroll patients in therapeutic modules targeting comorbid disorders (e.g., Seeking Safety for anxiety and trauma-related disorders) from a menu of evidence-based options. Targeted pharmacotherapy (e.g., fluoxetine for depression), if not initiated in phase two, should be started as indicated. This model could also be applied to externalizing disorders (e.g., multisytemic therapy for conduct disorder). Recent research indicates that a fourth "sustaining" phase, providing enhanced continued care, would likely increase effectiveness. More research, including the use of adaptive treatment research designs [92], is needed to adequately study and determine the efficacy of a modular approach to adolescent DD treatment.

Improving outcomes for dually diagnosed adolescents will not only necessitate greater implementation of evidence-based approaches, but will likely require a movement away from a "one size fits all" treatment approach. It likely will take many years to study the feasibility and effectiveness of individual treatment components given the multitude of patient presentations. In the meantime, practitioners should focus on providing high quality integrated care and the development of "menu-based" treatment options, comprised of evidence-informed treatments for various disorders.

**Compliance with Ethical Standards**

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