ABSTRACT

Objective: To provide a summary of the existing research on the characteristics of college students who report misusing prescription stimulant medications, to offer a set of clinical recommendations for practitioners, and to offer several possible prevention strategies.

Methods: Literature review and research-based recommendations for clinical practice and prevention.

Results: Misuse of prescription stimulant medication among college students is a prevalent and growing problem. Significant risk factors for misuse of stimulant medication include being male, being a member of a college sorority or fraternity, struggling academically, having elevated symptoms of ADHD and/or depression, being a high sensation-seeker, and using/misusing alcohol, cigarettes, and/or other illicit drugs. Health care providers, particularly those that see adolescent or college-aged individuals, need to be informed about stimulant medication indications, risks, benefits, and side effects and aware and attuned to problems associated with stimulant medication diversion and misuse. Suggestions for preventing misuse and diversion of prescription stimulant medications, including strategies for the individual and potential policy changes on college campuses, are offered.

Conclusions: Misuse and diversion of prescription stimulant medications is a growing concern among adolescents and young adults and should be addressed by health care practitioners. Additional research on effective intervention and prevention strategies is needed.

Prescription stimulant medications (eg, methylphenidate, amphetamines) are typically used for the treatment of attention-deficit/hyperactivity disorder (ADHD) to increase attentiveness, decrease distractibility, and improve daily functioning. Prescriptions for stimulant medications are on the rise; between 2002 and 2010, the number of prescriptions for ADHD medications for youth under 18 increased 46% [1].

A recent review of ADHD diagnosis among college students estimated a prevalence rate of 2% to 8% [2]. More individuals with ADHD are matriculating to college than in the past [3,4], as more supports have been put in place for college students diagnosed with ADHD, including improved educational/organizational treatments and accommodations [2]. Many college students with ADHD also use prescription stimulant medications as part of their treatment plan; McCabe, Teter, and Boyd reported that 2.2% of college students had prescriptions for stimulant medications annually [5].

As the number of individuals of all ages with stimulant medication prescriptions increase, more individuals without prescriptions are gaining access to stimulant medications. In a survey of college students with medication prescriptions, stimulants were the most commonly diverted medication, with 61.7% of students with these prescriptions reporting having shared or sold their medication at least once [6]. Studies report that as many as 43% of college students have misused stimulant medication in their lifetime [7], though prevalence rates vary by study. Throughout this review, “misuse of stimulant medication” refers to using prescription stimulant medications without a prescription or using more stimulant medication than prescribed (ie, a higher or more frequent dosage).

Given the ease with which college students are able to obtain stimulant medications, the alarming prevalence of
STIMULANT MISUSE

stimulant medication misuse among this population, and the potentially serious health risks associated with misuse of stimulant medication (especially when combined with other substances, such as alcohol, that are commonly used by college students), there is a need to both better understand and ultimately reduce the misuse of stimulant medication among college students. Thus, the purpose of this paper is threefold. First, we provide a summary of the existing research literature on the characteristics of college students who report misusing stimulant medication. Second, we offer a set of clinical recommendations for practitioners, which includes stimulant medication indications, risks, benefits, and side effects, along with problems associated with stimulant medication diversion and misuse. Finally, we offer several prevention strategies, including strategies for the individual as well as several suggestions for changing policies on college campuses to prevent stimulant diversion and misuse. Importantly, although our literature review addresses prescription stimulant misuse among college students, our clinical recommendations are also appropriate for adolescents and young adults not enrolled in college.

SUMMARY OF THE LITERATURE

The following summary is based on a comprehensive search of the existing research literature on misuse of stimulant medication among college students, which ultimately identified 30 relevant studies using 21 unique samples. A study was included if: (1) the main focus of the study was misuse of stimulant medication, (2) it was a peer-reviewed, empirical study using quantitative data analytic techniques, (3) it was written in English, (4) only undergraduate students were included in the sample, (5) it did not focus on only one type of stimulant medication (eg, methylphenidate only), and (6) if the article discussed multiple prescription drug categories (eg, stimulants, opiates), the data must have been analyzed separately for each category. An extensive meta-analytic review of this literature will be published elsewhere (contact the corresponding author to request a reprint). The following is a brief summary of our findings.

Prevalence, Availability, and Demographic Characteristics

Among prevalence rates reported, lifetime rates of stimulant medication misuse were the most frequently reported, ranging from 8.1% [8] to 43% [7]. Rates of misuse of stimulant medications within the last year ranged from 5.3% [9] to 35.3% [10]. A number of the studies asked students how they obtained stimulant medications for misuse; peers were overwhelmingly the most common source for obtaining the medications. For example, DeSantis, Webb, and Noar [11] found that 91% of the undergraduates who were interviewed obtained stimulant medications from friends or significant others.

Perceived availability of stimulant medications was also measured in several studies. DeSantis, Webb, and Noar [11] found that 82% of students thought it was somewhat or very easy to obtain stimulant medication; however, Sharp and Rosén [12] found that only 55% of students thought it was somewhat or very easy to obtain stimulant medication. In another study that examined perceived availability, 37% of men and 29.2% of women agreed that they knew students who would provide them with stimulant medications [13].

Many of the studies reviewed examined the relation between particular demographic characteristics (eg, gender, race, socioeconomic status, religious affiliation, year in college, sorority or fraternity membership) and misuse of stimulant medication among college students. The vast majority of studies that examined gender as related to misuse of stimulant medication found that significantly more males misused stimulant medication than females. For example, one study found that 26% of males and 17.3% of females reported misusing stimulant medication [14]; another study found that 39% of males versus 30% of females reported misuse [11].

It is also clear from the existing literature that members of fraternities and sororities appear to be more at-risk for misuse of stimulant medication than non-Greek students. In multiple studies, Greek students had rates of misuse twice that of non-Greeks. For instance, 48% of Greeks misused in their lifetime compared to 22% of non-Greeks [11]; 12% of Greeks misused in the past year compared to 5% of non-Greeks [15]; and Greeks were 2.32 times more likely to initiate use than non-Greeks [9].

Unfortunately, results from studies examining other demographic characteristics (eg, race, socioeconomic status, religious affiliation, year in college) as related to misuse of stimulant medication are much less conclusive and these correlates therefore require further investigation.

Motives For Misuse and Perceived Risk

Researchers have also evaluated college students’ motives for misusing stimulant medication and the risks they associate
with misuse. All of the studies that asked misusing students about their motives for misuse reported that the most commonly endorsed motives were related to academics. “To concentrate better while studying” [16], “to improve study skills” [17], “to stay awake to study longer” [11], and “to improve concentration” [18] were some of the most commonly endorsed motives in these studies. Nonacademic reasons, such as to get high, to prolong effects of alcohol and other drugs, and to lose weight, were less commonly endorsed [7,12,19]. In studies where participants were able to indicate multiple motives for misuse [16], very few students misused for only nonacademic reasons.

Several studies measured the relation between misuse of stimulant medication and perceived risk associated with misuse. Perceived risk was conceptualized as perceived harmfulness [20], perception of safety [14], concern with health risk [18], and the inverse of positive outcome expectancies [21]. These articles found that when college students perceive more risk or have less positive expectancies about stimulant medication misuse, they are less likely to misuse stimulant medication. For instance, those who associated stimulant medication misuse with low perceived harmfulness were over 10 times more likely to have used in the last year than those who associated misuse with high perceived harmfulness [20].

**Academic Outcomes Associated with Misuse**

Interestingly, despite academic motives being most common for college students who report misusing stimulant medication, a number of studies have found a negative association between academic outcomes and misuse of stimulant medication. For instance, nonusers reported an average grade-point average (GPA) of 3.28 compared to 3.16 for misusers [16]. Other research demonstrates that the lower the student’s GPA is, the greater the odds are of the student misusing stimulant medication [8]. Misuse is also significantly related to other detrimental academic behaviors such as skipping class and less studying [20,22].

**Psychological Correlates of Misuse**

Researchers have evaluated the relation between several different psychological variables and misuse of stimulant medication. The strongest association is between symptoms of ADHD and stimulant medication misuse. Studies are consistent in reporting a significant correlation between greater symptoms of ADHD and higher rates of misuse or a significant difference in rates of misuse between those who have an ADHD diagnosis and those who do not. One study found that 71.1% of stimulant medication misusers screened positive for adult ADHD symptoms [17]. Another study found that for every standard deviation increase in attention problems, the odds of becoming a stimulant misuser increased by 1.78 [9]. Two studies asked participants if they believed they had ADHD. Advokat, Guildry, and Martino found that 12% of misusers believed they had ADHD [7]. Twenty-nine percent of “self-diagnosers” reported misusing, compared to 11.4% of “non-diagnosers” in another study [18].

Although the literature base is smaller than for ADHD, several studies have suggested a significant difference in symptoms of depression between stimulant medication misusers and nonusers. Zullig and Divin [23] found that misusers were significantly more likely to feel very sad, feel depressed, and consider suicide than nonusers. More frequent misuse has also been shown to be significantly associated with depressed mood [24].

A number of studies demonstrate a clear association between high sensation-seeking and misuse of stimulant medication. These results are not surprising given the well-documented relation between sensation seeking and substance use [25–27]. One study found a significant interaction between sensation seeking and perceived harmfulness of misusing stimulant medication: those with high sensation seeking and low perceived harmfulness were most likely to misuse [20].

**Other Substance Use Associated with Stimulant Misuse**

Many of the reviewed studies found a positive correlation between misuse of stimulant medication and other substance use or a significant difference between stimulant misusers and nonusers in rates of other substance use. These findings held across all substances examined, including alcohol, cigarettes, marijuana, illicit stimulants (e.g., ecstasy, cocaine, or amphetamines), and non-stimulant prescription medications. For instance, significant associations were found between misuse of stimulant medication and several alcohol-related constructs, such as binge drinking [28,29], problematic drinking behavior [30], or meeting the Diagnostic and Statistical Manual of Mental Disorders [21] criteria for alcohol abuse [22].

With respect to cigarettes, 50.3% of misusers were found to have smoked cigarettes in the last 6 months compared to 13.3% of nonusers [16]. Similar findings emerged for illicit drug use. One study found that 73.5% of stimulant
medication misusers reported use of marijuana in the last 6 months, compared to 18.2% of nonusers [19], while another study found that 93% of misusers used marijuana in the last year compared to 34% of nonusers [5]. This same study found that 33% of stimulant medication misusers also reported cocaine use in the last year compared to 2% of stimulant nonusers [5]. Finally, many of the studies reviewed examined the association between other substance use in general and stimulant medication misuse. Results were striking; the odds of becoming a stimulant medication misuser increased by 3.81 for each standard deviation increase in the amount of other substance use [9].

Summary
The research literature reviewed in this section provides a descriptive characterization of which college students (and, by extension, adolescents and young adults not in college) may be at the greatest risk of misuse of stimulant medication. Significant risk factors include being male, being a member of a college sorority or fraternity, struggling academically, having elevated symptoms of ADHD and/or depression, being a high sensation-seeker, and using/misusing alcohol, cigarettes, and/or other illicit drugs. It is important to recognize that one, several, or many of these risk factors may be present in a given individual who is misusing stimulant medication. Moreover, there may be other risk factors not yet identified in the research literature. The following sections of this paper draw from the literature reviewed here to provide a number of clinical recommendations for reducing and preventing misuse of stimulant medications among college students, other young adults, and adolescents.

CLINICAL RECOMMENDATIONS

It is important for health care providers to be aware of the benefits and risks associated with stimulant medications, the prevalence of and risk factors for stimulant misuse, and the psychiatric, psychological, and medical comorbidities associated with the misuse of stimulant medication. Knowledge about stimulant medications, misuse of stimulant medications, and a thorough evaluation of the patient will enable health care providers to address the misuse, as well as any comorbidities or other factors that may contribute to stimulant medication misuse, either pharmacologically or through referral for more specified psychotherapeutic interventions.

Stimulant Medication Indications and Adverse Effects

Stimulant medications are efficacious for the treatment of ADHD and, when prescribed and used correctly, can improve attentiveness, decrease distractibility, and improve daily functioning in the short term [19]. When used by individuals without ADHD, patients may experience euphoria, stimulation, alertness, and are not likely to experience the cognitive benefits that those with ADHD receive [31]. Side effects can occur regardless of whether the individual is using the stimulant for ADHD, misusing, or is dependent, and include nervousness, headaches, tachycardia, poor appetite, depressed mood, and poor sleep [19,32]. Additionally, stimulant medications can cause psychosis, agitation, and hallucinations [31,33], which typically resolve after discontinuation of the stimulant within 2 to 6 days, though a longer time period to resolution has been reported [33]. Stimulant medications carry warnings about increased risk of sudden death, high blood pressure, cardiac arrest, and stroke, as well as a statement warning providers about abuse potential. Additionally, serious but rare medical complications, including seizures, tachycardia or dysrhythmias, and hyperthermia, can occur [31,34].

Physical Examination and Laboratory Data

Obtaining vital signs and performing a physical exam may reveal weight loss and an increase in heart rate or blood pressure. Methylphenidate and amphetamines are known to increase heart rate and blood pressure [35] and a recent study found an average increase in heart rate of 5.7 bpm and a 1.2–mm Hg increase in systolic and diastolic blood pressure in adults on stimulant medications compared to placebo [36]. No EKG abnormalities or changes are found with either methylphenidate or amphetamine [35]. Urine toxicology can be utilized to obtain further information if misuse is suspected. However, the clinician must be aware of the limitations of urine drug testing with stimulants [37]. The usual detection time for amphetamines is 48 hours from last use, though this may vary depending on the presence of metabolites, pharmacokinetics of the drug (eg, immediate release vs. sustained release formulations), and patient variables [37]. Additionally, a urine toxicology screen for amphetamines typically tests for amphetamines, racemic compounds such as dextroamphetamine and methamphetamine, and illicit compounds (ie, methylenedioxymethamphetamine), though there are many compounds
that are structurally similar, such as weight loss agents, over-the-counter cold products, and other psychotropic medications, including methylphenidate, that can cause a false-positive result [37]. Urine toxicology should be obtained in conjunction with a thorough evaluation of patients’ alcohol and drug use patterns. These 2 components are essential to the accurate diagnosis and formulation of a comprehensive treatment plan. As noted above, stimulant medication misuse and alcohol and illicit drug use are highly comorbid and should be carefully and thoroughly assessed.

**Psychiatric Comorbidity**

**ADHD**

The prevalence of ADHD is higher among individuals with substance use disorders [38]. As noted above, patients commonly report misuse of stimulant medication to enhance academic performance. One explanation may be that individuals misusing stimulants may be self-medicating undiagnosed ADHD [39]. The prevalence of ADHD among adults is 4.1% and it is more common in men than women with a ratio of up to 6:1 [40]. Several studies have found that individuals with misuse of stimulant medications endorse symptoms of ADHD, including higher levels of inattention and hyperactivity [41]. Twelve percent of participants in one study that endorsed stimulant medication misuse also endorsed the belief they had ADHD [7]. Another study found that individuals with higher baseline self-reported ADHD symptoms were also more likely to misuse stimulants [42]. The majority of individuals with ADHD have been found to take medications appropriately, though there is a minority, often with comorbid conduct disorder or other substance use disorders, that divert or misuse stimulant medications, most often the immediate release formulations [43,44].

Accurate diagnosis of ADHD in patients with substance use disorders can be challenging given the symptom overlap between intoxication and withdrawal syndromes of substances and symptoms of ADHD. Evaluating for ADHD is an important part of a thorough assessment and can be completed in several ways. The gold standard is with a standardized diagnostic tool such as the Connors Adult ADHD Diagnostic Interview for DSM-IV (CAADID) [45], which can be time consuming for a clinician and would likely involve referral to a psychologist for completion. Other scales have been examined, and the Connors Adult ADHD Rating Scale (CAARS) has been found to closely agree with the CAADID when both are administered [45]. Other scales are available, including the Wender Utah Rating Scales (WURS) and the Adult ADHD Self-Report Scale (ASRS), and have been found to have adequate sensitivity and specificity [45]. In an international study, the ASRS, a relatively brief instrument, showed encouraging results with 84% sensitivity and 66% specificity in detecting ADHD upon entry into substance disorder treatment for treatment-seeking patients [46]. When diagnosing ADHD among adults, it is crucial not to rely only on self-reported symptoms. A thorough childhood history of ADHD symptom presentation should be collected from a parent or caregiver, and collateral concurrent report should be collected from someone who knows the patient well, such as an employer, close friend, significant other, or parent. Valid diagnosis, whether ADHD is present or not, is of utmost importance in this population as individuals with comorbid substance use disorders and ADHD tend to have worse outcomes overall [47]. It is also important to appreciate that inaccurately diagnosing ADHD in individuals misusing stimulants could potentially diminish the importance of the diagnosis [48].

If ADHD is found, there are medications available that have a lower abuse potential compared to stimulant medications. Atomoxetine is the only FDA-approved nonstimulant for ADHD; off-label or second-line treatments include antidepressants, such as bupropion, venlafaxine, or tricyclic antidepressants, for which the data is limited, and clonidine [34,49,50]. If these therapies are not effective and, after careful consideration of risks and benefits, it is determined that a trial with a stimulant is needed, longer-acting formulations appear to be less abused [34,44]. Education for both the patient and his or her family should be provided on abuse and diversion potential and appropriate use and misuse [34,43,51]. Pill counts [43], regular office visits [52], and random urine toxicology screens [34] with informed interpretation of the screens may be helpful in deterring misuse or diversion. While medications are the mainstay of treatment for ADHD, there are several psychosocial interventions available, including cognitive behavioral therapy, coaching, and behavioral modification therapies [34].

**Other Comorbidities**

Other psychiatric comorbidities also should be explored. Studies have found a relation between depression and misuse of stimulant medication in that there is an in-
creased likelihood of depression and thoughts of suicide among those that misuse stimulant medication and vice versa [23,24,53]. The National Survey on Drug Use and Health in 2012 found that, of those that misused stimulants, nearly 20% had serious thoughts of suicide over the past year [54]. As noted earlier, stimulant medication can affect sleep and appetite. Among those that report misuse of stimulant medication for weight loss, these individuals are more likely to report other eating-disordered behaviors [55]. Sleep quality is worse and sleep disturbance greater in those that misuse stimulant medication [32]. Other traits and behaviors that have been described in individuals that misuse stimulant medications include impulsivity [56,57], sensation seeking [20], perfectionism [58], and poor time management skills or procrastination [59].

Appropriate treatment (which may include pharmacologic, psychological, or academic accommodation components) for individuals with these psychiatric disorders or psychological symptoms may reduce the misuse of stimulant medications among college students, especially if these students are misusing in order to reduce their symptoms (ie, a self-medication hypothesis).

**Treatment**

There are currently no FDA-approved medications to treat stimulant medication misuse. In fact, studies exploring pharmacotherapy for stimulant medication misuse are limited. Most trials focus on stimulants such as cocaine or methamphetamine and not stimulant medications alone. Additionally, these trials primarily include only individuals that meet criteria for stimulant dependence. Various medications and medication classes have been examined for the treatment of stimulant dependence, including naltrexone, various antipsychotics, and various antidepressants including bupropion, modafinil, baclofen, ondansetron, and dexamphetamine, with little to no effect [60]. In a review of the literature, one study examined the use of naltrexone versus placebo for stimulant dependence in 80 treatment-seeking Swedish individuals [61]. The different types of stimulants on which these individuals were dependent were not clearly delineated, though the study authors noted that the major amphetamine abused in Sweden was the racemic mixture d/l amphetamine and not methamphetamine. Naltrexone was superior to placebo in this trial, as evidenced by higher percentage of amphetamine-free urine samples. A large majority of this sample used intravenously (65%–76%) and had been using between 6 to 8 years, limiting the applicability to individuals with stimulant medication misuse. At this time, investigation into evidence-based pharmacotherapies for stimulant medication misuse remains in the early stages.

Generally speaking, efficacious behavioral treatments, such as contingency management (CM), cognitive behavioral therapy (CBT), skills training, motivational interviewing (MI), relapse prevention, couples and family treatments, and drug counseling, exist for drug abuse [62]. CBT, cognitive therapy, CM, MI, and community reinforcement approach (CRA) [63,64] have been explored for stimulant dependence and are currently the primary interventions for amphetamine-type stimulant dependence [60]. Similar to psychotherapy studies, most psychotherapy studies to date have examined primarily cocaine and methamphetamine dependence and not misuse of stimulant medications. In fact, no studies examining psychotherapy for stimulant medication misuse were found by our group in a search using the PubMed database. Therefore, discussion of psychotherapeutic interventions that may be efficacious for stimulant medication misuse extrapolates outcomes from studies of stimulant dependence, appreciating this is an approximation and imprecise as there are significant differences between stimulant medication misusers and those dependent upon stimulants such as methamphetamine or cocaine. As such, in a review from 2009 [63], Vocci and colleagues compared psychotherapy studies for cocaine and methamphetamine dependence and concluded that CBT and CM were moderately effective and that adding CM to standard treatment may help improve outcomes. A study of 214 amphetamine users (including methamphetamine users), with the majority (70%) enrolled in a methadone maintenance program and a large proportion (58.9%) using amphetamines intravenously, found that either 2 or 4 sessions of CBT, along with self-help material, increased rate of abstinence at 6 months post-intervention compared to the use of self-help material alone [65]. Baker and colleagues [64] recommend a practical stepped approach to treatment for stimulant dependence, including conducting a thorough assessment, offering education and self-help materials, monitoring use and consequences of use, and then transitioning to more intensive psychosocial interventions if needed, which may be applicable to those with stimulant medication misuse and is clinically reasonable. Offering a psychosocial intervention may require referral to more specialized treatment services than can be offered in a
general primary care clinic. Additionally, harm reduction techniques for stimulant medication misusers to reduce the medical and social consequences can be considered as well as prevention strategies and methods, which can be utilized in any treatment setting or in high-risk populations, such as college students.

**Prevention Strategies for the Individual**

The research findings summarized in this review suggest several specific strategies for preventing and reducing the misuse of stimulant medication among college students, a high-risk population. First, college students with a prescription for stimulant medication play a critical role. Not only do these students have a high rate of misuse themselves [28,66], but they are also the most common source from which other students obtain stimulant medication to misuse [11,67]. It is therefore important for physicians who provide college students with prescriptions for stimulant medications to discuss the possible consequences of misusing or diverting medication, including potential negative health outcomes, legal consequences, and on-campus repercussions, for students caught diverting stimulant medications. These practitioners should also monitor their patients for signs of diversion, such as finishing a prescription early, doctor shopping, or urine drug screen which is negative for the prescribed substance. Utilizing a prescription monitoring program to access information on the prescribing and filling of controlled substances can be a valuable tool in detecting multiple concomitant prescriptions for stimulant medications, number of providers writing stimulant medication, and information on the use of other prescribed controlled medications. Providers should also discuss safe storage of stimulant medications with patients, particularly if the student is currently living in a dorm setting or another community-type setting with the potential for lots of individuals in and around their personal belongings. Additionally, providers may wish to consider dispensing a small amount at each office visit until the patient has established responsible use of the medication, particularly if there are other findings or comorbidities that perhaps increase their risk of misuse. Pill counts and frequent office visits, as noted earlier, may also help prevent diversion.

Perceived risk/harm associated with the use of stimulant medications has been negatively related to misuse [18,20]. If college students were more aware of the risks associated with stimulant medication misuse, with regards to both health and legal consequences, fewer students may choose to misuse stimulants. Educating patients and their families about the abuse potential of stimulants, as well as consequences of misuse such as psychosis and agitation, when prescriptions are given for stimulant medication, may help address the misperception that stimulant medications are benign, safe and without adverse consequences.

**College Policy Changes for Prevention of Misuse**

Policy changes on college campuses could also help to reduce diversion of stimulant medications. For instance, education about the risks associated with stimulant medication misuse could be incorporated into other alcohol and drug prevention programs that are already in place at colleges and universities. Many colleges/universities require all first-year students to complete an online substance use education/prevention/assessment tool. Some of these, such as AlcoholEdu and The Alcohol eCHECKUP TO GO have demonstrated some success in reducing college student alcohol use in follow-up evaluations [68]. Information about misuse of stimulant medication could be included in these existing programs. Moreover, members of certain organizations (eg, fraternities or sororities) that are known for an increased risk of substance use/abuse among members are also sometimes required by their national chapters or host colleges/universities to complete a “risk management” class, which addresses behaviors such as binge drinking and drunk driving. Since one of the demographic factors most strongly related to stimulant medication misuse is Greek organization membership [14], presenting information about stimulant medication misuse to these groups during these classes could help reduce misuse on college campuses.

Finally, the most commonly reported motives for misuse of stimulant medications among college students are academic in nature (eg, to study more, to concentrate better) [16], and many students who misuse for these reasons feel the desired effect is achieved. Colleges and universities may need to improve the identification of students who are in need of academic assistance/supports and offer these interventions earlier in students’ college careers to prevent stimulant medication misuse as a “quick fix.” Such interventions may include teaching students skills such as note-taking and academic goal setting and educating students about the link between sleep deprivation and poor concentration [69].
Summary

Health care providers, particularly those that see adolescent or college-aged individuals, need to be informed about stimulant medication indications, risks, benefits, and side effects and aware and attuned to problems associated with stimulant medication diversion and misuse. Diagnosing ADHD can be invaluable for individuals with the disorder, thus the ability to perform a thorough and accurate assessment is important; equally important is the ability to assess when ADHD is not present. Education and prevention strategies to prevent misuse and diversion should be provided if stimulant medications are indicated. College programs and policies can also utilize prevention strategies, provide education to students, and assist those with academic difficulties. Comorbidities are common and should be explored thoroughly as they may play a role in continued stimulant medication misuse and outcomes. Various treatment techniques and modalities can be explored further with each patient, based on the individual and their particular needs.

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