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Middle and High School Based Interventions for Adolescents with ADHD

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Introduction & Background

When children enter middle school they are in the midst of many developmental changes and experience significant shifts in the expectations of parents and teachers.[1] The onset of puberty coupled with increased expectations for independence from parents and teachers can be challenging, and this is particularly true for children with Attention-Deficit/Hyperactivity Disorder (ADHD). Although ratings of ADHD symptoms may decline during adolescence, they remain elevated compared to peers[2] and the transition to middle school is associated with an interruption in the decline of symptoms.[3]

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Impairment in the school domain is one of the most prominent difficulties faced by adolescents with ADHD. Compared to their peers, adolescents with ADHD earn significantly lower school grades, score significantly lower on standardized achievement tests and experience higher rates of special education placements, grade retention, and school dropout.[4-6] In fact, adolescents with ADHD are more than eight times more likely to drop out of school than their peers without ADHD.[4] Additionally, problems with delinquency and substance use begin as young as age 11[7] and continue throughout adolescence.[8] Given the findings related to performance in secondary school, it is not surprising that adolescents with ADHD are far less likely to receive any post-secondary education or training than their peers.[9] As a result, social, behavioral and academic problems during adolescence are a high priority for parents of these youth and for the adolescents' long-term futures.

Fortunately, there continues to be a great deal of treatment development work being conducted for adolescents with ADHD.[10,11] Much of this work has focused on school-based treatments due to the considerable academic and social impairment exhibited at school. Providing treatment within a school allows providers to observe the students in structured and unstructured settings (e.g., classroom and cafeteria), speak regularly with the students' teachers, observe the direct effects of treatment, and provide services on a frequent basis over an extended period of time. These advantages of school mental health services are well-suited to address the chronic and pervasive problems of adolescents with ADHD.

As most of the psychosocial treatment outcome research for adolescents with ADHD has been conducted in schools, it is important to critically review this literature in order to understand future directions for the development and evaluation of services. In fact, future development of other clinic and community based services may be informed by such a review as some of the most effective approaches may be provided and coordinated across multiple settings. We begin by providing a description of the school-based services that have been developed and evaluated for adolescents with ADHD followed by a review of the evidence for each treatment. Following this review we examine the implications of this work related to modalities of treatment, models of care, and future treatment development and evaluation research.

Interventions and Other Services

Accommodations

The non-pharmacological services most frequently provided to adolescents with ADHD in schools are often referred to as accommodations. These include adjustments to educational practices such as allowing students with ADHD extended time to complete tests and assignments, providing them with teacher or peer prepared notes from class, and reducing the length of assignments. Adolescents with ADHD often qualify for and receive these services through Individualized Education Plans (IEPs) or Section 504 plans. The purpose of these services is notably different from psychosocial interventions as there is no expectation that the adolescent will develop new or improved skills from these services. For example, a student may be provided with additional time to complete tests for many years, but there is no expectation that being afforded extended time will eventually lead to the student being

able to complete tests independently within the expected time frame. When an adolescent is only provided accommodations, the parents and educators are not focusing on improving the student's ability to independently meet age-appropriate expectations, but instead are reducing expectations to help the student get by with a deficient skill set. A recent review of these services revealed that there was no evidence that any of these services met the criteria for being an “accommodation” and only minimal evidence that any provide direct benefits to the students.[12] Furthermore, these services do not address social impairment, disruptive or delinquent behavior. As a result, the most frequently provided school-based services for adolescents with ADHD have little to no evidence to support their use.

Interventions

There have been individual school-based interventions evaluated for adolescents with ADHD as well as comprehensive programs. In addition, there have been multiple secondary school-based interventions evaluated with samples that very likely included participants with ADHD, but that did not specifically examine the effects of the interventions on adolescents with ADHD (e.g., Check and Connect;[13] Family Check-Up[14]). We will restrict this review to those studies that specifically evaluated the effects of the treatment for adolescents with ADHD. Although research and development of school-based treatments for elementary school aged children goes back a few decades (see review[15]), adolescents were rarely participating in these studies throughout the 1990s.[16] Research in this area grew at the start of the new century and the first review of school based interventions specifically for adolescents with ADHD was published in 2008.[17] The treatment development work has focused on two specific interventions as well as two comprehensive programs.

Note-Taking—Two common struggles for adolescents with ADHD in the school setting are attending to tasks and organizing information. Both of these problems can reduce learning and academic performance. One academic intervention that addresses both of these issues is note-taking training.[18] In the only study of note-taking training for adolescents with ADHD completed to date, instruction and practice in taking notes was integrated into teacher instruction in an analogue classroom for a two-week period of time. After two weeks, the effects of taking notes and having notes provided on on-task behavior, daily assignment accuracy scores (i.e. classwork), and on quiz scores (i.e. brief tests on the lecture material) were examined in a within-subject two-by-two design study. Evans and colleagues[18] found that having students actively take notes improved time on-task and taking and having notes improved scores on daily out-of-class assignments. Within subject effect sizes for on-task behavior across conditions was approximately .81 for taking notes. The effect sizes for improved scores on daily assignments ranged between .38 and .96 for the difference between not taking or having notes and all three combinations of taking notes or having notes provided. However, adolescents' performance on quizzes was not improved by this intervention, suggesting that the benefits of note-taking interventions may need to be paired with study skills interventions to improve quiz/test performance. This study also demonstrated that middle school adolescents could learn to take notes with two weeks of instruction embedded into classroom instruction on American History (7 of 9 indices of quality of notes improved, $p < .05$). Thus the evidence from this one study suggests that note-taking training is an intervention that is likely to be feasible to implement in a

secondary school classroom, but due to the lack of additional research, according to the Oxford Centre for Evidence-Based Medicine[19] the level of evidence for this intervention is level three.

Self-Management—When adolescents enter middle school, they are often expected to manage their own classwork and homework completion behaviors with minimal external supports (e.g. from teachers). Therefore, teaching adolescents to self-manage these responsibilities becomes important for academic success. There is a large literature evaluating the effects of self-management training;[20] however, only two studies have evaluated its effects in secondary school settings with students with ADHD.[21, 22] In these two studies, students were taught to monitor and track behaviors related to preparing for class and homework completion through frequent brief meetings with a school psychologist. In these meetings, self-management goals were established (e.g., bring paper and pencil to class) and adjusted, problems meeting goals were addressed, and progress was encouraged. Gureasko-Moore and colleagues[21, 22] found the self-management intervention successfully improved classroom preparation and homework completion behaviors and that these behaviors were maintained as the intervention was faded over time. Further, students and teachers rated the intervention as acceptable for improving the students' classroom behaviors.

Although these findings are promising, across both samples there were only nine total participants (all male) with no comorbidities, and therefore, generalizing these findings may be limited. Analyses conducted included visual analyses of means and raw data points within conditions and percent of non-overlapping data between conditions. Based on the results of these two studies, self-management for adolescents with ADHD is classified as level four using the OCEBM levels of evidence.[19]

Challenging Horizons Program (CHP)—The CHP is a comprehensive school-based treatment program for middle and high school students with ADHD. It includes interventions targeting social, academic and family impairment and was first developed and evaluated in 1999. Two versions of the CHP have been evaluated including an after-school model and mentoring model and a third version is currently under development and evaluation. The after-school and mentoring models are described below.

After School Model: The after school model of the CHP has been provided between two and three days per week for 2 ½ hours per session over the course of an entire academic year. Interventions include Interpersonal Skills Group (ISG), academic skills training, sports skills, mentoring, and parent meetings. The CHP after school interventions have been provided by undergraduate students in the role of counselors with graduate students or faculty serving as supervisors. ISG is conducted in a group format and targets social impairment in a manner substantially different than traditional social skills training. The techniques in ISG address the developmental goal of defining a personal identity, teach adolescents to understand the cause and effect relationships between their behavior and this identity, and help them learn to engage in a constant monitoring and revising process pertaining to their interpersonal behavior so that it aligns with their goals for their identity. The academic skills training involves training in organization of academic materials and

tracking of assignments, training in note-taking (see above) and creating flashcards and using both notes and flashcards for studying. Sports skills training is included to provide an opportunity to practice interpersonal skills learned in ISG and to develop skills and knowledge in common sports to allow adolescents to participate in these recreational and social activities in the community and at school. Brief mentoring meetings with CHP counselors occur at every CHP session and provide adolescents opportunities to share their concerns of the day, initiate special interventions to augment program services, and receive coaching and encouragement on treatment goals. Finally, there are monthly parent meetings that involve providing parents with information about ADHD and adolescence and helping them learn effective parenting practices. In order to monitor progress, identify areas of concern, and assess implementation of skills; CHP counselors communicate with parents and teachers regularly and observe students in structured and unstructured school settings.

Mentoring Model: The mentoring model of the CHP was an attempt to provide a subset of the CHP interventions provided in the after school model during the school day. In the mentoring model school mental health professionals (SMHP; counselors, social workers, school psychologists), teachers and other staff meet weekly with the students to provide the organization and homework tracking interventions. These specific interventions were prioritized for the mentoring model due to their relationship with critical school functioning skills. CHP staff consult with mentors on a regular basis to monitor their implementation of the CHP organization interventions and help them address problems that arise. CHP mentors are also encouraged to teach a problem-solving model to students and use this model throughout the academic year to address issues related to the CHP interventions or other problems that arise for the students. A similar version of the mentoring model was also tried in high schools, but services were provided by school-based research staff instead of school-employed staff, as has been done in the middle schools. The mentoring model of the CHP was the first attempt to integrate CHP interventions into the school day in a model that is likely to be more feasible than the after-school program.

Evidence Supporting the Efficacy of the CHP: To date, there have been nine empirical manuscripts published focusing on the efficacy of the CHP, reporting results from three randomized trials, one trial using a quasi-experimental design and other small studies from the treatment development process. Three studies of CHP have included random assignment to CHP or to a control group[23-25] and one included random assignment of schools, but not participants.[26] Sample sizes in these four studies ranged from 20 to 79 and three were conducted at the middle school level and one in high schools.

Combining results across all studies there is evidence for meaningful gains in social, academic and family functioning. Some of these results are reviewed below and in order to facilitate interpretation, some of the findings are compared to the results of the MTA in order to examine efficacy of these studies with adolescents in relation to best practices with children. In the high school CHP study[24] the percent of respondents achieving reliable change (RC)[27] on parent ratings of functioning on the Impairment Rating Scale[28] were calculated. The percent of participants ranged from 17.3% to 47.3% with estimates based on those receiving the optimal dosage of CHP in the 40% to 60% range. Although the MTA

investigators did not report percent of respondents meeting RC criteria in any of the manuscripts we could find, the percent achieving RC on parent ratings for participants in any of the three active treatment groups can be calculated from analyses of MTA data reported by Karpenko and colleagues.[29] Based on their report of parent ratings of participants in the medication only, behavior therapy only, and combined groups (active treatment groups), at the 14-month evaluation 36% of participants met RC on the Columbia Impairment Scale, 48% on the Home Situation Questionnaire, 54% on the Homework Checklist, and 60% on the Social Skills Rating Scale. These percentages are based on results from well-established treatments for children between the ages of seven and nine. In the only study that we found of treatment of adolescents with ADHD that reported RC, Barkley reported that between 0% and 24% of participants demonstrated reliable improvement on parent ratings of a variety of functioning domains at home related to parent/child interactions.[30] Thus, the CHP evaluated in high schools resulted in percentages somewhat lower, but with overlapping percentages, than those that resulted from the combination of all three active treatment conditions in the MTA (behavioral, medication & combined), but participants receiving the optimal dosage of the CHP produced equivalent percentages.

An examination of between group effect sizes after 14 months of the CHP mentoring condition[26] and the MTA behavior treatment condition after 14 months provides an additional point of comparison.[31] Both studies reported data from similar parent rating scales of symptoms and the same parent rating scale of social functioning (Social Skills Rating Scale).[32] Effect sizes based on between group differences between treatment (behavioral treatment in MTA) and control revealed that the effect sizes in the CHP study are more than twice as large on parent ratings of symptoms (CHP: .45 HI & .31 In; MTA: . 15 HI & .13 In) and quite a bit larger on parent ratings of gains in social skills (CHP: .39; MTA: 0). Thus, based on these effect size data and percentage of the sample achieving RC, the effects of the CHP mentoring intervention are equivalent, with some advantages and disadvantages, compared to the evidence-based psychosocial treatments for children. As a result, the CHP meets criteria for level two using the OCEBM levels of evidence.[19]

Homework, Organization, and Planning Skills (HOPS) Intervention—The HOPS intervention is an offshoot of the CHP intervention described above. Given the importance of organization, time-management and planning skills for the academic functioning of adolescents with ADHD,[33] the HOPS intervention focuses entirely on teaching these skills (i.e. classroom/school behavior and interpersonal skills are not targeted). Similar to the CHP intervention, the HOPS intervention manual clearly operationalizes what it means for an adolescent to demonstrate effective organization, time-management, and planning skills. Consistent with a behavioral therapeutic approach, these definitions allow realistic and achievable goals to be established and progress with skills implementation to be consistently monitored and rewarded. The HOPS intervention includes the use of a structured materials organization system where adolescents learn to self-manage a specific system of binder, bookbag, and locker/desk organization. An organizational skills checklist containing the operationalized organization criteria (e.g., no loose papers are in the bookbag) is used by an SMHP to evaluate adolescents' adherence to the system.

The HOPS intervention is delivered by an SMHP through 16-sessions that take place during the school day (i.e. pull-out services). Skills are taught in an established and specific order and sessions take no longer than 25 minutes to implement (Mean session length = 20 minutes). Approximately halfway through the intervention, sessions with the SMHP move from two times per week to once per week, and the entire intervention is completed in one semester. Although similar to the CHP mentoring condition, the HOPS is much more structured and regimented as skills are always taught in a specific, session by session, order and in a time-limited fashion. Further, HOPS is always delivered by SMHPs and no outside consultation is provided.

The HOPS intervention also includes two, 1 hour, "family" meetings that the adolescent and his or her parents/guardians attend with the SMHP. All adolescents who participate in HOPS have a rewards system in place starting at session 1 and the points and rewards systems used are consistent across all adolescents receiving the intervention. The primary purpose of these meetings is to promote generalization of the HOPS skills and to transfer the monitoring and rewarding duties to the parent. During these meetings the SMHP works with the parents and adolescent to establish an effective and feasible home-based point system whereby the adolescent is sufficiently motivated to implement, self-monitor, and continually improve their organization and time-management skills. Small, daily rewards that do not cost money (e.g., privileges such as 15 minutes additional video-game time) are emphasized and consequences are not used.

The HOPS intervention also includes a heavy focus on time-management and planning skills. Students are taught to use their school planners or electronic planners to break projects and studying for tests down into small pieces and to schedule times to complete each task. Adolescents are taught to create evening schedules that list all of the activities to be completed after school each day (e.g., sports practice, dinner, and bedtime) and to input all of their planned homework and studying tasks into the schedule. A time-management checklist which provides operationalized definitions of the HOPS time-management and planning skills (e.g. the adolescent recorded an upcoming test in the planner at least 1 day in advance) is completed by the SMHP every session, and the adolescent earns points depending on the complexity of planning skills demonstrated.

Evidence Supporting the Efficacy of the HOPS Intervention: To date, there have been four empirical manuscripts published focusing on the HOPS intervention, reporting results from three distinct intervention trials. Two studies of HOPS have included random assignment to HOPS or to a control group,[34, 35] one of the studies was a small open trial,[36] and the fourth study focused on evaluating predictors of response and mechanisms of change.[37] The sample sizes associated with these studies have been modest, with the largest trial containing 47 middle school age adolescents with ADHD.[35]

To date, treatment outcome findings have been consistent across the various studies of HOPS. Adolescents with ADHD have made large gains (Cohen's *d* effect size of >.8) in parent-rated organization and time-management/planning skills and large improvements in the severity of parent-rated homework problems.[35] Importantly, these gains have been found to persist out to 3-months post-intervention, which is the longest follow-up conducted to

date.[35] Adolescents in the studies have also shown moderate improvements in ADHD symptoms of inattention, likely because multiple DSM inattentive items focus on forgetfulness, organization, and procrastination. In contrast, teacher ratings suggest that the adolescents with ADHD make small (e.g., $d = .28$)[34] and statistically non-significant improvements in organization and time-management/planning skills. However, multiple studies with HOPS suggest that adolescents who receive the intervention do make small to moderate effect size improvements in their grades.[34] In summary, the HOPS intervention has been evaluated in two moderate-size, randomized trials with well-defined samples (middle school age adolescents with ADHD) that have included short-term (8-week and 3-month) follow-up assessments. Accordingly, the HOPS intervention would meet the CEBM criteria for a level two treatment.[19]

What Have We Learned About Treating Adolescents with ADHD

Treatment Development

Currently, many of the treatments reviewed in this manuscript are not widely available in community or school settings. This is not a problem unique to treatments for adolescents with ADHD as interventions are frequently developed and tested under controlled conditions with minimal consideration given to the feasibility of implementation under real world conditions.[38] If psychosocial treatments for adolescents with ADHD are to be widely disseminated, they must be feasible for providers to implement using existing infrastructure. Weisz and colleagues[39] proposed the Deployment Focused Model (DFM) as a method of developing treatments that can ultimately be widely disseminated. This model stipulates that interventions should be developed in collaboration with stakeholders with a focus on ensuring that the intervention being developed will be feasible to implement if efficacy testing demonstrates that it is a viable treatment option. The treatments reviewed in this manuscript have been evaluated in schools and many of them were implemented by SMHPs. Furthermore, the development of many effective treatments that are feasible to implement in schools often spend considerable time evolving at the earliest levels of the DFM. For example, the CHP started as a collaborative development project between administrators and educators at a middle school and the first author. The goal of the collaboration was to develop a set of school-based interventions that could be feasibly provided at a middle school and effectively improve the social, behavioral and academic impairment of students with ADHD. Interventions were added to the CHP based on the empirical literature and teacher experience. During the first few years of the program, many interventions were tried, omitted, modified and replaced based on clinical experience with the students and analyses from small samples. Organization interventions and ISG evolved out of this iterative process. This process of frequent modifications was the reason it began as an after-school program so changes could be implemented within the context of a program that operated outside of the school day.

The iterative process continues through later stages of development. For example, two main findings from the CHP studies that inform future treatment development include evidence that dosage matters and attrition differs between models. First, larger dosages within a fixed amount of time[24, 40] or larger dosages over an extended period of time (i.e., cumulative

benefit over 2 ½ years)[26] lead to greater improvements in parent ratings of academic and social functioning. A second primary finding is that there are many important benefits to integrating the program within the school activities.[40] One such advantage has to do with attrition. In a large recently completed trial approximately 80% of the participants in the after-school model of the CHP remained in treatment across the entire academic year. Although this is a substantial majority, over 95% of those in the mentoring version of the model remained in care. Based on these findings, current CHP development work is focused on a model that will provide a large dosage within the school day in order to maximize benefits and minimize attrition.

Modalities of Treatment

One unique aspect of the treatments described above is that most of them do not involve manipulating the contingencies in the environments where outcomes are being measured. Best practices for children with ADHD involve changing the contingencies involving rewards and punishment in classrooms and homes by training parents and teachers how to effectively manage behavior.[10] The primary mechanism of action for the interventions reviewed above involves training adolescents to exhibit behavior in other settings. For example, in these school-based treatments, adolescents are trained to follow a system of organizing materials, interacting effectively with peers, planning their time at home, and following classroom rules. When rewards are provided, they are usually provided during times other than those where they are expected to exhibit the new behaviors. In the latest review of evidence-based treatments for children and adolescents with ADHD for the Society of Clinical Child and Adolescent Psychology,[10] this distinction between traditional behavior management treatments and training interventions is described. Training interventions, like the ones described in this manuscript, have many advantages for adolescents. They are supportive of adolescents' attempt to gain independence and self-reliance[41] and are feasible in the sense that they do not rely on the need to manage all of the various environments in which adolescents exist. Teenagers have many teachers at school, move through school independently, and spend an increasing amount of time outside of their parents' direct supervision when not at school. These reasons, along with others, have led those developing school-based treatments for adolescents with ADHD to primarily focus on training interventions instead of the behavior management techniques that are best practices for younger children.

Clinical Decision Making

Who Can Benefit?

The CHP and HOPS intervention studies reviewed above included adolescents with commonly occurring comorbidities, such as Learning Disorders, Oppositional Defiant Disorder (ODD), and Mood Disorders. To date, there has not been any association found between the presence of these comorbid conditions and pre-post improvements in functioning[37]; however, future research is needed to confirm this finding. One obvious limitation related to who can benefit is that the adolescent must be attending school. Given the higher rate of dropout for adolescents with ADHD compared to other students, this requirement may exclude some of the most impaired adolescents. Conversely, adolescents

who are attending middle or high school do not have to attend clinics to receive these services. Accordingly, school-based services provide a large access advantage for adolescents, as attending clinics usually requires substantial support from parents in terms of time and financial resources. We have observed that many of the more-impaired adolescents enrolled in our treatment outcome studies have not received services at clinics as the teenagers are reluctant to go and their parents either cannot or will not support them receiving clinic-based services. In fact, in a recent review[10] it was noted that many clinic-based treatment studies include children with higher scores on cognitive ability tests and families with higher income than children in school-based treatment studies. In summary, there does not appear to be comorbid conditions that alter response to these treatments or contraindicate the treatments and access advantages and limitations exist.

Predictors of Response to Intervention

As with many psychosocial interventions, the working alliance between the student and the service provider may be an important factor in predicting response to intervention for adolescents with ADHD. Broadly defined, the term working alliance refers not only to the bond between a therapist and client, but also to the therapist and client's ability to work together collaboratively and to agree upon treatment goals.[42] In each of the interventions described in this manuscript, setting realistic and achievable goals for skills implementation, motivating the adolescent to work towards those goals, and establishing realistic and achievable goals for the adolescent's own self-management are considered critical intervention components. If this does not occur, it is unlikely that the intervention will succeed. Accordingly, it is not surprising that in at least one study investigating the HOPS intervention, adolescents' ratings of the therapeutic working alliance were found to be strong predictors of improvement in parent-rated organization and planning skills.[37] In fact, after examining a host of different demographic variables and possible mechanisms of change, the only factor that predicted improvement above the working alliance was how well the adolescent adopted and adhered to the binder materials organization system. In summary, whether or not the adolescent agrees with the goals of the intervention and is motivated to work with the clinician to achieve the goals is an important predictor of outcomes.

The impact of psychotropic medication use has also been evaluated as a predictor of response to the CHP and HOPS interventions. Stimulant medications are clearly an effective treatment for adolescents with ADHD;[11] however, there is minimal evidence that the short-term gains in academic productivity associated with medication use translate into long-term improvements in academic outcomes such as grades.[43] Across studies of CHP and HOPS, approximately 50 – 70% of participants were taking ADHD medications while receiving the psychosocial interventions (e.g. 67%[23]; 69%[35]) with a smaller proportion of participants taking medications for comorbid mood disorders (e.g., 27%[23]). None of the studies completed to date have found medication use to be significantly associated with outcomes. For example, in the Evans and colleagues[23] study, there was a significant main effect for medication, whereby adolescents taking ADHD medication were rated as more severe/impaired in comparison to participants not taking ADHD medications; however, there were no significant condition by time by medication status interactions. Similarly, Langberg and colleagues[37] evaluated whether ADHD medication status was associated with the pre-post

gains of adolescents who received the HOPS intervention and found no effect on any of the homework problems or organizational skills outcomes. However, it is important to note that medication use was not controlled or purposefully manipulated in these studies (i.e. they were naturalistic studies in terms of medication). A wide-range of factors determine whether or not families pursue and are adherent with ADHD medication[44] and as such, it is not yet possible to draw conclusions about the importance of medication in the context of a psychosocial treatment studies.

Sequencing Treatments

Parents face choices when they decide to pursue services to help their adolescent with ADHD. These choices may include medication, accommodations, and the treatments described in this manuscript. Unfortunately, research findings often do not inform the decisions regarding the sequencing of these services. However, there is a model of care called the Life Course Model[45] based on the principle that treatments should be sequenced according to their likelihood for helping the patient independently meet age-appropriate expectations. In this model, services are organized into four layers with the first involving treatments designed to stabilize environments that may be significantly exacerbating problems such as a chaotic home or classroom. The second layer involves psychosocial services and may include treatments provided at schools, clinics or other locations in the community. The third layer includes medication and the fourth is accommodations. The model includes principles of care and encourages a data-based decision making process within each layer across multiple treatments as well as when making decisions to move to the next layer. Children may receive treatments across multiple layers concurrently, but the sequence is recommended based on the guiding principle of prioritizing treatments that will help patients independently meet age appropriate expectations (i.e., without continuous treatment). The rationale for the model, thorough descriptions, and additional details are provided in other publications.[45, 46] In this model of care, the school-based treatments described in this manuscript would be frontline services for adolescents with ADHD.

Future Directions

Some of the most pressing research questions pertaining to both CHP and HOPS are currently being addressed in three large federally funded randomized trials. Results will allow us to identify characteristics of adolescents, families and schools that may moderate treatment effects as well as aspects of the treatments that may mediate outcomes. These studies are being conducted at middle schools and high schools to allow us to determine the extent to which the age of the adolescents and differences between middle and high schools may affect access to care, engagement and outcomes. Other important questions will not be addressed in these studies such as sequencing of treatments and possible interactive effects of combining treatments. It may be that optimal care for some adolescents involves a combination of treatments such as medications, clinic-based or home-based care along with school-based services.

Although much more research and development work has been conducted with school-based treatments than clinic-based services for adolescents with ADHD, it is important to note that there are also some promising clinic-based treatments. For example, behavioral parent

training interventions have been developed to specifically address the academic and school impairments of adolescents with ADHD. One such intervention, the Supporting Teens' Academic Needs Daily (STAND) intervention is a parent-teen collaborative treatment model that has been evaluated with middle-[47] and high-school age[48] adolescents with ADHD, with participants making improvements in parent-rated academic functioning and ADHD symptoms. In addition, Fabiano and colleagues[49] have completed a pilot study of a clinic-based family treatment for adolescents with ADHD that led to improvements in the adolescents' driving behavior. The Summer Treatment Program (STP) was modified to address the needs of adolescents with ADHD[50] and has shown promise for improving behavioral functioning and academic skills.[51] Continued development work with these interventions may lead to being able to individually prescribe services based on characteristics of the adolescent, presenting problems, and school, community and family resources.

These studies have also shed light on directions for treatment development work that may not be as viable as the work described above. For example, although cognitive-behavioral treatment (CBT) is effective for adolescents with anxiety and depression and had some intuitive appeal for children with ADHD[52], results indicated it was not effective for children with ADHD[53] and there is little to suggest that the conclusion will be any different with adolescents. The efficacy of CBT for ADHD is reviewed by Antshel in this issue in the article, "**Cognitive Behavioral Therapy for Adolescents with ADHD**". Although there have been reports of CBT being effective for adults with ADHD, there are concerns that the participants in those studies may be meaningfully different in important ways from people being studied as children and adolescents with ADHD.[54] However, this characterization of CBT as unlikely to be effective is based on the traditional definition of cognitive therapy involving cognitive restructuring, changing automatic thoughts and addressing irrational beliefs. This approach was originally included in cognitive approaches to children with ADHD related to trying to have them change their thinking to be more reflective before acting.[52] Broadly defined, cognitive approaches could include problem-solving techniques and these may show more promise as part of a comprehensive treatment for adolescents with ADHD. Furthermore, CBT may be appropriate for treating comorbid depression or anxiety in adolescents with ADHD.

It is important to note that some of the interventions reviewed in this manuscript only addressed academic impairment (note-taking and HOPS). Disruptive behavior, social impairment and problematic family relations may be the most difficult areas of impairment to effectively treat. Self-management and ISG have shown some promise in these areas, but other treatments such as clinic-based family therapy have yielded disappointing results.[30] In addition, many related problems such as substance use, driving problems, delinquency and transitioning to independence and adulthood are problems that require considerable attention. Adolescents with ADHD who experience these problems have no evidence-based options for treating the disorder along with the related problems.

Conclusions

Treatment development and evaluation research on school-based treatments for adolescents with ADHD has led the way in the development of psychosocial treatments for adolescents with ADHD. The two treatment programs reviewed in this manuscript (CHP & HOPS) have evidence suggesting that they are effective at improving multiple areas of impairment, but many questions remain. Given the findings related to dosage, the degree of impairment, and the chronic nature of the disorder; it seems unlikely that ten to twenty sessions of any treatment is going to be adequate to address the needs of adolescents with ADHD. Combining treatments and providing them for extended periods of time may be the best answer for many adolescents. Unfortunately, the research is far from adequate to inform school or clinic based practitioners or parents how to proceed. Due to the many years that professionals believed that children "grew out" of ADHD when they hit puberty, the development of treatment for adolescents with the disorder has been significantly delayed and is only now gaining momentum (Box 1).

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Key Abbreviations

ADHD	– attention deficit hyperactivity disorder
CBT	– cognitive behavior therapy
CHP	– Challenging Horizons Program
HOPS	– Homework, Organization and Planning Skills program
IEP	– Individualized Education Plan
ISG	– Interpersonal Skills Group (a group treatment for social impairment)
MTA	– Multimodal Treatment Study of Children with ADHD
OCEBM	– Oxford Centre for Evidence-Based Medicine
ODD	– Oppositional Defiant Disorder

SMHP – school mental health professional (school counselors, school social workers, school psychologists)

STAND – Supporting Teens Academic Needs Daily

STP – Summer Treatment Program

Synopsis

The development and evaluation of psychosocial treatments for adolescents with ADHD has lagged far behind the treatment development work conducted with children with the disorder. School-based treatments for adolescents have been the focus of more development and evaluation research than traditional clinic-based treatments. Two middle school and high school based treatment programs including the Challenging Horizons Program (CHP) and Homework, Organization and Planning Skills (HOPS) program have the most empirical work indicating beneficial effects. Multiple delivery models of these interventions have been evaluated, including delivery through after school programming and during the school day. Different intervention dosages have also been evaluated, ranging from 1 semester of intervention all the way to 2 years of intervention.. Nevertheless, treatment development research addressing many of the basic questions related to mediators, moderators and sequencing of treatments and the common conditions such as comorbid disorders and impairment related to driving, substance use, and delinquency is sorely needed. Implications for future treatment development research are reviewed including the potential benefits of combining treatments of a variety of modalities to address the large remaining gaps in the literature.

Key Points

- Evidence indicates that the CHP and HOPS are likely to be effective treatments for many adolescents with ADHD.
- There is inadequate evidence to make scientifically informed decisions about moderators and mediators of treatment effects as well as optimal sequencing of treatment modalities.
- Benefits of treatment appear greatest when sessions are once or twice per week and continued over many months.
- There are many access advantages for school-based services compared to clinic-based care. Services integrated within the school day appear to have advantages for keeping students engaged as compared to after-school services.
- Treatment development work is needed to address many of the challenging areas of impairment exhibited by adolescents with ADHD including problems with driving, substance use, delinquency and school dropout.

Box 1

Summary and Recommendations for Clinicians Treating Adolescents with ADHD

- Deficits in organizational skills are common in adolescents with ADHD and are unlikely to be normalized with medication treatment.[55] For this reason, the four school-based interventions that have been developed for adolescents with ADHD to date (note-taking, self-management, CHP, and HOPS) all target aspects of organizational skills as they apply to social, behavioral or academic impairment.[56]

- Deficits in organizational skills are pervasive across domains of functioning and include problems with:
  - Organization of time (e.g., planning ahead and time estimation)
  - Organization of materials (e.g., filing and transferring school materials to and from home)
  - Organization of writing (e.g., structure of writing and use of main ideas and supporting details)
  - Organization of speech and social cues (e.g., turn taking, staying on-topic, and concise speech)

- Deficits in organizational skills manifest clinically as:
  - Lost and misplaced homework assignments
  - Procrastination, often resulting in parent-adolescent conflict and inadequate preparation for tests
  - Lack of structure and coherent themes in writing
  - Difficulty maintaining structured and reciprocal social conversations

- Organizational skills should be assessed and monitored during treatment using standardized ratings and/or with collection of data directly from teachers. Tools for measuring organizational skills include:
  - Daily report cards (DRC)[57], including teacher-report of homework assignment completion (e.g., number of assignments turned in and number of assignments due).
  - DRCs that contain operationalized definitions of binder and bookbag organization. “There are no loose papers in the bookbag” or “All homework to be taken home is in the homework folder”.
  - *Classroom Performance Survey* (CPS)[58] – A teacher-completed rating scale that includes items related to organization and class preparation.
  - *Homework Problems Checklist* (HPS)[59] – A parent-completed rating scale that assesses homework materials organization and homework completion behaviors.
  - *Children's Organizational Skills Scale* (COSS)[60] – Includes parent, teacher, and self-report versions that assess organization, planning, and time-management skills
  - *Behavior Rating Inventory of Executive Function* (BRIEF)[61] – Includes parent and teacher versions that assess organizational skills as an important aspect of executive functioning

Note: http://www.oucirs.org/resources/educator&mhprofessional - contains many of these resources

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