Psychosocial Treatments for Attention-Deficit/Hyperactivity Disorder in Children

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This article provides a brief overview of the major psychosocial treatments that have some efficacy for the management of attention-deficit/hyperactivity disorder (ADHD) in children. Parent training in effective child behavior management methods, classroom behavior modification methods and academic interventions, and special educational placement appear to have the greatest promise of efficacy. Augmenting these, additional family therapy in problem-solving and communication skills and the coordination of multiple school resources across the day may be necessary. To be effective in improving prognosis, treatments must be maintained over extended periods of time.

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Advances in the treatment of attention-deficit/hyperactivity disorder (ADHD) over the past 20 years have been relatively circumscribed and have occurred mainly in the area of psychopharmacology rather than psychosocial treatments. Research increasingly points to ADHD as a development disorder of probable neurogenetic origins in which some unique environmental factors play a role in its expression, though far less than do genetic ones. Treatment is actually management of the chronic developmental condition and involves finding means to cope with, compensate for, and accommodate to the developmental deficiencies, as well as providing symptomatic relief such as that obtained by various medications.

Those major psychosocial treatments that have some proven efficacy for the management of ADHD have been (1) parent training in contingency management methods,[1] (2) classroom applications of contingency management techniques,[2,3] and (3) assorted combinations of these approaches with psychopharmacology. Besides these interventions, therapists should also be cognizant of the availability of special educational programs for ADHD children now mandated under the Individuals With Disabilities in Education Act and Section 504 of the Civil Rights Act.[4,5] The determination of eligibility for such programs is often a major referral concern of parents or teachers, dictating that clinicians be familiar with federal, state, and local regulations regarding placement in such programs.

This article provides a brief overview of those treatments; more detailed discussions can be found elsewhere.[4,6,7] None of the treatments discussed here are curative of ADHD symptoms. Their value lies in the temporary reduction of symptom levels or in the reduction of related behavioral and emotional difficulties, such as defiance and conduct problems, depression and low self-esteem, or academic underachievement. When such treatments are removed, the level of ADHD symptoms appears to return to pretreatment ranges of deviance. Their effectiveness in improving prognosis, then, rests on their being maintained over long periods of time (often years).

BEHAVIOR MODIFICATION

One justification for using behavior modification techniques for ADHD is the argument that, since referral of children for ADHD in part rests on the social distress they have created for their caregivers, an intervention that attempts to change the interaction between children and their caregivers should be useful.[8] With the recent trend toward viewing ADHD as a potential problem in response inhibition and self-regulation in children that may cause secondary poor self-motivation to persist at assigned tasks,[1] a persuasive theory-based rationale for employing behavioral interventions with ADHD may now exist.

If ADHD is in fact a developmental delay in the self-regulation of behavior by internal means of representing information and motivating goal-directed behavior, then interventions that directly alter the nature of the stimuli controlling behavior as well as the pattern, timing, or salience of such consequences by socially arranged means would be useful, at least for symptomatic reduction in

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some settings and tasks. Such procedures for the manipulation of antecedent and consequent events are precisely those provided by the behavior therapies. A logical extension of this argument holds, however, that such socially arranged means of addressing this neurologically based dysregulation would not alter its underlying neurophysiologic basis. These techniques must be employed across situations over extended intervals (months to years) much as prosthetic devices (e.g., hearing aides, mechanical limbs) are employed to compensate for physically handicapping conditions. Premature removal of the socially arranged motivational programs would predictably result in an eventual return to pretreatment levels of the behavioral symptoms. Also, use of the behavioral techniques in only one environment would be unlikely to affect rates of ADHD symptoms in other, untreated settings unless generalization had been intentionally programmed to occur across such settings. The research reviewed below for the various behavioral techniques seems to support this interpretation.

Direct Application of Behavior Therapy Methods in the Laboratory

Early studies that evaluated the effects of reinforcement and punishment on the behavior and cognitive performance of ADHD children usually indicated that performance on tasks measuring vigilance or impulse control can be immediately and significantly improved by contingent consequences.[9,10] In some cases, the behavior of ADHD children approximates that of normal control children. However, no study has examined the degree to which such changes generalized to the natural environments of the children, calling into question the clinical efficacy of such an approach.

In a series of studies, Zentall and colleagues[11] showed that increasing relevant intratask stimulation and novelty, as well as reducing task complexity, reduced ADHD symptoms. In contrast, providing extratask stimulation, especially during difficult or complex tasks, increased ADHD symptoms and proved more disruptive to the performance of these children on academic tasks. Douglas and Parry[12] further suggested that repeating task instructions frequently throughout a task enhanced the performance of ADHD children to within normal limits in laboratory studies. Hence, an additional behavioral treatment of ADHD children besides altering response consequences would be to alter the stimulus properties of settings and especially tasks assigned to ADHD children.

Making tasks more novel and stimulating through the use of added color, motor participation by the child, frequent shifts in the nature of the task, increased rate of presentation of the material, frequent repetition of the task instructions, and greater enthusiasm and theatrics by the instructor during teaching of the task may make ADHD children more attentive, less active, and more productive in such tasks. Moreover, reducing the length of the task by creating smaller task units and providing frequent breaks from the task could also achieve improved task performance.

Another means of altering stimulus control parameters might be to increase the use of externally and concretely represented time limits and rules that are often associated with particular tasks. The behavior of ADHD children seems to be poorly controlled by such internal perceptions of time and self-statements or are inconsistently controlled by them.[1] These children could be assisted by portable timers placed on their desks and set to reflect the elapsed time available for task performance and by small "reminder" cards on their desks during individual desk work. A similar tactic to enhance stimulus control is to allow ADHD children to clip a small portable tape player to their belt with earphone attached to permit them to listen to tapes while performing desk assignments in class that remind them to stay on task, finish the work, and not daydream. Despite clinical anecdotes supporting the value of these methods, much research needs to be done to more rigorously test the efficacy of these stimulus control programs.

Paniagua[13] used correspondence training to establish greater control over ADHD symptoms by commands and rules previously stated publicly by the children. Correspondence refers to the degree of concordance between public statements by children as to what they will do and the actual behavior they subsequently display in that setting—in essence, the degree of agreement between "saying" and "doing." In this paradigm, ADHD children are requested to publicly state how they will behave in an immediately subsequent situation. Their behavior in that situation is then observed after which they are reinforced or punished for the degree of correspondence. Future research needs to show that the children's own statements are serving as the controlling stimuli in such paradigms rather than the presence of the examiner during the task.

Training Parents in Child Behavior Management

Despite the plethora of research on parent training in child behavior modification,[1] only a small number of studies have examined the efficacy of this approach with children specifically selected for hyperactive or ADHD symptoms. What limited research exists can be interpreted with cautious optimism as supporting the use of behavioral parent training with ADHD children.[14–16] One of the few studies to conduct a follow-up reevaluation 1 year after treatment, however, found that the families receiving parent training were no longer different from the control group, although the child's school behavior was rated by teachers as significantly better.[16]

Those treatment techniques used to date have primarily consisted of training parents in general contingency management tactics, such as contingent application of reinforcement or punishment following appropriate/inappropriate behaviors. Reinforcement procedures have typically relied on praise or tokens, while punishment

methods have usually been loss of tokens or time-out from reinforcement. Why these particular methods were chosen and what specific target behaviors they were used with have often gone unreported. I[1] have developed a parent-training program in child-management skills, the methods of which have been borrowed from research indicating their efficacy in managing defiant and oppositional children. Results suggest that up to 64% of families experience clinically significant change or recovery (normalization) of their child's disruptive behavior as a consequence of this program.[17]

The rationale for the program is 2-fold. First, it is hypothesized that ADHD children may have a specific deficit in rule-governed behavior or the stimulus control of behavior by commands, rules, and self-directed speech.[1] This does not mean that the problem has arisen due to poor child management by parents but instead proposes a neurophysiologic deficiency underlying the problem with rules. Consequently, parents need to use more explicit, systematic, externalized, and compelling forms of presenting rules and instructions to ADHD children and providing consequences for compliance than are likely to be needed with normal children. There also exists a considerable overlap of oppositional/defiant behavior with clinic-referred ADHD children. The most useful vehicle for managing these behaviors seems to be parent training in behavioral techniques.[1]

The program consists of 10 steps, with 1- to 2-hour weekly training sessions provided either to individual families or in groups. Each step is described in detail elsewhere,[1] but is briefly presented below:

1. Review of information on ADHD. In the first session, the therapist provides a succinct overview of the nature, developmental course, prognosis, and etiologies of ADHD. Providing additional reading materials, such as a book for parents,[18] and professional videotapes can be useful. Such a session is essential to dispel a number of misconceptions parents often have about ADHD in children. A recent study suggests that just this provision of information can result not only in improved knowledge of parents about ADHD but also in improved parental perceptions of the degree of deviance of their child's behavioral difficulties.[19]

2. The causes of oppositional/defiant behavior. Next, parents are provided with an in-depth discussion of those factors identified as contributing to the development of defiant behavior in children (see references 1 and 20 for reviews). Essentially, 4 major contributors are discussed: (1) child characteristics, such as health, developmental disabilities, and temperament; (2) parent characteristics similar to those described for the child; (3) situational consequences for oppositional and coercive behavior; and (4) stressful family events. Parents are taught that problems in (1), (2), and (4) increase the probability that children will display bouts of coercive, defiant behavior. However, the consequences for such defiance, (3) above, seem to determine whether that behavior will be maintained or even increased in subsequent situations in which commands and rules are given. Such behavior appears to function primarily as escape/avoidance learning in which oppositional behavior succeeds in the child's escape from aversive parent interactions and task demands, negatively reinforcing the child's coercion. As in the first session, this content is covered so as to correct potential misconceptions that parents have about defiance (i.e., it is primarily attention-getting in nature).

3. Developing and enhancing parental attention. Patterson et al.[20] have suggested that the value of verbal praise and social reinforcement to oppositional or hyperactive children is greatly reduced, making it weak as a reinforcer for compliance. In this session, parents are trained in more effective ways of attending to child behavior so as to enhance the value of that attention. The technique consists of verbal narration and occasional positive statements to the child with attention being strategically deployed only when appropriate behaviors are displayed. Parents are taught to ignore inappropriate behaviors but to greatly increase their attention to ongoing prosocial and compliant behaviors.

4. Attending to child compliance and independent play. This session extends the techniques developed in Session 3 to instances during which parents issue direct commands to children. Parents are trained in methods of giving effective commands, such as reducing question-like commands (e.g., Why don't you pick-up your toys now?), increasing imperatives, eliminating setting activities that compete with task performance (e.g., television), reducing task complexity, etc. They are then encouraged to begin using a more effective commanding style and to pay immediate positive attention when compliance is initiated by the child. Parents are asked to increase the frequency with which they give brief commands this week and to reinforce each command obeyed. Research suggests that these brief commands are more likely to be obeyed, thereby providing excellent training opportunities for attending to compliance. In this session, parents are also trained to provide more positive attention frequently and systematically when their children are engaged in nondisruptive activities while parents must be occupied with some other work or activity. Essentially, this method amounts to a shaping procedure in which parents provide frequent praise and attention for progressively longer periods of child nondisruptive activities.

5. Establishing a home token economy. Children with ADHD may require more frequent, immediate, and salient consequences for appropriate behavior and compliance in order to maintain it. Instituting a home token economy is critical to addressing difficulties with intrinsically generated and represented motivation by bringing more salient external consequences, more immediately and more frequently, to bear on child compliance than is typically the case.

In establishing this program, the parents list most of the children's home responsibilities and privileges and assign values of points or chips to each. Parents are encouraged to have 12 to 15 reinforcers on the menu to maintain the

motivating properties of the program. Generally, plastic chips are used with children 8 or younger as they seem to value the tangible features of the token. For 9-year-olds and older, points recorded in a notebook seem sufficient.

During the first week of this program, the parents are not to fine the child or remove points for misconduct. The program rewards good behavior only. Parents are also asked to be liberal in awarding chips to children for even minor instances of appropriate conduct. However, chips are given only for obeying first requests. If a command must be repeated, it must still be obeyed but the opportunity to earn chips has been forfeited. Parents are also encouraged to give bonus chips for good attitude or emotional regulation in their children. For instance, if a command is obeyed quickly, without complaint, and with a positive attitude, parents may give the child additional chips beyond those typically given for that job. When this is used, parents are to expressly note that the awarding of the additional chips is for a positive attitude.

6. Implementing time-out for noncompliance. Parents are now trained to use response cost (removal of points or chips) contingent on noncompliance. In addition, they are trained in an effective time-out-from-reinforcement technique for use with 2 serious forms of defiance that may continue to be problematic despite the use of the home token economy. These 2 misbehaviors are selected in consultation with the parents and typically involve a type of command or household rule that the child continues to defy despite parental use of previous treatment strategies. Time-out is limited to these 2 forms of misconduct so as to keep it from being used excessively during the next week.

The time-out is to be implemented shortly after noncompliance by a child begins. Parents issue a command, wait 5 seconds, issue a warning, wait another 5 seconds, and then take the child to time-out immediately should compliance not have begun. Parents are taught to tell the child not to leave the time-out chair until the parent tells them to. Three conditions must be met by the child before time-out ends, and these are in a hierarchy: (1) The child must serve a minimum sentence in time-out, usually 1 to 2 minutes for each year of their age, (2) the child must then become quiet for a brief period of time so as not to have disruption associated with the parents approaching the time-out chair and talking to the child, and (3) the child must then agree to obey the command. Failure of the child to remain in time-out until all 3 conditions are met is dealt with by additional punishment. The consequence is tailored to meet parental wishes but may consist of a fine within the home token system, extension of the time-out interval by an additional 5 or 10 minutes, or placement of the child in his or her bedroom. In the latter case, toys or other entertaining activities are removed from the bedroom, and the door to the room may be closed and locked to preclude further escape from the punishment.

7. Extending time-out to additional noncompliant behaviors. In this session, no new material is taught to parents. Instead, any problems with previously implementing time-out are reviewed and corrected. Parents may then extend their use of time-out to 1 or 2 additional noncompliant behaviors with which the child may still have trouble.

8. Managing noncompliance in public places. Parents are now taught to extrapolate their home management methods to troublesome public places. Using a "think aloud–think ahead" paradigm, parents are taught to stop just before entering a public place, review 2 or 3 rules with the child that the child may previously have defied, explain to the child what reinforcers are available for obedience in the place, explain what punishment may occur for disobedience, and finally assign the child an activity to perform during the outing. Parents then enter the public place and immediately begin attending to and reinforcing ongoing child compliance with the previously stated rules. Time-out or response cost is used immediately for disobedience.

Whenever time-out is used in a public place, it need not be for as long an interval as at home. Half of the usual time-out interval may be sufficient for public misbehavior, given the richly reinforcing activities in public places from which the child has just been removed. Parents can also be trained to use a delayed punishment contingency. In this case, the parent carries a small spiral notebook to the public place and, before entering the building, indicates that rule violations will be recorded in the book and the child will serve time-out for them upon return home from this trip.

9. Improving child school behavior from home: the Daily School Behavior Report Card. This session is a recent addition[1] to the original parent training program and was designed to help parents assist their child's teacher with the management of classroom behavior problems. The session focuses on training parents in the use of a home-based reward program in which children are evaluated on a daily school behavior report card by their teachers. This card serves as the means by which consequences will be dispensed at home for classroom conduct. The card can be designed to address class behavior, recess or free time behavior, or more specific behavioral targets for any given child.

10. Managing future misconduct. By now, parents should have acquired an effective repertoire of child management techniques. The goal of this session is to get parents to think about how they might be implemented in the future if some other forms of noncompliance developed. The therapist challenges the parents with misbehaviors they have not seen yet and asks them to explain how they might use their recently acquired skills to manage these problems.

One-month review/booster session. In what is typically the final session, the concepts taught in earlier sessions are reviewed, problems that have arisen in the last month are discussed, and plans made for their correction. Other sessions may be needed to deal with issues that persist, but for most families, the previous 10 sessions appear adequate for improving rates of compliant behavior in ADHD children.

For teenagers with ADHD and oppositional behavior, I have often recommended a family training program that includes Problem Solving Communication Training Program (PSCT) developed by Robin and Foster.[21]

Training Teachers in Classroom Management

Somewhat more research has occurred on the application of behavior management methods in the classroom with ADHD children than with parent training. A voluminous literature on the application of classroom management methods to disruptive child behaviors clearly indicates the effectiveness of behavioral techniques in the short-term treatment of academic performance problems in ADHD children.

A recent meta-analysis of the research literature on school interventions for ADHD comprised 70 separate experiments of various within- and between-subjects designs as well as single-case designs.[2] This review found an overall mean effect size for contingency management procedures of 0.60 for between-subject designs, nearly 1.00 for within-subject designs, and approximately 1.40 for single-case experimental designs. Interventions aimed at improving academic performance through the manipulation of the curriculum, antecedent conditions, or peer-tutoring produced approximately equal or greater effect sizes. In contrast, cognitive-behavioral treatments when used in the school setting were significantly less effective than these other 2 forms of interventions. Thus, despite some initial findings of rather limited impact of classroom behavior management on children with ADHD,[22] more recent studies, such as those by Pelham et al.,[23] Carlson et al.,[24] and the totality of the extant literature reviewed by DuPaul and Eckert,[2] suggest that behavioral and academic interventions in the classroom can be effective in improving behavioral problems and academic performance in children with ADHD. The behavior of these children, however, may not be fully normalized by these interventions.

Research suggests some promise in the use of stimulus control procedures with ADHD children, many of which can be readily adapted to the classroom. Reducing task length, "chunking" tasks into smaller units to fit more within the child's attention span, and setting quotas for the child to achieve within shorter time intervals may increase the success of the ADHD child with academic work.[3] As Zentall[11] has already documented, the use of increased stimulation within the task (e.g., color, shape, texture, rate of stimulus presentation) may enhance attention to academic tasks in ADHD children. Teaching styles may play an important role in how well ADHD children attend to lectures by a teacher. More vibrant, enthusiastic teachers who move about more, engage children frequently while teaching, and allow greater participation of the children in the teaching activity may increase sustained attention to the task at hand. Zentall has also shown that permitting ADHD children to move or participate motorically while learning a task may improve attention and performance. The use of written, displayed rules and timers for setting task time limits, as already described, may further benefit ADHD children in the classroom.

A number of studies have also shown that the contingent application of reinforcers for reduced activity level or increased sustained attention can rapidly alter the levels of these ADHD symptoms.[2,25] Usually, these programs incorporate token rewards as some research suggests that praise may be insufficient to increase or maintain normal levels of on-task behavior in hyperactive children.[3] Several studies have shown that group-administered rewards, where all children in class receive a reward contingent on the performance of one child, are as effective as individually administered rewards. One problem that arose in such research, however, was the demonstration that simply reinforcing greater on-task behavior and decreased activity level did not necessarily translate into increased work productivity or accuracy.[26] Since the latter are the ultimate goals of behavioral intervention in the classroom, these results were somewhat dismaying. Research now suggests that reinforcing the products of classroom behavior (i.e., number and accuracy of problems completed) not only results in increased productivity and accuracy but also indirectly results in declines in off-task and hyperactive behavior.[26,27]

A serious limitation to these promising results has been the lack of follow-up on the maintenance of treatment gains over time. In addition, none of the studies examined whether behavioral control generalized to other school settings where no treatment procedures were in effect. Other studies employing a mixture of cognitive-behavioral and contingency management techniques have failed to find such generalization with ADHD children,[28] suggesting that improvements derived from classroom management methods are situation-specific and may not generalize or be maintained once treatment has been terminated.

The role of punishment in the management of classroom behavior in ADHD children has been less well studied. Pfiffner et al.[29] evaluated the effects of continuous and intermittent verbal reprimands and response cost on off-task classroom behaviors. They found that while each of these treatments significantly reduced disruptive and off-task behavior, the continuous use of response cost (loss of recess time) was most effective. Allyon and Rosenbaum[30] also report on the initial success of adding response cost contingencies to an ongoing classroom token economy. However, after less than 1 week, disruptive behavior returned to baseline levels despite the punishment contingency.

Pfiffner and O'Leary[31] determined that the sole use of positive reinforcement for controlling ADHD behaviors in the classroom was not sufficient to maintain improved behavior in these children unless punishment in the form of response cost was added to the program. The addition of response cost further increased rates of on-task behavior and academic accuracy. These gains in behavior could then

be maintained by an all-positive program once the response cost procedure was gradually withdrawn. However, abrupt withdrawal of the punishment contingency resulted in declines in on-task behavior and accuracy suggesting that the manner in which response cost techniques are implemented and then faded out of classroom management programs is important in the maintenance of initial treatment gains. In general, the efficacy of response cost procedures with ADHD children has been well-documented.[32–35]

What can be drawn from this literature to date? First, contingency management methods can produce immediate, significant, short-term improvement in the behavior, productivity, and accuracy of ADHD children in the classroom. Second, secondary or tangible reinforcers are more effective in reducing disruptive behavior and increasing performance than are attention or other social reinforcers. The use of positive reinforcement programs alone does not seem to result in as much improvement nor does it maintain that improvement over time as well as does the combination of token reinforcement systems with punishment, such as response cost (i.e., removal of tokens or privileges). Third, what little evidence there is, however, suggests that treatment gains are unlikely to be maintained in these children once treatment has been withdrawn and that improvements in behavior probably do not generalize to other settings where no treatment is in effect.

Two additional classroom management techniques may prove of value in treating ADHD children, but their effectiveness remains to be more rigorously studied. One involves the use of a transmitter and receiver/counter for implementing an in-class token system.[34,35] Whenever the teacher witnesses the child off-task or disrupting the class, she presses a button on the transmitter that activates a red light on the receiver on the child's desk to deduct a point from the face of the counter. The other method deserving of further evaluation is the use of home-based contingencies for in-class behavior and performance based on daily school report cards, as mentioned earlier.[23,36]

Although little research has been done on the subject, it is likely that certain aspects of the teacher's personality, presence of psychological difficulties, compatibility of teacher and student characteristics, and the teacher's philosophy of child behavior management contribute to the success or failure of any contingency management methods to be used in the classroom and the success of the ADHD child in that classroom more generally.[37]

COMBINED INTERVENTIONS

Psychopharmacologic and behavioral treatments are not, by themselves, typically nor completely adequate to address all of the difficulties likely to be presented by clinic-referred ADHD children. Optimal treatment is likely to comprise a combination of many approaches for maximal effectiveness.[23,24,38] It appears that the combination of contingency management training of parents or teachers with stimulant drug therapies is generally little better than either treatment alone for the management of ADHD symptoms.[39–41] One study[22] found that classroom behavioral interventions may have mildly improved the deviant behavior of ADHD children but did not bring levels of behavior within the normal range. Medication, in contrast, rendered most children normal in classroom behavior. Others have found more impressive results for classroom behavior management methods,[2,23,24] but also found that the addition of medication provides added improvements beyond that achieved by behavior management alone. Moreover, the combination may result in the need for less intense behavioral interventions or lower doses of medication than might be the case if either intervention were used alone. Where an advantage to behavioral interventions exists, it appears to be in reliably increasing rates of academic productivity and accuracy.[39] Yet, here too, stimulant medication has shown positive effects.[23] Despite some failures to obtain additive effects for these 2 treatments, their combination may still be advantageous given that the stimulants are not usually used in late afternoons or evenings when parents may need effective behavior management tactics to deal with the ADHD symptoms. Moreover, between 8% and 25% of ADHD children do not respond positively to stimulant medications,[6] making behavioral interventions one of the few scientifically proven alternatives for these cases.

Several studies have examined the combined effects of stimulant medication with cognitive-behavioral interventions. Horn et al.[42] examined the separate and combined effects of *d*-amphetamine and self-instructional training with a 9-year-old inpatient ADHD child. The combined program was more effective in increasing on-task behavior during class work and decreasing teacher ratings of ADHD symptoms. However, academic productivity was improved only by the use of direct reinforcement for correct responses. In contrast, using group comparison designs, Brown et al.[43,44] found no benefits of combined drug/cognitive behavioral interventions over either alone on similar domains of functioning of ADHD children. Similarly, a later study by Horn et al.[38] did not find the combination of treatments to be superior to medication alone. Similarly negative results were found by Cohen et al.[45] for kindergarten-aged ADHD children at a 1-year follow-up evaluation.

Some success for combined medication and self-evaluation procedures has been reported[46] when social skills, such as cooperation, have been targets of intervention. Yet, when these same investigators attempted to teach anger-control strategies to ADHD children to enhance self-control during peer interactions, no benefits of combined intervention were found beyond that achieved by self-control training alone.[47] The self-control techniques were the most successful in teaching these children specific coping strategies to employ in provocative interactions

with peers that usually lead to angry reactions from the ADHD children. Medication, in contrast, served only to lower the overall level of anger responses but did not enhance the application of specific anger control strategies. These studies suggest that each form of treatment may have highly specific and unique effects on some aspects of social behavior while not on others.

Some investigators have evaluated the effects of behavioral parent training in contingency management alone and combined with self-control therapy[48] on home and school behavioral problems. The results failed to find any significant advantage for the combined treatments. Both self-control training and behavioral parent training alone improved home behavior problems but neither resulted in generalization of treatment effects to the school, where no treatment had occurred. Since a no-treatment group was not employed in this study, however, it is not possible to conclude that these effects were due to treatment rather than to nonspecific effects (e.g., maturation, therapist attention, regression effects). A later study by Horn et al.[49] did find such a treatment combination to be superior to either treatment used alone in producing a significantly larger number of treatment responders. Once again, no generalization of the results to the school setting occurred, however.

Satterfield and colleagues[50] have attempted to evaluate the effects of individualized multimodality intervention provided over extensive time periods (up to several years) on the outcome of ADHD boys. Interventions included medication, behavioral parent training, individual counseling, special education, family therapy, and other programs as needed by the individual. Results suggest that such an individualized program of combined treatments continued over longer time intervals can produce improvements in social adjustment at home and school, rates of antisocial behavior, substance abuse, and academic achievement. These results seem to be sustained across at least a 3-year follow-up period.[51] While such treatment suggests great promise for the possible efficacy of multimodality treatment extended over years for children with ADHD, the lack of random assignment and more adequate control procedures in this series of studies limits the ability to attribute those improvements directly to the treatments employed. And these limitations certainly preclude establishing which of the treatment components was most effective. Still, studies such as these and others[23,24] have raised hopes that multimodality treatment can be effective for ADHD if extended over long intervals of time. They have led to an historic venture by the National Institute of Mental Health to more systematically evaluate the effects of such treatment for ADHD in a multisite collaborative study.[41] The results of this study have only recently become available. They generally indicated that medication treatment and combined therapy were superior to psychosocial treatment or customary community treatment for the management of ADHD symptoms, specifically. The medication and combined therapy conditions did not differ from each other in this regard. Combined therapy may have proven superior to medication for management of some associated problems coexistent with ADHD.[41]

Intensive, Multimodal Treatment Programs

Two of the most well-known and well-regarded multimodality intervention programs are the summer treatment programs developed by William Pelham and colleagues[52] and the University of California-Irvine/Orange County Department of Education.[3] While the Pelham program is conducted during the summer months in a residential "camp" style program, the UCI-OCDE program is a year round day-school–style program.

More recently, my colleagues and I have completed the multimethod *UMASS/WPS Early Intervention Project* for kindergarten children with significant problems with hyperactivity and aggression, at least 70% of whom qualified for a clinical diagnosis of ADHD.[53] These programs rely on 4 major components of treatment: (1) parent training in child behavior management, (2) classroom implementation of behavior modification techniques, (3) social skills training, and (4) stimulant medication, in some cases. Some of the components of the day-treatment program, such as classroom contingency management, have been found to produce significant short-term improvements in children with ADHD, but the efficacy of other components, such as social skills training, is not so clear-cut. No data have been published as yet on whether the gains made during the treatment programs are maintained in the normal school and home settings after the children terminate their participation in this program.

CONCLUSION

The treatment of ADHD requires expertise in many different treatment modalities, no single one of which can address all of the difficulties likely to be experienced by such individuals. Among the available treatments, education of parents, family members, and teachers about the disorder, psychopharmacology (chiefly stimulant medications), parent training in effective child behavior management methods, classroom behavior modification methods and academic interventions, and special educational placement appear to have the greatest efficacy or promise of such for dealing with children who have ADHD. To these must often be added family therapy around problem-solving and communication skills and the coordination of multiple teachers and school-staff across the school day. To be effective in altering eventual prognosis, treatments must be maintained over extended time periods (months to years) with periodic reintervention as needed across the life course of the child as well as the increasing enlistment of the ADHD individual's cooperation with and investment in the long-term intervention program.

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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