Classwide Interventions for Students With ADHD

A Summary of Teacher Options Beneficial for the Whole Class

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Attention deficit/hyperactivity disorder (ADHD) is a behavioral disorder characterized by inattention, impulsivity, and hyperactivity (American Psychological Association, APA, 2000). The presence of ADHD is associated with behavioral and academic difficulties within a classroom setting, such as difficulty staying on task; trouble delaying responses (i.e., shouting out answers); academic underachievement; difficulty with peer relations; and trouble completing assigned tasks (Barkley, 2005). With a prevalence rate of 3% to 5% (APA; Barkley), teachers will undoubtedly come in contact with a student with ADHD at one point or another. Therefore, it would behoove teachers to be aware of effective interventions that help alleviate some of the difficulties students with ADHD may present.

School-based interventions are effective for managing the symptoms of ADHD, but they are typically individualized and time-intensive (DuPaul, 1991; DuPaul & Eckert, 1997). Although

effective, asking a general education teacher to devote the substantial amount of time needed for an individualized intervention can be taxing, is often not practical, and detracts the amount of time the class receives as a whole. Consequently, such individualized interventions for children with ADHD may not be implemented with a high degree of fidelity and that threatens the efficacy of the intervention (Witt, Martens, & Elliot, 1984).

Classwide interventions (i.e., interventions used with the entire classroom) that target students with ADHD may be a plausible alternative to the highly individualized interventions typically recommended for students with ADHD. Such classwide interventions are more cost-effective and efficient than individualized interventions because a teacher may use the intervention to help one student perform better in the classroom, but its use may benefit the performance of all students in the class. Additionally, the whole-class

application allows the individual student to remain anonymous in that no student in the classroom may ever know which student's behavior prompted the use of the intervention. Unfortunately, teachers may not be aware of what types of classwide interventions there are, how effective they are, or what outcomes to expect from their use (Witt et al., 1984). Therefore, this article summarizes some effective classwide interventions for ADHD to allow teachers to select from a menu of options (see Table 1). For each intervention discussed, the critical features of the intervention will be described, its associated behavioral and academics benefits summarized, and the authors' interpretation of the advantages and disadvantages of its use will be presented.

Summary of Interventions

Interventions in which the entire classroom participates and has access to the modifications in the intervention have been called *classroom-level, class-level,*

Table 1. Summary of Pros and Cons of Interventions

Intervention	Key Features	Pros	Cons
Behavioral			
Contingency Management	• Positively state rules • Clear expectations and guidelines • Identify reinforcers and punishers	• Effective • Flexible • Adaptive • Engaging, fun	• Requires consistency to be effective • Set-up time
Therapy Balls	• Replacing child's seat with a gym ball	• Effective • Socially valid • Simple to implement	• Costly ($$) • May not be practical for whole class
Self-Monitoring	• Identify target behavior • Explicitly teach rating scale • Decisions on when and how to monitor the behavior	• Teaches autonomy and responsibility • One-to-one teacher attention • Inexpensive	• Set-up time • Gradual shift toward positive behavior
Peer Monitoring	• Outline appropriate and inappropriate behaviors • Practice system before use • Clear guidelines and rules	• Focus on prosocial behaviors • Use of peers to improve behavior	• Requires vigilance and practice to prevent peer rejection
Instructional Choice	• Teacher-developed menu of assignments or tasks • Student choice of task	• Simple to implement • Inexpensive	• Preparation • Possible student expectancy
Academic			
Classwide Peer Tutoring	• Pair students together • Alternate tutor-learner roles • Provides immediate corrective feedback	• Teacher can monitor whole class • Peer attention • Immediate feedback • Self-selected pace • Inexpensive	• Set-up time • Initial training period
Instructional Modification	• Altering the assignment	• Personalized to target students' needs	• Time consuming • Challenging to find adequate modifications
Computer-Assisted Instruction	• Use of computer programs to supplement instruction • Align with curriculum	• Provides additional instruction • Fun, engaging • Builds fluency	• Expensive • Need computer access • Some programs may not be appropriate

Such classwide interventions are more cost-effective and efficient than individualized interventions because a teacher may use the intervention to help one student perform better in the classroom, but its use may benefit the performance of all students in the class.

classwide, and *classroom-wide* interventions (DuPaul & Stoner, 2003; Greenwood, Delquadri, & Carta, 1997). Although each term is interchangeable, for the sake of consistency, we use the term *classwide intervention* to refer to any intervention used with the whole class, regardless of why the intervention was implemented (e.g., to benefit one student vs. the entire class).

Classwide interventions for ADHD can be categorized into two major types: behavioral and academic. Behav-

ior interventions target the behavioral manifestations of the disorder (e.g., off-task behavior, difficulty staying in one seat; Barkley, 2005); whereas, academic interventions target the academic deficits that are often associated with ADHD (e.g., lower academic performance, lower rates of task completion and accuracy).

Behavioral Interventions

Contingency Management. One of the most common behavioral interventions for ADHD is contingency manage-

ment (CM), defined as the application of consequences contingent on specified behaviors (Wolery, Bailey, & Sugai, 1988). In general, this approach involves providing positive reinforcement for certain appropriate behaviors in an effort to increase their frequency (e.g., students who are on task earn time to play a game). CM can include several different components, such as having students earn tokens or chips for certain behaviors that can be exchanged for greater reinforcers (i.e., token economy); providing praise for specified actions (i.e., contingent attention); and/or the subsequent removal of those tokens or chips contingent on inappropriate behavior (i.e., response-cost). CM can also utilize group contingency, in which students earn rewards based on the behavior of the entire group (Wolery et al., 1988), or a "mystery motivator" in which the reward is unknown prior to earning it (Bowen, Jenson, & Clark, 2004, p. 87).

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Use of CM has produced positive results, as students displaying ADHD symptoms have increased the time on task (Anhalt, McNeil, & Bahl, 1998); the amount of work completed (Coles et al., 2005; Anhalt et al.); and the accuracy of academic responses (Ayllon, Layman, & Kandel, 1975). In addition, CM has decreased hyperactivity (Ayllon et al.); decreased inattentive behavior (Robertshaw & Hiebert, 1973); decreased disruptive behavior (e.g., talking out; van Lier, Muthen, van der Sar, & Crijnen, 2004); and increased compliance to directions (Anhalt et al.; Coles et al.). CM has also resulted in decreased dis-

ruptive behavior (e.g., talking out, out-of-seat) and increased academic performance (e.g., task completion, accuracy) for the entire classroom (Robertshaw & Hiebert; van Lier et al.). Such benefits for the whole class highlight the cost-effectiveness and the applicability for all students of such classwide approaches. A clear advantage of using CM is its effectiveness with all students and the ability for teachers to manage large groups of students at once. CM also provides overall classroom structure and serves as a basis for effective teaching practices. However, such a method requires some time and effort to establish and may require a high amount of vigilance from the teacher for it to be effective, at least in the initial implementation (see Wolery et al., 1988).

In general, the most effective use of CM includes simultaneous token reinforcement, response-cost, and group contingency (Forness, Kavale, Blum, & Lloyd, 1997). Such interventions as the "Good Behavior Game" (see Tankersley, 1995, for a review) or the "ADHD Classroom Kit" (Anhalt et al., 1998) are exemplars of classwide CM that teachers can use. The following elements are essential for any use of CM: (a) clearly defined expectations (e.g., three to five positively stated behaviors); (b) identified tokens; (c) identified relationship between tokens and back-up reinforcers; and (d) how and when students will exchange the tokens for reinforcers. Additionally, several guidelines are important to facilitate the effectiveness of CM, including (a) opportunities for students to practice and clarify desirable behaviors, (b) discussion and practice on appropriate ways to respond when a student loses a token, (c) planned procedures for fading use of CM and linking it to natural reinforcement, (d) a data tracking system, and (e) clear guidelines for when and how frequently the system will be used. There are several CM approaches that a teacher can use to establish management over the consequences that influence behavior; however, such detail is too exhaustive for the sake of this article. The reader is referred to Wolery and colleagues (1988) and Alberto and Troutman (2006) for further detail on CM.
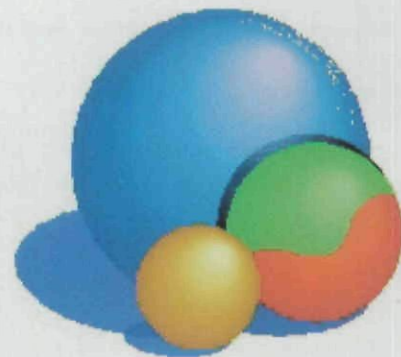
Therapy Balls. The use of therapy balls (i.e., gym balls) as an alternative to a typical classroom seat is an intriguing intervention explored by Schilling, Washington, Billingsley, and Deitz (2003). A therapy ball is an inflatable ball that the child sits upon. The therapy ball has molded feet that extend when the ball is not in use to prevent it from rolling away (see Sensory Edge, n.d.). Participants in a fourth-grade classroom found that sitting on the balls during language arts increased legible word production and increased in-seat behavior. In addition, all participants reported the use of the balls favorably and many preferred them to a desk chair. An advantage of such an intervention would be its social validity, whereas a disadvantage would be the cost of obtaining a therapy ball for every student.

Self-Monitoring. Typically used as an individualized intervention, self-monitoring involves a student evaluating and recording his or her own behavior(s) (Alberto & Troutman, 2006). The teacher and student agree on one to three behaviors for the student to monitor (e.g., work completion, attention, talking out) and the student is given a form to rate those behaviors on a Likert-scale indicating how well he or she performed the specified behavior. At specified times, the student then rates his or her behavior and compares it to the teacher's independent rating. Initially, students earn points for matching their ratings to the teacher's, which are then traded in for certain rewards. Over time, as a student is able to report a rating that matches the reality of his behavior, the teacher fades out her recording of the student's behavior, leaving self-monitoring to be entirely independent.

Self-monitoring techniques are usually faded out when the student is demonstrating favorable change (e.g., has increased time on task). More detail is provided in Alberto and Troutman and Wolery and colleagues (1988).

Individual self-monitoring with students with ADHD has resulted in increased time on task and reduced inattention and inappropriate behavior (Christie, Hiss, & Lozanoff, 1984). Only one study used self-monitoring on a classwide level; instead of student's rating their own behavior individually, the class was divided into four teams that rated their behavior collectively (Salend, Whittaker, & Reeder, 1992). Although no students with ADHD were in the classroom (several students were diagnosed with learning disabilities or an emotional and behavioral disorder), the use of group self-monitoring led to increased time on task and reduced verbalizations (i.e., talking out). Self-monitoring is advantageous in that the student is taught to be more independent, the deliverance of contingencies is less dependent on the teacher, and it facilitates generalization of targeted behavior (Alberto & Troutman, 2006; Wolery et al., 1988). Disadvantages include the time it takes to train the students to monitor the behavior accurately and that it may be less effective with elementary-age children (Wolery et al.).

Peer Monitoring. Peer monitoring involves training students to monitor one another's behavior and to reinforce positive behavior. Typically, this involves (a) defining an appropriate behavior (e.g., raising one's hand) and its inappropriate counterpart (e.g., talking out); (b) training students to identify and distinguish between the two behaviors; (c) having students catch each other displaying the appropriate behavior; and then (d) providing reinforcement for that behavior (e.g., praise, positive mark). Davies and Witte (2000) used peer monitoring in conjunction with a self-management and group contingency intervention in a classroom of third graders. Although the design of the study prevented any conclusions to be drawn on the use of peer monitoring by itself, the intervention decreased the number of inappropriate vocalizations

during instruction time in students with ADHD. Unfortunately, few data were collected on the benefit of the intervention for the whole class, but students in the class did report enjoying the intervention. An advantage of peer monitoring is the powerful impact that peers can have on one another's behavior (Alberto & Troutman, 2006; Wolery et al., 1988), but it may require a fair amount of set-up and training time for students to become accurate.

Instructional Choice. Instructional choice presents the student with two or more activities from a teacher-developed menu, and then the student is told to select the activity he or she would like to work on. The student can select one activity rather than another (e.g., chooses to do math rather than reading) or the order of assignments (e.g., working on math *before* working on reading). In general, instructional choice is associated with increased academic engagement and decreased behavioral problems (Hoffman & DuPaul, unpublished manuscript, as cited in Hoffman & DuPaul, 2000). Specifically, Powell and Nelson (1997) used choice-making with a 7-year-old child diagnosed with ADHD that led to decreased occurrences of undesirable behavior (e.g., inappropriate noise vocalizations, out of seat, noncompliance). In a similar study, Dunlap and colleagues (1994) reported improvements in task engagement with two 11-year-old boys with ADHD symptoms (though they did not report a formal diagnosis of ADHD).

Instructional choice has not been used on a classwide level, but its simplicity would allow easy transfer to the entire class. For example, during independent work time, a teacher could allow the entire class to choose the order of activities to work on, as opposed to only allowing one student that choice. Instructional choice is easy to implement and requires minimum additional preparation time for teachers. However, teachers may object to the idea of allowing students autonomy in which assignments they must complete, as they may fear students will come to expect a choice in all of their assignments. Currently, there is no research

we are aware of that has found such an adverse effect.

Academic Interventions

Classwide Peer Tutoring. Peer tutoring is an instructional manipulation strategy in which two students work together on an academic activity, with one student providing assistance, instruction, and feedback to the other (Greenwood, Maheady, & Carta, 1991). Students are paired (either by teacher selection or individual choice), provided with curriculum materials, and then alternate turns tutoring one another. Greenwood and colleagues (1997) developed a classwide peer tutoring model that included a group reinforcement component called ClassWide Peer Tutoring (CWPT). This program incorporates a point system into the peer tutoring methodology as an added reinforcement. Points are earned for correct answers, successful error correction, and correct procedures. Tests are administered weekly, the students' points are awarded as appropriate, and the winning team is announced. Partners and team assignments change the next week. For more detail, the reader is referred to the CWPT manual (Greenwood et al., 1997).

Research has demonstrated that CWPT increases student's time on task and improves academic performance (Greenwood et al., 1997). CWPT has led to significant improvements in on task behavior, activity level, and academic performance in math, reading, and spelling for students with ADHD in first through fifth grades (DuPaul, Ervin, Hook, & McGoey, 1998; DuPaul & Henningson, 1993). CWPT has also been found to reduce disruptive off-task behavior for children with ADHD, as well as to significantly show similar changes in task-related behavior for peer comparison children without ADHD (DuPaul et al., 1998). Classwide peer tutoring is flexible and allows for modifications to fit a specific classroom environment. Also, classwide peer tutoring enables students to receive one-to-one immediate feedback and error correction, which is difficult during whole-class instruction. A disadvantage we foresee would be the time it

Table 2. Summary of Interventions and Associated Outcomes

Intervention	Behavior Outcomes	Academic Outcomes
Behavioral		
Contingency Management	↓ Hyperactivity, inattentive, disruptive behavior ↑ Compliance, time on task	↑ Work accuracy and completion
Therapy Balls	↑ In-seat behavior	↑ Written work
Self-Monitoring	↑ Time on task ↓ Inattentive and inappropriate behaviors	
Peer Monitoring	↓ Talking out	
Instructional Choice	↓ Behavior problems	↑ Academic engagement
Academic		
ClassWide Peer Tutoring	↑ Time on task ↓ Disruptive behavior	↑ Performance in math, reading, and spelling
Instructional Modification	↓ Disruptive behavior ↑ Task engagement	↑ Performance in reading and writing
Computer-Assisted Instruction	↑ Time on task	↑ Math performance

Note. ↑ indicates increased, ↓ indicates decreased.

takes to develop the materials and the initial training period with students.

Instructional Modification. Instructional modification is a proactive strategy in which changes are made to the actual assignment in order to target a child's academic needs. For example, a teacher may divide a student's assignment into thirds, provide more frequent deadlines for assignments, or change the pacing of a read-along tape used with word lists (see Skinner, Johnson, Larkin, Lessley, & Glowacki, 1995). Use of instructional modifications have been shown to result in decreased disruptive behavior, increased task engagement, and increased academic performance in the areas of reading and writing. They have been found to have an immediate improvement in academic and behavioral performance for students with ADHD (DuPaul & Eckert, 1998; DuPaul & Stoner, 2003). However, although the use of instructional modification has not been implemented at the classwide level, such transfer to the whole class would be straightforward and easy. Instructional modifications are easy to implement, flexible, and are able to improve the academic environment of students experiencing difficulties (DuPaul & Stoner). Additionally, these modifications can occur within the daily classroom context and require minimal teacher preparation (DuPaul & Eckert, 1998; DuPaul & Stoner).

Computer-Assisted Instruction. Computer-Assisted Instruction (CAI) is the use of computer-based software programs designed to supplement teacher instruction and provide additional exposure to the academic material. The CAI program can modify the content and task in several ways. For example, it may draw attention to specific academic stimuli (e.g., highlighting math symbols); outline specific objectives; use multiple sensory modalities (e.g., audio and visual); provide immediate feedback (e.g., correct answers immediately on response); and/or divide the content into smaller chunks (DuPaul & Eckert, 1998; DuPaul & Stoner, 2003). Use of CAI has resulted in improved math performance and substantial reductions in off-task behavior (Ota & DuPaul, 2002). Although CAI has not been studied on a classwide level, it would be a logical step to use with all students in a given classroom. For example, during independent seat work, students could rotate using the CAI software (e.g., each student receives 10 min of CAI after receiving the teacher instruction) or if no computers are available in the classroom, whole classes could make use of the school's computer laboratory. CAI has the unique advantage of supplementing teacher instruction without requiring one-to-one attention or teacher time, but selection in the software program is critical as some programs require the teacher to work with the child at the computer. Finally, although some programs may be expensive, they are often engaging and naturally reinforcing for students.

Summary and Conclusions

Although this article is not an exhaustive review of the literature, it appears that teachers have several classwide intervention options for addressing the needs of their students with ADHD. It is important to realize that individualized interventions for students with ADHD are still viewed favorably and are a valuable option for teachers. However, the use of classwide interventions has a distinct advantage because their application can benefit *all* of the children in the classroom and not just the student with ADHD. Use of a classwide intervention is low-risk for teachers because they may use one of these classwide interventions and find that it is not com-

pletely effective in addressing the specific needs of the student with ADHD, but its use may still benefit other students in the class.

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To be most effective, classwide interventions are best used within the broader framework of Positive Behavior Supports (PBS). PBS is a three-tiered approach that utilizes continuous levels of support (primary, secondary, and tertiary) to prevent and manage the behavioral and academic needs of students (Positive Behavior Interventions & Supports, n.d., http://www.pbis.org/main.htm). Classwide interventions fall in the secondary level of support and teachers should ensure that a strong base of primary support for students with ADHD is in place before implementing a secondary level intervention. Primary levels of support include using one-step, clear directions; matching assignments to the students' levels; using preferential seating; minimizing distractions; and focusing on student strengths. The reader is referred to Carbone (2001), Pfiffner, Barkley, and DuPaul (2005), and Salend, Elhoweris, and van Garderen (2003) for further detail and examples.

Classwide interventions are time-efficient strategies for managing students with ADHD without singling out or stigmatizing the child, but careful assessment should be conducted prior to implementing any intervention. A brief Functional Behavioral Assessment (FBA) can guide the selection of an intervention and ensure that the intervention matches the function of the child's behavior (Crone & Horner, 2003). For instance, the selection for a student whose ADHD symptoms are maintained by peer attention would

point to using peer tutoring, whereas symptoms maintained by teacher attention may lead to using contingency management with a reward of individual time with the teacher. If a tertiary level of support is needed, a more detailed assessment (e.g., complete FBA, social and emotional assessment, curriculum-based measurement) and a Behavior Support Plan is recommended along with enlisting outside support (e.g., parents, school psychologist, administrative support; see Crone & Horner for more detail).

In general, classwide interventions can have an impact on academic and behavioral difficulties often associated with ADHD. Although one intervention may have more documented effects than another (see Table 2), this does not necessarily exclude the other strategies reviewed from being helpful for children. The authors do not view one intervention as superior to another because the ultimate benefit of an intervention depends upon balancing data-based decisions, social validity, contextual fit, cultural factors, and teacher and child preference.

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