

# Non-pharmacological approaches for treating children with ADHD inattentive type

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## Abstract

The behavioral difficulties of children with attention-deficit/hyperactivity disorder (ADHD) inattentive type differ from those of children with ADHD combined or hyperactive/impulsive type. Existing evidence-based interventions primarily target the disruptive and impulsive behaviors exhibited by children with ADHD combined and hyperactive/impulsive type. A number of recent advances have been made in the non-pharmacological treatment of behavioral difficulties associated with ADHD inattentive type. Additional research using randomized controlled research designs and long-term follow-up evaluation is necessary before these interventions may be considered established evidence-based interventions for patients with ADHD inattentive type.

## Introduction and context

Attention-deficit/hyperactivity disorder (ADHD) is a behavioral disorder usually diagnosed during childhood. It is characterized by developmentally inappropriate symptoms of inattention, hyperactivity and impulsivity and significant impairment in multiple domains of functioning [1]. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) diagnostic criteria define three ADHD subtypes based on the presence of inattention and hyperactivity/impulsivity symptoms: predominantly inattentive type, predominantly hyperactive/impulsive type, and combined type [2].

A recent US national epidemiological study of 8- to 15-year-old school children found an 8.7% prevalence of ADHD, with the predominantly inattentive type most prevalent (4.4%) among the ADHD subtypes (combined type, 2.2%; predominantly hyperactive-impulsive type, 2.0%) [3]. The behavioral manifestations of ADHD inattentive type differ from those associated with combined and hyperactive/impulsive type [2,4]. Children with combined and hyperactive/impulsive type exhibit problems with behavioral inhibition, including

interrupting, blurting out, getting out of their seat at inappropriate times, and playing loudly. In contrast, the primary difficulties of children with inattentive type are non-disruptive in nature and are related to planning and organizing actions [2,5,6]. Children with inattentive type often forget to complete or lose assignments, procrastinate, complete work carelessly, have difficulty planning for the completion of long-term projects and studying for tests, and have problems keeping materials organized [7-9].

Three treatments qualify as 'well-established' interventions for children with ADHD: psychopharmacological therapy, behavioral parent training, and behavioral classroom management [10,11]. Psychopharmacological therapy (e.g. stimulant medication) is the most utilized intervention modality for treating patients with ADHD and produces marked improvements in sustained attention, impulse control and noisy and disruptive behaviors [1]. While psychopharmacology ameliorates some of the core symptoms of ADHD inattentive type, there is minimal evidence to suggest that medication promotes improvements in the ability to effectively plan and

organize materials and/or actions. As such, stimulant medication is only minimally effective in improving important areas of functioning such as long-term academic achievement [12]. Similarly, evidence-based behavioral treatments, such as parent training and classroom management, primarily target impulsive and disruptive behaviors and do not focus on the problematic behaviors associated with inattentive type [13,14].

### Recent advances

In the past 2 years, several advances have been made in the treatment of behaviors exhibited by children with ADHD inattentive type. Interventions have been evaluated that target planning, materials organization, time-management, and homework management skills. These interventions typically focus on behavior in the school setting as demands for these skills are greatest at school and can lead to significant academic impairment [7].

Strategy and skills training are the core features of these interventions. Children are taught systems for organizing school materials and managing/planning homework responsibilities. Checklists with operationalized definitions of behavior are used to monitor skills implementation. Similar to existing evidence-based interventions for ADHD, these interventions incorporate behavioral therapeutic techniques, such as rehearsal, prompting, shaping and contingency management, to teach and promote skills use and their generalization. For example, point systems or token economies are often utilized to monitor and reward adherence.

Interventions have been evaluated that target multiple aspects of organization and planning, including: classroom preparation [15], organization of bookbag, binder, and locker [16,17], and planning and tracking homework assignments and long-term projects [17]. Multi-component interventions have also been evaluated that include all of these components [14,18]. These interventions are associated with short-term gains on process measures of materials organization, homework management, planning and procrastination. Some of these improvements appear to be sustainable for children with ADHD as assessed at 8-week [17] and 3-month follow-ups [14].

At this point, it is unclear if gains on process measures (e.g. materials organization or homework management checklists) are ultimately associated with improvement in functional outcomes such as school performance. Only a subset of studies completed to date included both process measures and measures of functional impairment. Langberg *et al.* [17] documented improvements in organizational skills, parent ratings of homework

problems, and grade point average. However, the gains in grade point average were relatively small. Pfiffner *et al.* [14] documented improvements in organizational skills and a clinician completed Clinical Global Impression, and these gains were maintained at a 3- to 5-month follow-up. Abikoff and Gallagher [18] showed improvements in both organizational skills and parent-rated homework problems, but it is unknown if improvements in homework problems resulted in overall academic improvements.

There are also methodological limitations that preclude the classification of these interventions as efficacious. Few studies have used random assignment to groups and/or appropriate control conditions. Hence, alternative explanations for observed patient improvements are possible (e.g. Hawthorne effects). In addition, generalization across settings was not formally assessed in most of the studies. It would be important to determine if skills generalize across classrooms or from school to home.

### Implications for clinical practice

The behavioral difficulties of patients with ADHD inattentive type may be markedly different from those of children with combined or hyperactive/impulsive type and the targets of treatment will need to be tailored accordingly. While behavioral interventions targeting organization, planning and time-management cannot be classified as 'well-established', they have shown considerable promise. A central challenge will be figuring out how to disseminate these interventions into clinical practice. The interventions evaluated to date have varied in where the intervention is delivered (e.g. school, home, or clinic), and dissemination models will need to account for these factors. Providing intervention directly in the setting where the skills are most relevant/problematic (e.g. school) should allow clinicians to achieve higher levels of skills generalization [19]. To promote dissemination, intervention protocols should be developed that do not require a high degree of clinical specialization to implement and that can be implemented directly in the setting of interest.

### Abbreviations

ADHD, attention-deficit/hyperactivity disorder.

### Competing interests

The authors declare that they have no competing interests.

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