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Review of Treatments for ADHD and the Evidence Behind Them
Written by members of the Pediatric Interest Professional Affairs

Committee of the New York State

Association of Neuropsychology (NYSAN)

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Summary

In an effort to educate our clients and their families about the most effective treatments and interventions for ADHD in children and adolescents, the New York State Association of Neuropsychology (NYSAN) has created a document reviewing evidence for a wide range of treatments. Please note that this document is intended only to summarize available treatments and the research evidence behind them and does not reflect NYSAN's support of any one treatment.

The treatments/interventions reviewed are as follows: pharmacological interventions; behavioral interventions; computerized interventions; executive functioning interventions; diets, vitamins, and supplements; neurofeedback; exercise; and mindfulness. To access the paper, follow the link to the NYSAN website. Please feel free to share the information with colleagues and clients.

ADHD and Its Treatments

Table of Contents

1. **What is ADHD?**
2. **How is ADHD diagnosed?**
3. **What are the current treatments for ADHD?**
 - a. **Pharmacological Interventions**
 - b. **Behavioral Interventions**
 - c. **Computerized Interventions**
 - d. **Executive Functioning Interventions**
 - e. **Diets, Vitamins, and Supplements**
 - f. **Neurofeedback**
 - g. **Exercise and Mindfulness**
4. **References and Resources**

What is ADHD?

The American Academy of Pediatrics defined Attention-Deficit Hyperactivity Disorder (ADHD) as a neurodevelopmental behavioral disorder characterized by difficulties with attention “frequently displayed and more severe than is typically observed in individuals at a comparable level of development.” While ADHD is the most commonly diagnosed pediatric behavioral disorder, prevalence estimates vary depending on the population being sampled (e.g., community samples, school samples, clinically referred samples). According to the American Academy of Pediatrics (2000), epidemiological studies suggest that 9.2% of boys and 2.9% of girls demonstrate behaviors consistent with the diagnosis. As currently defined by the *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition*, (DSM-5), symptoms of ADHD must be present before the age of 12, be clinically significant in at least two settings, and cause functional impairment. The disorder is further categorized based on symptom presentation and the predominant behavioral features. Currently, three major presentations are defined, including a Hyperactive–Impulsive presentation, an Inattentive presentation, and a combined presentation. ADHD-Hyperactive Impulsive type requires six of nine symptoms of hyperactivity or impulsivity including problems inhibiting impulses, difficulty taking turns (i.e., impatience), interrupting, and keeping still.

ADHD-Inattentive type is defined as exhibiting six of nine symptoms including inattention, distractibility, disorganization, and poor sustained mental effort. Lastly, ADHD-Combined type requires six of nine symptoms in both hyperactive/impulsive and inattentive type symptoms. Multiple population studies showed that ADHD Inattentive type is the most commonly diagnosed of the three subtypes, although this varies depending on the age group. Hyperactive/impulsive symptoms were more common in younger children, while inattentive ones were more prominent in older children and adolescents.

How is ADHD Diagnosed?

The DSM-5 diagnostic criteria for ADHD are symptom based. There is currently no single test or approach that can be used to make the diagnosis. Part of the challenge in making the diagnosis is that symptoms associated with ADHD are not unique to the disorder. Difficulties with concentration and self-control are observed in ADHD, as well as in a variety of other disorders. As a result, alternative explanations for the symptoms must be considered. Furthermore, many children with ADHD have another (i.e., comorbid) disorder such as a learning disability, an anxiety disorder, and/or oppositional defiant disorder. The impact of these co-occurring disorders must be teased apart from the symptoms of ADHD. Finally, the presence of symptoms alone is not enough to meet

DSM-5 diagnostic criteria for ADHD. There must be clear evidence that the symptoms impair social, academic, and/or work functioning relative to peers. Therefore, the diagnostic approach recommended by most experts includes a comprehensive interview with parents, an interview with the child/adolescent, and collateral reports including rating scales completed by parents and teachers. Psychometric testing also is recommended when learning issues are suspected. Furthermore, when additional information is needed to reach clarity on the diagnosis, direct observation of the child, interviews with the teachers, and/or review of school records including teacher comments on report cards may be warranted (Anastopoulos & Shelton, 2001; AAP, 2011; AACAP, 2007; WHO, 1993). A diagnosis of ADHD is generally made by a clinical psychologist, clinical neuropsychologist, or physician.

What are the current treatments for ADHD?

There is general consensus that only ADHD treatments and interventions proven effective should be recommended by psychologists and physicians. These approaches are termed “evidence based” because there is research data to support their effectiveness.

Pharmacological Interventions

Medication is the best-supported treatment for ADHD and is recommended as a first line treatment for children and adolescents by the American Academy of Pediatrics (2011). For children under six years of age, stimulant medication (specifically methylphenidate) is recommended should symptoms continue to have a significant effect on functioning after evidence-based behavioral interventions are tried. Medication helps most children (about 70-75%) improve concentration and reduce hyperactivity and impulsivity. However, medications do not “cure” ADHD. Symptoms will return when the medication is stopped. Furthermore, ADHD medication does not fix underlying cognitive difficulties, organizational difficulties, or academic problems but it may make them more available to learn skills and behavioral strategies. Consequently, medication intervention often is most effective when paired with behavioral interventions and skill development.

Medications for ADHD are generally considered safe. However, different medications have differing side effects. It may take time to find the most effective medication and dosage to control ADHD symptoms while minimizing side effects. The most common side effects are reduced appetite, trouble sleeping, headaches, stomachaches, irritability, and increased heart rate.

Medication interventions in children under six years of age have been studied less than in older children. Nevertheless, there is evidence that side effects may be more problematic in this population. Whatever the age of the child, medication interventions should include close collaboration with the prescribing medical professional with expertise in ADHD—usually a pediatric neurologist, psychiatrist, pediatrician, or nurse practitioner (psychologists do not prescribe medication in NY State)—and parents as well as teachers. This ensures optimal communication and the greatest likelihood of identifying the most appropriate medication and dosage, managing side effects, and discontinuing ineffective medications. Maintenance of medication may be managed, thereafter, by the primary care physician with periodic follow-up with the ADHD expert.

There are other medications than stimulants to treat ADHD. The choice to use stimulants or non-stimulants ultimately is the decision of the prescribing medical professional.

Stimulants. Stimulant medications quickly impact behavior after they are ingested (i.e., within 30-45 minutes) and are effective for approximately four to 12 hours. Afterwards, ADHD behaviors return to their pretreatment levels. Stimulant medications include: 1) methylphenidate (and ^ddexmethylphenidate) with the brand names of: Ritalin, Ritalin SR, Ritalin LA, Concerta, Daytrana Patch, Metadate CD, Metadate ER, Methylin, Methylin ER, Quillivant XR, Focalin^d, and Focalin XR^d, and 2) amphetamines (^amixed amphetamine salts, ^bdextroamphetamine, ^clisdexamfetamine) with the brand names of: Adderall^a, Adderall XR^a, Dexedrine^b, Dexedrine Spansules^b, and Vyvanse^c. Stimulants can be short-acting (4-6 hours) or long-acting (8-12 hours). The suffix designations of ER, XR, CD, LA, and SR indicate longer acting forms. Research has not consistently supported the superiority of any one of these medications, although stimulants generally have been found to be more effective than non-stimulants. Additionally, effectiveness may vary from one individual to another.

Non-stimulants. Non-stimulant medications take longer to become effective (sometimes up to 6 weeks). They also are metabolized slower and require gradual build up to an optimal dose and tapering down prior to being discontinued. One advantage of non-stimulant over stimulant medications is that it yields a more stable effect. ADHD behaviors do not return to pretreatment levels after four to 12 hours because these medications do not wear off. The most researched non-stimulant is atomoxetine (brand name Strattera). It often is prescribed when stimulants are not effective or not well tolerated. Individuals taking atomoxetine require monitoring for agitation, irritability, suicidal thinking, and self-injurious behavior. Other approved but less researched non-stimulants used to treat ADHD include guanfacine ER (brand name Intuniv) and clonidine hydrochloride (brand name Kapvay). These

medications sometimes are prescribed in combination with a stimulant to manage ADHD symptoms. Other non-stimulant medications with efficacy in moderating ADHD behaviors include: propranolol (Inderal), bupropion (Wellbutrin), modafinil (Provigil or Nuvigil), tricyclic antidepressants such as desipramine (Norpramin) and imipramine (Tofranil).

Stimulant medications generally are considered first line treatments for ADHD symptoms. However, other comorbid conditions (e.g., tics, Tourette's syndrome, anxiety disorder, seizures, and substance abuse) may influence the choice of prescribed medication and/or other treatment. Concerns about the possible misuse of medications (referred to as the "diversion of medication") may also influence the choice, as some medications must be absorbed through the digestive system and are less likely to be abused.

Behavioral Interventions

Parent Training. Behavioral parent training (BPT) is one of the most widely used and well-established treatments for youth with ADHD. Behavioral improvements across multiple domains of functioning have been consistently reported as a result of BPT. However, one caveat is that much variability exists in how parent training is delivered. Evidence supports the use of different methods (and/or a combination of formats) to fit the needs of individual clients or groups. BPT can be delivered in large community groups, small clinic-based groups, and individual formats. There also is evidence that enhancements can be made to the BPT to increase attendance and engagement, particularly for parents at-risk of poor outcomes in these areas (for example, single mothers who have limited psychosocial support). Common components include the discussion/implementation of principles of positive reinforcement, parent-child relationship building, effective limit setting/punishment, problem solving, anger management, psychoeducation/didactics, homework and review, role playing/behavioral rehearsal, modeling, provision of materials, and review of goals/progress.

Classroom Management. Classroom management is a well-established intervention for youth with ADHD. It uses contingency management, which is a behavioral therapy approach that selectively rewards target behaviors. For example, token economies may be used to reinforce desired behaviors. The child earns tokens that later may be exchanged for desired "rewards." Classroom management strategies have been shown to lead to improvements in teacher-rated ADHD symptoms and teacher-rated social skill measures in addition to increased daily work productivity. Independent observations of classroom behavior also have reported improvements in functioning.

Peer Interventions. Peer interventions are directed at improving social functioning for youths with ADHD. Traditional office-based social skills training has not been found to produce positive effects. Since many children in these studies also were being treated with ADHD medication, the magnitude of behavior change from drugs versus social skills training remains unclear. Although social skills training alone may not improve interpersonal functioning in children with ADHD, combining it with behavioral parent training increased parental engagement. Other peer interventions delivered in recreational settings, such as summer treatment programs (including social skills training, coached group play with contingency management, home rewards aimed at social functioning), were proven effective. Results were comparable to those from medication. It is important to note that research participants who received behavioral classroom management and behavioral peer interventions (as part of the efficacy studies summarized above) were often concurrently receiving BPT. The literature notes it is difficult to disentangle incremental benefits from simultaneous treatments.

Other Treatments. Non-behavioral psychotherapeutic or cognitive behavioral treatments (i.e., individual therapy, play therapy, or cognitive therapy) have not been found to be clinically effective for youths with ADHD. Although a problem-solving communication training group was minimally studied, there was initial evidence of a similar outcome compared to BPT.

Computerized Interventions

Multiple computerized programs claim to target ADHD specific symptoms, improving attention and working memory in addition to behavior and academic achievement. As these interventions do not involve medication, they have become popular. However, they can be expensive and time consuming. Furthermore, the evidence to support their efficacy is limited.

Cogmed. Cogmed working memory training program may be the most widely studied program. While many of the original studies were performed by the developer, more recently independent studies were completed with inconsistent results. A recent and comprehensive review recommended that Cogmed be defined as a “Possibly Efficacious” Treatment for Youth with ADHD. Many studies note improvement on the trained tasks, but transferring these gains to daily activities has not been reliably demonstrated. Additional reviews noted that claims about academic, behavioural, and cognitive benefits of cognitive training programs remain unsupported in ADHD research. In addition, other studies failed to demonstrate improvement in non-trained working memory tasks in children with more severe ADHD and learning disorders.

Additionally, there is no evidence that the gains reported in some studies last.

Interactive Metronome. Interactive Metronome is another popular treatment for children with ADHD. The theoretical basis for Interactive Metronome is that motor planning and organizing are based on an internal sense of rhythm. Thus, interventions aimed at improving timing and rhythm could improve symptoms of ADHD. Unfortunately, multiple studies with Interactive Metronome intervention failed to demonstrate improvement in ADHD symptoms. Additionally, many of these studies were marred by poor methodological designs.

Brain Beat. Brain Beat is based on a similar premise as Interactive Metronome treatment. While the company reports several studies on its website, no published studies were identified to date.

Brain Gym. Brain Gym incorporates kinaesthetic movements to promote neurological re-patterning. This approach was not supported by several research studies in peer reviewed journals. Additionally, considering the weak scientific support for the theories upon which Brain Gym is based, the American Academy of Pediatrics cautioned against its use.

Fast Forward and Earobics. These interventions were originally designed for treating language based difficulties. There is no evidence for their efficacy for the treatment of symptoms of ADHD.

Executive Function Interventions

Executive functions (EF) are higher order thinking skills that allow individuals to regulate and orient their behavior to reach a goal. These skills include inhibitory control, self-regulation, cognitive flexibility, working memory, as well as planning and organizing. EF interventions were developed in accordance with the clinical model of psychopathology which contends that the most effective interventions work to improve underlying neurobiological substrates and core psychological/cognitive features. This premise also is supported by a body of literature showing that neurodevelopmental processes are responsive to environmental influences. EF interventions, therefore, target ADHD-related executive function weaknesses observed in individuals with ADHD.

Facilitative Intervention Training (FIT). FIT programs were first proposed in the early 2000's to improve executive functioning. They differ from the other non-pharmacological treatment approaches by trying to promote the development of attention and executive functioning rather than compensate for weaknesses in these functions. The underlying premise of FIT programs is that extensive training (involving repetition,

practice, and feedback) can lead to enduring and measurable improvements in the development and efficiency of executive functions. These improvements, in turn, are thought to generalize to abilities and activities that are mediated by the same neural circuits.

Studies that investigated this intervention generally targeted short-term and working memory, attention, set-shifting, and a mix of executive function skills (e.g., inhibition and short-term memory). Recently published studies mostly employed computerized-based interventions. Of those, several used Cogmed Working Memory Training (see above). Other recent studies included “intrinsically rewarding” (i.e., fun) tasks. For example, TEAMS (viz., Training Executive, Attention, and Motor Skills) uses games and physical exercises applied within a social context to gradually increase neurocognitive and motor skill demands. A significant decline in ADHD symptom ratings by parents and teachers followed treatment. Furthermore, this clinical improvement was maintained three months following termination of active treatment. Children who used the game version of working memory training programs showed greater motivation (i.e., spent more time training), better performance (i.e., more sequences reproduced and fewer errors), and superior abilities at post-training than children who participated in regular working memory training.

The question of whether maturation and/or efficiency of neural circuitry underlying targeted EF can be accelerated with FIT programs (via protracted training, practice, and feedback) cannot yet be answered. FIT programs that targeted short-term memory yielded gains in children’s cognitive performance that remained evident at 3-6 months. However, programs that targeted mixed EF (such as combined inhibition and short term memory), set-shifting, or only attention processes did not produce significant improvements in the trained cognitive domains. Furthermore, it should be noted that training short-term memory was not associated with significant improvements on non-trained tasks. There also were “minimal-to-no-objectively measured improvements in behavior, academics, and cognitive functioning.”

Organizational Skills Training Program. Organizational and planning skills are often impaired in children with ADHD. These deficits result in children struggling to keep track of their belongings, assignments, and allotment of time in planning activities. A recently developed Organizational Skills Training Program (OST) may be effective in mitigating these behaviors. The program trains children, along with their parents and teachers, to develop tools and routines for tracking assignments, managing belongings, and allocating time for planning tasks. Parents and teachers receive guidance in behavior modification, whereas children are provided with instruction and practice from clinicians in individual sessions. OST was shown to improve organizational skills in children with ADHD, with beneficial effects lasting into the next school year (evidenced in

homework compliance, behavioral management, academic productivity, and familial tranquility).

Several other interventions were found to improve organizational skills. Parents and Teachers Helping Kids Organize (PATHKO) is one of those. PATHKO trains parents and teachers to develop individualized goals which they can prompt and reward. However, unlike the OST program, the PATHKO intervention does not provide children with specific skill instruction. Whereas each program utilizes praise and rewards, PATHKO additionally allows for response cost. Improvements in organizational skills obtained with PATHKO also remained positive at follow up.

Homework, Organization and Planning Skills. Homework, Organization and Planning Skills (HOPS) is a program that was utilized in schools for training children with ADHD and their parents. Individualized intervention is provided to children by school-based mental health providers for 11 weeks, targeting specific skills in material management, homework tracking, and time management. Self-monitoring and skill maintenance also are included as is a reward system. Improvements in organizational skills continued to be observed at three months, but teacher ratings did not identify group differences with regard to wait list controls.

Investigators have begun to explore ways to improve executive functioning in preschool children. Some evidence exists to suggest that playing intrinsically rewarding social games with parents, involving sequencing, following directions and rules, and planning, could improve a range of "executive functions" (including working memory and self-control).

Diets, Vitamins, and Nutritional Supplements

All medical and dietary interventions for children should be discussed with their primary health care provider. Although there is little evidence that use of special diets and nutritional supplements can resolve ADHD symptoms, well balanced and healthy diets are known to yield beneficial health effects that can positively impact attention, concentration, and behavior. Clinicians are encouraged to educate parents about what constitutes a "healthy diet." The "Western Diet" typically is high in fat and refined sugars, while the "healthy diet" tends to emphasize fiber, folate, and omega-3 fatty acids.

Other dietary strategies can be influenced by genetic, allergic and/or geographical history. For example, low zinc levels could be a concern for children who have relocated from regions where this tends to be endemic and can be addressed in consultation with their health care provider. The

dietary interventions listed below can be suitable for extended use, while relatively easy to implement:

Sugar/Aspartame Restricted. Some research supports limiting sugar intake in subsets of children with ADHD. However, the “hyperactive response” to sugar can reportedly be “blocked” by a previously consumed high protein meal (validating the wisdom of finishing dinner before desert).

Fatty Acid Nutritional Supplements. Some children with ADHD may have genetically based impairments in fatty acid metabolism and lower levels of long chain polyunsaturated fatty acids. However, the potentially beneficial effects of nutritional supplementation with omega-3 and 6 fatty acids have not been definitively observed for this population.

MINERAL DEFICIENCIES

Iron. Studies exploring the effect of iron deficiency in children with ADHD have not reported consistent findings. Nevertheless, there may be a low threshold effect when iron levels are particularly low (e.g., 7 ng/mL). Dietary supplementation with iron may represent a novel treatment for ADHD.

Zinc. Inattention was observed in children from Middle Eastern countries who presented with endemic zinc deficiencies. However, the literature associating zinc deficiency with hyperactive-impulsive behavior remains unclear. Consequently, the prospect of employing zinc as a treatment for U.S. raised children with ADHD is not supported.

Use of vitamins and/or minerals appears clinically sensible for children with “poor diets” who would be at risk for malnutrition. However, there is little scientific evidence in the literature of their value in treating ADHD. Additionally, implementing such treatment is difficult because patience, perseverance, follow-up, and involvement of a physician and a dietician are typically required.

ADDITIVE/PRESERVATIVE FREE (circa 1970’s)

Feingold Diet. The Feingold Diet “... may be appropriate therapy for children with sensitivities to food antigens or allergens and to dyes.” The diet specifies avoidance of “... apples, grapes, luncheon meats, sausage, hot dogs, and cold drinks containing artificial flavors and food colorings agents.” Orange and red synthetic dyes, as well as preservatives, are particularly targeted for avoidance (Millichap, 2011).

Oligoantigenic (“Elimination Diet”). The Elimination Diet involves removing known food antigens and/or allergens and providing hypoallergenic food alternatives. This strategy may benefit some

hyperkinetic children. However, when “food challenges” are presented to assess allergic response, escalation of behavioral and cognitive symptoms may occur.

Ketogenic Diet. This is a low carbohydrate and high fat diet that was developed in the 1920's to treat epilepsy. High comorbidity between epilepsy and ADHD suggests these disorders may benefit from the same treatments. Nevertheless, the literature does not support the notion of the ketogenic diet having value in treating ADHD.

Food Coloring. About eight percent of children exhibit a reaction to food coloring. Although studies demonstrated behavioral improvement in children by eliminating food coloring from their diets, the effect was small. Additionally, it was only observed with non FDA approved food dyes. Thus, this benefit was observed mostly for children residing outside the United States.

Neurofeedback

Neurofeedback is a computer-aided technique that trains individuals to control their brain wave activity to achieve a calmer state, thereby lessening ADHD symptoms. Studies across the last twenty years have reported neurofeedback to be a potentially effective treatment for ADHD. Nevertheless, there is controversy about whether the benefits of neurofeedback are due to changes in brainwaves themselves or to the executive strategies taught or self-derived for attempting to control their brainwaves (see Executive Functioning Interventions above).

What are some of the advantages of neurofeedback for ADHD?

- It is noninvasive.
- It can be used without medication.
- It may yield longer lasting effects on inattention than medication.

What are some of the disadvantages of neurofeedback?

- It is time consuming, requiring 20-40 sessions each lasting 30 to 50 minutes.
- It is costly.
- Some practitioners may extend the use neurofeedback to treat other disorders for which it may not be helpful (because its efficacy for those disorders has not been adequately researched).
- It may not be effective for ADHD symptoms other than inattention.

How does neurofeedback compare to other treatments for improving symptoms of ADHD?

Research on neurofeedback has been inconsistent, with some studies demonstrating a strong effect. For example, one study found that while methylphenidate was superior to neurofeedback for improving symptoms of hyperactivity and of impulsivity, neurofeedback was just as effective for inattention. Additionally, neurofeedback yielded better follow-up results for inattention (i.e., longer lasting benefits) than obtained with medication. However, most studies that have demonstrated the effect of neurofeedback did not have proper control groups or were not blinded. The most recently published meta-analysis of randomized controlled studies failed to support neurofeedback as an effective treatment for ADHD.

Neurofeedback Providers

- It is important to identify a provider who can tailor treatment to an individual's needs. This is particularly important for treating individuals with ADHD because it is a disorder with many different causes.
- The provider should be professionally licensed in your state and have completed training in a program accredited by a professional association (for example, the American Psychological Association or the Biofeedback Certification Institute of America).

Exercise and Mindfulness

Exercise. Exercise has been demonstrated to benefit the cognitive functioning of children (e.g., enhancing mental flexibility). Greatest benefit was observed for short duration and less strenuous exercise. Nevertheless, more recent studies suggest that vigorous exercise may facilitate executive functioning in children with ADHD (especially inhibition, planning, and working memory).

The proposed mechanism for the benefit of exercise on cognitive functioning is based on the theory that it causes dopamine release. Dopamine is a brain activating neurotransmitter. Thus, increased dopamine would be expected to heighten brain activation to potentially improve cognitive focus and, in particular, executive functioning ability.

Although additional research is necessary, evidence is increasing that exercise positively effects the cognitive functioning of children with ADHD.

Mindfulness. Mindfulness is enhanced awareness of one's internal and environmental contexts. Exercises to develop mindfulness include teaching children to consider new ideas, exercise cognitive flexibility, and meditation. Although literature on the effectiveness of mindfulness training in children with ADHD is not conclusive, some positive

preliminary findings were observed. For example, improvements were reported for self-regulatory skills and for behavioral compliance in children presenting with ADHD symptoms. Similarly, adolescents exhibiting ADHD symptoms showed improvements on self-reported externalizing and internalizing as well as on attentional and executive functioning tasks. However, the improvements appeared to diminish with time.

SUMMARY

There are many potentially effective treatments for ADHD. These include: pharmacological and behavioral approaches; computerized and executive function interventions; diets, vitamins, and nutritional supplements; as well as neurofeedback, exercise, and mindfulness training. The best options, determined in consultation with the child's or adolescent's healthcare provider, ultimately depend upon considerations of symptom severity and of family circumstances.

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References

- Abikoff H, Gallagher R, Wells KC, Murray DW, Huang L, Lu F, Petkova E (2013). Remediating organizational functioning in children with ADHD: Immediate and long-term effects from a randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 81(1), 113-128.
- American Academy of Child and Adolescent Psychiatry and the American Psychiatric Association. (2013). ADHD Parents Medication Guide. (www.aacap.org/App_Themes/AACAP/Docs/resource_centers/adhd/adhd_parents_medication_guide_201305.pdf)
- Arnold LE, Hurt E, Lofthouse N (2013). Attention-Deficit/Hyperactivity Disorder: Dietary and nutritional treatments. *Child and Adolescent Psychiatric Clinics of North America*, 22, 381-402.
- Bidwell LC, Clernon EJ, Kollins, SH (2011). Cognitive enhancers for the treatment of ADHD. *Pharmacology, Biochemistry, and Behavior*, 99, 262-274.
- Biederman J, Mick E, Fried R, Wilner N, Spencer TJ, Faraone SV (2011). Are stimulants effective in the treatment of executive function deficits? Results from a randomized double blind study of OROS methylphenidate in adults with ADHD. *European Neuropsychopharmacology*, 21, 508-515.
- Blach M H, Qawasmi A (2011). Omega-3 fatty acid supplementation for the treatment of children with Attention-Deficit/Hyperactivity disorder symptomatology: Systematic review and meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50, 991-1000.
- Chacko A, Feirsen N, Bedard A, Marks D, Uderman, JZ., Chimiklis A (2013). Cogmed working memory training for youth with ADHD: A closer examination of efficacy utilizing evidence-based criteria. *Journal of Clinical Child and Adolescent Psychology*, 42(6), 769-783.
- Chang Y, Liu S, Yu H, Lee, Y (2012). Effect of acute exercise on executive function in children with Attention Deficit Hyperactivity Disorder. *Archives of Clinical Neuropsychology*, 27, 225-237
- Cheng JY, Chen RY, Ko JS, Ng, EM (2007). Efficacy and safety of atomoxetine for attention-deficit/hyperactivity disorder in children and adolescents – meta-analysis and meta-regression analysis. *Psychopharmacology*, 194(2), 197-209.
- Cortese S, Ferrin M, Brandeis D, Holtmann M, Aggensteiner P, Daley D, Santosh P, Simonoff E, Stevenson J, Stringaris A, Sonuga-Barke EJ, European ADHD Guidelines Group (EAGG) (2016). Neurofeedback for Attention-Deficit/Hyperactivity Disorder: Meta-analysis of clinical and

neuropsychological outcomes from randomized controlled trials. *Journal of the American Academy of Child & Adolescent Psychiatry*, 55(6), 444-455.

Diamond A, Lee K (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, 333(6045), 959-964.

Effective Health Care Program of the Agency for Healthcare Research and Quality (2011). Treatment Options for ADHD in Children and Teens: A review of Research for Parents and Caregivers. http://effectivehealthcare.ahrq.gov/ehc/products/191/1148/adhd_con_fin_to_post.pdf

Faraone SV, Biederman J, Spencer TJ, Aleardi M (2006). Comparing the efficacy of medications for ADHD using meta-analysis. *Medscape General Medicine*, 8, 4-8.

Faraone SV, Buitelaar J (2010). Comparing the efficacy of stimulants for ADHD in children and adolescents using meta-analysis. *European Child & Adolescent Psychiatry*, 19, 353-364.

Faraone SV, Glatt SJ (2010). A comparison of the efficacy of medications for adult attention-deficit/hyperactivity disorder using meta-analysis of effect sizes. *Journal of Clinical Psychiatry*, 71, 754-763.

Gibson BD, Gondoli DM, Johnson AC, Steeger CM, Dobrezenski BA, Morrissey RA (2011). Component analysis of verbal versus spatial working memory training in adolescents with ADHD: A randomized controlled trial. *Child Neuropsychology*, 17(6), 546-563.

Hazel P L, Kohn MR, Dickson R, Walton RJ, Granger RE, van Wyk GW (2011). Core ADHD symptom improvement with atomoxetine versus methylphenidate: A direct comparison meta-analysis. *Journal of Attention Disorders*, 15, 674-683.

Hillman CH, Pontifex MB, Castelli DM, Khan NA, Raine LB, Scudder MR, Drollette ES, Moore RD, Wu C, Kajimo K (2014). Effects of the FIT Kids Randomized Controlled Trial on Executive Control and Brain Function. *Pediatrics* 134(4), e1063-1071

Kirby A, Woodward A, Jackson S (2010). Benefits of omega-3 supplementation for school children: Review of the current evidence. *British Educational Research Journal*, 36, 699-732.

Kordas K, Stoltzfus RJ, López P, Rico JA, Rosado JL (2005). Iron and zinc supplementation does not improve parent or teacher ratings of first grade Mexican children exposed to lead. *Journal of Pediatrics*, 147, 632-639.

- Kratochvil CJ, Wilens TE, Greenhill LL, Gao H, Baker KD, Frelman PD, Gelowitz DL (2006). *Journal of the American Academy of Child & Adolescent Psychiatry*, 45, 919-927.
- Mészáros A, Czobor P, Bálint S, Komlósi S, Simon V, Bitetr I (2009). Pharmacotherapy of adult attention deficit hyperactivity disorder (ADHD): A meta-analysis. *International Journal of Neuropsychopharmacology*, 12, 1137-1147.
- Millichap JG, Yee MM (2012). The diet factor in Attention-Deficit/Hyperactivity Disorder. *Pediatrics*, 129(2), 1-8
- Peterson K, McDonagh MS, Fu R (2008). Comparative benefits and harms of competing medications for adults with attention-deficit hyperactivity disorder: A systematic review and indirect meta-analysis. *Psychopharmacology*, 197, 1-11.
- Posey DJ, McDougle CJ (2007). Guanfacine and guanfacine extended release: Treatment for ADHD and related disorders. *CNS Drug Reviews*, 13, 465-474.
- Rapport MD, Orban S, Kofler M, Friedman LM (2013). Do programs designed to train working memory, other executive function and attention benefit children with ADHD? A meta-analytic review of cognitive, academic and behavioral outcomes. *Clinical Psychology Review*, 33(8), 1237-1252.
- Raz R, Gabis L (2009). Essential fatty acids and attention-deficit-hyperactivity disorder: A systematic review. *Developmental Medicine & Child Neurology*, 51, 580-592.
- Riccio CA, French CL (2004). The status of empirical support for treatments of attention deficits. *The Clinical Neuropsychologist*. 18, 528-558.
- Richardson A J (2004). Clinical trials of fatty acid treatment in ADHD, dyslexia, dyspraxia, and the autistic spectrum. *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 70, 383-390.
- Sarris J, Kean J, Schweitzer I, Lake J (2011). Complementary medicines (herbal and nutritional products) in the treatment of Attention Deficit Hyperactivity Disorder (ADHD): A systematic review of the evidence. *Complementary Therapies in Medicine*, 19, 216-227.
- Singh NN, Singh AN, Lancioni GE, Singh J, Winton AS, Adkins AD (2010). Mindfulness training for parents and their children with ADHD increases the children's compliance. *Journal of Child and Family Studies*, 19 (2), 157-166

- Someki F, Burns MK (2009). Methods for measuring student response to stimulant medication: A meta-analytic review. *Psychology in the Schools, 46*, 388-396.
- Weber W, Newmark S. (2007). Complementary and alternative medical therapies for attention-deficit/hyperactivity and autism. *Pediatric Clinics of North America, 54*, 983-1006.
- van de Weijer-Bergsma E, Formsma AR, de Bruin EI, Bögels SM (2012). The effectiveness of mindfulness training on behavioral problems and attentional functioning in adolescents with ADHD. *Journal of Child and Family Studies, 12* (5), 775-787.
- van der Oord S, Bögels SM, Peijnenburg D (2012). The effectiveness of mindfulness training for children with ADHD and mindful parenting for their parents. *Journal of Child and Family Studies, 21*(1), 139-147
- van der Oord S, Prins PJ, Oosterlaan J, Emmelkamp PM (2008). Efficacy of methylphenidate, psychosocial treatments and their combination in school-age children with ADHD: A meta-analysis. *Clinical Psychology Review, 28*(5), 783-800.
- Wilens TE, Gault LM, Childress A, Kratochvil CJ, Bensman L, Hall CM, Olson E, Robieson WZ, Garimella TS, Abi-Saab WM, Apostol G, Saltarelli MD (2011). Safety and efficacy of ABT-089 in pediatric attention-deficit/hyperactivity disorder: Results from two randomized placebo-controlled trials. *Journal of the American Academy of Child and Adolescent Psychiatry, 50*(1), 73-84.
- Yildiz O, Sismanlar SG, Memick NC, Karakaya I, Agaoglu B (2011). Atomoxetine and methylphenidate treatment in children with ADHD: The efficacy, tolerability and effects on executive function. *Child Psychiatry & Human Development, 42*, 257-269.

Additional Resources

Books for Parents and Teachers

The ADHD Book of Lists A Practical Guide for Helping Children and Teens With Attention Deficit Disorders by Sandra Rief

Late, Lost, and Unprepared: A Parents' Guide to Helping Children with Executive Functioning Paperback by Joyce Cooper-Kahn and Laurie Dietzel

Organizational Skills Training for Children with ADHD An Empirically Supported Treatment Richard Gallagher, Howard B. Abikoff, and Elana G. Spira

Promoting executive function in the classroom by Lynn Meltzer

Rewards for Kids!: Ready-To-Use Charts and Activities for Positive Parenting by Virginia M. Shiller, Meg F. Schneider and Bonnie Matthews

Smart but Scattered The Revolutionary "Executive Skills" Approach to Helping Kids Reach Their Potential by Peg Dawson and Richard Guare

Smart but Scattered Teens: The "Executive Skills" Program for Helping Teens Reach Their Potential by Richard Guare, Peg Dawson, Colin Guare

Taking Charge of ADHD: The Complete, Authoritative Guide for Parents, by Russell Barkley

Books for Children

Annie's plan: Taking Charge of Schoolwork and Homework by Jeanne Kraus

Cory Stories: A Kids Book About Living with ADHD by Jeanne Kraus

Learning to Slow Down and Pay Attention by Kathleen G. Nadeau, Ph.D.

Putting on the Brakes: Understanding and Taking Control of Your Add or ADHD by Patricia O. Quinn and Judith M. Stern

The Adventures of Everyday Geniuses, by Barbara Esham – series of books for young children to explain learning and impulse control difficulties.

Websites for Parents and Teachers

www.chadd.org

http://www.aacap.org/aacap/families_and_youth/resource_centers/ADHD_Resource_Center/Home.aspx

www.understood.org

<http://www.nimh.nih.gov/health/topics/attention-deficit-hyperactivity-disorder-adhd/index.shtml>

<http://www.idonline.org/adhdbasics>

The same is true of hyperactivity. Young children are naturally energetic – they often are still full of energy long after they've worn their parents out. In addition, some children just naturally have a higher activity level than others do. Children should never be classified as having ADHD just because they're different from their friends or siblings. Children who have problems in school but get along well at home or with friends are likely struggling with something other than ADHD. The same is true of children who are hyperactive or inattentive at home, but whose schoolwork and fr...
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