


What Works for ADHD: Evidence for Traditional & Alternative Treatments

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What's all the hype about ADHD?

- ADHD has become one of the most controversial diagnoses of the past decade. Ironically, ADHD has a high rate of both being “underdiagnosed” and “overdiagnosed”:
 - Some who legitimately have ADHD are not correctly diagnosed until late in life (if ever)
 - Others are mislabeled as having ADHD when, in fact, those symptoms are better explained by anxiety, depression, bipolar depression, inconsistent parenting, behavioral concerns or an undiagnosed medical condition
- ADHD is sometimes called a “designer diagnosis” (over-diagnosed), yet robust studies cont. showing prevalence rates of 4-7%-- much higher than most other mental disorders. That's at least 1-2 children in every classroom of 30. Fully half of these individuals are not currently treated.

Why ADHD Matters

- ADHD impacts learning, productivity, and relationships with spouses, parents, teachers, siblings & friends. 75% have a high rate of interpersonal problems
(e.g. chronic frustration and chronically feeling misunderstood)
- Many adults are still not diagnosed-- perhaps half.
- Most individuals don't “outgrow” the symptoms. Rather, hyperactivity becomes internal restlessness, adults learn to compensate and hide symptoms.

A quality ADHD evaluation includes:

- Thorough interviewing (2-3 hours)
- Observations and validated scale ratings both from the affected person and significant others, and teachers whenever possible
- Family psychological history
- Review of all relevant school and medical records
- Ruling out alternative explanations: anxiety, depression, bipolar, PTSD, sleep disturbance or apnea, parenting

% free of ADHD and ODD symptoms

	<u>14 Months</u>	<u>24 Months</u>
Combined Treatment	68%	48%
Intensive Medication	56%	37%
Intensive Behavioral	33%	32%
Community Care	25%	28%

MTA Cooperative Group (2004). NIMH Multimodal Treatment Study of ADHD: 24-Month Outcomes of Treatment Strategies for ADHD. *Pediatrics*, 113, pp. 754-760.

Head-to-Head Efficacy Studies of Strattera vs. Stimulant Medication

	<u>Strattera Efficacy</u>	<u>Stimulant Efficacy (Concerta)</u>
Meta-Analysis of 15 studies (11 controlled) ¹		57% mean
Brown Study ²	56%	71% (27% more effective)

¹ Wilens, T.E., Spencer, T.J., & Biederman, J. (2002). A Review of the pharmacotherapy of adults with Attention Deficit Hyperactivity Disorder. *Journal of Attention Disorders*, 5, pp. 189-202.

² Brown, T. (2004) National Comorbidity Study. Also presented (2004). *Conceptualizing & Diagnosing AD/HD in Adults. Update on Adult AD/HD: A One Day CME Conference*. St. Louis, MO.

Considerations for Choosing a Medication

- Strattera may have significantly more side effects, including vomiting in all ages and emergent urinary retention in middle to older adults. It does provide full-day coverage and may affect comorbid anxiety/depression differently.
- Strattera and Provigil typically will not be effective until 8-12 weeks after reaching the therapeutic dose, whereas stimulant efficacy will be largely evident in 1-3 days.
- A major goal for most ADHD families may be immediate work or school performance.

Addiction Risks & Myths: Conclusions

- Physicians, therapists, parents and school staff should emphasize what is expected from a student who is prescribed a stimulant. They should predict for the child that others may approach them about misusing their medication (23% were in one study), and discuss or role play how they will respond. (peer skit demo?)
- By late teens, abuse rates of alcohol or another drug with untreated ADHD is at least 50%. In those treated early, the rate declines to match that of the general population (appx. 9%).

Behavioral Treatment: Organization Training

	<u>Baseline</u>	<u>8 weeks tx</u>	<u>16 week f/u</u>
Binders	38%	98%	72%
Book bags	69%	92%	81%
Lockers	47%	95%	83%
Homework recorded	30%	72%	65%
Grades		not yet improved	improved

Langberg et. al. (2008). Efficacy of an organizational skills intervention to improve the academic functioning of students with Attention Deficit/Hyperactivity Disorder. School Psychology Quarterly, 23, 407-417.

Behavioral Treatment: Organization Training

Additionally, by parents' report:

- Homework inattention/avoidance decreased moderately vs. wait-list controls
- Homework productivity and homework rule adherence improved greatly

Langberg et. al. (2008). Efficacy of an organizational skills intervention to improve the academic functioning of students with Attention Deficit/Hyperactivity Disorder. School Psychology Quarterly, 23, 407-417.

Exercise!

- By parents' report sports participation was found to reduce anxiety and depression symptoms in 6-14 year old children with ADHD even after controlling for social functioning and general school functioning $r \approx -.50$ (no difference for those only with a LD)
- Several factors could be the "magic ingredient": the exercise itself, having a structured, supervised social activity or just having a predictable daily/weekly routine

Klika, Weden, & Culotta (2009). Sports participation and anxiety in children with ADHD. Journal of Attention Disorders, 12, 506

Exercise!

- Exercise increases dopamine and norepinephrine- two neurotransmitters crucial to brain functioning
- Over time, exercise causes growth in the neurotransmitter production system and brain cells' receptors

Ratney, John J. & Hagerman, Eric. (2008). Spark: The Revolutionary New Science of Exercise and the Brain. Little, Brown & Co.

Exercise!

- Exercise doesn't have to be 30-60 minutes of intense aerobic activity to have an effect
- Significant benefits in concentration, restlessness, etc. may be seen after elevating the heart rate for as little as 10-15 minutes
- Consider scattering such mini-breaks strategically throughout the day: before homework, before school in the morning, or even on a break during the school day itself to go up & down the stairs a few times

Ratney, John J. & Hagerman, Eric. (2008). Spark: The Revolutionary New Science of Exercise and the Brain. Little, Brown & Co.

Meditation

- 24 adults & 8 teens diagnosed with ADHD or “probable” ADHD (1 criteria short) took 8 weeks of mindfulness meditation classes with additional frequent practice at home. A majority were already taking medication.
- 78% self-reported a reduction in ADHD symptoms, with 30% reporting at least a 30% symptom reduction (beyond meds effect). Adults only self-reported significant reductions in depression and anxiety symptoms.
- On neurocognitive test performance, significant improvements were found (off meds) in attentional conflict and neuro tests (Stroop color-word, Trails A and B), but not for working memory.

Zylowska, et al. (2008). Mindfulness meditation training in adults and adolescents with ADHD. Journal of Attention Disorders, 11, 737-746.

Chinese Herbal Medicine

- 120 Israeli 6-12 year-olds newly diagnosed with ADHD, with two-thirds randomly given “Nurture & Clarity” herbal supplement. Control placebo tested as indistinguishable by taste and appearance.
- Individuals' own TOVA scores improved after 4 months treatment with herbs, but not with placebo. Treatment group average score also improved substantially compared to placebo group. 50% dropout on placebo vs. 10% on herbs may suggest greater parent dissatisfaction on placebo.¹

¹ (Stats that corrected for the differing dropout rate showed similar results).

Katz, Kol-Deqani, & Kav-Venaki (2010). A compound herbal preparation (CHP) in the treatment of ADHD: A randomized controlled trial. Journal of Attention Disorders. Published online on March 12, 2010

Chinese Herbal Study Limitations

- **No behavioral observation measures by self, parents or teachers.**
- **No academic measures**
- **Worse yet, are computerized ADHD assessments like the TOVA even valid?**

Edwards, et al (2007). Estimates of the validity and utility of the Conners' Continuous Performance Test in the assessment of inattentive and/or hyperactive-impulsive behaviors in children. Journal of Abnormal Child Psychology, 35, 393-404.

Chinese Herbal Study Limitations

- 104 6-12 year old children referred for evaluation of attention and behavior problems.
- After controlling for children's age and IQ score - which are both related to CCPT performance - there were **NO** significant correlations between the CCPT Overall Index or the CCPT Omissions score and parent and teacher ratings of inattentive or hyperactive symptoms.
- The CCPT Commission score was slightly correlated in the **opposite** direction of teacher ratings of both inattentive and hyperactive symptoms.

Edwards, et al (2007).

Neurofeedback Treatment

- German Study: 102 children age 8-12, 36 sessions neurofeedback or computerized learning software that requires sustained attention
- Blind parent and teacher ratings of inattentive and hyperactive-impulsive symptoms appx. 0.5 SD improved
- Parents (only) report superior neurofeedback improvement in oppositional and aggressive behaviors vs. controls

Gevenleben, et al., (2009). Is neurofeedback an efficacious treatment for ADHD? A randomized controlled clinical trial. Journal of Child Psychology and Psychiatry.

Neurofeedback Study Limitations

- EEG not taken during treatment and individual goals adjusted accordingly (as is the norm in real treatment)
- No academic outcome measures
- **Relatively Poor Efficacy:** 51% (vs. 26% controls) had at least a 25% improvement in ADHD core symptoms. After 6 months, efficacy was 15-30% for neurofeedback vs. 10-15% with placebo.
- **This non-response rate is greater than for other treatment options that are far less costly and time-intensive.**

Fatty Acids Studies (HUFA, Omega 3, 6)

- 29 8-12 y.o. with developmental dyslexia and high parent Connor's scores (but no formal ADHD dx) completed a randomized, double-blind, placebo-controlled study of Omega 3 & Omega 6 supplement treatment for 12 weeks.
- RESULTS: Inattention & global ADHD symptoms (originally similar) were now significantly lower in the treatment group than the placebo group. Average scores for the treated children now fell towards the upper end of what would be considered "normal." Significant reductions were found for psychosomatic problems, cognitive problems, anxiety, attention problems, hyperactivity, and a global behavioral problem index. For several of these scales, the treatment effect sizes exceeded .50, indicating a reasonably robust effect. No significant reductions found in the placebo group.

Richardson, A., & Puri, B.K. (2002). Progress in Neuro-Psychopharmacology & Biological Psychiatry, 26, 233-239

Fatty Acids Studies (HUFA, Omega 3, 6)

- 117 5-12 year old children, 1/3 girls with Developmental Coordination Disorder (DCD), and many with elevated ADHD Sx, but no formal dx. Randomized, controlled placebo trial tx for 3 months with 80% fish oil + 20% evening primrose oil (=omega 3, omega 6, Vitamin E).
- RESULTS: Minimal effect on DCD, but the supplement group had substantially better gains in reading, spelling and reduced Connor's scores. 7 of 16 who were originally elevated on Connors now in normal range (43%) vs. 1 of 16 in controls. Similar results for placebo group once switched to active treatment.

Richardson, A.J., et al. 2005. The Oxford-Durham Study: A randomized, controlled trial of dietary supplementation with fatty acids in children with developmental coordination disorder, Pediatrics, 115, 1360-1366

Fatty Acids Studies (HUFA, Omega 3, 6)

- 92 Swedish children age 7-12 off meds given Omega 3 vs. placebo.
- RESULTS:
- After 15 weeks, parents report no differences on Connor's short form.
- Teachers only report a statistically significant, but very small difference in inattention.
- Within highly ODD children, 50% vs. 9% decline in teacher-rated inattention and opposition, but not hyperactivity

Gustafsson et al. (2010). EPA supplementation improves teacher-rated behavior and oppositional symptoms in children with ADHD. Acta Paediatrica, 99, 1540-1549

Contrary Fatty Acid Evidence ☹️

- 92 Swedish 7-12 year olds dx with ADHD, none taking stimulant medication, randomly given 15 weeks PlusEPA fatty acid vs. placebo
- No differences on sum of parent and teacher short form Connors
- No parent subscale differences, and the only teacher subscale difference (inattention) was so small as to be clinically insignificant.
- Only positive finding was post-hoc: within those with high ODD behavior, teachers rated inattention and opposition substantially improved (50% vs. 9% controls). Could be a "fishing expedition"

Gustafsson et al. (2010). EPA supplementation improves teacher-rated behavior and oppositional symptoms in children with ADHD. Acta Paediatrica, 99, 1540-1549

Budding Evidence for Organic Diet?

- Early studies focus on those with especially high exposure to possible toxins, organophosphates in this case
- Retrospective data analysis of 148 children age 8-15 meeting ADHD criteria or medically treated for ADHD vs. the overall sample.
- "Each 10-fold increase in urinary concentration of organophosphate metabolites was associated with a 55% to 72% increase in the odds of ADHD" -Bouchard
- For the most common metabolite, above-median levels corresponded with nearly double the rate of ADHD

Bouchard, Maryse, et. al. (2010). Pediatrics online, May 17, 2010.

Working Memory Training

- Cogmed training of 20+ sessions over 5 weeks. 25 8-11 year-olds, almost all boys. Researcher discloses financial sponsorship ties with Cogmed.
- Measured at 4 times: off meds, on meds, on meds after training, and at 6 month follow-up. Both verbal and visuo-spatial working memory and short-term memory were assessed on a computer program.

Rabbitts, D. (2009). Unpublished manuscript or in press. See helpforadd.com 2009 newsletter

Working Memory Training

- Medication alone aided only visuo-spatial working memory. No ST memory effects. With both tx, all 4 areas of working memory and short term memory improved to the normal range, on average. At 6 months, gains were maintained in all but visuo-spatial STM.
- Note: efficacy of meds or WM training were not assessed for attention, hyperactivity, behavior problems, and academic performance: the authors do not assert that WM training is overall "superior" to meds or can replace meds.

Other "Alternative" Treatments

- (e.g. yoga, balance exercises, nature/green exposure)
- Most lack well controlled studies or studies with an adequate number of participants
- However, such treatments may:
- Be highly enjoyed and provide encouragement, thereby improving treatment adherence
 - Reduce concurrent anxiety & depression
 - Be viewed as efficacious beyond medication by the patient
 - Lack any adverse effects