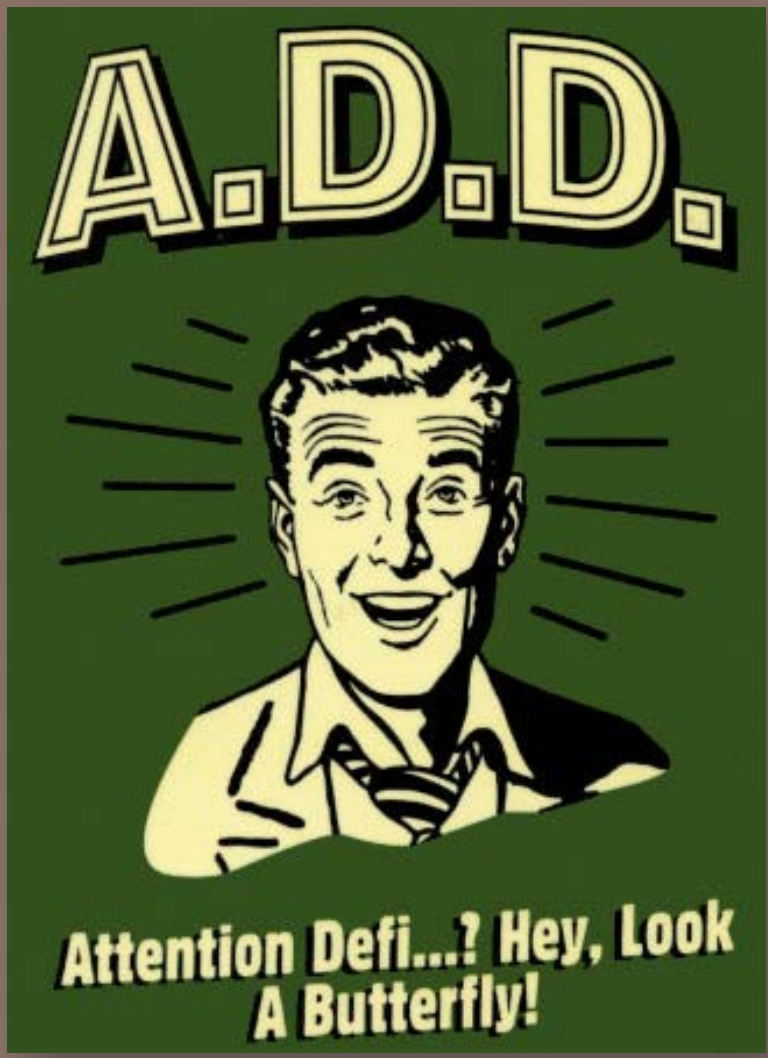


ADHD & MIND-BODY INTERVENTIONS

Allen Tran OCTH 6540

ADHD

- Attention deficit-hyperactivity disorder (ADHD/ADD)
  - A psychiatric and neurobehavioral disorder
  - Characterized by
    - difficulty staying focused and paying attention
    - difficulty controlling behavior
    - hyperactivity (over-activity)
- One of the most common childhood disorders and can continue through adolescence and adulthood.

ADHD Causes

- No specific cause of ADHD is known
- Twin studies have shown a large genetic component (highly heritable)
  - Combination of various genes (many affect dopamine transporters)
- Smaller role from environmental factors
  - Exposure to cigarette smoke during pregnancy
  - Childhood exposure to lead
  - Low birth weight, premature birth, childhood TBI

ADHD Symptoms

- Everyone has occasional difficulty sitting still, paying attention, or controlling impulsive behavior.
- For some children and adults, however, the problem is so pervasive and persistent that it interferes with their daily lives at home, at school, at work, and in social settings.
- Currently affecting 5-8% of school age children with symptoms persisting into adulthood in as many as 60% of cases (i.e. approximately 4% of adults)

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders: DSM IV (4th ed., text, revision)

ADHD Symptoms

- Three subgroups of symptoms:

1. Inattention
2. Hyperactivity-Impulsivity
3. Combination of 1 & 2

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders: DSM IV (4th ed., text, revision)

ADHD Symptoms- Inattentive Type

1. Be easily distracted, miss details, forget things, and frequently switch from one activity to another
2. Have difficulty maintaining focus on one task
3. Become bored with a task after only a few minutes, unless doing something enjoyable
4. Have difficulty focusing attention on organizing and completing a task or learning something new or trouble completing or turning in homework assignments, often losing things (e.g., pencils, toys, assignments) needed to complete tasks or activities
5. Not seem to listen when spoken to
6. Daydream, become easily confused, and move slowly
7. Have difficulty processing information as quickly and accurately as others
8. Struggle to follow instructions.

APA DSM IV

ADHD Symptoms- Hyperactive-Impulsive Type

1. Fidget and squirm in their seats
2. Talk nonstop
3. Dash around, touching or playing with anything and everything in sight
4. Have trouble sitting still during dinner, school, and story time
5. Be constantly in motion
6. Have difficulty doing quiet tasks or activities

- Other impulsive symptoms:
  - Be very impatient
  - Blurt out inappropriate comments, show their emotions without restraint, and act without regard for consequences
  - Have difficulty waiting for things they want or waiting their turns in games

APA DSM IV

ADHD Exhibited Problems

- Untreated, ADHD can have profound consequences:
  - School failure, depression, conduct disorder, failed relationships, and substance abuse.
  - Hyperactivity can diminish in the teen years transitioning from childhood
    - However many symptoms can continue into adulthood
- Also ADHD can be mistaken for other problems
  - Inattention = quiet personality
  - Hyperactive/Impulsive = emotional/disciplinary problems

Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD)

Treatment for ADHD

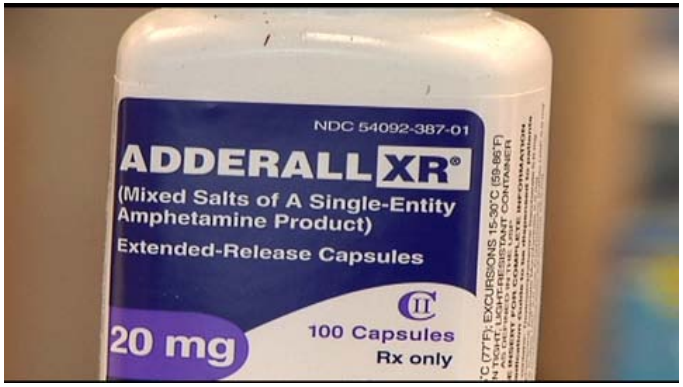
-Medication

-Psychotherapy

-Alternative Interventions

Treatment- Medication

- The most common type of medication used for treating ADHD are *stimulants*
  - Adderall (amphetamine)
  - Ritalin (methylphenidate)
  - Concerta (methylphenidate (long acting))
  - Focalin (dexmethylphenidate)



Treatment- Medication

- ADHD medications reduce hyperactivity and impulsivity and improve their ability to focus, work, and learn. Medication also may improve physical coordination.

Insight: Shortage of ADHD drug Adderall seen persisting

By Toni Clarke

BOSTON | Sun Jan 1, 2012 6:06pm EST

(Reuters) - A shortage of Adderall, which is used to treat attention deficit hyperactivity disorder, shows little sign of easing as manufacturers struggle to get enough active ingredient to make the drug and demand climbs.

Adderall, a stimulant, is a controlled substance, meaning it is addictive and has the potential to be abused. The Drug Enforcement Administration

Medication Side Effects?

- Most common side effects
  - Decreased appetite
  - Sleep problems
  - Anxiety
  - Irritability
- Other side effects
  - Personality change: appearing “flat” or without emotion
  - Tics

Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD)

Medication Side Effects?

- Rare but serious side effects
  - ADHD patients w/ existing heart conditions
    - Higher risk of strokes, heart attacks, and/or sudden death
  - Psychiatric Problems (1 in 1,000)
    - Hearing voices
    - Hallucinations
    - Being suspicious for no reason
    - Manic condition
  - Suicidal thoughts (found in *Strattera* medication only)

Children and Adults with Attention-Deficit/Hyperactivity Disorder (CHADD)

Treatment for ADHD

-Medication

-Psychotherapy

-Alternative Interventions

Treatment- Psychosocial

Contents lists available at ScienceDirect

Clinical Psychology Review

A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder

Gregory A. Fabiano [a,*], William E. Pelham Jr. [a], Erika K. Coles [b], Elizabeth M. Gnagy [a], Andrea Chronis-Tuscano [c], Briannon C. O'Connor [a]

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ABSTRACT

There is currently controversy regarding the need for and the effectiveness of behavior modification for children with attention-deficit hyperactivity disorder (ADHD) despite years of study and multiple investigations reporting beneficial effects of the intervention. A meta-analysis was conducted by identifying relevant behavioral treatment studies in the literature. One-hundred seventy-four studies of behavioral treatment were identified from 114 individual papers that were appropriate for the meta-analysis. Effect sizes varied by study design but not generally by other study characteristics, such as the demographic variables of the participants in the studies. Overall unweighted effect sizes in between group studies (.83), pre-post studies (.70), within group studies (2.64), and single subject studies (3.78) indicated that behavioral treatments are highly effective. Based on these results, there is strong and consistent evidence that behavioral treatments are effective for treating ADHD.

Treatment- Psychosocial

- The evidence is strong for the effectiveness of behavioral treatments in ADHD.
- Recommended first line in those who have mild symptoms and in preschool-aged children
- Therapies include:
  - Psychoeducational input (within school)
  - Cognitive Behavior Therapy

Treatment- Psychosocial

- Cognitive Behavior Therapy
  - Helps patients understand the thoughts and feelings that influence behaviors
  - May involve practical assistance:
    - Helping organizing tasks or completing schoolwork
    - Working through emotionally difficult events
    - Teaching how to monitor his or her own behavior
    - Controlling anger or thinking before acting
    - Clear rules and structured routines

Treatment for ADHD

-Medication

-Psychotherapy

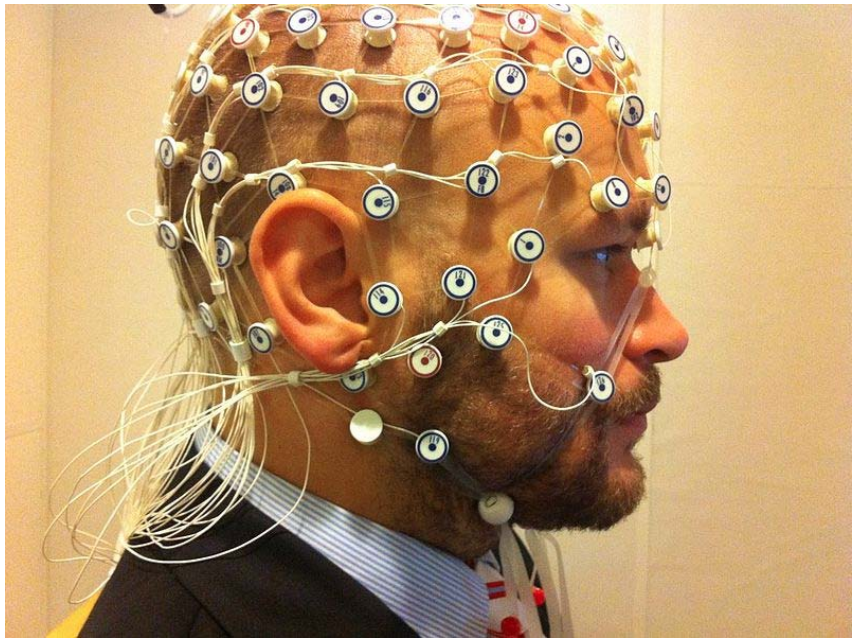
-Alternative Interventions

Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- Nature exposure
- Light Therapy
- Massage Therapy
- Meditation

Neurofeedback (EEG Biofeedback)

- **Biofeedback:** Using instruments to provide physiological information
- **Neurofeedback:** uses electroencephalography (EEG) to provide a signal that can be used by a person to receive feedback about brain activity.



Neurofeedback (EEG Biofeedback)

- EEG is used to measure and then feedback information about physiological processes to the patient who is given instructions about modulating one of the physiological parameters in a desired direction

Client being treated with EEG biofeedback. Display shows alpha amplitude from left and right frontal lobe as well as the moment-to-moment balance between two sites.

Neurofeedback (EEG Biofeedback)

- Auditory and/or visual signals proportional to the relevant EEG measure are presented to the subject.
- The goal in children with ADHD consists of decreasing theta wave activity and increasing sensorimotor rhythm or beta wave activity
  - A tone may come on when the theta amplitude drops below a preset threshold, while a second tone may come on when the sensorimotor rhythm or beta amplitudes rise above a given value
  - Cognitive tasks are used along with auditory neurofeedback to promote generalization

Applied Psychophysiology and Biofeedback, Vol. 30, No. 2, June 2005 (© 2005)
DOI: 10.1007/s10484-005-4305-x

Literature Review

Electroencephalographic Biofeedback in the Treatment of Attention-Deficit/Hyperactivity Disorder

Vincent J. Monastra,[1,2,7] Steven Lynn,[2] Michael Linden,[3] Joel F. Lubar,[4] John Gruzelier,[5] and Theodore J. LaVaque[6]

Historically, pharmacological treatments for attention-deficit/hyperactivity disorder (ADHD) have been considered to be the only type of interventions effective for reducing the core symptoms of this condition. However, during the past three decades, a series of case and controlled group studies examining the effects of EEG biofeedback have reported improved attention and behavioral control, increased cortical activation on quantitative electroencephalographic examination, and gains on tests of intelligence and academic achievement in response to this type of treatment. This review paper critically examines the empirical evidence, applying the efficacy guidelines jointly established by the Association for Applied Psychophysiology and Biofeedback (AAPB) and the International Society for Neuronal Regulation (ISNR). On the basis of these scientific principles, EEG biofeedback was determined to be "probably efficacious" for the treatment of ADHD. Although significant clinical improvement was reported in approximately 75% of the patients in each of the published research studies, additional randomized, controlled group studies are needed in order to provide a better estimate of the percentage of patients with ADHD who will demonstrate such gains in clinical practice.

KEY WORDS: attention-deficit/hyperactivity disorder; ADHD; EEG biofeedback; neurotherapy; efficacy; review.

INTRODUCTION

Attention-Deficit/Hyperactivity Disorder is an enduring mental disorder, characterized by persistent symptoms of inattention alone or in combination with hyperactivity and

TABLE 1: LEVELS OF EFFICACY (AMERICAN PSYCHOLOGICAL ASSOCIATION)		
Level 1	**Not Empirically Supported**	supported only through anecdotal evidence or non-peer reviewed case-studies;
Level 2	**Possibly Efficacious**	shown to have a significant impact in *at least one* study, but the study lacked a randomized assignment between controls;
Level 3	**Probably Efficacious**	shown to produce positive effects in *more than one* clinical, observational wait list or within-subject or between-subject study;
Level 4	**Efficacious**	shown to be more effective than a no-treatment or placebo control group; the study must contain valid and clearly specified outcome measures, and it must be replicable by at least two independent researchers demonstrating the same degree of efficacy;
Level 5	**Efficacious and Specific**	shown to be statistically superior to credible placebo therapies or to actual treatments, and it must be shown as such in two or more independent studies.

Applied Neuropsychology
2005, Vol. 12, No. 2, 64–76

Clinical Utility of EEG in Attention Deficit Hyperactivity Disorder

Sandra K. Loo and Russell A. Barkley

"there is much work to be done to demonstrate that EEG biofeedback provides that alternative and that actually changing the EEG is the mechanism of change in ADHD symptoms (as opposed to just more time with a therapist)"

lying neurophysiology of ADHD, but also clinically in the assessment, diagnosis, and treatment of ADHD. This review will first provide a brief overview of EEG and then present some of the research findings of EEG correlates in ADHD. Then, the utility of EEG in making an ADHD diagnosis and predicting stimulant response will be examined. Finally, and more controversially, we will review the results of the most recent studies on EEG biofeedback (neurofeedback) as a treatment for ADHD and the issues that remain to be addressed in the research examining the efficacy this therapeutic approach.

Key words: EEG biofeedback, diagnosis, treatment, neurotheraphy

Electroencephalography (EEG) measures reflect the correspondence between intracranial electrical currents and the resulting voltages on the scalp reflecting certain facets of brain electrical function and processing, such as how electrically active various brain regions are and how responsive they may be to stimuli or during cogni-

ral resolution (EEG can measure changes in the brain to the millisecond). The spatial resolution (i.e., where the EEG signal is coming from), however, is sometimes difficult to determine because electrical currents recorded from the cortex do not always bear a direct relation to any specific underlying brain structure and are

Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- **Interactive Metronome Training**
- Nature exposure
- Light Therapy
- Massage Therapy
- Meditation

Interactive Metronome Training

- Relatively new intervention
- Computerized version of a simple metronome – i.e. what musicians use to "keep the beat"
- Computer makes a rhythmic beat that individuals attempt to match with hand or foot tapping.

Interactive Metronome Training

- Computer makes a rhythmic beat that individuals attempt to match with hand or foot tapping.
- Auditory feedback is provided, which indicates how well the individual is matching the beat.

Interactive Metronome Training

- Theory
  - Motor planning and timing deficits are common in patients with ADHD
  - Thought to be related to problems with *behavioral inhibition* that some experts believe are critical to ADHD.
- To date, one single study has examined this intervention for ADHD

Effect of Interactive Metronome® Training on Children With ADHD

Robert J. Shaffer, Lee E. Jacokes, James F. Cassily, Stanley I. Greenspan, Robert F. Tuchman, Paul J. Stemmer, Jr.

Key Words: attention deficit disorder with hyperactivity • coordination training • motor control

Objective. *The purpose of this study was to determine the effects of a specific intervention, the Interactive Metronome®, on selected aspects of motor and cognitive skills in a group of children with attention deficit hyperactivity disorder (ADHD).*

Method. *The study included 56 boys who were 6 years to 12 years of age and diagnosed before they entered the study as having ADHD. The participants were pretested and randomly assigned to one of three matched groups. A group of 19 participants receiving 15 hr of Interactive Metronome training exercises were compared with a group receiving no intervention and a group receiving training on selected computer video games.*

Results. *A significant pattern of improvement across 53 of 58 variables favoring the Interactive Metronome treatment was found. Additionally, several significant differences were found among the treatment groups and between pretreatment and posttreatment factors on performance in areas of attention, motor control, language processing, reading, and parental reports of improvements in regulation of aggressive behavior.*

Conclusion. *The Interactive Metronome training appears to facilitate a number of capacities, including attention, motor control, and selected academic skills, in boys with ADHD.*

Shaffer, R. J., Jacokes, L. E., Cassily, J. F., Greenspan, S. I., Tuchman, R. F., & Stemmer, P. J., Jr. (2001). Effect of Interactive Metronome® training on children with ADHD. *American Journal of Occupational Therapy, 55,* 155–162.

Robert J. Shaffer, PhD, is Adjunct Assistant Professor of Pediatrics and Human Development, College of Human

The ability to attend, which begins early in life, is a vital part of the capacity to learn, concentrate, think, interact with others, and master basic acade-

Interactive Metronome Study

- 56 boys with ADHD
  - 19 on IM Training
  - 19 on selected non-violent video games
  - 18 control subjects

- Boys with ADHD who received the Interactive Metronome intervention improved significantly more in areas of:
  - attention
  - motor control
  - language processing
  - reading
  - ability to regulate aggression

  than boys receiving either the video game treatment or no treatment.

Shaffer, R.J. et al (2001). Effect of interactive metronome training on children with AD/HD. American Journal of Occupational Therapy, *55*, 155-162.

Interactive Metronome Training

- With only one supporting study, needs more research
- Shows promise as an effective intervention

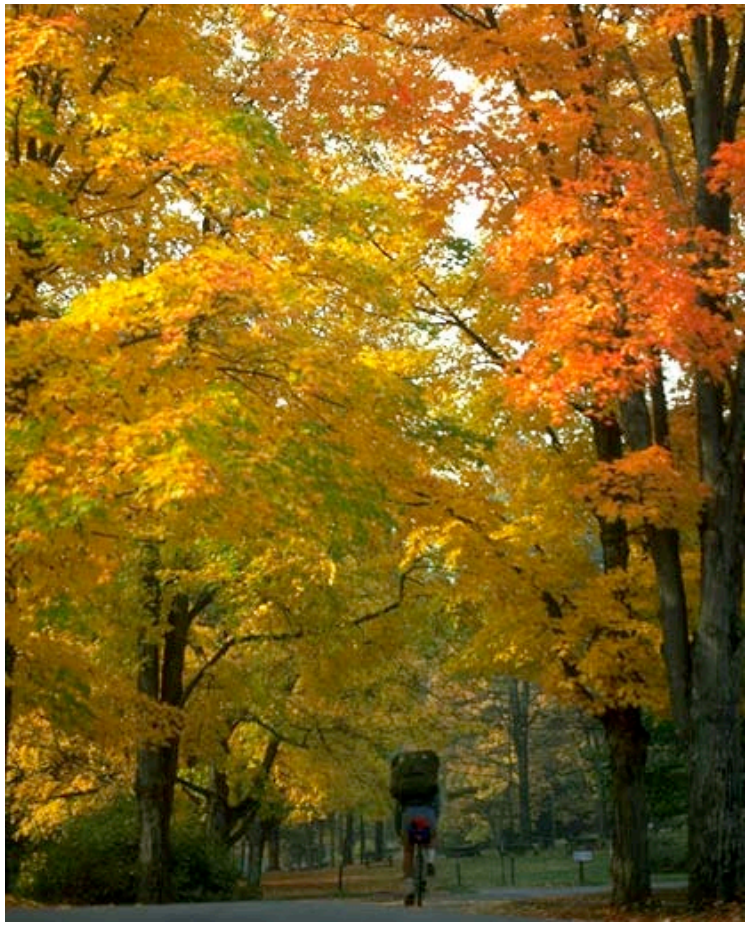
Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- **Nature exposure**
- Light Therapy
- Massage Therapy
- Meditation

Nature Exposure

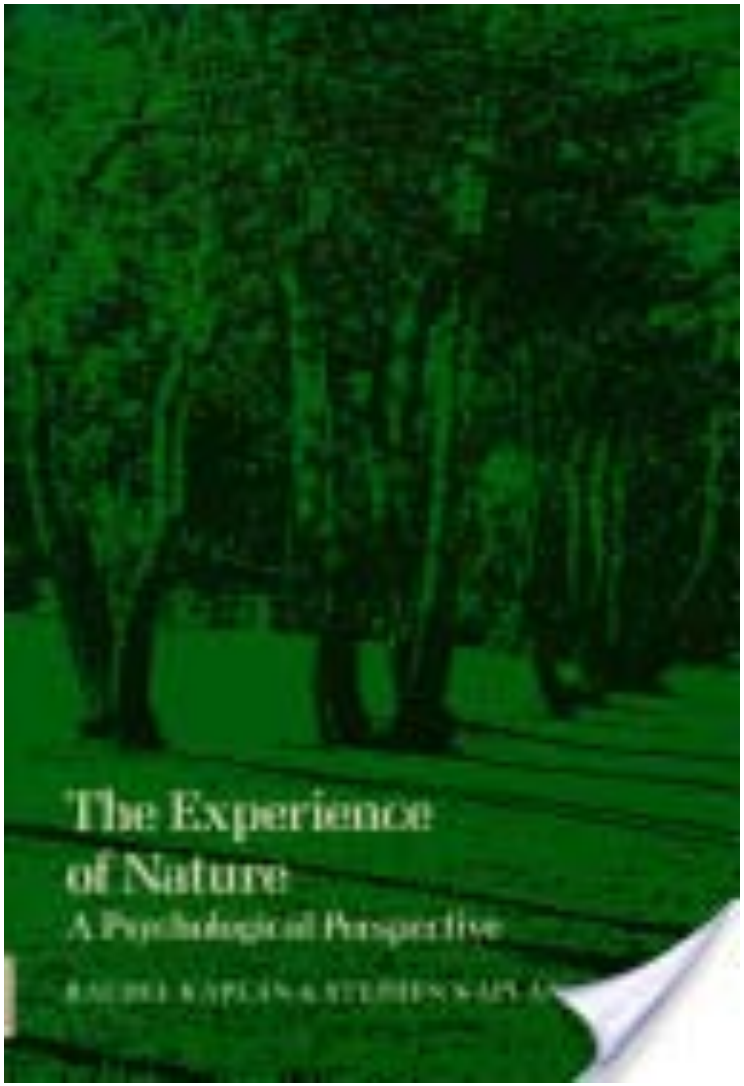
- How does Nature therapy work?

Contact with nature restores attention in the general population.



One explanation comes from *Attention Restoration Theory*

- Stephen Kaplan, PhD, U of Mich.
- According to Attention Restoration Theory:
  - Nature is engaging, so attracts our attention effortlessly.
  - This allows *deliberate attention* to rest.
  - Restored *deliberate attention* is then available when needed.



A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder: Evidence From a National Study

Frances E. Kuo, PhD, and Andrea Faber Taylor, PhD

Objectives. We examined the impact of relatively "green" or natural settings on attention-deficit/hyperactivity disorder (ADHD) symptoms across diverse subpopulations of children.

Methods. Parents nationwide rated the aftereffects of 49 common after-school and weekend activities on children's symptoms. Aftereffects were compared for activities conducted in green outdoor settings versus those conducted in both built outdoor and indoor settings.

Results. In this national, nonprobability sample, green outdoor activities reduced symptoms significantly more than did activities conducted in other settings, even when activities were matched across settings. Findings were consistent across age, gender, and income groups; community types; geographic regions; and diagnoses.

Conclusions. Green outdoor settings appear to reduce ADHD symptoms in children across a wide range of individual, residential, and case characteristics. (*Am J Public Health.* 2004;94:1580–1586)

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood.[1] It manifests as an unusually high and chronic level of inattention, impulsivity/hyperactivity, or both, and it may affect more than 2 million school-aged children.[2] Recent statistics indicate that, among children aged 6 to 11 years, the incidence of ADHD is approximately 7%.[3] ADHD exacts a substantial toll on afflicted individuals and often persists into adulthood. According to the Centers for Disease Control and Prevention: "if untreated, a person with ADHD will struggle with impairments in crucial areas of life, including relationships with peers and family members, and performance at school or work."[2(p1)]

Unfortunately, current ADHD treatments fall far short of ideal, offering only limited relief from symptoms and often involving serious side effects.[4–7] The Centers for Disease Control and Prevention has labeled ADHD "a serious public health problem,"[8] citing "the large estimated prevalence of the disorder; the significant impairment in the areas of school performance and socialization; the chronicity of the disorder; the limited effa-

pensive, nonstigmatizing, and free of side effects.

NATURE AND ADHD "SYMPTOMS" IN NON-ADHD POPULATIONS

Substantial research conducted among non-ADHD populations has shown that "symptoms" of ADHD—inattention and impulsivity—are reduced after exposure to natural views and settings. Environmental psychologist

mechanism has an opportunity to rest, fatigue dissipates and behavior and performance improve. According to Kaplan, natural environments assist in recovery from attention fatigue, in part because they engage the mind effortlessly,[12–15] providing a respite from having to deliberately direct attention.[9,10] Thus, the sense of rejuvenation commonly experienced after spending time in natural settings may in part reflect a systematic restorative effect on directed attention

APPLIED PSYCHOLOGY: Health and Well-Being

APPLIED PSYCHOLOGY: HEALTH AND WELL-BEING, 2011, *3* (3), 281–303
doi:10.1111/j.1758-0854.2011.01052.x

Results: Findings suggest that everyday play settings make a difference in overall symptom severity in children with ADHD. Specifically, children with ADHD who play regularly in green play settings have milder symptoms than children who play in built outdoor and indoor settings.
This is true for all income groups and for both boys and girls.

ongoing reductions in ADHD symptoms. **Methods:** Data on 421 children's ADHD symptoms and usual play settings were collected using a national Internet-based survey of parents. **Results:** Findings suggest that everyday play settings make a difference in overall symptom severity in children with ADHD. Specifically, children with ADHD who play regularly in green play settings have milder symptoms than children who play in built outdoor and indoor settings. This is true for all income groups and for both boys and girls. Interestingly, for hyperactive children, the apparent advantage of green spaces is true only for relatively open green settings. **Conclusions:** These and previous findings collectively suggest that it is time for randomised clinical trials testing the impacts of regular exposure to greenspace as a treatment for ADHD.

Journal of Attention Disorders OnlineFirst, published on August 25, 2008 as doi:10.1177/1087054708323000

Journal of Attention Disorders
Volume XX Number X
Month XXXX xx-xx

10.1177/1087054708323000
http://jad.sagepub.com
hosted at
http://online.sagepub.com

Children With Attention Deficits Concentrate

Conclusion: Twenty minutes in a park setting was sufficient to elevate attention performance relative to the same amount of time in other settings. These findings indicate that environments can enhance attention not only in the general population but also in ADHD populations. "Doses of nature" might serve as a safe, inexpensive, widely accessible new tool in the tool kit for managing ADHD symptoms.

park setting was sufficient to elevate attention performance relative to the same amount of time in other settings. These findings indicate that environments can enhance attention not only in the general population but also in ADHD populations. "Doses of nature" might serve as a safe, inexpensive, widely accessible new tool in the tool kit for managing ADHD symptoms. (*J. of Att. Dis. 2008; XX(X) 1-XX)*

Keywords: *children; attention; physical environment; symptom management*

A central puzzle about ADHD is that although the deficits are chronic and generally severe, they are not consistent (Rosenthal, Riccio, Gsanger, & Jarratt, 2006; Shue & Douglas, 1992). In children with attention deficits, while performance on tasks involving attention

infancy. A more precise characterization of when and why the deficits abate could yield insights into ADHD's etiology and treatment; it might also help address the challenge these short-term fluctuations pose for accurate diagnosis (DuPaul & Barkley, 1992).

Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- Nature exposure
- **Light Therapy**
- Massage Therapy
- Meditation

Light Therapy

- Purposeful exposure to light for the treatment of disorders
  - Sleep Disorders
  - Seasonal Affective Disorder
  - ADHD?
    - Rationale: delayed sleep/activity rhythm and/or seasonal mood symptoms may contribute significantly to disorder

J Clin Psychiatry. 2006 Oct;67(10):1527-35.

An Open Trial of Light Therapy in Adult Attention-Deficit/Hyperactivity Disorder

Yuri E. Rybak, M.D.; Heather E. McNeely, Ph.D.; Bronwyn E. Mackenzie, B.A.; Umesh R. Jain, M.D.; and Robert D. Levitan, M.D.

Results: Morning bright light therapy was associated with a significant decrease in both subjective and objective measures of core ADHD pathology, improved mood symptoms, and a significant phase advance in circadian preference.

Conclusion: These findings suggest that during the fall/winter period, LT may be a useful adjunct in many adults with ADHD.

Corresponding author and reprints: Yuri E. Rybak, M.D., Department of Psychiatry, University of Western Ontario, London Health Sciences

open trial of LT during the fall or winter months. Primary outcome measures included percentage

sion analyses determined which variables at base-line best predicted improvement on a given out-come measure and which variables changed in parallel with one another. The study was conducted from November 2003 through February 2004.

Results: Morning bright light therapy was asso-

senting complaint, in adolescents and adults it is deficits in mood regulation, arousal, and organization that often come to the forefront.[2] As the pressure to conform to work schedules increases over time, an inability to adapt daily activity schedules to occupational demands contributes

Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- Nature exposure
- Light Therapy
- **Massage Therapy**
- Meditation

Massage Therapy

- Field TM, Quintino O, Hernandez-Reif M, Koslovsky G.
  - Adolescence. 1998 Spring;33(129):103-8.
  - *Adolescents with attention deficit hyperactivity disorder benefit from massage therapy.*

- 28 adolescents with attention deficit hyperactivity disorder were provided either massage therapy or relaxation therapy for 10 consecutive school days.
- The massage therapy group, but not the relaxation therapy group, rated themselves as happier and observers rated them as fidgeting less following the sessions.
- After the 2-week period, their teachers reported more time on task and assigned them lower hyperactivity scores based on classroom behavior.

MASSAGE THERAPY IMPROVES MOOD AND BEHAVIOR OF STUDENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Sonya Khilnani, Tiffany Field, Maria Hernandez-Reif, and Saul Schanberg

ABSTRACT

In the present study, 30 students between the ages of 7 and 18 years (M = 13 years) diagnosed with attention-deficit/hyperactivity disorder (ADHD) were randomly assigned to a massage group or a wait-list control group. The massage group received massage therapy for 20 minutes twice per week over the course of one month. The results revealed that massage therapy benefited students with ADHD by improving short-term mood state and longer-term classroom behavior.

Adolescence. 2003 Winter;38(152):623-38.

Khilnani et al. (2003)

- 30 students between the ages of 7 and 18 years (Mean = 13 years) diagnosed with ADHD
- Randomly assigned to a massage group or a wait-list control group
- The massage group received massage therapy for 20 minutes 2x per week over the course of 1 month.
- **Results:** massage therapy benefited students with ADHD by improving short-term mood state and longer-term classroom behavior.

Alternative Interventions

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- Nature exposure
- Light Therapy
- Massage Therapy
- **Meditation**

Meditation therapies for attention-deficit/hyperactivity disorder (ADHD) (Review)

Krisanaprakornkit T, Ngamjarus C, Witoonchart C, Piyavhatkul N

THE COCHRANE COLLABORATION®

Cochrane Review

- Four studies reviewed
  - 2 used mantra meditation
  - 2 others used yoga
  - Compared to "drugs, relaxation training, non-specific exercises and standard treatment control"
- Review found high risk of bias
- "As a result of the small number of studies that we were able to include in this review and the limitations of those studies, we were unable to draw any conclusions regarding the effectiveness of meditation therapy for ADHD."

Alternative Interventions for ADHD

- Neurofeedback (EEG Biofeedback)
- Interactive Metronome Training
- Nature exposure
- Light Therapy
- Massage Therapy
- ~~Meditation~~