

# OUTSIDE THE BOX



**NON-TRADITIONAL APPROACHES TO TREATING  
ADHD**

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**HELP GROUP SUMMIT  
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# IS ADHD A NEW PHENOMENON?

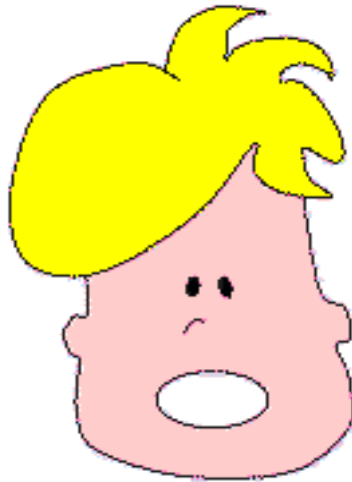
## The Story of Fidgety Phillip

by Heinrich Hoffman

"Let me see if Phillip can  
Be a little gentleman;  
Let me see if he is able  
To sit still for once at table!"  
Thus Papa bade Phil behave;  
And Mamma looked very grave.  
But fidgety Phil,  
He won't sit still;  
He wriggles,  
And giggles,  
And then, I declare,  
Swings backwards and forwards,  
And tilts up his chair,  
Just like any rocking-horse—  
"Phillip! I am getting cross!"

See the naughty, restless child  
Growing still more rude and wild,  
Till his chair falls over quite.  
Phillip screams with all his might,  
Catches at the cloth, but then  
That makes matters worse again,  
Down upon the ground they fall,  
Glasses, plates, knives, forks, and all.  
How Mamma did fret and frown,  
When she saw them tumbling down!  
And Papa made such a face!  
Phillip is in sad disgrace.

Where is Phillip, where is he?  
Fairly covered up you see  
Cloth and all are lying on him;  
He has pulled down all upon him.  
What a terrible to-do!  
Dishes, glasses, snapped in two!  
Here a knife, and there a fork!  
Phillip, this is cruel work.  
Table all so bare, and ah!  
Poor Papa, and poor Mamma  
Look quite cross, and wonder how  
They shall have their dinner now.



- Johnny Look-in-air



# DSM V ADHD Diagnostic Criteria



- People with ADHD show a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development:
  - Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:
    - Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
    - Often has trouble holding attention on tasks or play activities.
    - Often does not seem to listen when spoken to directly.
    - Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
    - Often has trouble organizing tasks and activities.
    - Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
    - Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
    - Is often easily distracted
    - Is often forgetful in daily activities.
  - Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:
    - Often fidgets with or taps hands or feet, or squirms in seat.
    - Often leaves seat in situations when remaining seated is expected.
    - Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).
    - Often unable to play or take part in leisure activities quietly.
    - Is often "on the go" acting as if "driven by a motor".
    - Often talks excessively.
    - Often blurts out an answer before a question has been completed.
    - Often has trouble waiting his/her turn.
    - Often interrupts or intrudes on others (e.g., butts into conversations or games)

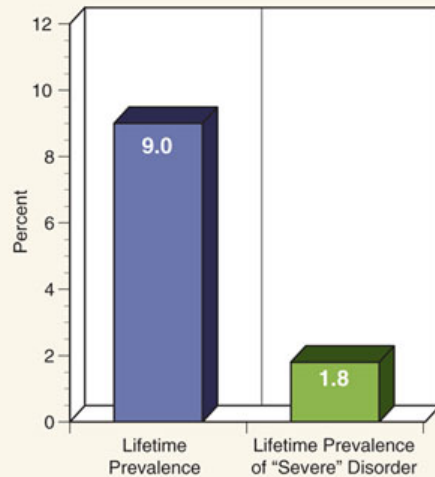
# CURRENT STATISTICS



## Attention Deficit Hyperactivity Disorder

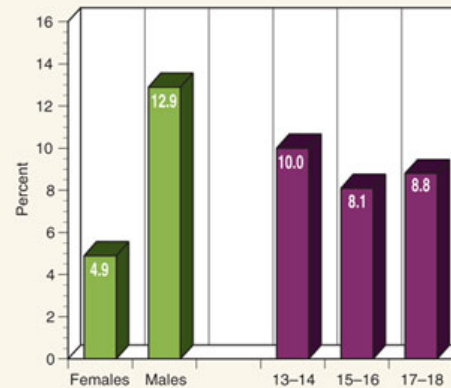
### Lifetime Prevalence of 13 to 18 year olds

- **Lifetime Prevalence:** 9.0% of 13 to 18 year olds
- **Lifetime Prevalence of "Severe" Disorder:** 1.8% of 13 to 18 year olds have a "severe" disorder



### Demographics (for lifetime prevalence)

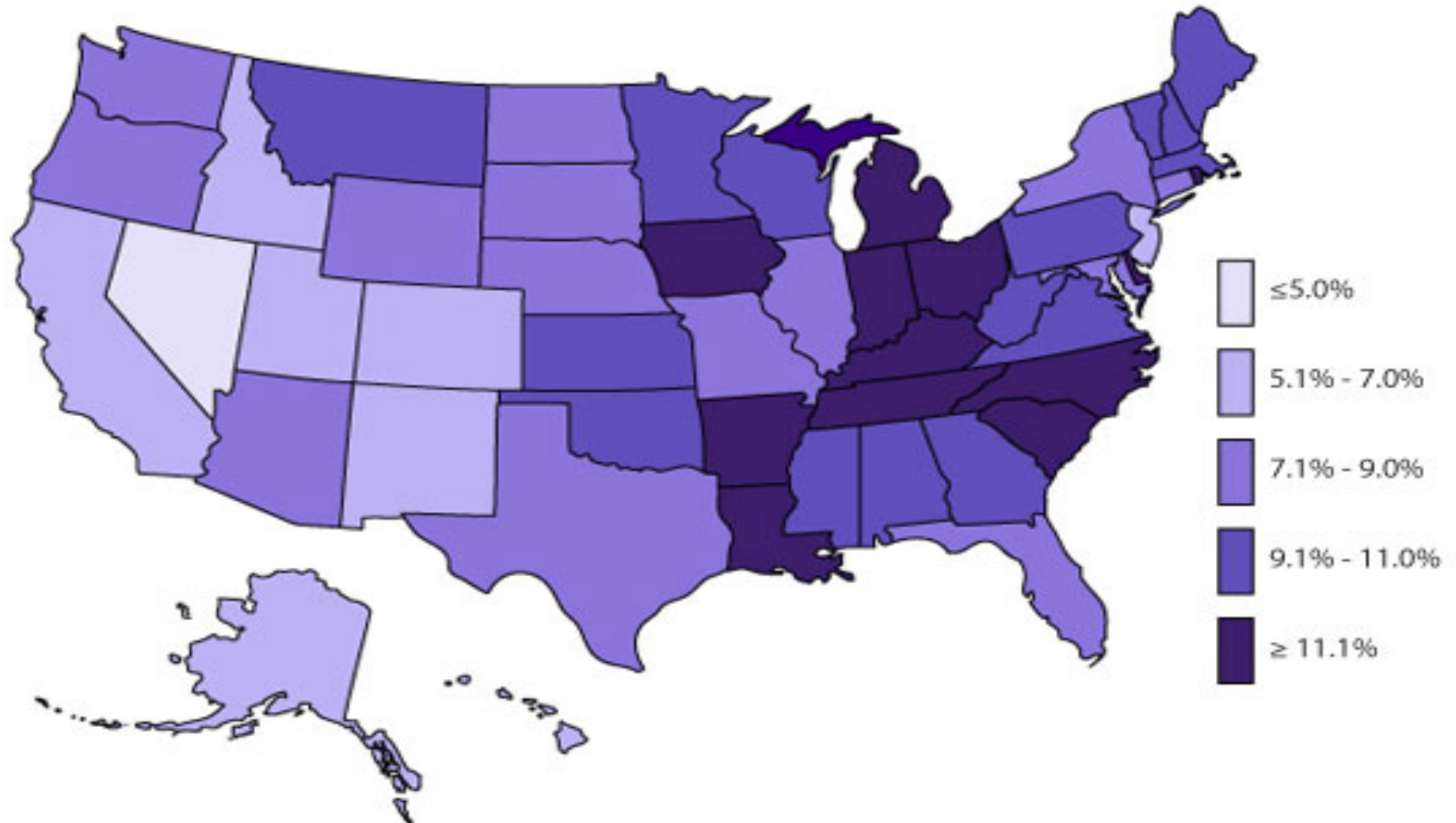
- **Sex and Age**



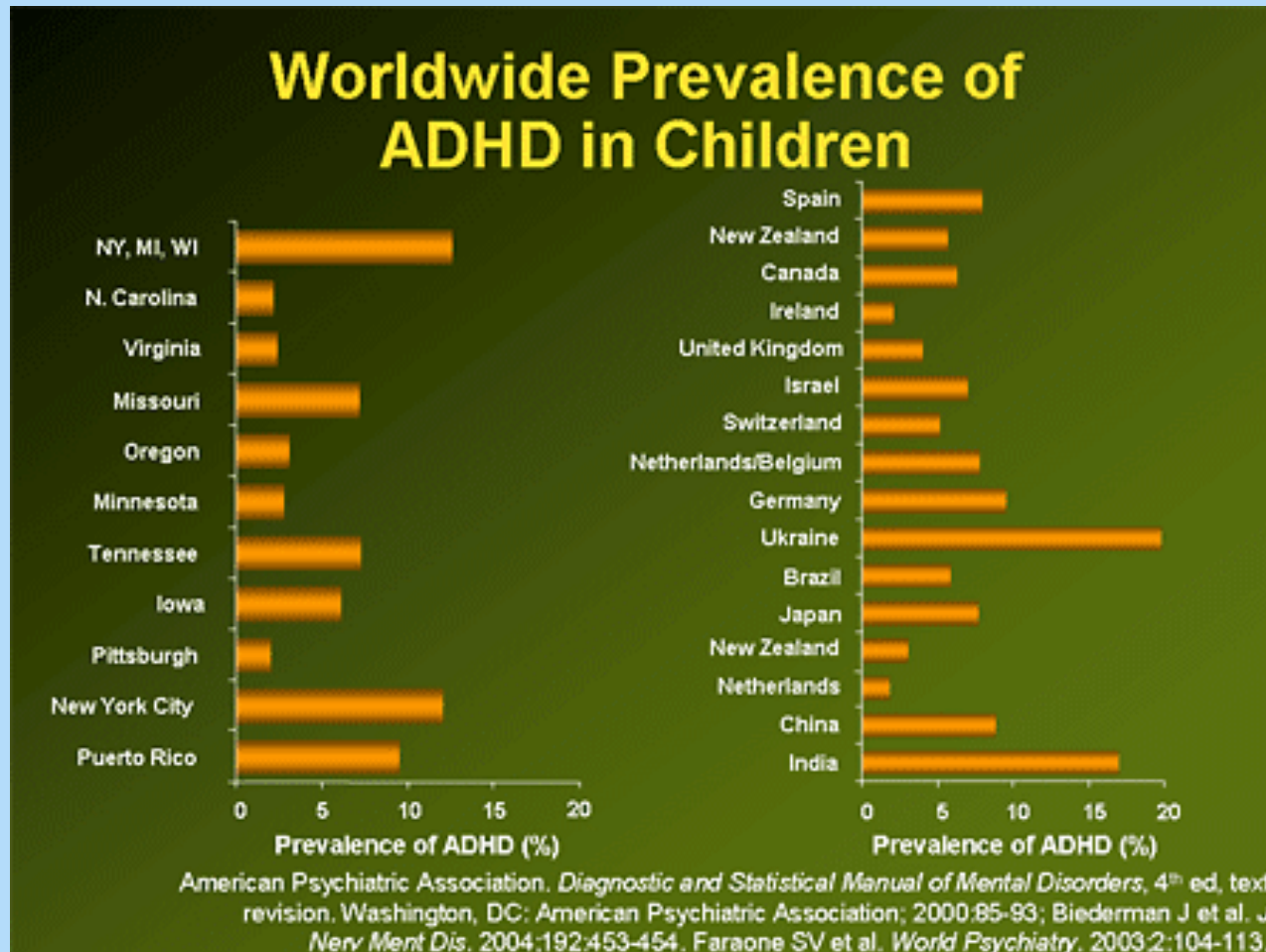
- **Race:** Not Reported

Merikangas KR, He J, Burstein M, Swanson SA, Avenevoli S, Cui L, Benjet C, Georgiades K, Swendsen J. Lifetime prevalence of mental disorders in U.S. adolescents: Results from the National Comorbidity Study-Adolescent Supplement (NCS-A). *J Am Acad Child Adolesc Psychiatry.* 2010 Oct;49(10):980-989.

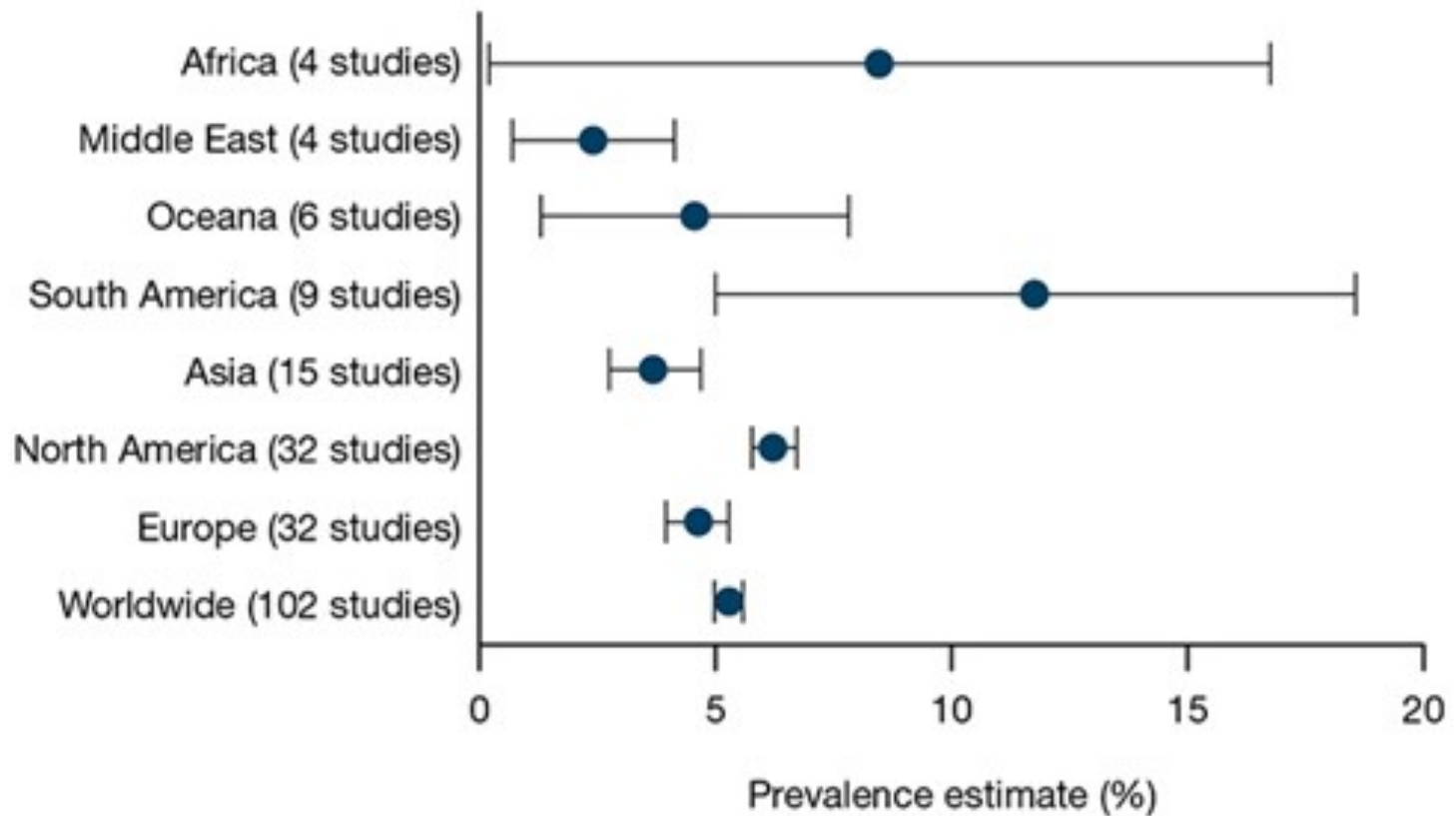
# U.S.A. PREVALENCE STATISTICS 2011



# INTERNATIONAL STATISTICS




Geographic location



Reproduced with kind permission Polanczyk G, de Lima MS, Horta BL, et al.  
Am J Psychiatry 2007; 164: 942-948.

Children and adolescents with ADHD, n=171,756

An iceberg floating in a blue ocean under a blue sky with light clouds. The tip of the iceberg is above the water line, while the much larger part of the iceberg is submerged below the water line. Text labels are placed around the iceberg to describe symptoms.

Attention Deficit Hyperactivity Disorder

Motor Restlessness  
Impulsivity  
Distractibility

Anxiety  
Depression  
Oppositional Defiant Disorder

Learning Disabilities

Executive Function Challenges  
Planning and Organization  
Time Management  
Working Memory  
Metacognition  
Emotional Control  
Task Initiation  
Flexibility  
Goal-directed Persistence



# WHAT WE KNOW WORKS



- **BEHAVIORAL STRATEGIES**
  - PARENT TRAINING PROGRAMS
  - PARENT COACHING
  - EXECUTIVE FUNCTION TRAINING
  - BEHAVIORAL INTERVENTIONS
  
- **MEDICATION**
  - STIMULANT MEDICATIONS
  - NON-STIMULANT MEDICATIONS

# WHEN MEDICATION DOESN'T WORK



- PROBLEMS WITH DURATION OF ACTION
- PROBLEMS WITH EFFICACY
- PROBLEMS WITH SIDE EFFECTS
  - APPETITE
  - SLEEP
  - INCREASED ANXIETY
  - TICS
  - PERSONALITY CHANGES
  - IRRITABILITY

# 2007 National Health Interview Survey



- 12 % of children in the US have used or been given CAM therapy
- More than 50% of children with ADHD have been given a CAM therapy
- Only 11% of parents discuss CAM therapies with their child's doctor

# OUTSIDE THE BOX



- **DIET**
- **SUPPLEMENTS (minerals, fish oil)**
- **EXERCISE**
- **MANIPULATIVE THERAPIES**
- **MINDFULNESS PRACTICE**
- **NEUROBIOFEEDBACK**
- **SENSORY INTEGRATION STRATEGIES**
- **HERBAL TREATMENTS, HOMEOPATHY**
- **ELECTRONICS USE AND SLEEP**

# DIET

## Pediatric Integrative Medicine Approaches



- Diet has an impact on health and ADHD symptoms
  - (review of 23 controlled studies)
- Inflammation (oxidative stress) is an underlying risk factor in ADHD
- Western diet high in omega 6 fatty acids, sodium, and sugar can induce inflammation

# HEALTHY EATING



AUSTRALIAN STUDY 2011



**HEALTHY DIET**



**WESTERN DIET**

**Western Diet associated with ADHD symptoms**

# Artificial Colorings and Additives



- **Feingold Diet**

- Salicylates
- Artificial flavors
- Artificial dyes (only 9 are FDA ok'd)
- Artificial sweeteners (Equal, Splenda)
- Preservatives (BHA, BHT, TBHQ)



- **Sodium Benzoate:**

- Preservative
- Sodas, coffee syrups, teas



# WHAT ABOUT THE RESEARCH?



3 meta analyses examining effect of eliminating AFC's from food:

2004 Schab & Trinh: 15 double blind placebo controlled studies...showed improvement in parent rating scales

2012 Nigg et.al.: showed improvement in parent rating scales and on psychometric measures

✦ 2011: Clinical Pediatrics: review of 35 years of research



# ROLE OF GENETICS



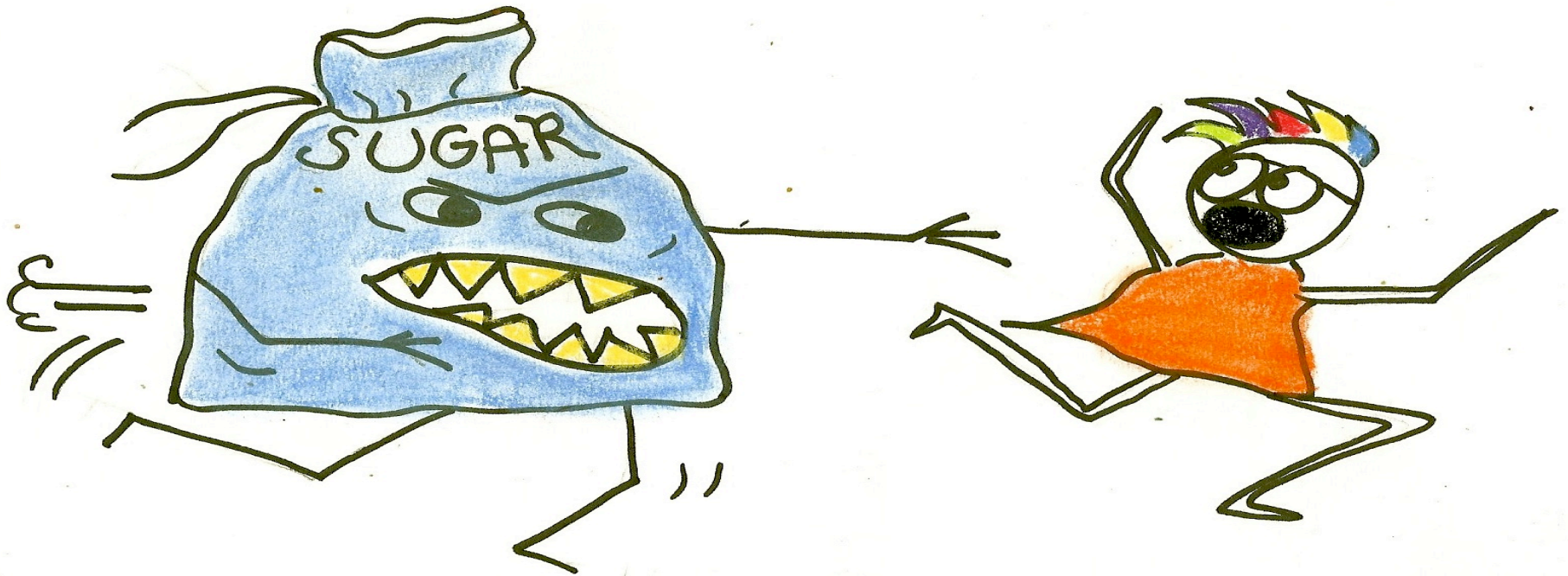
- **GENETIC POLYMORPHISMS COULD EXPLAIN DIFFERENT RESPONSES TO FOOD ADDITIVES IN ADHD**
  - DAT1 – Dopamine Transporter Gene associated with ADHD
  - HNMT – Histamine Degradation Gene – impaired clearance of histamine
  - Worsening in clinical ADHD symptoms when challenged with food additives

# TAKE HOME POINT



- **TRY TO HAVE AS CLEAN A DIET AS POSSIBLE**
- **FRESH, ORGANIC PRODUCE**
- **LIMIT PROCESSED FOODS INCLUDING SODAS AND SPORTS DRINKS**
- **LEAN MEATS, RANGE FED/GRAZED**

# WHAT ABOUT SUGAR?



- Little evidence to support an association between sugar consumption and ADHD symptoms

# Review Article in Pediatrics Feb. 2012



- Parents of children with ADHD often report a worsening of hyperactivity with sugar consumption
- Meta analysis of 16 studies
  - Sugar does NOT USUALLY affect behavior/cognitive performance
  - BUT, in a small subset of preschool boys, sugar consumption was linked with inattention and duration of aggressive episodes
    - THIS RESPONSE WAS BLOCKED BY EATING A HIGH PROTEIN MEAL

# SUGAR AND THE EEG



- High blood sugar – see increase in faster B rhythms in the EEG...not clear if this has any behavioral significance
- **LOW BLOOD SUGAR** is associated with impaired electrical activity in the cerebral cortex
  - Also associated with decline in performance on cognitive tests

# Thought you might like to know...



- **AMERICAN HEART ASSOCIATION RECOMMENDS NO MORE THAN 6 TEASPOONS (25 GM) OF ADDED SUGAR PER DAY**
- Twinkie – 19 gm
- Gogurt – 10 gm
- Yoplait – 27 gm
- Clif bar (banana nut bread) 68 gm

# TAKE HOME POINT



- **IF YOU THINK TOO MUCH SUGAR AFFECTS YOUR CHILD'S BEHAVIOR, BELIEVE WHAT YOU SEE**
- **IF YOU THINK YOUR CHILD IS EXPERIENCING LOW BLOOD SUGAR, BELIEVE WHAT YOU SEE**

# KETOGENIC DIET



- This is a high fat low carb diet that was first used for the treatment of epilepsy in the 1920's
- Many children with epilepsy have ADHD symptoms, and there is a higher frequency of epileptiform discharges on the EEG's of children with ADHD.
- In a study of 65 children with intractable seizures who went on this diet, better behavior was seen





# What about Gluten?



- **CELIAC DISEASE**
- **IgE MEDIATED WHEAT ALLERGY**
- **GLUTEN SENSITIVITY**



# Gluten and Gluten free Grains



- Grains containing gluten – **wheat** (including **wheat varieties** like **spelt, kamut, farro and durum, plus products like bulgar and semolina**), **barley, rye, triticale** and **oats\***
- Gluten free grains – **corn, millet, rice, sorghum**. Gluten free pseudo-cereals – **amaranth, buckwheat, quinoa**.

# Multiple Food Elimination Diets



- Eliminate foods that are the most common antigens
- Adhere strictly to diet for 2 – 3 weeks
- If significant improvement seen in behavior, reintroduce foods one at a time, waiting 3 days in between each addition
- **COMMON ALLERGENS:** Corn, soy, eggs, nuts, citrus, dairy, wheat, rye, barley, chocolate

# INCA study



- Randomized clinical trial of effects of a restricted diet on the behavior of children with ADHD
- Children ages 4 – 8 showed improvement in ADHD symptoms (Connors scale, abbreviated) after 5 weeks on a Restricted Elimination Diet
- 63% of those children who improved, relapsed with increased ADHD symptoms after a food challenge

# TAKE HOME POINT



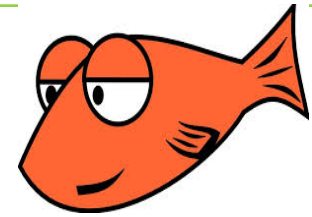
- **CONSIDER EVALUATING CHILDREN FOR FOOD ALLERGIES/SENSITIVITIES ESPECIALLY IF THEY HAVE AN ALLERGY PROFILE**
- **ELIMINATE TOP ALLERGENS FOR 2 -3 WEEKS, THEN RE-INTRODUCE FOODS ONE AT A TIME**
- **FOOD ALLERGY TESTING MAY HAVE SOME USE HERE (OR NOT)**

# ESSENTIAL FATTY ACIDS



- Omega 3 = EPA = eicosapentenoic acid
- Omega 3 = DHA = docosahexanoic acid
  
- EPA is metabolized to DHA
  
- Omega 6 = linoleic acid, arachidonic acid)

# Essential Fatty Acids



- Omega 3 most highly concentrated in fish and seafood
- EPA and DHA combos are best
- Optimal dose not established
- Ratio of omega3/6 is important factor
- Lower levels of Omega 3 & 6 seen in plasma and RBC of children with ADHD
- 4 open label trials of fatty acid supplementation showed normalized blood levels and clinical improvement in ADHD symptoms
- Placebo controlled studies show inconsistent results



# Oxford – Durham Study



- Pediatrics 2005
- Looked at 117 children with developmental coordination disorder
- No reduction in incoordination, but beneficial results in ADHD symptoms as measured by the Connors' Teacher Rating Scale, and gains in reading and spelling scores

# Fish Oil Treatment for Impulsive Aggression



- Prospective, placebo controlled, crossover, randomized study
- Treated for 6 weeks, then placebo or vice versa
- Small number of participants (21) ranging in age from 6 – 21 years old
- Excluded Cognitive Impairment, developmental disorders, PTSD, substance users, bipolar disorder or psychotic disorders, acute psychiatric conditions
- Given 4 grams daily of fish oil (2000mg DHA and 400mg EPA)

# 2007 OPEN LABEL PILOT STUDY HIGH DOSE EPA/DHA SUPPLEMENTATION



- 9 CHILDREN WITH ADHD
- GIVEN HIGH DOSE OMEGA 3 (up to 16.2 GRAMS)
- BLOOD TESTS MONITORED RATIO OF AA/EPA
- AFTER 8 WEEKS, IMPROVEMENT IN BEHAVIOR NOTED – inattention, hyperactivity, OD, Conduct

# ? VAYARIN ?



- Medical food
  - NOT required to do pre-market controlled studies of efficacy
- Proprietary formulation of
  - Phosphatidal serene plus EPA
  - NO WAY TO KNOW FROM THIS HOW MUCH EPA YOU ARE ACTUALLY GETTING

# TAKE HOME POINT



- The Omega fish oils may be helpful in ameliorating the symptoms of ADHD
- An anti-inflammatory diet (high in omega 3, low in omega 6) may be helpful
- Omega 3 supplementation may be helpful, but not clear what the dose should be

# Mineral Supplements



- Iron in ADHD
- Magnesium and ADHD
  - Ghanizaheh, Ahmad Arch Iran Med 2013 16 (7):412 – 417  
A Systematic Review of the Magnesium Therapy for Treating ADHD
- Zinc in ADHD

# Iron Deficiency Anemia and ADHD

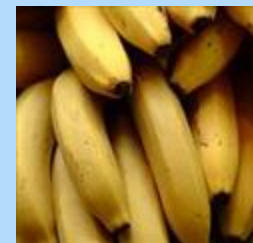
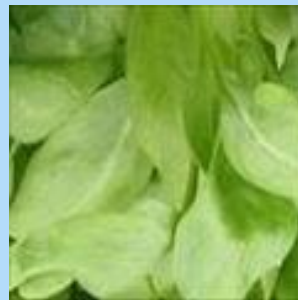


- Iron deficiency and resultant anemia has known association with adverse effects on cognitive development
- Non-anemic iron deficient school age children had lower scores on IQ testing (Oteron et al, 1999)
- More severe ADHD symptoms associated with non-anemic iron deficient children with ADHD (Konofal et al 2004)
- In open label and placebo controlled trials – less ADHD symptoms after iron treatment

# Magnesium and ADHD



- Some research shows children with ADHD have lower levels of magnesium compared to controls
- Open label studies have shown improvement in ADHD symptoms with supplementation





**Table 2.** Summary of controlled clinical trials of magnesium for treating patients with attention- deficit hyperactivity disorder

First author (year)	Sample size	Diagnosis	Design of study	Intervention	Main outcome measure	Main outcomes	Main adverse effects
Mousain-Bosc, 2006 <sup>20</sup>	76 children including 40 children (mean age: 6.49 years; 13 girls and 27 boys) with ADHD symptoms and 36 children (mean age: 4.37 years, 14 girls and 22 boys)	ADHD symptoms	Open controlled trial	Magnesium-vitamin B6 (Mg-B6) regimen (6 mg/kg/d Mg, 0.6 mg/kg/d vit-B6) for at least eight weeks.  No other con-current medication was allowed.	Symptoms of ADHD (hyperactivity, hyperemotivity/aggressive-ness, lack of attention at school) were scored	Hyperactivity and (hyperactivity, hyperemotivity/ aggressiveness were decreased. Attention increased. Intraerythrocyte Mg (Erc-Mg) values significantly increased in ADHD ( $2.32 \pm 0.41$ mmol/L versus $2.05 \pm 0.3$ mmol/L, $P = 0.004$ ) while these values were still lower than for control. Erc-Mg level returned to lower level when Mg-B6 supply was discontinued. Changes in Erc-Mg values were not statistically correlated with changes in clinical symptoms.	Not reported.
Nogovitsina, 2006 <sup>21</sup>	31 children aged from six to 12 years, and 20 children with similar manifestations as control group	Attention-deficiency and hyperactivity syndrome	Controlled clinical trial	A polyvitamin complex Magnesium-vitamin B6 (Mg-B6) for 30 days	Not reported	Decreased the level of synkinesis, increased the characteristics of attention	Not reported
Starobrat-Hermelin, 1998 <sup>23</sup>	75 children with ADHD and deficiency of magnesium	ADHD according to DSM-IV	Controlled clinical trial	50 patients received standard treatment and magnesium supplement for six months, 25 patient were left with standard treatment without magnesium supplement.	The "Connor's Rating Scale for Parents and Teachers".	Hyperactivity was decreased in magnesium group while hyperactivity increased in the group which received standard treatment	Not reported

# Zinc and ADHD

## INTERNATIONAL STUDIES



- Across several countries, zinc has been found to be low in children with ADHD
- Two controlled studies
  - 12 week study saw improved hyperactivity, impulsivity and socialization but not inattention when supplemented with 150mg zinc per day
    - Bilici et al, 2004
  - Children given both Ritalin and zinc had significantly improved parent and teacher ratings compared to ritalin group alone
    - Akhondzadeh & Khademi, 2004

# ZINC AND ADHD UNITED STATES STUDIES



- 2011 Arnold, et al
  - 8 week study with 52 children comparing zinc to placebo
    - ✦ results equivocal
  - 5 weeks with d-amphetamine supplemented by zinc
    - ✦ Lower dose of d-amphetamine needed in those given zinc supplement

# TAKE HOME POINT



- **IRON IS IMPORTANT – CHECK LEVELS**
- **MAGNESIUM AND ZINC – EVIDENCE IS NOT AS STRONG SUPPORTING THEIR USE IN ADHD TREATMENT**

# EXERCISE AND ADHD



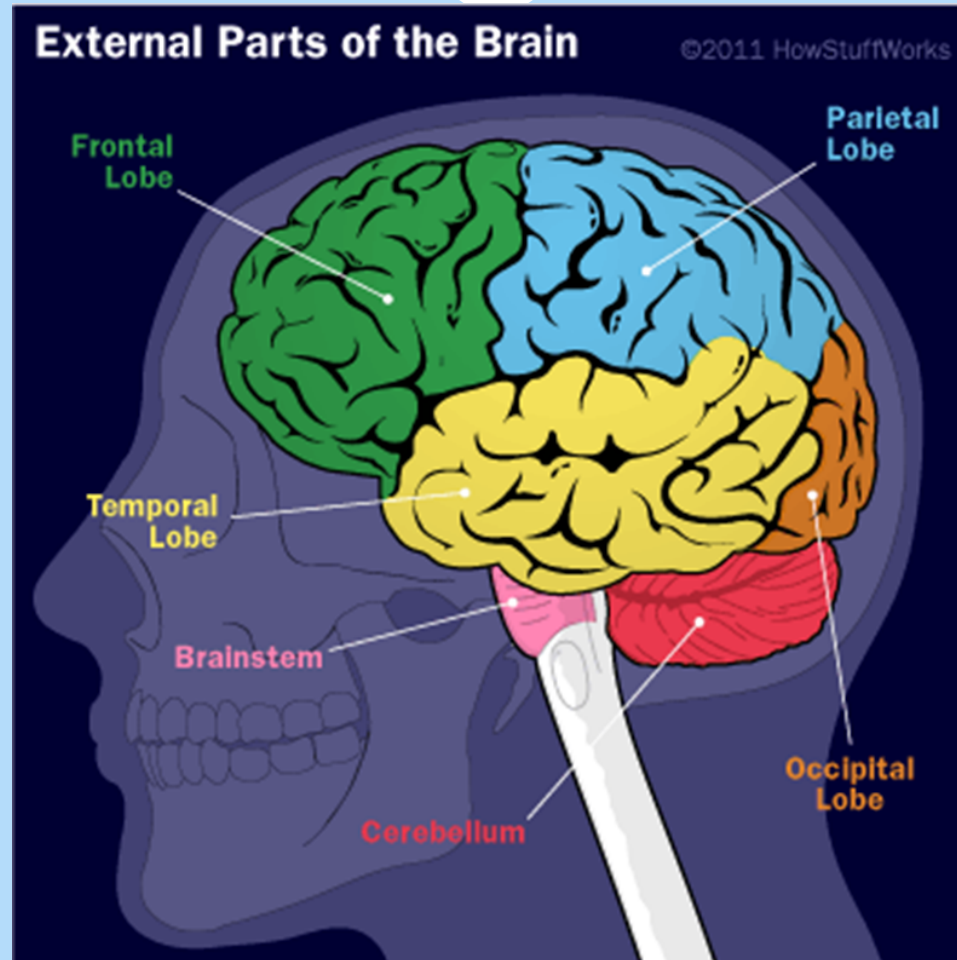
- **EXERCISE IS GOOD!**
  - Aerobic exercise is good, but activities that require complex movements during heavy exertion are even better
    - ✦ ADHD boys 8 -11 years old participated in martial arts 2 x week
    - ✦ Improved in behavior/performance ( finished more homework, better prepared for class, better grades, less restless) compared to controls doing typical aerobic exercise (but both groups improved compared to kids who did nothing)

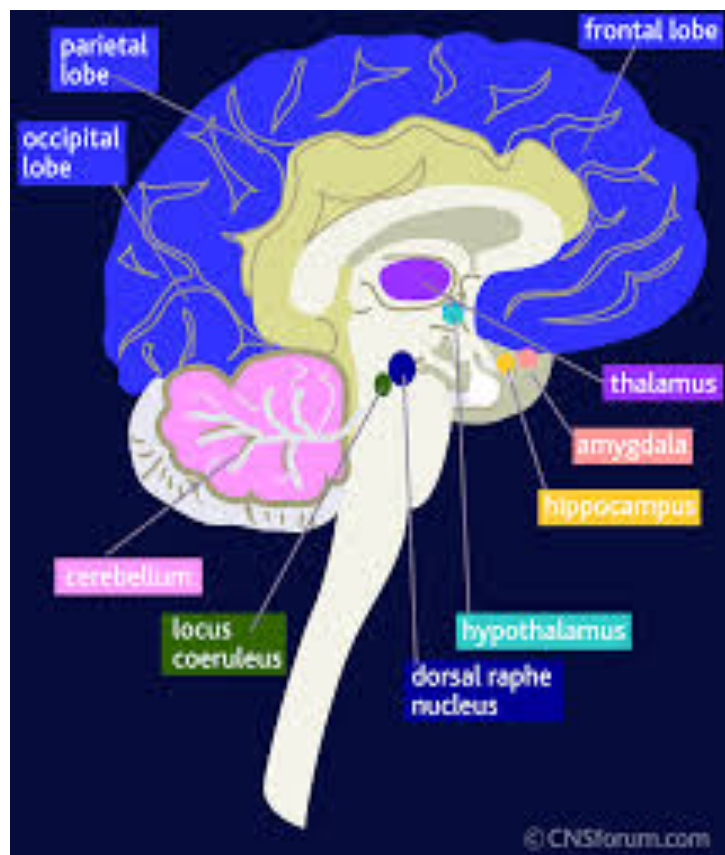
# So....why is complex exercise better?



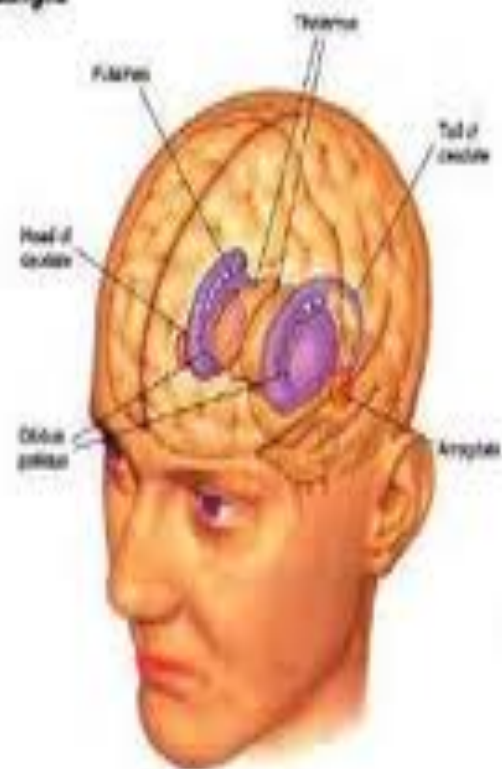
- Taps into a variety of brain areas:
  - Balance
  - Timing
  - Sequencing
  - Switching
  - Error correction
  - Fine motor adjustments
  - Inhibition (Impulsivity)
  - **CONCENTRATION**

# ADHD isn't just a frontal lobe problem

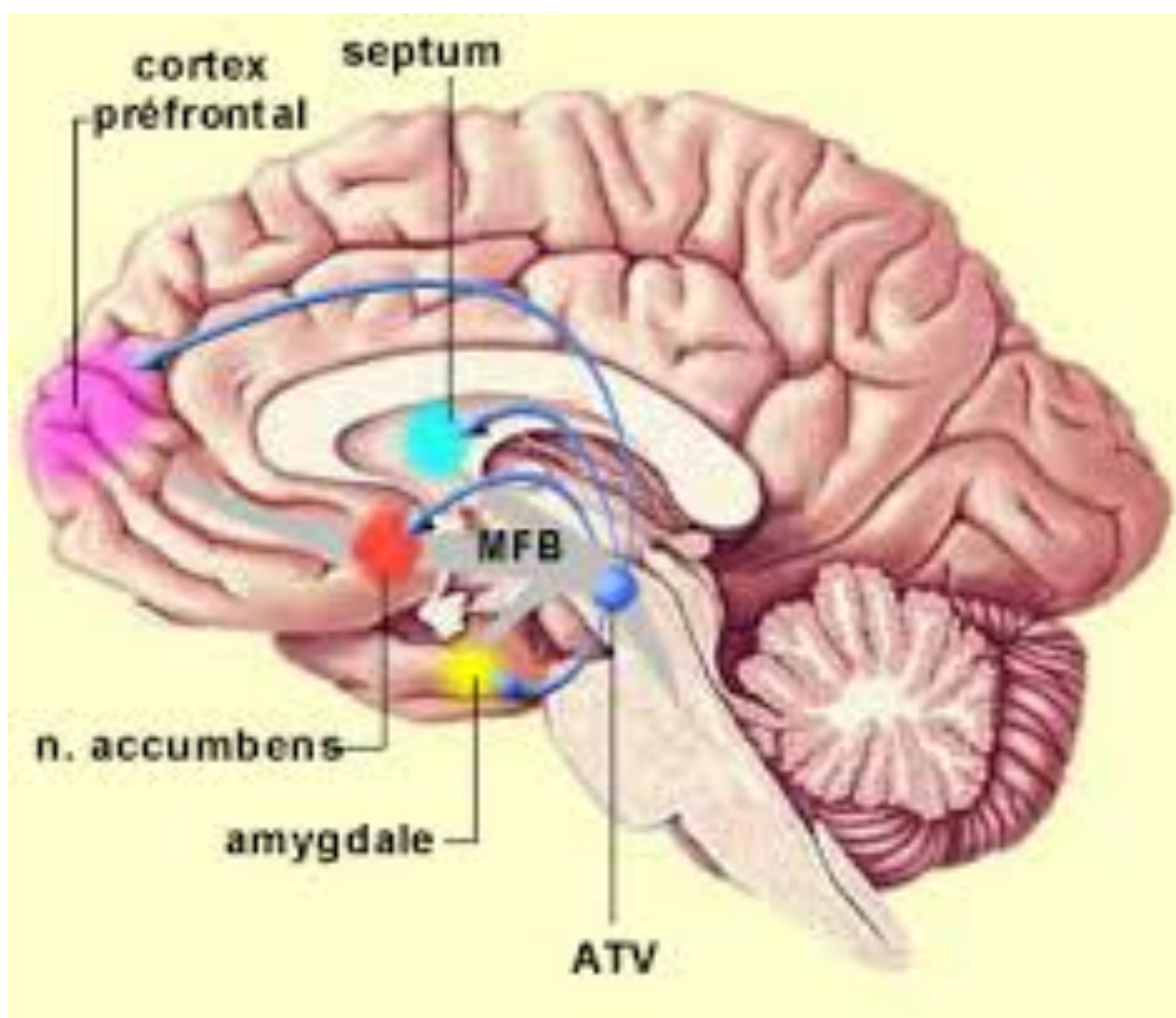




### ► The Basal Ganglia







# ELECTRONICS USE AND SLEEP



- SLEEP IN GENERAL IS OFTEN A PROBLEM IN PEOPLE WITH ADHD
- EVENING USE OF ELECTRONICS MAY SUPPRESS EVENING MELATONIN LEVELS AND DELAY SLEEP ONSET.



# TAKE HOME POINT



- **TURN OFF THOSE DARN ELECTRONIC DEVICES AT LEAST ONE HOUR BEFORE BEDTIME**
- **GO OUTSIDE AND PLAY IN THE SUN!!!!**
- **ANY EXERCISE IS GOOD; COMPLEX EXERCISE THAT REQUIRES CONCENTRATION IS BETTER**

# MANIPULATIVE THERAPIES



- THERAPEUTIC MASSAGE
- CHIROPRACTIC
- CRANIAL SACRAL MANIPULATION
- \*\*\*\*\*
- *BOTTOM LINE – no good evidence for efficacy in ADHD, but massage has promise*

# TAKE HOME POINT



- **SOME SPARSE EVIDENCE THAT MASSAGE MAY HELP WITH ADHD SYMPTOMS**
  - IT'S CHEAP
  - IT FEELS GOOD
  - WHY NOT?

# NEUROFEEDBACK



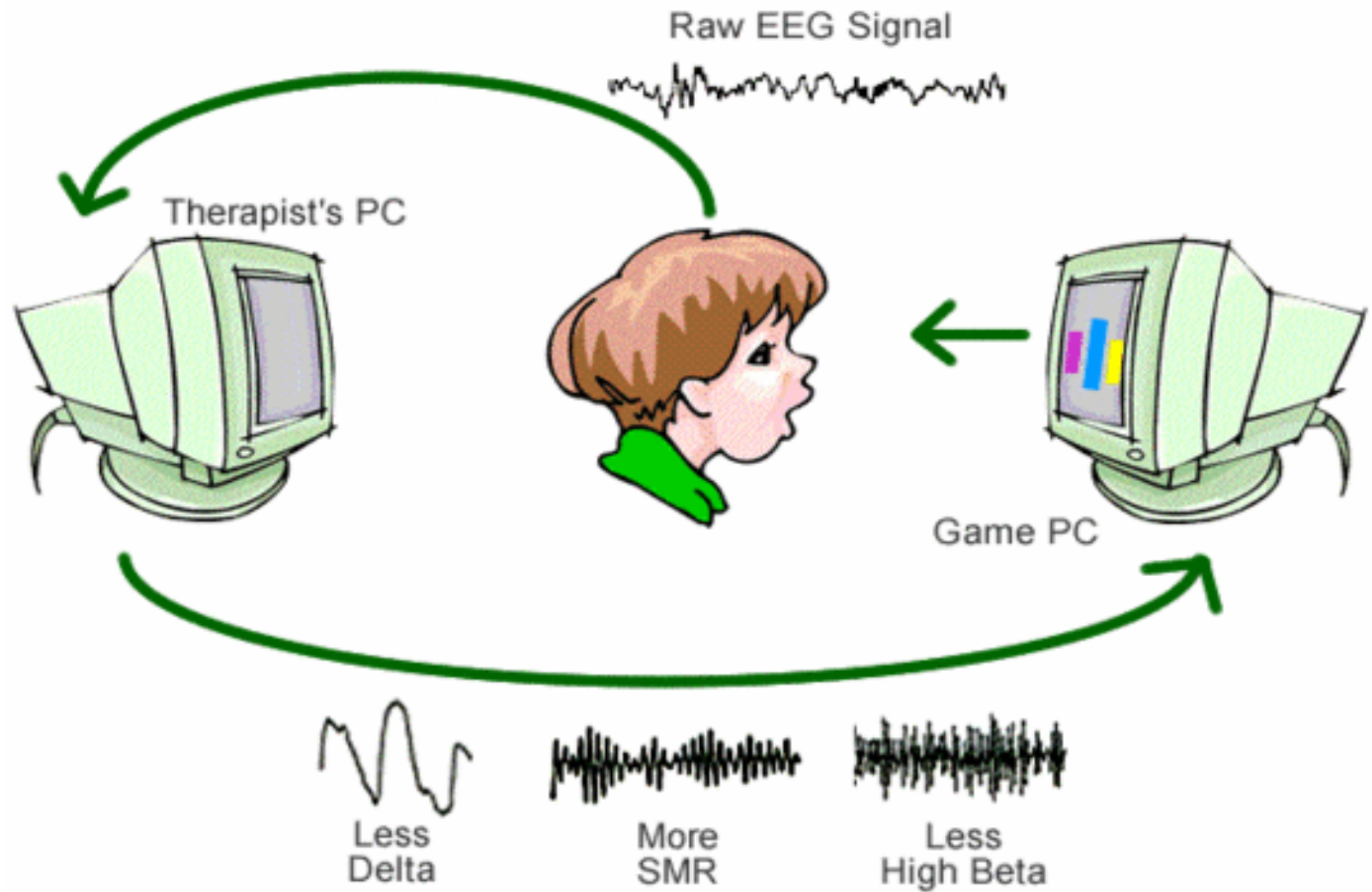
- Training the brain's electrical activity using classical learning/conditioning techniques



# HOW DOES IT WORK?



- Four types of brain waves:
  - Alpha (medium frequency)
  - Beta (fast frequency)
  - Theta (slow frequency)
  - Delta (deep sleep)
- Theory is that people with ADHD have too much theta activity and not enough beta activity
- Neurofeedback training attempts to increase beta activity and decrease theta activity....this increases the arousal level of the brain





# OUTCOME RESEARCH



- First randomized study done in 1994
- Currently evidence is “promising but not conclusive”
- American Psychological Association Grading:
  - Level 1: Not empirically supported
  - Level 2: Possibly efficacious
  - Level 3: Probably efficacious \*
  - Level 4: Efficacious
  - Level 5: Efficacious and specific

# 2011 Review of Neurofeedback and ADHD



- Journal of Attention Disorders
- Review of 14 studies
  - Randomized assignment to treatment
  - 5 different methodological limitations that make it difficult to draw firm conclusions about efficacy:
    - ✦ Minimal use of triple blinding
    - ✦ Nature of the control groups
    - ✦ Insufficient identification, measurement and control of concomitant treatments
    - ✦ Lack of post-treatment follow up
    - ✦ Limited attention to possible adverse side effects

# MINDFULNESS



- *UCLA Mindful Awareness Research Center*
  - *MAP Program (Mindfulness Awareness Practices for ADHD)*
  - *Small study – pilot with 25 adults & 8 teens*
  - *Self report and cognitive measures*
  - *Visual Aids...blue skies, clouds*
  - *Emphasizes observing negative emotional states and practicing positive emotions*
    - ✦ *Focusing on the present moment*
    - ✦ *Having an attitude of curiosity, openness, and acceptance*

# More MINDFULNESS



- **Virginia Commonwealth University**
  - ONE Research Institute in Midlothian, Va.
  - 2 mothers of ADHD children
  - ADHD children
  
- **Mindfulness Based Stress Reduction program**
  - U. Mass Worcester
  - Jon Kabat-Zinn

# TAKE HOME POINT



- **NEUROFEEDBACK**

- A KIND OF HIGH TECH MINDFULNESS
- SOME EVIDENCE OF EFFICACY
- EXPENSIVE AND TIME CONSUMING
- NEW PRODUCTS IN THE PIPE LINE

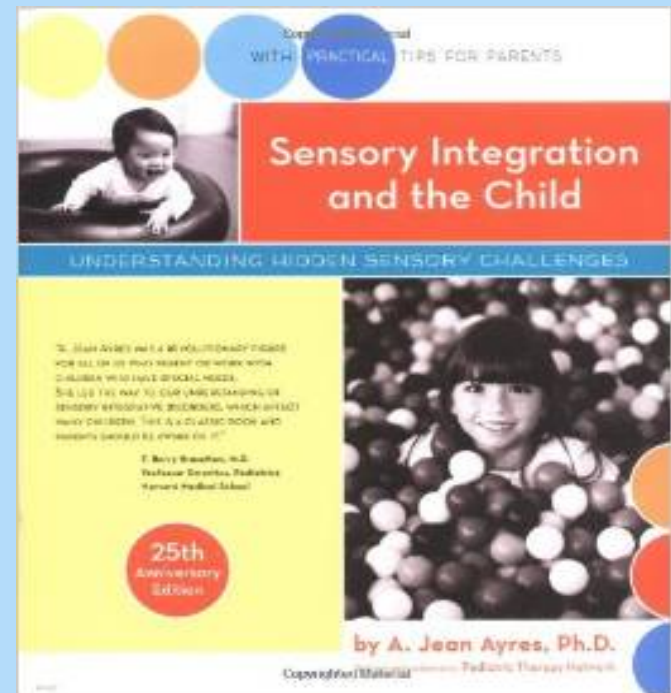
- **MINDFULNESS PRACTICE**

- INEXPENSIVE
- CAN BE DONE AS A FAMILY
- INCREASING EVIDENCE THAT IT CAN HELP WITH EMOTIONAL AND BEHAVIORAL STATE REGULATION
- WHY NOT?

# SENSORY INTEGRATION AND ADHD



- What is Sensory Integration?
- What is Sensory Integration Disorder?  
not a “stand alone” diagnosis  
.... yet



# Sensory Integration Disorder vs ADHD



- It can be hard to tell the difference between a sensory problem and the symptoms of ADHD



- Are there more problems with sensory integration in individuals with ADHD?
  - ✦ Psych Investig v 8 (2); 2011 Jun  
Ahmad Ghanizadeh  
Literature review

# RED FLAGS FOR SPD



- Adolescents and adults
- \_\_\_ Over-sensitive to touch, noise, smells, and other people
- \_\_\_ Poor self-esteem; afraid of failing at new tasks
- \_\_\_ Lethargic and slow
- \_\_\_ Always on the go; impulsive; distractible
- \_\_\_ Leaves tasks uncompleted
- \_\_\_ Clumsy, slow, poor motor skills or handwriting
- \_\_\_ Difficulty staying focused
- \_\_\_ Difficulty staying focused at work and in meetings



# TAKE HOME POINT



- **IN YOUNG CHILDREN, ALWAYS LOOK FOR SENSORY PROCESSING ISSUES PRIOR TO BEGINNING A TRIAL OF MEDICATION**
- **USE SENSORY STRATEGIES TO HELP WITH STATE REGULATION**

# HOMEOPATHY AND ADHD



- **WHAT IS HOMEOPATHY?**
  - LIKE CURES LIKE
  - INDIVIDUALIZATION
  - MINIMAL DOSE
  
- **DOES HOMEOPATHY WORK?**
  - NO RECENT STUDIES
  - NO CONCLUSIVE EVIDENCE OF EFFICACY THAT MEETS SCIENTIFIC STANDARDS
    - ✦ Cochrane review 17 October 2007

# TRADITIONAL CHINESE HERBAL MEDICINE AND ADHD



- **ADHD SYMPTOMS CORRESPOND TO TCM CATEGORIES OF:**
  - IRRITABILITY
  - INSOMNIA
  - PROFUSE DREAMS
  - OPPRESSIVE GHOST DREAMS
  - VEXATION AND AGITATION
  - IMPAIRED MEMORY
- **DOES TCM WORK FOR ADHD?**
  - NO SOLID SCIENTIFIC EVIDENCE OF EFFICACY
    - J. of Evidence Based Complementary & Alternative Medicine 2012

# HERBAL MEDICINE AND ADHD



- **NATURAL DOES NOT EQUAL SAFE**
- **SOME HERBS THAT HAVE BEEN STUDIED:**
  - PYCNOGENOL
  - VALERIAN AND LEMON BALM
  - GINKGO/GINSENG
  - RHODEOLA ROSEA

# PYCNOGENOL



- AKA FRENCH MARITIME PINE BARK
- Anti-oxidant properties may be acting
- At least two double blind placebo controlled randomized studies have shown positive effects
- Some studies did NOT show benefits
- Can cause gastric discomfort, headache, mouth ulcers
- Can prolong bleeding time

# GINKO BILOBA



- Extracts have hundreds of active ingredients
- Anti Oxidant properties
- May increase extracellular dopamine levels in prefrontal cortex (in rats)
- 2013 meta analysis showed improved selective attention, memory, executive functions, processing speed
- More studies needed to determine dosage and to determine what kind of extract to use



# RHODIOLA ROSEA



- One of a group of plants called ADAPTOGENS
- Contains hundreds of biologically active ingredients
- May stimulate the RAS and elevate levels of neurotransmitters (dopamine, serotonin, NE)
- 11 controlled studies evaluating effects for a variety of mental health conditions, mental performance and physical performance
- Additional studies needed to document efficacy in ADHD treatment





# TAKE HOME POINT



- **SOME PROMISING INFORMATION ABOUT THE USE OF HERBAL TREATMENTS IN ADHD**
- **CONSIDER ANTI-INFLAMMATORY QUALITIES OF THE HERBS THAT HAVE BEEN STUDIED**
- **CAVEAT EMPTOR**

# Transcranial Stimulation



- **Small study from Germany**
  - N = 12 boys, ages 10 – 14 years
  - Attempted to improve sleep dependent consolidation of declarative memory
  - Played a concentration type computerized card game before bedtime
  - Slept in sleep lab with stimulator on
  - Tested in AM for memory retrieval
  - Controls in place, exclusions for low IQ, sleep problems, or documented profound memory impairment
  - ADHD boys had significant loss of overnight memory in sham condition...worse than controls...performance increased with treatment to equal controls

# New Research at UCLA



- **Trigeminal Nerve Stimulation**
  - Phase I trial showed significant improvement in ADHD symptoms after 8 weeks of nightly use
  - Phase II trial will be blinded, placebo controlled, monotherapy
  - Cell phone sized pulse generator and a patch on forehead
  - Signal transmitted through lead wires to trigeminal nerve in skin of forehead; this sends signals to targeted brain regions and changes activity there
  - Use while sleeping

# If I Were Queen of the Universe....



# AT HOME



- ENSURE PROPER SLEEP HYGEINE...think about electronic use
- ORGANIC, UNPROCESSED DIET...consider allergies
- SUPPLEMENTS AS NEEDED...iron, Omega 3
- MASSAGE AT NIGHT (10 MINUTES)
- DAILY VIGOROUS EXERCISE, PREFERABLY IN THE MORNING, complex is best



- **USE HERBS WITH CAUTION**
- **NEUROBIOFEEDBACK CAN BE CONSIDERED**
- **TAKE A LOOK AT SENSORY SYSTEMS**

# MY DREAM SCHOOL...



- **SMALL CLASS SIZE**
- **STIMULATING, ENTERTAINING TEACHING STYLE**
- **OPPORTUNITIES FOR HANDS ON LEARNING**
- **USE MOVEMENT TO FACILITATE ROTE LEARNING**
- **CREATIVE USE OF TECHNOLOGY**
- **HOMEWORK “LITE”**
- **TEACH COLLABORATION AND PROBLEM SOLVING**
- **EMPHASIS ON TEACHING EXECUTIVE SKILLS STARTING AT ELEMENTARY LEVEL**



# RESOURCES



- CHADD
  - [www.CHADD.org](http://www.CHADD.org)
- Sensory Integration
  - [www.SPDstar.org](http://www.SPDstar.org)
- My Website
  - [www.danismd.com](http://www.danismd.com)

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