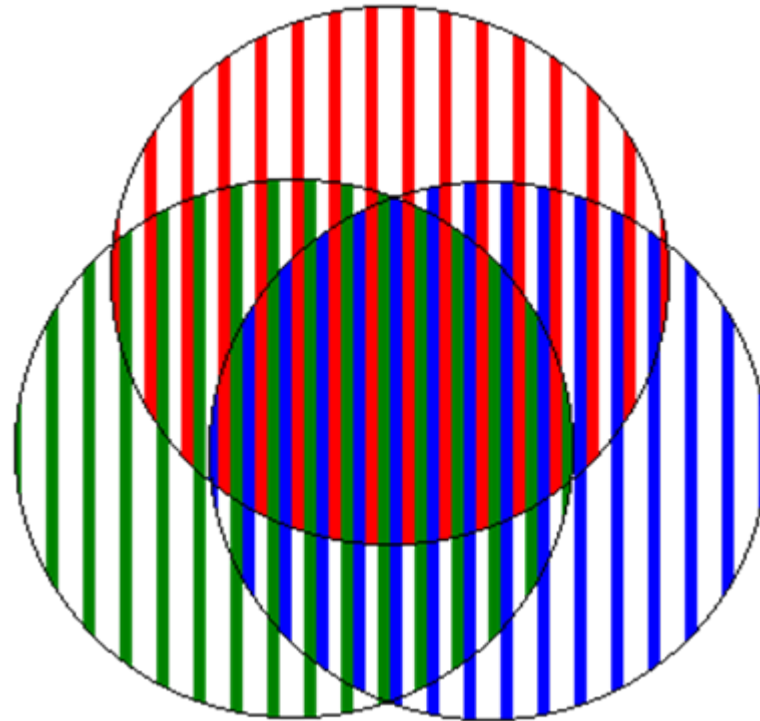


ADHD: CO-MORBIDITIES AND NON PHARMACOLOGIC TREATMENT

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OVERLAPPING DIAGNOSES AND TREATMENTS



CONFOUNDING CONSIDERATIONS IN ADHD

- Language
- CAPD
- Motor Coordination
- Nonverbal Learning Disability
- Learning Disability (in 20-30%)
- Frequency ADHD in PDD (52-78% various studies)
- Oppositional Defiant Disorder, Conduct Disorder (in 1/3-1/2, mostly boys)

<http://www.nimh.nih.gov/health/publications/adhd/disorders-that-sometimes-accompany-adhd.shtml>; Sinzig J et al Eur Child Adolesc Psychiatry 2007 Sep 24; J Autism Dev Disord. 2004 Jun;34 (3):329-39; J Child Adolesc Psychopharmacol 2006 Dec, 16: 737-46



LANGUAGE

- Prospective study 30 month olds with language delay - at 7 years old, 62% diagnosed PDD and/or ADHD
- Assessment of 15-16 years olds with persistent speech-language impairment-increased incidence attention and social difficulties

Miniscalco et al. Dev Med Child Neurol 2006 May, 48: 361-6; Snowling MJ et al
J Child Psychol Psychiatry 2006 Aug 47:759-65

CENTRAL AUDITORY PROCESSING DISORDER

- Sensory end-organ intact
- Higher order “central” deficit
 - Cortical impairment
- Difficulty learning in auditory mode
- CAPD can mimic ADHD or language-based LD
- For CAPD, can send child to audiologist for SCAN or speech language pathologist

<http://www.nidcd.nih.gov/health/voice/auditory.asp>

DEVELOPMENTAL COORDINATION DISORDER

- Significant motor delay (>1.5 SD), clumsiness, involuntary movements
- Deficits in motor sequencing (dyspraxia)
- Deficits in visual spatial abilities
- Patients do not “outgrow” condition

Diagnostic criteria for 315.4

Developmental Coordination Disorder

- A. Performance in daily activities that require motor coordination is substantially below that expected given the person's chronological age and measured intelligence. This may be manifested by marked delays in achieving motor milestones (e.g., walking, crawling, sitting), dropping things, "clumsiness," poor performance in sports, or poor handwriting.
- B. The disturbance in Criterion A significantly interferes with academic achievement or activities of daily living.
- C. The disturbance is not due to a general medical condition (e.g., cerebral palsy, hemiplegia, or muscular dystrophy) and does not meet criteria for a [Pervasive Developmental Disorder](#).
- D. If [Mental Retardation](#) is present, the motor difficulties are in excess of those usually associated with it.



ADHD + DCD

- DCD in 55.2% of 96 consecutive ADHD children, more frequently in inattentive-type
- ADHD + DCD > specific learning disabilities and expressive (phonological) language deficits than ADHD alone
- Intensive Physical Therapy markedly improved motor performance



NONVERBAL LEARNING DISORDER

- A neurological syndrome involving right hemisphere dysfunction.
- Reception of nonverbal or performance-based information impaired in varying degrees
- Problems with visual-spatial organization, tactile perception, motor functions, social skills, and executive functions such as self-regulation, planning, and problem-solving
- Can have advanced verbal skills

Stein MT, Klin A, and Miller K. Pediatrics 2004; 114:1458-1463



NONVERBAL LEARNING DISORDER

- Often initially referred for attentional concerns; can have comorbid ADHD
- Can be difficult to distinguish Asperger's with associated visual-perceptual and attention deficits and verbal cognitive strengths from verbally gifted with NLD and ADHD
- “The process of differentiating the characteristics of AS, NLD, and a pragmatic language disorder arguably may be the most challenging diagnostic tasks in developmental-behavioral pediatrics.”

Stein MT, Klin A, and Miller K. Pediatrics 2004; 114:1458-1463

SPECIFIC LEARNING DISABILITY

- A deficit... an imperfect ability to ...
 - Listen, think, speak, read (dyslexia), write (dysgraphia), spell, calculate (dyscalculia)
- Significant discrepancy between learning potential (IQ) and academic achievement (generally > 1 SD difference)
- Unexpected UNDER achievement
- Not due to : MR, VI, HI, lack of opportunity

TREATMENT CONSIDERATIONS

- Non-MD Resources
 - Occupational/Physical Therapy
 - Language Therapy
 - Psychosocial Therapy
 - Education System
 - Social Work
 - Nutrition
 - Alternative Therapies

Classroom seating for children with attention deficit hyperactivity disorder: therapy balls versus chairs

RESULTS: Results demonstrated increases in-seat behavior and legible word productivity for the students with ADHD when seated on therapy balls. Social validity findings indicated that teacher and students preferred therapy balls.

CONCLUSION: This study provides evidence that use of therapy balls for students with ADHD may facilitate in-seat behavior and legible word productivity.

- Schilling DL, et al. Am J Occup Ther. 2003 Sep-Oct;57(5):534-41

ADHD and SI INTERVENTION

Preliminary findings from study of children with ADHD show that sensory intervention – for example, deep pressure and strenuous exercise -- can significantly improve problem behaviors such as restlessness, impulsivity and hyperactivity.

Of children receiving occupational therapy, 95% improved. This is first study of this size on sensory intervention for ADHD.

<http://news.bio-medicine.org/medicine-news-3/Study-finds-ADHD-improves-with-sensory-intervention-9921-1/>

PSYCHOSOCIAL TREATMENT

- Also called behavior therapy or behavior modification
- Only non-medical treatment for ADHD with large scientific evidence base
- Should be started as soon as the child receives a diagnosis

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

REASONING

- Children with AD/HD face problems beyond inattentiveness, hyperactivity and impulsivity
- Poor academic performance and behavior at school
- Poor peer and sibling relationships
- Failure to obey adult requests
- Poor relationships with parents

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

REASONING

- How a child with AD/HD will do in adulthood is best predicted by
 - whether his or her parents use effective parenting skills
 - how he or she gets along with other children
 - his or her success in school
- Behavioral treatments teach skills to child AND parents and teachers

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

TRAINED THERAPISTS

- Offer effective behavioral treatment
- Many psychotherapeutic treatments not proven including traditional individual therapy, in which a child spends time with a therapist or school counselor talking about his or her problems or playing with dolls or toys. "Talk" or "play" therapies do not teach skills and have not been shown to work.
- Psychiatrist, Psychologist, Social Worker, trained Educator, Licensed Professional Counselor

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

IMPLEMENTING

- 1. Start with goals that the child can achieve in small steps.
- 2. Be consistent -- across different times of the day, different settings, and different people.
- 3. Implement behavioral interventions over the long haul-not just for a few months.
- 4. Teaching and learning new skills take time, and children's improvement will be gradual

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

TEACHING PARENTS

- Establish house rules and structure
- Learn to praise appropriate behaviors (praising good behavior at least five times as often as bad behavior is criticized) and ignoring mild inappropriate behaviors (choosing your battles)
- Use appropriate commands
- Use "when-then?" contingencies (withdrawing rewards or privileges in response to inappropriate behavior)
- Plan ahead and work with children in public places

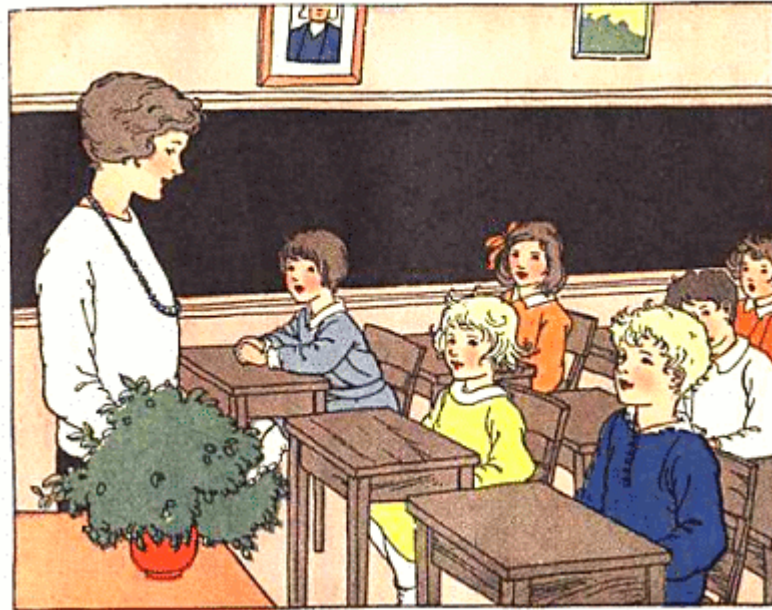
<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

TEACHING PARENTS

- Time out from positive reinforcement (using time outs as a consequence for inappropriate behavior)
- Daily charts and point/token systems with rewards and consequences
- School-home note system for rewarding behavior at school and tracking homework
- Some families can learn these skills quickly in 8-10 meetings; other families with most severely affected children require more time and energy.
- Parenting sessions usually involve an instructional book or videotape on how to use behavioral management procedures with children.

<http://www.help4adhd.org/en/treatment/behavioral/WWK7>

WORKING WITH THE EDUCATION SYSTEM



LD MANAGEMENT

- Demystify and educate
- Support groups
- Advocate for special education
- Educational strategies
 - Remediate (extra practice, flash cards)
 - Compensate (extra time, less work)
 - Circumvent (oral tests, audio texts)

SECTION 504

- Stems from federal law
- Individuals cannot be discriminated against because of their disabilities (ADHD is included in this).
- Does not automatically place adolescent under special education umbrella.
- Does allow modifications/plan to deal with disability, generally in a regular classroom.
- School districts may have Section 504 specialist

INDIVIDUALS WITH DISABILITIES EDUCATION ACT (IDEA)

- United States federal law amended 2005
- Ensures free, appropriate public education
- Least restrictive environment
- Requires public schools provide necessary testing and modifications for disabilities
- “Special Education”

Basic Process

- 1. “Child Find”**
- 2. Impact Meeting**
- 3. Adolescent is evaluated**
 - In all areas of suspected disability
 - Parents, teachers, MDs can request & ask school to pay
- 3. Eligibility is decided**
 - By team of qualified professionals
 - Parents can request hearing
- 4. Adolescent is found eligible for services**
 - IEP must be written

THE INDIVIDUAL EDUCATION PLAN

- 5. Services are provided according to the IEP**
- 6. Progress is measured and reported to parents.**
 - IEP is reviewed at least annually
 - Admissions, Review, Dismissal (ARD) Meeting
- 9. Adolescent is reevaluated**
 - At least every 3 years, more often if needed or if teacher or parent requests
- THE IEP IS KEY!!**

OTHERWISE HEALTH IMPAIRED

- Definition: a health condition that:
 - Adversely affects classroom performance
 - May decrease vitality
 - May decrease ability to pay attention
- Examples:
 - ADHD, asthma, SZ, CHD, CP, Developmental Coordination Disorder

AS PHYSICIANS WE MAY:

- 1) Recommend testing
- 2) Sign a form that allows a student to be placed in special education (OHI)
- 3) Attend the IEP meeting
- 4) Request the results of the testing (comprehensive education report) and IEP
- 5) Coach families as to their rights or refer them to an advocacy organization
- 6) Serve as a mediator between school and family,
- 7) Help monitor a student's progress.
- 8) Watch for co-morbidities

NUTRITION?

- **Food additives and hyperactive behaviour in 3-year-old and 8/9-year-old children in the community: a randomised, double-blinded, placebo-controlled trial.**
- **BACKGROUND:** Randomised, double-blinded, placebo-controlled, crossover trial to test whether intake of artificial food colour and additives (AFCA) affected childhood behaviour.
- **METHODS:** 153 3-year-old and 144 8/9-year-old children were included in the study. The challenge drink contained sodium benzoate and one of two AFCA mixes (A or B) or a placebo mix. The main outcome measure was a global hyperactivity aggregate (GHA), based on aggregated z-scores of observed behaviours and ratings by teachers and parents, plus, for 8/9-year-old children, a computerised test of attention.

McCann D et al Lancet 2007 Sep 5

NUTRITION?

- FINDINGS: Mix A had a significantly adverse effect compared with placebo in GHA for all 3-year-old children (effect size 0.20 [95% CI 0.01-0.39], $p=0.044$) but not mix B versus placebo.
- 8/9-year-old children showed a significantly adverse effect when given mix A (0.12 [0.02-0.23], $p=0.023$) or mix B (0.17 [0.07-0.28], $p=0.001$)
- INTERPRETATION: Artificial colours or a sodium benzoate preservative (or both) in the diet result in increased hyperactivity in 3-year-old and 8/9-year-old children in the general population.
- McCann D et al Lancet 2007 Sep 5

CAM

- *Complementary* interventions are not alternatives to multimodal treatment, but have been found by some families to improve the treatment of AD/HD symptoms or related symptoms.
- *Controversial* treatments are interventions with no known published science supporting them and no legitimate claim to effectiveness.

<http://www.help4adhd.org/en/treatment/complementary/WWK6>

THE FUTURE?

- **Breathing Meditation With Methylphenidate for Treatment of ADHD** (This study is currently recruiting participants.)
- **Herbal Treatment for ADHD** (This study has been completed.)
Sponsored by: [National Center for Complementary and Alternative Medicine \(NCCAM\)](#)
- **Nutrient Intake in Children With ADHD**
(This study is currently recruiting participants.) Sponsors and Collaborators: [National Center for Research Resources \(NCRR\)](#)
- **Transcutaneous Electrical Nerve Stimulation** A small study found a moderate benefit in children with ADHD, but further research is warranted before a firm conclusion can be drawn.

<http://www.intelihealth.com/IH/ihtIH/WSIHW000/8513/34968/363973.html?d=dmtContent>

WHAT ELSE IS OUR ROLE?

- Continuity of care over time
- Notify schools if additional testing needed
- Refer as necessary to OT, S&L, Therapists
- Advocate for further services (call teacher/counselor, write letters, attend meetings)
- Determine impact of disability on pt/family
- Provide information, support, and contact names and numbers for additional resources (local and national)