

# New Approaches to ADHD:

Addressing Patient Needs  
From a Whole-life Perspective

## Clinical Management Resources for ADHD

Previously Recorded Presentation With



Mark L. Wolraich, MD

Professor of Pediatrics  
Vanderbilt Child Development Center  
Nashville, Tennessee



Sponsored by the Pragmaton  
Office of Medical Education



Supported by an unrestricted educational  
grant from Eli Lilly and Company

# New Approaches to ADHD:

Addressing Patient Needs  
From a Whole-life Perspective

## Physician Accreditation Statement

The Pragmaton Office of Medical Education (POME) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians

## Physician Designation Statement

The Pragmaton Office of Medical Education designates this educational activity for a maximum of 1.0 hour in category 1 credit toward the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the activity.

## Pragmaton Office of Medical Education Mission Statement

Our mission is to promote excellence in continuing professional medical education by developing and implementing activities that meet national and regional healthcare needs. In these objective, fair, and balanced activities, we strive to transfer new knowledge and skills into the clinical setting, improve professional practice, and enhance patient care.

Areas of expertise include women's health, cardiology, neurology, psychiatry, endocrinology, and ophthalmology. Because of the scope and content of programming, the Pragmaton Office of Medical Education develops a variety of multidisciplinary activities for primary and specialty care physicians, nurses, pharmacists, and other allied healthcare professionals. Methods of educational delivery include live presentations, self-study materials, and interactive electronic media, including use of the Internet.

In addition, the Pragmaton Office of Medical Education has established collaborative relationships with nonaccredited providers who share our mission in meeting national and regional healthcare needs.

The Pragmaton Office of Medical Education, under the guidance of both a Physician and Pharmacist Advisory Board, is supported by Pragmaton's senior management and receives support and commitment from healthcare companies.

Conference content and discussions may include information regarding the use of products that may be inconsistent with or outside the approved labeling for these products in the United States. Participants should note that uses of these products outside the current approved labeling are considered experimental and are advised to consult prescribing information for these products.

## Instructions for Obtaining Continuing Medical Education Credit

To obtain category 1 AMA PRA credit, the physician should:

- (1) view the Internet program;
- (2) take the post-test\*; and complete the evaluation form for CME credit.

A permanent record of this CME activity will be kept by POME, and a certificate indicating 1 hour of category 1 AMA PRA credit will be issued.

***There is no charge for participating in this educational activity.***

\*A score of at least 70% on the post-test is required to earn CME credit.

## Target Audience

This program was created for physicians who have an interest in ADHD.

## Learning Objectives

After completion of this program, participants should be able to:

- Use effective clinical tools for the diagnosis of ADHD
- Formulate empirical and psychopharmacological treatment plans for patients with ADHD
- Describe emerging therapeutic options for patients with ADHD
- Identify practical management issues in the care of patients with ADHD

## Term of Offering

CME credit for this internet program will be available through September 1, 2002. The original release date of this material was June 4, 2001. CME credit is offered upon successful completion of the post-test.

## Pragmaton Office of Medical Education Faculty Disclosure Policy

It is the policy of the Pragmaton Office of Medical Education that faculty members of CME/CE-accredited programs must disclose any significant financial interest, arrangement, or affiliation with a corporate organization that may have an impact on the faculty member's presentation, such as grants, research support, honoraria, member of speakers' bureau, consultant, major stock shareholder, etc.

## Faculty Disclosure

**Mark L. Wolraich, MD** Formal advisor: Alza Pharmaceuticals; Shire Richwood Inc.; Noven Pharmaceuticals, Inc.; Eli Lilly and Company; East3, Ltd.; Help4life, Inc. Researcher: Alza Pharmaceuticals; Shire Richwood Inc.; Eli Lilly and Company. Educational consultant: Medical Education Systems, Inc. Speakers' bureau: Medical Education Systems, Inc.

## Clinical Management Resources for ADHD: Overview

- Use of effective diagnostic tools
- Formulation of treatment plans
- Existing and emerging therapeutic options
- Practical management issues in patient care

1

## History of ADHD

- 1960s
  - Minimal brain dysfunction
  - Minimal brain damage
  - Minimal cerebral dysfunction
  - Minimal cerebral damage
- 1970s
  - Hyperkinetic reaction of childhood
  - Hyperactive child syndrome
- 1980s-90s
  - Attention deficit disorder with/without hyperactivity
  - Attention deficit hyperactivity disorder

2

## CNS Function and Genetic Characteristics

3

- CNS activity
  - Decreased perfusion in the striatum<sup>1-3</sup>
  - Decreased size in frontal lobes, cerebellar vermis, basal ganglia, and corpus colosum<sup>4-6</sup>
- Genetic
  - Siblings at 2 to 3 times greater risk<sup>7-9</sup>
  - Increased occurrence in parents<sup>10,11</sup>
  - Moderate to high heritability in twins<sup>12-16</sup>
- Possible association with dopamine transporter gene (DAT1) and dopamine receptor (DRD4)<sup>17-20</sup>

References 1 through 20 are listed at the conclusion of this presentation.

## Clinical Assessment Tools

4

- School-related assessment from as many current and past teachers as possible
  - Reports of behavior, learning, attendance
  - Grades and standardized test scores
  - Teacher, counselor, social worker reports
- Parent reports/interview
- Patient interview
- Rating scales (many available)
- Observation (may be more useful for assessing medication response than for diagnosing)
- Medical and physical evaluation

## Child Diagnostic Interview

5

- Symptoms of ADHD
- Oppositional behavior
- Aggressive behavior
- Mood and affect
- Anxiety
- Obsessions or compulsions
- Form, content, and logic of thinking and perception
- Fine and gross motor coordination
- Tics, stereotypies, mannerisms
- Speech and language abilities
- Clinical estimate of intelligence

Dulcan M. *J Am Acad Child Adolesc Psychiatry*. 1997;36(10 suppl):85S-121S.

---

---

---

---

---

---

---

---

---

---

## Interview With Parents<sup>1</sup>

6

- Child's history
  - Developmental history
  - *DSM-IV* symptoms of ADHD<sup>2</sup>
  - *DSM-IV* symptoms of alternate or comorbid psychiatric diagnosis<sup>2</sup>
  - History of treatment for ADHD; details of medication trials
  - Areas of relative strength (talents and abilities)
  - Medical history
    - Primary diagnoses
    - Medications that may cause symptoms

1. Dulcan M. *J Am Acad Child Adolesc Psychiatry*. 1997;36(10 suppl):85S-121S.

2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Press; 1994.

---

---

---

---

---

---

---

---

---

---

## Interview With Parents<sup>1</sup> (cont'd)

7

- Family history
  - ADHD, tic disorders, substance abuse, conduct disorder, mood or anxiety disorders, schizophrenia
  - Developmental and learning disorders
  - Family coping style, level of organization, resources
  - Past and present family stressors, crises, changes in family constellation
  - Abuse or neglect
- Completion of standardized rating scale

1. Dulcan M. *J Am Acad Child Adolesc Psychiatry*. 1997;36(10 suppl):85S-121S.

## DSM-IV Diagnostic Criteria: Inattention Symptoms

8

- Careless mistakes
- Difficulty sustaining attention
- Seeming not to listen
- Failing to finish tasks
- Difficulty organizing
- Avoiding tasks that require sustained attention
- Losing things
- Easily distracted
- Forgetful

## ***DSM-IV* Diagnostic Criteria: Hyperactivity-Impulsivity Symptoms**

---

**9**

- Hyperactivity
  - Fidgeting
  - Inability to stay seated
  - Moving excessively
  - Always on the go
  - Difficulty playing quietly
  - Talking excessively
- Impulsivity
  - Blurting out answers
  - Difficulty waiting turn
  - Interrupting

---

---

---

---

---

---

---

---

---

---

## ***DSM-IV* Diagnostic Criteria: ADHD Symptoms**

---

**10**

- Present before age 7
- Present for 6 months or more
- Present in 2 or more settings
- Cause of significant impairment

---

---

---

---

---

---

---

---

---

---

## **DSM-IV Diagnostic Criteria: ADHD Subtypes**

**11**

- Predominantly inattentive: at least 6 of 9 inattentive symptoms
- Predominantly hyperactive-impulsive: at least 6 of 9 hyperactive-impulsive symptoms
- Combined: at least 6 of 9 inattentive and 6 of 9 hyperactive-impulsive symptoms

---

---

---

---

---

---

---

---

---

---

## **Basis for Treatment Decisions: Domains of Impairment**

**12**

- Peer relationships
- Adult relationships
- Family relationships
- School/occupational functioning
- Leisure activities

---

---

---

---

---

---

---

---

---

---

## Diagnostic Issues

13

- Dependent on reports of a child's behavior by multiple sources, especially parents and teachers
- Not clear how to handle parent/teacher discrepancies
- Because the symptoms fall within a spectrum, some children's ADHD falls close to diagnostic borderlines
- Behaviors are environmentally dependent and reports are subjective to some extent
- There are no specific and developmentally based criteria for defining inappropriate behavior

---

---

---

---

---

---

---

---

---

---

## Common Comorbid Conditions

14

- Disruptive behavior disorders
  - Oppositional defiant disorder
  - Conduct disorder
- Depressive disorders
- Anxiety disorders
- Tic/movement disorders
- Cognitive disorders
  - Learning disabilities
  - Language disorders

---

---

---

---

---

---

---

---

---

---

## Gender Distribution Within Subtypes

15

| Subtype               | M/F Ratio |
|-----------------------|-----------|
| Inattentive           | 2:1       |
| Hyperactive-impulsive | 3:1       |
| Combined              | 3:1       |

Wolraich ML, et al. *J Am Acad Child Adolesc Psychiatry*. 1996;35:319-323.

## ADHD: Contributing Factors

16

- Environmental factors: home
  - Family dysfunction
  - Parental psychopathology
  - Parenting skills
  - Poverty
- Environmental factors: school
  - Teacher skills
  - Class placement
  - Class structure
- Constitutional factors
  - Other disorders
  - Comorbidities
  - Intelligence
  - Social skills
  - Language skills

## Treatment Planning

17

- Establish target symptoms and baseline impairment
- Consider treatment for comorbid conditions
- Prioritize modalities to fit target symptoms and available resources
- Monitor multiple domains of functioning
  - Learning in key subjects
  - Academic productivity
  - Emotional functioning
  - Family interactions
  - Peer relationships
  - Height, weight, vital signs, laboratory parameters (if using prescription medication)

Dulcan M. *J Am Acad Child Adolesc Psychiatry*. 1997;36(10 suppl):85S-121S.

## Nonpharmacologic Approaches to Treatment

18

- Empirically supported
  - Parent training in child management
  - Classroom behavior modification
- Have some face validity
  - Classroom modifications/accommodations
  - Support groups (eg, CHADD, NADDA)
  - Family education
- “Unproven”
  - Diet management
  - Self-control/cognitive therapy
  - Play therapy
  - Psychotherapy
  - Sensory integration training
  - Biofeedback



## Stimulant Medications: Pros and Cons

21

- Positive characteristics
  - Mild, nonpermanent side effects
  - Large margin of safety
  - Most extensively studied therapy
- Limitations
  - Treatment is symptomatic
  - Treatment is nonspecific to ADHD
  - No proven long-term benefits
  - Contraindicated in some comorbid conditions (eg, anxiety disorders and tic disorders)

---

---

---

---

---

---

---

---

---

---

## Stimulant Medications: Myths and Misinformation

22

- Are addictive to children
- Have paradoxical or sedative effects
- Stunt growth
- Cause brain damage or long-term adverse effects

---

---

---

---

---

---

---

---

---

---

## Methylphenidate

23

- Onset of action: 15-20 minutes
- Duration of action
  - Regular form: 3-4 hours
  - Sustained-release form: 2-8 hours
  - Osmotic pump release form: 12 hours
- Initial dose: 5 mg, 1-3 times a day
- Increase dosage based on response, up to 0.8 mg/kg/dose

---

---

---

---

---

---

---

---

---

---

## Dextroamphetamine

24

- Onset of action: 15-20 minutes
- Duration of action
  - Regular form: 4-5 hours
  - Spansule capsules: 6-8 hours
- Initial dose: 5 mg, 1-3 times a day
- Increase dosage based on response, up to 0.4 mg/kg/dose

---

---

---

---

---

---

---

---

---

---

## Mixed Amphetamine Salts

25

- Onset of action: 15-20 minutes
- Duration of action: 6-8 hours
- Initial dose: 5 mg, 1-2 times a day
- Increase dosage based on response, up to 0.4 mg/kg/dose

---

---

---

---

---

---

---

---

---

---

## Pemoline

26

- Onset of action: 2 hours (after 2nd day of administration)
- Duration of action: 7-8 hours
- Initial dose: 37.5 mg, 1-2 times a day
- Increase dosage based on response, up to 3 mg/kg/dose
- Need to monitor liver function every other week
- Obtain written parental consent
- No longer a first-line treatment

---

---

---

---

---

---

---

---

---

---



## Stimulant Treatment Issues

29

- When do stimulant medications become performance-enhancing drugs?
- How to maintain compliance with treatment?
- When to discontinue therapy?
  - Temporarily (drug holiday)
  - Long-term

---

---

---

---

---

---

---

---

---

---

## Nonstimulant Therapy: Noradrenergic Compounds

30

- Antidepressants
- Bupropion
- Tricyclic compounds
- Alpha-2 agonists (clonidine, guanfacine)

---

---

---

---

---

---

---

---

---

---

## Emerging Therapeutic Options\*

- Transdermal patch
- D-isomer of methylphenidate
- Nonstimulant medications (eg, atomoxetine)

\*Not yet approved by the FDA.

31

## Summary

- ADHD is a *real* disorder that has a significant impact on daily functioning
- ADHD is a chronic condition that requires ongoing treatment and management
- ADHD has defined criteria so that an accurate diagnosis can be made
- Diagnosis requires obtaining information from more sources than just the parents
- It is important to identify comorbid conditions
- Both stimulant medications and behavioral therapy have been found to be efficacious in treating patients with ADHD

32

---

## References (slide 3)

1. Lou H, et al. *Lancet*. 1990;335:8-11.
2. Vaidya CJ, et al. *Proc Natl Acad Sci USA*. 1998;95:14494-14499.
3. Zametkin A, et al. *Arch Gen Psychiatry*. 1993;50:333-340.
4. Hynd G, et al. *J Child Neurol*. 1993;8:339-347.
5. Aylward EH, et al. *J Child Neurol*. 1996;11:112-115.
6. Castellanos FX, et al. *Arch Gen Psychiatry*. 1996;53:607-616.
7. Biederman J, et al. *J Am Acad Child Adolesc Psychiatry*. 1990;29:526-533.
8. Morrison JR, Stewart MA. *Biol Psychiatry*. 1971;3:189-195.
9. Cantwell DR. *Arch Gen Psychiatry*. 1972;27:414-417.
10. Morrison JR, Stewart MA. *Arch Gen Psychiatry*. 1973;28:888-891.
11. Alberts-Corush J, et al. *Am J Orthopsychiatry*. 1986;56:413-423.
12. Goodman R, Stevenson J. *J Child Psychol Psychiatry*. 1989;30:691-709.
13. Gillis JJ, et al. *J Abnorm Child Psychol*. 1992;20:303-315.
14. Gjone H, et al. *J Am Acad Child Adolesc Psychiatry*. 1996;35:588-596.
15. Levy F, et al. *J Am Acad Child Adolesc Psychiatry*. 1997;36:737-744.
16. Sherman DK, et al. *J Am Acad Child Adolesc Psychiatry*. 1997;36:745-753.
17. Cook EH, et al. *Am J Hum Genet*. 1995;56:993-998.
18. Gill M, et al. *Mol Psychiatry*. 1997;2:311-313.
19. Giros B, et al. *Nature*. 1996;379:606-612.
20. Swanson JM, et al. *Mol Psychiatry*. 1998;3:38-41.