

## ADHD: OVERVIEW AND RECENT DEVELOPMENTS

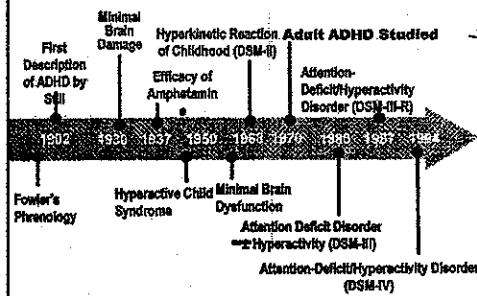
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### HISTORY OF ADHD

#### Diagnostic Terms

- *Defective moral control (1902)*
  - *3 lectures given to the Royal Society of Medicine by Still (also see Crichton, 1798)*
- *Post-encephalitic behavior disorder (1920s-30s)*
- *Minimal brain damage and dysfunction (1950s-70s)*
- *ADD with or without hyperactivity (1980)*
- *ADHD : DSM-IV (1994)*

### ADHD: Timeline of Definitions



### CORE SYMPTOMS

- *Poorly sustained attention*  
*5-7 years first appears*
- *Impulsivity*  
*2-4 years first appears*
- *Hyperactivity*

### COMMON DEVELOPMENTAL FEATURES

- *Onset in early childhood (mean 4 years)*
- *Relatively chronic over time*
- *Pervasive across situations*
- *Deviant from age-based standards*
- *Excludes autism, psychosis, severe MR*
- *Often comorbid with other psychiatric/ learning problems*

### PREVALENCE AND SEX RATIOS

- *3-5% children*
- *Varies slightly across social class*
- *Male:Female is 3-1 in community*  
*6:1 to 9:1 in clinic*
- *30% to 40% of referrals*
- *Found in all countries/ethnic groups*  
*Highest in US*

### **DIAGNOSIS**

#### *Important aspects*

- **Parent interview**
- **Behavior rating scales**
  - **Teacher, parent, and adolescent**
  - **Broad spectrum and specific (e.g., ADHD rating scale)**
- **Parent self report**
- **Objective assessment devices**
  - **Continuous Performance Test**
- **LD testing as indicated**
- **Child/adolescent interview**

### **ASSOCIATED PROBLEMS**

#### *Psychiatric*

- **Oppositional/Defiant (60%)**
- **Conduct Disorder (45%)**
- **Anxiety Disorder (0-30%)**
- **Major Depression (0-33%)**

### **ASSOCIATED PROBLEMS**

#### *School/Cognitive*

- **Under-productivity in school (90%)**
- **Learning Disabilities (25 - 35%)**
- **Low Average Achievement Levels**
- **Low Average Intelligence (over time)**

### **ASSOCIATED PROBLEMS**

#### *Emotional*

- **Immaturity (50%+)**
- **Overreaction to situations**
- **Low Frustration Tolerance**
- **Poor self-esteem and demoralization**

### **ASSOCIATED PROBLEMS**

#### *Social Skills*

- **Selfish/Self-Centered**
- **Rejected because of intrusive behavior**
- **Little regard for social consequences**
- **Immature/Social interests**

### **ASSOCIATED PROBLEMS**

#### *Medical*

- **Demanding early temperament**
- **Immature motor coordination (30-60%)**
- **Greater enuresis/ encopresis (10-20%+)**
- **More somatic complaints**
- **More allergies, colds, URI's, Otitis**
- **Sleep disturbance**
- **Accident proneness**

**DEVELOPMENTAL COURSE**

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*ADHD symptoms*

*Absolute level declines*

- 70 - 80% fully ADHD in teens
- 50 -60 % fully ADHD as adults

**DEVELOPMENTAL COURSE**

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*Conduct problems*

- Antisocial personality (25%+)
- More traffic citations (4x)
- Police involvement (50%)
- Physical aggression (20% past 3 yrs.)

**DEVELOPMENTAL COURSE**

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*Educational attainment*

- Fail to complete HS (35%)
- More grade retention (25-35%)
- More school expulsions
- Persistence of learning disorders

**DEVELOPMENTAL COURSE**

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*Employment functioning*

- As teens, function as well on the job
- As adults, rated worse in job functioning
- Change jobs more often
- Most are able to be self-supporting

**DEVELOPMENTAL COURSE**

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*General outcome*

- 60-70% have a satisfactory outcome
- Most are living on their own and self-supporting
- As a group, are less educated and under-employed
- ADHD continues to affect the fabric of daily living

**PROPOSED CAUSES**

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*Neurological*

- Brain damage (3-5%)
- Neurochemical abnormalities (likely but not yet definitive)

**PROPOSED CAUSES**

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*Genetic*

**Familial-hereditary transmission (55-92%)**

**PROPOSED CAUSES**

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*Psychosocial*

- **Chronic stress**
  - *No evidence...more related to ODD/mood disorder*
- **Poor child management (no evidence)**
- **Family dysfunction (no evidence)**

**PROPOSED CAUSES**

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*Toxins/allergens*

- **Food additives (disproven)**
  - *May exaggerate symptoms in preschoolers*
- **Side effects of sedatives**
- **Lead exposure (weak relationship)**
- **Prenatal exposure to tobacco/alcohol**
  - *Significant link*

**PROVEN TREATMENTS**

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- **Parent counseling about ADHD and ODD**
- **Parent training in child management**
- **Parent training in adolescent management**
- **Pharmacological therapies**

**PROVEN TREATMENTS**

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*Continued*

- **Teacher counseling about ADHD**
- **Individual counseling**
- **Teacher training in classroom management**
- **Special Residential treatment**
- **Parent/family interventions**
- **Parent support groups**

**UNPROVEN OR DISPROVEN TREATMENTS**

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*From Barkley*

- **Dietary management**
- **Megavitamins**
- **Sensory-integration treatment for ADHD**
- **Chiropractic manipulations**

**UNPROVEN OR DISPROVEN TREATMENTS**

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*Continued*

- *Ocular motor exercises*
- *Traditional play therapy*
- *Relaxation training/EMG*
- *Neurofeedback (EEG training)*
- *Self-control/social skills training in clinics*

**PHARMACOLOGICAL TREATMENTS**

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*Stimulants*

- *Ritalin (77% positive response)*
- *Dexedrine (74%)*
- *Cylert (73%)*
- *Adderall*
- *Concerta*
- *Placebo rate is 35%+*
- *Effect size for stimulants is among the largest of any drug for any psychiatric disorder*

**“Five P’s of Delivery**

- *Pills (immediate release form of MPH or AMP)*
- *Pumps (osmotic system of Concerta)*
- *Pellets (Adderall XR)*
- *Skin Patch (Daytrana)*
- *Pro-drug (Vyvanse)*

**BEHAVIORAL EFFECTS**

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*Stimulants*

- *Increased attention span and concentration*
- *Decreased Impulsivity*
- *Decreased aggressiveness*
- *Decreased task-irrelevant activity*
- *Improved handwriting and fine motor skill*
- *Improved peer relations*

**SIDE EFFECTS**

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*Stimulants*

- *Insomnia and decreased appetite (50-60%)*
- *Headaches and stomach aches (20-40%)*
- *Prone to crying (10%)*
- *Nervous mannerisms (10%)*
- *Tics (<5%) and Tourette=s (very rare)*
- *3% fail to tolerate any dose*

**SIDE EFFECTS**

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*Stimulants continued*

- *Mild weight loss (1st 2 years)*
- *No effect on skeletal growth*
- *Mild increase in heart rate and blood pressure*
- *Cylert affects liver functioning and need monitoring*

### Non-stimulant Medication

- o Atomoxetine (aka Strattera)
  - o Why the need?
    - o Not all respond to a stimulant
    - o 3-8% cannot tolerate any dose
    - o Limited abuse or diversion potential
    - o May help treat other associated conditions
    - o Parents benefited by early evening and sleep improvement
  - o Treatment effects not as large

### Collaborative Multisite Multimodal Treatment Study of Children with ADHD (MTA; 1999)

- Sponsored by NIMH
- 579 ADHD children in 1<sup>st</sup> through 4<sup>th</sup> grade at 6 sites
- Four treatment groups
  - Med Mgt: Medication management
  - Beh: Multicomponent behavior therapy
  - Comb: Combined
  - CC: Community Care

### Collaborative Multisite Multimodal Treatment Study of Children with ADHD (MTA)

- ▣ Treatment Groups
  - MedMgt (Medication Management): 3 x a day dosing, 7 days a week, and monthly 30 minute clinic visit
  - Beh (Behavior Therapy): 27-session group parent training with 8 individual sessions, 8 week summer program, 12 weeks of classroom administered behavior therapy with half-time aide and 10 teacher consultations
  - Comb (the above combined)
  - CC: Community Care

### Collaborative Multisite Multimodal Treatment Study of Children with ADHD (MTA)

- ▣ Findings After 14 months of treatment
  - ▣ All groups showed improvement
  - ▣ Comb and MedMgt showed greater improvement than Beh or CC
  - ▣ Comb and MedMgt did not differ
  - ▣ Comb only superior to Beh and CC on isolated measures, e.g., teacher rated social skills
  - ▣ Addition of behavior therapy to medication did not provide for a significant increment!

### Resulting change in treatment to favor medication

- ▣ JAACAP (July 2004)
  - "no support for adding ambitious, long-term, psychosocial interventions" to improve ADHD
  - There was no support for added benefits from academic assistance in this group of children with ADHD
  - There was no support that educational interventions enhanced academic achievement or emotional adjustment

### Trends in Medication Use

- ▣ Before MTA, Concerta and Adderall XR
  - Most children medicated 1-3 years
  - Most of during the summer and weekends
  - Modal Daily Dose of MPH: 15 to 20 mg
  - Lifetime dose of MPH: 5400 to 10,800 mg
- ▣ After MTA, Concerta and Adderall XR:
  - Weekends and summers medicated
  - Equivalent daily dose: 36 mg of Concerta
  - Start med's early and continue through school years
  - Lifetime dose: 14,600 mg per year x 12= 175,000 mg of MPH

### Back to MTA Follow Up

- ▣ Findings 10 months after treatment ended. 2 years after initiation
  - First follow up: One/half of treatment advantage for MedMgt and Comb disappeared
  - Second follow up (22 months after treatment ended): No longer significant differences between the groups

### Six and Eight Years after follow-up (JAACAP, 2009)

- ▣ No appreciable difference based on initial assignment
- ▣ The MTA group as a whole was functioning significantly less well than the non-ADHD classmate sample (recruited at 24 months)
- ▣ Initial ADHD presentation (symptoms, conduct problems, social advantage) was a better predictor of treatment that type of treatment received for 14 months

### Collaborative Multisite Multimodal Treatment Study of Children with ADHD (MTA; JAACAP, 2009)

- ▣ Children taking medication 6 to 8 years later did not fare any better than their non-medicated counterparts
  - This is despite a 41% increase in daily dosing and use of extended formulations
- ▣ Although symptoms improved from baseline, normalization was not achieved
  - ADHD children performed more poorly on 91% of the variables
  - But only 30% maintained diagnostic status at 8 years
- ▣ Measurement of functioning and not symptoms is more critical for the study of ADHD

### Whither psychosocial interventions?

- ▣ Pelham et al (2008)
  - If behavioral treatments are started first and continued, 50-75% of ADHD children do not need medication and doses are lower in those who do need medication
  - For children who need both, multimodal interventions produce better results acutely (especially impairment), fewer SE's, lasting behavioral effects if medication is withdrawn, and are more often preferred by parents

### Example of standard behavior modification (Pelham)

- ▣ 12 sessions of group parent training followed by monthly group booster training for 3 years
- ▣ Up to 4 individual parent sessions per year, initiated when problems arise
- ▣ School intervention including daily report card and low intensity procedures (classroom rules, sit-outs, commands)
- ▣ 3 initial meetings with teacher to establish program + up to 4 individual session per year
- ▣ Weekly social skills training conducted along with the initial 12 parent training sessions

### Recommendations for ADHD

- ▣ Shift to evaluation of impairment in daily skills and monitor to assess treatment effects
- ▣ Consider behavioral treatments first, depending on severity.
- ▣ Dose low (not optimally) to minimize SE's and so as not to remove need for behavioral and educational treatments
- ▣ Treat for settings and domains of impairment

### Recommendations for ADHD

- ❑ Start psychosocial treatments early and continue
  
- ❑ Interventions need to be feasible and palatable for families
  
- ❑ Effective treatment requires collaboration between systems

### Recommendations for ADHD

- ❑ Academic skill development can be preventive to work production problems and demoralization
  
- ❑ ADHD is a chronic disorder
  - Ultimately self-awareness and self-regulation are critical

### Internet Sites

- ❑ CHADD
  - <http://www.chadd.org/>
- ❑ National Resource Center on ADHD
  - <http://www.help4adhd.org/>
- ❑ Additudemag.com
  - <http://www.additudemag.com/selfhelp.asp>
- ❑ Downloads for assessment of children from Mass General Hospital
  - [http://www2.massgeneral.org/schoolpsychiatry/screeningtools\\_table.asp](http://www2.massgeneral.org/schoolpsychiatry/screeningtools_table.asp)
- ❑ Downloads for behavior treatments (University of Buffalo-State University of New York)
  - [http://ed.buffalo.edu/resources\\_downloads.php](http://ed.buffalo.edu/resources_downloads.php)
- ❑ Also: Useful Text
  - How to reach and teach children with ADD/ADHD (2005) by S.F. Rief  
ISBN: 0-7879-7235-9

Thank you

## Internet Sites

- ☐ CHADD
  - <http://www.chadd.org/>
- ☐ National Resource Center on ADHD
  - <http://www.help4adhd.org/>
- ☐ Additudemag.com
  - <http://www.additudemag.com/selfhelp.asp>
- ☐ Downloads for assessment of children from Mass General Hospital
  - [http://www2.massgeneral.org/schoolpsychiatry/screeningtools\\_table.asp](http://www2.massgeneral.org/schoolpsychiatry/screeningtools_table.asp)
- ☐ Downloads for behavior treatments (University of Buffalo-State University of New York)
  - [http://ccf.buffalo.edu/resources\\_downloads.php](http://ccf.buffalo.edu/resources_downloads.php)
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