

Attention Deficit Hyperactivity Disorder (ADHD) and Schools: Outline Focused on Key Questions and Concerns

The outline that follows is designed as a starting point for individuals and groups wanting to begin an investigation into or just beginning to think about a presentation on Attention Deficit Hyperactivity Disorder (ADHD) as related to schools. It is organized to highlight key questions and concerns surrounding the topic.

Some data and content notes are provided. These are drawn from a variety of resources, all of which are cited in the list of references. These notes are meant mainly as an aid in preparing a presentation.

Major Questions an investigation or presentation should minimally address:

- *How many students are diagnosed?*
- *What factors contribute to errors in diagnosing ADHD (false positives and false negatives)?*
- *What are the common interventions?*
- *What interventions are seen as not effective?*

Key concerns minimally include:

- *diagnosis*
- *medication*
- *behavior control strategies*

*The information presented here was culled from the literature and drafted by Stephanie Moore as part of her work with the national Center for Mental Health in Schools at UCLA.

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I. How Many Students are Diagnosed?

A. Overall Reported Prevalence and Incidence Data

Data: > *DSM-IV-TR* reports prevalence of 3-7% of school age children meet criteria.

> CDC reports that incidence rate increased an average of 3% per year between 1997 and 2006 and that prevalence of ADHD increased among children aged 5-17 years from 6.9% to 9.0% from 1998-2000 through 2007-2009 (Bloom, Cohen & Freeman, 2009; Akinbami, Liu, Pastor & Reuben, 2011).

Notes: > Over the years, the incidence rate has been reported to range from 1% to 20%; the differences in reporting are due to use of different criteria, methodologies (e.g., nonrandom sampling, relying on a single information source), misdiagnoses, etcetera (Scuitto & Eisenberg, 2007).

> CDC notes that for their 2011 report, the authors were unable to determine if the increase in prevalence was indicative of a true increase in the prevalence of ADHD or due to increased detection and diagnosis (Akinbami, Liu, Pastor & Reuben, 2011).

B. Disaggregated Data

Data: > CDC reports:

- Boys are more likely than girls to have ever been diagnosed.
- Adolescents ages 12-17 are more likely than younger children to have ever been diagnosed ("Data & Statistics," 2011).
- Hispanic children were less likely than African American children or Caucasian children to have ADHD (Bloom, Cohen, & Freeman, 2009).

> While there is always controversy about disparities, a body of data has been gathered that indicates that African American and Hispanic children are disproportionately diagnosed with ADHD in comparison to their Caucasian peers (Frye, 2010; LeFever, Arcona, & Antonuccio, 2003). A 2007 study reports that 8.7% of African American children, 6% of Hispanic American children, and 9.8% of White children are diagnosed with ADHD and that African American and Hispanic American children are over diagnosed (Froehlich, Lanphear, Epstein, Barbaresi, Katusic & Kahn, 2007). At the same time, some researchers suggest that African American and

Hispanic children who have ADHD are being ignored; and some in the African American community are reported as not viewing ADHD as a legitimate disorder and the use of medication as being an inappropriate social control strategy (Olaniyan, DosReis, Garriett, Michailyszyn, Anixt, Rowe & Cheng, 2007).

>Ethnic minority children are being treated at lower rates and African Americans are less likely to request treatment information for both medication and school intervention (Rowland, Umbach, Stallone, Naftel, Bohlig, & Sandler, 2002; Frye, 2010).

Notes: >Researchers have found differences related to student age in a classroom cohort, school environment, and family characteristics (Schneider & Eisenberg, 2006).

>Racial differences in health and treatment rates are noted in many studies; in addition to financial barriers, some attribute the disparities to racism and cultural differences (Maddox, 2003; Olaniyan et al., 2007; Rowland, Umbach, Stallone, Naftel, Bohlig, & Sandler, 2002).

>Differences in treatment rates could also be due to concern about stigma and lack of trust of medical professionals among ethnic minority groups, particularly African Americans (Frye, 2010).

C. Comorbidity Data

Data: As many as 75% of children with ADHD meet criteria for another DSM disorder diagnosis.

Notes: The most common comorbid conditions contain symptoms that overlap with the criteria for ADHD, such as the inability to sustain attention which is common when experiencing stress and for those with depression or anxiety and noncompliance which is a defining symptom of conduct disorder or oppositional defiant disorder (ODD) (Scuitto & Eisenberg, 2007).

For more statistics, see the National Resource Center on AD/HD About ADHD page - <http://www.help4adhd.org/about/statistics>

II. What Factors Contribute to Errors in Diagnosing ADHD? (false positives and false negatives)

A, Assessment Practice Limitations

Notes: >There is variability in assessment procedures used to identify ADHD and more comprehensive evaluations need to be conducted to prevent false positives and false negatives (Scuitto & Eisenberg, 2007).

>Currently, no one test, assessment, or interview method can say without a doubt that a student has ADHD (Emphasized in most reviews – see reference list).

>According to Froehlich and Colleagues (2007), assessments used to diagnose ADHD are culturally insensitive.

>It is worth noting that during the four stage participant screening process for the Multimodal Treatment Study of ADHD (MTA), the researchers excluded 79 of 929 children who made it to stage 3 of screening because diagnostic interview criteria were not met (MTA Cooperative Group, 1999). All participants were recruited via mental health settings, pediatricians, advertisements, and school settings, suggesting that all potential participants were initially believed to have or were already diagnosed with ADHD. The 79 children ruled out for study participation may represent useful data about false positives; more research into the prevalence of false positive ADHD diagnoses needs to be conducted.

B. Factors Influencing Demographic Differences (besides diagnostic errors related to race and economics)

Notes: >Gender disparity –girls usually have more inattentive symptoms which are not as disruptive and, therefore, less likely to be noticed.

> Certain child factors, like age of entrance into kindergarten, appear to systematically influence diagnosis (Elder, 2010; Evans, Morril, & Parente, 2010).

- One's age relative to his or her classmates, more specifically their birth date in relation to the cutoff date for entrance into kindergarten, does influence the likelihood for diagnosis with ADHD and subsequent treatment with stimulant medication. Essentially, many children may be misdiagnosed. Children who

are the youngest in their class, born just before the cutoff date, are more likely to be diagnosed with ADHD than children who are the oldest in their class, those born just after the cutoff date who must start school the following year, even when these children have similar demographic characteristics.

- Researchers suggest that this is due to relative immaturity of younger children in comparison to the older children in their class. Therefore, their immature behavior is mistaken as ADHD-like behaviors when compared with older, more mature children.
- Furthermore, this means that older-for-class children who have ADHD may be underdiagnosed, or under identified, as their behavior may seem “normal” in comparison to their younger classmates. (Elder, 2010).

C. Motivation

Notes: > Motivation is a driving force in behavior. One researcher has suggested that individuals with ADHD have motivation deficiencies due to disruptions in the reward system in the brain (Low, 2009). Others suggest that motivational deficiencies stem from loss of interest (Barkley, 2007).

>The following questions, however, have yet to be well-researched.

- How does motivation relate to ADHD symptoms – inattention/activity expressed in the classroom?
- How does motivation relate to and influence interventions for ADHD/ADHD-like behaviors?
 - o Does ADHD lead to lack of motivation?
 - o Does deficient motivation (and associated consequences) lead to ADHD diagnosis?
- Is it ADHD or are children in classrooms disengaged/unmotivated?

D. What about false positives and possible overdiagnosis?

Notes: >Comorbidity of ADHD with other disorders can make ADHD hard to differentially diagnose and may lead to false positives.

>Findings reporting over-diagnosis are obscured when reported without the context of geographic location, gender, and age (LeFever, Arcona, & Antonuccio, 2003)

>Many speculate about the reasons for the increase in ADHD diagnosis: while some argue that increases are due to overdiagnosis and to ADHD being a “fad,” others suggest increases are due to better diagnostic tools, increased awareness, and better access to special services if diagnosed (Pacana, 2011).

>Diagnostic inaccuracy, influenced by comorbidity and including variability in assessment procedures, may also lead to incorrect diagnosis.

>Detection of false positives has not been a major focus of research or practice (Scuitto & Eisenberg, 2007).

E. What about false negatives and possible underdiagnosis?

Notes: >Gender differences in symptom presentation may lead to false negatives for girls.

- Boys with ADHD usually display more hyperactive/impulsive behaviors while girls tend to be more inattentive, have more internalizing symptoms, and more social impairment. Therefore, boys are more likely to be referred by teachers for diagnosis and subsequently diagnosed with ADHD while girls with ADHD, whose inattentive symptoms are less noticeable, are less likely to be noticed by a busy classroom teacher or parent as their behavior is not as disruptive to others (Scuitto & Eisenberg, 2007).

>Subgroup norms

- Failure to use sex-specific norms is more likely to result in under identification of girls than over identification of boys (Scuitto & Eisenberg, 2007).

III. What are the Common Interventions?

A. About Access to Treatment

Data: >More than 50% of children with mental health needs do not receive any form of treatment.

Notes: >Access to health care differs according to many factors like gender, age, race, ethnicity, and insurance (Scuitto & Eisenberg, 2007).

B. Medication

Data: >CDC reports that, as of 2007, parents of 2.7 million youth ages 4-17 years (66.3% of those with a current diagnosis) reported that their child was receiving medication treatment for the disorder.

> In a study tracking medication use for ADHD over a 12 year period, use of ADHD drugs was the highest among youth aged 6 to 12, rising slightly from 4.2 percent in 1996 to 5.1 percent 12 years later. The most pronounced rise was in older children aged 13 to 18, however. In that group, use of ADHD drugs more than doubled -- from 2.3 percent in 1996 to 4.9 percent in 2008 (Zuvekas & Vitiello, 2012).

>Stimulant studies have reported effects in hundreds of controlled laboratory studies (Pliszka, 2007).

>Findings from the influential MTA research (e.g., Multimodal Treatment of Attention Deficit Hyperactivity Disorder Study, 1999) indicated that combination medication and behavioral treatment and medication treatment alone were more effective in symptom reduction than behavioral treatment alone. Combined medication and behavior treatment were reported to lead to the greatest improvements in other areas of functioning (e.g., on limited measures of anxiety, academic performance, parent-child relations, and social skills).

Note: Medication treatment may have been more effective in the MTA study because doctors were highly involved in the treatment of their young patients and treatment was more intensive.

>Other studies also suggest that medication alone may not be enough to both reduce symptoms *and* improve functioning – therefore, medication treatment alone may be insufficient to improve student learning (Lopez-Duran, 2010). For example, Epstein et al. (2010) found that medication led to significant symptom reduction but not to significant improvements in functioning (e.g., academic performance, social relationships, and familial relationships). One interpretation offered is that the students functioning improved, but still remained impaired (i.e., was not “normalized” compared to that of peers).

>There have been few longer-term studies examining the effects of stimulant medications. A 1993 review focusing on studies reporting

learning and achievement outcomes found that, overall, substantial benefits were indicated for daily classroom behavior, but not for achievement over periods ranging from months to years (Carlson & Bunner, 1993). The reviewers reported:

- Short term effects of methylphenidate (MPH) were discussed to include academic performance in the areas of classroom behavior and productivity, as well as math, reading, spelling, general workbook tasks, and quiz and test performance. Most tasks studied, however, seemed to involve simple arithmetic and reading or laboratory tasks, suggesting that further research needs to be conducted for more advanced skills and higher order learning.
- Most of the studies reviewed were conducted with elementary aged boys with ADHD; fewer were conducted with young adolescents (ages 12-14). Studies conducted with adolescents found some improvement on history tests and quizzes and on cognitive tasks in the laboratory. In several studies, the medication effects on laboratory tasks did not correlate with improvements in classroom tasks (Carlson & Bunner, 1993).

Notes: > Treatments often must be combined and maintained over time to maintain initial treatment effects.

>The American Academy of Pediatrics (2011) recommends that medication be used in combination with behavior management to address a wider range of symptoms and so that lower doses of medication can be used.

>Other, nonstimulant types of medications also are often used if stimulant medications do not work. These include: dextroamphetamine and mixed amphetamine salts (Adderall), antidepressants, atomoxetine (Strattera), and antihypertensives.

>When reviewing literature concerning the effects of medication on school or academic performance, take note of age of study participants and tasks to be completed. Medication efficacy (tested in the lab) is not equivalent to medication effectiveness (effects outside of the lab, in real world/non-controlled settings). Similarly, effects of medication on performance of simple arithmetic or reading tasks should not be generalized to potential effects on higher order learning (i.e., algebra or reading comprehension).

>Controversies

- Many critics are concerned about side effects of medication and whether young children should be medicated. Researchers still need to answer the question: What are the long-term effects of medication usage?
- Medications are very widely used and demonstrate some symptom reduction, but research still needs to clarify whether the benefits outweigh the costs.
- Critics raise red flags about practices that suggest some students should be medicated during school hours, but don't need it otherwise.

C. Behavior Management/Behavioral Therapies and Cognitive Therapy

Data: >Behavior therapy alone was found to be less effective than medication alone or combination treatment in the MTA study (Multimodal Treatment, 2009).

>Children with comorbid disorders and who have fewer family resources are reported to be more likely to benefit from combined and behavioral treatments (MTA Cooperative Group, 1999).

>Research suggests that improvements of behavioral methods may be limited to the setting (e.g., home, school) in which the intervention occurs (e.g., see Barkley, 2006).

Notes: >Behavior management techniques involve using reinforcement contingencies (e.g., rewards, aversive stimuli) and often are used by teachers and parents to modify student behavior. The focus is on using rewards to increase wanted behavior (e.g., paying attention in class, staying in seat, bringing homework to and from school) and implementing consequences/punishment (e.g., taking away privileges, sending to "time out") to decrease unwanted behaviors (e.g., climbing on furniture, talking out of turn, forgetting assignments). Examples include: implementing structure and routine, use of contingency management or a token economy (stickers, prizes, etc.). Relatedly, teachers are expected to make some accommodations for individual differences that enable students to function effectively, such as, in the classroom, simplifying instructions, varying pace and type of assignment, and teaching the most difficult concepts early in the day (U.S. Department of Education, 2008).

>The American Academy of Pediatrics (2011) recommends behavior management as the preferred treatment for preschool age children and its use in combination with medication for school-age children and adolescents.

>Some experts believe that behavior and cognitive therapies may be able to replace high doses of stimulant medication and may also have long term benefits. For example, teaching good study habits to students early to implement throughout the remainder of their education or implementing cognitive therapy to increase cognitive control, ultimately leading to improved attention (SciCurious 2012).

D. Public and Parent Education

Data: >Public education focuses on encouraging early identification and treatment of ADHD. The emphasis is on common symptoms, causes, types of treatment, and prognosis, as well as addressing common misconceptions.

>Parent education about ADHD and its management is widely advocated and implemented alongside other forms of treatment (Barkley, 2006).

Notes: >Public and parent education should include explanation of the range of interventions available (e.g., accommodations at school, family counseling, special education services if needed, behavioral techniques, medication considerations, therapies, etc.)

>The following strategies for addressing problems associated with ADHD are prominently recommended to parents by clinicians:

- Use of behavioral techniques to enhance structure and communication (e.g., establishing routines for morning, after school, evening, bedtime; charting behavior; systematic use of rewards and punishments for behavior; using directives instead of questions; being specific and concrete; ensuring expectations and consequences are developmentally appropriate; stating consequences and consistently following through)

E. Education for Teachers and Other School Staff

Data: >Given that it is important that teachers and school staff are informed and willing to work with students with ADHD, researchers have studied the matter. Not surprisingly, findings indicate that while one

day presentations can convey basic information about the disorder, more extensive training is needed for teachers to understand how to teach students diagnosed as ADHD (Pfiffner, DuPaul, & Barkley, 2006).

>Researchers also advocate for ongoing consultation and evaluation at schools as essential (Pfiffner, DuPaul, & Barkley, 2006).

Notes: >Efforts to inform school staff about ADHD include providing information so that teachers and other staff avoid prematurely viewing certain symptoms as indications of ADHD. This involves addressing common misconceptions, distinguishing common symptoms from ADHD symptoms, understanding causes and what teachers should do in the classroom, etc. School staff also need to understand other types of school interventions, how to problem solving with families, etc.

>The following strategies for addressing problems associated with ADHD are prominently recommended (e.g., U.S. Department of Education, 2008a,b):

- Personalized strategies for preventing problems and managing those that arise; enhancing the range of options for learning and special assistance; working as a team to support the student; seeking student input; working on difficult concepts early in the day; varying pace and type of activity; structuring the environment and lessons to accommodate special needs.

F. Unvalidated Interventions

Data: > Elimination diets show little or no effect in treating ADHD. Data show no effect on behavior or cognition of children from sugar withdrawal and small effects on hyperactivity of elimination of artificial food colorings (Ballard, Hall, & Kaufmann, 2010). Further, supplementing fatty acids also was not shown to improve symptoms.

Notes: >Interventions whose effectiveness has not been supported with empirical evidence include dietary management (e.g., removing sugar from the diet, high doses of vitamins/minerals/trace elements), long-term psychotherapy/psychoanalysis, biofeedback, play therapy, chiropractic treatment, sensory-integration training (Barkley, 2006).

>The American Academy of Pediatrics asserts that there is no need for rigorous study of occupational therapy, biofeedback, vitamins, herbs, and food supplements as these interventions are not presently supported by evidence-based studies.

A Special Note About Outcome Research

It is important to recognize that studies of outcomes and negative side effects have mostly been short term, often done under laboratory conditions, and have used limited measures of impact.

Clearly, longitudinal data are needed before any practice can be designated as proven. And as noted above, studies done in lab settings may not prove effective in schools. Finally, measures of effectiveness need to focus not just on symptom reduction and reduced behavior problems but also on important indices of improved cognitive and social-emotional learning. This means more than measuring improvement on simple learning tasks (e.g., arithmetic or reading fundamentals) and moving on to assess effects on higher order learning (i.e., algebra, reading comprehension, interpersonal relationships). And it means measuring long-term negative side effects. Until all this is done, it is premature to suggest that current measures of impact are adequate empirical support for any practice.

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Additional Resources

See the Center for Mental Health in Schools Online Clearinghouse Quick Find for ADHD - http://smhp.psych.ucla.edu/qf/p3013_01.htm

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