

An Update on ADD/ADHD for Educators

Thomas E. Brown, Ph.D.

As a new school year begins, many parents of children or adolescents with ADD/ADHD will discover that teachers educating their children lack updated, accurate information about this disorder. Offering a copy of this article to interested teachers may help to facilitate more productive

While burgeoning numbers of children and adolescents are being diagnosed with attention deficit disorders (ADD or ADHD), a large number of teachers and school administrators report uncertainty about how they should respond to parents who ask, “Do you think my child has ADD or ADHD?” or who insist that their child be given multiple accommodations for presumed ADD/ADHD. Many feel even more uncertain about what interventions are appropriate when school staff believe a child may be impaired by ADD/ADHD while the parents are skeptical or refuse to consider that possibility.

Epidemiological studies estimate that 5 to 10% of school aged children are currently diagnosed with Attention Deficit Disorder (ADD) or Attention Deficit/Hyperactivity Disorder (ADHD). This means that most teachers are likely to have in every class they teach, on average, at least a couple of students with ADD/ADHD (those terms are used interchangeably in this article). Yet very few educators have had opportunity to learn about major changes that have recently emerged from scientific studies of ADD or about implications these findings have for schools...

For decades, most educators, physicians, psychologists and parents have thought of ADD/ADHD as essentially a cluster of behavior problems, a label for children who can’t sit still, won’t stop talking, and often are disruptive in class. Discussion about ADD has centered mainly on controversy over whether children with this diagnosis should be treated with stimulant medication, an intervention generally thought of as a paradoxical tranquilizer to calm down overactive bodies and brains. Recent research has produced a radically different understanding, a new paradigm, for understanding this disorder and a totally different view of how medication treatment actually works within the brain.

Few researchers still think of ADD as a simple behavior disorder. Increasingly specialists are recognizing that ADD is a complex syndrome of impairments in development of the cognitive management system of the brain. It is a syndrome that involves chronic impairments in a wide cluster of cognitive management functions of the mind. These include the capacity:

- to organize and get started on work tasks
- to attend to details and avoid excessive distractibility

- to regulate alertness and processing speed;
- to sustain and, when necessary, shift focus;
- to utilize short-term working memory and access recall
- to sustain motivation to work;
- to manage emotions appropriately.

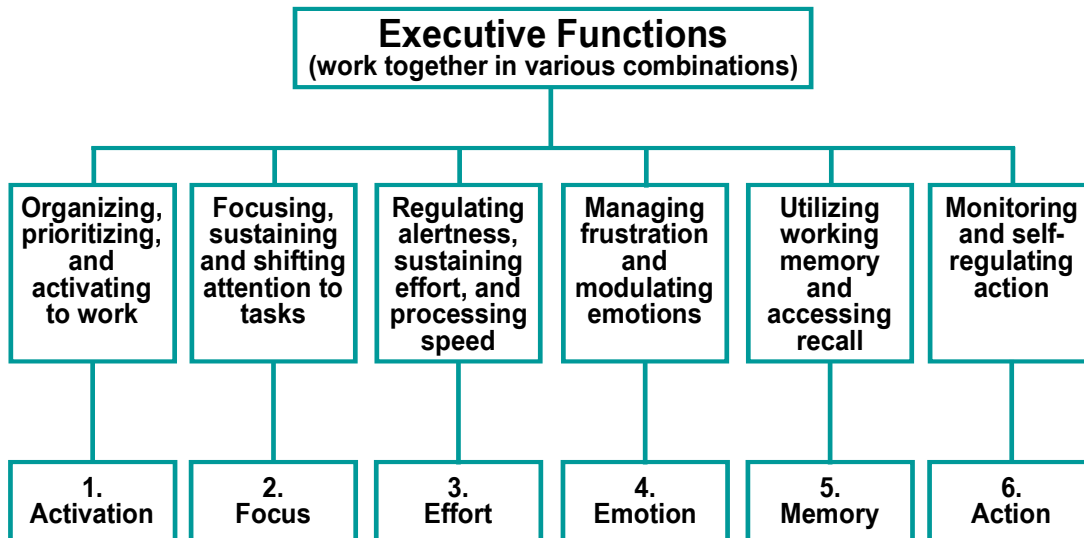
This extended, interacting cluster of cognitive functions impaired in ADD is generally referred to as “executive functions” or EF.

One way to imagine the cluster of cognitive functions involved in this new model of ADD is to visualize a symphony orchestra in which all of the musicians are very good at playing their instruments.

Regardless of how talented those musicians might be, there must be a competent conductor who can select what piece the orchestra will play, who will start their playing together and keep them on time, who will fade in the strings and then bring in the brass, who will organize and start and manage them as they interpret the music.

Without an effective conductor, the symphony will not produce very good music. The problem of individuals with ADD is not with parts of the brain that would correspond to the individual musicians of the symphony; those work perfectly well in certain situations discussed below. Impairments of ADD involve those neural circuits that function as the conductor of the symphony of the brain.

Executive Functions Impaired in ADD Syndrome



[TE Brown (2005)]

Several models have been developed to describe these executive functions. Figure 1 shows the model that emerged from my research with children, adolescents and adults (1996, 2001, 2005). Although each of the six components of this model has a single word label, they are not unitary variables like height, weight or blood pressure. Instead, each could be thought of as a basket containing a cluster of related cognitive functions. For most tasks of daily life these six clusters of cognitive functions operate, often without conscious thought, in integrated and dynamic ways to accomplish a wide variety of tasks in daily life. These executive functions do not constantly work at peak efficiency for any of us; everyone has difficulty with these various functions from time to time. What is different for those diagnosed with ADD is that they have substantially more impairment in their ability to utilize these EF than do most other of the same age and developmental level.

ADD, as now conceptualized, is not an all-or-nothing concept. It is not like pregnancy where one either is or is not pregnant, with nothing in between. ADD is more like depression. Everyone feels sad or unhappy from time to time, but being sad for a couple of days does not warrant a clinical diagnosis of depression. Only when a person is significantly impaired by depressive symptoms over a substantial period of time does it make sense to diagnose and treat them for depression. In the same way, the

diagnosis of ADD/ADHD is not warranted for people who have just occasional difficulty with the relevant symptoms. It is only when an individual is significantly impaired by the cluster of ADD symptoms over a longer period of time that the diagnosis of ADHD/ADD is legitimately made.

As every teacher knows, a child's capacity to exercise these various self-management functions develops slowly from early childhood until late adolescence or early adulthood. We hold very different expectations for 8 year olds than for 5 year olds and for 15 year olds than for 10 year olds in their capacity to sustain attention, to follow directions, to keep information in mind, etc. We also know, of course, that within any given age group, some children develop these abilities much more quickly and in more refined ways than others. Diagnosis of ADD/ADHD is appropriate only when the individual's impairment from the stipulated cluster of symptoms is significantly greater than most others of the same age and developmental level.

Scientific evidence has now demonstrated that networks of the brain which support these executive functions develop quite slowly. While some basic elements of executive functions emerge during early childhood, these complex self-management networks are not fully developed until the late teens or early twenties. Most governments will not allow anyone to drive a motor vehicle until they are at least 16 years old. This is not because their legs are too short to reach the pedals; rather, it is because critical executive functions of the brain are not developed sufficiently until mid or late adolescence for an individual to manage the complexities and high stakes responsibilities of driving a car.

Since normal development of executive functions is not completed until late adolescence or early adulthood, it is not always possible to identify during childhood those students for whom development of these functions is impaired. For some students, ADD impairments become obvious during preschool. They may be wildly hyperactive, unable to sit still or follow even the most basic directions. Yet other students may learn and behave quite well during their elementary school years, showing signs of ADD impairments only as their self-management abilities are challenged when they move into middle school or high school, leaving the classroom where one teacher is helping to guide their executive functions.

Some students do not manifest their ADD impairments in noticeable ways until they encounter the more demanding world of secondary school. There they may display noticeable ADD impairments for the first time as they try unsuccessfully to manage diverse demands for study, classroom performance and homework from five to seven different teachers each day while also trying to cope with ongoing conflicts and demands in family and social interactions. Other students with ADD may not have their

symptoms noticed until much later. Their parents may have been so successful in building compensatory scaffolding around a son or daughter that their ADD impairments do not become apparent until the scaffolding is suddenly removed as the student moves away from home to go to college or university.

Existing diagnostic criteria for ADHD stipulate that an ADD diagnosis requires at least some ADD symptoms apparent before age 7 years, but experts have discredited that requirement because it contradicts clinical experience and is without any empirical support. Most specialists are now willing to diagnose ADHD in adolescents and young adults, even if the individual had no apparent symptoms until adolescence.

The most perplexing aspect of ADD diagnosis is the situational specificity of the symptoms. Every child, adolescent or adult with ADD that I have ever seen has a few types of activity in which they have no difficulty in exercising cognitive functions that are quite impaired in almost every other circumstance. My favorite example is Larry, a high school junior who was the goaltender for his ice hockey team. His parents brought him for evaluation the day after the team had just won the state championship in ice hockey.

As they described his performance, it was clear that he was extraordinary goalie, one who kept careful track of the puck throughout each game. He was very bright; IQ was in the very superior range. Yet this same student was always in trouble with his teachers. They reported that he occasionally made comments in class that were impressively perceptive, yet most of the time he was distracted and “out to lunch”, unable to follow the class discussion. Their question: “If you can pay attention so well when you are playing hockey, why can’t you pay attention in class?”

Not all individuals with ADHD focus best in sports; some get intensely involved in video games or drawing or building with Legos or doing mechanical tasks. All seem to have a few specific activities in which they can focus very well, often for long periods of time. Yet they have great difficulty in focusing for many other tasks that they recognize as important and want to do well. One of my adult patients suggested that having ADD is like having “erectile dysfunction of the mind.” He observed that “If the task you’re trying to do is intrinsically interesting, you’re ‘up’ for it; but if it’s not really interesting to you, you can’t ‘get it up’ regardless of how much you may want to because it just isn’t a willpower kind of thing.” Often ADD looks like a problem of willpower—“You can do it here, why can’t you do it there?” Despite appearances, ADD is not a problem of willpower; it is a chronic impairment in the chemistry of the management system of the brain.

There is now considerable evidence showing that ADD is a highly heritable disorder with impairments related to problems in the release and reloading of two critical neurotransmitter chemicals in the brain---dopamine and norepinephrine. There is also a massive body of evidence showing that 8 of 10 individuals with ADHD experience significant improvement in their functioning when treated with appropriately fine-tuned medications. However, these medications cure nothing. ADD is not like a strep infection where you can take a course of antibiotics and knock out the infection. It is more like impaired vision. Wearing appropriately prescribed eyeglasses will usually improve one's vision significantly, but the eyeglasses do not cure the vision problem. They work only when they are actually being worn. Similarly, medications for ADD may help to alleviate symptoms, but only for those hours of the day when that medication is actually active in the brain.

Some students with ADHD impairments respond dramatically to adequately tailored treatment with appropriate medications. For them, if the chemical problems are adequately addressed, they can perform most self-management tasks quite well, so long as the medication is in place. Their deficit is not in knowing what they should do; it is primarily in being able to get themselves to do what they know they should be doing.

For others, medication treatment is necessary to alleviate EF impairments of ADHD, but medication alone is not enough to help these students function significantly better on tasks requiring EF. They lack the necessary skills to do what needs to be done. For these students, medication treatment does not create the skills, but it can help the student to be more available to learn to perform these skills, if appropriate instruction is available.

This has important implications for students with both ADHD and specific learning disorders.

Among students with reading disorder, math disorder or disorder of written expression, many also have ADHD. If students with concurrent ADHD and LD are not provided adequate treatment for their ADD impairments, it is not likely that they will benefit much from special education instruction. Likewise, about 50% of students with ADHD also have one or more specific learning disorders. Medication treatment alone cannot reasonably be expected to alleviate their LD problems; it can only make them more available to learn. Often they still require accommodations or special education services.

In earlier days when ADHD was seen as a simple behavior disorder, it was quite easy to diagnose. Students who were chronically inattentive, restless and impulsive could readily be recognized in the classroom and on the playground by simple observation. Operating with this new paradigm of ADD as developmental impairment of executive functions requires a very different kind of evaluation, an

approach that can pick up more implicit and subtle cognitive impairments that may or may not be accompanied by hyperactivity or any other readily observable symptoms. To assess for ADD/ADHD as understood in this new paradigm requires different methods.

The most important element of assessment is an individual clinical interview with the student to query about a variety of cognitive functions in everyday life. This requires a clinician who is well-trained to recognize ADD and to differentiate it from many other learning, emotional and behavioral problems that may be present in addition to or rather than ADD. The evaluating clinician also needs to gather information from parents and from teachers who can describe strengths and impairments of the student as she encounters various tasks like keeping track of assignments, doing homework, reading for understanding, organizing thoughts for writing projects, etc. as well social interactions within and outside of school. Often rating scales such as the Conners, BASC, BRIEF, or Brown ADD Scales are helpful to gather data for such evaluations, but none is sufficient in itself for making or ruling out a diagnosis of ADD.

Standard IQ scores or achievement test scores cannot help to make or rule out a diagnosis of ADD. However, IQ index scores on the WISC-IV or WAIS-III tests can be suggestive of ADD impairments if the student's score for the Working Memory and/or Processing Speed Index is one standard deviation or more below that student's index score for Verbal Comprehension or Perceptual Organization. Any student who is underachieving in school and has such discrepancies between basic cognitive abilities and his executive functions should be carefully evaluated for possible ADD.

Among students who chronically underachieve, there are three groups where students with ADD are often overlooked. 1) Very bright students: Often students with ADD who are very bright are seen as lazy; some mistakenly assume that one cannot be very bright and still have significant ADD impairments; 2) Female students with ADD are often overlooked because they do not generally call attention to themselves with dramatic disruptive behavioral symptoms that draw the attention of parents and teachers; 3) students with ADD coming from families with multiple social stressors, e.g. divorce, unemployment, poverty, multiple relocations, etc. are often seen as unlikely to have ADD. Teachers and others may assume that the academic problems of such students are just reactions to their psychosocial stressors; such observers may not realize that ADD is more common in families with such severe psychosocial stressors.

Students with ADD who are especially bright are likely to be at particular risk of having their ADD impairments unrecognized until late in their educational career. Many educators and physicians believe that anyone with a high IQ is not likely to suffer from ADD. When very bright students do poorly in school, many blame boredom, lack of motivation, or insufficient stimulation in the classroom. Our group recently published a study of 117 children and adolescents with IQ scores of 120 or above, in the top 9% of their age group, all of whom fully met diagnostic criteria for ADHD. Data showed that these very bright students, despite their high IQ, suffered from significant impairments in working memory, processing speed and many other executive functions that are critical for success in school. The full text of that research report is available on my website www.DrThomasEBrown.com .

When a student of any level of ability is chronically underachieving, with or without hyperactivity or behavior problems, educators should consider whether evaluation for ADD/ADHD might be appropriate. If so, school staff can systematically gather relevant information from teachers and the school psychologist about specific impairments observed in the student's academic work, classroom performance and/or social interactions. This information can then be presented to parents with suggestions about how they can arrange in the school or community for an appropriate evaluation to identify causes of the student's chronic difficulties and possible options for intervention.

Yet, before school staff can adequately assist parents in identifying students in need of evaluation for possible ADD, it is necessary for teachers, school psychologists and administrators to develop a solid understanding of this new paradigm for ADD, what this disorder is and what it is not. Resources to develop such an understanding can be found online at the caddac website: www.caddac.ca.

Thomas E. Brown, Ph.D. is Associate Director of the Yale Clinic for Attention and Related Disorders in the Dept. of Psychiatry at Yale University School of Medicine.

More information about his work is available at www.DrThomasEBrown.com.

