

Attention Deficit Disorder

Where We've Been, Where We Are, and Where We're Going

Stephen C. Copps, MD

Why is it so important to understand ADD? If one does not understand ADD that professional will not be able to diagnosis it and will not be able to treat it. The person with ADD will not be able to live successfully with it. Understanding comes from examining the past, recognizing the present and gaining encouragement from considering the future.

Where We Have Been

In the beginning we don't think God had ADD. If God would have had ADD he would have pulled an all nighter and not had to work for six days. Some have suggested that Atilla the Hun might have had ADD and there is a lot of evidence to suggest that Leonardo da Vinci had it. Those of you that have seen reproductions of his sketch books understand. There is a washing machine next to a picture of a pretty girl right beside an airplane next to a picture of a suspension bridge. He had eight occupations – writer, teacher, inventor, architect, musician, healer, engineer and artist. Likely, if he had not painted the Last Supper, we would not remember him as an artist. He started 120 paintings and finished 11.

In 1845 Heinrich Hoffman, a German physician, wrote a book of moral tales for children. He described a number of youngsters' misbehaviors including hyperactivity. There was Fidgety Phil. "He was a naughty restless child who grew more rude and wild." Many have seen the picture of Phil kicking the dishes off the table. Perhaps the first depiction of a child with ADHD.

Then in the very next chapter, Hoffman describes Suck A Thumb and threatened that if you suck your thumb the great long red-legged scissors man will come and cut off your thumbs with his tailor scissors. The picture shows Suck A Thumb crying with the blood dripping from his severed thumbs. Great bedtime fare for children. I've often wondered what would have happened if the poor boy wet the bed. The reference to morality has been a fly in the ointment to those with ADD whose behaviors can't be helped as they are labeled immoral and their parents are blamed.

In 1909 George Still, a renowned British physician, described disruptive, inattentive children as having a lack of moral control. Then, in one of his more rational, thoughtful moments, he reasoned that many of these children had good caring mothers and fathers with adequate parenting skills. So he thought it must be in the biology – a defect in inhibitory volition. That's not too far from inhibition theory favored by some today.

Then in the 1940s there was an epidemic of viral encephalitis followed by reports that as sequelae of this central nervous system disease, some children became disruptive, hyperactive, impulsive and inattentive. The label Brain Damage Behavior Disorder was given to this condition.

By the 1950s physicians became aware of other children with similar characteristics that exhibited no evidence of having central nervous system disease. These children were, at the time, said to have minimal brain damage.

Shortly thereafter, a school bus carrying children to a special education facility in Sweden ran off a mountain road in a storm. Several of the children were killed including some suspected of having minimal brain damage. Autopsies were done on six of the children and, using all the tools available at the time, including electron microscopy, no brain damage, even minimal, could be found.

The name changed to Minimal Brain Dysfunction or MBD. As the condition began to be thought of as a dysfunction rather than due to damage, many psychiatrists, influenced by a faulty nurturing philosophy of behavior, decided that if there was no damage it was the influence of the family environment.

In due time it became evident that medication could alleviate many of the symptoms of ADD. This cast doubt on the psychogenic theory of poor parenting and suggested a neurobiologic cause.

In the 1960s the condition came to be called, by the most observable characteristic, "hyperactivity". At that time an article with a picture of Fidgety Phil appeared in Time magazine entitled "The Curse of Hyperactivity". Add a curse to a deficit in moral control caused by poor parenting and perhaps an exorcist would be more appropriate than a physician or psychologist.

In 1968 the DSM-II (the second edition of the Diagnostic Statistical Manual of the American Psychiatric Association) listed the condition as Hyperkinetic Reaction of Childhood. (Hyperkinetic is synonymous with hyperactivity).

During the 1970s it became apparent that many hyperactive children had a deficit in being able to pay attention. In fact, it readily became evident that this was the major defining characteristic. The name changed to Attention Deficit Disorder (ADD) in the DSM-III. In the years that followed we recognized that some children with ADD were hyperactive and some were not. In fact, many without hyperactivity were somewhat slow and sluggish in processing information as well as physical activity. The DSM-III R (R stands for revised) listed the condition quite properly as ADD with hyperactivity and ADD without hyperactivity. It might have been best if we had left it at that.

Then in the 1990s the DSM-IV came out which calls everything ADHD (Attention Deficit Hyperactivity Disorder). If there was no hyperactivity you said it was ADHD predominantly inattentive. If there was inattention and hyperactivity you were to call it ADHD combined. Although we have to give credit to the efforts of those who developed the DSM-IV, we are now called upon to change the diagnostic criteria as we better understand the condition. I refuse to use the H word for it has a tendency to dissuade professionals in making an appropriate diagnosis in those persons that do not have hyperactivity. Why on earth say Attention Deficit Hyperactivity Disorder for a person that isn't the least bit hyperactive.

ADD is due to food coloring, preservatives, sugar or yeast. Not at all true, but as is so often the case, there is sometimes a grain of truth in an absurdity. I once said to Ben Fiengold, the purveyor of the Fiengold diet “you have taken a grain of truth and created a sand castle.” What’s the grain of truth – approximately 2-3% of children with ADD will have an idiosyncratic, hyperactive reaction to food coloring. The color is always red, yellow or orange, not green or blue. It is not allergy mediated. There is no antigen antibody response. It comes on within approximately ten minutes and lasts no longer than fifty minutes. The child may become hyper for a relatively short period of time. Believe mothers when they tell you about this phenomena. In the past we saw it to the very orange liquid erythromycin and even to the yellow dye in the early Ritalin. If your child has such a reaction it certainly would be prudent to avoid such ingested colored matter.

I’m often asked what is an appropriate diet for ADD. My best answer is the prudent diet of the American Heart Association. Sugar – yes, some children get hyper on sugar, but it is usually a pretty good sugar load like a bowl of sugar frosted flakes with a couple of tablespoons of refined sugar added. But, the reaction isn’t always hyper. It is like alcohol, a simple sugar. Some get hyper and are the life of the party, others vomit, while still others fall asleep. Persons with ADD are oversensitive to everything. When it is hot it is boiling, when it is cold it is freezing. They are always at the thermostat. Some, when exposed to a sugar load, can become sleepy or sick as well as hyper.

And then there is yeast. It is a little ludicrous to believe that yeast can cause arthritis, chronic fatigue syndrome, LD, depression, fibromyalgia and even PMS, as well as ADD. Billy Crooke should have been ashamed of himself for such a suggestion.

Along came medication. Way back in the 1930s a group of scientists were attempting to synthesize an antihistamine, ephedrine (we know this is not an antihistamine), and created a new product, amphetamine. This was a racemic compound that had an L (level – left-handed) form and a D (dextro right-handed) form. The D form was dextroamphetamine (Dexedrine) and came to be recognized as an appetite suppressant.

The story continues at a home for wayward girls that attempted to rehabilitate the delinquent. Understandably, some had ADD (perhaps with a lot of H) and some of those with ADD were overweight. So having a holistic approach to rehabilitation, the overweight girls were given dextroamphetamine to lose weight by cutting their appetite. Low and behold, they not only ate less, they became less hyperactive, less impulsive and more attentive. A medical treatment for ADD was fortuitously discovered.

In order to try to reduce some of the appetite suppressant effect but maintaining the beneficial ADD therapy effect, a piperidine ring was added and another new product formed, methylphenidate hydrochloride (MPH). This passed out in the urine as an inactive metabolite – ritalinic acid – hence the name Ritalin (MPH is generic Ritalin). Some suggested that Ritalin was named for the scientist’s wife Rita Lynn – so be it.

As Ritalin became more frequently prescribed there were fears of addiction and other myths arose such as it would calm you down if you had ADD but it would cause you to be hyper if you

didn't. You outgrow ADD as you get older. About 2-3% of the population have ADD. There are 8 boys to every girl with ADD.

Where We Are

There is no controversy in sophisticated medicine today regarding the existence of ADD, its diagnosis or its treatment. "ADD is a valid disorder with severe life-long consequences" so said the Surgeon General of the United States in 2001. Every major medical organization has echoed this sentiment.

Every study done, and there are now about eight, have indicated that persons with ADD treated with psychostimulant medication, such as Ritalin, are less likely to become addicted to drugs and/or alcohol than as the untreated person with the condition.

Ritalin does not have the paradoxical reaction of calming you down if you are hyper and hyping you up if you are not.

You do not outgrow ADD as you get older. You may still have ADD but not qualify for it by present day criteria as you get older because you have learned to compensate for it. Treatment should be sought at any age should the symptoms substantially interfere with your life. My oldest patient was 78 when I first saw him. He is doing well and thankful he sought treatment.

Approximately 7% of the population have ADD, not 2-3%. This is not only true for our country but, as the global nature of the condition becomes evident, it is true for most other countries as well and even higher in those countries which have a greater incidence of consanguinity.

It is likely that as many girls as boys have ADD and there are as many persons that have ADD without hyperactivity as have ADD with hyperactivity. We don't know why some people are hyper and some are not. Let's admit we don't know and not guess. That is a better road to follow than trying to make it two different conditions. Many of us have observed that in the same family the progeny of that mother and father can differ considerably. There might be one child with ADD with hyperactivity, another with ADD without hyperactivity, in fact, somewhat sluggish, then two children without ADD at all. There has to be a common genetic route. Someday we will discover why some are hyper some are not but it's not a wholly different condition.

It is a genetic neurobiologic condition. Not caused by a single gene like cystic fibrosis or color-blindness. It is polygenic in its inheritance, meaning several genes are involved. The person with ADD might get all from mom or all from dad or some from mom and some from dad. If a mating pair has a child with ADD the probability of having another child with ADD, as a product of a single conception, is about 25%. If both mother and father have ADD chances are all their children will have ADD.

Alan Zametkin at the National Institute of Health in 1990 demonstrated the underutilization of glucose in the attending areas of the brain by a PET scanning technique. This was reported in the New England Journal of Medicine. This assisted in demonstrating the neurobiologic nature of

ADD. Then in 1991 in the Journal of the American Medical Association, David Cummings, City of Hope California, showed there was a genetic overlap between ADD, autism, Tourette's Syndrome and alcoholism.

It should be noted that at the present scanning techniques such as PET and SPECT are not reliable diagnostic measures, nor are a variety of different electroencephalogram alterations. There is a grain of truth here but not enough to build a diagnostic castle or empire.

Biofeedback is a most interesting tool but it is best also not to consider it as a reliable therapeutic modality for the vast majority of those with ADD because it isn't.

As we evaluate and treat more and more patients with ADD we come to be increasingly aware of those conditions that often, not always, co-exist with ADD. We must rule these conditions in or out in the evaluation process. Oppositional Defiant Disorder (ODD) often co-exists with ADD. It may result from ineffective management of ADD or maybe primary. It has to be dealt with behaviorally and can't be expected to be totally eliminated by medication.

Depression and anxiety must be recognized and treated along with the ADD. We must treat by inventory and not by diagnosis and use the medications most effective for each condition. This often may mean 2 or 3 medications but it is best not to rely on a single medication to do it all. I like to refer to these problems as co-existing conditions, not co-morbidities. That just sounds too morbid.

We have come to recognize that Bipolar condition is not an uncommon occurrence in those with ADD and we must be leery of the possibility of activation of symptoms by the medications that are helping the ADD.

Approximately 20-30% of those with ADD will have a learning disability (LD) and most important is the recognition that about 80% of those with LD may have ADD. We must recognize this and treat the ADD first. When a child struggles in school check vision and hearing first then evaluate for ADD and do some measure of intelligence. If ADD is present, treat it. If, with considerable improvement in attention, the child still struggles academically, do a learning disability evaluation. Attention is the basic neurologic function, without attention there can be no learning.

Medication is the cornerstone of therapy and not a last resort if all else fails. The psychostimulants such as Ritalin (Focalin and Concerta) and Adderall are the first line medications of choice.

There is no correlation between milligram dose and weight of the patient. Dose is adjusted according to response in the individual person. The physician must follow the patient carefully and ask how well does the medication work, how long does it last, are there any differences between morning and afternoon and are there any side effects.

There should be no drug holidays. Learning as well as social interaction goes on during weekends as well as summer vacation. A knowledge base is being augmented as you listen to dialog in a movie or on television and overhear conversations between your grandparents.

It is best to attempt to cover approximately 12 hours of each day with medication. Medication is often as necessary for homework as for attention in the classroom.

Exercise is important. We have come to recognize that the beneficial effect of exercise can last for a considerable part of the day and not just an hour or so after the exercise has been completed. Medication can often be reduced if accompanied by a consistent exercise program. Yoga and meditation are of considerable benefit to some.

We have seen the value of providing academic and workplace accommodations for those with ADD. IDEA (Individuals with Disability Education Act) and Section 504 of the Rehabilitation Act and the Americans with Disability Act (ADA) are important pieces of legislature.

We have come to recognize there are no so-called natural remedies for ADD. If it works it is a drug.

There is now better insurance coverage for ADD but unfortunately it is still considered a mental illness rather than a neurobiologic condition and is excluded in some policies. The state of Louisiana is the first to make it illegal not to cover ADD by third party carriers.

There is now greater recognition that adults can have ADD. It doesn't go away but some may not fit the present diagnostic criteria even though significantly impaired.

The proper role of genetics in etiology is becoming more accurately delineated and we are seeing the significance of gene mapping as a possible diagnostic tool. There is increasing public awareness of ADD and a great deal more favorable PR. Its acceptance is being driven by the recognition of the incidence of the condition and, as mentioned before, without attention there can be no learning.

As far as medication is concerned, Cylert (magnesium pemoline) has been put to rest because of fear of liver damage and Ritalin SR because of its labile wax matrix is seldom used – a hot drink and the active ingredient is available at once, a cold one and nothing happens for quite a while.

Strattera, a nonstimulant, is fading from use because of the much more favorable response to the psychostimulants in most with ADD. This medication has been effective for some and finds a use in Tourette's Syndrome for it does not activate tics.

It should be noted that the psychostimulants are not contraindicated when tics are present for in approximately 1/3 the tics will actually decrease when psychostimulant are given, in another 1/3 they will stay the same, and only in about 1/3 will they definitely be made considerably worse.

Also we have come to realize that there is no true Ritalin psychosis. Methylphenidate, the active ingredient, can activate an underlying psychiatric disorder as it can in some activate tics. It is also evident that the psychostimulants are not selective in their action. If a person has accompanying depression or anxiety, it can significantly be made worse by the psychostimulants. You pay better attention to everything and you can attend to what you are depressed about or anxious about while you are getting a favorable increase in attending ability from the medications.

We are becoming increasingly aware of the cost of untreated ADD. There are more hospitalizations, more ER visits, automobile accidents, work lost, crime, teenage pregnancy, school failure and an awful lot more discontented adults in those with ADD that remains untreated. Insurance companies and some in government are waking up to this fact.

Where Are We Going

The future may hold an ADD evaluation for all operators of vehicles that transport people on land, sea and air and also, perhaps, for long distance truck drivers.

More and more people will be diagnosed and treated for ADD. This will be especially true in minority groups who remain significantly underserved.

We will continue to see increasing public awareness and acceptance and required ADD coverage by all third party carriers.

It is likely that psychostimulants in therapeutic use for ADD will be dropped from the controlled substance class II designation. There will be developments of new delivery systems for the medication at hand in order to effectively cover a 12 hour period and, in time, new selective medications based on differentiation as to whether the person with ADD is hyperactive or not. There may also be combinations to treat ADD along with conditions that can co-exist with it such as depression and anxiety in a single pill – but learning from the past fixed combinations are often not successful.

There will be a better understanding of the genetics of ADD – witness the NIH family study and the extensive work on gene mapping. It is also not too far fetched to consider the possibility of genetic alteration preventing the expression of ADD in high risk mating pairs (mothers and/or fathers that have ADD or other children have ADD). This is not out of the question when one considers the simple expedient of giving folic acid to pregnant women which can prevent 50% of the genetic malformation spina bifida (open spine).

Laboratory tests and/or scanning procedures might be developed that can accurately and economically diagnosis ADD. They are not here yet but there is a glimmer of hope. Perhaps first will come a gene mapping procedure from a blood test that will determine that ADD is possible. The absence of such a revelation marker would indicate that the person could not possibly have the condition. We may see that within a decade.

There will come increasing proof of long-term effectiveness of ADD therapy for we are beginning to appreciate how new neuronal pathways can develop with task success and even new nerve cells can appear (neurogenesis).

We will see a movement towards the awareness of functional capacity, not just symptom analysis, in the diagnosis of ADD. I predict that the DSM-V will look very different from the DSM-IV regarding criteria for the presence of ADD. But, as we move in that direction, we hope to realize that function is a great deal harder to measure and there still is room for symptom impairment. As we get all absorbed in executive function (a reasonable pursuit) let's not, as G.K. Chesterton warned, throw out the baby with the bath water.

Coaching will come under increasing scrutiny as many will attempt to determine its value in the therapeutic milieu. We recognize ADD as a medical condition so it is reasonable to assume that this endeavor should have to prove itself as any other therapy. Those of us that work with coaches know of its value in dealing with many, not all, with ADD. Now we have to prove it. Also, it will be necessary to arrive at some type of certification which at present does not exist.

In the DSM-V we may see some changes taking gender into account. But here I caution for the differences in manifestations of ADD in the female is different but not quite as great as some would have us believe. We also are apt to see significant change in criteria for diagnosing according to age. One must not apply static criteria to a developmental condition.

It is likely that there will be increasing emphasis on social competency in therapy and the importance of medication as well as counseling to that end.

There will be increased attention to the importance of the father's perspective and role in the family management of the child with ADD. Fathers need to be brought into the equation for, without such attention, they often, without understanding, can thwart therapeutic effort.

In order to be effective in dealing with ADD, persons that have it and persons that treat it must come to the realization that ADD any way you cut it is not a blessing. Many with ADD are creative, think outside the box, are energetic and tireless. That is true and it is a distinctive advantage but persons with ADD do not hold a corner on these traits and, unfortunately, have others that get in the way of success. But the condition in the vast majority of cases with proper treatment can be adequately managed so that the goal of contentment is attained.

Serotonin might be more involved in the neurobiology of ADD than we have appreciated in the past, especially in regards to hyperactivity. It doesn't appear to be all dopamine, even though that neurotransmitter remains at the top of the list.

We may well see the treatment of certain types of learning disabilities with psychostimulant medication even though ADD might or might not be present. This is likely to be especially true in the somewhat sluggish, slow processing persons with inattentive type of ADD.

Private schools, in order to be certified, will be called upon to abide by the same accommodation laws such as IDEA and Section 504 as public schools are now required to follow. This can't come soon enough.

Hopefully in the future there will be mandatory screening of all 1st, 2nd and 3rd graders for ADD and LD. Should this occur, followed by appropriate remedial accommodations, counseling and therapy, we could save this dear country of ours billions of dollars. Truthfully, no child would be left behind to suffer a life of success deprivation with its undeniable consequences.

In Summary:

Where We've Been

It's a behavior problem caused by poor parenting, food coloring or yeast.

Where We Are

No controversy in sophisticated medicine today regarding the existence of ADD, its diagnosis and its therapy.

Where We're Going

Increased acceptance, coverage by all third party carriers. Diagnostic laboratory tests, possible genetic alteration of the condition.

Stephen Copps, MD is presently Medical Director of ADD Specialty Healthcare in Macon, Georgia. He has lectured throughout this country and abroad, authored the book *The Attending Physician: An ADD Guide for Physicians*, and served on the faculty of Emory, Morehouse and Mercer Universities.