

# ADD, ADHD, ODD, LD, ASD OR TRAUMATIC BRAIN INJURY?

## *Neurotherapeutic Treatment For Traumatic Brain Injury In Children*

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In my practice we see many children who have been diagnosed with ADD, ADHD, ODD, LD, ASD and many other acronyms. The central or common behavioral difficulties shared by many of these children include problems with attention, problems with learning, problems with getting along with others, oppositional and defiant behavior, and problems with impulse control. Based on the specific combination of these “problematic” behaviors as judged by parents and teachers, the health care provider – physician, psychologist, school counselor, and the like – attach one or more of the above acronymic labels and recommend “treatment”. The treatment usually includes a dangerous medication, a special school program and often counseling to help the family cope with the problematic child.

The problem with the above procedure is that the health providers neglected to consider a very important acronym, TBI, which stands for traumatic brain injury. Common characteristic symptoms associated with TBI include problems with concentration and attention, difficulty with planning and organizing, problems with anxiety and depression, sleep disturbances, mood swings, major problems with impulse control, irritability, personality changes and visual/spatial impairments.

Misdiagnosis of children with traumatic brain injury is very common. Since the diagnosis is based on the child’s behavior, health care providers routinely diagnose these brain-injured children as having attention deficit hyperactivity disorder or oppositional defiance disorder or developmental delay or Asperger’s or one of the many learning disorders. As the reader will note from the above list of characteristic symptoms of traumatic brain injury, many of these symptoms are identical to those of the other diagnostic categories. The huge advantage of neurotherapy in the treatment of children is that the brain mapping procedure provides a precise indication of the exact location of the problem in the brain and the exact nature of that problem. Hence, true ADD has one of several specific brainwave patterns, which are quite distinguishable from TBI.

Children (as well as adults) with TBI always have some difficulties with symptoms associated with damage to the frontal regions of the brain. Because of the way the brain sits in the cranial vault, any head injury, no matter where the impact, affects the frontal cortex. Injury to the

frontal cortex is routinely associated with problems with emotional volatility, impulse control, learning difficulties, personality and mood 2 problems and problems with attention, planning, organizing and following through on tasks. Does the latter sound like ADHD or ODD? You bet, but drugs like stimulants, antidepressants or the new abomination, antipsychotics, simply exacerbate the problems of these brain-injured children.

The following is the case of Mike, a 9-year-old child who was referred with a diagnosis of ADHD and/or ODD. His problem was, however, TBI.

Most children are frightened when they walk into a doctor's office and Mike was no exception as he grumpily entered my office with his weary looking father. Despite his heroic efforts to conceal his unease, Mike's eyes widened as he saw all of the electrodes and other electrical gadgetry in my office.

Kids are not the only ones who become concerned when they see the electrodes that I intend to attach to their heads. The first thought is usually: "He's going to give me electroshock therapy." So my first task when starting therapy with any of my clients is to assure them that the electrodes are for the purpose of measurement only. They are attached to the head with a paste the consistency of toothpaste in order to measure the electrical activity of the brain. The client feels absolutely nothing but can see the electrical activity coming from the brain displayed on the computer monitor.

Always directly addressing the client whenever possible, I asked Mike, "Do you know what I do?"

"Sort of. You do something to my brain," he replied.

"Well, Mike, sort of. I set things up so you can do something with your own brain. You might think of me as a coach. Coaches, or neurotherapists, as we call ourselves, help you make your brain more efficient, kind of like a trainer helps football players strengthen their bodies. By the way, part of what I do is work with professional athletes." I could see his eyes light up in interest. "A lot of super athletes do neurotherapy because it makes them much better at their game. I expect that you may do some optimal performance training at some point if you continue training with me here in the clinic."

"What we'll do today is have a look at how your brain is functioning. I will do that by attaching a wire to each of your ears and one on top of your head that I will move around from place to place." Doubt entered his eyes, and I reassured him, "You won't feel anything. We are simply measuring the electrical activity of your brain. You'll be able to see your brain activity on the computer monitor. I'll ask you to open and close your eyes at various times, read something for a minute or so, and I'll also play a sound that sounds like 'shush.' It takes about fifteen minutes and then I'll do some calculations and go over it with you in detail to see if what the brain is telling me is the same as what you experience." He seemed all right with that, and I continued

to explain. “What I’m looking for are areas in which the brain is working really well and areas in which the brain is not working so well. If we find areas that are not working so well, the way we correct those areas is what’s called neurotherapy. The most important form of neurotherapy is called neurofeedback. That is basically playing a video game, with only your brain. You don’t touch anything. You simply think about moving pictures on the computer monitor.”

I was watching Mike’s father out of the corner of my eye. Parents are usually focused on telling their tales of woe regarding the incorrigibility of their child, their long-suffering tolerance and their willingness to make “one final attempt to help – provided the child will make a serious effort, etc, etc.”

The serious behavioral consequences of brain injury can be extremely disruptive to positive family functioning. Resentment, anger, defiance and disappointment are all direct consequences of the family dynamics that are associated with the child’s disruptive behavior. Told that they are not working, or not trying, or lazy, or bad, or unlikable, when in fact they are doing the best they can, inevitably leads the child to conclude that he is stupid, worthless and unlikable. The problems with impulse control, explosive anger and rages, and severe mood swings further confuse and alienate the child. Defiance and other forms of acting out can also be vain efforts to protect themselves from their core emotional belief about themselves. And self-loathing is not too strong a term to describe the emotional pain of these children.

One element of neurotherapy that parents, and older people generally, feel unsettled about is the notion of changing the way the brain functions. Changing brain functioning is completely at odds with what we have been taught, namely, that what you were born with is what you must live with. We were also taught that after a brain injury that recovery was limited to about 18 months. After that time there would be very limited improvement. We now know that the brain is very plastic and brain inefficiencies can be corrected long after the traumatic brain injury. Fortunately, children do not have such hang-ups. They feel comfortable with computers and mind-control concepts. Yet that was not the reason I was talking directly to Mike. His father was trying to enter the conversation to inform me about Mike’s problems. Instead I told Mike, “The brain is going to tell me everything I need to know about why you are here. If after we go over the results of the brain measurements, there is something I’ve missed, you can let me know, OK?” I say to Dad, “If there is anything Mike or I miss, please let us know.”

I have Mike’s attention. He is sitting forward in his chair and looking directly at me. His sullen behavior, at least toward me, is gone, and he is eyeing the items in my office. I explain to Mike that to measure his brain activity we are going to attach a wire to each ear with a plastic clip and attach one to his head with a little paste. He will feel nothing because we are only measuring the brain activity; similar to the way a doctor listens to his heart. I asked Mike to sit in a chair facing the computer monitor, and then I cleaned his ear lobes with an alcohol wipe with a bit of abrasive to remove oils and dead skin. For children Mike’s age I usually just say that they will feel the cold of the alcohol and the scratching sensation when I clean the scalp.

For younger children who still seem frightened I usually say “ouch” when I first touch the ear lobe with the alcohol wipe. Inevitably they laugh and say it did not hurt.

“OK, Mike, we are about ready to start. As I said, the measurements will take ten or fifteen minutes. You will feel nothing, and you can watch the electrical activity coming from your brain on the monitor in front of you. I will ask you to open and close your eyes at various times. I will also ask you to read something (for nonreaders I usually ask them to count if they can), and I am going to have you listen to a sound. When we are finished, I will remove all of the paste from your head and ears and then do some calculations on your measurements. We will then go over what the brain is telling us about your strong areas and areas where you might have some difficulties. It is very important that you remain as still as possible during the measurements. Every few minutes I will stop the measurements so you can move around if you wish (for young children I refer to these pauses as “wiggle breaks”).

The measurement phase is very short consisting of two and a half minutes of recording on top of the head, one minute at the back, forty-five seconds over each of the two frontal lobes in the brain and finishing with eighty seconds of recording over the middle of the front part of the brain. This adds up to only six minutes and twenty seconds of actual data, but moving electrodes, printing the data and chatting with the child usually takes fifteen minutes or so in total.

Most neurotherapists try to make use of every moment of contact with the child. While moving the electrodes one might chat about sports they play, favorite pastimes and things they collect. I have many objects in my office, including old bottles, arrowheads, semi-precious stones, fossils, sharks teeth, and old money. The child usually becomes intrigued by these things, and I then introduce “Dr. Swingle’s Treasure Chest,” which contains all sorts of wonderful things, including dinosaur bones, sharks teeth, coins, stamps, paper money, semi-precious stones, fossils but no toys, candy or other silly trinkets. The child is told that at the end of every session they can take one of the items from the treasure chest. This not only serves as a reward but also supports the educational model of the treatment. After brain treatment the child is intellectually sharp. The items in the treasure chest are all labeled and have a short informative description of the item. Also on the wall above the chest are world maps, geological calendars, and sample charts so the child can identify, date and locate any item in the chest. And because of their mental state they do not forget the material. Often they bring these items in to school for show and tell, frequently startling teachers about the breadth of their knowledge about these items. Incidentally, it is often hard to keep parents out of the chest!

While the measurements are in progress, I also speak softly to the child, placing my hand on his shoulder and reinforcing him for cooperative participation. I am also instructing the parent, to some extent, in that they observe me directing the child in a firm but kind manner. I speak to them with obvious interest but do not permit disruptive behavior. Occasionally, we run into parenting situations that are outrageously out of control, such as a parent who has obviously

abrogated his responsibilities about who makes the decisions. Such situations definitely require family therapy in addition to neurotherapy. Fortunately, in Mike's situation the father, although angry and worn out, understood the need for parental authority and responsibility.

Likewise, the reading material that I use to measure a cognitive challenge is thematically important. The brief excerpts include stories of the first human on earth, when all the animal tribes spoke one language; brothers who loved each other so much that they secretly shared their food with each other without the other's knowledge; and that being good at something does not mean being perfect but rather failing less often.

"Now, that was painless, wasn't it?" I said to Mike as I removed the electrodes and cleaned off the electrode paste from his head and earlobes. "Did you think I was going to zap you with the electrodes?"

Mike was smiling now and highly interactive. He said that when he first saw the "electric stuff," he thought I was going to "electrocute him." I then asked Mike to sit next to me at my desk while I reviewed his brain numbers.

Neurotherapists generally provide a great deal of detail during an initial evaluation. This part concerns mostly the parents, but the child is kept as strongly engaged as possible during the review. I explain that some brain waves are associated with slower activity in the brain, such as daydreaming; other brain waves are associated with brain efficiency, others with trauma, and still others with processing information.

Children hear so much bad news when they go to physicians and psychologists, school counselors and teachers. They are told that they are not behaving properly, not performing at their level of capability, lazy, disruptive, and not nice to be around. They are told that they need help, if only they would try, and maybe they should be in a special-needs program. The message is – you're stupid and unlikable!

I always start off with the positive features found in the brain map, and there are always good things to be found. In Mike's case I was very lucky to see that his brain showed the "artist's signature". "Hey, Mike, look at this. Do you like to draw, or build things, or write or play music? This is the artist's signature in the brain." I could tell by the look on the father's face and by Mike's smile that I was batting a thousand.

"He's always drawing and building stuff," said Dad enthusiastically. "He used to be crazy about Lego's and now he builds models – he also takes apart a lot of things and forgets to put them back together." He looked at me curiously. "How did you know that about Mike?"

I responded, "The brain tells us everything," a concept I repeat over and over during the first session. I showed Mike and Dad the artist's signature, which is a very large increase in a

particular brain wave when the client closes their eyes. “Mike,” I said, “that is an extremely valuable skill to have. Good artists, architects, choreographers, and fiction writers have that signature, and so do fine cabinetmakers and good mechanics. You’re a lucky kid. You will probably pick a career that uses that skill.”

After reviewing the areas of brain functioning that are within normal limits, I zero in on the reason the child has been brought to my office. The reason Mike was brought to my office was because he was highly disruptive in school and at home and had been given the diagnosis of Attention Deficit Hyperactivity Disorder. His father also revealed that a psychiatrist had also suggested that Mike might also “have” Oppositional Defiance Disorder”. Mike had a very mild case of a form of an attention problem that I have found more often in males than in females. In Mike’s case the indicator was a slight excess of slow-frequency brainwave amplitude over the top of his brain. This excessive amplitude became a bit worse when he read. As I showed this to Mike and his father, I asked Mike, “In class, do you have problems staying with the teacher?” Mike nodded. “Do you find yourself thinking about other things when the teacher is talking?” He kept on nodding.

However, the brain also revealed something else that was far more serious than a very mild ADD condition. Mike showed major slowing of brainwave activity in the frontal regions of the brain. There are several measures of frontal cortex injury such as increased amplitude of slow frequency brainwaves including Delta (1 to 3 cycles per second (Hz)), and Theta (3 – 7 Hz). Slowing of the Alpha band (8 -12 Hz) and imbalances in frontal arousal are also found. The emotional and behavioral consequences of these brain inefficiencies are major. They include violent outbursts, rage, marked defiance, depression, severe impulse control problems, severe cognitive and memory deficits, major mood and personality changes, and poor moral compass. These behaviors have nothing to do with ADHD, or ODD or LD or any of the other diagnostic labels tacked on to these children.

I explained to Mike’s Dad that these conditions could be corrected with neurotherapy. The same electrodes used in the assessment would be placed on Mike during treatment sessions. The electrodes were again for measurement only, and Mike would not feel anything. We would set up the treatment so that when Mike made his slow brain waves decline, Pacman would move on the screen. Through concentrating Mike would slowly learn to reduce the amplitude to the normal range. The same procedure would be used to increase the dominant brainwave frequency and to balance the activity in the frontal brain regions. Both of the latter conditions (i.e., slowing of the dominant brainwave frequency and imbalances in the frontal regions) are common conditions found with clients who have frontal brain injury.

I also prescribed a recorded sound CD that Mike could use at home while doing homework. It would suppress the slow frequency brainwave amplitude as well as speed up the dominant frequency in the Alpha band. Suppression of the slow frequency amplitude would help him concentrate and retain information and the increasing of the dominant Alpha frequency would

increase brain efficiency. The CD contained the harmonic sound that I had tested during Mike's assessment. The sound had instantly suppressed the slow frequency by 22.1%, so I knew it would work before I prescribed the CD. Also, the specific harmonic also has the effect of increasing the dominant frequency of the Alpha band in addition to suppressing the excessive Theta amplitude, which is of major benefit to clients with TBI. In an article published several years ago in the *Journal of Neurotherapy*, I reported that the specific harmonic that was prescribed for Mike suppressed Theta amplitude by over 30% on average for a clinical sample of clients with serious TBI.

Mike needed twenty-six sessions to normalize the slow brain activity. He soon was reporting that with the exception of one C, his grades were "great." The balancing of the frontal lobes and the increasing of the dominant brainwave frequency required an additional 22 sessions. Mike's negative thought patterns, his oppositional behavior and in particular his impulse control problems and inappropriate social behavior were markedly improved based on reports not only from Mike but also from his parents and teachers. His relationship with his father is much better.

Disorders like TBI are not just problems for the individual but should be considered family disorders. Many problems, other than those directly resulting from TBI, including alcoholism, depression, anxiety, chronic pain, attention deficit disorders, and age-related declines in memory also affect the entire family and friends. Further, fixing the neurology of a problem may not resolve the psychological issues associated with the disorder that can have debilitating effects on people. Neurotherapy is not a stand-alone treatment. Clients and their families need complementary therapies to deal with the psychological "baggage" associated with all disorders. This is particularly true of clients with TBI. TBI clients are often seriously disordered in terms of mood modulation, anger/aggression/rage behavior and serious deficiencies in terms of impulse control.

Just imagine if Mike had been forty years old before he came for treatment. He might well be alcoholic or addicted to some other substance or harmful behavior, at a career dead end, unsuccessful at multiple relationships, angry, depressed and believing that he was a defective human being. Individuals with TBI have earlier age of onset of drug abuse, longer duration of substance-use disorder, and are more likely to progress from alcohol abuse to another drug-use disorder. Criminal behavior seems to be more likely with persons with TBI. In one study 100% of inmates on death row had evidence of TBI and numerous studies have found that incarcerated males are very likely to have frontal lobe injury.

Another side of this issue is also important. Consider the older Mike, now in a troubled marriage, who is in marital counseling with his wife. The counseling does not seem to be going anywhere, and Mike and his wife are likely to end up being one of the statistics of over fifty percent failure rate in marital counseling. Why? The marital counselor is missing a big part of the problem. There is a family disorder of TBI that manifests itself in alcohol abuse, anger

problems and career failure. The marital counselor is likely to be considerably more successful if the whole problem is treated. The brain inefficiencies are corrected with neurotherapy, and the interpersonal problems are dealt with in marital counseling. Mike might also benefit from some individual therapy focused on important life changes, including treatment for self-destructive addictive behavior and career counseling.

As the above case indicates, many common disorders including learning problems, ADHD, depression, anxiety disorders, sleep problems as well as serious problems such as traumatic brain injury can be effectively, safely, and permanently improved or corrected with procedures that help the brain regain normal functioning. Neurotherapy is a drug-free, self-regulation treatment that corrects problems in the brain. Medications do not correct problems like those associated with brain injury but rather just mask or sedate the problem often with serious side-effects.

Now although Mike's behavior would suggest a diagnosis of ADHD or perhaps ODD, it was apparent to me that the major cause of Mike's difficulties was TBI. The brain map did not show the common patterns associated with these diagnoses other than a very minor ADD pattern. Mike's brain did show a slowing of the Alpha frequencies and slow frequency amplitude excess in the frontal regions. There are other patterns associated with TBI as well including excessive high frequency amplitude and problems with brain site to brain site communication, referred to as coherence. Whenever we suspect TBI because of inconsistency between brain patterns and reported behavior, such as ADD, we always do a full 19 point brain map and compare the data from that map with our databases. The data base comparisons show how the brain data in question differs from normal functioning brains. This analysis can be remarkably detailed showing the interconnecting activity between all 19 sites as well as detailed analysis of one cycle per second bands of activity.

The remarkable aspect of neurotherapy is that these departures from normal brain functioning can be markedly improved by focusing on the exact brain activity shown in the maps to be abnormal. What is even more remarkable is that we have proven that what we were taught in medical and graduate school just a few years ago, and still believed by a discouragingly large proportion of the medical/psychological health provider community, is simply wrong. Brain injury is treatable. Further, the notion that after about 18 months post trauma there will be minimal further recovery is just wrong! Compelling evidence shows that with proper neurotherapeutic treatment further recovery can be realized years after the brain injury. The recent research on brain plasticity at some of the world's most prestigious universities shows conclusively that recovery of brain function can occur at any time if proper treatment procedures are employed AND you don't further damage the brain with sedating drugs. Concerned readers can find much useful scientific and clinical research on the web. Two good sources are the Journal of Neurotherapy available at [www.isnr.org](http://www.isnr.org) and the Journal of Applied Psychophysiology and Biofeedback available at [www.aapb.org](http://www.aapb.org).

Further discussions with Mike’s family revealed that Mike had experienced a serious head injury from a fall when he was about 5 years old. The conventional wisdom, at the time, was that he probably sustained a concussion and his young brain would recover - no big deal! It was further revealed that Mike had a number of other “whacks on the head” which were all assumed to be quite normal for a healthy and active male child. TBI can be cumulative. A child can have several head impacts that appear to have no residual effects and then a minor head impact that results in behavior changes. Because the critical last head injury appears to everyone to be trivial it is logically assumed that the problem is not related to brain damage.

Obviously, the severity of the head injury is an important issue but the age of the child when the injury occurred is also extremely important. We always seemed to assume that the younger the brain the greater the recovery potential. Researchers at the University of Melbourne, Australia, report in a 2005 volume of the journal, *Pediatrics*, that obviously there is a direct relationship between severity of the injury and recovery of cognitive functioning. However, what these researchers also report is that the amount of recovery from severe TBI was considerably better for OLDER children. Recovery for infants to age of about 2 years was minimal after severe injury whereas better outcomes were observed for older children with injuries of comparable severity. Further, younger children with moderate TBI likewise did poorer than older children with comparable injuries. These findings indicate that we need to modify our thinking about head injuries in infancy. The research on brain plasticity indicates on the one hand that the brain has remarkable capability for recovery and improvement in function after TBI even many years post incident. On the other hand the evidence is indicating that very young children may be particularly vulnerable to TBI resulting in significant intellectual impairment. Although the evidence is limited at this time, it would seem advisable for parents to have a neurotherapeutic assessment and treatment for infants that have sustained head trauma. In my clinic we see many very young children who respond well to the non-volitional form of neurotherapy, developed in this clinic, which I call “braindriving”. This procedure involves direct-loop stimulation of the brain with light and/or sound that is completely dependent on brain activity. For example, if the amplitude of slow frequency in a specific area of the brain increases above a set threshold then lights at specific frequencies and/or sounds are presented to suppress that activity. This procedure is based on behavioral conditioning techniques and has the effect of normalizing brain functioning for clients that have limited ability for volitional procedures. Such clients would include infants, autistic children, severe fetal alcohol children, developmentally delayed, and severe TBI.

Children who have sustained a mild to moderate TBI as an infant may show up in my clinic at age 11 with a diagnosis of ADHD or ODD or ASD. The parent assumes that the infant had the “normal bumps and knocks” so does not see the TBI as implicated in the child’s cognitive and behavioral problems. Although neurotherapy can be remarkable effective in the treatment of TBI, it is important to be aware that the treatment of brain damage may require considerably more sessions and that recovery may not be as complete as in the case of say ADD that is not a result of TBI.

Parents are often not accurate at detecting brain injury because they assume that the problems they see with their child are the result of some other cause such as genetic basis for ADD, or bad influence from his peers, or poor discipline from parents, etc. As the reader will recall from the list of symptoms of TBI, many of these symptoms are the same as for conditions such as ADHD, ODD, Asperger's and the like. The best "red flag" for a possible brain injury is a sudden change in behavior including mood changes, emotional volatility, impulse control problems, aggression, and cognitive functioning. If you see rapid onset of one or more of these symptoms, TBI should be considered. Finally, if the red flag appears, remember that conventional MRI, CATS and visual EEGs as commonly used in hospital environments are very likely NOT to reveal any noticeable damage. The quantitative EEGs used by neurotherapists, and now many hospitals, reveals areas of functional difficulties that the child may be experiencing. These areas may, or may not, be the result of TBI but, none-the-less, are related the child's problems. Who cares if they are related to TBI? One uses neurotherapy to correct the problem regardless of the origin.

Uncorrected brain irregularities are likely to deteriorate into the problems we discussed in the case of the mature Mike regardless of the original source of the brain inefficiencies. However, behavioral problems resulting from ADD do seem to be more controllable with behavior therapy whereas similar problems resulting from TBI do seem to be far less modifiable with behavioral control methods. The injury has to be treated with neurotherapy for the child to be able to efficiently respond to the behavioral control programs put in place by parents and teachers.