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## **INTRODUCTION**

This manual is for parents of children with ADHD, ADD, dyslexia, learning disabilities, behavioral disorders, OCD and other related problems. Though most of the clinical references will be to ADD, the concepts and program content in this booklet apply to the full spectrum of what we refer to as “brain processing disorders”. Though our program is primarily for children, we have a similar program for adults. For more details on the adult program, please speak with the Doctor or a staff member.

In this manual we have several objectives:

1. Provide all parents with a better understanding of how a child’s brain functions, how it develops, how it can dysfunction.
2. What other treatment options are available besides medications.
3. To help all parents realize that this program is only going to help their child and that there is no down side where in their child could become worse.
4. That every parent will understand that the way their child is now is not the way they have to be for the rest of their life. If the child seems to have a problem that is caused by faulty neurological processing, or dysfunction of their brain, it can be improved through specific activities and therapies.
5. How fast and how much a child will improve is dependent on the degree of commitment and effort the parent and the child put into this program.

Whether or not a child has ADD, learning disabilities, behavioral problems or other related problems, does not mean that they are achieving the most they can achieve in school, athletics, or other areas of their lives. Just because a child is performing at a “C” or “B” level or seems “normal” does not mean that he or she does not have the potential to be an “A” student or excel in other areas as well. The program we have developed is not only useful for children with learning and behavioral problems. It also has powerful application for both children and adults in helping to maximally develop and express their genetic potential in a wider range of human expression. Our programs have applications in the areas of learning, memory and intellectual development, sports performance, behavior modification and improvement and skill development in the areas of music and dance performance. These same programs have powerful application in treating victims of Traumatic Brain Injury and other neurological problems. It is well known that very few people ever develop their full genetic potential in scholastic, artistic, athletic and other areas of human expression. **Every child (and adult) has unlimited potential!** We never know what that potential is and how far it may take a person unless we give each individual every opportunity to reach and develop it. Whether you are 7 or 70 years old you now have a greater possibility

of having a bright future. As a chiropractic physician and extensive training in post graduate neurology, I have had a strong interest in how the human brain and nervous system function. Because of my orientation and training I do not use surgery or medications as my mode of treatment. Instead, I approach these problems with “natural” therapies such as exercises, cognitive activities, physical therapies, nutritional therapies, neurointegrative activities, homeopathic and herbal remedies, and “high tech” therapies such as cold laser, auditory integration training, electromicrocurrent therapies, and computer training programs including Computerized Brain Hemifield Stimulation, Visual Motor Training Therapy, and others. These therapies are safe and have been proven to be very effective in helping children and adults with ADD / ADHD, learning disorders and other attention/concentration disorders as well as other cognitive problems, including those associated with traumatic brain injury. This booklet will serve as an introduction to some of the concepts and theories of what we are trying to achieve with this program. It includes a description of some of the different therapeutic evaluation methods that we use. The beauty of this program is that it takes a practical approach to something that is typically complex, difficult to understand and somewhat non-tangible to most parents. Brain function itself is something that is generally intimidating to people, especially when the typical approaches to altering brain function are either through a psychological or medication approach. The psychological approach focuses on thoughts, ideas, and emotions, which are things that are hard to identify with because they are not tangible. While behavioral problems, such as rage (which may be part of the clinical picture in some ADD children), can respond to psychological types of interventions, this approach has not demonstrated much success in dealing with the other aspects of ADD. We believe this is so because problems such as ADD, in our opinion, are not truly psychological problems at all. We believe they are more developmental and neurological processing problems, which are intimately related to the motor functions of the brain. However, because of the frustrations and responses children experience that have ADD, psychological problems may develop. The second most common treatment approach uses medications such as Ritalin and deals with complex chemicals called neurotransmitters. These are things like Serotonin, Dopamine and Acetylcholine. Trying to understand what these are and what they do is confusing and difficult for most people. For this reason, we will talk more about this aspect of treatment further in this booklet.

### **MYTHS ABOUT ADD**

Despite its prevalence, there continues to be a great many misconceptions and false beliefs about ADD.

These are a few of them.

- ADD is a fad diagnosis. It's given as an excuse for bad behavior.
- ADD is over diagnosed. Every child that acts up gets diagnosed with it.
- ADD only affects boys.
- ADD is really due to bad parenting and ineffective teachers. If parents and teachers would simply do their job, we wouldn't have these problems.
- ADD is usually outgrown by age 12 or 13.
- People with ADD need to simply try harder. They are coddled and given excuses for the way they act.

## **FACTS ABOUT ADD**

- ADD has been recognized in the medical literature since 1902. Dr. George Still, MD, described a group of children who were hyperactive, impulsive, and inattentive. Unfortunately, he believed these children were “morally defective” instead of recognizing they had a medical problem.
- Many people with ADD are not hyperactive. (If they are, the diagnostic term is ADHD - Attention Deficit Hyperactivity Disorder). These children and adults are usually labeled as “willful”, “lazy”, “unmotivated”, or “not that smart”.
- Of those with ADD:
  - 35 percent never finish high school (25 percent repeat at least one grade).
  - 52 percent of untreated teens and adults abuse drugs or alcohol.
  - 19 percent smoke cigarettes (compared to 10 percent of the general population).
  - 43 percent of untreated hyperactive boys will be arrested for a felony by age 16.
  - 50 percent of inmates in a number of studies have been found to have ADD (75 percent in one study).
  - 75 percent have interpersonal problems; untreated ADD sufferers have a higher percentage of motor vehicle accidents, speeding tickets, citations for driving without a license, and suspended or revoked licenses.
  - They also have many more medical visits and emergency-room visits.
  - Parents of ADD children divorce three times more often than the general population.
  - ADD is found in every country where it has been studied and in about the same proportions.

While poor parenting or teaching can certainly make ADD symptoms worse, they are not the cause. ADD is a neurological problem that is largely a genetic disorder. Even skilled parents and teachers can appear inept when trying to deal with ADD children. The harder many people with ADD try, the worst things get for them. Brain-imaging studies show that when people with ADD try to concentrate, the part of their brain involved with concentration, focus, and follow-through actually shuts down.

Many children never outgrow ADD and have symptoms that are severe enough to interfere with their whole lives. Half the children diagnosed with ADD have disabling symptoms into adulthood.

We believe that ADD is only one of a spectrum of neurobehavioral disorders that are very similar neurologically. Depending on the severity of the disorder and the specific areas of the brain that are involved, a person may be given the diagnosis of ADD, ADHD, OCD (Obsessive Compulsive Disorder), ODD (Oppositional Defiant Disorder), Tourette’s Syndrome, Bipolar Disorder, Pervasive Learning Disorder, Asperger’s, Autistic Spectrum Disorder, Autism, and some forms of Schizophrenia.

## RECOGNIZING ATTENTION-DEFICIT / HYPERACTIVITY DISORDER

Approximately 3 to 7% of children and adolescents in this country meet the full diagnostic criteria for an ADD diagnosis, yet only 2 percent are treated. However, many more have significant impairment from ADD symptoms though they do not meet the official criteria to receive a diagnosis. Many researchers believe that boys who have ADD outnumber girls by a 3:1 ratio, but some feel that girls are affected just as often, though they are correctly diagnosed 4 to 5 times less often. Either way, research has shown that females can be just as impaired, and maybe even more so by this disorder, than males. Children with ADD tend to have problems with learning disorders, being inconsistent or unmotivated in their learning, developing age-appropriate self-care and self-control, experiencing abnormal sleep patterns, a higher incidence of accidental injuries, an increased driving risk and have more motor vehicle accidents. They also have problems with relationships with peers and adults and have an elevated high school dropout rate.

ADD is recognized as a developmental disorder that is usually inherited and is a result of impaired function of certain networks in the brain, resulting in impaired *executive functions*. Executive functions of the brain are cognitive functions that activate, integrate, and control other functions of the mind. They operate like the conductor of an orchestra who selects the piece to be played and then organizes the musicians – directing them as to when to play or stop playing, keeping time and help. When the executive functions of the brain do not work properly the dysfunction manifests itself in a wide range of problems. Persons with ADD typically have problems with listening attentively, organizing their work, sustaining efforts for tasks and keeping track of their belongings or homework. Many of them have significant problems remembering what they read or recalling what they have learned. These difficulties may or may not be accompanied by hyperactivity or behavior problems such as mood swings and emotional outbursts.

Students with ADD impairments are often a puzzlement to their teachers and parents. When they're involved in an activity that interests them, such as sports, video games, arts, music, mechanical tasks or computer activities, they show little impairment in doing these types of functions. However, when doing schoolwork or homework they tend to display marked impairment and extreme inconsistency in their functioning, even when they want very much to do well. While adults may interpret this behavior as a lack of self-discipline or motivation, it is not.

Children with learning disorders are often placed in special education programs. However, if a child with a specific learning disorder also has an untreated ADD impairment, that student's ability to benefit from special education services for the learning disorder is likely to be severely compromised. The next question is why do those areas of the brain that are responsible for executive functions not do their job? To understand this we first need to understand how the brain develops after birth and how it functions.

## HOW THE BRAIN DEVELOPS – HOW THE BRAIN WORKS

ADD is an expression of brain dysfunction. **When we say that the brain is dysfunctional we do not mean that the brain is damaged.** What we mean is that the cells in specific areas of the brain are not as active as they should be or that certain brain areas are not communicating with each other as effectively as they should. Most experts agree that this is not primarily a psychological or emotional problem, nor is it generally a result of poor parenting, but rather a physical disability. In considering the development of the brain, there are two major concepts that need to be understood. The first is ***plasticity***. The second is ***mechanoreceptor stimulation***. **Plasticity is defined as the ability of the brain to grow and change in accordance with stimulation.** We know that by the 16<sup>th</sup>

or 17<sup>th</sup> week of embryological life, we have all the brain neurons (brain cells) we will ever have. The connections in our brain are initially formed through genetically controlled mechanisms. Connections are made between the millions of nerve cells as well as other areas of the brain, which create pathways within the brain. This is what forms the basic structure of our central nervous system. After birth these primary connections and pathways are maintained and developed by being stimulated through use. All neurons (nerve cells) generate electrical impulses that travel throughout the nervous system much like the electrical impulses in a computer do and carry information and commands all through the brain and the body. Neuroscientists believe that in ADD children, the areas of their brain that are responsible for executive functions are either underdeveloped or function at a lower level. In other words, the neurons (nerve cells) of a child with ADD do not create as many electrical impulses as the neurons do in children who do not have ADD. The more we use a specific pathway in the brain the better it will be maintained, as well as function, at a higher level. In addition, if we frequently stimulate a given pathway, we will actually increase the size and volume of the cells associated with that pathway. Developing nerve and brain pathways is similar to developing muscles. When you do physical exercise the muscles grow in size and strength. Similarly, when you use your brain, the areas and pathways involved develop more neural connections, which make them stronger, faster and more efficient. This is the basis of learning as well as the basis for changing brain function.

For example, when you first try to learn to play the piano, it is difficult and you probably won't perform very well. However, with consistent, frequent practice you will become increasingly better. You may begin with playing "chopsticks", but with practice, you can learn to play pieces by Mozart or Beethoven. The reason this happens is that your practice and effort creates more and more neural connections in your brain in the areas and pathways that let you play the piano. The more neural connections you create, the better you can do the thing you want to do.

As mentioned earlier, we cannot increase the number of neurons (brain cells), but we can increase the number of connections between brain cells through **frequent stimulation of the brain.**

What causes stimulation to our brain? Because the brain cannot stimulate itself it must receive stimulus from the outside environment. The outside sources that the brain is dependent on are natural environmental sources. This would make sense since during most of human history we haven't had TV, radio or computers to stimulate our brains. The natural sources of stimulation would include light, sound, smell, taste, touch, temperature, and especially, **gravity and motion**. As stated before when we talked about the principle of plasticity, brain cells grow in accordance with the most frequent source of stimulation. When we look at the different sources of stimulation in a natural environment we realize that vision, hearing, taste, touch, and smell are not constant sources of stimulation. However, gravity is constant. It is with us twenty-four hours every day and it affects everyone equally. This is advantageous because our nervous systems are engineered to respond most powerfully to mechanical forces such as gravity. This brings us to the second important concept of brain development. The effects of gravity are mediated within the nervous system through special nerve receptors called **mechanoreceptors**. We are able to appreciate and experience our environment because of the action of tiny neurological structures called receptors. Receptors are on the ends of millions of nerves and are stimulated by environmental forces such as heat, cold, light, odors, flavor, touch, gravity and movement. The most common and abundant type of nerve receptor in the body is the mechanical receptor or "mechanoreceptor", as it is referred to by neuroscientists. While all receptor stimulation impacts the brain's function, because there are more mechanoreceptors than any other type of receptor, they have by far, the greatest affect on the brain. A person may function well with out visual receptors (be blind) or with out hearing receptors (be deaf), but if you lost all of your mechanoreceptor function, your brain would be unable to work. Mechanoreceptors are located mostly in the muscles, joints and tendons of the body. There are also important numbers in the inner ear. They are primarily stimulated by gravity and **motion**. After we are born, gravity is the most powerful stimulator of our brain. As we begin to move about by rolling over, lifting our heads, crawling, and then finally standing up and walking, we greatly increase the amount of stimulation to our brains. So important are the effects of movement in our development and neurological function, that children who have the normal sequence of motor (motion) development interrupted, by not going through the normal stages of learning to crawl and walk, will demonstrate developmental deficits in both mental and movement functions.

## **WHAT BRAIN AREAS ARE MOST INVOLVED?**

We know that three primary areas of the brain are frequently involved in ADHD / ADD types of problems. These are the **neocortex** (or outer brain) especially the frontal area (frontal lobe), the **thalamus** (the main relay center of the brain), and the **cerebellum**, or "little brain" that is located at the rear of the head and below the neocortex. We also know that all three areas develop at about the same time and that the thalamus, connects the cerebellum with the neocortex. It is the cerebellum that is of particular interest to us in dealing with ADHD / ADD and related types of conditions. It is no coincidence that up to 90% of children and adults with ADD, and other types of learning disabilities, display one or more forms of cerebellar dysfunction. While the cerebellum stimulates all areas of the brain, the largest connections are between the cerebellum and the frontal lobe

itself. As we have already pointed out, it has been shown with PET brain scans that children with ADD and dyslexia have less frontal lobe activity than children who do not have these types of problems. The greatest source of stimulation to the frontal lobe of the brain comes from the cerebellum and the greatest source of stimulation to the cerebellum comes from the nerve receptors located in the joints and muscles of the body.

What has been known for years about the cerebellum is that it is stimulated primarily by movement activities and that its chief responsibility is control of balance and fine-tuning of all movement, including movement of the tongue, eyes, fingers, arms, legs, mouth or any other activity involving the muscles. However, what was not known until fairly recently is that the cerebellum also has tremendous influence over mental processing (cognition), learning, memory, thoughts, emotional states and automatic functions of the body, including heart rate, digestion and immune functions. In the past we have been able to diagnose cerebellar dysfunction based on certain types of abnormal movement behaviors or, what are referred to as, motor dysfunctions. People who have cerebellum dysfunctions have problems with balance, coordination, body posture, poor tracking activity of their eyes and are not able to coordinate fine movement activity. They may be more sensitive to motion sickness, have fear of heights, elevators or stairs. They may also have poor handwriting, have difficulty drawing or have difficulty using a keyboard. They tend to avoid or perform poorly in athletic activities that require higher levels of coordination such as basketball, baseball, skiing or gymnastics. On the other hand, many of those people with ADD / ADHD may be able to compete very well in sports such as football or track which do not require as much fine motor control but depend more on gross motor control, speed, strength, or endurance. It is easy to see some of the functions that rely on proper cerebellar control when a person drinks too much alcohol. Alcohol deactivates the cerebellum. A person who has consumed too much alcohol becomes clumsy and uncoordinated, has difficulty speaking, has poor balance, poor reflex activity and impaired cognitive and mental function. It is also interesting to note that a drunk person will also exhibit poor judgment and memory function as well as often loose control of their emotions and inhibitions.

### **Hemisphericity – Right Brain vs. Left Brain**

The cortex of the brain is made of two main sections, or hemispheres. There is one on the left side and one on the right side. While each half can do most things we want done, each half does certain things better than the other half. It is also vital that the two hemispheres integrate their separate functions correctly for full cognitive and other functions to take place. For example, the left hemisphere is better at spelling, performing mathematical operations, reading and hearing word recognition, and verbal communication while the right brain is better at nonverbal communication abilities, math reasoning, reading comprehension, understanding context, social behaviors and hearing comprehension. If the two hemispheres do not integrate their functions, problems arise. For example, when you listen to a person give a speech your left brain evaluates the actual words being spoken. The right brain evaluates the nonverbal messages or context of the words such as voice inflexions, facial expressions and body language. Your impressions of the speaker, as to whether or not she is credible or trustworthy is a right brain

function. Children with ADD more often have problems with right hemisphere function, and so express symptoms characteristically deficient in right brain function and stronger in left brain functions. It seems that the right hemisphere, especially in boys, does not develop completely. Deficient right brain function may express itself in problems with reading comprehension, understanding the subtleties of nonverbal cues such as facial expressions or body language, understanding what they hear, applying math reasoning (doing story problems) and engaging in inappropriate social behavior. On the other hand because a right brain deficiency can cause over function of the left hemisphere they are often good at doing math computation, understanding language, and are very friendly sometimes to the point of being obnoxious or unsafe in their willingness to approach strangers.

The right hemisphere also acts more to inhibit the areas of the brain that experience anger, fear or rage. Because this hemisphere is often underdeveloped in ADD / ADHD children, they may become more easily upset or angry or have emotional outbursts. This can become especially difficult for the child and their family as the child enters puberty when hormonal function begins to kick in. The combination of emotional activity caused by the release of hormones along with the lack of emotional control of the centers of the brain that express anger and fear can be dramatic in their effects and even tragic in their outcome. The following is a general list of the dominant functions of each brain hemisphere that you may find interesting:

### ***Brain Hemisphere Functions***

#### **Left Brain**

- Verbal Communication
- Word meaning processing
- Social Motivation
- Analytical processing
- Approach types of behaviors
- Deals with details (focuses on content): breaks perceptions down into their component parts
- Responds to high frequency sound, light, vibration
- Reading and hearing word recognition
- Math skills (numerical operations)
- Spelling ability
- Fine motor skills
- Sequential processing
- Immune-responsive
- Intention
- Female Dominant
- Likes sequential and familiar processes
- Cardiac rhythm problems (if left brain deficient)

## **Right Brain**

Nonverbal communication abilities: reading “body language” such as facial expressions, voice tones and postural cues that help analyze other’s emotions or the communication content beyond the actual meaning of the words used.

- Intuition
- Distinguishing and remembering musical tones
- Withdrawal types of behaviors
- Evaluates the “safety” of a new or novel experience
- Visual / Spatial; recognizing faces
- Responds to low frequency light, sound and vibration
- Reading comprehension
- Hearing comprehension
- Math Reasoning
- Gross motor functions (posture and gait)
- Social Behaviors
- Humor (ability to understand)
- More connected to the limbic system (emotional centers)
- Immune suppression
- Context
- Visualizing in three-dimensional space; activities that involve perceptual-spatial relations
- Global processing (getting the big picture); Perceives and analyzes things as a whole
- Male dominant
- Sense of Self
- Rapid heart rate (with right brain deficit)

## **Decreased Function of Right Brain**

- Talks a lot or in “circles”
- Approaches others too easily (lack of appropriate caution behavior); difficulty with successful socialization with others
- Do not understand jokes except “slap stick” type humor
- Miss nonverbal cues such as facial expressions and body language
- Poor reading comprehension
- Postural problems and gait (walking or running) abnormalities; poor muscular coordination
- Poor sense of self
- Poor math reasoning
- Difficulty controlling emotions; get angry easily; depression or overly anxious about things

An important part of developing a treatment program for your child will involve determining which brain hemisphere is weak and then creating a therapeutic program that will stimulate and develop that hemisphere more as well as help the two hemispheres integrate better with each other.

## Neurotransmitters and Brain Function

Much of current medical treatment of ADD focuses on special brain chemicals called **neurotransmitters**. Even though there are many types of neurotransmitters, they all do basically only two things. One is to excite nerve cells (neurons) so they fire their electrical impulses more frequently and the other is to inhibit them so they fire their electrical impulses less frequently. In other words, they either speed up neurological activity or they slow it down. Neurotransmitters are produced when the nerve cell is stimulated. The neurotransmitters allow any electrical impulse that is traveling down a nerve to jump to the next nerve so it can continue on its journey. The gap between nerve cells is called a “synaptic cleft”. In order for an electrical impulse to jump from one cell to another across the synaptic cleft, there must be a release of a neurotransmitter chemical between the two cells that acts as a bridge. ***Unless the nerve is stimulated adequately the neurotransmitter will not be made or it will be made in inadequate amounts.*** This is not because the cell cannot make neurotransmitter. Rather, it is due to inadequate stimulation of the nerve, which, in turn causes it to under-produce neurotransmitter. It is also important to understand that immediately after a nerve releases neurotransmitter and the nerve impulse jumps the synaptic cleft, that the neurotransmitter is reabsorbed back into the cell and stored for the next time it is needed. Researchers had noted that the neurotransmitters Dopamine and Serotonin, as well as others, are present in lower levels in children with ADD. Some believe that children with ADD cannot produce enough of these neurotransmitters and therefore, the best way to treat these children is to use medications that correct these deficiencies. When the amount of neurotransmitter is measured in the blood of a child with ADD it may very well be below normal, but this is not because their nerve cells cannot make enough neurotransmitter. The nerve cells of children with ADD are able to make as much neurotransmitter as children who do not have ADD. The problem most commonly is that their nerve cells are not being stimulated enough to produce enough neurotransmitter or it may be that they have fewer synaptic sites to stimulate.

## Long Term Correction – Building A Better Brain vs. Drugging the Brain

Unfortunately, current medical practice focuses on correcting the symptoms rather than on correcting the primary cause of the symptoms. Usually, medication has been the primary mode of treatment because, as we have just explained, it has been believed that the symptoms of ADD are due to abnormalities in neurotransmitter levels in the brain. Two other reasons medications are the treatment of choice is that traditional medicine has always had its focus on the chemical makeup of the body as it relates to disease, and the drug companies, which sponsor most of the research in medicine, are only interested in developing drugs that can be used to correct health problems. So how do medications that are used to treat ADD work? Some medications chemically stimulate the nerve cell that produces the neurotransmitter. Other medications may replace or mimic the neurotransmitter in bridging the gap between the nerve cells. Still others may slow or block the neurotransmitter from being reabsorbed in to nerve cells, causing the amount of neurotransmitter between the nerve cells

to increase. In general, what they all do is increase stimulation to the brain. While replacing a seemingly lack of important brain chemicals to correct a related health problem seems to make sense, it is not necessarily the best way to go. Even though these drugs often work, they have numerous side effects that are serious and even life threatening. Some may permanently change the normal function of the brain itself in undesirable ways. Others are suspected of having cancer causing potential. In many countries outside the United States some of the most common medications are not used for these very reasons. Most of the Ritalin used in the world, for example, is used in the United States. Ritalin is a central nervous system stimulant, but at this time it is not fully understood how it works and the long-term effects of its use have not been established. Yet hundreds of thousands of children are given it daily. The side effects of Ritalin include increased blood pressure, weight loss, growth retardation, facial tics, nervousness, irritability, agitation, insomnia, psychotic episodes, violent behavior, heart arrhythmias, psychological dependence, paranoid delusions and muscle twitching. In animal studies, Ritalin has been shown to cause cancer. Besides this, Ritalin does not cure the problem, as do not most drugs. We do not believe that drugging children with ADD is the best solution and certainly not a desirable long-term solution. We believe that a better approach is to stimulate the child's brain through more natural means that are free of side effects and also act to develop and improve the brain on a more permanent basis. How do we do this? By applying in a clinical program, the knowledge we have of how the brain works.

## **THE BRAIN CAN GROW AND IMPROVE**

Recent research has shown that the brain is constantly changing and can improve in its function. New information and experience actually cause structural changes in the brain that result in changes in brain activity. The way a child's brain functions now is not necessarily the way it has to function for the rest of his or her life. A good example of this was Albert Einstein. It has been said that as a child Albert Einstein had ADD and/or dyslexia. He did not speak until he was about 7 years old, did very poorly in elementary school, high school, and college and in fact struggled at all of these stages of education. After failing to be accepted to a postgraduate program, Albert Einstein resigned himself to becoming an apprentice in a clock shop at the age of 20. However, at the age of 26, Albert Einstein published the first draft of his general theory of relativity for which 10 years later, he won a Nobel Prize. To this day he is considered one of the greatest minds that has ever lived. Albert Einstein's brain was examined after he died and it was shown that his brain was basically the same as everyone else's. It was roughly the same size and shape as most brains and it had roughly the same amount of brain cells. However, one researcher did find that he did have more connections between his brain cells. These connections obviously grew later on in his life. It is believed that these increased connections may have been not only a product of genetics but also a product of specific physical and mental exercises that he had done on a repetitive basis through his life. One thing that we know that Albert Einstein did that may have contributed to his

growth of connections was the fact that he loved music. He played the violin and piano regularly. In fact, later on in his life, he stated that when he was stuck on a mathematical problem, he would often sit down with his violin and play until the answer came to him. Einstein, as with other geniuses, would write notes to himself constantly. He was also constantly thinking of equations in his head, using his mental capacities to the fullest at all times. Einstein, when thinking, used his brain in a unique way. He used his imagination and creative side to envision his equations as a daydream at first, then put them into more practical terms later. It is believed that the combination of physical movement (such as playing the piano or violin on a regular basis), the stimulation of the music, as well as fine motor activities (such as writing and playing music) coupled with the mental concentration and effort of daydreaming, caused the explosive growth of connections in his brain.

This short story has been provided to illustrate how an individual's performance and mental potential is really more determined by the things they can do than by set genetics. It was also provided to help you understand that your child too, can increase their brain function through certain types of activities, and that change and improvement are within the grasp of most everyone who is willing to do the things that cause these changes to occur.

## **HOW WE TREAT THE PROBLEM**

Various methods have been used to try to increase natural stimuli to the brain. Different techniques such as sensory and auditory integration and neurodevelopmental training, as used by occupational therapists and speech pathologists, have been successful in improving a child's ability to interpret normal sensations. Children who go through these various programs have been shown to improve their sense of touch, balance and coordination, fine motor and gross motor activities. These types of treatment have also been shown to eliminate some of the symptoms of ADD. Activities such as running have been shown in various studies to be successful in improving a child's function to the point of eliminating the need for medication. Eye exercises and activities developed by some optometrists have shown to be effective in helping children with ADD and learning disabilities. Nutritional interventions and dietary changes may have dramatic positive effects on a child's behavior and mental function. As already stated, we know the greatest source of stimulation to the brain comes from nerve receptors in the muscles and joints; and especially those of the spine. We also know that these receptors are stimulated primarily by the forces of gravity and by movement. While gravity is a constant factor, equal to everyone, quality and quantity of voluntary movement varies from person to person. Correcting improper or restricted joint motion and muscle imbalance, especially in the spine and neck, is therefore, an important part of a comprehensive treatment program.

### **CHIROPRACTIC THERAPY AND CHILDREN**

At this point it would be good to make a comment about chiropractic therapy. Chiropractic therapy has a very powerful effect on the brain because it stimulates

mechanoreceptors and can alter brain function and activity in a very selective manor. It is an extremely powerful and effective tool in treating neurological problems. Unfortunately, there are a few misconceptions about just what chiropractic therapy is. Many people believe that chiropractic treatment consists of twisting the spine or neck, which causes the joints to “pop”. There are many techniques, or treatment methods, used by chiropractic physicians. Some techniques do cause the joints to make a popping sound. However, **in our clinic these techniques are not used**. Basically, there are methods that are done by hand manipulation (and cause the “popping” referred to) and those that are done using a precision hand held instrument. We prefer the instrument methods of treatment that do not involve twisting or popping. These treatment methods are so gentle and safe that they are used on infants. We prefer these techniques because they are extremely safe, painless, and highly effective for both children and adults. No one is going to “pop” or “crack” your child’s neck or spine. Having said this, which we hope clears up any misconceptions you may have and helps to put your mind at ease; we can get on with how we treat ADD and related problems.

## **ALTERNATIVE TREATMENTS TO DRUG THERAPY**

In our program we take multiple approaches to treatment. We draw on therapeutic methods that have been shown to be effective from other health professions and then add our own unique methods or applications. The first is based on using a series of specific exercises that will stimulate specific areas of your child’s brain, which will then improve the brains function on a long-term basis. These exercises include balance activities, coordination development, strength development, eye exercises, fine motor activities, and activities that combined motion and thinking activities. Some of these exercises have to be done under professional supervision, but others the child can do at home. We recognize that each child’s nervous system is unique, and therefore, your child may respond better to one or more specific exercises. As we go along we will be able to fine tune your child’s program and emphasize the exercises that seem to have the greatest effect for them. The second approach is using reflexive and direct stimulation to your child’s brain. We do this with auricular therapy, cold laser therapy, neuroelectrical therapy with microcurrent, color therapy and music and hearing therapy. These therapies help stimulate the brain, act to integrate brain function and help restore normal oscillation frequencies to those areas of the brain where dysfunction is occurring. We have also used these therapies successfully in treating brain dysfunction and traumatic brain injury in adults. All of these therapies are completely safe and have no negative side effects of any kind. The beauty of our program is that none of the treatment methods have any negative side effects. There is no “down side” to any of the therapies. The exercise portion alone will improve a child’s attention span, ability to learn and increase his or her overall level of health. This is not to say that all children in this program will eliminate all their symptoms. Please keep in mind that children may also have other underlying health issues such as genetic problems and psychological or behavioral problems that may need to be addressed separately by other health care professionals. However, we believe the vast majority will show significant and worthwhile improvement. This program has already demonstrated its ability to improve children’s problems, no matter what level they

are at now, and that it has only a positive effect on a child's ability to cope with whatever problems they may have and improve their feelings of self worth.

## **WHAT ELSE CAN WE DO?**

It is believed that one of the probable causes in the sharp increase in children with ADHD is due to our children being much less active than they were ten or twenty years ago. This seems to especially be a problem with children in the United States. Our children, as a whole, are more sedentary than other children around the world. American children have higher rates of obesity and generally are in worse physical condition. Children in this country have more money to spend on video and computer games and so gravitate towards these types of activities. In the summer time or after school, try driving through different neighborhoods and see how many children are out playing. You don't see as many as when we were children. Television and videogames have also become the electronic babysitters for many hassled and overextended parents. It can be easier to let the kids watch TV or play video games than to try to get them up playing or to spend time doing things with them. However, it is important that we do encourage our children to be more active. Insisting your child go out and play games like tag, ball games, running, hop scotch, jump rope, riding bikes, playing on swings etc. or on bad weather days having indoor physical activities like balance boards, wobble boards, mini trampolines, jump rope etc. available can help a great deal. If you have the resources, signing them up for dance, gymnastics or karate lessons can be very helpful too.

Another probable cause is biochemical / nutritional imbalances and the increasing development of food allergies and sensitivities. Eating the right foods, and even more so, avoiding the wrong foods, is an important part of the treatment program.

## **EACH CHILD MAY RESPOND DIFFERENTLY**

Each child is unique and so response to treatment can vary. Some children will respond rapidly while other children may take longer, and in some children there is the possibility that no change may occur at all, though this is highly unlikely. Change takes place over time and results are greatly affected by the degree of effort and dedication made on the part of the child and the parents. Consistency in doing the exercises and other assigned activities as well as developing correct dietary practices, is critical to increasing the probabilities of a successful outcome. It is also hoped that over the treatment period, the child will develop new habits of physical and mental activity, which will act to make the gains from their treatment lasting. Developing such habits will also aid in continuing the process of brain development and improving your child's mental capacity long after they have completed their training and treatment with us.

Now we want to give you information about some of the various treatment and evaluation tools we use in our program.

### **Neurocognitive Training – The Interactive Metronome®**

Neurocognitive therapy is used to develop and correct faulty brain function. Because cognitive (mental) function relies on healthy motor (movement) function, we combine voluntary activities and non-voluntary activity with mental / cognitive activity at the same time. This approach has wide application and is used extensively in our treatment programs. Neurocognitive therapy is used in our office for both ADD / ADHD as well as an important part of our brain injury treatment program. It is also the core treatment for related types of “brain processing” problems, such as OCD, Dyslexia, Autism, and other learning and behavioral problems. While we use a number of different neurocognitive training techniques, the Interactive Metronome is very important in this type of treatment. This is a biofeedback technology that is extremely powerful in developing cognitive function and integration, motor function and coordination. If you would like more information about this specific technology, go to [www.interactivemetronome.com](http://www.interactivemetronome.com)

### **Auditory Stimulation**

Though this is part of the fine motor exercise program, we also have some done separately at home. We will recommend your child spend a certain amount of time listening to music. We have chosen specific types of music that have been engineered specifically for developing brain function. This music plays at higher frequencies that are between 5,000 and 8,000 hertz. This is because these frequencies have the greatest effect on increasing brain function, IQ and memory. We suggest your child be exposed to this type of music frequently. Having a small tape or CD player in their bedroom to listen to at bedtime is a great way to end the day. Playing this type of music at a low level while they read or do other school homework is also encouraged.

### **Visual Motor Training**

Children with ADD, dyslexia and related problems often have visual motor function problems. This is to say their eye muscles do not work correctly. This causes problems with their ability to read or to move their vision back and forth from their desk to the black board. Part of your child’s evaluation with us will be to screen for these types of problems. If they are present we use both a home computer vision-training program as well as vision therapy training in our office to help correct these deficits. In addition to helping correct eye function these exercises have a very powerful effect on the whole brain. If you have not already done so, we recommend you have your child examined by an optometrist to make sure they do not need glasses.

### **Color Therapy**

On various visits we may have your child wear a pair of colored glasses while undergoing other therapies. Depending on the color frequency used color

therapy stimulates the different hemispheres of the brain through the vision pathways.

### **Eye Light® Therapy**

These are special electronic glasses that can be programmed to engage a sequence of flashing lights in the glasses. We use these to stimulate specific brain areas through the visual pathways of the brain. A pair of these will be provided to your child as part of their total treatment program to be used at home. You may get more information about Eye Lights at [www.eyelights.com](http://www.eyelights.com)

### **Electro-Neurotherapy and Auricular Therapy**

While these may sound a little ominous, they are very safe. We use tiny amounts of electric current from a small 9-volt battery to stimulate specific points on the head and ears that relate to specific brain areas. We also use these therapies in treating traumatic brain injuries. These two therapies are a combination of Eastern and Western medical techniques and are highly effective in treating neurocognitive problems as well as other health conditions. These therapies seem to promote reintegration of brain function and communication between areas of the brain itself. Auricular therapy' which involves stimulating acupuncture points on the ear, has been around since the 1970's and is now being used by the United States Air Force and the Mayo Clinic.

### **Nutritional Therapy**

Biochemical balance through proper nutritional intake is vital to normal brain function. A diet rich in fresh vegetables and whole grain products contributes greatly to proper brain function. Refined carbohydrates such as sugar as well as excitotoxins like NutraSweet and MSG can have powerful negative effects on brain function, as well as the rest of the body. Many children have sensitivities to food additives as well. We may also have a metabolic blood evaluation completed and / or conduct a detailed nutritional evaluation using MRT (muscle response testing) to help determine if any nutritional or biochemical imbalances or organ malfunctions are present that could be causing or contributing to your child's problems. We will then recommend dietary changes, if necessary, and prescribe specific nutrients and food supplements that will help improve overall health and especially, brain function. We may also prescribe homeopathic and herbal medications if appropriate. Children and adults with ADD often have supplemental need for essential fatty acids, magnesium, specific amino acids and other nutrients. Specialized nutritional formulas are often used to help the body produce more neurotransmitters which can dramatically improve the symptoms of ADD. At the beginning of the program the amount of nutritional support needed is greater, and then tapers off each succeeding month until most patients are only on one or two core maintenance products. This is due to two factors:

1. The patient's biochemical balance is gradually improved.

2. The development of better eating habits takes place, so fewer supplements are needed.

Most nutritional programs only last about 3 months, but they can take longer if the patient's biochemistry is severely out of balance, many organ systems are involved or there are genetic factors involved. Allergies are also very common in children with behavioral and learning problems as is heavy metal accumulation. Various foods or chemicals can trigger a wide range of physical and emotional responses in susceptible individuals and effect brain function. Heavy metals such as mercury and lead may have accumulated in the child's tissues and may cause problems as well. Allergies are usually evaluated by MRT (muscle response testing) to see if they are involved while heavy metals are tested for by hair analysis or MRT. These tests are included in the cost of your child's program. If it is determined that certain foods are contributing to your child's problems, it is important that the entire family be supportive and have these foods eliminated from the families diet for a time until chemical balance can be restored in your child. This usually only takes a few weeks to achieve.

### **Auditory Integration**

Many children with learning disabilities, ADD / ADHD, dyslexia, etc. have problems with hearing. The problem is mostly one of integrating sound so they understand or correctly hear what is being said to them. Children with ADD often seem to have "selective deafness" or seem to ignore their parents or teachers. What is really happening with these children is that they really do not fully hear what is being said to them because the sounds do not get processed correctly in their brain. If your child's evaluation indicates a possible problem with auditory integration, we will have them tested by an audiologist at no extra cost to you. We have an effective hearing integration program based on the Tomatis Method that you use at home to correct this dysfunction.

### **OTHER PROFESSIONAL ASSISTANCE**

If it is determined that your child could benefit from additional help outside our expertise, we will make the proper referral. For example, sometimes, emotional problems may develop in a child who has ADD, not due to the ADD itself, but due to the negative responses such children often get from peers, family and others as a consequence of their behavior. In these cases, a course of counseling from a psychologist or family counselor can be of great benefit.

### **IF YOUR CHILD IS ON MEDICATION**

Many parents bring their children to us for treatment because they want options to placing their child on medication or they would like to get them off the medication they are currently taking. However, if your child is already on medication we recommend you not take them off it. We recommend you work with your doctor to gradually eliminate medications as your child improves. The medication will not negatively affect any of the therapies we use, nor will our treatment methods cause any interaction or problem with your child's medication.

## **A FINAL COMMENT**

We realize that most parents are already over loaded with a million-and-one things they have to do. Asking you to do even more in working with your child with the home therapies we will prescribe, controlling their diet (which will impact the whole family) and making sure they take the prescribed nutritional supplements is an additional demand. "It ain't easy" as the song says. However, you may take some comfort in knowing that most programs last only 3 months, so there is a light at the end of the tunnel. In addition to this we fully expect some wonderful things to happen to your child that will make all the work and sacrifice well worth it. Much of your child's success will depend on how diligent and dedicated they are in doing what we ask them to do, both in our office as well as home. Be sure to let us know if you are having problems in implementing any of the home exercises or therapies or if other challenges are occurring. There are no short cuts and no "magic bullet" in getting the results we all want your child to have. Success in this program is a product of time and work. If you wish to have your child come into this program, or if you would like more information, please call our office at 419-424-0100.