

HEALING THE BRAIN NATURALLY

**Understanding and taking care of ADHD, ADD, behavioral disorders,
learning disorders, developmental delay and autism.**

Part 1

Hemisphericity and Functional Disconnection Syndrome

By Dr. Marina Zaré

Introduction

As parents, we all want the best for our children. From the time they are born, we hope to see them grow and develop properly, flourish, build their personality, benefit from vibrant health, succeed in their social and romantic relationships, academic endeavours or career paths. We aspire to see them express the best of who they are and to see them prepare to enter the world of adulthood so that they in turn can become fulfilled parents.

For many, the miracle of life blossoms and the circle of life are completed without too many challenges or incidents. But for others, the dream soon becomes a nightmare.

According to epidemiological research, between 5-20% of our children suffer from one or more neurobehavioral disorders such as attention deficit (ADD), hyperactivity (ADHD), learning disorders, behavioral disorders, developmental delay disorders, obsessive-compulsive disorder, Tourette's syndrome (tics), Asperger's syndrome or even autism. And this percentage is on the rise.

Those statistics don't even take into account all the children that do not formerly meet diagnostic criteria for a mental disorder, but who are not functioning at their greatest potential. It doesn't account either for all those who are not really sick to the point of

being hospitalized but whose health is far from ideal: allergies, asthma, skin problems, recurring ear infections, abdominal pains, growing pains, sleep problems, back pain, headaches or migraines and many other symptoms who are usually medically unexplained and who are not taken properly into account by the pediatrician or family doctor.

The parents of those children are looking for real answers and solutions. Some will choose the conventional medical system, following the advice of family physicians or pediatricians. Unfortunately, those practitioners are often poorly trained in the field of neurodevelopmental disorders and have few options to offer beyond prescribing powerful psychotropic medications such as Ritalin. Others will, alone or in combination to drug treatment, chose to follow some form of behavioral therapy with a psychologist or child psychiatrist.

Other parents - more critical or poorly convinced by drug treatments, or who have not found the desired results - turn to alternative and complementary approaches. Many options are then available such as kinesiology and "Brain Gym"; dietary approaches and diet without food additives, phosphates or Feingold diet; auditory training and Tomatis Method, music therapy, color

therapy, magnet therapy, massage therapy or even Neurofeedback or chiropractic care.

Although all of these approaches – conventional or alternatives – claim their share of success stories or even miraculous cures, many are limited by their one-size-fits-all perspective which only addresses one small piece of the puzzle of the complex pictures that those disorders represent.

In this two part article, I will help you discover an integrated and holistic approach to the natural management of neurobehavioral disorders that is heavily founded in breakthrough discoveries made in neurosciences and in the field of functional medicine.

Kevin, a 21st century boy

When Kevin was born, his parents' dream was realized beyond their greatest expectations. The happiness was so great that the epidural, the long labor that required drug treatment, and the difficulty that the ObGyn had to pull Kevin out of his mother's womb (although one of the assistant pushed hard on his mother's tummy) were soon long forgotten. As a baby, and despite some irritability, colicky cries and sleeping problems, Kevin was developing fine. His torticollis (Kevin always had his head turned to the right side) had seemingly disappeared without complication. At least, that's what the pediatrician had said. The first months were pure delight, although his mother had suffered an episode of "post-natal" blues. The family doctor had said this was "normal" and a few months of antidepressant had helped her feel better.

Kevin was your average child. He received all his vaccines, without any apparent side-effects. He developed within the norm. He had not walked on all four and had walked quite prematurely, but the pediatrician had comforted the mother and said that "this did not matter, that some children preferred to walk rather than crawled first." And that's what Kevin had done. From the pediatrician's point of view Kevin is healthy. He only suffers two or three colds per year, and had some bronchitis here and there. He had some tougher times around 5 years of age where he had 6 ear infections who where all

successfully treated with antibiotics. Maybe, he just seems a bit clumsy (he bumps easily into things and falls easily). Kevin is quite a character. He easily throws a temper tantrum and tends to stay by himself (at least, that's what the lady in charge of day-care said – both parents work).

We meet Kevin again in primary school, during physical education class. He is playing dodge ball. Kevin was able to pick up the ball which was on the ground near him. Other children run by him, scoffing him, knowing they won't be hit. They know perfectly well that Kevin "isn't that good at catching and throwing" and that there is no risk getting hit. Kevin knows it also. In team sports he is always the last one to be picked to be on a team.

And what was supposed to happen, happened. Kevin clumsily threw the ball on a classmate. He caught it and throws it back at Kevin who is hit and eliminated.

In class, Kevin isn't more comfortable either. He has difficulties. The teacher is always calling on him about his bad behavior and poor handwriting skills. Since he cannot impress others with any kind of special talent, Kevin acts out to attract attention. He often interrupts the class or bothers his classmates, which inevitably leads to the teacher making comments. His behavior affects the whole class which does not progress as fast as it could.

During recess, Kevin often has problems socializing. Others do not spontaneously integrate him in their games. He has problem relating to others because he has a hard time understanding social cues, always take jokes to the first degree and constantly thinks others are pulling his leg or making fun of him. Therefore, he prefers to be alone or gets involved in a fight just to attract some attention. His poor behavior does not only affect his class. At home, his constant tantrums and oppositional behavior is creating a lot of tensions in the family. His mom and dad do not have any time for themselves any more because they always need to police him. His little sister suffers because it seems that "it is always about Kevin." Kevin often responds back to his parents; he does one silly

thing after another, never becoming aware of the consequences of his actions. Moreover, he has poor self-esteem and is often alone. He only really connects with younger children, but does not really have any close friends. At night, during homework, the war begins and it takes hours to get them done. Despite all the efforts invested by his parents and the teacher, Kevin is failing and he might have to repeat a grade. What is more frustrating is that everyone recognizes that Kevin is a bright boy. But he does not seem to understand how to effectively use his intelligence.

The last time his mom went to the doctor to refill her antidepressant prescription; she shared her concerns with the doctor. He told her that it looked like Kevin had ADHD and suggested they tried a therapeutic trial of Ritalin to see if that would help. Although mom was reluctant at first, she knew things were out of control and that she would go into burn-out if nothing was done, so she ended up trusting the doctor. Since he has been taking his daily pill, Kevin is calmer and behaves better. In fact, even the teacher commented on how much better he is following instructions. It seems things between mommy and daddy are getting better also.

Kevin is only one example amongst many others of a growing number of children of sexes who are suffering from and are being diagnosed with such disorders as hyperactivity (ADHD), attention deficit (ADD), behavioral problems and learning disabilities. All of these children are like Kevin to some degree. Kevin could have as well been suffering from dyslexia, or obsessive-compulsive disorder, or even autism.

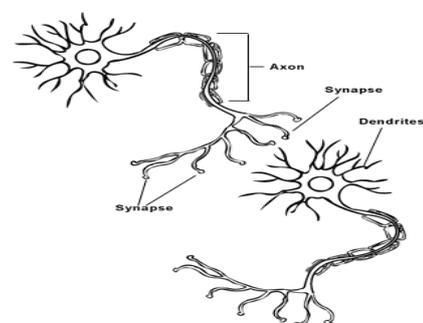
All those disorders have devastating consequences on the lives of those they affect and their direct family. If those disorders are not properly managed, the child is at risk of failing school (or at the very least of not fulfilling his academic potential), to injure himself or to develop self-esteem and socialization problems. Later on, during adolescent years, he is at greater risk to suffer other mental disorders such as depression, to abuse substance, to cause car accidents or even to violate the law. So what are causing all those disorders?

To get a proper answer, we first need to review a few basic facts about how the brain works.

In truth over the last decades a growing number of scientific studies have shown that those disorders – as diverse as they may seem – all share the same common neurological origin. They are not distinct disorders or diseases but are rather part of a spectrum of disorders.

A little bit of neurophysiology...

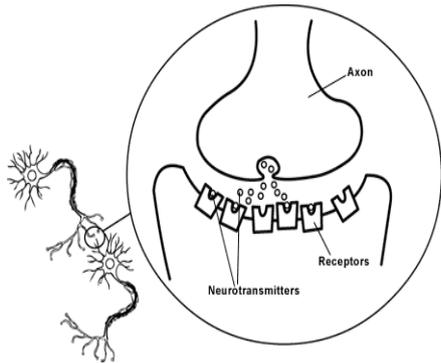
Our central nervous system (which includes our brain) is made of billions of cells called neurons. A neuron is made of a cell body and an axon. The body of the cell contains a nucleus and various other organelles produce the energy necessary for the neuron to function optimally. The surface of the cell body is covered with hair-like structures called dendrites. Dendrites act as line of communication between the cell body of neuron and the axon of other neurons. A single neuron can be connected to hundreds and even thousands of other neurons.



The axon is a long tube-like “pipeline” which extends from the cell body and ends up in a synapse. The synapse is the communication point between an axon and another neuron. This interface between two neurons is done through a small space, called the synaptic or interneuronal space.

When a nerve impulse reaches the end of the axon of a neuron, it triggers biochemical reactions which lead to the release of small chemical substances into the interneuronal space. These substances, called neurotransmitters, cross the space and attach

themselves to receptors on the second neuron's surface. If those neurotransmitters are in high enough quantity, they trigger a new impulse on the second neuron. Once their work is done, the neurotransmitters are released from the receptors and recaptured by the first neuron to be recycled. This phenomenon is called neurotransmitters reuptake.



A little bit of neuroanatomy...

Starting with the oldest structures, our central nervous system (CNS) is broken down into several elements:

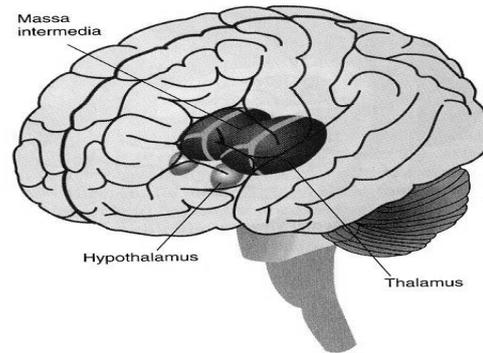
The **spinal cord** is the communication highway between the brain and the rest of the body; it has many relay stations and is the seat of all reflex activities (such as automatically taking your hand off a burning plate).

The **brain stem** contains the breath and heart control centers, the cranial nerves, as well as some areas that control the state of alertness of the individual.

On the back of the brainstem, we find the **cerebellum**. It is involved in the coordination and timing of movements. Recent studies have showed that it also plays an essential role in coordinating visceral functions, emotions and attention.

Above the brain stem, we find the diencephalon which is made up of the **thalamus** – the relay center for all the sensory information (except the sense of smell) that are moving up to the cortex – and the

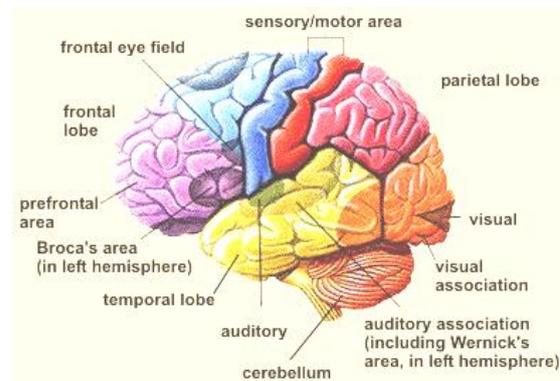
hypothalamus – which is the control center for hormones and glands.



Finally, we find the telencephalon which is made of two cerebral hemispheres and the basal ganglia.

The **cerebral hemispheres** are made of four lobes (frontal, parietal, temporal and occipital) and the limbic system, which is the seat of emotions.

The **basal ganglia** are a series of nuclei or centres involved in movement control.



In our exploration of the brain's anatomy as it relates to learning and behavioral disorders such as ADHD, two areas are particularly interesting. They are:

1. A part of the frontal lobe, called the prefrontal cortex, which is the seat of so-called executive functions (attention, planning, organization, impulse inhibition, self-control).
2. A system of circuits connecting the prefrontal cortex, the basal ganglia and the cerebellum.

In order to better understand ADHD, we must also understand how the brain integrates all the information it receives from the senses

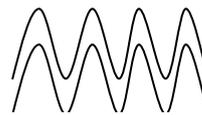
The brain: a question of timing, synchronisation and wavelength.

Each second, our brain is bombarded with thousands of sensory information coming from numerous sources: sight (eye), hearing, olfaction, taste, touch, organs and viscera, skin, muscles, and articulations; in short, from our internal and external environment.

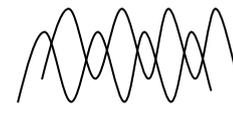
The brain cannot make sense of all this information unless they are integrated into a meaningful experience. Only then can the brain react optimally to its environment. However, there is no single physical area in the brain where all these information can meet. To solve this problem, our brain integrates and synchronizes this information in a temporal manner.

This means that two pieces of information coming from the same sensory experience can only be integrated – and therefore become meaningful - only if they are synchronized in time (« happen together »). In contrast, two pieces of information coming from the same sensory experience which are not synchronized in time cannot be integrated by our brain.

Imagine that you are watching a French movie that has not been properly dubbed. Imagine for example that the image and the sound are not synchronized. Imagine how the lips of the characters are sometimes immobile while the voice still speaks or imagine how the lips keep on moving although the sentence is already finished. The coherence is lost and it becomes annoying, shocking, meaningless, or even ridiculous. After a while, you would stop watching that movie. Children and adults suffering from ADHD have the same problem. Except that for them, the desynchronization is ongoing and never stops. Moreover, the desynchronization does not only affect two senses (such as hearing and sight in our example) but all of the thousands of pieces of sensory information that are coming in from our various senses.



Synchronised
(good timing)



Desynchronised
(bad timing)

In order for the various pieces of information to be synchronised in time, our brain must have a very precise timing mechanism. And this timing mechanism requires a basic rhythm; the same as a music student uses a metronome to acquire his tempo skills.

In our brain, the metronome is our cerebellum. It gives the timing mechanism upon which all the incoming information will be synchronised. Any malfunction of the cerebellum can therefore lead to a desynchronization of the information, a frequent problem in children suffering from ADHD.

In addition to good timing, the different parts of our brain must be on the same wavelength or frequency to communicate properly.

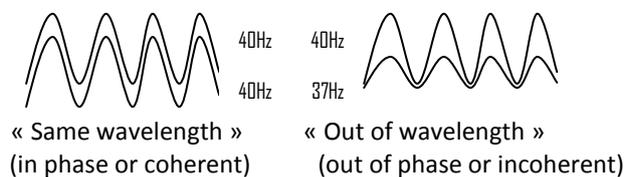
In order to illustrate this concept, let's imagine that you are using walkie-talkie with your child who is in the front yard. If both devices are on the same frequency (the same wave length), you will be able to communicate without any problems. However, if they are on two different wave lengths, there will be some crackling sounds on the line and communication will be more difficult. If both frequencies are too different, it becomes impossible to communicate.

Our cerebral hemispheres and our cortex function at a 40 hertz frequency (40 times per second). This frequency is the basis for human consciousness. At this speed, timing must be very precise or any error can be devastating.

Our brain functions at its best when both hemispheres are coherent, which means when they oscillate at the 40 hertz frequency. When this situation happens, both hemispheres can not only communicate together through traditional neurological relays, but also energetically.

This 40 Hertz frequency originates in the thalamus, the relay center for all information going toward the brain (except the smell).

In order to better understand this concept, let's imagine an experiment where the right side of someone's body isn't stimulated anymore. The left hemisphere – because the information from the right side of the body crosses to the left side of the brain - will not be stimulated any longer, and the 40 Hertz rhythm cannot be maintained. In consequence, we develop a lack of coherence, a desynchronization between the two hemispheres. In this situation, the brain cannot work at its best.



Research in neuroscience has shown that ADHD is a consequence of a brain timing errors which give rise to a desynchronization of incoming information or a coherence problem in which two or more parts of our brain are no longer on the same wavelength anymore.

Cerebral hemisphericity and neurological lesions

In functional neurology, we use the word “cerebral hemisphericity” when both hemispheres are no longer on the same wavelength anymore and when, in consequence, one side of the brain is “weaker” than the other one. A neurological lesion (reversible) is a term which describes a part of the brain that is not functioning 100%. The malfunction that is causing the lesion can be due to a lack of stimulation or to a delay in development of the brain.

The neurological lesion is one of the principal causes of desynchronization (loss of timing) of information and of the loss of coherence between parts of our brain. The loss of coherence is called hemisphericity if the affected parts are the hemisphere. We also

sometimes call this problem a “functional disconnection syndrome”.

Numerous scientific studies carried out in the past ten years have shown that neurological lesions and the brain hemisphericity were the underlying brain problem in ADHD.

We can therefore conclude that ADHD is due to some hypo-functioning or delayed development of some circuits of the brain that link the prefrontal cortex to the basal ganglia to the cerebellum.

Many studies also showed that these parts are smaller in size in children suffering ADHD, than in “normal” children when they are measured by magnetic resonance.

A health care professional specially trained in functional neurology is therefore able to evaluate the deficient areas (neurological lesions) in a precise manner for each individual and to develop an individualized program aimed at rehabilitating naturally these parts.

Hypo-functionality and developmental delay: the HYPER-active is HYPO-stimulated.

Traditional medicine understands this seemingly paradoxical situation. The most well-known medication for ADHD is methylphenidate (Ritalin) which is a stimulant medication. At first, we may wonder why we give a stimulant to someone who is already “hyper.” Well, parts of the brain that are hypofunctional in ADHD predominantly use dopamine as neurotransmitter. One of the predominant theories in the field of neuroscience suggests that, in children with ADHD, dopamine is recaptured and recycled too fast (reuptake phenomenon). In consequence, the prefrontal cortex –the part of the brain that acts as a break for the rest of the brain – is not sufficiently stimulated. The rest of the brain is no longer under control and gets “hyper.” Ritalin is a dopamine reuptake inhibitor. This means that it allows dopamine to remain longer in the space between the two neurons. This also means that the second neuron gets more stimulation. This way, by stimulating the break (the

prefrontal cortex), we can regain control of the rest of the system.

The causes of the problem

Traditional medicine seems quite content with a genetic explanation and a pharmaceutical treatment. However, as someone who attempts to understand the underlying cause of problems, we are not satisfied with such a simple explanation.

Heredity and genetics are only predisposing factors. It is like a loaded gun. But nothing happens with the loaded gun until something presses on the trigger. And that something is the environment.

Medicine concluded that ADHD is a brain chemical imbalance. In the Unritalin Solution, we ask a much more fundamental question: what causes the chemical imbalance?

And as we have seen in our review of neurophysiology, the production of neurotransmitters is dependent upon two factors:

1. The presence of an electrical impulse along the axon of the neuron.
2. Having sufficient building blocks to produce neurotransmitters.

Therefore, the cause of the problem should not be sought in the biochemical imbalance – which is only a consequence – but in the “electrical imbalance”, that is the neurological lesion or the hemisphericity.

In consequence, when a child exhibit ADHD symptoms, we can have 4 possible causes (or a combination thereof):

1. An electrical dysfunction caused neurological lesions and brain hemisphericity
2. A deficiency in the building blocks of neurotransmitters (which is a nutritional and metabolic problem)
3. Neurotoxic factors, i.e. toxins that affect the proper function of the brain.
4. Or none of the above. In that case, the symptoms look like ADHD, but they are caused by something else such as

food allergies, or heavy metal intoxication, or sleep deprivation, etc.

Causes of the causes

I have said that the chemical imbalance present in ADHD is the consequence of neurological lesions and brain hemisphericity. But as a true detective, I am not content with that conclusion and I want to dig deeper by asking the question: what is causing the lesions and the hemisphericity in the first place?

Without going too deep in the theory of evolution, it is commonly recognized that one of the main factors that have allowed humans to develop the big brain they have is the fact that we, as a species, have transitioned from going on all four to walking standing on two legs.

To make it very succinct and short, suffice it to say the development of our brain and of our cognitive abilities is highly dependent upon motor activity. Said another way, movement nourished cognitive development.

The majority of stimulations to which our central nervous system is exposed are not constant (for example, sight is not stimulated during the night). The one and only constant source of stimulation and information to the brain comes from the motor activity produced by our postural muscles as they constantly adapt to the field of gravity.

These stimulations are transmitted to the thalamus and the cerebellum, producing the so-vital 40 Hertz frequency as well as the necessary timing mechanisms which allow the brain to integrate the many pieces of sensory information into a meaningful experience.

From there, this information stimulates the circuits that link the cerebellum to the basal ganglia and to the prefrontal cortex. Remember the prefrontal cortex plays a major role in regulating emotions, inhibiting impulses (which is important for proper social behaviour), attention and concentration and all other higher human cognitive functions.

In summary, the functional integrity of our spine and its postural musculature is therefore

essential for the brain, as is regular movement and physical activity.

Those considerations allow us to start understanding what may be causing the formation of reversible neurological lesions and hemisphericity. Amongst the most common causes, we find:

Perinatal factors such as a traumatic birth, cerebral hypoxia (lack of oxygen), or fetal distress.

Dysfunctions of the spine and its postural muscle structure: poor posture, vertebral dysfunctions (called vertebral subluxations by chiropractors), and muscular imbalances.

Cerebral traumas: car accidents with acceleration/deceleration syndrome (“whiplash”), cerebral concussion, or direct blunt trauma to the head.

Sedentary lifestyle with reduced physical activity: in less than one generation, we went from street games for which we used our big muscle groups and coordination (sports, hop scotch, hide and seek) to sedentary computer games or activities (television, computer, video games, etc.)

Psycho-social factors: sensorial deprivation, physical abuse, parental negligence, lack of social support, familial stress

We need to add to those other types of neurotoxic and nutritional factors that I will discuss in part 2 of this article, such as unhealthy eating and fast foods, environmental toxins, vaccines and hormones.

A solution for Kevin

Our children are the future of our society. What will happen in the future when one child out of five cannot express his or her best potential because several severe imbalances prevent his or her brain from functioning optimally? When a child suffers from ADD, ADHD, learning disorders, behavioral problems, developmental delays, obsessive-compulsive disorder, Tourette’s syndrome, Asperger’s syndrome or autism, it is not only the child who is affected, but the whole family, as well as the whole community.

Those children deserve the best and this is why any approach which pretends to be an answer to their suffering has to be holistic and global, including various natural treatments that have been shown to be effective in helping those types of disorders.

This is why we have created our ADHD Wellness Program. Our program is designed to evaluate and correct the hemisphericity and reversible neurological lesions, as well as the metabolic imbalances that are the true causes of the symptoms of those various so-called disorders.

Our ADHD Wellness Program evaluate the specific needs of your child and offers a natural approach tailored and customize to help your child overcome his or her many challenges.

Contact info@bodyelementspdx.com or call (503) 477-6322 for more information!

About the Author



Dr. Marina Zarè has a Doctorate of Chiropractic degree from University of Western States and a successful practice in Portland, Oregon. Dr. Marina spent many years as an electrical engineer working for high-tech companies like Intel before changing careers so she could dedicate her life to the health of children and their families. Dr. Marina is most passionate about helping kids be as healthy as they can so they can reach his or her full brain potential and live a normal life. She enjoys a hands on approach to helping people live up to their fullest potential.