

THE UNRITALIN SOLUTION E-BOOK SERIES

FREE EBOOK

Dr. Yannick Pauli

ADHD and The Brain

*Better understand what is going on
in the brain of a child with ADHD.*



Introduction

Many of the parents who come and see me have been told that ADHD was caused by a chemical imbalance in the brain. The doctor has explained that ADHD was a developmental disorder with genetics playing a strong role. Medically speaking, the only accepted treatment is the use of medication. If the child is lucky, he or she will also receive some form of behavioural therapy.

It is quite obvious that the symptoms of ADHD are produced by the brain. And from the medical perspective, those symptoms are the results of a chemical imbalance. As a practitioner interested in finding the causes of ADHD, and not only treat the symptoms, the first question that come to my mind is: "what is causing the chemical imbalance in the first place?".

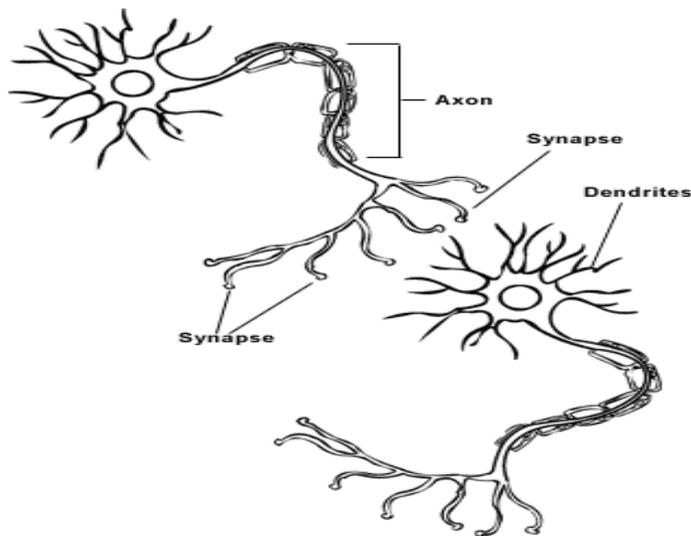
In this e-book, I would like to invite you on a neurological journey that will help you understand better what is going on in the brain of a child with ADHD. But more than that, I want also to start introducing you to the many factors that force the brain to function like it does in ADHD.

In order to understand what is going on in the brain of children with ADHD, we must first become familiar with a few basic concepts of neurology, neuroanatomy and neurophysiology.

I have tried my best to keep this e-book as simple as possible. I would also like to mention that if you understand only 20% of what I share with you in this e-book, you will know more about the ADHD brain than most health care professionals out there.

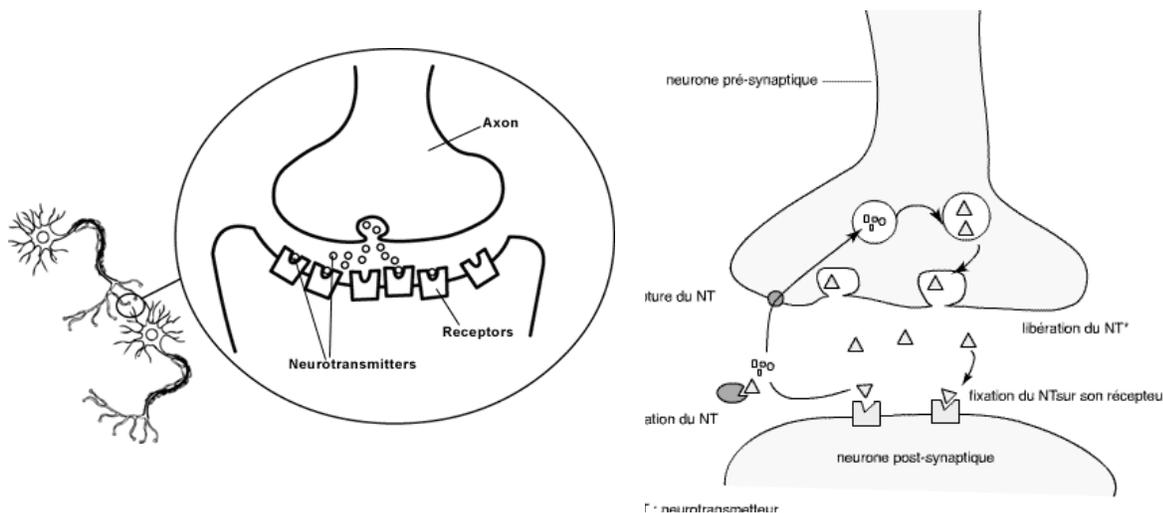
A little bit of neurophysiology...

Our central nervous system (which includes our brain) is made of billions of cells called neurones. A neurone 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 another neuron. 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 a 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 centres, the cranial nerves, as well as some areas that control the state of alertness of the individual.

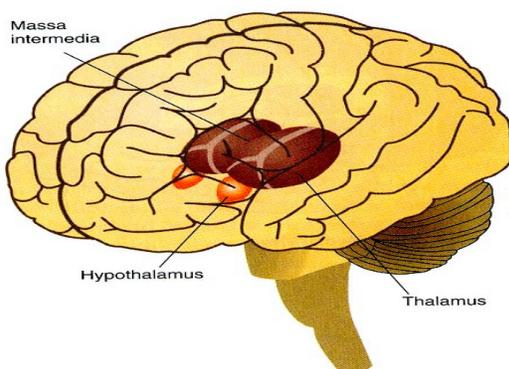
On the back of the brainstem, we find the **cerebellum**. It is involved in the coordination and timing of movements. Recent studies have showed that it also plays an essential role in coordinating visceral functions, emotions and attention.

Above the brain stem, we find the diencephalon which is made up of the **thalamus** – the relay centre for all the sensory information (except the sense of smell) that are moving up to the cortex – and the **hypothalamus** – which is the control centre 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, organisation, 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 these 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 synchronises these 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 synchronised 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 synchronised. 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 tow senses (such as hearing and sight in our example) but all the thousands 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.

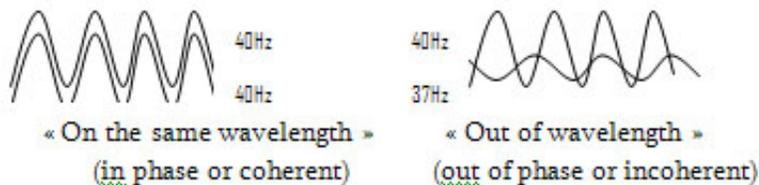
In order to illustrate this concept, let's imagine that you are using walkie-talkie with your child who is in the garden. If both devices are on the same frequency (« the same wave length »), you will be able to communicate without any problems. However, if they are on two different wave lengths, there 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 centre 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 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 a individualized program aimed at rehabilitating naturally these parts.

Hypo-functionality and development 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 – who 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):

- An « electrical » dysfunction caused neurological lesions and brain hemisphericity
- A deficiency in the building blocks of neurotransmitters (which is a nutritional and metabolic problem)
- Neurotoxic factors, that is toxins that affect the proper function of the brain.
- 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, ...

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 to deep in the theory of evolution, it is commonly recognized that one of the main factor that has 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 our sensory information into a meaningful experience.

From there, these information stimulate 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 allows 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 foetal 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, ...)
- **Psycho-social factors** - sensorial deprivation, physical abuse, parental negligence, lack of social support, familial stress

Solution to the ADHD puzzle: retraining the brain

Understanding what is truly going on is a very important step on the path to overcoming ADHD. But the most exciting aspect of all is that research has shown that neurological lesion and brain hemisphericity can be corrected naturally. The brain is very plastic, which means that it is able to create new connection and reinforce existing neurological pathways. Health care professionals trained in functional neurology are able to carefully evaluate which brain circuits are weaker and design a rehabilitation program that will retrain the brain.

For example, in one small pilot study I did on 9 patients and subsequently published in the Journal of Vertebral Subluxation Research, I found that only two months of a special, low-force type of chiropractic – called Network Spinal Analysis – allowed more than 80% of the participants to experience significant increase in attention and concentration.

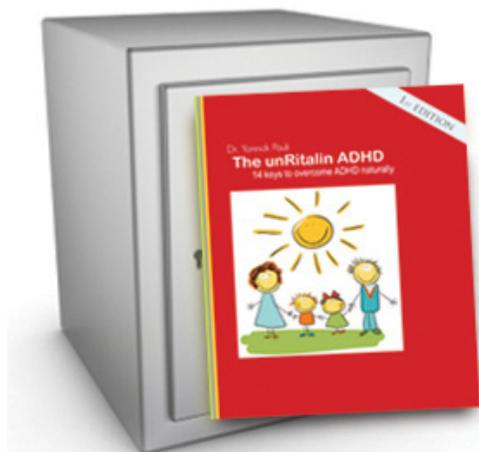
The best you could do is consult with a chiropractic neurologist. That would bring you maximal benefits. There are however a few simple things that you can do at home to start retraining the brain of your child. You can find some of those exercises in the Unritalin ADHD Solution Starter Kit.

ADHD and the Brain Resource Box

Chiropractic Neurologist Referral Directory: www.acnb.org
Carrick Institute: 321-868-6464

If you liked this free eBook, please make sure to check out:

The UnRitalin Solution Starter Kit 14 Keys to Overcome ADHD Naturally



The UnRitalin Solution Starter Kit includes

- The 14 Keys to Overcome ADHD Naturally eBook
- The 45-days Home Program Action Step Guide
- access to additional premium content that is updated on a regular basis

In the UnRitalin ADHD Solution Starter Kit, you will learn about, among many other things:

- The little known brain cells that can explain ADHD (you have never heard of them anywhere else – in fact, your doctor probably never has heard of them!).
- 5 reasons why medication are not the real long-term solution.
- 10 key questions that will pinpoint to the causes of ADHD.
- Lab test your doctor may not know about that will help understand the underlying cause of the problem.
- When, how and who to select to create a health care team that will assist you on the road to overcoming ADHD.
- A revolutionary new approach that helps erase the stress of ADHD while boosting concentration.
- The two worst food for children with ADHD (for some children, they are the true causes of ADHD).
- Brain-healing nutrients for the ADHD brain.
- Tools to discover and embrace the gift in ADHD.
- 45 days Home Program that will get you started on the road to overcoming ADHD.

Please visit www.unritalinsolution.com/adhdnaturaltreatment for more eBooks.