



ADHD In Depth: A Neuro-Development Perspective

This blog post is a condensed version of our podcast episode about ADHD, where we took a deep dive into all the different facets of ADHD. Scroll down to the bottom of the page if you want to listen to the entire episode. This post just contains the highlights.



I am super excited about this post! It is all about Attention Deficit Hyperactivity Disorder (ADHD). ADHD is a very complex topic and we are going to dive and break down this diagnosis. We are going to talk about what it is and look at the neurological, physiological and developmental systems that are at play. Hopefully this will give parents and professionals a better understanding of what is going on with kids with ADHD and a better idea of how to effectively treat or mitigate ADHD symptoms.

Now before we jump it, it is important to understand how an ADHD diagnosis works. Most childhood development diagnosis like ADHD are symptom based. Meaning if your child has enough symptoms then they have ADHD. **So a diagnosis tells you a lot about what symptoms are happening but it doesn't tell you anything about why those symptoms exist in the first place.** When making decisions about the best course of treatment, the why is a lot more important than the what.

Now answering the why question is easier said than done. We don't have a definitive answer for what causes ADHD. We know that there is a strong family link and we also know that certain pregnancy and birth complications increase the likelihood of a child developing ADHD. All of these things are closely related to retained reflexes and developmental delays. I am going to use this post to lay out a argument that many cases of ADHD are caused by the retention of primitive reflexes and delays in related brain and body systems.

So lets look at the diagnostic criteria for this disorder. Mental health professionals who are assessing for an ADHD diagnosis use the DSM which is the Diagnostic and Statistical Manual of Mental Disorders. This is a huge book that lays out specific diagnostic criteria for different mental health disorders. Below is a page from the DSM-5 (the most current to-date) and lays out the criteria for an ADHD diagnosis.



DSM-5 Diagnostic Criteria for ADHD

Symptoms and/or behaviors that have persisted ≥ 6 months in ≥ 2 settings (e.g., school, home, church). Symptoms have negatively impacted academic, social, and/or occupational functioning. In patients aged < 17 years, ≥ 6 symptoms are necessary; in those aged ≥ 17 years, ≥ 5 symptoms are necessary.	
Inattentive Type Diagnosis Criteria	• Displays poor listening skills • Loses and/or misplaces items needed to complete activities or tasks • Sidetracked by external or unimportant stimuli • Forgets daily activities • Diminished attention span • Lacks ability to complete schoolwork and other assignments or to follow instructions • Avoids or is disinclined to begin homework or activities requiring concentration • Fails to focus on details and/or makes thoughtless mistakes in schoolwork or assignments
Hyperactive/ Impulsive Type Diagnosis Criteria	Hyperactive Symptoms: • Squirms when seated or fidgets with feet/hands • Marked restlessness that is difficult to control • Appears to be driven by “a motor” or is often “on the go” • Lacks ability to play and engage in leisure activities in a quiet manner • Incapable of staying seated in class • Overly talkative Impulsive Symptoms: • Difficulty waiting turn • Interrupts or intrudes into conversations and activities of others • Impulsively blurts out answers before questions completed
Additional Requirements	• Symptoms present prior to age 12 years • Symptoms not better accounted for by a different psychiatric disorder (e.g., mood disorder, anxiety disorder) and do not occur exclusively during a psychotic disorder

for Diagnosis	(e.g., schizophrenia) • Symptoms not exclusively a manifestation of oppositional behavior
Classification	Combined Type: • Patient meets both inattentive and hyperactive/impulsive criteria for the past 6 months Predominantly Inattentive Type: • Patient meets inattentive criterion, but not hyperactive/impulse criterion, for the past 6 months Predominantly Hyperactive/Impulsive Type: • Patient meets hyperactive/impulse criterion, but not inattentive criterion, for the past 6 months Symptoms may be classified as mild, moderate, or severe based on symptom severity

Source: DSM-5 Diagnostic and Statistical Manual of Mental Disorders, 5th edition; ADHD: attention deficit hyperactivity disorder

Just remember that there can be a lot of different reasons why these symptoms exist and even with good efforts to rule out obvious other causes like medical conditions an ADHD diagnosis won't ever tell you why the symptoms are there. So if you're a professional working with these kids it is important to **try and be very open minded about all of the different things that may be at play** and not get boxed in to one way of thinking.

Also as you're looking at these symptoms you will probably notice that many of them are things that we all experience as a normal part of being human. The difference between this being a symptom of something deeper vs a normal part of living has to do with the frequency and intensity of these symptoms. There is also a spectrum of severity in people who are diagnosed with ADHD. These things all contribute to ADHD being complex, dynamic and difficult to understand even for people who specialize in this field.

So now let's look at what ADHD actually looks like in people and how their brain differs from the "normal" population. There are a lot of professionals who have dedicated their careers to studying and treating ADHD and have created a more dynamic understanding of the things that typically come alongside these diagnostic symptoms. So here are some of the best summaries I have found that describes how the ADHD brain works:

The ADHD brain thrives on excitement. Excitement, typically in the form of novelty (but not always), is what allows the person to focus their attention. A lot of people think about ADHD as an inability to focus, but that isn't true. Kids with ADHD can actually get very hyper focused but usually only on things that are very exciting. They require a high level of arousal in order to focus their attention and they really struggle with boring things. Boring is intolerable.

One of the current theories is that the ADHD brain is internally hyperactive. Kids pay attention to too many things all at once and their brain does not know how to prioritize important things, and it REALLY struggles to prioritize boring things. Something really has to take an extreme precedence in order to be prioritized. This is often why you see extreme procrastination in teens and adults with ADHD. A boring task has to become very urgent before it can be prioritized.

Someone with a typically functioning brain can use other factors to create importance and to get themselves going. They can simply think, this is important I should at least get started doing it. Getting started is generally what actually creates motivation and once we get going its easier to keep going. They can also think that something is important to someone else and use that to get started. Or then can simply make the connection that doing x will lead to a specific reward or positive consequence and so they do it.

Someone with ADHD really struggles to use these tools to get started. They may mentally understand the connection but getting started is MUCH harder for them. Also, getting started doesn't necessarily mean they will get motivated to continue. For most people getting started and doing something is what creates motivation. Motivation is the reward we get for starting. Someone with ADHD doesn't always follow that same path. If they are easily distracted they may start and stop something over and over again and really struggle to get into that motivation groove. A lot of this is due to a high level of internal and external distractibility. Their brain is struggling to prioritize information.

Another key component is impulsivity. For most of us we have a moment of pause before reacting. This moment allows our brain to evaluate the situation and suppress impulses and behaviors we decide aren't appropriate. The ADHD brain doesn't get that same moment of pause, at least not consistently, and the result is lots of impulsivity, especially when emotions are high.

Another common component is hyperactivity. Some children, particularly girls may not experience the hyperactive side of ADHD. But many do. These kids are impulsive with their body and their movements. Just like their thoughts, their body is in constant motion. They fidget, they squirm, the move constantly. Many, but not all of these kids struggle with balance and coordination, particularly when doing slow methodical things. They seem as spatially unaware as they are distractible.

This leads to lots of struggles with social skills and emotional maturity. It is hard to maintain close relationships if you are impulsive and hyperactive. These behaviors really strain family relationships with siblings, parents and spouses. Distractibility makes it hard to pick up on social cues and forgetfulness particularly in a romantic relationship can really make your partner feel like they aren't a priority.

I am in the middle of reading a book called Driven to Distraction which so far has given the most dynamic description of ADHD that I have seen. It is worth reading if you or someone you know struggles with these things.

So let's look at this diagnosis from a neuro-development perspective. There are several different primitive reflexes and dysfunctional body systems that I consistently see in the children I work with who have an ADHD diagnosis or a lot of these symptoms.

The first, most prevalent thing I see is the Moro reflex. That is the infant fight-or-flight response. This is an immature version of a normal stress response. The mature startle response connects to parts of our brain to help us evaluate a situation and respond appropriately. The Moro doesn't have these same connections, it just reacts. Most of the time it over reacts to things that wouldn't cause a stress response in a healthy brain.



This reflex should disappear within the first few months after birth and this allows us to develop a healthy normal relationship with our internal body and our external world. When this reflex doesn't inhibit properly you see some significant negative consequences in the way kids learn to regulate their attention and arousal.

Our emotions and our stress response are very dynamic and they function to let us know when our person or our values are threatened. A child with a retained Moro doesn't learn how to respond or regulate that stress properly. Their brain doesn't learn what is an actual threat and what is not.

We like to think about advanced brain functions like organization, learning and planning as very rational and emotion-free processes, but they aren't. There is a really great quote by Yale Psychologist Marc Brackett that says **"The three most important aspects of learning - attention, focus and memory - are all controlled by our emotions, not cognition"**.





What this quote means is that proper emotional control and development is the foundation of attention and learning. If our brain cannot prioritize what is and isn't an actual threat it will not be able to prioritize day-to-day tasks.

One of the main theories of ADHD right now is that the part of the brain called the striatum isn't working properly. One of the jobs of this part of the brain is to take in information about our thoughts, feelings and past experiences sort through it and send the most important information up to the conscious part of our brain to think about and deal with. In an ADHD brain the striatum can't prioritize one piece and sends lots of different information up to the cortex.

I think that often times this is a direct result of having a stress response that is over reactive and doesn't prioritize danger properly. The brain doesn't learn how to filter and prioritize information. It is constantly reacting to everything. This directly affects a person's ability to focus their attention and prioritize normal every day tasks.

Many of the children I see with a retained Moro are hyper aware of the environment around them. Their attention is constantly jumping to changes in their environment which is the exact same thing as being distractible. Often times when we think about our stress response we correlate that with fear or anxiety,

which is true for some kids, but for others **a dysfunctional stress response presents as distractible, hyperactive, inattentive, excitable and forgetful**. Pretty much all of those descriptions of an ADHD brain can stem from having a stress response and an arousal system that doesn't process sensory and emotional information correctly.

This theory is not something that is exclusive to me or to people who work with primitive reflexes. There is an AMAZING man, Dr. Gabor Mate who is one of the leading experts in trauma. He is a physician that specializes in trauma, addictions, chronic health problems and he wrote an amazing book about ADHD. It is called Scattered Minds and it talks about the origins of ADHD and shows how it should be viewed as a disorder of development rather than an illness. He goes into a ton of depth on the brain science of ADHD and shows how it can best be explained as an immature and underdeveloped nervous system.

The presence of primitive reflexes are the testable indicators that his theory about ADHD is right. What I mean by that is that when you see a child with a retained Moro, it doesn't mean that, that one little reflex is causing tons and tons of other problems. What it means is that, that child's whole nervous system is stuck in an immature stage of development. The Moro or really any combination of primitive reflexes are positive signs that the nervous system did not mature out of infancy properly and that there are likely lots of brain and body systems that have patchy immature development.

The second common problem that I see in kids with ADHD is vestibular dysfunction. The vestibular system is a little apparatus in your ear that tells you where you are in space and what your body is doing. It is really like our bodies sixth sense and it plays a HUGE role in perception both internal and external.

Kids with vestibular delays often have trouble connecting appropriately with their body. Their perception of their body and where they are in space is off. They often have trouble controlling their movements and navigating their environment. You see symptoms like bumping into things, touching everything around them, spilling things, stubbing toes, wandering around, and misplacing things. They have difficulty navigating new environments spatially, meaning they lose where they are in the grocery store or struggle to remember what door they came through. This kind of physical and spatial ineptness can really exacerbate focus and attention.

A lot of kids with vestibular delays also move constantly. It is almost like they need a higher quantity of vestibular input because the quality isn't good. I see kids in my office all the time that climb on things or spin or hang upside down. These things all calm down once we get the vestibular system functioning properly.

There are other primitive reflexes like the Asymmetrical Tonic Neck Reflex, the Symmetrical Tonic Neck Reflex, The Tonic Labyrinthine Reflex, the Spinal Galant and a few others that can also contribute to ADHD symptoms. Each of these reflexes affect different areas of perception, posture and coordination and these things can also exacerbate focus and attention problems.

They can make it difficult for kids to stay seated in a chair and to keep their body still if their head is moving. It can make it very difficult for them to control their eyes to follow a line of print, or focus their visual attention on a specific letter or word. When these reflexes are present it just means that it requires a lot of effort for kids to control their body and this leave very little attention left for anything else, especially if attention is already a struggle. **I have worked with lots of children whose ADHD symptoms improved dramatically or disappeared completely when we work on these underlying systems.**

In the full podcast episode I go into depth on each of these areas. I also talk about the mainstream explanations for ADHD: genetics, pregnancy complications and brain chemistry and how these connect to development. I also talk about some common anecdotal contributors to ADHD like parenting styles, school environment and nutrition and how these factors play a role in ADHD.

If you have a child with ADHD please visit my website to learn more. I have a [screening questionnaire](#) that you can fill out and I offer free phone consults to reveiw the questionnaire and see if your child could benefit from NDD therapy. Thank you so much for reading, I hope you learned something helpful.