

Neuro-Development of Children

4 Common Childhood Disorders

Gregory Stasi; Ph.D.
&
Peter A. Dodzik, PsyD, ABPdN, ABN



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Article 1: Child Development: Is Your Child Typical?

The number one reason that parents contact myself and the various therapists at North Shore Pediatric Therapy is to find out whether or not their children are developing and progressing at a normal rate. When should my child crawl? When should she start speaking? At what age should he be walking? These are all questions that we find ourselves answering on a daily basis. Parents often are not privy to this information. If only children would come with an instruction manual. Each child develops at a different rate, which is found to be dependent upon several factors including environmental influence (exposure to a variety of experiences) to genetic predisposition. That being said, there are stages of development that every child will reach in a hierarchical order. The main areas of development include a child's motor ability and his or her language functioning. Language functioning can then be broken down into two main areas: receptive language, which is the child's ability to listen to and follow auditory demands, and expressive language, which is the ability to provide comprehensive responses. Below is a chart for the major stages of motor and language development along with typical ages in which the child should reach the stage.

Motor Development

| <u>Motor Skill</u> | <u>Expected Age of Achievement</u> |
|----------------------------------|------------------------------------|
| Head erect and steady when held | Six weeks |
| Lifts self up by arms when prone | Two months |
| Rolls from side to side | Two months |
| Rolls from back to side | Four months |
| Sits alone | Seven months |
| Crawls | Seven months |
| Stands alone | Eleven months |
| Walks without assistance | Twelve months |
| Walks up stairs with assistance | Sixteen months |
| Jumps up and down | Twenty three months |

Language Development

Receptive Language (listening and responding to information)

| <u>Age of Child</u> | <u>Speech/Language Behavior Observed</u> |
|------------------------|--|
| Zero to three months | Turns head to caregiver and smiles when spoken to |
| Four to six months | Responds to word "no" and responds to changes with tone of voice |
| Seven to twelve months | Listens when spoken to, recognizes names of objects, first word |
| Two to three years | Understand two part commands and understand contrasting words |
| Three to five years | Understand most of what they hear |



Expressive Language (communicating needs and wants)

| <u>Age of Child</u> | <u>Speech/Language Behavior Observed</u> |
|--------------------------------|---|
| Zero to three months | Make sounds indicating pleasure, cry differently to express needs |
| Three to six months | Laugh, babble, mimic sounds |
| Nine to twelve months | First words, repeat sounds, use most consonant and vowel sounds |
| Twelve to fifteen months | Gesture and speak 'no', ask for help with gestures and sounds |
| Fifteen to eighteen months | Use 10-20 words, 20-25 percent of speech is intelligible by others |
| Eighteen to twenty four months | Use three word sentences, 50-70 percent of speech is intelligible |
| Two to three years | 400 word vocabulary, word for almost everything, answer "what" questions |
| Three to four year olds | 900-1000 word vocabulary, use pronouns correctly, use three to six word sentences |
| Four to five years old | 1,500-2,500 word vocabulary, use six to eight word sentences |

The above charts are what we know to be the stages of development with regard to children's receptive and expressive language and motor functioning. Typically, children will reach the target behaviors within the ages given. However, development is variable for many children and not every child will reach the various stages at the same time.

If your child is not demonstrating the motor or language behaviors that should be present at his or her age, there are several things you should do. First, do not panic. Ask your pediatrician about your concerns. If you continue to have concerns, have an evaluation by a psychologist, occupational therapist, or speech/language therapist in order to determine if there are possible delays and what type of therapy may be warranted. A lot of parents ask me: won't my child develop those skills eventually? Many children may often "catch up" with their development; however, the concern would be at what cost? How did the child's delays impact him or her socially or emotionally? What was the impact with his or her academic performance? Parents often know instinctually when there is something atypical about their child. If you are watching other children at the playground or at play-dates doing things that your child is not (that you feel they should be) and you have any concern at all, it can't hurt to ask a professional. Be proactive! Do not wait until it is too late to get the assistance your child needs most. Research has shown that the earlier intervention is applied, the more successful it can be. The goal of the therapies would be to ensure the child reaches his or her potential with no long term consequences.



Article 2: Anxiety Disorder in Children

Childhood Anxiety



Anxiety disorders are considered to be one of the most common type of psychiatric disorders affecting children and adolescents. However, studies have indicated that fewer than twenty percent of children with anxiety disorders actually receive treatment. According to the Diagnostic and Statistical Manual, Fourth Edition, Text Revised (DSM-IV,TR), there are nine specific anxiety disorders that a child can have. Although they are all distinct disorders, the commonality that they all share is intense anxiety. The focus of the anxiety is what distinguishes the disorders.

Consequences of Anxiety

There are many possible long-term consequences of leaving anxiety disorders untreated. Children and adolescents who do not receive the necessary treatment are at risk for repeated school absences, impaired relations with peers, poor self-esteem, alcohol or drug use, problems adjusting to work situations, and continued anxiety disorders in adulthood. Although there are quite a few long-term consequences of not treating anxiety, the majority of children with significant anxiety do eventually demonstrate improvement on their own without treatment. One large study (Perrin, Hersen, and Kazdin, 1995) indicated that 82% of children recovered from the initial anxiety after four years, 68% recovered after the first year, and 8% evidenced relapse of anxiety after remission. Although a good majority of children do eventually recover on their own with no intervention, a portion of children continue to demonstrate significant debilitating anxiety. Additionally, early intervention for anxiety symptoms would make the child's life easier and be less at risk for later anxiety relapses.

When to be Concerned

Children with anxiety disorders are at increased risk of exhibiting additional, co-existing psychological conditions, including: Depression, learning disorders, ADHD, and Tic Disorders to name a few. It is quite common and developmentally normal for young children (5 years and younger) to demonstrate fear and anxiety of various situations including the dark and strangers. Parents should start looking out for anxiety symptoms when their children are around six to eight years old. At that age, the common and acceptable childhood fears should decrease. If your child continues to demonstrate significant fear at that age, then he or she should receive intervention. There is hope and a plethora of treatments are available. Specifically, Cognitive Behavior Therapy (CBT), relaxation techniques, Biofeedback, family therapy, parent training, and medication are all available and have been proven beneficial for treating anxiety in children.



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Article 3: Attention Deficit Hyperactivity Disorder

What is ADHD?

A parent asked me this the other day: She and the teachers were so frustrated with her son's behavior. It turns out that "Johnny", as he is known in this blog, is a bright child with [Attention Deficit Hyperactivity Disorder \(ADHD\)](#). Luckily for him, his parents, and his teachers, he is not alone and there are many well-validated interventions to get him to "sit still". Johnny is just one of the estimated 8-10% of school aged children who have a diagnosis of ADHD. [The DSM-IV](#), which is the diagnostic manual for all mental health disorders, indicates that there are several symptoms of ADHD including: inattention, impulsivity, and hyperactivity.

Developing an Intervention Plan

Once the diagnosis of ADHD has been made by a pediatrician, psychiatrist, or psychologist, the next step is to develop the most efficacious and lasting intervention plan. Typically, the intervention plan should be applied across multiple settings, including: home, school, and the child's social environment.

[The American Academy of Pediatrics](#) published a best practice paper for the intervention of ADHD in 2001. In a nutshell, the paper states that the two primary interventions for ADHD include the use of [stimulant medication](#) and [behavioral therapy](#). Donna Palumbo, a neuropsychologist from New York, wrote a chapter in a [Pediatric Neuropsychology Textbook](#) in 2007 that updated the AAP practice guidelines to include parent training and social skills training in addition to the already mentioned stimulant medication and behavior therapy.

ADHD in the Classroom

The one area that was left off of everything is the child's school performance. Children with ADHD frequently exhibit deficits with their performance in the classroom setting. They have trouble focusing on the teacher's lectures, and often exhibit co-existing learning disorders. Previous blogs of ours have described the [Individual Education Plan \(IEP\) and 504 Plan process](#) two extremely important aspects of the child's plan for school success. However, the child's academic performance and behavior within the classroom must be an area that is addressed. Children with ADHD do need help receiving behavior strategies in school. It is imperative that the behavior therapist working with the child provide support for the academic team to ensure that he or she progresses to potential.



Article 4: Childhood Depression

We all know when an adult is sad and depressed - they cry easily, prefer to be alone, and can verbally express their feelings. It is often hard, however, to identify depression in young children because it often mimics other disorders and concerns, including inattention, impulsivity, aggression and learning problems.

Symptoms of Childhood Depression

Some warning signs that parents and teachers should look out for include:

- Easily comes to tears, feeling sad
- Feeling worthless
- Not interested in activities that used to be enjoyable
- Irritable and often in a bad mood
- Increase in aggressive and externalizing behaviors
- Changes in sleep behavior (either sleeping more or less than normal)
- Changes in eating behavior (either dramatic increase or decrease)
- Decrease in energy and easily fatigued
- Frequently turned away and neglected by peers
- Decrease with academic performance
- Difficulty staying still

As you can see, there are a plethora of symptoms of depression and every child who is depressed will express a variety of the above symptoms. If you notice changes with your child's behavior and the onset of any of the above symptoms, the first thing that you should do is contact your child's pediatrician. It is always important to identify whether or not there are medical concerns at the root of the symptoms.

Treatment Of Childhood Depression

Once a medical diagnosis has been ruled out, the next step is to have an evaluation from a psychologist or neuropsychologist in order to determine if it is depression or something else. For example, children who are depressed often do poorly with their academic work; however, children who have learning disorders are often at risk for depression. It is of the utmost importance to identify what issues your child faces in order to determine the most effective interventions possible.

Once it has been determined that the child suffers from depression, it is then warranted to develop a multidisciplinary approach to intervention. Research demonstrates that the number one type of psychotherapy for depression is Cognitive Behavior Therapy. CBT is a structured therapy that specifically teaches children skills and coping mechanisms to use when they are depressed.



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Understanding the Behaviors of Childhood Depression:

It is also important that the child's parents and teachers are educated on the signs and symptoms of depression. These children can often be perceived as irritable and aggressive - it is important that the child is not labeled as being "bad" or "behavior disordered," but rather that the behaviors are recognized as a symptom of the emotional concerns. If the child does not demonstrate marked improvement with CBT and parent/teacher education, it is then recommended that the parents and child have a consultation with a pediatric psychiatrist in order to determine if pharmacological intervention is warranted.

Depression in children is often difficult to identify. These children can often seem disruptive and aggressive. Furthermore, many other conditions mimic depression or have depression as a secondary concern. Therefore, it is recommended that the child have a comprehensive evaluation in order to determine whether or not he or she truly has depression. Once the depression has been identified, it is pertinent that a multidisciplinary approach be applied to the treatment.



Article 5: Developmental Dyslexia

Dyslexia is one of the more common conditions to affect school age children. It is estimated that between 5 and 10% of children between the ages of 5 and 20 meet criteria for the disorder. The definition of dyslexia is an inability to read; however, while this is a disorder that is very easy to define, it can be difficult to diagnose and treat. Reading is an intimate and essential skill in our school systems. Children are taught to read in first and second grade; but by grade three they are expected to acquire new information from what they read and children who have difficulties in reading will begin to suffer in all subjects if left untreated.

Dyslexia and the Brain

There has been a wealth of information published on this disorder since first conceptualized nearly a hundred years ago. What researchers have essentially concluded is that we don't have a formal reading center in our brain. Rather, we utilize language and speech areas to make sense of written words. Thus, any disorder that affects language systems can impact reading. In fact, in adult stroke patients, there is an unusual condition called alexia (can't read) without agraphia (can't write), which means that a person could write a sentence but be unable to read what they had just written. Through the advent of neuroimaging, we have been able to trace the pathways that lead from the visual perception of written text to the decoding of that text for meaning and have a pretty good understanding of how children with dyslexia read (or don't read) differently than normal children. We have not been as successful in figuring out the cause of this disorder.

The current thinking is that our visual system is built to recognize objects from a variety of different angles because we are creatures that move in the world. For instance, if I turn a chair on its side, it won't take you longer to figure out it is still a chair. However, letters and words need to be identified in the same orientation and in the same order if they are to have meaning. The visual system, therefore, "cheats" by funneling letters and words over to the language centers for processing instead of in typical object recognition centers. If this process occurs correctly, most children will be able to read as early as five years of age. If they don't funnel this information correctly to the left side, they will continue to treat letters and words just like objects in the environment. For instance, a child might see the word "choir" but say the word "chair" since they are visually so similar in appearance. However, their meaning is quite different and clearly comprehension is going to be affected if many of those errors occur.

Signs of Dyslexia in Children

Some of the common signs of dyslexia in younger children can be the omission of connecting words (i.e., in, an, the, to, etc.), taking the first letter or two of the word and guessing, or converting words that they have never seen into words that they already know, even when the meaning is quite different. I hear often that parents become worried because their child reverses letters and, while this does occur in children with dyslexia, it is also a fairly common phenomenon with children who are learning to read, particularly with letters that look similar (i.e., b and d). Thus, it often does take a trained professional to differentiate children who are poor readers or who are developing slowly or in a patch-like fashion from children who actually have dyslexia.



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Dyslexia in School

One of the challenges with this condition is that many of the schools have gone to an RTI Model (Response To Intervention) for reading. This means that they wait to see how a child responds to a normal classroom and if they fail, they move them to additional services, and if that fails, they move them to further intense services. Failing that, an evaluation is ordered. In real life, this means that many children are not evaluated properly for several years and by that time there are major gaps in their learning and acquisition. We do know of several methods for remediating dyslexia, although they often involve multiple hours a week of tutoring on a one-on-one basis and some school systems are simply ill-equipped to provide those types of services for children.

Most children that we see here at the clinic with dyslexia are bright and capable children who become increasingly frustrated with school because they are unable to bring their intellect to bear on many of the activities they are asked to perform in the school system. Even subjects in which they find much enjoyment are limited in terms of their ability to access the material because so much of it is done through written form. They often look poor on standardized reading and math testing; but because they are bright they can usually “muddle along” just enough to escape attention until they have fallen several years behind by middle school.



Treatment for Dyslexia

Fortunately, several treatment methods have been developed over the years that lead to a “normalization” of the reading system within the brain on imaging studies and to a dramatic increase in reading scores on educational tests. Only a trained professional can determine if your child has a developmental delay, dyslexia, or some other condition that is impacting their reading; but these are often critical evaluations to get done early since the remediation process can take 12 to 24 months.

I have evaluated hundreds of children for this condition and seen rather dramatic improvements when these children are placed in evidence-based programs for even a short amount of time. I urge all families who have children who struggle with reading to at least get a consultation with a trained professional to determine an accurate diagnosis and appropriate treatment planning.



About the Authors

Gregory Stasi, Ph.D., is a licensed Clinical Psychologist at North Shore Pediatric Therapy who graduated from Purdue University with a Bachelor Degree in Psychology. He went on to earn his Masters and Doctorate at the Illinois Institute of Technology where he made his decision to focus his career on pediatric neuropsychology. Dr. Stasi has worked and studied at numerous medical centers including: The University of Chicago Medical Center and the University of Minnesota Medical Center. Prior to working at North Shore Pediatric Therapy, Dr. Stasi was a faculty member at Rush Presbyterian St. Luke's Hospital and was a neuropsychologist at the Rush Neurobehavioral Center. Dr. Stasi has extensive experience with the assessment and diagnosis of a variety of conditions including: learning disorder, ADHD, Autism Spectrum Disorders, and social/emotional concerns. Dr. Stasi also serves as a school advocate for parents by providing assistance and case management in order for children with special needs to obtain the most effective school accommodations possible.

Peter Dodzik, PsyD, ABPdN, ABN is a board-certified pediatric neuropsychologist at North Shore Pediatric Therapy. He graduated from the Florida School of Professional Psychology with a doctorate in Clinical Psychology and completed a fellowships in sleep and behavior medicine at The Sleep & Behavioral Medicine Institute at Rush North Shore Medical Center and neuropsychology at Fort Wayne Neurological Center. He is an Associate Professor of Medicine at Indiana University Medical Center. His interests including assessment and treatment of children with autism, Asperger's syndrome, LD, ADHD and children with complex medical conditions including TBI, epilepsy and other neurodevelopmental disorders.

Additional Resources:

[Download and watch a free copy of Dr. Stasi's "Understanding the Differences Between ADHD and SPD"](#)

[Schedule a Free Personal 30 Minute Consultation with Dr. Stasi or Dr. Dodzik](#)



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