

TREATMENTS FOR CHILDREN WITH ADHD

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AVAILABLE TREATMENTS:

Currently, there are 2 treatments for ADHD with a strong evidence base: Medication Management and Behavioral therapy. Overall, studies show that Combined treatment (both medication AND behavioral therapy) works best for most children. However, due to lack of research about long-term effects of medication, it is generally advised to try behavioral treatment alone first, before considering adding a medication. This is especially true in children under the age of 7.

It's important to know that most research has focused on treatments that reduce the core symptoms of ADHD – which are inattention and hyperactivity. So, when we say a treatment “works,” we mean that the treatment has been shown to improve attention and/or reduce hyperactivity. In most cases, researchers have not done a good job of seeing whether these treatments actually improve educational and academic attainment over time. In other words, we know very little, overall, about whether medication and/or behavioral therapy lead to better grades, improved standardized test scores, higher likelihood of high school or college graduation, and so forth.

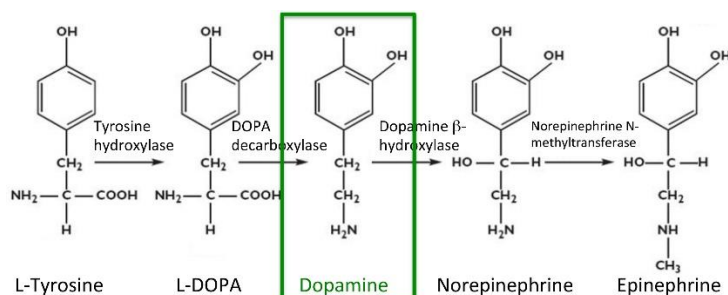
WHAT MEDICATIONS ARE USED? AND SOME NEUROCHEMISTRY TO EXPLAIN WHAT CAUSES ADHD SYMPTOMS.

It's easy to get overwhelmed with all of the medications out there for ADHD, so I wanted to go over the different kinds for you here:

Stimulants. Stimulants generally affect the chemicals dopamine (DA) and norepinephrine (NE) (or both) in your brain. Both of these chemicals are related in the brain. In fact, your brain makes NE from DA. There's a picture below if you're a chemistry nerd. =) For those of you that don't like chemistry, basically the only difference is that your body added some Oxygen to DA to make NE. To do that, it used an enzyme called Dopamine β-hydroxylase. All of these chemicals – DA, NE, and Epinephrine (also called adrenaline), are called **catecholamines**. Clinically, ADHD is widely considered to be a catecholamine problem, particularly in an area of the brain called the prefrontal cortex.

Also, if you like chemistry, you might be interested to know that stimulant medications also all have a structure very similar to DA and NE. In other words, the drugs themselves are very close (nearly identical) to catecholamines.

Lastly, you might like to know that stimulants also affect serotonin in the brain, but only a little bit, and usually not enough to really help with serotonin problems (like depression and anxiety, for example).



These chemicals (and all neurotransmitters, really) work like keys to unlock doors in your brain. Each key can open different locks. DA, for example, has 5 different locks that it can open. Some of the locks are called “excitatory,” meaning they tell the rest of the brain it’s time to go. Other locks are “inhibitory,” meaning they tell the rest of the brain it’s time to stop. The same is true for NE. Different medications might open all the locks or open some, but not others. Generally, newer medications try to only open certain locks that are known to help with ADHD.

DA does a lot of different things in the brain, depending on which locks it opens. Mainly, dopamine is necessary for reward (your brain releases a lot when you do anything pleasurable). It also helps movement. Parkinson’s disease, where a person has trouble moving and gets stiff muscles, is caused by the destruction of a brain structure called the substantia nigra (literally, “the black thing”), which is one of the places in your brain where Dopamine is made. Without dopamine, a person with Parkinson’s has trouble moving.

If you understand what DA and NE do, it’s easier to understand some of the symptoms of ADHD. People with ADHD usually aren’t using enough of the natural dopamine. They need the DA to last longer. Because DA is so important for reward, people with ADHD often have a hard time finding things to be rewarding! That’s why they tend to lose focus or jump from one interest to another. Their lack of DA is telling them, “This is boring!” so they move on to something else, trying to find something interesting. Often, once they find something that finally gives them that reward – something that is interesting enough to hold their attention – they will seek it out as much as possible. But once that thing is gone, their need for another reward will soon return. Similarly, **punishment doesn’t tend to work very well for people with true ADHD. That’s because their brains are far, far more interested in seeking reward than avoiding punishment. Keep this in mind, because it’s important for why behavioral treatment is focused on rewards, instead of punishment.**

Most people can understand why there is inattention once they understand the above, but what about hyperactivity? The hyperactivity in children with ADHD follows a similar path. Their bodies are constantly seeking a way to produce/use more dopamine. Movement does that, to some extent. It tells your body, “Hey, send me some Dopamine so I can move around!” So, think of hyperactivity as your child’s way of trying to get some more DA. That’s why stimulant medications often calm children down. It gives them the dopamine their bodies crave, so now they don’t need to work so hard to force it out.

One last important note is to remember that medications that treat ADHD don’t give you more DA and NE, they just help people use DA and NE better, usually by helping you use more of the chemicals you already have. **It can be dangerous to just give the body more DA**, because your body can’t tell the difference of where it’s supposed to send the extra DA. This can cause you to have scary side effects, like hallucinations, psychosis, and movement disorders. **Instead, it’s better just to help your body use the DA that’s already there.** Also, because DA is so rewarding, stimulants can be abused. That’s why they are a “controlled substance” under FDA rules. That doesn’t mean you should be afraid to use your medications as prescribed. When taken as prescribed, most children do not become “addicted” or more likely to abuse other substances. Instead, teenagers and adults with ADHD may abuse substances for other reasons, as a way to seek that reward their body is missing. If you take ADHD medications as prescribed though, you don’t have to worry. BUT, there might be side effects. Because DA and NE can be found almost everywhere throughout the nervous system, medications can lead to undesirable side effects. These are usually minor though, and because the medications don’t last very long in your body, you can stop taking the medication if the side effects are a problem. They’ll then go away within a day.

Non-Stimulants. There are really only two non-stimulant medications used to treat ADHD: Strattera and Wellbutrin. These are prescribed less frequently than stimulants. They are newer and have less evidence overall as a result. Wellbutrin is prescribed “off-label,” meaning that it wasn’t designed for ADHD. However, because it increases NE, it can help in certain cases. It’s most often considered when a child is also depressed or anxious, in addition to having ADHD.

BEHAVIORAL THERAPY FOR ADHD

The primary goal of behavioral therapy for ADHD is to flood your child with simple rewards. It teaches parents how to use rewards to maximize their child's focus on performing behaviors that feel good (that release DA). Behavior therapy works best when children are younger. This is because a child's brain is doing a lot of important development during the early years, especially during the first 5 years. It's during that vital window that parents can make purposeful choices to behaviorally train their child's brain to use its neurotransmitters in healthier ways. **Importantly, this does NOT mean that a parent causes a child to have ADHD by not following the "right" parenting techniques.** The brain is more complicated than that. But, there are things that parents can do to help their child with ADHD to develop healthy habits, which, over time, can actually change brain functioning. Behavior therapy is designed to teach parents the techniques that we know help improve core symptoms of ADHD. Behavior therapy can improve both inattention and hyperactivity, because it targets the core problem – a deficient reward system. **Good behavior therapy, then, is reward focused. That doesn't mean that you shouldn't talk about punishment eventually during behavior therapy, but the first goal of good behavior therapy should be teaching children how to properly seek rewards.**

Just because behavior therapy works best when a child is younger does not mean that it won't work when children are older. However, neurochemical pathways are more solidified in older children and can be harder to change with just behavioral therapy. That's why it's common to combine medications and behavior therapy in older children. The medications help normalize the brain a little bit, so that behavior therapy can be more effective.

The one place where behavior therapy is clearly superior to medications is that there is not a risk of undesirable side effects common to medications. In fact, you don't have to worry about any side effects with behavior therapy. However, behavior therapy takes a commitment – mainly from caregivers, but also from the child too, to some extent. It takes work and patience to see it through. With medications, if they work, they work quickly. Most parents and children see changes immediately, and they can tell when the medications wear off too. With behavior therapy, changes take longer, and it may be 1-3 months before you really start to experience relief.

However, the benefits of behavior therapy can also be longer lasting. Therapy teaches parents how to teach children how to manage their own behaviors. If you're willing and able to see it through, this can potentially help your child tremendously throughout his or her life.

OTHER INTERVENTIONS – THINGS TO KNOW

If treating only ADHD, your clinician should *not* be meeting 1-to-1 regularly with your child without also meeting regularly with you. There are no evidence based treatments for ADHD that involve individual therapy with just a therapist and a child. There are some emerging interventions (i.e. neurofeedback) that are still being researched. Some of these interventions have shown initial promise, but right now they do not have as much evidence as medication and behavior therapy.

Your clinician may recommend individual counseling to address *other* issues that can co-occur with ADHD. Kids with ADHD can very often have other things going on. They may have trouble making or keeping friends, depression, anxiety, social skills, and many other challenges. Your therapist may wish to address these issues in individual counseling. If this is the case, be sure to have a discussion with your therapist about the reason for the treatment, so that you understand what it is for and what to expect.

HOW DO TREATMENTS AFFECT ACADEMIC AND EDUCATIONAL OUTCOMES?

MEDICATIONS

Medications DO help with children's abilities to handle general tasks and demands at school. They improve academic productivity.

They have NOT been shown to help with learning and applying knowledge. For example, medications don't help improve reading abilities and don't predict a higher likelihood of achievement. However, the studies that have looked at this have not always been able to control for all possible factors that could affect overall academic performance.

BEHAVIOR THERAPY

The impact of behavioral treatments on long-term academic and educational outcomes has not yet been studied. Only short-term outcomes have been examined. Short term outcomes show that behavior therapy improves parent-child interactions around school work. It also reduces overall oppositional-defiant behavior.

COMBINED TREATMENT

In a major 2-year study on multimodal therapy for ADHD, neither medication alone, behavior therapy, or the combined treatment showed improvement in academic and educational outcomes of ADHD.

EDUCATIONAL INTERVENTIONS

Children with ADHD are able to qualify for educational accommodations under section 504 of the Vocational Rehabilitation Act of 1973, often called a 504 plan. If ADHD is the only diagnosis, they do not qualify for special educational services, most often termed an IEP (Individualized Education Plan). Children with ADHD may qualify for special education services if eligible under another category, such as emotional disturbance or specific learning disability. Most schools require a doctor's diagnosis to qualify for either a 504 or IEP. They may also require additional evidence, in addition to a doctor's diagnosis.

The following accommodations have been suggested as being typically most useful in predicting better academic outcomes in children with ADHD:

- 1) Small class size (8-15 students)
Variations in average class size (25-35 students) have little effect on a student's progress. Children with ADHD do better with one-on-one instruction. And so smaller class size is recommended.
- 2) Reduce distractions
Classrooms are often noisy. Children perform better with decreased noise. Repetition of instructions does not usually help children with ADHD. Instead, they do better when given directions when free of distractions.
- 3) Antecedent interventions
These include (but aren't limited to) choice making, peer tutoring, and computer-aided instruction. The goal of each is to be proactive in supporting adaptive behavior and preventing unwanted, challenging behaviors.

In choice-making, students select work from a teacher-developed manual. Studies have shown that choice-making does improve academic engagement and decreases behavior problems from children with ADHD in school. Project-based learning is another analog to this option.

Class wide peer tutoring has been studied extensively and shown to enhance task-related attention and academic accuracy in elementary school students with ADHD. It has also been associated with positive changes in behavior and academic performance. Time requirements of teachers is often described as a significant barrier to inclusion of ADHD students; peer tutoring helps reduce the demand on teachers to provide one-to-one instruction. It also gives students with ADHD a chance to practice and refine academic skills and to enhance peer social interactions, promoting self-

esteem. Peer tutoring is believed to be particularly effective when students with ADHD are using disruptive behavior to gain peer attention, because it allows them to gain attention in a more positive way.

Computer-aided instruction helps because it also give students with ADHD access to one-on-one instruction in an interactive way. It also gives immediate feedback. It has not been studied well, though, in kids with ADHD. Existing studies have small sample sizes, but they suggest promising results.

4) Increased physical activity

Regular, non-contingent exercise helps reduce overactivity in ADHD. Recess and other physical activity should not be removed as a punishment for undesirable behavior. This is likely to only make problems worse.

5) Alternative methods of discipline

Children with ADHD are reward oriented and tend to not respond as desired to punishment. Suspension or being sent to principal's office may often in fact be rewarding to students, as it can allow them to avoid work. If suspension is absolutely necessary, in-school suspension is preferred. More importantly, teaching replacement behaviors is the most evidence based way to improve behaviors in children with ADHD. It is not enough to punish or discourage inappropriate behaviors, but educators must also specify and reward appropriate replacement behaviors. A daily report card can help tremendously with this process. The link below provides detailed guidance on how to establish a daily report card in the school.

https://ccf.fiu.edu/assets/pdfs/how_to_establish_a_school_drc.pdf.

ADDITIONAL RESOURCES

For more information on ADHD, I highly recommend the following webpage:

<https://ccf.fiu.edu/about/resources/index.html>.

Differences between IEP and 504 plans: <https://www.understood.org/en/school-learning/special-services/504-plan/the-difference-between-ieps-and-504-plans>.

Other classroom management techniques, highly recommended for teachers: <https://chadd.org/for-educators/classroom-accommodations/>

Teacher card from CHADD: <https://chadd.org/wp-content/uploads/2019/03/FinalTeacherCard2019.pdf>

Other classroom management techniques: <https://www.understood.org/en/school-learning/partnering-with-childs-school/instructional-strategies/classroom-accommodations-for-adhd>

States are required to have parent training centers to help address questions parents may have about special education for their students. I've listed a few below for states that we commonly serve at Chattanooga Peds:

TENNESSEE

Support and Training for Exceptional Parents, Inc. (STEP), 712 Professional Plaza, Greeneville, TN 37745, (423) 639-0125, (423) 639-8802 TDD, (800) 280-7837 (English toll-free in TN only), (800) 975-2919 (Spanish toll-free in TN only), information@tnstep.org, www.tnstep.org

GEORGIA

Parent to Parent of Georgia, Inc., 3070 Presidential Parkway, Suite 130, Atlanta, GA 30340, (800) 229-2038 | (770) 451-5484, info@p2pga.org, www.p2pga.org

ALABAMA

Alabama Parent Education Center (APEC), 10520 US Highway 231, Wetumpka, AL 36092, (866) 532-7660 (in AL), (334) 567-2252, apec@alabamaparentcenter.com, www.alabamaparentcenter.com