

The Use of Stimulant Medications in Treating Executive Functioning Disorders

Interview with Jason Rowland, M.D.

Dr. David Parker recently sat down with CRG psychiatrist, Dr. Jason Rowland, to learn more about the role of stimulant medications in the treatment of individuals with EF issues.

- 1) When physicians use the term, “executive function” (EF), what do they mean? Is it just another word for ADHD?

I don't know that most physicians use the term “executive functioning disorder.” It's not a medical diagnosis found in the DSM-5 or ICD-9 or ICD-10 (diagnostic manuals). It's a descriptive term coming out of disability services and educational realms. It is much broader than ADHD; ADHD is a specific disorder of EF. ADHD has to start in childhood and can continue across the lifespan. Not all problems with EF are ADHD. But the term EF refers to the mental processes involved in forward planning, time management, being able to initiate and stay with tasks and activities, break projects down into individual pieces and get them accomplished. It includes working memory, which is the ability hold information in your head and work with it. Focus and concentration are a part of that, too. Impulse control and emotional regulation are also a part of EF; not in the sense of broad depressive or manic episodes but in the sense of being able to modulate your daily emotions to the situation you're in.

- 2) What types of symptoms or problems do your patients report when they are struggling with EF issues?

Typically, there's an overlap of EF symptoms with ADHD, which may or may not be diagnosed. The patient is struggling with the demands placed on them and trying to finish those demands in a timely fashion. In an elementary school child, it could be a student who can't finish their schoolwork and cannot maintain appropriate behavior for the classroom. It can continue up to college students, who might present a profile where they have done well in high school with formal or informal supports (from the structure of the high school environment combined with a parent who is very in tune with when assignments are due and tests are coming up). When the patient goes off to college and these structures aren't in place, they often struggle to perform at the same level as before. The new environment suddenly demands much greater use of EF skills such as organization, time management, sustained focus, and the ability shift from task to task. This may be due to a previously undiagnosed ADHD where the demands have ratcheted up and supports, which have helped to compensate, have been removed. It could also be due to anxiety, depression, substance abuse, or other issues that may be contributing to EF dysfunction.

- 3) Can co-occurring conditions exacerbate some patients' EF abilities? If so, what's a simple way of explaining how you would think through their best

treatment options? For example, would you always treat a co-occurring condition AND the executive functioning disorder at the same time?

Let's start with the demands on your EF ability when the patient has ADHD. Again, you can experience a big increase in your demand to manage impulse control, manage time, organize yourself; this can be triggered by significant changes in environmental expectations. We often see this as kids move into middle school, where the demands rapidly expand academically and socially. These children are also growing physically and emotionally at that stage. Even when they have been on medications, those medications may no longer be appropriate to their body weight. All of these factors may exacerbate the EF issues so we see a new level of impairment at this stage. This might lead a physician to increase the medication dose or add another medication to the patient's regimen. In addition, middle school years are a time where kids who have a susceptibility to anxiety or depression often see those issues emerge, too. These co-existing issues can exacerbate the EF impairment. Impaired focus is a symptom of depression, along with a decrease in energy and motivation. Anxiety can be its own distraction and often limits people's ability to engage and ask question. This can impair their ability to use EF skills successfully, too.

People with ADHD, particularly if this hasn't been adequately diagnosed or treated, are at a higher risk for developing anxiety, depression, and substance abuse issues. Studies have shown that children with ADHD who take stimulant medications decrease the likelihood of experiencing substance abuse issues in adolescence and adulthood.

In situations where anxiety or depression co-occur with ADHD, which set of symptoms to address first, has to be taken on a case-by-case basis. The interaction between anxiety and ADHD, in particular, can be complicated. Medications that treat anxiety can make the ADHD look worse, and medications that treat ADHD can sometimes make the anxiety look worse. In some people who are both distractible and anxious, sometimes the distractibility can be your friend. Distracting yourself from the thoughts that make you anxious can be a very easy way to feel anxious less of the time. *Some* anxiety helps you address working memory issues by keeping you focused on something you need to remember, giving a sense of urgency to get something started or completed, and some social anxiety can help keep impulsivity in check in some settings. If your worries aren't stemming from ADHD, like having a fear of storms, then treating the ADHD won't help to address these types of anxieties. In people who have significant anxiety or depression in addition to ADHD, treating with psychotherapy, particularly cognitive-behavioral therapy (CBT), to address the anxiety and depressive symptoms while treating the ADHD with medication, ADHD coaching, appropriate accommodations, and other interventions can be an effective combination.

- 4) In layman's terms, what part of the brain's neurochemistry is affected by executive functioning disorders?

With ADHD (and it's generally true of people with other EF issues), some areas in the pre-frontal cortex, the area right behind the forehead, are underactive. In those areas of the brain, dopamine and norepinephrine are the primary neurotransmitters that increase brain cell activity. All of the medications used to treat ADHD are trying to increase the activity of these two neurotransmitters by triggering their increased release, by slowing their reuptake or by mimicking their effect and by doing so increasing the activity of the parts of the brain that are underactive. One of these areas turns down motor activity; another is involved in forward planning and impulse control; yet another turns down the background chatter in your brain so you can focus on one thing at a time. So, by increasing the activity in those parts of your brain, you are less hyperactive, less impulsive, and more able to stay focused.

- 5) Again, in layman's terms, tell us more about the use of medications to treat EF issues. Several questions come to mind. First, why are stimulants often the first type of medication to try? How do stimulants help people with EF issues?

The reason that stimulants get used most often in people with ADHD is because they work most effectively with the greatest number of people to reduce ADHD symptoms. About 60% of individuals with ADHD will have a very good symptomatic response to the first stimulant they try. There are a lot of brand names but the stimulants that get used to treat ADHD all are one of two chemicals: methylphenidate or amphetamine. If people with ADHD don't respond well to a preparation in the first chemical group, they are still likely to respond well to one from the second group 60% of the time. The other advantage of the stimulants is, they work quickly. So, if you have the right medication and the right dose, you'll see improvement on Day 1. You don't need time for the medication to build up in the person's blood stream. Stimulants also have some common drawbacks. One of the biggest of which is that they can't cover the whole day. You have to let them wear off by bedtime so you can get to sleep. Consequently, there's a period of time at the end of the day and when you first wake up in the morning that you can't cover with a stimulant medication. They also have the potential to make anxiety worse and they can trick the part of your brain that tells you that you are full to give that message when you are not. This can lead to weight loss or lack of weight gain. People who don't eat well during the day due to stimulant side effects can also experience low blood sugar levels, which in turn can lead to headaches, irritability and feeling sluggish.

If the EF issues are coming from depression or anxiety, stimulants are probably not the best place to start. You would want to start something that addresses those issues directly first.

- 6) Many teenagers (and their parents) hope that they won't need to "depend" on stimulant medications their whole lives. Why do people have this concern and how do you help your patients address it?

It comes up often and in different ways. Because ADHD often runs in families, and because substance use risk is increased by ADHD, there's often a family history of substance use issues that makes parents of kids with ADHD more sensitive to this concern. The other piece is that, on the surface, stimulant medicines do have the potential for abuse and dependence. Putting someone with an increased risk for substance abuse and dependence on a medication with this risk, too, raises a concern. That's why those studies of long-term use of stimulants by kids with ADHD (which found it decreased their likelihood for developing dependency) are important. Another piece of that concern is cultural. We have a very "rugged individualistic" idea that we should be able to help ourselves by pulling up our boot straps and just deal with our challenges on our own. This can apply to people's attitudes about having a medication to help, or support services in school, or asking teachers for additional help or a second explanation. Having the tools you need and using them appropriately, however, is the best way to be able to be successful.

- 7) Why do some patients need to change the type of stimulant, or its dose, over time?

Again, this is usually because the original dose hasn't kept up with their growth and body weight over time, so the benefit lessens. For others the demands on their EF skills have increased dramatically. Another possible cause for a perceived decline in effectiveness, particularly with high school and college students, is their sleep pattern. Some days they get up at 6 a.m. or earlier; some days, noon or later. And they often don't get good sleep regardless. If you are chronically sleep deprived, you may feel that the stimulant medication isn't working as well now, but it's actually a sleep issue. Stimulant meds are not a good substitute for sleep.

- 8) Are there other medications besides stimulant medications that can help people with EF disorders?

Yes. There are three medications that are FDA approved for ADHD treatment that are non-stimulants and there are other medications that can be used off-label. The three that are FDA indicated are Strattera, Intuniv, and Kapvay. A number of the anti-depressants that affect norepinephrine or dopamine can be helpful for the inattentive symptoms of ADHD and/or the depression that can co-occur with ADHD. Strattera, Kapvay, Intuniv, Wellbutrin, and the serotonin-norepinephrine reuptake inhibitors all take more time than stimulants to work. Strattera, in particular, can take up to three months to produce its full benefits; the others can take a month to six weeks. This makes them difficult to use for someone in a crisis and who needs help immediately to get work done, but these medications have more potential to help at the times of day that the stimulants cannot cover. Some of these, particularly Intuniv and Kapvay, can be used effectively in combination with stimulants. They all have potential to be effective in people who do not tolerate stimulants.

For more information, please visit the following websites and articles:

[ADDitude: Living Well With Attention Deficit](#)

[CHADD: Children and Adults with Attention-Deficit/Hyperactivity Disorder](#)

[ADDA: Attention Deficit Disorder Association](#)

[Psych Central: Learn, Share, Grow](#)

[ADHD, stimulant treatment in childhood and subsequent substance abuse in adulthood - A naturalistic long-term follow-up study](#)

[Stimulant treatment for attention-deficit hyperactivity disorder and risk of developing substance use disorder](#)