

## **Despite years of ADHD research, diagnosis remains tricky and treatment, more so**

By Amanda Mascarell

When my son was in preschool, I did what many parents of excessively energetic and impulsive preschoolers have surely done: I worried whether his behavior might be a sign of attention-deficit hyperactivity disorder (ADHD). Then I sought input from two pediatricians and a family therapist.

The experts thought that his behavior was developmentally normal but said it was still too early to tell for sure. They offered some tips on managing his behavior and creating more structure at home. One pediatrician worked with my son on self-calming techniques such as breathing deeply and pushing on pressure points in his hands. He also suggested an herbal supplement, Valerian Super Calm, for him to take with meals and advised us on dietary adjustments such as increasing my son's intake of fatty acids. Studies have shown that a combination of omega-3 (found in foods such as walnuts, flaxseed and salmon) and omega-6 fatty acids (from food oils such as canola and flax) can reduce hyperactivity and other ADHD symptoms in some children.

In the couple of years since trying these techniques, my son has outgrown most of those worrisome behaviors. I had just about written off the possibility of ADHD until a few weeks ago, when his kindergarten teacher mentioned that she was going to keep an eye on him for possible attention issues. Hearing that left me worried and heavy-hearted.

**Why is it still so hard to diagnose ADHD? And why is there so much emotional baggage associated with treating it?**

There are no firm numbers for the number of children with ADHD in the United States. The Centers for Disease Control and Prevention estimates that 9 percent of U.S. children ages 5 to 17 had received diagnoses of ADHD as of 2009.

It is far more prevalent in boys than in girls. Among those given the diagnosis, a small minority suffers extreme symptoms, and in those cases, diagnosis is fairly straightforward. Children with extreme cases tend to have trouble staying engaged in tasks, even those that they enjoy, for any length of time and find it impossible to stay still, particularly in classroom settings.

But for the vast majority of children who are not so severely affected or who only partially fit the criteria, symptoms are often blurred, making it much more difficult to assess the disorder.

“There is no line” that defines who does and does not have ADHD, says Lawrence Diller, a behavioral developmental pediatrician and an assistant clinical professor at the University of California at San Francisco. Except in the extreme, diagnosing ADHD is a “judgment call based on subjective opinion,” he says.

### A flawed testing system

Schools play a major role in whether a child ends up with an ADHD diagnosis and is treated with stimulant medications. A large majority of referrals are generated by problems reported at school, Diller says, yet schools typically do not investigate the context of learning disorders and behavioral problems. “The whole system of diagnosis [of ADHD] is based primarily on symptoms of behavior only.”

Many doctors and some schools rely on the Vanderbilt Assessment Scale, a questionnaire meant to flag symptoms of ADHD and identify other underlying conditions. It includes general statements — such as “Is distracted by extraneous stimuli” and “Is forgetful in daily activities” — and asks the person completing the form to rank how often each applies to the child throughout the day.

But the test does not provide the necessary insights into a child’s home life — discipline patterns, inadequate learning environments, familial difficulties — Diller says. “If the behavior crosses the threshold on these forms, the parent is likely to be told the child has ADHD, even though there can be a host of other reasons why the kid is acting that way.” The child may also have other problems that have little to do with attention but result in ADHD-type behaviors.

For instance, a child with an auditory processing problem — a disorder in which the ears and the brain are not properly coordinated — will hear oral instructions, but then those instructions might get scrambled. Instead of getting out the blue notebook and turning to Page 20, he or she may take out the wrong book and look lost, stare out the window or bother a friend. “That will be reported on the Vanderbilt as being distractible and not completing tasks,” Diller says.

Diller recommends that parents first address discipline and learning issues before turning to medications, particularly in children younger than 6. He shows parents how to be more immediate with setting limits, such as using a timer to let kids know how long they can play or being clear about consequences (for instance, if cleanup isn’t sufficient, toys are removed immediately for a brief period of time), and he recommends “1-2-3 Magic,” a book that gives parents tools for effective discipline.

For “the kids who are in this gray zone, it can be difficult,” says Thomas Insel, director of the National Institute of Mental Health. “What we usually say is to err on the side of trying to provide kids with structure and feedback. If that doesn’t help, then you think about medication.”

### The science of ADHD

Researchers are beginning to understand the neural pathways that underlie ADHD, progress that is identifying potential new strategies for treatment.

One promising area of research has found that dopamine, a chemical messenger in the brain commonly associated with motivation and reward, is reduced in adults with ADHD. (Such studies have not been done in children since they require the use of small amounts of radioactivity, which is not recommended for people younger than 18.)

In a 2009 study in the Journal of the American Medical Association, a team led by Nora Volkow, director of the National Institute on Drug Abuse, reported that decreased dopamine signaling in the ventral striatum, an area of the brain involved with reward and motivation, was associated with attention problems in adults with untreated ADHD. The results suggest that low dopamine levels in the reward center might explain why many children and adults with ADHD struggle with a lack of motivation about certain tasks.

In a 2012 study in the Journal of Neuroscience, Volkow and colleagues showed that methylphenidate, a stimulant that is the active ingredient in Concerta and Ritalin, restored dopamine to normal levels and significantly improved inattention and hyperactivity in adults. Notably, they found that the dopamine messages were enhanced in the ventral striatum following treatment. This showed that increased dopamine transmission in the reward center of the brain was key to improving their patients' ADHD symptoms.

Even though stimulants have been proved safe and effective in children with ADHD, the decision to medicate is controversial and fraught with anxiety for many parents.

“We just tend to fight against” treating a disorder whose diagnosis is based on behavioral symptoms, Insel says. He emphasizes that behavioral interventions should be tried first in those with moderate symptoms but says that medication can be remarkably helpful for children with the disorder.

Deferring treatment for a child who needs help can have serious consequences, he notes, as with children whose self-esteem begins to suffer because they are constantly being corrected for not sitting still or paying attention. “The cost of not doing something about it becomes more severe,” Insel says.

Even if your child is identified as having ADHD, it remains an open question whether he will outgrow the diagnosis. A 2013 study in the journal Pediatrics found that just 30 percent of people who had received such diagnoses as children still had symptoms as adults. But other research has shown that the number is as high as 65 percent.

In our case, we plan to observe our son closely and stay in touch with the teacher, but we don't yet have major concerns. He's happy in school and progressing well. But as any parent surely understands, it can be nerve-racking to wait and see, especially when a child's well-being is at stake.