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Learning Objectives

After reading these articles, you should be able to:

1. Evaluate the benefits of addressing target symptoms vs diagnosis-based research studies when planning treatment for children and adolescents.
2. Identify the effectiveness of using reading interventions for children and adolescents.
3. Assess and treat the health impacts of ADHD on children and adolescents.
4. Summarize some of the current findings in the literature regarding psychiatric treatment for children and adolescents.

Are Target Symptoms More Important Than Diagnosis?

Recently I evaluated Caroline, a 15-year-old patient who presented with symptoms of depression, including insomnia, poor appetite, loss of interest in friends and activities, and inability to focus on her schoolwork. In addition, Caroline described a sad, dark view of herself, the state of the world, and her future. It seemed clear that I needed to address these aspects along with neurovegetative symptoms. When I asked Caroline about her treatment goals, I expected her to say she wanted to be happier, but I was surprised to learn that her priority was to “stop the same thoughts running through my head over and over” and quell her associated compulsions over much of the day to put things in order.

Research often does not describe the patients who come to our clinics. One of the chief reasons for this is that

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Highlights From This Issue

1. The long-term effects of ADHD on longevity support assertive treatment in childhood and adolescence.
2. Most reading programs that are heavily marketed do not have direct research demonstrating their efficacy; however, we can learn the important principles and offer families guidance.
3. There are many practical strategies to help families manage ADHD that focus on building from strengths.
4. There is little scientific evidence to argue against carefully increasing dosages of methylphenidate beyond conventional limits when clinically indicated.

Q&A With the Expert

Reduced Life Expectancy in ADHD Russell Barkley, PhD

Clinical Professor of Psychiatry at The Virginia Commonwealth University Medical Center, Department of Psychiatry and the Virginia Treatment Center for Children

Dr. Barkley has disclosed that he has no relevant financial or other interests in any commercial companies pertaining to this educational activity.

CCPR: To start, tell us about how the thinking has changed in terms of health consequences from ADHD.

Dr. Barkley: In the 1970s, we saw ADHD as an educational disorder with impacts on school behavior and academic achievement. Around that same time, there was a parallel path recognizing ADHD as a social problem in family functioning and peer relationships. Later it was viewed by some in terms of predisposing children and teens to aggression, conduct disorder, delinquency, and substance disorders. Recently, we have broadened our view even further to incorporate the health-related consequences of the disorder (Nigg JT, *Clin Psychol Rev* 2013;33(2):215–228). For instance, decades of research show a predisposition to accidental injuries in children and adolescents, and in the adult workplace—not just falls, scrapes, burns, and broken bones, but pedestrian cyclist accidents and car crashes.

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Expert Interview—Reduced Life Expectancy in ADHD

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And then, of course, we also see an increased likelihood of sports-related injuries, such as traumatic brain injuries (Barkley RA. *Attention Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment*. 4th ed. New York, NY: Guilford Press; 2015). But about a decade ago, we began to focus on other adverse health consequences associated with ADHD. For instance, people with ADHD were reporting twice the level of obesity, particularly by adolescence and adulthood.

CCPR: Can you give us some specifics on ADHD's effect on health?

Dr. Barkley: Forty percent of all ADHD children and adults have sleep difficulties, including night waking, insomnia, inefficient sleeping, and daytime sleepiness. We see problems with nutrition and diet—a predisposition to high-carbohydrate “junk” or fast food and, relatedly, to obesity and increased risk for type 2 diabetes. Many people with ADHD are leading a sedentary lifestyle, drawn to social media and gaming, and less likely to exercise. The Swedes saw problems in dental health: increased likelihood of cavities, infections, and dental trauma (Sabuncuoglu O & Irmak MY, *Dent Traumatol* 2017;33(2):71–76). Headache and vague bodily complaints emerged in a variety of studies on the outcomes of children with ADHD (Barkley, 2015). Finally, ADHD was showing up across many predisposing factors for cancer, heart disease, and most recently a shortened life expectancy.

CCPR: Tell us more about the specific research on life expectancy.

Dr. Barkley: Drawing from large databases, Sweden, Denmark, and Taiwan found high risks of accidental injury and increased suicide, leading to a marked rise in mortality risk at all ages. Dalsgaard in Denmark showed that children with ADHD were nearly twice as likely to die before age 10 from accidents and that by age 45, the rate of accidental death was nearly 5 times greater than normal (Dalsgaard S, *Lancet* 2015;385:2190–2196). This was replicated in the subsequent Swedish and Taiwanese research. More recently, we wondered about the health factors that are well-established correlates of ADHD—smoking, drinking, sleep issues, risk for seizures and migraines, etc. It doesn't take a life insurance agent to see that they all adversely affect life expectancy. In my Milwaukee study of children followed to ages 27–32, we did a comprehensive physical exam and lab studies but couldn't put the findings together into a single picture. Then two years ago, the Goldenson Center for Actuarial Research at the University of Connecticut made publicly available a life expectancy equation for calculating life expectancy based on very large data sets, and so we used it to analyze our data. No one had ever done this before.

CCPR: What did you find?

Dr. Barkley: When the computer algorithm results were analyzed, I had one of those gut-punch aha moments—truly stunning. What we found was that if you were diagnosed with ADHD in childhood, regardless of whether you outgrew your disorder or not, there was a 9- to 10-year reduction in life expectancy regardless of having received treatment as a child. We found roughly a 13-year reduction in life expectancy if your ADHD persisted, and 7 or 8 years if the ADHD was no longer present, compared to the control group. And there was a greater number of unhealthy years of life (Barkley RA & Fischer M, *J Atten Disorders* 2019;23:907–923).

CCPR: That's disturbing to say the least. How does ADHD stack up against other health risk factors?

Dr. Barkley: Compared to other killers from a public health standpoint, it's bad. Smoking, for example, reduces life expectancy by 2.4 years, and if you smoke more than 20 cigarettes a day, you're down about 6.5 years. For obesity and diabetes, it's a couple of years. For elevated blood cholesterol, it's 9 months. So ADHD is worse than the top 5 killers in the US combined, coming in at nearly 13 years of reduced healthy life if it persists to adulthood.

CCPR: What you are saying is that ADHD is truly a major public health issue.

Dr. Barkley: Yes, and that's on top of all of the findings on a greater risk for accidental injury and suicide. The range around that 13-year figure goes from 4 up to 29 years or more, with about two-thirds of people with ADHD having a life expectancy reduced by up to 21 years (Barkley & Fischer, 2019).

CCPR: What about other mental illnesses?

Dr. Barkley: Some psychiatric disorders have worse life expectancy than ADHD, such as schizophrenia, which has higher associations with homelessness, disease, and suicide. But ADHD is clearly worse than depression, anxiety, and bipolar disorder, and more like what you see in the psychotic disorders.

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Expert Interview—Reduced Life Expectancy in ADHD

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CCPR: But with higher prevalence rates, correct?

Dr. Barkley: Yes, 5%–8% of children and 5% of adults have ADHD. Autism, for instance, is 1 in 66, and schizophrenia is even lower, according to the DSM-5.

CCPR: How do these ADHD outcome statistics frame our thinking?

Dr. Barkley: The way I see it, there are four vectors of change that we need to address. First, we need to make families aware of these consequences. Talk with them about health, wellness, sleep, nutrition, exercise, substance use, and so on. This is beyond the already well-known psychiatric, educational, social, and emotional aspects of ADHD. Priority number two is encouraging mental health clinicians to look at health and wellness variables—you don't have to have a black bag or a stethoscope to ask about these—then refer patients with ADHD to community resources for smoking, weight, sleep, coaching, and so on as needed. Third, primary care providers need to be more aware of ADHD as a background factor when treating patients for these sorts of adverse health conditions. And vector number four is awareness on the part of government agencies—if ADHD is unrecognized and untreated, they're not going to be very successful in helping people change health behaviors, which drives up the cost of care.

CCPR: So people with ADHD come to primary care with other health problems, but their ADHD is not recognized?

Dr. Barkley: The disinhibition and impulsivity in ADHD are the gorilla behind the curtain here. The health factors that lead to reduced life expectancy are related to poor conscientiousness, which comprises these sorts of disinhibitory traits. So the primary care providers, who are tasked to deal with obesity, smoking, cholesterol, exercise, sleep problems, and so on, need to look for ADHD when patients present with these problems, particularly if the patients have failed in prior attempts at self-improvement. Providers need to use a screener, which can be easily done.

CCPR: Is there a specific screener that you recommend?

Dr. Barkley: The World Health Organization has the Adult ADHD Self-Report Screening Scale (ASRS). It's a 6-item screener, more for adults than kids. It's well normed and has good data on its ability to detect. A high score is cause to refer for a thorough evaluation. Using the 6-item ASRS isn't going to break the bank when it comes to time or expense. *(Ed note: There are many scales that are helpful for tracking patient progress, but they are no substitute for your clinical assessment. Unfortunately, there is a lack of current research on most except the Attention Deficit Disorder Evaluation Scale [ADDES] and the better but longer NICHQ Vanderbilt Assessment Scales. My personal favorite is the CAP—quick for teachers, quick to score, and informative.)*

CCPR: Compliance is still tough, whether it's primary care or psychiatry referring for intervention.

Dr. Barkley: Yes. I teach our residents: "You are only as good as your Rolodex." Know your area resources for people specializing in reducing these various health risks who can assist your ADHD patients. You need to start there and address compliance at follow-up. *(Ed note: See CCPR Sept/Oct 2019 for articles on motivational interviewing.)*

CCPR: Switching gears, meds work over the long haul, and we are often the ones managing them. There have been mixed findings about the impact of ADHD and medication on growth in kids. Can you speak to this concern?

Dr. Barkley: A failure to gain about 2–4 pounds a year and about 1 centimeter in height is typical in children with ADHD on medication. These growth effects are limited to the first few years of treatment, with no evidence of medications affecting predicted adult stature. There's some catching up that eventually occurs.

CCPR: What about Parkinsonian syndromes with chronic use of stimulants?

Dr. Barkley: Two studies were published last year that showed people with ADHD were between 2 and 4 times more likely to develop Parkinson's (Tzeng NS et al, *J Atten Disorders* 2017;23(9):995–1006). And that's also true for ADHD predisposing to other basal ganglia and cerebellar late-stage disorders (Goodwin RD et al, *Psychol Med* 2009;39(2):301–311). So later upper-motor neuron difficulties and cerebellar problems may have some link with ADHD earlier in life. It's not the medication creating this risk—the disorder arises from those brain structures, and those are the ones that decay during the latter part of life. One study showed an eight-fold increase in Parkinson's if people had been on an ADHD stimulant medication. But the authors noted that medication is a marker for severity of ADHD, so their study couldn't show that it was the stimulant creating that risk (Curtin K et al, *Neuropsychopharmacol* 2018;43:2548–2555). We have to be careful not to sensationalize that finding. Other than growth lag during the first 2–4 years of treating children, we have no evidence that there's a lasting effect on height, weight, or other physical parameters.

CCPR: Good to know. What other interventions should we consider?

Dr. Barkley: Cognitive behavioral therapy (CBT) targeting executive-functioning deficits in adults with ADHD is very beneficial, and studies are promising for use in older teens (Knouse LE et al, *J Consult Clin Psychol*

“Compared to other killers from a public health standpoint, ADHD is worse than the top 5 killers in the US combined, at nearly 13 years of reduced healthy life if it persists to adulthood. And that's on top of all of the findings on a greater risk for accidental injury and suicide.”

Russell Barkley, PhD

Expert Interview—Reduced Life Expectancy in ADHD

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2017;85(7):737–750). Mary Sollanto, Russ Ramsey, Steve Safren, and others have published clinical manuals on this intervention. For example, Sollanto's CBT manual for adult ADHD helps with daily problems with decision-making, planning, organizing, emotion regulation, and stress control that are triggers for other health problems like overeating, drug use, smoking, and sleep difficulty (Sollanto MV. *Cognitive-Behavioral Therapy for Adult ADHD: Targeting Executive Dysfunction*. New York, NY: Guilford Press; 2013). And the adult ADHD coaching network is blossoming in the US. Coaching can help initiate and sustain gains in managing ADHD, typically by staying in touch with people daily or near daily and thus providing increased accountability for their plans for self-improvement.

CCPR: What are your thoughts about exercise and meditation?

Dr. Barkley: A growing body of evidence shows physical exercise may be more beneficial for ADHD management than for any other psychiatric disorder. It's not curative, but routine aerobic exercise seems especially beneficial for symptomatic management of ADHD. It also provides weight control or loss, stress reduction, and improved sleep. But the beneficial effects of exercise also include what I call micro-exercising: any kind of movement during class or homework or meetings, such as having a stress ball in one hand or working at a standing desk. Even small amounts of movement are very beneficial to work productivity and attention for these individuals. Mindfulness meditation may be helpful, but it's not well researched for ADHD at the moment. Personally, I think it's mainly for the emotion dysregulation and stress experienced by adults with ADHD. It's not so much for improving other executive deficits like time management and self-organization—no one would expect meditation to touch those. (*Ed note: A systematic review and meta-analysis suggests there is evidence of benefit from meditation: Chimiklis AL et al, J Child Fam Stud 2018;27(10):3155–3168. doi:10.1007/s10826-018-1148-7*)

CCPR: You've outlined a full plan.

Dr. Barkley: Yes, but treating ADHD boils down to five components in the treatment package: diagnosis, patient education, medication, behavior and lifestyle modification, and accommodation—meaning how the patient changes the environment to reduce impairment. The specific evidence-based treatments for adult ADHD would be medication, CBT, exercise, coaching, and maybe mindfulness meditation practice.

CCPR: Any final thoughts you'd like to share?

Dr. Barkley: ADHD is the most treatable disorder in psychiatry, bar none. We have more medications with (in most studies) larger effect sizes, greater response rates, and more delivery systems that change people's lives more than any other disorder. They're some of the safest medications in psychiatry. The risks for coronary problems, seizures, sudden death, and drug abuse later in life from these medications—well, they're not there. The epidemiological studies published on large populations in the last three years have eviscerated those concerns. For me, as I come to the end of my career, if I have to go out with one last gasp, it's going to be about ADHD as a public health disorder, not just a mental health disorder.

CCPR: Thank you for your time, Dr. Barkley.



Are Target Symptoms More Important Than Diagnosis?

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research studies typically have exclusion criteria in order to create more pure populations—usually, subjects with one diagnosis. But multiple comorbid diagnoses is more the rule than the exception in child and adolescent mental health care. In this article we'll review the nuances of measuring improvement, especially in the context of treating complex mixtures with a common thread of adolescent depression.

Sorting out treatment goals

To start with, we need to define what we are looking for as an outcome. Common rating scales such as the clinician-reported Children's Depression Rating Scale-Revised (CDRS-R) and

the adolescent-reported Patient Health Questionnaire (PHQ-A) can track symptom severity. However, these scales do not necessarily measure outcomes that matter most to children, their families, and society. Functional outcomes and even patient and parent goals of treatment must also be taken into consideration. For example, what about the teenager who is less depressed but still not going to school?

A 2019 *JAACAP* research study suggests that, in addition to the usual symptoms, it is important to focus on broader ranges of outcomes, or domains (Krause KR et al, *J Am Acad Child Adolesc Psychiatry* 2019;58(1):61–71). These include:

- **Symptoms.** The usual symptoms include altered mood, appetite, energy, concentration, and sleep, as well as suicidal thoughts.
- **Functioning.** At home, is the patient getting up, dressed, showering, brushing her teeth? Is she helping with meals and caring for pets? At school, is she attending class and engaged in class discussions and activities? Is she getting her schoolwork done? Is she still going to sports, clubs, or other groups?
- **Relationships.** How is the patient getting along with family and peers?

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Q & A With the Expert

Reimagining ADHD Edward Hallowell, MD

Child and adult psychiatrist. Founder of The Hallowell Centers in Boston MetroWest, New York City, San Francisco, and Seattle. Host of the podcast "Distraction" (www.distractionpodcast.com)

Dr. Hallowell has disclosed that he has no relevant financial or other interests in any commercial companies pertaining to this educational activity.

CCPR: Thanks for speaking with us today, Dr. Hallowell. Please tell us about your work.

Dr. Hallowell: I'm a writer, a speaker, and a practicing psychiatrist. I have offices in Boston, New York, San Francisco, and Seattle. I went to Harvard College, Tulane Medical School, Harvard residency, and fellowship at Mass Mental Health Center. After that I was on the Harvard Medical School faculty for about 20 years, then I devoted my time to lectures, writing, and raising my kids. My first book, *Driven to Distraction*, came out in 1994. It really caught on, bringing ADHD to the general public. Since then, I've written 19 more books.

CCPR: *Driven to Distraction* is a classic. But if you were going to suggest one or two more recent books, are there a couple that you feel are particularly useful to families?

Dr. Hallowell: My favorite of all my 20 books is called *The Childhood Roots of Adult Happiness*, and it's about raising children. I realized I knew nothing about promoting healthy children. I knew about misery, but I didn't have an evidence-based game plan for how to bring out the best in children. We all want the same for our kids, but how do you get there? The book is a five-step plan that frees parents from the tyranny of what I call "the pyramid model," which holds that in order to lead a wonderful life, you have to be number one in everything and go to Harvard, Yale, or Princeton—this thinking grips so many families and children, and it's just not true.

CCPR: Tell us about your plan.

Dr. Hallowell: The aim is to focus on attitudes, not grades and sports. Attitudes like confidence, self-esteem, optimism, the ability to get along with others, resilience—the ability to bounce back. Hopefulness, industry, the ability to initiate something new, come up with new ideas. All of those attitudes are things everyone can acquire. While only one person can be valedictorian, any child can acquire helpful attitudes.

CCPR: Sounds lovely.

Dr. Hallowell: In terms of ADHD, the book I'd recommend came out in 2005 called *Delivered From Distraction*. And then I'll have a book coming out next year that's going to be called *From ADHD to VAST*. VAST is my new name for the condition. It stands for Variable Attention Stimulus Trait.

CCPR: Tell us about VAST.

Dr. Hallowell: The current Adult Deficit Disorder model is slanted toward pathology and misses the good stuff that goes with this condition. It perpetuates stigma, shame, and feeling bad about yourself. It's time to jettison that model. Yes, the condition can pose lots of problems. It can ruin your life. But it can become a tremendous asset, as it has for many artists, creators, chefs, and brain surgeons. It is a "vast" condition, full of variety—a trait, not a disorder, though it can be a disaster if you don't manage it properly. Prisons are full of people with it, and it's common in the addicted population, the unemployed, and the marginalized. But in addition, some of the wealthiest people, Nobel and Pulitzer Prize winners, and many entrepreneurs have it. The point of the book is to take the condition seriously and help you realize that if you handle it properly, it's a superpower. The sky's the limit. The book's subtitle is *A Bold New Understanding of Strength, Talents, Pitfalls, and Ultimate Success*.

CCPR: How does this change everyday practice?

Dr. Hallowell: One patient told me: "I feel as if I've been living my life with half my brain tied behind my back." Getting the diagnosis, understanding himself, and then getting the meds freed him up in amazing ways. You say to yourself, "Think what I could have done had I had this diagnosis sooner." It can liberate resources that you're not otherwise able to organize. Having untreated ADHD is analogous to Niagara Falls—a lot of noise and mist until you build a hydroelectric plant. I'm in the business of helping these people build their hydroelectric plant; take their enormous energy, creativity, originality, drive, spunk, resilience, and channel it in such a way that they can be productive as opposed to letting that energy dissipate, as so often happens. My job is to say, "Yes, you're right; you're not lazy or lacking in discipline. You're not characterologically flawed. You don't have a deficit disorder. What you have is an abundance of attention, not a deficit of attention. But you have trouble channeling it, focusing it. You have trouble turning it into something useful. But don't despair because I can tell you how to do it."

CCPR: Can you give us an example?

Dr. Hallowell: Medication is one major tool in the toolbox, but it doesn't always work. There



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are other interventions. In the book, I write about this 8-year-old boy in Shanghai who was in trouble in school every day. They hit him with a stick every day. I gave his mother guidance over email with no medication but using education and cerebellar exercises. It was a combination of education, love, what I call the other vitamin C—vitamin Connect—and persuading the teacher not to hit him anymore. We eliminated fear (the real learning disability), gave him massive doses of love at home, and explained to him that he has a race car brain with bicycle brakes. This helped him be excited about who he is instead of ashamed, and it motivated him to strengthen his brakes, which we did using the cerebellar exercises. In three months, he was at the top of the class, not acting out, and loving school.

CCPR: Do you have data on this concept of reconfiguring ADHD? Perhaps studies on people who've been highly successful?

Dr. Hallowell: Russ Barkley said to me, “Ned, nobody’s going to fund studies on success.” But I have a wealth of anecdotal evidence—famous people who have ADHD and are willing to talk about it. For example, Tim Armstrong, the former CEO of AOL and Yahoo!, and his wife Nancy are funding a documentary based on my strength-based approach that will come out in 2021. We’ll portray the road to success, with cameos by famous people who have this condition.

CCPR: There are studies of attention improving in young adults with ADHD during exercise, and some support for exercise as an adjunct treatment for ADHD (Rassovsky Y and Alfassi T, *Front Psychol* 2019;9:2747). Other cerebellar training techniques have yet to demonstrate efficacy in controlled trials. It will be helpful to do research on the exercises you describe.

Dr. Hallowell: Absolutely. Roy Rutherford in England, and Jeremy Schmahmann at Harvard Medical School, who really put the cerebellum on the map, did MRI studies showing that the cerebellum occupies 10% of brain volume, but it’s got 75%–80% of the brain’s total neurons, with rich connections to the prefrontal cortex (Schmahmann JD et al, *Neuroimage* 1999;10(3 Pt 1):233–260). If you stimulate the cerebellum and indirectly stimulate the cortex, you get these amazing results. In addition to ADHD, it helps dyslexia, dyscalculia, and dyspraxia. Any exercises that challenge balance and coordination, such as skiing, skateboarding, and surfing, are helpful, as well as exercises that you can do at home.

CCPR: Such as?

Dr. Hallowell: I prescribe exercises like standing on one leg and then the other leg with eyes closed, and other standing exercises on a wobble board or Bosu (a half sphere-shaped exercise device). Also, sitting on an exercise ball with your legs off the floor, then with your eyes closed. When you close your eyes, it is much more difficult. If you do these exercises 10 minutes twice a day, eye tracking is also improved, which can help reading problems.

CCPR: What about naysayers? Many look askance at developmental optometrists who prescribe eye exercises.

Dr. Hallowell: This is totally different. Cerebellar exercises stimulate different parts of the brain. I don’t get naysayers; I just tell stories. I make no pretense to be a double-blind prospective study guy. I leave that to other people.

CCPR: Liz Torres also focuses on cerebellar function, often as part of understanding autism and related disorders. What you’re describing seems consistent with work in that field helping people to be more regulated, able to manage their sensory systems, able to connect in a meaningful way and, therefore, communicate and learn better.

Dr. Hallowell: Right.

CCPR: How does this apply to everyday practice?

Dr. Hallowell: Look for strengths and tell patients that it’s not a deficit of attention but an abundance of attention, and the challenge is to control it. A toddler on a picnic goes wherever her curiosity leads, with no regard for danger or authority. Telling her to sit still and be more disciplined won’t work.

CCPR: How might assessment differ from a typical child psychiatry practice?

Dr. Hallowell: It probably doesn’t differ a lot, except in attitude. We have slogans on the wall, “No brain is the same; no brain is the best; each brain finds its own special way.” The culture of the offices is infused with positivity. Focus on your history from multiple sources. People with ADHD are not good self-observers. We do neuropsych testing if people can afford it, looking at such things as processing speed and memory.

CCPR: What is the role of medication in this model?

Dr. Hallowell: We always offer medication. Some families decline, but I want them to make the decision based on facts and not on rumor and hearsay. And 9 out of 10 times when they learn the facts, they want to give it a try. We usually give a trial of medication in conjunction with coaching. Most don’t need psychotherapy. They need coaching—lifestyle

“The current ADHD model is slanted toward pathology and perpetuates stigma, shame, and feeling bad about yourself. To me it is a ‘vast’ condition, full of variety—a trait, not a disorder. I say to patients, ‘You’re not lazy or lacking in discipline, and you’re not characterologically flawed. You don’t have a deficit disorder; what you have is an abundance of attention that you have trouble channeling and focusing.’”

Edward Hallowell, MD

Reviews of Programs That Purport to Improve Reading

Pavan Madan, MD and Fagie Mandel, MEd

Dr. Madan and Ms. Mandel have disclosed that they have no relevant financial or other interests in any commercial companies pertaining to this educational activity.

Families of children who struggle with reading often ask child psychiatrists for insight into reading intervention programs. These programs are usually heavily marketed with neuropsychological terms as well as testimonials from families and educators. Many reading intervention programs are expensive, and all are time-consuming, so it is important to understand the elements they involve.

Principles of reading remediation

Before delving into individual programs, let's spend a few minutes reviewing some of the basics. According to the National Reading Panel, led by the National Institute of Child Health and Human Development, reading instruction must include five components to be effective: phonemic awareness (orally identifying the individual sounds that comprise spoken words), decoding (word-level reading that is dependent on understanding the correspondence between letters and sounds), fluency, vocabulary, and text comprehension (www.tinyurl.com/qudjo9l).

Reading occurs on a developmental continuum. That means physical brain development and neurological maturation is required for a child to be able to read; this usually occurs between 5 and 7.5 years of age. For many children, their natural brain development will activate reading acquisition in an environment of literacy instruction. However, this is not the case for all children. It's often unclear whether early reading difficulties are due to latent development or an underlying disability that requires intensive instruction to overcome.

As with all remediation, early reading intervention is important in order to reduce reinforcement of incorrect practice. The conventional recommendation is for reading intervention to start prior to the end of third grade, because most school systems cease to teach decoding

in a systematic manner after that point. However, it is never too late to learn how to read; the International Dyslexia Association (www.dyslexiaida.org) maintains that children and adults of all ages can do so when provided with multisensory, structured instruction.

Given this background, we review several commonly used programs—Arrowsmith, Fast ForWord, Lindamood-Bell, and Orton-Gillingham—and discuss how to evaluate the research claims associated with them.

Arrowsmith

Arrowsmith (www.arrowsmithschool.org) is an alternative education program provided through participating schools worldwide, at a cost of about \$8000 per child per year. It is designed to be implemented 4 periods a day, 5 days a week, for 3 to 4 years. Teachers must attend 3 weeks of training prior to implementing the program. Though its specific methodologies are not disclosed, Arrowsmith claims to build learning capacity in a vast range of cognitive areas, including reading, writing, math, auditory processing, visual processing, attention, nonverbal functioning, problem solving, communication, memory, and executive functioning. Its exercises are primarily computer based, supported by oral and written exercises. According to Arrowsmith, research on its effectiveness has been in progress since 1997, but no research on Arrowsmith has yet been published in a peer-reviewed journal (Hannan T, *Australian Science* 2015;36(9):41).

Fast ForWord

Fast ForWord (www.fastforwordhome.com/about) is an internet-based intervention program in a game-like format; it is designed to improve children's reading and language skills in areas ranging from phonics and grammar to comprehension, processing, and sequencing. Fast ForWord claims that results will occur with regular use (30 minutes a day, 5 days a week) across children with diverse learning needs. Each subscription comes with access to a remote, trained mentor who can personalize the program for the child. A search for research

literature on Fast ForWord revealed only a single positive study via fMRI (Temple E et al, *PNAS* 2003;100(5):2860–2865), while a meta-analysis of 6 studies found no evidence of significant effectiveness (Strong GK et al, *J Child Psychol Psychiatry* 2011;52(3):224–235).

Lindamood-Bell

Lindamood-Bell (www.lindamoodbell.com/category-article/phonological-processing) offers multiple programs to address various learning needs. For example, the "Visualizing and Verbalizing" program teaches visualization skills for language comprehension and big-picture thinking, while the "Seeing Stars" program teaches orthographic processing through "symbol imagery," defined by Lindamood-Bell as the ability to visualize word parts. Lindamood-Bell's intervention services can be delivered one on one or in small groups at their learning centers located in the US, UK, and Australia. Remote learning through teleconferencing is also available, with implementation instruction for teachers and tutors via scripted kits. Lindamood-Bell recommends implementing its programs for 4 hours a day, 5 days a week, for 4 weeks; the learning centers reportedly charge \$90 per hour, totaling \$7200 for a program. Another website reported that Lindamood-Bell charged \$20,000 for 12 weeks of intervention (www.adhd-bipolar-and-beyond.com/lindamoodbell.html).

The Lindamood-Bell website offers three papers supporting its results. Two of them are from the same research group, while the third paper, from an outside entity, was the only one to appear in PubMed. This paper, a peer-reviewed article conducted by independent researchers, found that untimed word reading, untimed pseudoword reading, timed pseudoword reading, and oral reading fluency improved with implementation of the "Seeing Stars" program (Christodoulou JA et al, *J Learn Disabil* 2017;50(2):115–127). The study did not control for the Hawthorne effect—ie, improvement in cognitive function because of the sheer amount of attention and follow-up provided by

Continued on page 8

Reviews of Programs That Purport to Improve Reading

Continued from page 7

the program (McCarney R et al, *BMC Med Res Methodol* 2007;7(30)). Also, the control group was comprised of children who were on the Lindamood-Bell “waiting list” during the study period. The outcomes of the research would be more meaningful if the control group had received an active control intervention, such as regular sessions with a reading specialist or a tutor.

Orton-Gillingham

Orton-Gillingham (www.ortonacademy.org) is a methodology for explicit instruction on sound-symbol connection of the alphabetic principle and morphological awareness using multisensory learning. The structured lessons follow an essential phonics-based scope and sequence that cumulatively builds on prior knowledge and is systematically reviewed. Orton-Gillingham’s teacher preparation programs require anywhere from 30 to 300 hours of instruction and supervision. Orton-Gillingham programs are generally conducted in small groups by specialists in pull-out and after-school settings, but they can also be held with entire classes. The findings of

the National Reading Panel support the Orton-Gillingham approach, but although many reading programs use components of this approach, not all programs are equal. For example, a multisensory component is critical to the fidelity of the intervention, but many programs that claim to follow the Orton-Gillingham methodology fail to include this. It is also important to ensure incorporation of reading and writing fluency as well as reading comprehension at every level.

Understanding research claims

Effective programs must be backed by actual research, not ideology. A given reading intervention may sound promising, but scientific rationales and support are not always as ironclad as a website might boast—research claims often rest on general principles rather than study of the programs themselves. Watch for jargon, look to see if a program’s cited research is actually searchable (eg, in PubMed), and note the balance of research vs marketing. We hope for at least two good peer-reviewed research articles done by different groups. Intervention, whether at school or through

an after-school program, should focus on direct reading instruction. Also, engagement is key: No matter the intervention, the child’s own desire to participate will be key to success.

CCPR VERDICT:

What do we tell parents?

All these programs can claim satisfied families. And we can’t rule out a child’s natural development when looking at any program’s purported results. That said, a well-built Orton-Gillingham program will have the most research supporting it. Remember that reading comprehension, not speed, is what matters most. We’ve all had timed tests, but it turns out that merely increasing speed reduces comprehension; the reality is that authentic faster rates of reading are founded upon solid comprehension skills (Rayner K et al, *Psychol Sci Public Interest* 2016;17(1):4–34). Get your students extra time to read if needed, and do not press for faster reading in and of itself.

Expert Interview—Reimagining ADHD

Continued from page 6

revision—with tips on getting organized, dressing in the morning, or finishing homework. For adults, we talk about who makes a good match for a marriage partner, what makes a good job prospect, and how to get from A to B without too many detours.

CCPR: Tell us more about picking a partner.

Dr. Hallowell: I tell people to find someone who loves them for who they are and doesn’t try to turn them into someone who doesn’t have ADHD; to find someone who helps them compensate for lapses in memory, organization, and focus, but not in a punitive or humiliating way. The partner benefits from new ideas, fun, and positive energy. People with ADHD, because they react too readily, are prone to marry people who have a lot of problems, which is something to watch out for. They are also prone to marrying people who seem like a caricature of a bad 5th grade teacher—constantly punishing, reprimanding, demeaning.

CCPR: What about job choices?

Dr. Hallowell: Similar to relationships, people with ADHD are prone to reacting to the demands of a job, even if they’re not making real progress. This is often what school was like, so they’re used to it even though it isn’t good for them. I tell people they should find what they’re good at, what they love to do, and what someone will pay them to do. Where those three overlap, that ought to be where they spend most of their time.

CCPR: Can you give a quick example of that?

Dr. Hallowell: Sure. I love speaking, writing, and working as a doctor. People are willing to pay me for those activities. And I delegate paperwork. But more than this, people need meaning and purpose, a larger mission, despite the ups and downs. Staying in the game is what matters. And the key to a great childhood and a great life is positive connection—to friends, family, pets, activities, work, nature, places, festivities. We’re living in an epidemic of disconnection. That’s what drives depression, suicide, addiction, and school shootings. Yet connection is free and infinite. People don’t take it seriously, or don’t know how to get it, because they’re shy or depressed. That’s where people need help from folks like you and me, or teachers or coaches or parents.

CCPR: Thank you for your time, Dr. Hallowell.



Are Target Symptoms More Important Than Diagnosis?

Continued from page 4

What is his capacity to mutually connect and participate with close family members and best friends or dating partners? How has this changed?

- Goals of treatment. What are the patient's own treatment goals?
- Service utilization. What level of care makes sense for the patient right now given her overall functioning? This includes psychiatric and other mental health services at outpatient and other levels of care, but also medical needs and supports such as school counselors and academic accommodations or modifications.
- Parental functioning. There is growing research showing that when parents suffer, kids have more difficulty. Assess parental needs for support and treatment and make those referrals, preferably with warm (facilitated) hand-offs to help ensure follow-through.
- Physical health. Patients need to have good medical assessment and often have additional medical needs, including management of chronic conditions such as asthma, obesity, sleep disorders, etc.

A mix of perspectives and targets?

Another issue is who's reporting these improvements; is it the clinician, the parents, or the patient? Ideally, we should consider everyone's perspective, but this

doesn't always happen, especially in research. The bulk of research focuses on clinician-rated improvement, and if youth reports are even considered, they are often not a primary outcome.

Using depression as an example, researchers in the aforementioned Krause study tracked 98 depression trials between 2007 and 2017 to determine how those authors measured improvement and who the respondents were, and if either of these variables changed over the 10 years.

Most studies (94%) measured symptom severity via the CDRS-R. The next most common outcome was functioning (48%), usually assessed via the Clinical Global Impression Scale-Improvement (CGI-I). Some studies also looked at academic functioning and graduation rates. Less frequently, 13% of studies measured cognitive or behavioral patterns, like ruminative thinking, and/or changes in comorbidities such as drug use. Only a smattering of studies measured changes in patient satisfaction, treatment compliance, or personal growth (< 10%). 53% of studies included youth self-report, and 75% of studies primarily relied on a clinician's report. Researchers relied on youth self-report for domains not easily assessed otherwise, such as patient satisfaction and quality of relationships (Krause, 2019).

Over the course of these studies, there were upward trends in the number of domains measured and the number of studies including youth self-report. By 2015, all studies published included youth self-report. The authors speculate these trends may reflect changes in mental health policies aligned toward these outcomes.

*Looking at Caroline's case, I was able to see that her ruminations were creating a lot of her distress and interfering with her ability to concentrate at school and to connect with family and friends. She did better when she was actively playing lacrosse, so we worked to keep this activity going while using medication and cognitive behavioral therapy to help combat her ruminative thinking. Still, we needed to work with Caroline's school to offer more flexibility in completing assignments during her treatment, which would help prevent her from falling too far behind. This approach was organizing for not only Caroline, but also her parents; their distress was ameliorated, making the entire process smoother (DeJong H et al, *J Behav Ther Exp Psychiatry* 2019;63:28-35).*

CCPR VERDICT:

Real-world treatment planning demands that clinicians think beyond tracking symptom reduction in isolated psychiatric conditions. With such a framework, we can optimize care through evidence-based assessment and treatment practices. Yet we don't typically see this in research due to factors such as deadlines, money, policy priorities, recruitment, and the need for statistical validity and reproducibility in research. Evolving research frameworks such as the NIMH Research Domains Criteria (RDoC) will help. In the meantime, we need to think beyond simple disease reduction when we ask, "How are you feeling today?"

Carlat Publishing News

Updates on additional clinical resources we're working on

The Carlat Psychiatry Report: The current February 2020 issue explores inflammation and depression. Upcoming issues cover bipolar II, psychopharmacology, traumatic brain injury, and borderline personality disorder.

The Carlat Addiction Treatment Report: The current Jan/Feb 2020 issue covers harm reduction. Upcoming issues tackle substance use in health professionals and older medications with emerging risks.

Current book titles include:

- *The Medication Fact Book for Psychiatric Practice* (Fifth Edition), available with 12 CME credits
- *The Child Medication Fact Book for Psychiatric Practice*, available with 8 CME credits

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Research Updates
IN PSYCHIATRY

MEDICATION

Can Stimulants Prevent Crime?

REVIEW OF: Mohr-Jensen C et al, *J Am Acad Child Adolesc Psychiatry* 2019;58(4):443–452

ADHD has long been linked to anti-social behavior leading to arrests and incarcerations. Children and young adults with ADHD are more likely to be charged with anything from traffic violations to violent crimes. However, these associations do not prove causality. Is the ADHD causing these antisocial behaviors, or are there other psychosocial factors that would explain the findings? And if ADHD is indeed an independent risk factor for criminal behavior, can that risk be decreased through stimulant medication?

These big questions require population-based studies. Researchers evaluated data from Danish national medical and prescription registries and matched 4,231 children diagnosed with ADHD from 1995 to 2005, with controls based on sex and age. Follow-up data from an average of 22 years were obtained regarding arrests, incarcerations, substance abuse, time on stimulant medications, and other psychosocial factors. Nearly all (98%) of stimulant prescriptions were for methylphenidate, and most of the children (85%) were male.

After controlling for confounders such as psychiatric comorbidity, socioeconomic status, parental psychopathology, and other psychosocial factors, males with ADHD were 60% more likely (hazard ratio [HR] = 1.6) to be convicted of a crime and 70% more likely (HR = 1.7) to be incarcerated. For females, the effect was even more profound—they were 120% more likely (HR = 2.2) to be convicted and 190% more likely (HR = 2.9) to be incarcerated. However, when looking at times of active treatment with

stimulant medication, the risk of conviction dropped significantly by 40% (HR = 0.6) for both males and females compared to time periods off medication. Incarceration risk also dropped by 40% (HR = 0.6) for males, but did not drop significantly for females.

CCPR'S TAKE

This study takes a mile-high view of a given population, looking for large trends over time. While population-based studies do not apply to every individual patient, knowing that appropriate treatment of ADHD may prevent criminal behavior is very encouraging. The data for more severe consequences of ADHD in females are particularly interesting, though they may stem from underrecognized mild ADHD in girls. For all cases, early recognition of the complex needs (related to poverty, trauma, etc.) of children with ADHD and supporting psychosocial treatment with medication can change lives.

—Thomas Jordan, MD. Dr. Jordan has disclosed that he has no relevant financial or other interests in any commercial companies pertaining to this educational activity.

Methylphenidate Max Dosing

REVIEW OF: Ching C et al, *JAMA Pediatr* 2019;173(7):630–639

Methylphenidate was one of the first stimulants prescribed for the treatment of ADHD in children, adolescents, and adults. Its efficacy is clear, and its availability in immediate release, sustained release, osmotic release oral system (OROS, brand name Concerta), and transdermal patch keeps it a popular choice. The typical dosing strategy in children and adolescents is to start low and go slow, but if symptoms remain and side effects are tolerable, at what dose should we stop titrating?

The standard FDA dosing information recommends a maximum dose of 60 mg per day in children and

adolescents ages 6–17 for both immediate release and sustained release methylphenidate. For the OROS formulation, the dose is capped at 54 mg per day for children ages 6–12 and 72 mg per day in adolescents ages 13–17. These guidelines are backed by a few randomized controlled trials, and various organizations have slightly different maximum dose guidelines, but does the rest of the literature support these limits?

This meta-analysis reviewed data from 11 randomized controlled trials (1304 participants) and 38 cohort studies (5524 participants) examining methylphenidate dosing strategies. Some studies cited guidelines or previous studies for their maximum doses, but several of the studies capped themselves at a lower maximum dose than the source they were citing recommended. Most studies listed maximum doses far lower than the common guidelines. Only one cohort study went higher—90 mg per day of OROS for ages 6–13. Overall adverse effects were common at a rate of 66% in the cohort studies. The most common side effects were decreased appetite (33%), insomnia (15%), and headaches (14%). Serious adverse events were exceedingly rare, with transient psychosis reported in just 5 cohort study participants and hypertension in 7.

CCPR'S TAKE

There is ample evidence of efficacy for many patients at dosages lower than the suggested maximums, yet evidence for a true maximum dose for methylphenidate is lacking. If a patient's ADHD symptoms remain on a given dose, and a review of the differential diagnosis yields no other intercurrent conditions, we do not have evidence that would preclude continued careful upward titration while monitoring for side effects.

—Thomas Jordan, MD.



CME Post-Test

To earn CME or CE credit, log on to www.TheCarlatReport.com to take the post-test. You will be given 2 attempts to pass the test. You must answer 75% of the questions correctly to earn credit. Tests must be completed within a year from each issue's publication date.

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- Physical brain development and neurological maturation are required for a child to be able to read. During which age range does this usually occur? (LO #2)
 - a. 2 and 4.5 years
 - b. 4 and 6 years
 - c. 5 and 7.5 years
 - d. 7 and 9 years
- According to Dr. Barkley, which type of nonpharmacological intervention has been shown to help ADHD in adults with promise for use in older teens? (LO #3)
 - a. Mindfulness-based cognitive therapy (MBCT)
 - b. Cognitive behavioral therapy (CBT) that targets executive functioning
 - c. Dialectical behavior therapy (DBT)
 - d. Functional analytic psychotherapy (FAP)
- A 2019 study suggests the importance of focusing on broader ranges of outcomes, or domains, in addition to usual symptoms. Two examples of these outcomes include functioning and physical health. (LO #1)
 - a. True
 - b. False
- According to a 2019 study, how did incarceration risk compare between males and females with ADHD who received active treatment with stimulants? (LO #4)
 - a. Incarceration risk dropped by 30% for both males and females
 - b. Incarceration risk dropped by 20% for females but did not drop significantly for males
 - c. Incarceration risk dropped by 30% for males and 20% for females
 - d. Incarceration risk dropped by 40% for males but did not drop significantly for females
- Which reading intervention is a methodology characterized by highly structured lessons that follow a specific phonics-based scope and sequence? (LO #2)
 - a. Fast ForWord
 - b. Orton-Gillingham
 - c. Arrowsmith
 - d. Lindamood-Bell
- In a 2019 study on methylphenidate for children under 18 with ADHD, which side effect was most common? (LO #4)
 - a. Decreased appetite
 - b. Insomnia
 - c. Agitation
 - d. Headache
- According to Dr. Hallowell, exercises such as _____ that help with balance and coordination may improve symptoms in patients with ADHD. (LO #3)
 - a. Weight training
 - b. Sprinting
 - c. Long-distance running
 - d. Skiing
- According to a 2019 study examining depression trials, improvements in depression were most often measured by youth self-reporting outcomes. (LO #1)
 - a. True
 - b. False
- In order for children and adolescents to improve in areas such as reading, the Arrowsmith program recommends following a timeframe of: (LO #2)
 - a. 2 days a week for 6 months
 - b. 3 days a week for 1 year
 - c. 4 days a week for 2 years
 - d. 5 days a week for 3–4 years
- According to studies, what is the relationship between ADHD and the development of Parkinson's disease? (LO #3)
 - a. There is no relationship between ADHD and the development of Parkinson's disease
 - b. People with ADHD are between 0.5 and 1 times more likely to develop Parkinson's disease
 - c. People with ADHD are between 2 and 4 times more likely to develop Parkinson's disease
 - d. People with ADHD are between 5 and 6 times more likely to develop Parkinson's disease
- A 2017 study showed reading-related improvements in children and adolescents using the Lindamood-Bell "Seeing Stars" program. One of the limitations of this study, however, was the following: (LO #2)
 - a. No control for comorbidity of other learning-related or neurological issues
 - b. Low sample size
 - c. Exclusion of children between ages 6 and 10 with ADHD
 - d. No control for improvements due to the attention and follow-up provided by the program (the Hawthorne effect)
- A 2019 study on methylphenidate dosing strategies for children under 18 with ADHD showed that most studies listed maximum doses higher than common guidelines. (LO #4)
 - a. True
 - b. False

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This Issue:
**ADHD in Children
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Jan/Feb/March 2020

Next Issue:
**Psychosis in Children
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April/May/June 2020

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Note From the Editor-in-Chief

It is hard to put into words what it was like talking with Russ Barkley and Ned Hallowell for this issue on ADHD. I thought I'd be getting a solid summary and update of great behavioral techniques from Dr. Barkley. But he did not rest on those laurels, instead blowing open a transformative view of the magnitude of ADHD's impact on our patients. Dr. Hallowell, true to form, spoke of love and relationships and finding the right life partner. I hope that when you read these two interviews, you will experience my joy at spending time with these masters in the field. And of course, there's more to this quarterly issue...

We live daily with the conundrum of fitting people into diagnostic criteria vs opting to focus on target symptoms. In this issue, we sort through that problem. How many of us really understand dyslexia? We were wondering about the legitimacy of reading programs and decided to investigate. Rounding things out, we look at research on whether stimulant medications can reduce the risk of criminal behavior, and finally, we take a look at maximal dosing of methylphenidate. I loved putting out this issue, and as always, I welcome your comments and questions.

Regards,
Josh Feder, MD
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