Medicating Children: The Enduring Controversy over ADHD and Pediatric Stimulant Pharmacotherapy

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Attention Deficit Hyperactivity Disorder (ADHD) holds the distinction of being both the most extensively studied pediatric mental disorder and one of the most controversial. This is partly due to the fact that it is also the most commonly diagnosed mental disorder among minors. On average, one in every ten to 15 children in the U.S. has been diagnosed with the disorder and one in every 20 to 25 uses a stimulant medication—often Ritalin, Adderall, or Concerta—as treatment. The biggest increase in youth diagnosed with ADHD and prescribed a stimulant drug occurred during the 1990s, when the prevalence of physician visits for stimulant pharmacotherapy increased five-fold. This unprecedented increase in U.S. children using psychotropic medication triggered an intense public debate.

Drs. Mayes, Bagwell, and Erkulwater, University of Richmond, have disclosed that they have no financial interests in any commercial companies pertaining to this editorial content.

Learning objectives (LO) for this issue:
1. Assess the clinical, educational and economic factors that influence the treatment of ADHD.
2. Evaluate the debate over the overuse of medications in children.
3. Describe the ambiguities in classification and diagnosis of ADHD.

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Ironically, neither the debate nor ADHD and stimulants were new. Methylphenidate, more commonly known by the trade name Ritalin, was first introduced in the United States in 1955, and approved by the Food and Drug Administration in 1961 for use in children with severe behavioral problems. Prior to Ritalin, another stimulant (benzedrine) had been tested and used by small numbers of children as early as 1937. As for ADHD, the basic symptoms of the disorder have gone by several different diagnostic labels since the early 1930s: “organic drivenness,” “minimal brain damage,” “hyperkinetic impulse disorder,” “minimal brain dysfunction,” “hypermoticism,” “hyperactive child syndrome,” and “attention deficit disorder.” Even the core of the controversy, children using physician-prescribed psychoactive drugs, dates back almost four decades. Nevertheless, negative publicity over the “drugging of problematic children” in the early 1970s—together with another negative media blitz and a wave of lawsuits against physicians, school personnel and the American Psychiatric Association in the late 1980s—greatly reduced the prevalence of ADHD diagnoses and pharmacotherapy compared with current rates. When the 1990s began, most schools across the country had only a handful of (if any) children diagnosed with ADHD and using stimulants. By 2000, most every classroom in the United States had, on average, at least one to two such students treated for the disorder. Currently, almost 8% of youth aged 4 to 17 years have a diagnosis of ADHD, and approximately 4.5% have the diagnosis and are taking medication for the disorder.

The massive increase in the number of U.S. children diagnosed with ADHD and using stimulants stemmed primarily from a confluence of trends (clinical, economic, educational, political), an alignment of incentives (among clinicians, educators, policy makers, health insurers, the pharmaceutical industry), and the sizeable growth in scientific knowledge about ADHD and stimulants that converged in the first half of the 1990s. Growing political movements advocating for children’s welfare and mental health consumers, along with the decreasing stigma associated with mental disorders, led to three seemingly minor policy changes in the early 1990s—to a federal income support program (Supplemental Security Income, SSI), a federal special education program (Individuals with Disabilities Education Act, IDEA), and a joint federal-state public health insurance program (Medicaid)—that helped trigger the surge in ADHD diagnoses and related stimulant use.

ADHD and stimulant use have been and remain controversial, in part because most children are diagnosed and medicated as the result of decisions made by their parents and clinicians. In short, the treatment is ordinarily decided for them instead of by them, a scenario that invites criticism that a patient’s autonomy is being compromised to some extent. Yet many medical decisions involving children are made this way and are not controversial. Mental disorders such as ADHD, however, are different. They are regularly diagnosed based mainly, if not solely, on the presence of behavioral symptoms—inattentiveness, hyperactivity, and impulsiveness—that are common—this despite the fact that the DSM-IV outlines a far more extensive and rigorous approach to making a proper diagnosis of ADHD than relying exclusively on rating an individual’s symptoms. The key difference is one of degree. Children with ADHD are significantly more inattentive, impulsive, distractible, and/or fidgety than their peers, such that their symptoms cause major personal impairment and interfere with daily human functioning.

At the same time, mental disorders usually involve matters of degree, so why has ADHD been more controversial than other mental disorders? One of the main reasons has to due with the disorder’s dominant educational aspect. The majority of ADHD diagnoses originate with the observations of a child’s...
teacher, and many of the disorder’s symptoms—rated on behavioral scales—require teacher reports to make a diagnosis. The child

“often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities,”

“often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace,”

“often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort [such as school work or homework],”

“often leaves seat in classroom or in other situations in which remaining seated is expected,”

“often blurts out answers before instructions and fails to finish other activities,”

“All of the above”

The child is whatever is considered “normal” childhood behavior. The United States, for example, consumes the majority of the world’s production of stimulants with school-age children using as much as three times more psychiatric medication than children in the rest of the world combined. In some European countries, only a child psychiatrist can prescribe stimulants by many children who do not have pre dorsal schedule II drugs, which are underused with serious personal and public health consequences.

This more complicated and nuanced reality of both over- and under-use of stimulants is rarely presented in the popular press, but it reflects two key factors. First, while a valid (real, genuine) disorder, ADHD is also—similar to many mental disorders—one that primary care physicians often diagnose in a less than strictly thorough manner due to the intense economic and time constraints they face, as well as to their training (or lack thereof) in the area of mental disorders.

The Core of the Controversy over ADHD and Stimulants

It seems virtually impossible to give a presentation on or even just talk about ADHD and stimulants without being asked if the drugs are overused in the United States. We assume that many readers of this paper will have the same curiosity. The answer is “yes” and “no.” In some geographic areas and among specific childhood populations, ADHD appears to be over-diagnosed and the drugs overused. However, several of the same research findings that identify this overuse also identify areas and populations in which ADHD is very likely underdiagnosed and the drugs underused with serious personal and public health consequences.

This reality is important, because primary care physicians make the majority of ADHD diagnoses and stimulant drug prescriptions. In addition, it is not clear to clinicians, researchers or the general public if ADHD is primarily a medical disorder, a behavioral problem manifesting primarily in schools, a mental illness, or an evolutionary disorder of human adaptation. It is also not self-evident how hyper, inattentive, and/or impulsive a child has to be to warrant a diagnosis, because the benchmark of comparison for diagnosing a child is whatever is considered “normal” for his or her peer age-group.

The ambiguity over ADHD’s classification, and the manner in which it is regularly diagnosed, contributes to significant variation in diagnostic and treatment styles by clinicians: prevalence rates for the disorder range from as low as 2% to as high as 18% in different communities across the United States.

This variation results in a serious mismatch between the need for and provision of pharmacotherapy, with both “under-treatment” of ADHD and the “over-use” of stimulants by many children who do not meet full ADHD diagnostic criteria (as well as some children who exhibit no symptoms of ADHD at all).

The second factor that fuels the debate is that stimulants are heavily regulated Schedule II drugs, which are effective in helping individuals with or
Without ADHD. In other words, they enhance most individuals' ability to sustain their level of concentration. This is not the way the public understands medical interventions to operate. The general view of medicines is that they treat people with a chronic or acute episode of illness or a disorder, but that they would either have no effect or possibly be harmful to someone who did not have an illness or a disorder. Consequently, when stimulants help those with ADHD and enhance the performance of individuals without the disorder, they often invite skepticism about the appropriateness of stimulant use by millions of children.

Even as scientific understanding of ADHD advances, it is hard to imagine the social and political controversy over ADHD abating. As a diagnosis and form of treatment, ADHD and stimulant pharmacotherapy illustrate both the success that science is capable of producing—when applied to the study of mental disorders—and its limitations. Researchers have made tremendous progress over the last three decades in increasing our understanding of ADHD, but when it comes to diagnosing most mental disorders our system is still far behind other branches of medicine, notes E. Jane Costello, a professor of psychiatry and behavioral sciences at Duke University. "On an individual level, for many parents and families, the experience can be a disaster; we must say that." For these families, the search for a diagnosis is best seen as a process of trial and error that may not end with a definitive answer. If a family can find some combination of treatments that help a child improve, Costello adds, "then the diagnosis may not matter much at all." ADHD is more straightforward and easier to diagnose in children than, for example, bipolar disorder or autism. Yet, as previously noted, diagnosing ADHD still relies on some combination of interviews with children (who often do not exhibit symptoms in a clinician's office or are reluctant or unable to talk about themselves the way an adult would), behavioral checklists, less-than-precise rating scales (that measure the existence and severity of ADHD symptoms along the lines of "never," "occasionally," "often," "very often"), and reports from teachers and parents.

### Clinical Uncertainty and Boundary Drawing

Ultimately, then, diagnosing and treating ADHD is still partially an art, despite the fact that the science applied to it has improved dramatically in recent decades. At the heart of the controversy over ADHD were questions of boundary drawing. Children exhibit symptoms of inattentiveness, hyperactivity, and impulsiveness along a continuum. Despite the fact that scientific research can inform our choices, where the boundary between ADHD and typical childhood behavior is located is ultimately a political and social choice, not a scientific one. No amount of clinical research, therefore, can resolve this question for us. Moreover, to the extent that the boundary between sickness and health is, in the case of mental disorders such as ADHD, demarcated without the ability to reference objective clinical signs or indicators of illness, debates about underdiagnosis or overdiagnosis invariably tap into society's ambivalence about mental disorders. The DSM was designed to identify children with the severest symptoms, those with the lowest levels of functional ability. Yet the DSM is not applied in a vacuum: Social, political, and economic forces impinge on where healthcare financing arrangements and the attitudes of teachers and physicians toward their children's ADHD. In addition, critics like Peter Breggin and Phyllis Schlafly write for a broad audience with colorful anecdotes and pithy phrases, and they publish their work in places that are easily accessible to the general public. Meanwhile, most researchers write for an expert audience in specialized journals and in language filled with clinical and scientific jargon that lay readers might find difficult to comprehend. As a result, even with the advances in our understanding of the nature of ADHD and especially in our knowledge of effective treatments brought about by extensive research (including the Multimodal Treatment Study of Children with ADHD and numerous carefully designed medication trials), parents often have easier access to the vocal, and sometimes extreme, views of critics of stimulant treatment via the Internet and news re-
ports than to the research published in scientific journals. It is little surprise, then, that despite the growth of scientific knowledge of ADHD and stimulants, parents are swayed by the extremists and unsure about which treatment to pursue; the misinformation that fills the public debate over ADHD only serves to heighten parents' fear that they will choose the wrong path. Thus, even if parents decide to medicate their child, it is a decision that can be fraught with guilt and anxiety. Although other mental disorders are difficult to diagnose with accuracy, although rates of childhood depression and other disorders are also on the rise, and although the growing pediatric use of psychotropic drugs is not limited to stimulants, no other disorder touches upon so many vexing social and political questions, a situation that amplifies the ambivalence that parents feel about medicating their children.

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References


(continued on page 9)
Efficacy of bupropion SR and individual counseling as smoking cessation treatments was assessed in a randomized, placebo-controlled clinical trial among adult daily smokers. Intent-to-treat analyses indicated that bupropion SR increased abstinence rates at the end of treatment. Bupropion SR treatment also improved latency to lapse and relapse in survival analyses. Counseling was not associated with increases in the likelihood of abstinence at any time point.


**Effect of Genetic Polymorphisms**

Even though bupropion is a first line pharmacological agent for smoking cessation, not all smokers successfully quit smoking by using bupropion. It means other factors such as genetic predisposition could contribute to the therapeutic outcome.

**Objectives:** The aim of this study is to elucidate the question of whether abstinence rates in a bupropion trial would be different depending on genotypes.

Six candidate genes, thought to be involved in the interaction of nicotine and bupropion (for example, the dopamine receptor type 2, dopamine transporter, norepinephrine transporter, serotonin transporter, catecholamine-O-methyltransferase) and the clinical outcomes of smoking behavior were investigated. The participants were 225 male smokers to whom 150mg of bupropion SR was administered for 4 weeks.

**Main Results:** (1) the frequencies of A1/A2 genotype of the dopamine receptor type 2 TaqI A gene and the SLC6A3-9 genotype of the dopamine transporter1 gene were higher in the non-abstinence group than in the abstinence group. The frequencies of COMTH/COMTH and A/G genotypes of the norepinephrine transporter gene were higher in the abstinence group than in non-abstinence group. (2) Participants having specific genotypes such as homozygotes (A1/A1 or A2/A2) of DRD2 TaqI A, COMTH/COMTH, AG of NET-8 and LL of 5-HTTLPR showed higher abstinence rate than other participants.

**Conclusions:** It can be concluded that genetic diversity might determine the effects of bupropion on smoking cessation.


**Medicating Children (continued from page 5)**