

President's Commission on Bioethics

Staff Background Paper¹

Human Flourishing, Performance Enhancement, and Ritalin

The ADD-Ritalin issue reveals something about the kind of society we are at the turn of the millennium -- for no country besides America is experiencing such a rise in Ritalin use. It throws a spotlight on some of our most sensitive issues: what kind of parents we are, what kind of schools we have, what kind of health care is available to us. It brings into question our cultural standards for behavior, performance and punishment; it reaches into the workplace, the courts and the halls of Congress. It highlights the most basic psychological aspects of nature versus nurture, and it raises fundamental philosophical questions about the nature of free will and responsibility.

Lawrence Diller, M.D., *Running on Ritalin* (1998)

Introduction

Ritalin and other stimulants have been extensively used to treat children diagnosed with Attention-Deficit Disorder (ADD) and Attention-Deficit/Hyperactivity Disorder (ADHD). Their use in the U.S. over the last twenty years has grown enormously. In addition, their stimulant effects have made these drugs attractive for other "non-therapeutic" uses - to pacify troublesome youngsters; to enhance performance - and there is growing concern among parents and the public. Books on the subject have been written from a wide variety of perspectives (1), and the matter has been the topic of Congressional hearings and debate.

According to child psychiatrist Lawrence Diller, M.D., Ritalin can be considered a "universal performance enhancer." "It helps anyone, child or adult, ADHD or not, to perform better" (2). By reducing fatigue and distraction and increasing endurance and concentration, Ritalin appears to help almost anyone perform better (in some sense of the word) in almost any activity, physical or mental. There are reports that many prep-school and college students are taking it before

¹ *This staff background paper was discussed at the Council's December 2002 meeting. It was prepared by staff solely to aid discussion, and does not represent the official views of the Council or of the United States Government.*

writing papers or tests (3). Some adults reportedly use it instead of afternoon naps, and professionals use it to steady themselves in charged situations.

Stimulants like Ritalin and amphetamine are chemical substances that increase blood pressure and make people less sleepy. They bind to the dopamine transporter protein in the brain and thus affect dopamine action on multiple brain systems. The physiological effects and abuse potential of Ritalin depend on the dose and the route of administration. Up to 20 mg of Ritalin taken repeatedly as a pill by mouth up to three times a day does not appear to lead to physical addiction. However, Ritalin can be an addictive drug if one mashes up the pill, dissolves it in water, and injects it directly into the bloodstream, or if one snorts the dry powder. Presumably the pill-by-mouth route leads to lower blood and brain concentrations of the drug and slower waxing and waning of its effects than intravenous administration.

The uses of Ritalin and other stimulants raise questions about the ethically appropriate uses of powerful substances that affect the human brain, mind and thus human behavior. In young children, even their prescribed use raises deep issues about the nature of childhood and parenting. Because stimulants also enhance adult performance, their spreading use also raises ethical and social issues about competition and performance. By taking this topic up in the context of the Council's "enhancement" project, we view it not in isolation, but as an example of dual-use drugs that treat disease, but can also be used for non-therapeutic purposes.

Background on ADHD

Children exhibit considerable variation in the amount and intensity of their spontaneous activities. Some are quiet and "dreamy" while others are boisterous and rambunctious. At the far ends of the distribution curve are children whose spontaneous activity goes so far beyond the norm, that they are labeled "impulsive" or "hyperactive", or who are so easily distracted that they are labeled "inattentive".

The standard reference for diagnosis of psychiatric disorders in the U.S. is the *Diagnostic and Statistical Manual of Mental Disorders*, now in its fourth edition (DSM-IV). A psychiatrist determining whether a hyperactive child was suffering from a hyperactivity or attention disorder would consult the diagnostic criteria in DSM-IV (see Appendix 1). The DSM-IV diagnosis of ADHD is based upon the presence, frequency, and severity of multiple symptoms of inattention and hyperactivity/impulsivity that have persisted for at least six months. As can be seen from the multiplicity of symptoms and the subjectivity of their rating, a diagnosis of ADHD is always a matter of judgment.

ADHD is believed to be a complex condition brought about by interaction between genetic susceptibility and environmental factors. Recent studies have shown that genetic factors contribute substantially, "with most estimates of heritability exceeding 0.70" (4). A recent study has located a major susceptibility locus for ADHD on a specific portion of chromosome 16 (5). Environmental risk factors include traumatic brain injury, stroke, severe early emotional deprivation,

familial psychosocial adversity and maternal smoking during pregnancy. It seems likely that the group of children who are currently diagnosed as having ADHD is heterogeneous, and consists of some individuals with specific biological correlates of their disorder (such as the recent finding that the brains of some ADHD children were 3 to 4 percent smaller than a non-ADHD control group) (6), and other individuals with an as yet unidentified combination of genetic susceptibility genes (such as the one on chromosome 16) and environmental risk factors. Given the subjective elements in diagnosing ADHD, this heterogeneous ADHD group may include borderline individuals who wouldn't require drug treatment in a different home setting or a less crowded classroom.

According to Castellanos and Tannock in a recent review article (4), "ADHD is conservatively estimated to occur in 3.0 to 7.5 percent of school-age children (7), but more permissive criteria yield estimates of up to 17 percent (8), and up to 20 percent of boys in some school systems receive psychostimulants for the treatment of ADHD (9). Despite the absence of controlled studies in pre-school-age children, and concern about potential long-term adverse effects (10), stimulant medications are increasingly being administered to children as young as two years of age (11)."

Ritalin in the Treatment of ADHD

The stimulant medications used to treat ADHD are primarily methylphenidate (Ritalin) and amphetamine (under the trade name Adderall). Multiple controlled studies over at least 30 years have demonstrated that these drugs effectively reduce symptoms of ADHD in a large majority of those treated. Minor side effects appear to consist primarily of transient loss of appetite, rare weight loss, and insomnia if the Ritalin is taken too close to bedtime. Thus, critical questions about stimulant use in children with ADHD have more to do with who should get the drug and its long-term safety, rather than its effectiveness.

One concern is that mildly inattentive or hyperactive - or merely unruly - children are being inappropriately treated with Ritalin or amphetamine. The diagnosis of ADHD and prescription of stimulants to treat it are currently affecting millions of American schoolchildren. In elementary schools across the country, parents and children are talking with teachers, and with each other, about their ADHD diagnoses and demanding their entitlements, while teachers are telling parents of difficult-to-manage children to get psychiatric examinations for ADHD and treatment with Ritalin. Groups of children visit the school nurse for their Ritalin as part of their daily routine. Others take the only dose they need in the morning. Ritalin has thus entered the practice of schooling and the culture into which our youngest citizens are inducted.

How did this happen? American doctors have prescribed Ritalin to children with behavior problems, including hyperactivity, for over thirty years. Controversy about such prescriptions began at least as early as 1975. However, in 1990, Congress passed the Individuals with Disabilities Education Act (IDEA), which mandates special education and related services for eligible children. Children with a diagnosis of ADD or ADHD are eligible for special educational services if

they need special education and related services because of that disability. Compared to other alternatives, according to Lawrence Diller, "savvy parents prefer to win IDEA eligibility for their child; it offers a wider range of options, access to special-education classrooms and programs that are guaranteed funding, and stricter procedural safeguards. (12)"

Ethical Context and Questions: Children

Since young children are major recipients of Ritalin, the primary human contexts for assessing its significance are the character of childhood and the nature of responsible parenting. What is human flourishing for the very young and how might it be affected by widespread Ritalin use? Answers to these questions in turn touch issues of preparing oneself for a flourishing adulthood and of raising children responsibly.

Ritalin appears to act at that most mysterious and morally crucial of junctures, between mind, brain, will and behavior. Its effect on children, at the level of ordinary experience, is to reduce "bad"-inattentive, immoderate, wild, and sometimes pathological-behavior among young people, particularly young boys. It does so by working directly on the brain, following a medical diagnosis of ADHD that implies or claims the presence of a malfunction in the child's brain. If impulse control is the behavioral product of combining an impulse-to-do and the will-to-restrain, one can then imagine Ritalin as acting to reduce impulse-to-do rather than to strengthen the will-to-restrain.

In contrast, the traditional tools of teaching young children "good" and "bad" behavior, involves praise and blame from parents and teachers. These can be seen as strengthening the will, which slowly increases the child's ability to control his or her impulses.

A central moral question about treating hyperactive children with Ritalin is now apparent: Is it desirable to substitute the language and methods of medicine for the language and methods of morals? This is a troubling example of "medicalization", made acute because it has to do with young children. Whatever a diagnosis of ADHD might ultimately mean biologically and philosophically, its day-to-day social meaning is clear: "It's Nobody's Fault" was the title of one best-selling book about ADHD in the 1990s. As one high school teacher told Council staff, "Students approach you and tell you they have ADHD, and the message is that this is like not being able to bend a broken finger- it's physical-and therefore they should be accommodated in whatever ways they tell you."

The method of morals assumes that children can learn to control their impulses, that they have or can develop moral responsibility. Without the potential for self-control, the moral method would be wrong-headed: it would neither be effective, nor fair to children with "broken minds." So the truth or falseness of the medical claim matters: Is having ADHD like having a broken finger that can't bend, or could at least some of the children with the diagnosis control themselves if they tried and had social support in the effort? That is, is Ritalin going to children whose behavior is subject to their will? Is Ritalin, in some cases, a "quick and easy" substitute for the slower and more difficult process of developing impulse

control through strengthening the child's will?

It is likely that the behavior of at least some children taking Ritalin for ADHD is not subject to their will. Both the will and the impulses it seeks to control are manifestations of brain function; there is no reason to think that the relevant brain mechanisms cannot be broken in some children. For them, Ritalin is therapeutic medicine. The question concerns those children whose behavior is difficult to control, whose will is weak or impulses are strong, who might need an unusual degree of support and correction, but who could learn to control their impulses. Does psychiatric practice as it stands give them Ritalin? Should it?

Apart from the medical case, what does use of Ritalin and amphetamine teach drug users and their peers about themselves? What does it lead children to become? Do they fail to learn self-control? Do they learn that self-control isn't necessary? Do they see themselves as weak and afflicted? Do they see themselves as excused for bad behavior or poor performance while off-Ritalin, or excused while on it? Our phrase "take responsibility" implies that full moral agency isn't something one simply has, but something one takes, perhaps by growing up. Do children who have taken Ritalin for years develop moral autonomy and responsibility?

Raising children with Ritalin brings up ethical issues besides medicalization, including the following:

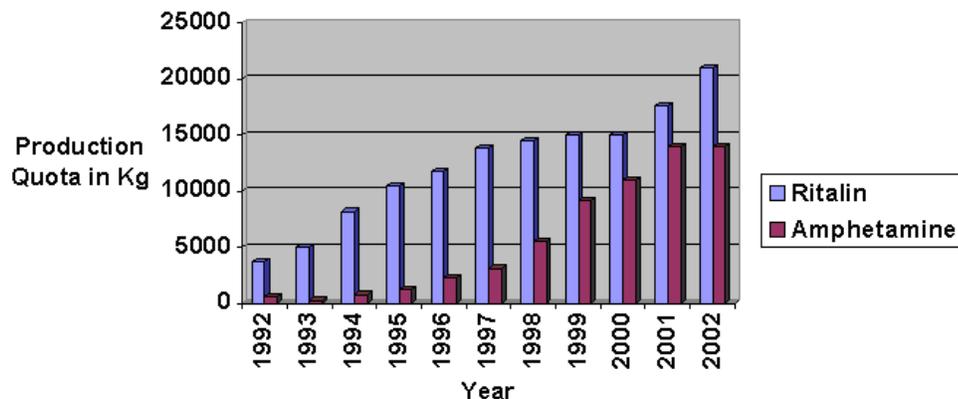
- *Social Control.* Has Ritalin become a way to manage crowded classrooms and noisy homes in addition to treating ADHD children?
- *Spiritedness and Childhood.* Childhood is and ought to be marked by spiritedness. Does Ritalin sap it?
- *Good Social Roles.* Should doctors use their craft for purposes of social control? Should teachers pressure parents to medicate their children? Should parents use ADHD diagnoses and Ritalin to win their children competitive advantages?
- *Good Societal Structures.* Is government policy encouraging the over-prescription of Ritalin? Are pharmaceutical companies pushing the drug in unethical ways?
- *Safety.* In more than 30 years of clinical testing and widespread use, Ritalin seems not to pose significant acute safety or addictiveness problems when administered properly. However, the effects of daily Ritalin use for years in childhood on health and flourishing in midlife and old age are not yet known. Recent experiments in which Ritalin was given continuously to young rats have shown sustained changes in brain levels of critical proteins, even after Ritalin is discontinued (10).

- We should also better evaluate the addiction potential and long-term hazards of snorting Ritalin. Even with proper administration, what is the potential for psychological, as opposed to purely physical, addiction?ⁱ
- Should Ritalin be prescribed now for children younger than 6 years old? Controlled trials to evaluate the safety and efficacy of Ritalin in "inattentive" and "hyperactive" children between ages 3 and 5 are now underway, but will not be completed until 2004. Current Ritalin prescriptions for this very young age group constitute an "off-label" use of a drug whose safety and efficacy in this age group are not yet evaluated, and whose long term effects in very young patients will not be known for many years.

- **Increasing Production and Use of Ritalin and Amphetamine**

Because of its abuse potential when injected, Ritalin is a controlled substance, listed on Schedule II by the U.S. Drug Enforcement Administration (DEA). For controlled substances used in medicine, the DEA establishes annual production quotas for manufacturing these drugs for domestic medical use. Records of annual Ritalin production quotas are available as a gauge of the amount of Ritalin currently being prescribed and consumed in the U.S. As shown in Figure 1, the annual production quotas for Ritalin almost tripled between 1992 (3708 kg) and 1995 (10410 kg) and doubled again between 1995 and 2002 (20967 kg). The 2002 quota of 20967 kg is sufficient to produce a little over one billion Ritalin pills containing 20 mg of methylphenidate. As shown in Figure 1, the DEA production quota for amphetamine also increased sharply during 1996-2002.

Figure 1: DEA Production Quotas for Ritalin and Amphetamine in U.S. (1992-2002)



- With millions of children diagnosed with ADHD, and large amounts of Ritalin

and amphetamine being prescribed to treat them, it is not surprising that some of these drugs are being resold or given to others for non-therapeutic use.ⁱⁱ Young children taking a Ritalin pill for ADHD are likely to be supervised by parents and teachers. Non-therapeutic use of under-the-counter Ritalin by older students and adults is not medically supervised and is open to abusing the drugs and becoming physically or psychologically addicted. The annual DEA production quota offers a simple lever in public policy. Yet that very simplicity could lead to unwanted consequences. If Ritalin production were reduced, there is no assurance that the children who needed it would still get it, or that the children who (presumably) did not need it would cease to get it.

Ethical Context and Questions: Adults

The use of Ritalin and other stimulants by adults raises a different set of ethical questions related to their capacity as "universal performance enhancers." Three concerns come immediately to mind. In a competitive society, where people "get ahead" on the basis of their performance on tests of various kinds, one ethical concern is that use of Ritalin by some to improve their performance is "unfair" to others who can't or won't obtain Ritalin under-the-counter. Perhaps we should have a free Ritalin pill supply at the door as students file into the testing room, so that all who wished to take it could do so, and we would know it was being properly administered. Even if the fairness issue were addressed by making Ritalin widely available, do we want a society more competitive than ours already is? Do we want a society where a non-medicated person can't compete successfully? The second concern comes from the suspicion that the results of a test in which performance is enhanced by taking Ritalin might be valid only for the "on-Ritalin" state of that person's brain and mind. What should we conclude about that person's mental abilities in situations where Ritalin is not available? Widespread Ritalin use undercuts the current assumption that such test results measure abilities that a person could always display. Finally, adult ingestion of a Ritalin pill for "performance enhancement" constitutes non-medical use of a controlled substance that is obtained under-the-counter without a prescription or by "off-label" use. Should there be tighter limits on "off-label" prescriptions for stimulants? What does the spreading adult use of Ritalin and amphetamine teach young people regarding use of such drugs? Would it not be more difficult for a parent who used Ritalin in this way to explain why it was morally wrong for his or her child to obtain methamphetamine in the same way?

Ritalin, Social Ethics, and the Case for Public Scrutiny

The ethical concerns that Ritalin raises are basically social in nature. Even

the description of current usage conveys the social dimension of the ADHD and Ritalin problem with both children and adults. The issues of medicalization, social control, good social roles, good societal structures, competition, the validity of performance tests, and modeling of drug taking all have sharp social significance. But the point is particularly acute with children. For this reason, behavioral medication of children raises questions beyond those raised for adults. The principle of "freedom to choose" is an insufficient guide. In many other areas of bioethics, any moral misgivings about a practice must, certainly prior to making policy suggestions, be weighed against the freedom we Americans have to do things to and with ourselves despite the moral misgivings of others. But the more such private use has serious social consequences, the more society has a mandate to interfere with individual liberty. Where such socially significant biotechnologies are used on vulnerable subjects, the case for social scrutiny and regulation is stronger still. In the case of young children, what they do is in part what we do to them. Young children are not independent moral agents. Our relationship to them is one of responsibility; our role is to nurture and educate them, in those terms' broadest sense. * * * *Is there a message in this pill? If so, what is the Ritalin boom telling us? Ritalin seems to have become the drug for our day. As competition on every level intensifies, our preoccupations as a culture increasingly center on performance. And our children, whether we realize it or not, have been serving as a proving ground for the premise of medicating to enhance performance. Are we likely to see a time in the not-so-distant future when a large part of America will be running on Ritalin?* Lawrence Diller, M.D., *Running on Ritalin* (1998)

Appendix 1: Diagnosis of ADHD Using DSM-IV Criteria

A. Either (1) or (2):

1. six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

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

often has difficulty sustaining attention in tasks or play activities

often does not seem to listen when spoken to directly

often does not follow through on instructions and fails to finish school- work, chores, or duties in the workplace (not due to

oppositional behavior or failure to understand instructions

often has difficulty organizing tasks and activities

often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)

often loses things necessary for tasks or activities (e.g. toys, school assignments, pencils, books or tools)

is often easily distracted by extraneous stimuli

is often forgetful in daily activities

2. six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least 6 months to a degree that is maladaptive or inconsistent with developmental level:

Hyperactivity

often fidgets with hands or feet or squirms in seat

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

often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings or restlessness)

often has difficulty playing or engaging in leisure activities quietly

is often "on the go" or acts as if "driven by a motor"

often talks excessively

Impulsivity

often blurts out answers before questions have been completed

often has difficulty awaiting turn

often interrupts or intrudes on others (e.g. butts into conversations or games.)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.

C. Some impairment from the symptoms is present in two or more settings

(e.g. at school [or work] or at home.

D. There must be clear evidence of clinically significant impairment in social, academic or occupational functioning.

E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, or a Personality Disorder).

References

Reference 3 contains the following student report: "I know a girl in the freshman class who actually stole a script pad from the health center and faked her own prescription,' Green said. 'She's an unbelievably smart girl, got a 1600 on her SAT, but is convinced that she needs to snort Ritalin in order to do all her work.'"

The amount of Ritalin used may start to change as a consequence of the November 2002 approval by the FDA of atomoxetine (trade name Strattera), the first medicine useful in treatment of ADHD that is not a stimulant.

- See, among many others:
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- Reference 1, page 149