

Children with ADHD

Medical vs. Chiropractic Perspective and Theory

BY NATALIYA V. SCHETCHIKOVA, PhD

Drug abuse is a horrifying subject for many American parents. But it has a special meaning for the parents of about 8 million children who are labeled with attention deficit hyperactivity disorder, or ADHD. Government officials, schoolteachers and medical doctors say that if the children do not take Ritalin now, they will “self-medicate” with illegal substances later in life.^{1,2} But many parents are worried because Ritalin itself is an addictive substance that produces pharmacological effects similar to those of cocaine and amphetamine,³ and their children may have to take it all their lives, gradually increasing the dosage.

Ritalin is the No. 1 physicians’ choice for ADHD treatment. The troubling fact is that in the past decade, doctors have seen a massive increase in Ritalin prescriptions, says Robert Melillo, DC, DACBN, whose multidisciplinary clinic specializes in treatment of neurological disorders. “From 1990 to 2000, worldwide use of Ritalin increased five-fold, and 90 percent of it is consumed in the U.S. When I learned this, my first reaction was that doctors are over-prescribing the drug, that this is the latest fad, and that pharmaceutical companies are pushing the medication.”

But when Dr. Melillo started interviewing schoolteachers, he learned the situation is more complicated: “Teachers told me that all children are now more impulsive, have shorter attention spans and more language problems, and demand quick gratification.” More objectively, a comparison of the standardized fourth-grade tests of the ‘60s and ‘80s showed the tests have become easier, which should predict better grades. But the opposite is true.

Typical Diagnostic Scenario

When a child’s behavior or academic performance starts troubling teachers, they usually make the preliminary ADHD diagnosis and report it to the parents. The parents take the child to a general practitioner or a pediatrician who makes the final diagnosis and prescribes a stimulant medication, typically Ritalin. The problem with this scenario is that the people involved shouldn’t be making the diagnosis. “Before placing a child on medications and pinning him or her with a diagnosis of ADHD, first get a second opinion from a healthcare professional that specializes in this disorder, such as a psychiatrist, psychologist, or doctor specializing in neurology and/or in ADHD specifically,” says Toni Ward, DC, DACBN, a former instructor of clinical nutrition at the Southern California University of Healthcare Sciences.

But even for a qualified specialist, ADHD is not always easy to diagnose. ADHD belongs to a spectrum of neurological disorders with no known physiological basis, says Dr. Melillo. “The spectrum goes from attention deficit disorder (ADD) and attention deficit hyperactivity disorder (ADHD) through learning disabilities, obsessive-compulsive disorder (OCD), and Tourette’s syndrome, to pervasive developmental disorders and autism. The neurological mechanisms involved in all the disorders are very similar. Besides, there is increased co-morbidity, which means that, for example, 50 percent of the ADHD patients will have OCD, and 50 percent of patients with Tourette’s syndrome will have ADHD.” Early-onset mania or bipolar mixed state may be particularly difficult to distinguish from ADHD, or may be co-morbid.⁴

On the other hand, some children may be at the high end of the normal range of activity, or have difficult

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brain are underfunctioning. It may be the cerebellum, the frontal lobes, or the right or left hemisphere,” Dr. Smith says. “Underfunctioning may be caused by two factors—the level of stimulation of the brain or the biochemical substrates to the brain. It means that some children have difficulty gathering and/or processing the information from the environment, some have biochemical problems, and some have both,” he explains.

In view of the individuality of each patient’s ADHD mechanism, different disorder subtypes, co-morbid conditions, and functional deficits, the treatment, too, should be individual. “The severity of presentation of the symptoms will also vary, so the treatment that benefits one patient may not help another,” says Dr. Carrick.

Medical Diagnosis and Treatment

The traditional medical model, however, seems to follow the cookie-cutter principle. The very diagnosis of ADHD is based on the questionnaire laid out in the DSM-IV⁵ or other diagnostic manuals. If the child’s parents or teachers identify as positive six out of nine criteria for inattention, or six out of nine criteria for hyperactivity and impulsivity, the child leaves the doctor’s office with a drug prescription and a new personality label. The patient is basically at the mercy of the medical doctor’s clinical experience—and 60 percent of doctors agree that there aren’t enough properly qualified ADHD diagnosticians.⁶

The medical treatment also reflects the “one size fits all” approach. Out of the three most commonly used medications for ADHD, Ritalin, or methylphenidate (MPH), is prescribed for more than 70 percent of patients.⁷ Although in many patients the disorder may result from the lack of brain stimulation, the medical profession leans toward developing the biochemical theory of ADHD—hence, the use of medications that affect the level of dopamine in the brain.

Dopamine is the main neurotransmitter in the “pleasure center” of the brain—a network of nerve cells that motivates much of human behavior. The pleasure center reinforces people’s drives to eat, drink, and procreate and is responsible for addiction. For example, when a person tastes ice cream, the sensors of the tongue signal the brain that it feels something, and neurons fire in the presynaptic terminal—the taste center of the brain. Dopamine is released into the synapse from the presynaptic terminal (the giving neuron), and the receiving neuron (the postsynapse) takes it up. The receiving neuron, in turn, sends the signal to another neuron by the same process. Through this

complicated network of signaling, the brain lets the person know that an experience is pleasurable and is worth paying attention to.

Dopamine is recycled by dopamine transporters—proteins that are embedded in the presynaptic terminal membrane. When molecules of dopamine are floating around in the synapse, any that come in contact with the transporters are sucked back into the presynaptic neuron. A recent study⁸ showed that ADHD patients have more dopamine transporters than people without the disorder. This means that dopamine is not given enough time to reach the postsynapse and instead is taken back into the presynaptic terminal. As a result, an inadequate number of dopamine molecules reach the postsynapse and the neuron won’t send the reinforcing signal. MPH is called a reuptake inhibitor. It blocks dopamine transporters and allows dopamine to reach the postsynapse and create a signal,⁹ improving children’s ability to focus.

Effects and Side Effects

But Ritalin is not a cure for ADHD. The medication neither corrects the disorder nor addresses the patient’s individual problems. Eighty percent of hyperactive children have ADHD features in adolescence, and up to 65 percent maintain them in adulthood.⁴ Medications merely control the symptoms of hyperactivity/impulsivity and even aggression, and allow children to concentrate better.¹⁰ Studies, conducted mostly on 6- to 12-year-old children, show a 70 to 96 percent response to stimulant treatment, while the placebo response rate is 11 percent.¹¹

Effects associated with moderate doses of stimulants are decreased appetite and insomnia. Negative effects on growth rate are possible, but ultimate height appears not to be affected.¹ Very high doses of psychostimulants, particularly of amphetamines, may cause central nervous system damage, cardiovascular damage, hypertension, compulsive behaviors, and, in certain vulnerable individuals, movement disorders. A rare percentage of children and adults treated at high doses have hallucinogenic responses. An animal study of Ritalin has produced a “weak signal” that the drug may potentially cause cancer.¹² Other drugs used for ADHD have their own adverse reactions: tricyclic antidepressants may induce cardiac arrhythmias, bupropion at high doses can cause seizures, and pemo-line (Cylert) is associated with liver damage.¹⁵

MPH cardiovascular effects include mild tachycardia and blood pressure increase. Based on a report of sudden death in one child treated simultaneously with clonidine, the American Heart Association recom-

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mends a cardiovascular evaluation by a pediatric cardiologist before initiation of stimulant therapy.¹⁴

Stimulant therapy is not recommended in patients with a history of tics or Tourette's disorder, the presence of a thought disorder, significant resistance to such medications in the patient or family, or insufficient severity of the symptoms or dysfunction.¹⁵

Ritalin and Substance Abuse

Ritalin's chemical properties cause the most serious concerns about its use. MPH is a schedule II narcotic that belongs in the amphetamine family of stimulants and is regulated by the Drug Enforcement Agency (DEA) as a controlled substance.³ Chronic exposure to stimulants during development may change the way the brain reacts to environmental challenges, including stressful events and pharmacological agents. Another concern is that long-term stimulant administration in children may alter the way the brain reacts to further exposure to stimulants or other drugs with potential for abuse.¹⁶

A recent study¹⁷ showed that MPH is not a weak stimulant, as had been thought, but is a more potent transporter

inhibitor than cocaine. A typical dose given to children—0.5mg/kg—blocked 70 percent of dopamine transporters, while cocaine blocks only 50 percent. People who took MPH displayed high levels of extracellular dopamine—just as people using cocaine did.⁹ The only difference between the MPH and the cocaine effect on the brain is in the way it is administered: MPH taken orally raises

dopamine in about an hour, whereas inhaled or injected cocaine hits the brain in seconds. Researchers speculate that the speed at which dopamine is increased is a key to the addiction process.⁹

In 1999, approximately 9 million Americans used prescription drugs for non-medical purposes—to get high, to have fun, to get a lift, or to calm down.¹⁸ Ritalin abuse has been reported among middle and high school students. Some used it to suppress appetite or to stay awake while

studying. The DEA lists Ritalin as a “drug of concern” and reports that some abusers have dissolved the tablets in water and injected the mixture, which can block small blood vessels and damage the lungs and retina of the eye.¹⁸

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Government resources for the general public declare that, when taken as prescribed, Ritalin is not addictive.¹⁹ The main problem is, there are no data on dosage response, and different children's dosage needs vary.¹⁰ Dosage prescription, consequently, is guesswork. The common practice is, "Start low, gradually move the dose up until you have reached maximal efficacy and/or run into side effects that are problematic, and then back off a bit."¹⁰ Another problem is, the average physician gets little training in identifying drug abuse and may not recognize the warning signs.²⁰

A common tactic promoting the use of stimulants states that if a child with ADHD is not taking medication, he or she will "self-medicate" with illicit drugs later in life.²¹ This theory has not been confirmed by research. No fully experimental studies (e.g., parallel groups with random assignment, etc.) have been done in this area to date.⁷ The only two large epidemiological studies on the topic conflict. One reports more drug addiction in children with ADHD who took MPH, compared with children with ADHD who took no drug;²² the other shows the opposite results.²³ A major limitation of the research in the area is the inability to independently examine the use of stimulant medication, the diagnosis and severity of ADHD, and the effect of coexisting conditions.¹⁵ Some sources note, however, that it's not the nature of ADHD itself, but the children's social impairment,²⁴ or difficulties adjusting in society, that places them in the higher risk category for conduct problems, including substance abuse.¹⁶ Consequently, the risk can be reduced by helping the child build social skills.

Increased Ritalin Use and Research Needs

Despite all the controversy surrounding its use, Ritalin prescriptions have dramatically increased in the past decade. During 1990-1993, ADHD outpatient visits increased from 1.6 to 4.2 million per year, while production of MPH in the United States rose from 1,784 to 5,110 kg. More than 10 million MPH prescriptions were written in 1996.⁷ Without uniform agreement on diagnosis and treatment of the disorder, however, current programs are handled in a hit-or-miss fashion. One survey in four different communities found that only one-eighth of diagnosed ADHD children were being treated with stimulants,²⁵ while another survey in rural North Carolina found one-third of the school-age children on stimulants did not meet diagnostic criteria for ADHD.²⁶

A survey of Canadian doctors showed that 39 percent of doctors who treated ADHD felt pressured to prescribe MPH by teachers and 16 percent felt pressured by parents. The majority of physicians agreed that

other factors responsible for the increased use of MPH are heightened public awareness of ADHD and its treatments, a general increase in acceptance of medication as a treatment for ADHD, and a lack of resources for other interventions.⁶

Although stimulants have been given to children for years and are considered the most widely researched medications children take, medical experts admit that the following areas have not been adequately studied:

1. Treatment of ADHD, inattentive type, which may include a large percentage of females.⁷

2. Stimulant treatment of preschool children.

Despite a warning in the MPH package insert against use in preschoolers, and reports of higher rates of adverse events in this age group, over 500,000 MPH prescriptions were written for preschoolers in 1998,⁷ including two-year-old children.¹¹ These numbers are especially disturbing because the ADHD criteria of hyperactivity, impulsivity, and inattention laid out in the DSM-IV are common daily behaviors of most preschool-aged children.¹¹ Because MPH acts primarily via the dopamine transporter protein, which undergoes active development during the preschool years, increased prescribing for these children is of great concern.⁷

3. Safety information on sustained, long-term stimulant treatment (lasting longer than 14 months, even though current practice is to maintain drug treatment in children for years).⁷ Medications remain the first-line treatment, despite a lack of adequate evidence of long-term academic and functional improvements using this intervention.²⁷

4. Tailoring treatments to children and outcomes.

There is no research on the advantages of one stimulant medication over others. Doctors need an effective and comprehensive prescribing plan based on the characteristics of the child and family and tailored in terms of type, intensity, and frequency that would include relating treatments to specific behaviors or components of ADHD, rather than the whole symptom complex.²⁸

5. Treatment of ADHD in conjunction with coexisting conditions, including anxiety, depression, oppositional defiant disorder, conduct disorder, and learning disabilities; how the conditions affect the effectiveness and safety of treatments.²⁸

6. Development and evaluation of new treatments.

Treatments that have more lasting and curative effects are needed. Many children do not respond to stimulant medications, or suffer severe side effects. Well-designed rigorous studies of currently promoted but less well-established therapies such as occupational therapy, biofeedback, herbs, vitamins, and food supplements are needed. These interventions are not currently supported by evidence-based studies.²⁸

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7. Epidemiology and etiology. Research on the etiology of ADHD (i.e., its biological and socioenvironmental causes) and its possible prevention is lacking.²⁸

Chiropractic Neurological Approach

The medical treatment model seems especially limited in view of the recent discoveries in neurology. The 1990s—the so-called “Brain decade”—gave scientists insight into how the neurological system works, says Dr. Smith. “Brains are not static entities. The brain grows—it has plasticity, which is the basis of the ability to learn. If you stimulate the brain, it will cause plastic changes.”

This theory has laid the foundation for chiropractic neurologists who, unlike other neurology specialists, treat patients without medications or surgery.

“Chiropractic neurologists are trained to identify the hypo-functioning part of the brain and apply correct treatment modalities to stimulate brain growth through plasticity,” says Dr. Smith. “As chiropractors, we identify subluxations and different sensory stimuli that specifically affect the deficient hemisphere and thus help normalize brain function.”

Patient examination is one of the most important steps in the process, Dr. Carrick explains: “On every patient, we perform a comprehensive history and brain function exam to identify what environmental stimuli may cause changes in brain function. We use various high-tech, but low-cost, diagnostic techniques that are very accurate and non-invasive. We test reflexes, such as visual and auditory, through optokinetic testing, and infrared photography of the eye.”

In all the spectrum of neurological conditions, similar areas of the brain stem are affected, yet children show different symptoms, says Dr. Melillo. “Detecting which hemisphere is not developing quickly enough is the key. For example, the right-brain areas are responsible for the ability to focus attention, visual-spatial orientation, reading comprehension, and social non-verbal communication. The left hemisphere controls verbal communication,” he says. If the tests show that one side of the brain is less efficient than the other, the doctor stimulates the hemisphere by evoking environmental potential: light, sound, heat, cold, or mechanical stimulation, such as exercise or adjustment of certain body regions. “Then we will replicate the diagnostic criteria and see if there is a change,” explains Dr. Carrick.

The identification of the underfunctioning hemisphere and the monitoring of the patient’s response to the stimuli are especially important. Our hemispheres are connected to opposite sides of our bodies, i.e., the left hemisphere controls the right side of the body. “Only stimulation of the side of the body opposite to the hemisphere with the decreased brain development will improve brain function,” says Dr. Melillo. “Manipulation on both sides will cause no change, but stimulation of the same side of the body as the hypo-functioning hemisphere will worsen the symptoms—by increasing the function of the more developed hemisphere and creating more of an imbalance.”

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Moreover, chiropractic neurological treatment modalities are often chosen depending on which hemisphere is less efficient, explains Dr. Melillo. “We use different frequencies of light and sound because the right brain responds to low frequencies and the left brain responds to higher frequency stimulation. For example, the sense of smell affects the right side, especially in boys, through the orbital frontal cortex. We also apply

somatosensory stimulation, vibration, muscle stretches, and work with Tens units.”

Chiropractic neurologists closely focus on the individual functional difficulties their ADHD patients have, Dr. Smith says. “Some children have a sequencing problem—problems with planning, organization, and coordination—so they can benefit from timing therapies. They learn to clap or tap to the metronome—with the hand or foot that goes to the deficient hemisphere. Spinning and balancing exercises are very effective—as well as adjustments. We may also use visual-motor exercises—targeting (such as throwing darts at a board, coordination exercises), and cognitive tasks (such as crossword puzzles or mazes).”

The key to quick rehabilitation is frequent stimulation for a short time, says Dr. Melillo, so patients should do some procedures at home. “Sometimes we use special glasses that flash light in either the right or left eye and block the remaining field of vision—or get patients to smell some things throughout the day. Adult patients can use the Tens unit at home—for short periods of time three times a day. But the doctor should always consider how much the patients’ joints and muscles can take so as not to overstimulate them.”

Although currently no studies comparing chiropractic neurological and medical treatment for ADHD are available, the Carrick Institute is compiling the data.

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Children undergoing neurological treatment are given the Wyatt test—an individual achievement test evaluating reading comprehension, math, vocabulary, and reasoning. “We test children before they start the treatment and then every three months,” says Dr. Melillo. “Within the first three months, the children get a two-grade-level increase on average—which is pretty dramatic. With children on medications, the improvement in academic performance is short term, and when they are taken off the medication, the problems come back. Medications don’t affect the underlying problem. Our programs change the brain function and the academic performance.”

ADHD and Chiropractic Theory

Recent studies indicate that the ability to think is the evolutionary development of the ability to move.²⁹ This concept explains the effectiveness of chiropractic neurological treatment with ADHD patients, says Dr. Melillo. “Motor activity—especially development of the postural muscles—is the baseline function of brain activity. Anything affecting postural muscles will consequently influence brain development. If you improve either the movement or the cognitive ability,

you will improve the opposite. Musculoskeletal imbalance will create imbalance of brain activity, and one part of the brain will develop faster than the other.”

This theory explains the effects of adjustments that DCs have observed for years. “We have long known that one adjustment can affect many functions,” says Dr. Melillo, “because adjustment changes the brain function—and, depending on the individual, affects different symptoms in the body, for example, the ability to hear. Our hearing is controlled by the brain, not by the ear—so through adjustments, we are affecting the brain’s ability to process auditory information.”

But the effectiveness of chiropractic with ADHD children needs to be confirmed by research studies, says Dr. Fallon. “From clinical practice, we know that if patients with ADHD—especially the ones with sensory integration issues—do not receive chiropractic care, they miss a big part of the treatment plan. Chiropractic care is consistent with physiology, and adjustments can help greatly. Besides, doctors of chiropractic spend more time with kids, see them in a different context, and may identify those who receive unnecessary medical treatment.”

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The success of chiropractic treatment is not only in the drugless treatment modalities, but in the holistic approach to treatment. “The medical treatment model is based on the diagnosis, i.e., the name that is given to the patient’s condition,” says Julie Bjornson, DC, secretary of the ACA Council on Neurology. “After that, the name is treated, not the patient. But DCs enhance the function of the body by removing the interference to the body’s natural self-healing capabilities expressed through the nervous system.”

Many neurological conditions, and ADHD in particular, are truly displaying the premise of chiropractic—subluxation. Subluxation can include imbalance of muscle tone that causes nerve irritability, which leads to inefficient nervous system function and agitation.⁵⁰ Depending on the severity of any subluxations and on how much the children are shut down sensorially, the children may be ADHD, dyslexic, or autistic, says Bobby Doscher, DC, president and CEO of Oklahaven Children’s Center. “I can see it even in babies. If infants can’t lift the head up, or cry on the stomach and back, there may be head misalignments. I also see if babies can latch on to nurse, suck, swallow, and breathe rhythmically. If 2- to 8-month-old infants can’t turn the head in the direction of the sound they hear, it’s also a problem.”

Chiropractic patient assessment not only aims at subluxation detection, but also identifies patients’ individual symptoms. “Symptomatology must be globally evaluated,” says Dr. Doscher. “Reading problems at the age of 6 or 8 mean disorganization of the body, and a lack of communication between the two body sides. Check the vision and see if there is any divergence. Children may have auditory problems—when they can’t perceive the sounds, localize them, or are hypersensitive to them. Check the child’s tactility—see if he likes to touch and be touched, or not. If a child can’t creep or crawl and has to roll instead, it’s a sign. Is the language clear? Is the child clumsy? Has trouble dressing? Put the child on the belly and see if he can lift the head up, look in both directions, do the army crawl, and lift the opposite arm and leg.”

In addition to the physical exam, the doctor needs to address the chemical and emotional issues, says Dr. Barnes. “You need to have the patient’s blood chemistry and stool analysis to check for food sensitivities. Address the emotional issues the child may have. All those aspects are important because you can adjust the child all day long, but then he goes back to the family environment and the problems come back. Art therapy is effective. Instead of talking to the child, give him a piece of paper and pencil and ask him to draw his family or a picture of how he feels.”

Chiropractic can help ADHD children with sensory integration problems. “ADHD children are often irritated by the tags on their clothes. They may not like the texture and coarseness of certain foods.

Chiropractic adjustments—together with tactile programs, such as exercises with a fine brush or a feather—help reduce their sensitivity,” says Dr. Doscher. Reducing sensitivity means better attention spans, as children will not be distracted by the factors that used to irritate them, explains Dr. Fallon.

Another Piece of the Puzzle— Learning Disabilities

Learning disabilities are closely connected to sensory integration issues. For a child to be able to learn at school, “the senses of the body need to be examined and trained to their highest potential,” explains William A. Hurst, OD, a world-class learning specialist who has been practicing developmental optometry for 60 years. “Of all the senses, vision is most important. Many other aspects of vision—and not just the ability to see—determine if the child will read, write, or do math.”

Contrary to common belief, parents shouldn’t feel that if the child has 20/20 vision, there is no ground for concern, says Dr. Hurst. “The 20/20 chart—the chart that

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is placed at 20 feet—tests only the ability to see things on the blackboard. Most of the academic work, however, is done at the distance of 6 to 7 inches, and may even be as close as 4 to 5 inches, so the 20/20 chart doesn't evaluate the child's ability to learn. Vision examination professionals should consider using 6- to 7-inch charts and also evaluating the vision at the near-point distance the child works at in school."

Besides, Dr. Hurst explains, vision examination should include testing the eyes turning up, down, left, and right, as well as the movements of both eyes together—for example, by asking the child to hold a pencil, gradually moving it closer to the nose and then away—or by observing how the eye reads across the page or jumps to another letter. "Clarity of vision, eye movement, and focus should be trained individually to achieve proper coordination," says Dr. Hurst.

Other senses are just another piece of the puzzle. Hearing should be trained and coordinated with vision and touch. Children should learn to tell shapes with their eyes closed by touching a circle, a square, a triangle, etc. Phonics training helps coordinate sounds with the letters of the alphabet. The senses of smell and taste can also assist the child in learning to read if there is difficulty. "You can put substances with different smells on each letter—or have the alphabet made from different foods—and let the child smell or taste it," Dr. Hurst says. "With this training, children almost immediately overcome the learning disability."

The importance of the ability to learn in a person can't be overestimated. An unpublished study conducted on 2,700 juvenile delinquents in San Bernardino Juvenile Hall by Drs. Stan Koseno and Blanche Brandt showed that up to 95 percent of the youngsters had an undiagnosed, previously untreated visual perception problem, which resulted in reading problems in school.³¹ After 24 therapy sessions spread over 12 weeks, they achieved a marked improvement in eye muscle coordination. Their IQ test scores went up by about five points, their reading grade levels improved from those of fifth-grade students to high school level, and, according to specialists in the San Bernardino probation department, their general behavior has improved.³¹ ▼

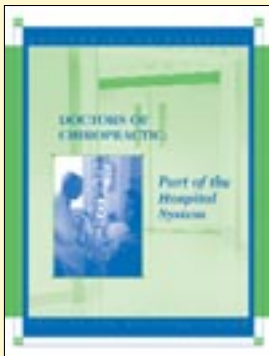
Next Month—the Nutrition Factor, ADHD Causes and Parents' Responsibility

The author is very grateful to Anthony Rosner, PhD, FCER Director of Research and Education and John Boal, MA Experimental Neuropsychology, George Mason University Research Associate at Naval Medical Research Center for their expertise and contributions.

References

1. Attention Deficit Hyperactivity Disorder (ADHD) - Questions and Answers. National Institute of Mental Health. April 19, 2000. <http://www.nimh.nih.gov/publicat/adhdqa.cfm>
2. Stocker S. Medications Reduce Incidence of Substance Abuse Among ADHD Patients. National Institute on Drug Abuse. NIDA

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Notes. *Research News*, Volume 14, Number 4 (November, 1999).

http://165.112.78.61/NIDA_Notes/NNVol14N4/ADHD.html

3. *Methylphenidate (Ritalin®)*. U.S. Department of Justice. Drug Enforcement Administration. <http://www.usdoj.gov/dea/concern/ritalin.htm>

4. *Summary of the Practice Parameters for the Assessment and Treatment of Children, Adolescents, and Adults with Attention-Deficit/Hyperactivity Disorder*: American Academy of Child and Adolescent Psychiatry, March 22, 1997. <http://www.aacap.org/clinical/adhdsum.htm>

5. *American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. Washington, DC, American Psychiatric Press, 1994.

<http://www.behavenet.com/capsules/disorders/adhd.htm>

6. *Survey of Attention Deficit Hyperactivity Disorder (ADHD) Diagnosis and Treatment with Methylphenidate among Canadian Physicians*. Final Report. Factor Research Group. August 20, 1999. http://www.bc-sc.gc.ca/hpb-dgps/therapeut/files/english/publicat/adhd_survey_e.html

7. Greenhill LL. *ADHD: A Public Health Perspective Conference*. <http://www.edc.gov/ncbdd/adhd/dadabtre.htm>

8. Dougherty DD, Bonab AA, Spencer TJ, Rauch SL, Madras BK, Fischman AJ. Dopamine transporter density in patients with attention deficit hyperactivity disorder. *Lancet*, 1999; 354:2152-2155

9. Vastag B. Pay Attention: Ritalin Acts Much Like Cocaine. *JAMA*, Aug. 22/29, 2001 — Vol. 286, No. 8. <http://www.jama.ama-assn.org/issues/286n8/ffp/jmn0822.pdf>

10. *Pediatric Subcommittee of the Anti-Infective Drugs Advisory Committee*. Department of Health and Human Services. Food and Drug Administration. Center for Drug Evaluation and Research. Sept. 11, 2000.

www.fda.gov/obrms/dockets/ac/00/transcript/5641tl.pdf

11. Connor DF. *Preschool Attention Deficit Hyperactivity Disorder: A Review of Prevalence, Diagnosis, Neurobiology, and Stimulant Treatment*. *Developmental and Behavioral Pediatrics*. Vol. 25, No. 1S. February 2002.

12. *Ritalin Studies. Answers*. Food and Drug Administration. Jan. 12, 1996.

<http://www.fda.gov/bbs/topics/ANSWERS/ANS00705.html>

13. *Diagnosis and Treatment of Attention Deficit Hyperactivity Disorder: NIH Consensus Statement Draft*.

<http://my.webmd.com/content/article/1680.50285>

14. Gutgesell H. *AHA scientific statement: cardiovascular monitoring of children and adolescents receiving psychotropic drugs*.

(American Heart Assn.) *Journal of the American Academy of Child and Adolescent Psychiatry*, August, 1999.

15. Wiener J. Is Ritalin Overprescribed?—No. *American Council on Science and Health*. <http://www.acsh.org/publications/priorities/0805/pno.html>

16. *Long-Term Effects of Stimulant Medications on the Brain: Possible Relevance to the Treatment of ADHD*. Dec. 1-2, 1999 Workshop. <http://www.nimh.nih.gov/events/adhdworkshop.cfm>

17. Volkow ND, Wang G, Fowler JS, Logan J, Gerasimov M, Laynard L, Ding Y, Gattley SJ, Gifford A, Franceschi D.

Therapeutic Doses of Oral Methylphenidate Significantly Increase Extracellular Dopamine in the Human Brain. *J Neuroscience*, 2001, 21:RC121:1-5.

18. *Prescription Drug Use and Abuse*. *FDA Consumer magazine*. Sept.-Oct. 2001.

http://www.fda.gov/fdac/features/2001/501_drug.html

19. Farley D. *Attention Disorder: Overcoming the Deficit. Abuse of Attention Deficit Drug Can Be Deadly*. *FDA Consumer*. July-Aug. 1997 http://www.fda.gov/fdac/features/1997/597_adhd.html

20. *Meadows M. Prescription Drug Use and Abuse*. *U.S. Food and Drug Administration*. *FDA Consumer magazine*. Sept.-Oct. 2001. http://www.fda.gov/fdac/features/2001/501_drug.html

21. *ADD, Ritalin, CHADD (CH.A.D.D.) and Ciba-Geigy*. Transcript of a Special Report. PBS and the Merrow Report. October 20, 1995. http://www.add-adhd.org/ritalin_CHADD_A.D.D.html

22. Lambert NM, Hartough CS. *Prospective study of tobacco smoking and substance dependencies among samples of ADHD and non-ADHD participants*. *J Learn Disabil*. 1998;31 (6):535-544.

23. Biederman J, Wilens T, Mick E, Spencer T, Faraone SV. *Pharmacotherapy of ADHD Reduces Risk for Substance Use Disorder*. *Pediatrics*. 1999; 104:e20.

24. Greene RW, Biederman J, Faraone SV, Wilens TE, Mick E, Blier HK. *Further validation of social impairment as a predictor of substance use disorders: findings from a sample of siblings of boys with and without ADHD*. *Clinical and Research Program in Pediatric Psychopharmacology, Massachusetts General Hospital, Boston 02114, USA*. *J Clin Child Psychol* 1999 Sep;28(3):549-54.

25. Jensen P, Kettle L, Roper M, Sloan M, Sloan M, Dulcan M, Hoven C, Bird H, Bauermeister J, & Payne, J. *Are stimulants over-prescribed? Treatment of ADHD in four U.S. communities*. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 797-805, 1999.

26. Angold A & Costello E. (In Press). *Stimulant medication: A general population perspective*: *Psychopharmacology Bulletin*, 1997.

27. Pelham W, Greenhill LL. *Public Health Issues in the Treatment of ADHD Workshop*. June 15, 1999

<http://www.edc.gov/ncbdd/adhd/dadtrat.htm>

28. *Clinical Practice Guideline: Treatment of the School-Aged Child With Attention-Deficit/Hyperactivity Disorder: AMERICAN ACADEMY OF PEDIATRICS*. *Pediatrics*. Vol. 108, No. 4.

October 2001. <http://www.aap.org/policy/s0120.html>

29. Llinás RR. *I of the Vortex: From Neurons to Self*. MIT Press. 2001.

30. Peet J. *Adjusting the hyperactive/ADHD pediatric patient*. *Chiropr Pediatr* 2:12-16, 1997.

31. *Plan to Cut Juvenile Crime—Send Offender to an Eye Doctor*. *The Sunday Star*. Aug. 11, 1985.