Clinical Paediatric Update
Royal Children's Hospital Mebourne
2-3 June 2012

Stimulant medication treatment of ADHD: controversies, concerns and politics

Rick Jarman

Stimulants - effects

- Sustained attention
- Vigilance
- Off task behaviour
- Restlessness
- Motor activity
- Impulsivity
- Noisiness
- Out of seat behaviour
- Compliance with parental commands
- Maternal controlling behaviour
- Peer interaction
- Social standing

Stimulants - effects

- Speed of arithmetic calculation
- Reading comprehension
- Spelling
- Accuracy and reaction times to computerised tasks
- Handwriting

The Nile River

15-10-92

Egypt is called 'The Gift of the Nile'.
The Nile is the longest river in the world. Through the long ages, water flowing and flooding from the mountains ~~[illegible]~~ of Abyssinia have carved out a valley some 20 kilometres wide on their way to the Mediterranean Sea. At the delta the waters [illegible] on either side of the valley i.e. vast flat deserts, fringed by [illegible] and Sandstone mountains. Even today, 99 Egyptians out of every 100 live on the upper [illegible] of Egypt's, [illegible] farming the Nile on the very land where the ancient [illegible] Egypt.

To Egypt, the Nile brought two things — water and soil. The soil, rich and red, was carried down from the African Mountains and [illegible] by the flooding river on a [illegible] [illegible] sand. The [illegible], [illegible] to [illegible] [illegible] [illegible] in [illegible], [illegible] [illegible] [illegible] [illegible].

The [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] to [illegible] [illegible] [illegible], and [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] higher levels. [illegible]

Pure Substances And Mixtures

9-10-92

Properties are the features by which a material can be identified.

All the materials around us are either pure substances or mixtures of substances. Some examples are given in the following table.
The properties of a pure substance are fixed. The particles making up a pure substance are the same all throughout the material for example, sugar is made up of sugar particles, aluminium is made up of aluminium particles. However, sugar particles are different from aluminium particles.

Pure substances have exact melting points and boiling points. Clean water is a pure substance which melts at 0°C and boils at 100°C. Butane, the fuel used in gas cigarette lighter, is a pure substance which melts at −138°C and boils at −0.5°C.
Materials which are made up of different substances are called mixtures. The properties of a mixture can vary. Each part of the mixture keeps its own properties. The amounts of each substance in a mixture can also vary. Air is a mixture of different gases. The gases in the air of a polluted city are different from those in the countryside. Air close to the ground is different from air high up in the atmosphere.

Tuesday 21st March 1995

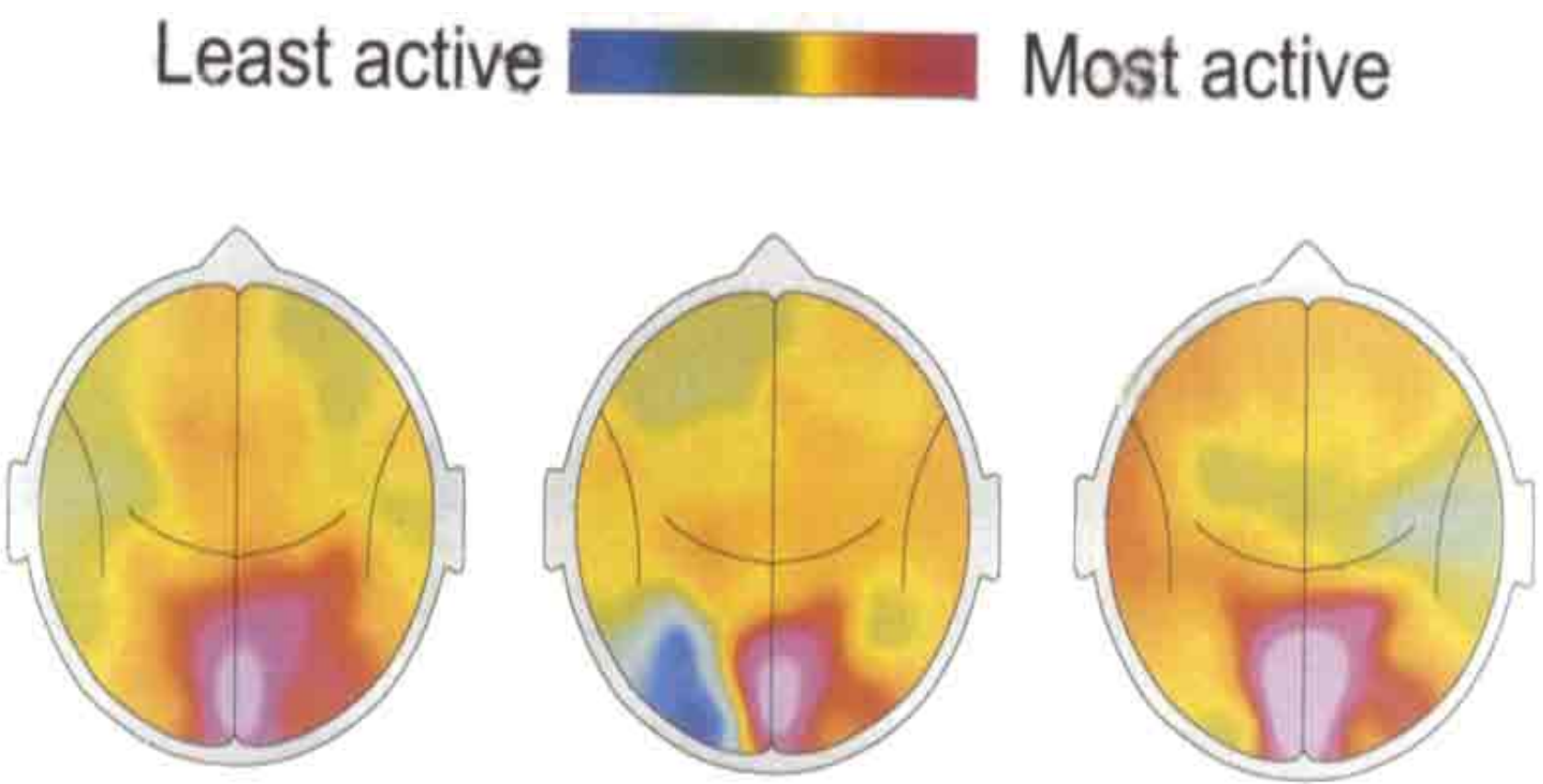
The golden west

Out on the westen diggings
(Fit) That land of sand and gold
Our plucky lads they ventured
Their lives for wealth untold.
Mothers morn for manly sons
And wives for husbands dear.
And daughters moarn for swethearts
theyll never more be near.

Fantastic [illegible]

Tues June 20, 1995 [illegible]

It was [illegible] [illegible] I live in [illegible] on the gold fields. There is not much gold there any more so my family and I are moving to [illegible] to find more gold and hopfully make a fortune

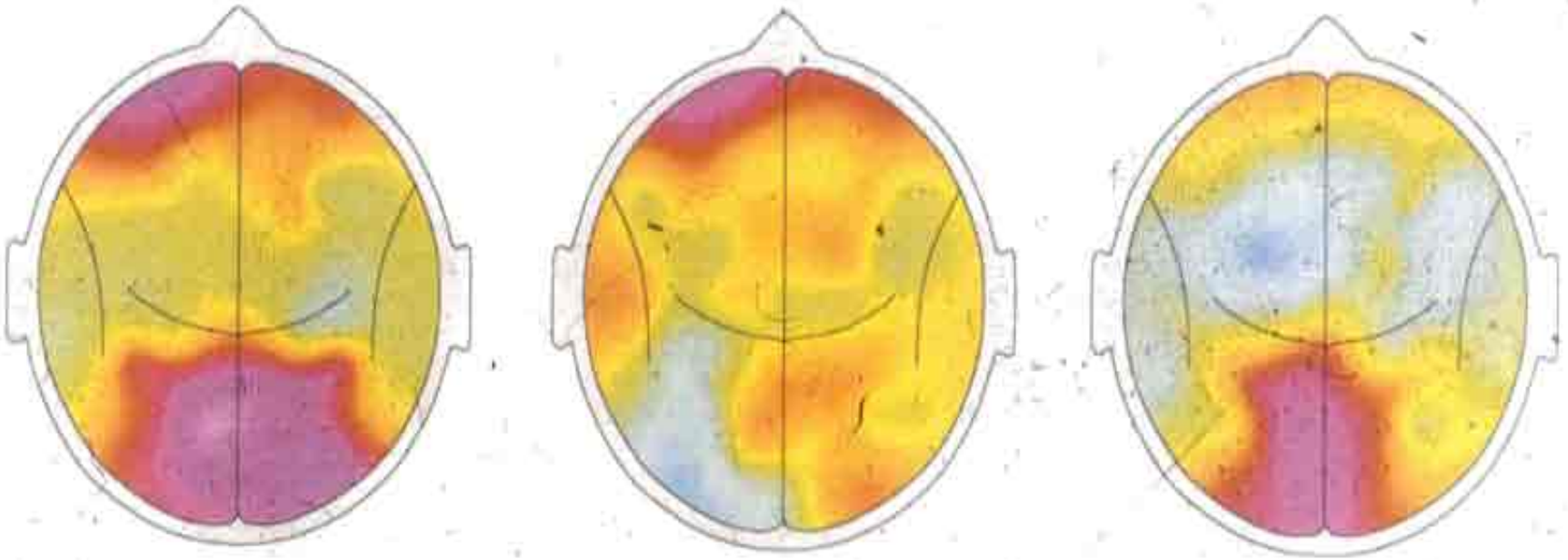


Lachlan Campbell

AX Task

Before medication

Least active Most active

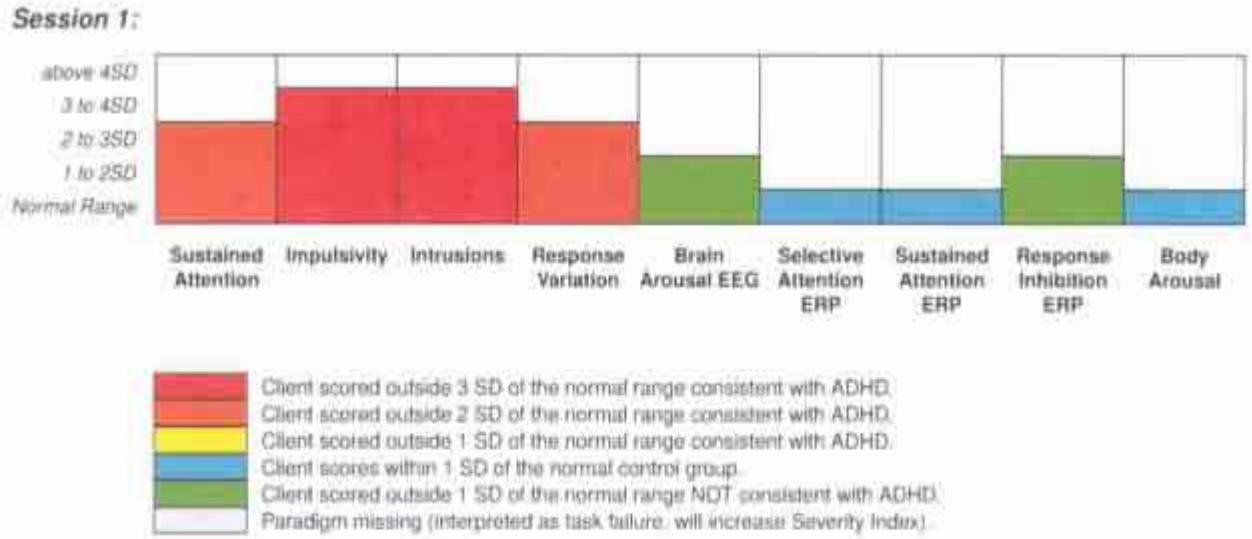


A on A off X on

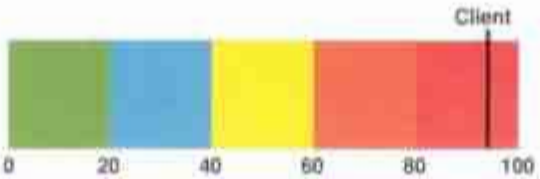
Lachlan Campbell AX Task After medication

1. Summary of ADHD Marker Profile

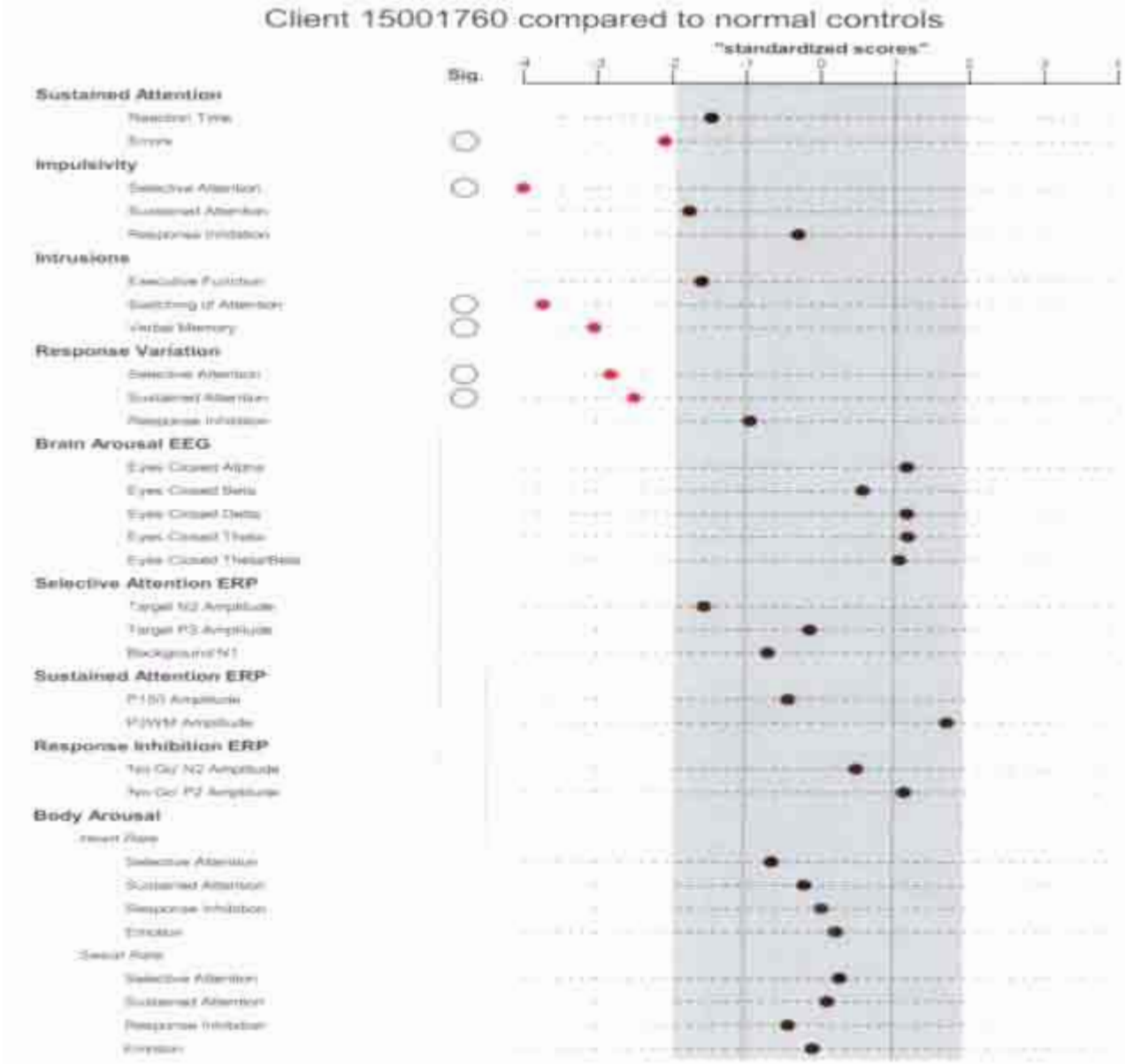
Different individuals have personalized profiles. Nine markers in ADHD have been found to reflect severity (see Appendix 2). The markers are listed below along the horizontal axis. Severity is indicated by the changes in standard deviation (SD) with respect to healthy peers (vertical axis).



Markers (composite scores) revealed by ADHD group findings are combined below to calculate an overall **ADHD Severity Index** for this client (see page Appendix 2 for more details). The higher the Index of the client, the more likely he/she fits an ADHD profile. This client's Index is 94, which means this client's Index is greater than 94% of controls.

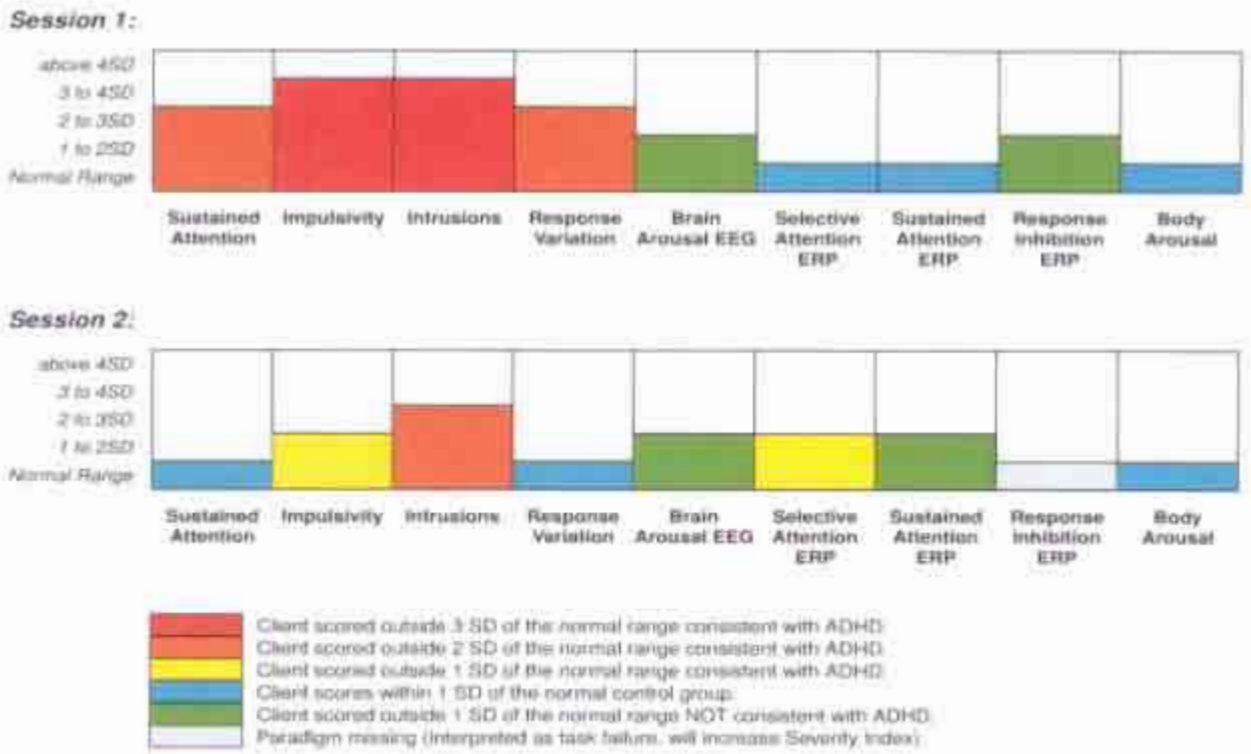


2. ADHD Impairment Details

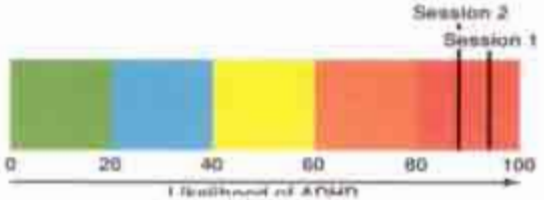


The circles on the left indicate statistically significant differences compared with the normal control. The "standardized scores" on the right are normalized for age, gender and years of education, which means differences from zero reflect differences from "average peer (also known as z-scores). Positive "standardized scores" indicate strengths, negative "standardized scores" indicate potential deficits. "Standardized scores" beyond -2 to +2 are statistically significant. **See Appendix 1 for details of all the cognition raw scores and remarks. See Appendix 2 for description of these scores. See Appendix 3 for visualization of significant findings.**

Different individuals have personalized profiles. Nine markers in ADHD have been found to reflec severity (see Appendix 2). The markers are listed below along the horizontal axis. Severity i indicated by the changes in standard deviation (SD) with respect to healthy peers (vertical axis).

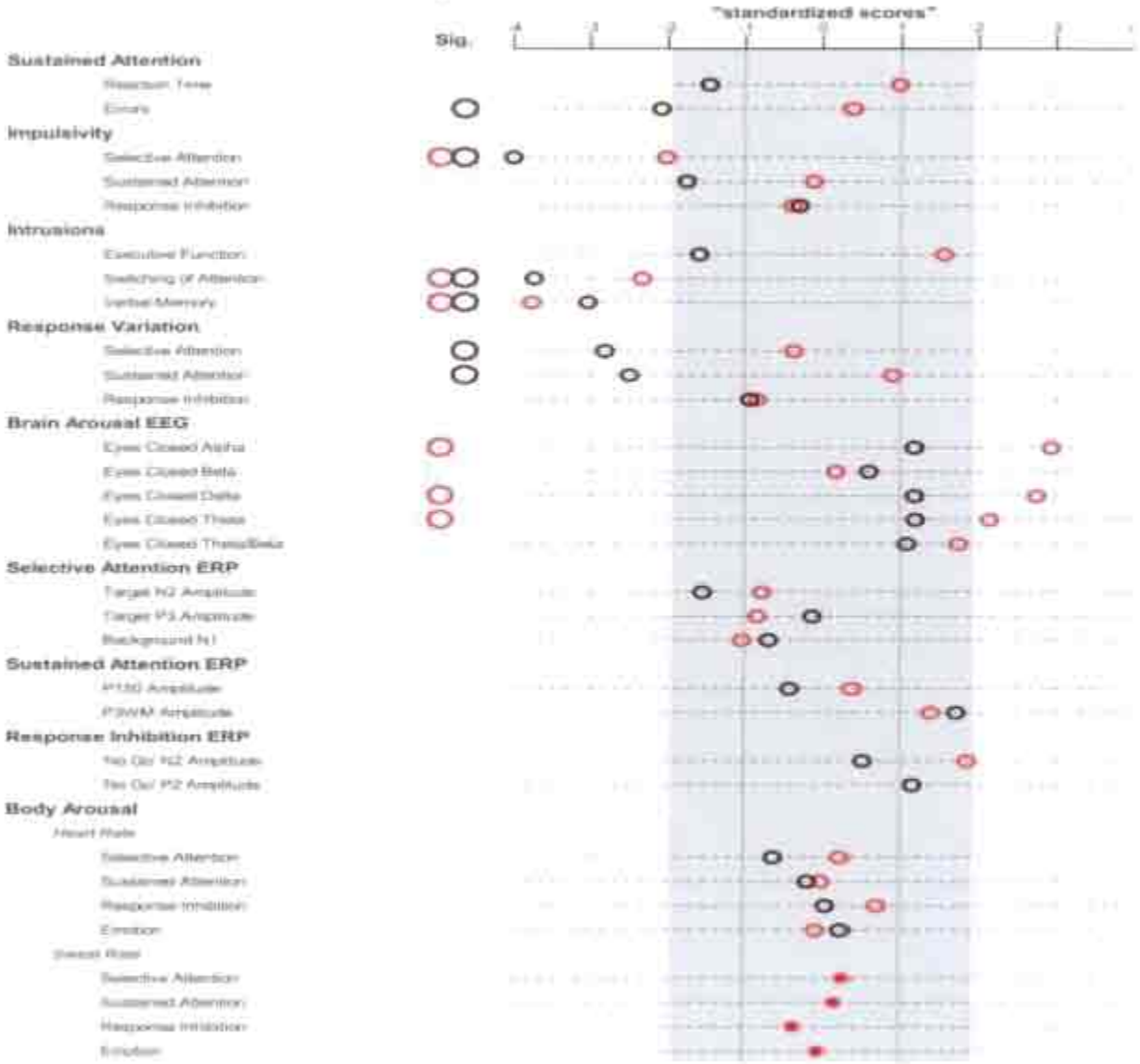


Markers (composite scores) revealed by ADHD group findings are combined below to calculate an overall **ADHD Severity Index** for this client (see page Appendix 2 for more details). The higher the Index of the client, the more likely he/she fits an ADHD profile. This client's Index is 88, which means this client's Index is greater than 88% of controls.



2. ADHD Impairment Details

Client 15001760 - subject repeated & compared to normal controls



The circles within the left column indicate statistically significant differences compared with the normal control. Black circles show the result for session one, and red circles show the result for session two. Solid red circles are shown if the black and red circles overlap. The "standardized scores" on the right are normalized for age, gender and years of education, which means differences from users refle differences from 'average peer' (also known as z-scores). Positive "standardized scores" indicate strengths, negative "standardized scores" indicate potential deficits. "Standardized scores" beyond -2 to +2 are statistically significant. **See Appendix 1 for details of all th**

Context and Disclaimer

Reference: PA 5152 4457
Test Date: 15 May 2006
Report Date: 24 Jul 2006

This report provides indications of brain function and cognition as compared to a control group in the normative database. It is not to be used as a basis for action without consideration by a competent relevant professional. Always seek the advice of a trained health professional or relevant specialist regarding any highlighted variances within this report before any treatment or action is taken.

This report is not intended to diagnose, treat or cure any health condition. It is also not intended to be used in any way on its own.

This report does not establish any physician-patient relationship or supplant any in-person medical consultation or examination. Appropriate medical attention should always be sought for specific ailments. Do not disregard professional medical advice or delay seeking medical treatment as a result of findings contained within this report.

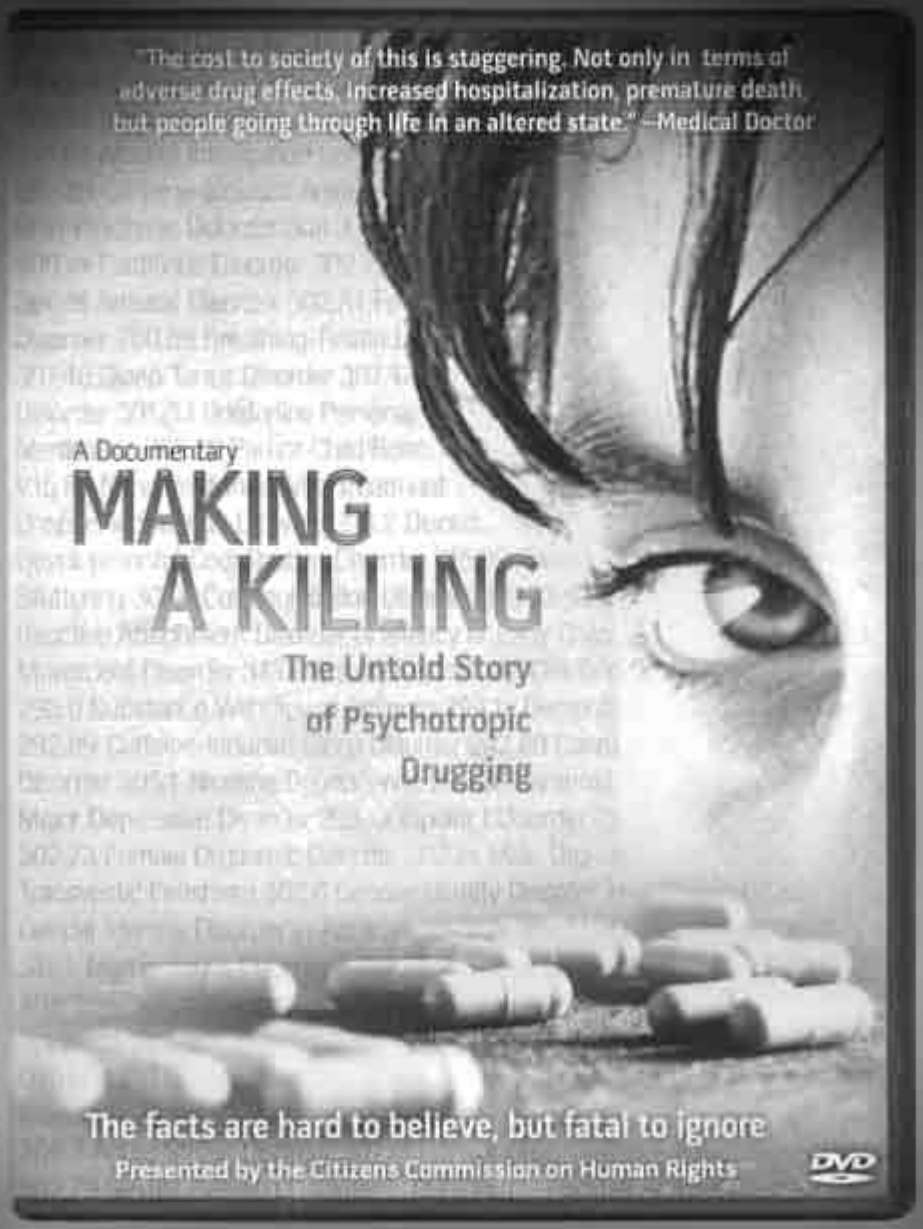
BRC expressly disclaims any and all responsibility for any liability, loss or risk which may be or is incurred as a consequence, directly or indirectly, of any non-specialist use and application of this report.

Stimulants - side effects

- Decreased appetite
- Nausea, abdominal cramps
- Headaches
- Difficulty dropping off to sleep
- Tearfulness
- Anxiousness
- Tics
- Rebound irritability
- No addiction, dependence, long term growth suppression.
- No increased risk of heart attack or stroke

Recommendation 9. During drug treatment for ADHD the patient should be monitored for treatment emergent side effects

- Stimulants
  - Decreased appetite, weight loss, insomnia, headache, emotional lability,
  - Bierderman 2002 no increase in tics c/f placebo
  - Wolraich 2001. ADHD and tic disorders show decline in tics when treated with stimulants, even after 1 year
  - If patient develops tics then alternative stimulant or atomoxetine should be tried
  - Alternative is to continue stimulant and add clonidine
- Atomoxetine
  - GI distress, sedation, decreased appetite, headaches
  - ?suicidal ideation: 12 controlled trials - 1357 ATX vs 851 placebo
    - 4/1357 in ATX, one attempt suicide no completion, 0/851 in placebo.


"The cost to society of this is staggering. Not only in terms of adverse drug effects, increased hospitalization, premature death, but people going through life in an altered state." —Medical Doctor
A Documentary
MAKING A KILLING
The Untold Story of Psychotropic Drugging
The facts are hard to believe, but fatal to ignore
Presented by the Citizens Commission on Human Rights
DVD

Remove the Myth in Ritalin Debate

By Russell A. Barkley

In the past nine months a concerted effort has been made by the Church of Scientology, under its Citizens Commission on Human Rights International, to blanket the country through the news media with highly inaccurate or distorted information on a prevalent childhood disorder and its treatment with medication. These reports often question the validity or existence of this childhood behavior disorder, known as hyperactivity or attention deficit-hyperactivity disorder (ADHD), and its treatment with stimulant medications, such as Ritalin.

Exaggerated, alarming and misleading claims have been made in these reports, resulting in understandable anguish for many parents whose children are being diagnosed with the disorder and prudently treated with these medications. Many parents have ceased using the medication with their children, believing these news accounts to accurately represent the facts about ADHD and stimulant medication, often to the detriment of their children's current behavioral or academic adjustment.

Abundant Literature

The Church of Scientology claims that ADHD is not a mental disorder and has no scientific basis as claimed by the American Psychiatric Association. This is simply not true. The disorder has been studied in more than 3,000 published scientific papers over the past 20 years, making it the most well-studied childhood behavioral disorder currently known. This huge body of scientific literature is consistent in a number of conclusions about the disorder.

ADHD is a disorder characterized by developmentally inappropriate levels of poor sustained attention, impulsiveness, and restlessness or hyperactivity. These behavioral symptoms often arise in early childhood, before age 4, and are almost always evident by 7. This behavioral disorder occurs in approximately 3 percent of the school-age population, frequently in boys more than girls on an average of three to one. The disorder is relatively chronic, with most children continuing to display significant levels of these symptoms into adolescence or even young adulthood. More than 80 percent of these children have additional problems with aggressiveness or oppositional behavior and serious difficulties in interacting with other children. Over 80 percent of these children experience significant underachievement in school, being unable to work up to their known intellectual or academic potential. This is often seen in frequent incompletion of school assignments, disruptive classroom behavior, poor relations with classmates, and generally poor academic grades. Over half of these children have excessively low tolerance for frustration, frequently reacting with anger, distress, or temper outbursts with little provocation.

Most experts in this country view the disorder as having a biological predisposition, often running across generations in families. Nevertheless, the environment in which the child is raised, while not causing the disorder,

Children, medication and adjustment

may contribute to the development and severity of other problems, such as aggression and defiance. Treatment frequently consists of the use of behavior modification techniques, family therapy, special educational services and, in up to a third of the cases, stimulant medication, such as Ritalin, Dexedrine, or Cylert. No treatment is curative, but in combination these treatments can assist ADHD children to being more productive in school, having better family relationships, reducing the teasing and rejection they receive from peers, decreasing the amount of punishment they may receive, and remaining in school longer than they otherwise might have done without treatment.

Singled out by Scientologists for particularly inaccurate, exaggerated and emotionally alarming descriptions have been the side effects of the stimulant medications, such as Ritalin, used to treat some ADHD children. Claims have been made that Ritalin makes children "zombie-like," and serves as a "chemical straitjacket" for slowing children down. The side effects are described as "devastating." Ritalin it is said, is a "highly addictive" and "dangerous" drug, and that its use may result in "the turning of normal, healthy children into drug addicts." Murder, suicide attempts and long-lasting emotional disability have also been attributed to these medications or withdrawal from them.

Such statements are totally unfounded and are easily contradicted by the more than 400 scientific studies conducted on the stimulant medications with ADHD children. This makes Ritalin one of the most well-studied of medications used with children, including frequently used over-the-counter medicines. What these studies consistently show is that Ritalin, used in appropriate therapeutic doses and monitored properly by a physician, results in substantial increases in attention span, impulse control and productivity in school, as well as decreases in hyperactivity and aggressiveness.

No drug, however, is without side effects. Throughout my own federally funded research studies of Ritalin, and the research of many other scientists, careful monitoring of potential side effects has revealed the most common to be mild difficulties falling asleep at night and reduced appetite, especially at noon. Some children may experience irritability and restlessness late in the afternoon as their medication is wearing off but such changes in behavior are often mild and pass within one to two hours. Few traces of Ritalin can be found in the body 12 to 24 hours after its ingestion. Severe withdrawal from it cannot result in overdose, suicides or serious emotional disturbance weeks after it is discontinued, as the Scientologists have claimed.

A few children treated with stimulants may occasionally complain of headaches or stomach aches, but these are quickly resolved by reductions in the dose. Fewer than 2 percent of children on Ritalin develop tics and these are almost always resolved by discontinuing the medication. Growth in children on medication is not typically impaired and, where reduction in growth is noted, often resolves within the first to second year of treatment. Such facts about stimulants are readily apparent to anyone taking the time to read the published scientific literature.

Drug-Abuse Link

Statements have also been made that the increase in the use of Ritalin in this country may be related to increased drug abuse or addiction by children on the medication or by diversion into illegal street sales to substance abusers. This conveniently overlooks two more obvious explanations for the increase in use of the medication. One has been the greater awareness of the public and professionals to the existance of ADHD and earlier detection of such children leading to earlier treatment. The second has been the demonstration that short periods of medication treatment of a few years in childhood does not reduce the risks of later maladjustment in adolescence and adulthood. Maintaining children on their medication longer, as well as on weekends and school holidays for some children, may assist these children to be better adjusted in adolescence and adulthood. Claims that the drug is over-prescribed as a quick fix for children's behavior problems do not agree with research surveys indicating that only a third or less of children diagnosed as ADHD are receiving medication. While there will always be instances of excessive prescribing of any medication, or misapplication to children improperly diagnosed, this is not the widespread practice that church claims have insinuated.

Russell A. Barkley, Ph.D., is director of psychology and professor of psychiatry and neurology at the University of Massachusetts Medical Center.

Boston Globe
July 1989

Parents and Doctors Fear Growing Misuse Of Drug Used to Treat Hyperactive Kids

By Lenda Williams
Staff Reporter of The Wall Street Journal

To many doctors, teachers and parents, Ritalin is a godsend that enables hyperactive children to concentrate and control their impulses so that they can do schoolwork. They say the drug has proved safe and effective in 30 years of use in such situations.

But an increasing number of parents and medical professionals are concerned that, in many cases, the drug is being used as a substitute for more productive ways of helping children whose discipline problems stem from other causes.

Thomas J. Lang, director of Catholic University's National Center for Family Studies and a specialist in the modern-day pressures on children, says he believes Ritalin is frequently prescribed for kids who aren't truly hyperactive but are instead reacting to stress. Those pushed to grow up too fast and take care of themselves too early, he notes, "respond by being aggressive and ineffective." Moreover, some kids who spend a lot of time in day care learn early to compete for attention.

Such behavior can lead them to be misdiagnosed as hyperactive, Mr. Lang says. And for parents and teachers, Ritalin can look like the easy cure. "They want to see things fixed quickly," he says, "and we are in a drug-taking society. When we have a headache, we reach for aspirin."

A Quick Fix

David Elkind, a child psychologist at Tufts University, also believes Ritalin is increasingly being prescribed for children whose hyperactive behavior is caused by stress. "Drugs should be the treatment of last resort," he says. But Ritalin "is convenient," he adds. "Let's face it: It solves the problem."

Ritalin, made by Ciba-Geigy Corp., is commonly recommended for children who suffer from hyperactivity, or attention deficit disorder (ADD). This group comprises an estimated 3% to 5% of all children, and the number is growing—although as doctors point out, it is hard to tell how many cases are accurately diagnosed. Their inappropriately. Ritalin can worsen matters, causing side effects [illegible] such as dizziness, insomnia and suppressed appetite.

Alleged inappropriate use is the focus of four Ritalin-related lawsuits that have been filed in the U.S. since last October, and the legal battles promise to be both emotional and sensational. Three of the suits are being handled by John F. Coale, a Washington, D.C., lawyer with a flair for publicity who also represents victims of the deadly chemical leak at the Union Carbide Corp. plant in Bhopal, India.

Instrumental, too, in publicizing the issue has been the Citizens Commission on Human Rights, started by the Church of Scientology, a group founded on the teachings of the late science-fiction writer L. Ron Hubbard. The commission distributes pamphlets about Ritalin use and operates a hot line for concerned parents in the Baltimore area, where Mr. Coale is currently researching another lawsuit.

Grover McCain Jr., a Chapel Hill, N.C., plaintiff's lawyer who specializes in medical litigation, says he believes many more suits will follow. "I know a lot of parents who are very angry about misuse of Ritalin," he says.

Since 1985, the amount of Ritalin sold annually has increased 97% to 2.882 kilograms (many children get 10 milligrams a day in the form of sustained-release tablets). However, the Drug Enforcement Administration, which sets manufacturing quotas, is proposing to reduce the supply by 34% next year in expectation that the controversy will depress demand.

> "DRUGS should be the treatment of last resort," says one child psychologist. But Ritalin "is convenient. Let's face it: It solves the problem."

Ciba-Geigy says the recent surge in use is explained by several factors, including the drug's newly discovered usefulness in treating narcolepsy, a condition marked by a frequent, uncontrollable urge to sleep. Also, says a spokeswoman, more doctors are prescribing Ritalin for teens and young adults previously thought to have outgrown ADD. Ciba-Geigy says it sees no evidence that the drug is being misused.

Health officials aren't so certain what is behind the increase, although they know the drug isn't being diverted to street use. However, the Georgia Board of Medical Examiners, which investigated Ritalin use in Atlanta's affluent, fast-growing northern suburbs, concluded that use of the drug there was disproportionate to the expected [illegible] of ADD. Andrew Wolf, executive director of the board, says he believes demand was "in large part driven by the schools." In addition, he says, parents in the area pushed shorter school problem kids who did well in school after taking Ritalin, and as the stories circulated the drug came to be looked on as a "panacea."

One woman who doesn't see the drug that way is LaMarie Parker, who last November filed suit in U.S. District Court in Atlanta against the Gwinnett County School System and several of its employees, among others. Mrs. Parker, an electrical contractor, alleges that the school employees punished her son, Melvin, whom they had labeled hyperactive, and threatened to expel him if he didn't take Ritalin. She says the drug—which Melvin took for about four years, beginning when he was 10—brought on sleeplessness and hair dreams, and slowed his growth. Worse, she adds, he became violent and suicidal.

The lawsuit, handled by Mr. Coale, also charges the American Psychiatric Association with fraud, claiming it misrepresents an overly broad definition of ADD as scientifically valid. The suit alleges that the "fraudulent" definition "induces" parents to give Ritalin to children.

Superintendent Alice Crews responds to the lawsuit with a prepared statement: "Gwinnett County school employees do not prescribe medicine. Nor do they give medication to children. The charges are absolutely without fact." The APA, for its part, declines to comment on the suit.

Finding the True Cause

Susan Marshall is another mother who says she took the advice of teachers and put her son, Brad, on Ritalin two years ago after he began acting up, falling behind and generally hating the first grade. When the drug didn't work—and when Brad stopped sleeping and didn't gain any weight—the Hingham, Mass., housewife took him for an extensive medical exam. The real culprit turned out to be minor brain damage, probably sustained at birth, which had slightly paralyzed his right side and ruined his handwriting, causing him frustration and trouble at school. "Ritalin was a mistake," says Ms. Marshall, who notes that Brad has done well without medication at a private school.

Many psychiatrists and psychologists who treat ADD children say Ritalin, properly prescribed, deserves its reputation as a wonder drug. And some worry the controversy could cause a backlash that would deem it from kids who need it.

But establishing real need and administering Ritalin properly require careful monitoring followed by a [illegible] behavior-modification effort, specialists say. "Often, people don't go through all the steps that are necessary to determine what should be the diagnosis and treatment," says Mr. Elkind, who believes problems can frequently be solved by changing a child's schedule or school.

Ritalin, adds William Pelham, a psychiatry professor at the University of Pittsburgh Medical School and a leading authority on hyperactive children, "was never supposed to be the only form of intervention, but people acted as if it as the only treatment."

FIGHTING MANDATORY RITALIN IN THE SCHOOLS

A New Hampshire couple finds their son expelled from school when they try to take him off drug therapy.

When Valerie Jesson of Derry, New Hampshire, agreed in 1985 to use the drug Ritalin to treat her six-year-old son's hyperactivity, she had no idea where it would lead. She never expected Casey to suffer the ill effects from the drug that he did. She never expected school officials to insist that Casey continue taking the drugs, nor for them to expel him from school when she took him off Ritalin. But most of all, she never expected to become the focus of national attention and the center of a landmark court case in parents' rights.

The battle over Ritalin involves the civil liberties issue of whether schools can require parents to put their children on a drug even when the parents believe the drug is harmful. It involves the medical questions of the extent to which Ritalin is being used appropriately on children, as well as what some call the increasing medicalization of special education in our public schools. But in this case the battle over Ritalin is also the story of one little boy.

BY GENE BRUCE

Ritalin Issue Is Like a Medical Seesaw Rid

y Chris Pope
e Telegram Staff

With Ritalin it's difficult to find a mid-
le ground.

Is the drug a chemical choke-chain for
e brain — a psychotropic time bomb
at turns fidgety kids into human vegeta-
les and sometimes into psychotic mon-
ters? Or is it a miracle medication that
elps them focus on their schoolwork and
ontrol their behavior?

It depends on who's doing the talking.

According to members of some child
dvocacy groups, school systems are turn-
g increasingly to Ritalin as a quick but
oney fix for behavior problems in the
lassroom. They argue that doctors are
rescribing it and school systems are
oercing parents into having their chil-
ren take it as a solution for learning
roblems that require complex and often
stly strategies to remediate.

Ritalin's critics say misuse of the drug
rowing. Children are being given it in-
criminately with little attention paid to
s dangerous side effects, including stunt-
d growth, facial tics, hair loss, drug de-
endency and even criminality.

But those who work closely with chil-
dren who suffer from hyperactivity or at-
tention deficit disorder, as it is currently
known, are crying foul.

Drug Misinformation

According to them, anti-Ritalin advo-
cates have recently flooded the media
with misinformation about the drug. They
consider the campaign against Ritalin to
be an hysterical overreaction to news ac-
counts and believe unwarranted fears
about the drug threaten to undermine its
use as a valuable tool in helping children
with attention deficit disorder conquer
their problems.

The American Psychiatric Association
describes an attention deficit disorder
child as one who has difficulty concentrat-
ing, following instructions or behaving in
school or at home. Doctors who prescribe
Ritalin believe that when administered
correctly, the drug helps these children
cope with their illness. The trouble is the
definition of the disorder covers a lot of
ground, say those responsible for diagnos-
ing the condition. The problem lies in dis-
tinguishing between children who mis-

Turn to DEBATE Page 30A

Dr. Martin T. Feldman
... Leominster pediatrician

State, Leominster Differ On Ritalin-Use Statistics

Are too many school kids taking Ritalin in Leominster?

Perhaps, says Katherine Messenger, overseer of the state's Psychotropic Drug Program, which keeps track of Ritalin use among Massachusetts public school students.

Absolutely not, say Leominster school officials and the physicians who sometimes prescribe Ritalin for students diagnosed as having attention deficit disorder. If anything, they say, the city does a better job identifying and helping children with attention deficit disorder than other communities do.

During the 1984-85 school year, the last for which complete figures are available, public school nurses in Leominster were dispensing Ritalin to 142 students — more than 2 percent of the school system's pop-

ulation and the highest number o
taking the mood altering drug o
lic school system in the state at t

The statistics show that dur
years the number of students ta
lin was much lower in the Worc
Boston public schools, even tho
school systems are far larger
minster's. Worcester officials
that just 10 students were recei
lin during the 1984-85 school ye
school officials reported that
their students were on the drug

The relatively high number o
receiving Ritalin in Leominster
some, Ms. Messenger said. Alt
doesn't have the updated sta
prove it, she believes that the

Turn to STATE

EATHER:
owers.
gh near 60.
n Page 16A

SUNDAY TELEGRAM

WORCESTER, MASS., SUNDAY, MARCH 27, 1988

$1 DELIVERED BY CARRIER

The Ritalin Q

Debate Over Ritalin Use Has No Middle Ground

Continued From Page One

behave and have trouble concentrating because they suffer from attention deficit disorder and those whose problems may be caused by a host of other reasons.

The use of Ritalin became an issue recently during the trial of 15-year-old Rod Matthews of Canton. Earlier this month Matthews was found guilty of second-degree murder in the 1986 baseball bat slaying of Shaun Ouillette, Matthews' classmate at Canton High School. At Matthews' trial, defense lawyers argued unsuccessfully that he committed the crime during a psychotic attack caused by Ritalin and brought on by withdrawal from the drug.

Continuing Concern

This is not the first time Ritalin has caused concern. Russell A. Barkley, professor of psychiatry and neurology at the University of Massachusetts Medical School and an authority on attention deficit disorder, said that during the late 1980s, a spate of newspaper stories labeled Ritalin as a dangerous drug widely misused in the treatment of hyperactive children.

The scare was aggravated by one newspaper story, which wrongly reported that 9 percent of students in the Omaha, Neb., public schools were taking Ritalin. The correct figure was 0.5 percent.

"The reporter who wrote the story misplaced the decimal point," said Barkley, who heads a diagnostic clinic for children suspected of having attention deficit disorder. The clinic, which this year will evaluate more than 400 children suspected to have the disorder, is only the second of its kind in New England.

The federal Drug Enforcement Administration estimates that about four million mostly elementary school children are taking Ritalin in the United States. But Barkley, who has studied attention deficit disorder for 15 years, has placed the true number of Ritalin users at a more modest one million.

Ritalin critics say they know of schools where up to 40 percent of the students are on Ritalin. But Barkley says those numbers give a false impression because they are culled from special schools dedicated

tered puberty, physicians now lean toward the theory that they need to remain on the drug for much longer periods of time — perhaps into adulthood.

"We're thinking of Ritalin more as a maintenance-type drug now," Barkley said. "A person with ADD would take it as long as his condition lasted in much the same way as a person with diabetes would take insulin."

Statewide, the number of students on Ritalin has increased significantly since the early '80s, said Katherine Messenger, acting director of Maternal and Child Health Services for Massachusetts. The agency administers the state's Psychotropic Drug Program, which operates in accordance with a 1974 state law requiring local school systems to get state approval before they are allowed to dispense Ritalin to students during school hours. According to Ms. Messenger, the law was passed after child advocacy groups raised concerns about overuse of Ritalin by public school students in the Springfield and Boston areas. The advocacy groups contended that school systems were pressuring parents to put their children on the drug.

Increased Use

Psychotropic Drug Program figure

State figures also show that dur
1984-85 school year, 142 public sch
dents in Leominster were receiv
drug from school nurses during
hours — the most students receivi
in any school system in the sta
minster School Superintendent
Amadio said the school system
overall figure for the number of s
on Ritalin while in school, but
states the number at "more than
The school system contains abou
students — meaning that the Rita
rate among Leominster students
2 percent, a bit higher than the
average, according to Barkley.

Change in Opinion

Ms. Messenger believes the num
students using Ritalin has risen p
because more schools are aware
law and have become more diligen
reporting Ritalin use among their
to the state. But she said doctors
gear to feel more comfortable
drug now.

"We have seen evidence that at
trict in which Ritalin had a bad rep
there has now been a change in
opinion," Ms. Messenger said.

Parents Who Blame Son's Suicide On Ritalin Use Will Join Protest

Group Plans Demonstration at Psychologists Convention

By Susan Laccetti
Staff Writer

On July 20, 1987, 16-year-old Brad Eckstein spent the day working on his yellow Mustang, talking on the phone with his girlfriend, helping a friend on his car, lolling around the house.

That night, Brad's parents found the tall, slender youth with sandy brown hair hanging from the ceiling of their garage with a water skiing rope around his neck.

A little more than a year after Brad's death, Art and Cathy Eckstein say they now believe their son's withdrawal from Ritalin — a stimulant that calms hyperactive children — caused him to take his own life.

The Ecksteins will be among dozens of parents expected Saturday at a protest against Ritalin at the American Psychological Association's annual convention in downtown Atlanta. The demonstration is being organized by the Citizens Commission on Human Rights, an arm of the Church of Scientology.

Inside the Peachtree Plaza, there will be discussions on the benefits of Ritalin as a treatment for hyperactivity and as an educational aid for children who suffer from Attention Deficit Disorder.

Brad, who had been on Ritalin for nine years after being diagnosed as hyperactive, had been taking 60 milligrams a day, but his dosage was reduced to 40 milligrams just before his death.

A medical journal on drug complications and the manufacturer of the drug say "careful supervision is required during drug withdrawal, since severe depression as well as the effects of chronic overactivity can be unmasked. . . . Daily dosage above 60 milligrams is not recommended."

"If somebody else can stop a suicide because of this . . . we want to help them," Mrs. Eckstein said of the couple's plans to protest.

"I am sympathetic with the people whose children have committed suicide," said Dr. Stanley Levine, a Columbus pediatrician and specialist in treating hyperactive children. "But I am angered at people who protest wrongly. There is no relationship between committing suicide and taking Ritalin. Ritalin has a bad name and has an undeserved bad name."

Several leading child psychologists, pediatricians and psychiatrists — including those who will give seminars on Ritalin at the psychologists convention — say Ritalin, also known as methylphenidate hydrochloride, can work wonders in treating hyperactive students. Studies show that when administered properly, the stimulant calms abnormally energetic youngsters and helps them focus on the task at hand.

RITALIN Continued on 7B

RENEE HANNAN/Staff

Art Eckstein and his wife, Cathy, believe the suicide of their son, 16-year-old Brad (shown in photo held by Mr. Eckstein), was caused by his withdrawal from Ritalin. 'If he had not been on Ritalin, it would have made a difference,' Mrs. Eckstein said.

ATLANTA JOURNAL
FRONT PAGE 8/13/88

Of Ritalin; They Blame Drug for Son's Suicide

By Susan Laccetti
Staff Writer

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But some parents, educators and medical experts say Ritalin is being used too freely nationwide as a quick fix to treat children with behavioral problems.

In Georgia, the Composite State Board of Medical Examiners is investigating the use of Ritalin among schoolchildren, and the U.S. Drug Enforcement Administration also is conducting a national review. Nationwide, Ritalin use jumped 80 percent between 1985 and 1987, and Georgia ranked fourth in consumption during the first quarter of last year.

Dr. Edwin Mikkelsen, chief of child psychiatry at the Massachusetts Mental Health Center in Boston, said a 60-milligram daily dosage of Ritalin is high, and it would be "theoretically possible that someone could get depressed" coming off the drug, but he said he had never heard of anyone committing suicide because of Ritalin.

Brad first showed signs of hyperactivity when he was 5 years old. He flunked kindergarten and first grade.

When he was in the third grade, the Ecksteins took their son to specialists for testing. "His concentration was zippo," said Mrs. Eckstein.

When family physicians prescribed Ritalin, the Ecksteins were relieved. "We were happy Ritalin parents," Mr. Eckstein said. "We believed the drug was having a positive effect."

But Brad continued to earn poor grades, the Ecksteins say. He also experienced common side effects from the drug, including dilated pupils, loss of appetite and bedwetting.

Brad also began to have mood swings, his parents said. He would devote lots of time and energy to building model cars, his father said, but then would suddenly smash a model and destroy days of work.

Because of his age, the side effects of Ritalin and a lack of improvement in his schoolwork, the Ecksteins decided last summer that they wanted Brad off the drug.

They reduced the drug from 60 milligrams a day to 40 milligrams just after Brad started his summer break.

"He never talked about suicide to us," Mr. Eckstein said, adding Brad was looking forward to a trip to Lake Lanier the next day and starting school in the fall as he could take vocational courses in automobile repair at Gwinnett Vocational Education Center.

A tearful Mrs. Eckstein added, "I started to go over it in my head to find a reason why. I'd say 'Why didn't I go to the books to find out about side effects?' Why didn't I pin doctors down about the drug?"

"All of us have been through guilt trips. If he had not been on Ritalin, it would have made a difference."

Newton psychiatrist sued by couple over prescription of Ritalin

BY ANTHONY S. TWYMAN
STAFF WRITER

NEWTON – A Bellingham couple is suing a Newton doctor and two other physicians for allegedly incorrectly diagnosing their child as hyperactive and negligently prescribing the controversial drug Ritalin for him.

William E. and Bernice Power filed suit on March 18 against Dr. David L. Stagner, a child psychiatrist in Newton Centre; Dr. Leo R. Muido, a Plymouth pediatrician; and Dr. Charles A. Rizzi, a Holliston pediatrician.

According to the Powers' attorney, Lawrence Lafferty of the Boston law firm of Robert Karns, the suit is the latest in a growing number of lawsuits brought on by the publicity surrounding the Rod Matthews trial.

Matthews, 15, of Canton, was convicted in March for clubbing to death a classmate, Shaun Ouillette, 14, with a baseball bat in November 1986.

During Matthews' trial, his attorney argued that Ritalin, a drug Matthews had taken for five years, played a role in his client's erratic behavior.

But Jeanne Quinn, Ouillette's mother, said her son received therapy and also took Ritalin from age 7 through 11, and it worked.

The Powers' suit alleges the three doctors "negligently, carelessly, unskillfully and without regard for the health and well-being of the minor ... prescribed and/or administered" Methylphenidate Hydrochloride, also known as Ritalin, to their son, William S. Power.

According to the suit, Stagner "prescribed and/or administered" the drug to the child from about February 1985 to August 1985; Muido, from about March 1986 to September 1987 and Rizzi, from about September 1987 to January 1988.

As a result of the alleged negligence of the three doctors, the suit claims the child has suffered severe and permanent injuries including "brain damage, blurred vision, stunted growth, nervousness, depression, suicidal behavior, addiction, spasms, disorientation, tic, hallucinations, loss of education, future psychosis and loss of future earning capacity and income."

Contacted by telephone at his Bellingham home, Power's father referred all questions about the case and his 6-year-old son to his attorney. Lafferty said although the suit was filed in court – making it public record – Stagner has yet to be served with it.

By law, Lafferty said, he has up to 90 days from the time he filed the suit to have it served to Stagner.

Contacted late last week, Stagner was offered to have the complaint read to him over the telephone, but declined.

"All I can say is I do the best I can, but I can't comment on it," he said.

According to Lafferty, one of the main contentions of the suit is that all three doctors allegedly failed to tell the Powers about the dangers associated with the ingestion of Ritalin.

The suit also maintains the doctors allegedly failed to notify the parents of "less intrusive alternatives."

Lafferty said the suit is the ninth he has filed in Massachusetts involving children and Ritalin. All but one of the suits involved children under 18.

In the next several weeks, Lafferty said, he plans to file four more suits in Washington state. All involve children being prescribed Ritalin.

Convicted killer Rod Matthews, shown here at his recent trial, was a user of the drug Ritalin. Matthews' lawyer argued that Ritalin played a role in his client's erratic behavior.

As more attention is focused on the effects of Ritalin, the medical world is being forced to take a closer look at the drug usually prescribed for hyperactive children.

The Citizens Commission on Human Rights, an international organization that advocates psychiatric reforms, recently led a demonstration in Derry, N.H.

Supported by the Church of Scientology, the group protested the decision of a Derry school to expel a student unless he was put on Ritalin.

Last month, the group also led a demonstration in Newton Centre against the use of the drug.

Nationally, a $120 million class action lawsuit was filed in Atlanta, last November against the American Psychiatric Association. The suit alleges the diagnosis of attention-deficit disorder – hyperactivity – is fraudulent because the diagnostic criteria are the product of a committee vote, not scientifically verifiable studies.

The Call, Woonsocket, R.I., Tuesday, March 8, 1988

Massachusetts

Ritalin linked to bludgeoning death of teen- ager

DEDHAM, Mass. (AP) — The defense in the trial of a teen-ager being tried as an adult for the beating death of a classmate rested its case after two psychiatrists gave conflicting testimony about whether the youth had a chronic psychotic disorder.

Closing arguments in the case were expected to be delivered today.

Rod Matthews, 15, of Canton, has admitted killing 14-year-old Shaun Ouillette, but defense attorneys contend Matthews was unable to control his actions because of a mental disorder that was aggravated by his use of a drug prescribed to hyperactive youths.

Prosecutors say Matthews clubbed Ouillette to death with a baseball bat for a thrill.

Classmates have testified that Matthews took them to view the body in a wooded area where it remained for three weeks after the November 1986 killing.

Dr. Kenneth Holbert, director of the state's Gaebler Children's Center in Waltham, testified that while Matthews has had a long-term mental illness that may have contributed to his behavior, he should have been able to control his actions the day he killed Ouillette.

"I don't believe he was suffering from a chronic psychotic disorder," Holbert said. "He could have used his cognitive strengths to behave in another manner."

But Dr. Bernard Yudowitz of Belmont's McLean Hospital said Matthews "was suffering from an atypical psychosis which in every manner impaired his ability to conform his conduct to the standards of law."

Matthews first decided to kill someone after viewing the controversial videotape *Faces of Death*, which shows animal and human killings and tortures, said Yudowitz. He said that Matthews' use of the drug Ritalin may have made it harder for him to control his behavior.

Matthews did not kill for reasons of vengeance but "to get rid of the urge to kill," said Yudowitz, a former director of Bridgewater State Hospital.

Yudowitz said he knows of hundreds of cases in which children and adults are misdiagnosed as hyperactive and given the drug Ritalin.

"There is no way of knowing what the exact effect Ritalin had" on Matthews, said Yudowitz. "There was a distinct possibility" it contributed to a loss of impulse control, he said.

Assistant Norfolk County District Attorney Peter Casey questioned the methodical manner with which Matthews approached the killing of Ouillette and the cover-up of the crime.

Yudowitz said that the methodical nature of the act "in no way contradicts the fact that Rod Matthews is an extremely sick individual ... consistent with this boy having a disturbed mind."

Former friends have said Matthews told them he wanted to know what it was like to kill someone. They said he named several potential victims before settling on Ouillette.

The teen-agers testified last week about viewing Ouillette's body several hours after a pre-Thanksgiving pep rally, then bicycling with Matthews to a shopping mall pizza parlor for a snack.

(Continued from p 2517.)

Berkeley project, was for the fourth through seventh grades. Combined, those curricula covered elementary school. The National Center for Health Education and Roger Schmidt at the American Lung Association, New York City, were instrumental in bringing the two together, making the program available to interested schools, and further refining the lessons and concepts taught.

So far, volunteer facilitators who can teach the program to school districts have been trained in 41 states and the curriculum is used in more than 3000 schools across the nation.

The center itself has also gone through a number of changes. In 1988, Clarence Pearson, a retired vice president from Metropolitan Life Insurance Company, New York, took over as an unsalaried, full-time president and moved the center from San Francisco to offices on the Lower East Side of Manhattan, because 90% of its funding comes from the East Coast. Pearson then asked the members of the Board of Directors to resign to make way for new blood. At one point, the center had about 22 employees. Now there are eight.

Part of the problem, say Schwarz and Pearson, is that the center has never had a basic endowment or enough support from the government to put together its own agenda and program. As a result, to win grants the center must cater to the specific agendas of each funding organization. That situation fosters a cycle, because then the center never has one clear-cut, major purpose that would attract other money.

Those at the center would like to see it expand its endeavors. "Yes, of course there is a need [for the center]," says Schwarz, particularly now with the country putting increased emphasis on prevention through life-style change. In addition, he adds, "The center can help the AMA achieve its goals in the area of public health—beyond that which the AMA can do alone."

—by Timothy F. Kirn

The Ritalin Controversy: What's Made This Drug's Opponents Hyperactive?

A WAVE OF ADVERSE publicity involving methylphenidate hydrochloride (Ritalin), a drug that has been used for more than 30 years to treat children and adults with attention-deficit hyperactivity disorder, has created concern that public opinion may eventually affect medical practice.

There appears to be growing belief on the part of some of the public that the drug has dangerous side effects, that schools want to have it prescribed, and that psychiatrists are eager to label children as having a condition that may not even exist. Among the recent developments:

- A suit was filed in Georgia against a public school district and against the American Psychiatric Association.
- At least eight medical malpractice suits have been filed, five of them recently in Massachusetts.
- The defense attorney for a 15-year-old youth convicted of killing a classmate with a baseball bat argued that his client's behavior may have been affected by taking methylphenidate.

All of these events have caused widespread unease.

"I don't remember as much furor over any other issue," comments Richard Roberts, MD, professor and chair of pediatrics at the University of Virginia in Charlottesville and for the past four years chair of the American Academy of Pediatrics' Committee on Drugs. Roberts reports numerous telephone calls from fellow pediatricians who are concerned about possible adverse effects of drug treatment with methylphenidate or who have general concerns.

In a sense, there is methylphenidate the drug and "political methylphenidate" and, like many other emotion-laden issues, a public debate over either one makes it difficult for parents of children with attention-deficit hyperactivity disorder to know whom to trust.

Actually, treatment for attention-deficit hyperactivity disorder has remained pretty much the same over recent years, with methylphenidate and dextroamphetamine being the two drugs most often prescribed when pharmaceutical treatment is used. Behavior therapy, cognitive training, and dietary manipulation are also used, although experts disagree about whether there is any benefit to be gained from special diets (*JAMA* 1987;247:948-956).

There even appears to be some consensus on the short-term effectiveness of drug therapy (*JAMA* 1980;248:279-287), a consensus summed up by Judith Rapoport, MD, chief of the Child Psychiatry Branch, National Institute of Mental Health, Rockville, Md, who says, "The data are very good that stimulant drugs are one of the mainstays of treatment. Although there are individual cases of overuse or misuse, properly used stimulant drugs can be good treatment."

There has always been concern about overuse or misuse of methylphenidate, a concern that led the (then) Department of Health, Education, and Welfare to sponsor a 1971 panel that recommended more research, particularly in the areas of safety and efficacy. Methylphenidate became a controlled substance on Schedule II in 1971. Side effects are not common but can include anorexia, abdominal pain, drowsiness, an increase in heart rate, and suppression of growth. Treatment with methylphenidate does not create an increased risk of later drug abuse, although the drug does have abuse potential.

"Treatment with stimulant medication should not be undertaken lightly," says Barry D. Garfinkel, MD, director of the Division of Child and Adolescent Psychiatry at the University of Minnesota, St Paul, talking about prescribing habits. Is it prescribed too often? "We just don't have a good way to judge that," Garfinkel responds.

It is true that Drug Enforcement Agency figures show a large increase in the amount of the drug allowed to be manufactured over the past five years. However, an agency spokesman said the figures don't correspond with prescribing practices.

Explanation of Increase

The spokesperson said that when available supplies are drawn down, more of a Schedule II drug may be manufactured the next year to make the

Three areas of concern

- Growth
- Cardiovascular side effects
- Substance use and abuse

Recommendation 13. Patients treated with medication should have their height and weight monitored throughout treatment

- Stimulant treatment may be associated with reduction in expected height gain, in first 1-3 years of treatment
- MTA study: decreased growth rates in stimulant vs non-drug treatment groups after 2 years, persisting for 3 years
- PATS study: After 12 months height (-1.38cm) weight (-1.3kg)
- Spencer et al: no height deficits c/f controls in childhood, a small reduction in height at puberty, but no difference in height in adulthood
- Faraone 2005. Stimulant induced growth delays are greater in first year of treatment but attenuate after that.
- Dose related. Significant effects only with MPH > 2.5mg/kg/day
- If crossing 2 percentile lines then drug holiday, reduced dose or alternative therapy indicated
- No evidence of reduction in final adult height

Cardiovascular issues

- FDA review 2006
  - 20 deaths DEX, 14 deaths MPH
  - Rate of sudden death children — 1.3-8.5/100,000 pt years
  - Rate of sudden death in children with CHD — 6% by age 20
  - MPH rate sudden death — 0.2/100,000 pt years
  - DEX rate sudden death — 0.3/100,000 pt years
  - ATX rate sudden death — 0.5/100,000 pt years
- The rate of sudden death of children taking ADHD medications does not exceed the base rate of sudden death in the general population
- Cardiac consult if stimulants to be used in children with pre-existing cardiovascular disease

Label warnings 2009

1. Stimulant medication can be abused or lead to dependence. Keep stimulants in a safe place to prevent misuse or abuse
2. Like all stimulants this medicine may become habit forming and can be abused by some people. If you or your child take it correctly as instructed by your doctor, abuse or dependence should not be a problem, either now or in later life.

Key questions

- Does stimulant drug use increase the risk for substance abuse later in life?
- Do ADHD medications have the potential for abuse?
- What is the distinction between drug abuse and misuse/diversion with respect to ADHD medication

Theoretical concerns

- Stimulants such as DEX and MPH chemically similar to cocaine
- Potential for stimulants to lead to increased sensitisation to later stimulant exposure.
- Studies in mammals suggest repeated stimulant exposure leads to subsequently greater craving and self administration of stimulants
- No evidence that this happens with the therapeutic doses of medical stimulants used in humans

Is ADHD a risk factor for SUD?

Biederman J et al. J Am Acad Child Adolesc Psychiat 1997;36:21

- 140 ADHD, 120 controls baseline and 4 years later
- Baseline mean age 11.5. Follow up mean age 15.2
- Cases and controls both had 15% rate SUD
- Increased risk with comorbid CD (45%)
- Marijuana by far commonest drug abused

ADHD children grown up

Barkley R et al. J Child Psychol Psychiat 2004;45:195-211

- 13 year follow up 147 ADHD and 73 controls
- Higher rates than controls of
  - Antisocial acts
  - Arrests
  - Property theft
  - Disorderly conduct
  - Assaults
  - Carrying a concealed weapon
  - Motor vehicle accidents, speeding fines
  - Illegal drug possession
  - Substance use and abuse
- Comorbid CD explains almost all the variance in this increased risk

Shared comorbidity between ADHD and SUD in adults. Problem issues

- 15% of adults with ADHD have SUD
- 20% of adults with SUD have ADHD
- Difficulty with DSM IV diagnosis of ADHD in adults, given that criteria developed for primary age children.
- Symptoms of intoxication and withdrawal may mimic ADHD symptoms
- Adult patients may feign ADHD symptoms to obtain stimulant meds

Does the treatment of ADHD with stimulants contribute to drug use/abuse.

Barkley R et al. Pediatrics 2003;111:97-109

- 13 year prospective study
- 147 clinic referred ADHD followed into adulthood (mean 21y)
- Interviews and multiple ratings at age 15 and age 21

Relationship of childhood stimulant use to adolescent self reported drug use

	Rx %	No Rx %
Alcohol	41	35
Marijuana	20	6
Cocaine	5	0
Heroin	0	0
Hallucinogens	3	0
Unprescribed stimulants	6	6
Unprescribed sedatives	3	0

Likelihood of using drugs by adulthood as a result of stimulant treatment in childhood

	Rx %	No Rx %
Alcohol	66	81
Marijuana	66	71
*Cocaine	26	5
Heroin	0	0
Hallucinogens	3	0
Unprescribed stimulants	30	14
Unprescribed sedatives	11	0

* No longer statistically significant after controlling for severity of ADHD and CD in childhood, adolescence and adulthood

Does the treatment of ADHD with stimulants contribute to drug use/abuse.

Barkley R et al. Pediatrics 2003;111:97-109

- No association between duration of childhood or high school stimulant treatment and frequency of any form of drug use.
- Study did document a significant relationship between being treated with stimulants in high school and risk of ever trying cocaine.
- The greater risk of using cocaine in adulthood was explained by the severity of current CD symptoms

Pharmacotherapy for ADHD reduces risk for SUD

Biederman J et al Pediatrics 1999;104:293

- Cumulative incidence of SUD compared in 56 medicated ADHD subjects, 19 unmedicated ADHD subjects, and 137 non-ADHD controls in longitudinal study over 5 years

- Medicated subjects at baseline at significantly reduced risk for SUD at follow up relative to unmedicated ADHD subjects OR 0.15 (0.04-0.6)
- Medicated ADHD subjects at same risk at follow up as non-ADHD controls

- Conclusion: untreated ADHD a significant risk factor for SUD in adolescence. Pharmacotherapy associated with 85% reduction in risk for SUD in ADHD youth

Does stimulant treatment lead to substance use disorders

Faraone S, Wilens T. J Clin Psychiat 2003;64 suppl:9-13

- Meta-analysis 7 studies
- Exposure to stimulant therapy for ADHD does not increase the risk for developing substance use disorders, but is in fact protective against it.
- Stimulant medication treatment of ADHD reduces the risk of SUD by 50% to levels well within the normal population risk

Another meta-analysis

Wilens T et al. J Child Adolesc Psychopharm 2005;15:787

- Four adolescent and five adult studies in ADHD with comorbid SUD (n=222)
- Treating ADHD pharmacologically in individuals with ADHD and SUD has a moderate impact on ADHD and SUD symptoms

Comorbidity of psychiatric disorders and nicotine dependence among adolescents

Griesler P et al. J Am Acad Child Adolesc Psychiat 2008;47:1340

- 1039 subjects, age 12-16, over 2 years
- Home interview on 5 occasions using DISC
- Known risk factors for nicotine dependence are SES, earlier age of smoking, smoking by parents & peers, parental psychopathology, female gender.

- Are behavioural or psychiatric disorders causal?

- DSM disorders preceded first criterion of nicotine dependence
- Disruptive behaviour disorders (ADHD/ODD/CD) predicted the onset of nicotine dependence (OR 2.1)
- Nicotine dependence did not predict the onset of DSM diagnosis

Effects of smoking abstinence on adult smokers with ADHD

McClernon FJ et al. Psychopharmacology 2008;197:95-105

- ADHD adolescents and adults smoke at double the the rate of the general population
- Case control study. Smokers >15 cigs/day
- ADHD vs nonADHD after overnight abstinence
  - Withdrawal symptom severity — NS
  - Mood — NS
  - Craving — NS
  - Conners CPT
    - Reaction time variability — $p<0.001$
    - Errors of commission (impulsive errors) — $p<0.001$
- ADHD individuals may smoke at higher rates due to greater worsening of attention and response inhibition after abstinence

ADHD and smoking treatment failure

Humfleet GL et al. Nicotine & Tobacco Research 2005;7:453-460

- Longitudinal study 428 Adult smokers
- Randomised controlled study of treatment
- Only 1 of 47 participants with history of childhoood ADHD remained abstinent by week 52 compared to 68 of 381 participants who had no history of ADHD (OR 0.36, $p<0.0001$)

Dopamine in smoking behaviour

- Addictive properties of nicotine result from its ability to bind to nicotinic acetylcholine receptors that stimulate dopamine release and reuptake.
- This ability to alter dopamine concentrations in the brain reward system is shared by many drugs of abuse

- 220 subjects, surveyed and genotyped at age 15
- Smoking initiation was associated with dopamine D4 receptor gene (DRD4)
- Smoking continuation and dependence associated with dopamine D2 receptor gene (DRD2)
- Allelic variation in dopamine genes accounted for only a small amount of the total variance in smoking progression

Genetic studies in ADHD

Faraone S, Khan S. J Clinical Psychiatry 2006;59:1065

- Meta-analysis candidate genes
  - DopamineD4 receptor gene (DRD4)
  - Dopamine D5 receptor gene (DRD5)
  - Dopamine transporter gene (DAT)
  - Dopamine beta hydroxylase gene (DBH)
  - Serotonin transporter gene (5HTT)
  - Serotonin receptor 1Bgene (HTR1B)
  - Synaptosomal protein 25 gene (SNAP25)

ABT-089 in treatment of ADHD

Biological Psychiatry 2006;59:1065

- ABT-089 (neuronal nicotinic receptor partial agonist)
- 11 adults with ADHD
- Randomised to 2mg, 4mg, 20mg, placebo for 2 weeks
- Superior to placebo on Conners ADHD index and CGI
- Dose linear effects on attention and memory

Sources of prescription misuse

Schepis T, Krishnan-Sarin S. J Am Acad Child Adolesc Psychiat 2009;48:828-836

- Rise in prescription misuse last 10 years
- Decline in use of other illicit drugs, alcohol or tobacco (except ecstasy)
- 2005 National Survey of Drug Use and Health
  - 36,992 between 12-17 years
  - Lifetime prevalence of misuse
    - Opiods 10.1%
    - Tranquillisers 3.0%
    - Stimulants 3.4%

Sources of prescription misuse

1. Friends or relatives for free 41%
2. Purchasing 21%
3. Physician 22%
4. Theft 10%
    1. From medical source 0.8%
    2. Stolen forged prescription 0.5%

Australian data limited

- Queensland Crime and Misconduct Commission
  - "Illicit diversion and abuse of ADHD meds only a minor problem"
- Aust School Students Alcohol and Drug Survey
  - 8% of students had (ever) used Dex or Ritalin without doctors prescription
  - Access by being given them, bought them, or traded something for them

RACP working party 2009

- The use of stimulant medication to treat people with ADHD does not increase the risk of developing substance use disorder
- Medication treatment for ADHD with substance misuse should only be provided by a medical practitioner with expertise in both conditions
- ATX should be the first medication trialled if the person with ADHD has a comorbid substance use disorder

Summary

- Patients with ADHD and SUD have an earlier age of onset of SUD, and may take longer to achieve remission than those with SUD alone. They are likely to have a longer course, poorer outcome, and higher rates of psychiatric comorbidities.
- Stimulant meds may be misused and diverted
- Stimulant meds do not exacerbate SUD and may help it.
- Extended release stimulant meds and non-stimulants may be less likely to be misused or diverted than short acting stimulants
- Treatment of SUD is more difficult if ADHD symptoms are not controlled. Weigh up risks individually
- Use standardised tools for assessing drug use, and think about toxicology screens
- Be familiar with local resources for helping SUD youth

AACAP MEDIA PRESS RELEASE

- CHADD and AACAP Applaud Michael Phelps for Addressing Stigma of ADHD

  WASHINGTON, D.C., August 22, 2008 – Children and Adults with Attention-Deficit Hyperactivity Disorder (CHADD) and the American Academy of Child and Adolescent Psychiatry (AACAP) applaud Olympic gold-medalist Michael Phelps and his mother, Mrs. Deborah Phelps for educating the public about succeeding with attention-deficit/hyperactivity disorder (AD/HD).