Just Say No
The case against stimulants

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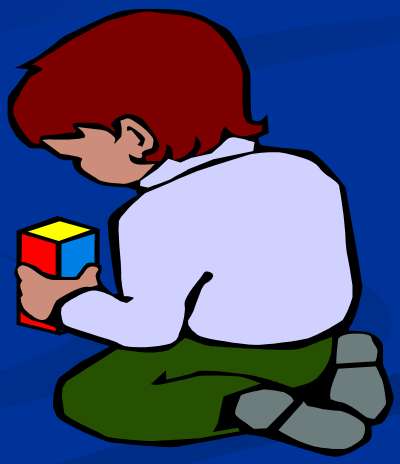
ADHD History

- 1902 George Still's 1st clinical description
- 1917 Encephilitis outbreak leaves survivors
- 1937 Amphetamines noticed to improve behavior
- 1940s: Minimal brain dysfunction
- 1950s: Hyperkinetic Impulse Disorder
- 1960s: Hyperkinetic Syndrome
- 1980s: ADD then ADHD

2003 CDC

National:
7.8% had been told the child has ADD/ADHD
14% of boys diagnosed

Louisiana:
2nd highest level diagnosis
>10%



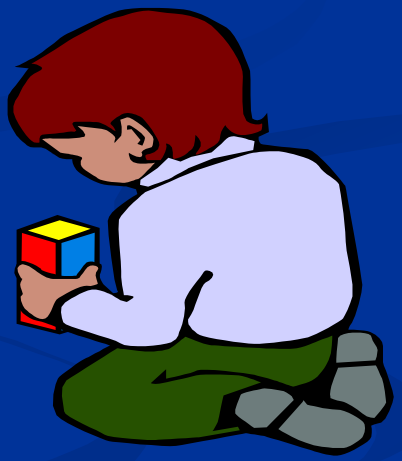
National Survey of Child Health, Parents of 102,353 children ages 0–17 years during 2003–2004

Worldwide Prevalence

- **5.29% school-aged children**

The Worldwide Prevalence of ADHD: A Systematic Review and Metaregression Analysis. Polanczyk, et al Am J Psychiatry 164:942-948, June 2007

- **One matched study**
- **Varying rates unexplained**



AND: Not found in Nepal*

Folmar JAACAP 2009

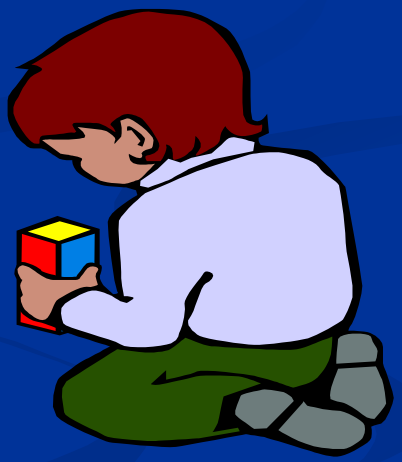
Subtype Prevalence

- **Gender Ratio:**

Boys 3.5:1 Girls

Hyperactive Subtype 4:1

Inattentive Subtype 2:1



Louisiana: use of stimulants

Louisiana ranked 1st in 1999 in use of stimulants

- Cox, Pediatrics, Express Script Formulary
- 6.5%, 3 to 1 male

Louisiana Medicaid Drug Utilization Review 2003

- 10.31% of children ages 9-12 years prescribed stimulants in LA in 2003
- 0.46% Received Therapy (104 / 22,481)

Pre – Perinatal Causes

- Lead: -Nigg Bio Psychiatry 2008
- Low Maternal Omega3 FA: Hibbeln 2010
- Low Maternal Folate: Schultz Brain & Beh 2009
- Maternal Smoking: Bruan J Env Health Perspectives 2007
- Maternal Alcohol: Devries - Alc Clin. & Exp. Research 1997
- Pre-maturity / Low Birth Weight: Nigg - J AACAP 2007

Post Natal Causes

- Trauma or Prolonged Stress
- Malnutrition
- Insufficient Sleep
- Excessive Media exposure
- Kin care / foster care

- Major League Baseball (#103 in 2007)
- Divorce: Strohschein Can Medical Assn J 2007

A continuum

- Northern Finnish Birth Cohort,

Lubke JAACAP 2007

- Maternal Ratings of Attention Problems

Lubke, J AACAP 2010

- "ADHD is a continuous trait, like height and weight… another dimension of human brain and behavioral diversity."

Problems with DSM Model

- Reductionist
- Ignores development and life cycle
- Subjective
- Unrelated to function
- Unrelated to etiology
- Disease model / Categorical
- Not adjusted for family / social context
- Reflects adults preferences

We shape our buildings, and afterwards our buildings shape us. Winston Churchill, 1943

- Dubos 1968: "The precise causes of the diseases of civilization are hard to identify"
- Cruise 2005 "There is no such thing as a chemical imbalnce"
- Nigg 2009: "Genes are necessary but not sufficient"
- Shannon 2010: "ADHD is final common pathway for an number of CNS insults"

Welcome to the Principal's Office

ADHD Assessment Problems

- Enormous changes in different classrooms
- Lack of payment for testing / utility of testing
- The medication trial effect
- Subjective symptoms list
- Caretaker attitude is a primary driver of treatment
- Time pressures

Differential Diagnoses

- Family Dysfunction
- Abuse or Neglect
- PTSD / Anxiety
- Depression
- Bipolar Disorder
- Inappropriate classroom
- Schizophrenia or psychotic prodrome
- ODD / CD
- Poor Vision / Hearing
- Learning Disability
- Low IQ
- Poor Nutrition
- Toxic exposures
- Insufficient Sleep
- Substance Abuse

THE
PHARM
TEAM

Center for Education Policy 2010

National:

- No overall difference in Boys v Girls in Math
- Girls outperform boys in reading at the 4th, 8th, 12th.

Louisiana:

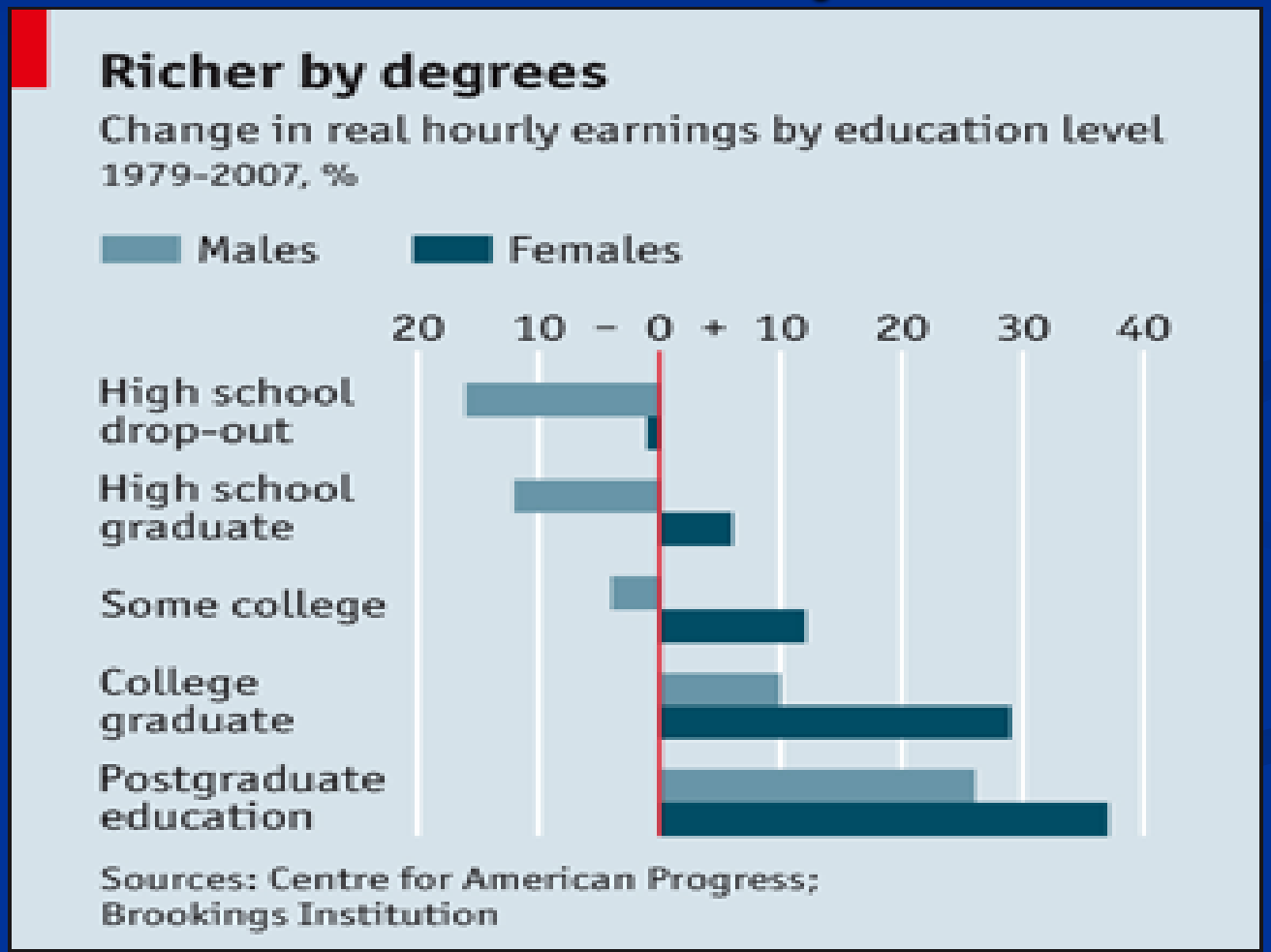
1 of 5 states where elementary girls outperform boys >10% (Proficient 64% vs 75%)

- 2008 % Proficient at grade 10 males is 54% (vs 64% females)

Nation Center for Education Statistics

ADVANCED DEGREES 2008	Male	Female
Bachelor's	667,928	895,141
Master's	246,491	378,532
Doctor's	31,215	32,497

“The only place where success comes before work is in the dictionary,”



Kaiser Foundatoin 2010

Media in the lives of 8-18 year olds

Television	Video Games	Computer	MUSIC	Overall Exposure /Total time
4.29 hrs	1.13 hrs	1.29 hrs	2.29 hrs	10.5 hrs/ 7.3 hrs

Boys:

Average 90 min daily on consol video games, if at all

Less time with music and print media

Less social networks / More gaming

The Vidiots

Amount of use	Heavy	Moderate	Light
Fail/ Poor Grades	47%	31%	23%
Get into trouble	33%	21%	16%
Often sad /unhappy	32%	23%	22%
Often Bored	60%	53%	48%

Suggested Reading

- The Mind of Boys – Gurian 2005
- Boys Adrift – Sax 2008
- The Last Normal Child – Diller 2007
- Please Don't Label my Child – Shanon 2007
- Spark – Ratey 2008
- The Boy Problem – Tyre 2008
- Why Boys Fail – Whitmere 2010

The School Problem

- Schools too large
- 90% Female teacher
- Male teachers 8%
- NCLB / excessive and inappropriate testing
- Kindergarten: "The new first grade"
- Removal of PE / Recess
- Title IX

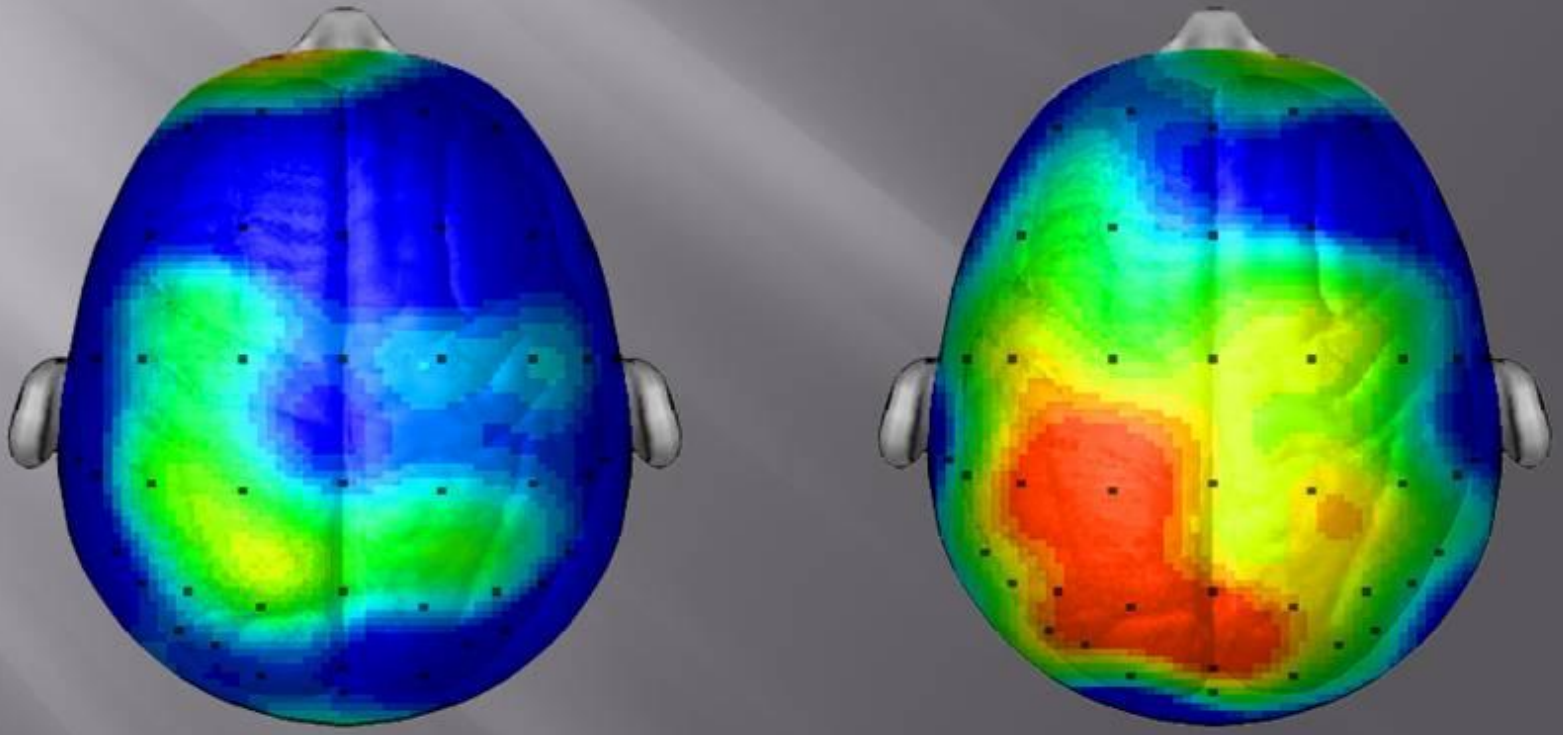
Spark: The Revolutionary New Science of Exercise and the Brain

- John Ratey: "Exercise is ***Miracle Grow*** for the brain"
- Naperville Ill: 97% of freshman at ideal weight
- PE4 life http://www.pe4life.org/
- Cooper Institute Data: 2.4 million Youth fitness grams: Higher fitness schools had better academics, less behavior problems

Average composite of 20 students brains taking the same test

BRAIN AFTER SITTING QUIETLY

BRAIN AFTER 20 MINUTE WALK



Research/scan compliments of Dr. Chuck Hillman University of Illinois

Kantomaa, Medicine & Science in sports and exercise, 2008

Emotional and Behavioral Problems in relation to Physical activity in youth *N=7001,Finish Birth Cohort*

	Internalizing Syndromes[a] (%)			Other Syndromes[a] (%)			Externalizing Syndromes[a] (%)	
Physical Activity[b]	Anxious/Depressed Problems	Withdrawn/Depressed Problems	Somatic Complaints	Social Problems	Thought Problems	Attention Problems	Rule-Breaking Behavior	Aggressive Behavior
Boys								
Active	1.9	4.4	5.0	1.5	1.7	2.5	7.7	7.5
Moderately active	4.2	7.6	4.1	3.5	1.3	3.2	7.9	6.7
Inactive	3.6	8.3	5.7	4.6	1.8	4.4	10.2	7.4
Girls								
Active	5.0	5.8	14.4	2.7	4.1	6.1	11.9	9.7
Moderately active	5.2	6.0	12.5	3.0	4.0	4.5	12.9	6.7
Inactive	6.7	9.6	17.6	6.3	4.1	10.8	19.8	9.9

[a] Includes individuals scored on borderline clinical range and clinical range in the syndrome scales.

[b] Physical activity level was defined according to weekly participation in moderate- to vigorous-intensity physical activity (MVPA): 1) Active (≥4 h of MVPA), 2) Moderately active (2–3 h of MVPA), and 3) Inactive (≤1 h of MVPA).

Stimulants and Academic Achievement

MTA Study: no SS improvement in reading or math scores

- Evans 2001: Lower doses MPH often better
- Jadad 1999 Review: performance not improved
- Barnard 2010: Generally positive but subset worse trajectory
- Dupaul 2006: Tutoring / Counseling moderate to good effect size
- Many studies: small effect size

Massetti 2007: 4 to 6 year olds over 8 year

- Inattentive subtype did worse
- Internalizing symptoms predicted poor outcome
- Conduct /ODD symptoms did not predict outcome
- Treatment was not a predictor of success

"ADHD treatments effect academic behavior, but not academic achievement"

Weight and ADHD

- Waring, Pediatrics 2008 / National Sample
- ADHD unmedicated 1.5x risk of being overweight
- ADHD medicated 1.6x risk of being underweight

- Bazar, 2005: Television oversampling?

Micronutrients

- Zinc / Iron supplementation beneficial
- Deficits of CU, Fe and Zn found

- Influence of Vitamins, Mineral and Essential Fatty Acid supplementation on Violent Behavior of Prisoners Gesch, Brit J Psych 2002

Lipids

Department of Agriculture 2005: 86 pounds per person added fats

Rise fueled by Trans Fat, Saturated Fat and Omega 6 FA rich corn and soybean

- High fat diet impairs cognition in animal models – Murray 2009, Faseb J

Omega 3 Fatty Acids: improves in specific cognitive functions

NIH: http://efaeducation.nih.gov/

Carbohydrates

- Department of Agriculture: 142 pounds per person added sweeteners in 2005
- Consumption of Soft Drinks and Hyperactivity... Lein, 2006 A J Public Health
- Many studies showing impairing effect of high simple carb breakfast (worse than no breakfast)

Preservatives and Additives

- Sodium Benzoate: Dengate, J Ped and Child health 2002
- Additives McCann Lancet 2007
- European Review of preservative and additives: 16 / 22 studies showed effects in some children EFSA J 2008

Chemicals and Additives

- Bisphenol A: Von Saal, 2005 Env. Health Perspective
- Phthalates: Kim, Biological Psych 2009
- Lead: Nigg 2010 Current Dir in Psych Science,
- Mercury: Ha 2009 Epidemiology

- *FIBER:* Ancestors 100 grams
- American 10-15 grams

Nature / Sunshine

- Vit D receptors in Brain and level tied to cognitive decline in elderly
- Animal models: low Maternal Vit leads to offspring with abnormal brain

- Exposure to Nature reduces ADHD symptoms, Kuo, A J Public Health

Behavioral training / Mindfulness

- Normalize brain also!
- Computer based training and biofeedback
- Mindfulness improves concentration
- Yoga / Karate: correct cerebeller disfunction

Sleep

- National public health crisis
- Lack of sleep decreases school performance

- Stimulant medications give false sense of confidence

Hallowell: "Without sleep you will look like you have ADHD, whether you have it or not"

2007 Medico Data: 2001-06 increase highest in younger adults

- Girls Type II DM up 167%
- Girls antipsychotics up 117%
- Girls Sleep Aids up 81%
- Boys antipsychotics up 71%
- Boys Type II DM up 33%
- Boys Sleep Aids up 64%

Misuse and Abuse

- Significant recent increase in ER visits for stimulants, Setlik Pediatrics 2009
- Selling / Trading common (about 25%)
- Diller: “up to speed for the SAT”

Risks

- Growth loss does occur, typically 1.2 to 2.4 cm if long term treatment (Shaw A J Psych)
- Psychosis at usual doses (and then a 2nd medication added to treat psychosis)

Cardiovascular Disease and Sudden Death

Sudden Death estimated at 0.6/100,000 vs. 4.5/100.000 on stimulants

- Unclear if EKG benefits outweigh costs, but is recommended by some
- Long term risk unknown

MTA Study

14 month randomized clinical trail / 10 Month evaluation period

- Naturalistic follow up now 10 years
- No control group

- Within 3 years all groups looks pretty much the same

After we trusted you!

The Ecological Model

- Slightly evolved primates
- Health, context, environment and skill building
- "Self Care is the heart of health care" - Gordon
- "In the long run, skills are as good as pills"

Rey, MJA 2008

THE END

- QUESTIONS????
- Comments?
- Kristopher Kaliebe, MD

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The Integrated Ecological System

Dubos, So Human an Animal (1968):

- An organism is healthy only within the context of his environment
- Man creates technologies before he knows how to use them wisely
- "Political and social mechanisms can neither predict or control the nefarious consequences of technological developments for economic purposes"