Just Say No
The case against stimulants

Kristopher Kaliebe, MD
Assistant Professor of Psychiatry
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
• 5.29% school-aged children

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

- Low Maternal Omega3 FA: Hibbeln 2010
- Low Maternal Folate: Schultz Brain & Beh 2009
- Maternal Smoking: Bruan J Env Health Perspectives 2007
- 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
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

<table>
<thead>
<tr>
<th>ADVANCED DEGREES 2008</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's</td>
<td>667,928</td>
<td>895,141</td>
</tr>
<tr>
<td>Master's</td>
<td>246,491</td>
<td>378,532</td>
</tr>
<tr>
<td>Doctor's</td>
<td>31,215</td>
<td>32,497</td>
</tr>
</tbody>
</table>
“The only place where success comes before work is in the dictionary,”

Richer by degrees
Change in real hourly earnings by education level 1979-2007, %

- Males
- Females

High school drop-out
High school graduate
Some college
College graduate
Postgraduate education

Sources: Centre for American Progress; Brookings Institution
Kaiser Foundation 2010

*Media in the lives of 8-18 year olds*

<table>
<thead>
<tr>
<th>Media Type</th>
<th>Boys:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>Average 90 min daily on consol video games, if at all</td>
</tr>
<tr>
<td>Video Games</td>
<td>Less time with music and print media</td>
</tr>
<tr>
<td>Computer</td>
<td>Less social networks / More gaming</td>
</tr>
<tr>
<td>MUSIC</td>
<td>2.29 hrs</td>
</tr>
<tr>
<td>Overall Exposure</td>
<td>10.5 hrs / 7.3 hrs</td>
</tr>
<tr>
<td>Total time</td>
<td>4.29 hrs 1.13 hrs 1.29 hrs</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Amount of use</th>
<th>Heavy</th>
<th>Moderate</th>
<th>Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail/ Poor Grades</td>
<td>47%</td>
<td>31%</td>
<td>23%</td>
</tr>
<tr>
<td>Get into trouble</td>
<td>33%</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>Often sad/unhappy</td>
<td>32%</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>Often Bored</td>
<td>60%</td>
<td>53%</td>
<td>48%</td>
</tr>
</tbody>
</table>
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
- 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
# Emotional and Behavioral Problems in relation to Physical activity in youth

**N=7001 Finish Birth Cohort**

## Table: Internalizing, Other, and Externalizing Syndromes (%)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>1.9</td>
<td>4.4</td>
<td>5.0</td>
<td>1.5</td>
<td>1.7</td>
<td>2.5</td>
<td>7.7</td>
<td>7.5</td>
</tr>
<tr>
<td>Moderately active</td>
<td>4.2</td>
<td>7.6</td>
<td>4.1</td>
<td>3.5</td>
<td>1.3</td>
<td>3.2</td>
<td>7.9</td>
<td>6.7</td>
</tr>
<tr>
<td>Inactive</td>
<td>3.6</td>
<td>8.3</td>
<td>5.7</td>
<td>4.6</td>
<td>1.8</td>
<td>4.4</td>
<td>10.2</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>Girls</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>5.0</td>
<td>5.8</td>
<td>14.4</td>
<td>2.7</td>
<td>4.1</td>
<td>6.1</td>
<td>11.9</td>
<td>9.7</td>
</tr>
<tr>
<td>Moderately active</td>
<td>5.2</td>
<td>6.0</td>
<td>12.5</td>
<td>3.0</td>
<td>4.0</td>
<td>4.5</td>
<td>12.9</td>
<td>6.7</td>
</tr>
<tr>
<td>Inactive</td>
<td>6.7</td>
<td>9.6</td>
<td>17.6</td>
<td>6.3</td>
<td>4.1</td>
<td>10.8</td>
<td>19.8</td>
<td>9.9</td>
</tr>
</tbody>
</table>

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**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
- Dupaual 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 cerebellar dysfunction
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 2\textsuperscript{nd} 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 trial / 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

Hate mail: kkalie@lsuhsc.edu
Cell: 504 782 9070
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”