Childhood Obesity Prevention Conference

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I have nothing to disclose...*

* And I am not particularly proud of it!
Major Take Home Messages

1. Obesity is a biologically difficult and challenging condition
2. Early-life obesity tracks across the lifespan
3. Evidence is growing to support the value of early identification
4. Interventions that involve increasing physical activity are essential
1. Obesity is a biologically difficult and challenging condition
How did we get into this mess?
A Tale of Two Cell-Types

Leukemic Cells

Fat Cells
## COMPARE AND CONTRAST: TWO TROUBLING PEDIATRIC DISEASES

<table>
<thead>
<tr>
<th></th>
<th>Leukemia</th>
<th>Obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Occurrence</strong></td>
<td>4.1 cases annually per 100,000 children &lt;15 y.o.</td>
<td>16,000 per 100,000 children &lt;15 y.o.</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>If untreated, invariably fatal</td>
<td>If untreated, few fatalities in children; but many comorbidities</td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td>Haven’t the foggiest.</td>
<td>Not rocket science.</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Up to 90% longterm survival</td>
<td>Unknown and controversial</td>
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</table>
Why is it happening?

ENERGY INTAKE  ENERGY EXPENDITURE
Mammals Protect Stored Fat—Hibernation and Migration
Modern Hunter-Gatherers Show Value of Exercise

UA anthropologist David Raichlen discovered that the Hadza, an indigenous ethnic group in Tanzania, meet the U.S. government’s weekly physical activity recommendations in only two days.
Physical activity patterns and biomarkers of cardiovascular disease risk in hunter-gatherers


- We show that Hadza participants spend large amounts of time in moderate-to-vigorous physical activity (MVPA) and maintain these activity levels across the lifespan.

- In fact, the Hadza engage in over 14 times as much MVPA as subjects participating in large epidemiological studies in the United States.

- We found no evidence of risk factors for cardiovascular disease in this population (low prevalence of hypertension across the lifespan, optimal levels for biomarkers of cardiovascular health).
Online Grocery Shopping

10 Reasons to Give it a Try
It's changed this mom's life!

HarvardHomemaker.com
A Tale of Two Orange County Schools
Fifth Graders that Need Improvement*

Percent of 5th Graders

Aerobic Fitness

Body Composition

Madison Elementary (Santa Ana)

Turtle Rock Elementary (Irvine)

*Data from California Department of Education Fitnessgram (2015)
% Obese Children in Four OC Cities

<table>
<thead>
<tr>
<th>City</th>
<th>Median Family Income</th>
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<tbody>
<tr>
<td>Anaheim</td>
<td>$59k</td>
</tr>
<tr>
<td>Santa Ana</td>
<td>$61k</td>
</tr>
<tr>
<td>Fountain Valley</td>
<td>$81k</td>
</tr>
<tr>
<td>Irvine</td>
<td>$92k</td>
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</tbody>
</table>

% Children in Obese Weight Category

- Anaheim: 26%
- Santa Ana: 16%
- Fountain Valley: 5%
- Irvine: 7%
2. Early-life obesity tracks across the lifespan
Medical Conditions Associated with Obesity

- Metabolic Syndrome
- Diabetes
- ↑CV disease risk
- Depression
- Learning disorders
- Liver disease
CONCLUSIONS
Incident obesity between the ages of 5 and 14 years was more likely to have occurred at younger ages, primarily among children who had entered kindergarten overweight.
3. Evidence is growing to support the value of early identification
Childhood fitness reduces the long-term cardiometabolic risks associated with childhood obesity


A 20-year follow-up of 1,792 adults studied originally when they were 7–15 years of age.
• Childhood waist circumference and cardiorespiratory fitness are both strongly associated with cardiometabolic health in later life.

• Higher levels of cardiorespiratory fitness during childhood substantially reduce the risk of adult metabolic syndrome, even among those with abdominal obesity in childhood
4. Interventions that involve increasing physical activity are essential
Exercise and Growth: A Naïve Framework (by me) in 1982
Children—Not just miniature adults...

Exercise is Essential for Healthy Growth and Development
CRITICAL PERIODS OF GROWTH:

Exercise In Neonatal Rats Increases Muscle Mass Later In Life

A Simple View of Growth Regulation: Circa late 1980s
Thanks for your attention!