



Childhood Obesity Prevention Conference

Dan M. Cooper MD

Associate Vice Chancellor for Clinical
and Translational Science

Professor of Pediatrics

Principal Investigator

UCI Irvine Institute for Clinical and
Translational Science

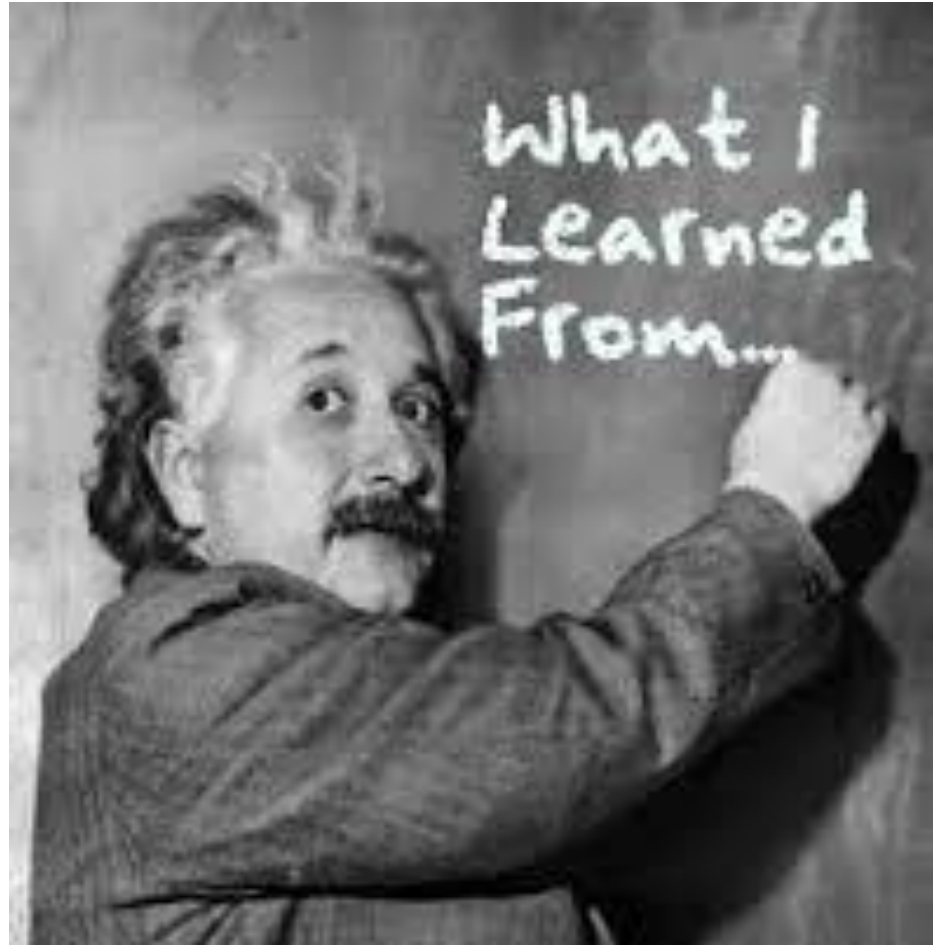
I have nothing to disclose...*



* And I am not particularly proud of it!

Major Take Home Messages

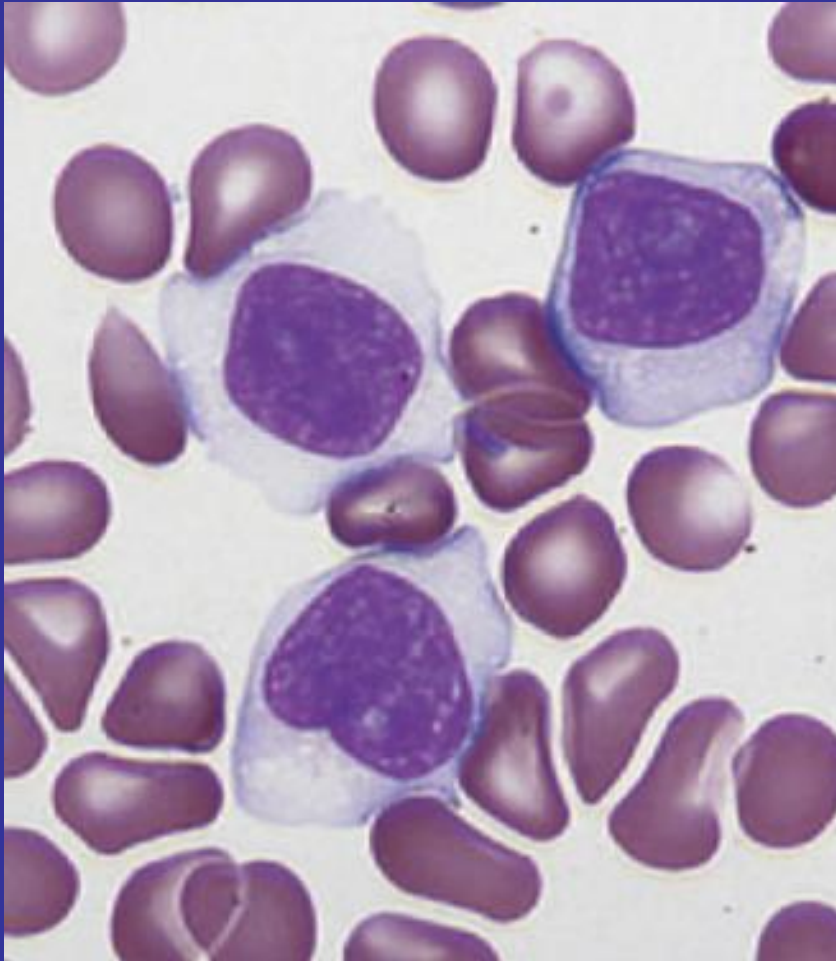
1. Obesity is a biologically difficult and challenging condition
2. Early-life obesity tracks across the lifespan
3. Evidence is growing to support the value of early identification
4. Interventions that involve increasing physical activity are essential



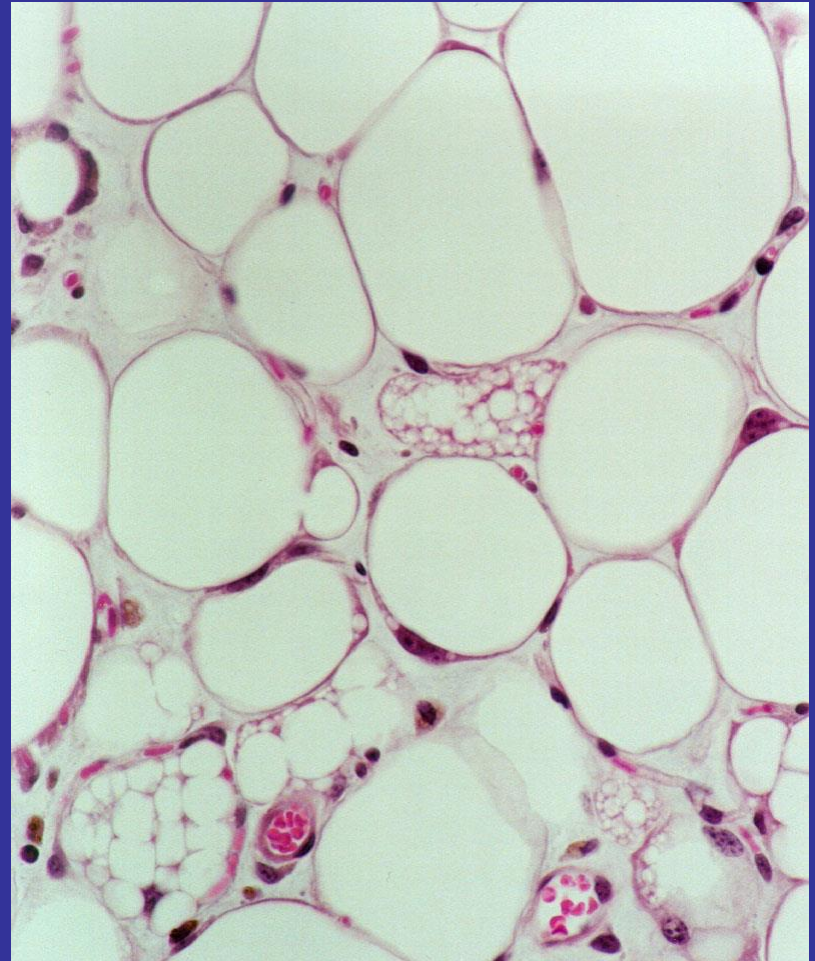
1. Obesity is a biologically difficult and challenging condition



How did we get into this mess? A Tale of Two Cell-Types



Leukemic Cells



Fat Cells

COMPARE AND CONTRAST: TWO TROUBLING PEDIATRIC DISEASES

Leukemia

Obesity

Occurrence

4.1 cases annually per 100,000 children <15 y.o.

16,000 per 100,000 children <15y.o.

Outcome

If untreated, invariably fatal

If untreated, few fatalities in children; but *many* comorbidities

Cause

Haven't the foggiest.

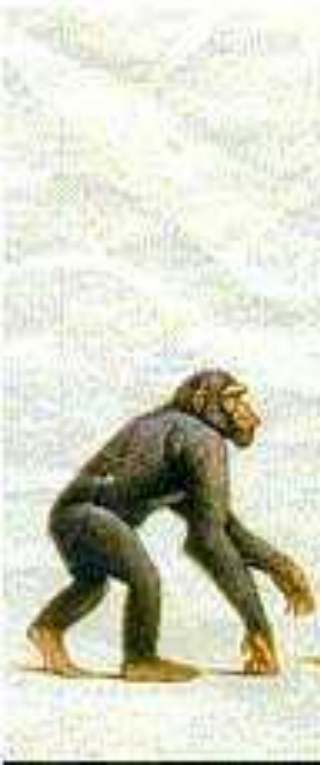
Not rocket science.

Treatment

Up to 90% longterm survival

Unknown and controversial

Why is it happening?



Mammals Protect Stored Fat—Hibernation and Migration





The Hadza people, in north-central Tanzania, are among the last hunter-gatherers on Earth. (Photo: Brian Wood)

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

Raichlen et al. *Am J Hum Biol.* 2017;29:e22919.

- 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

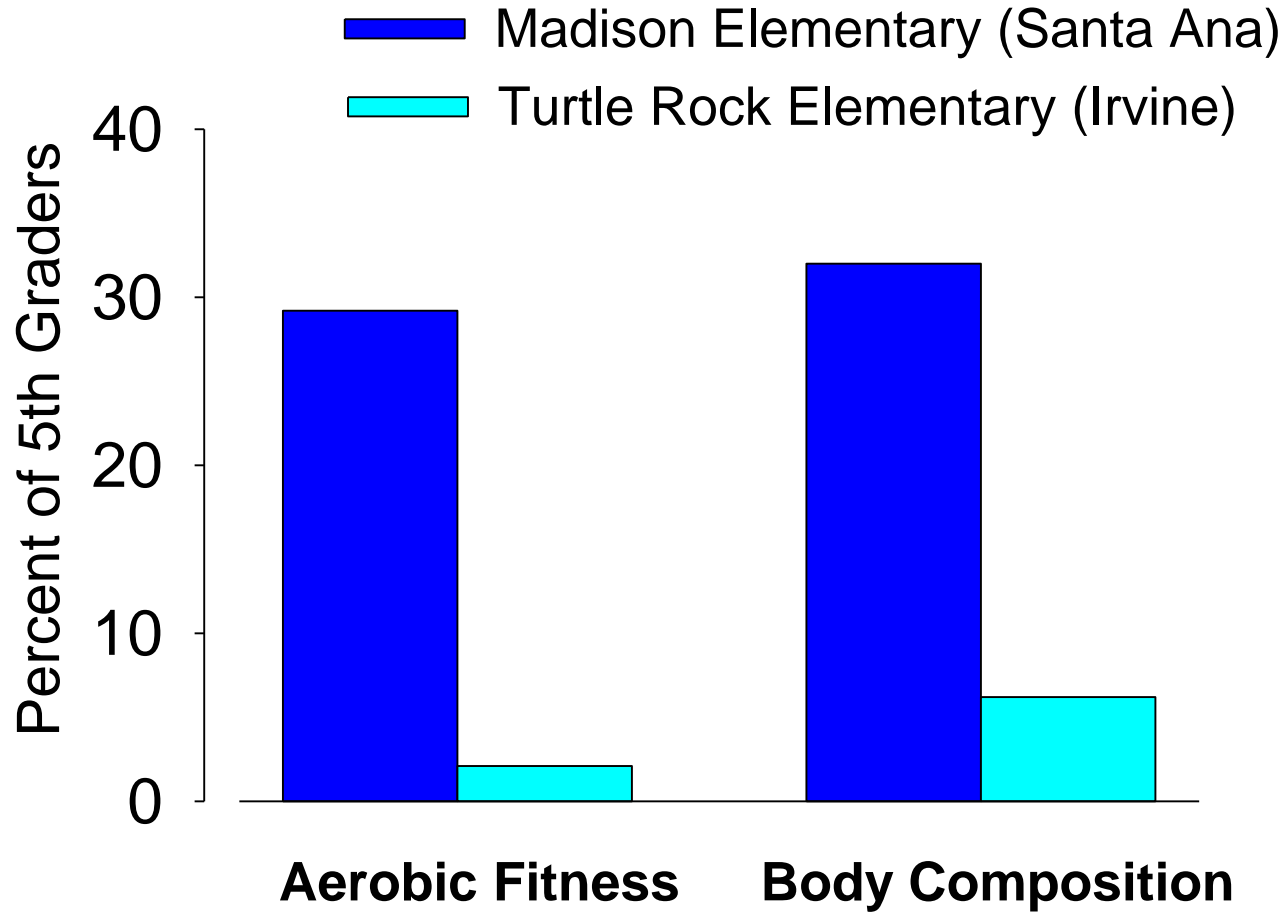
It's changed this mom's life!



HARVARDHOMEMAKER.COM

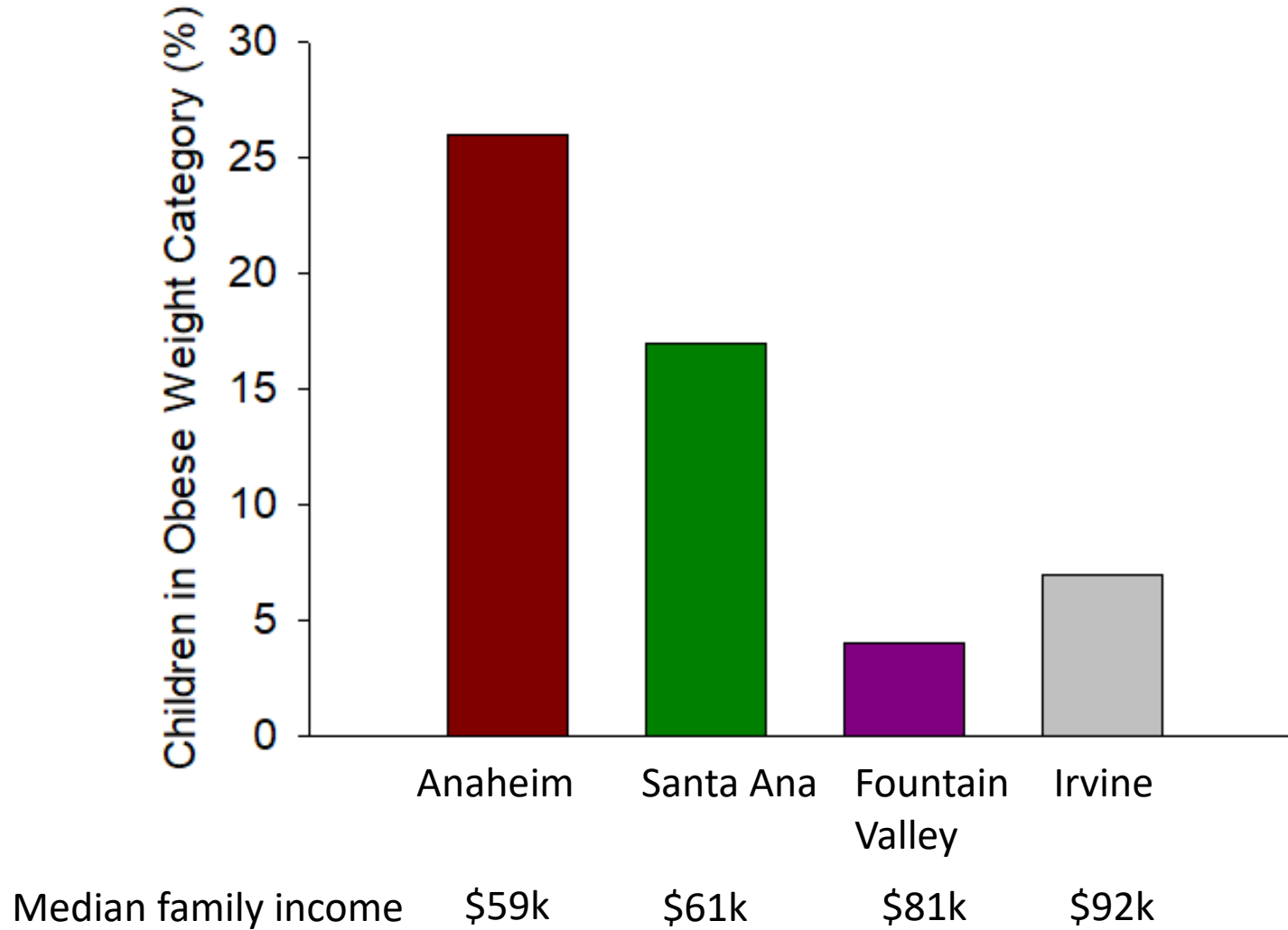
A Tale of Two Orange County Schools

*Fifth Graders that Need Improvement**



*Data from California Department of Education
Fitnessgram (2015)

% Obese Children in Four OC Cities



2. Early-life obesity tracks across the lifespan



Medical Conditions Associated with Obesity

- Metabolic Syndrome
- Diabetes
- ↑CV disease risk
- Depression
- Learning disorders
- Liver disease



The NEW ENGLAND
JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

JANUARY 30, 2014

VOL. 370 NO. 5

Incidence of Childhood Obesity in the United States

Solveig A. Cunningham, Ph.D., Michael R. Kramer, Ph.D., and K.M. Venkat Narayan, M.D.

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

Schmidt et al. *International Journal of Obesity* (2016) 40, 1134–1140

a 20-year follow-up of 1,792 adults studied originally when they were 7–15 years of age.

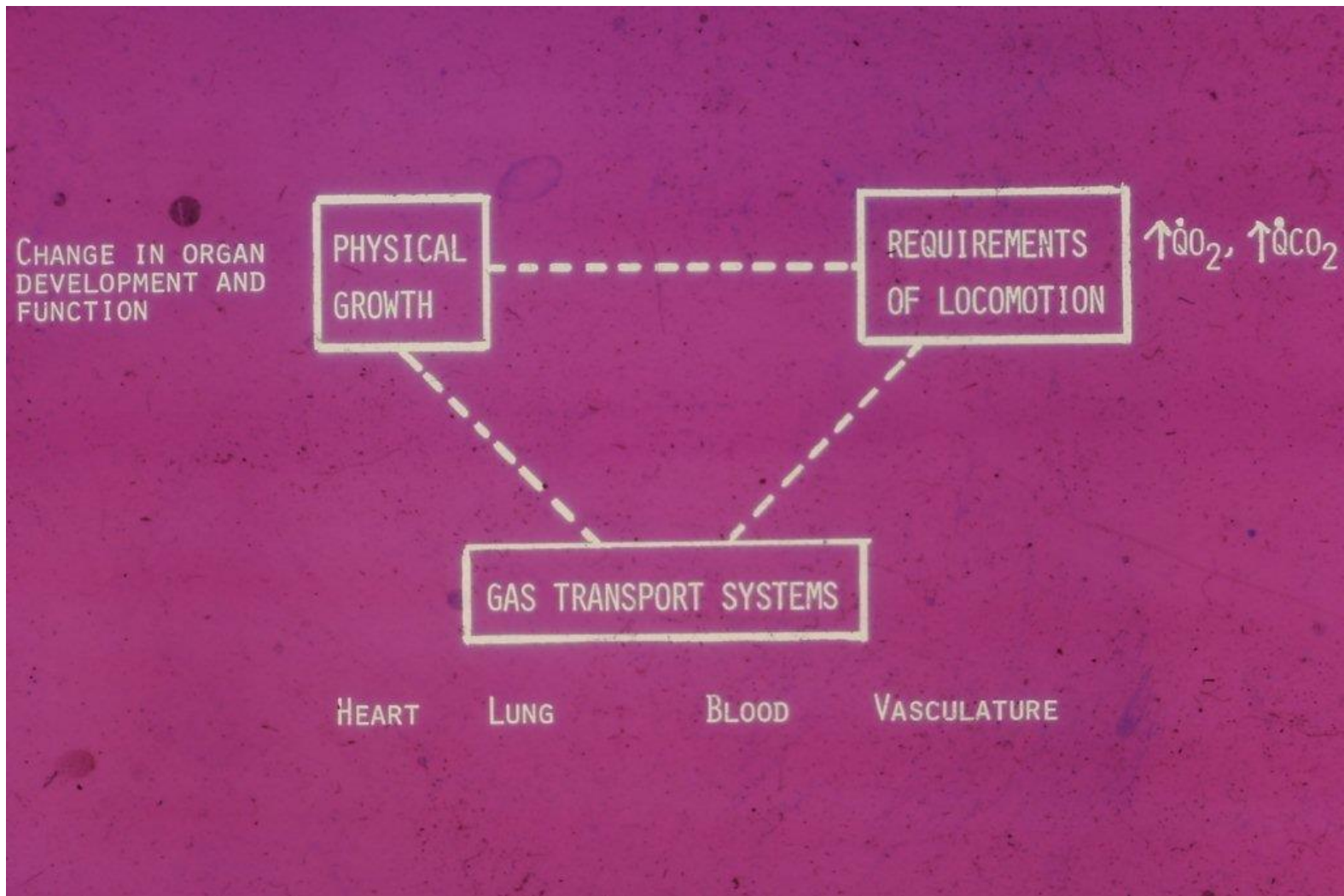


- Childhood waist circumference and cardiorespiratory fitness are both strongly associated with cardiometabolic health in later life.
- Higher levels of cardiorespiratory fitness during childhood substantially reduce the risk of adult metabolic syndrome, even among those with abdominal obesity in childhood

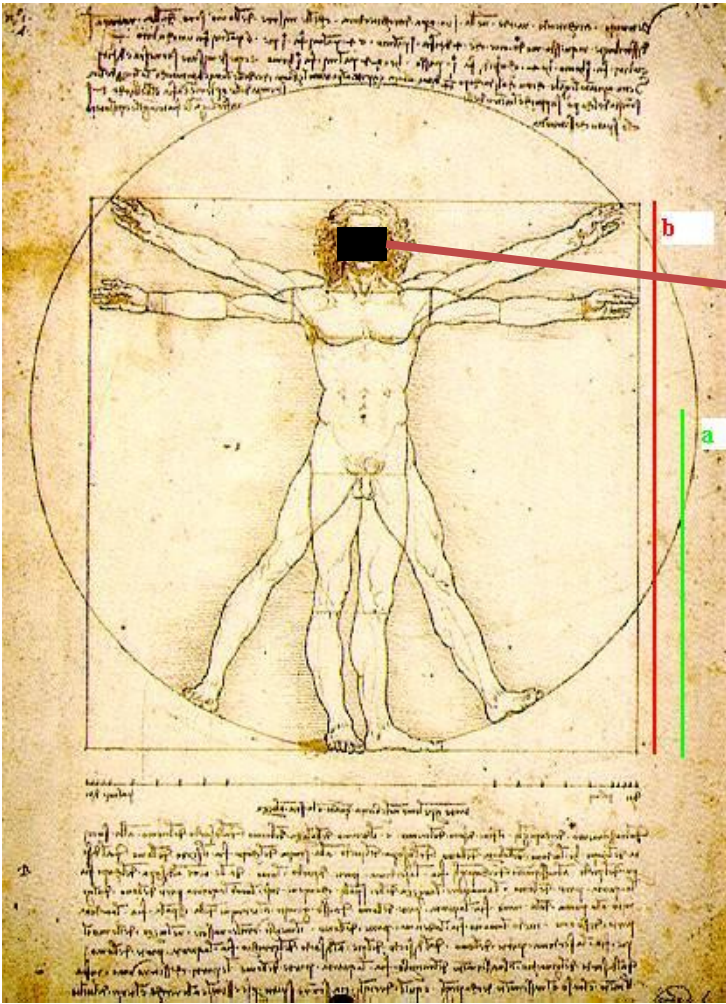
4. Interventions that involve increasing physical activity are essential



Exercise and Growth: A Naïve Framework (by me) in 1982



Children—Not just miniature adults...

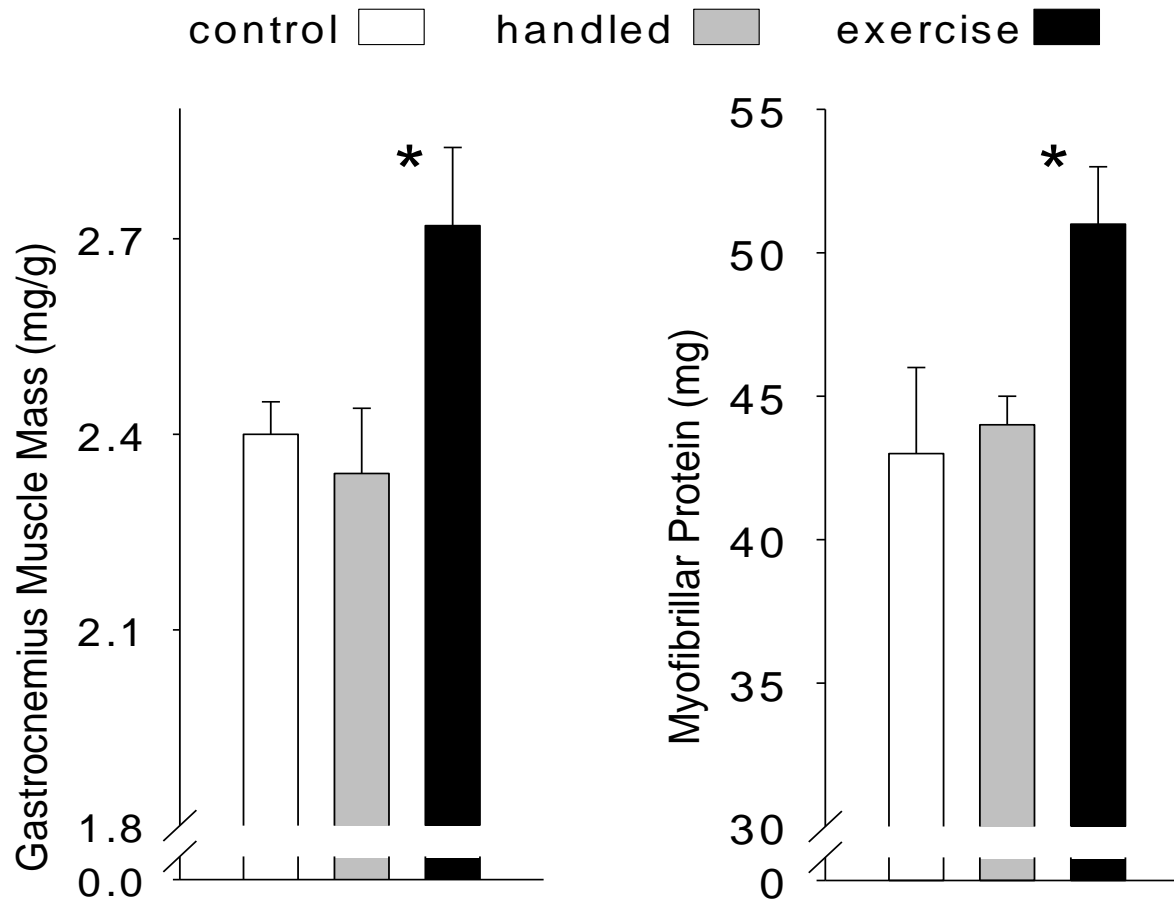


De-Identification
required by
HIPAA

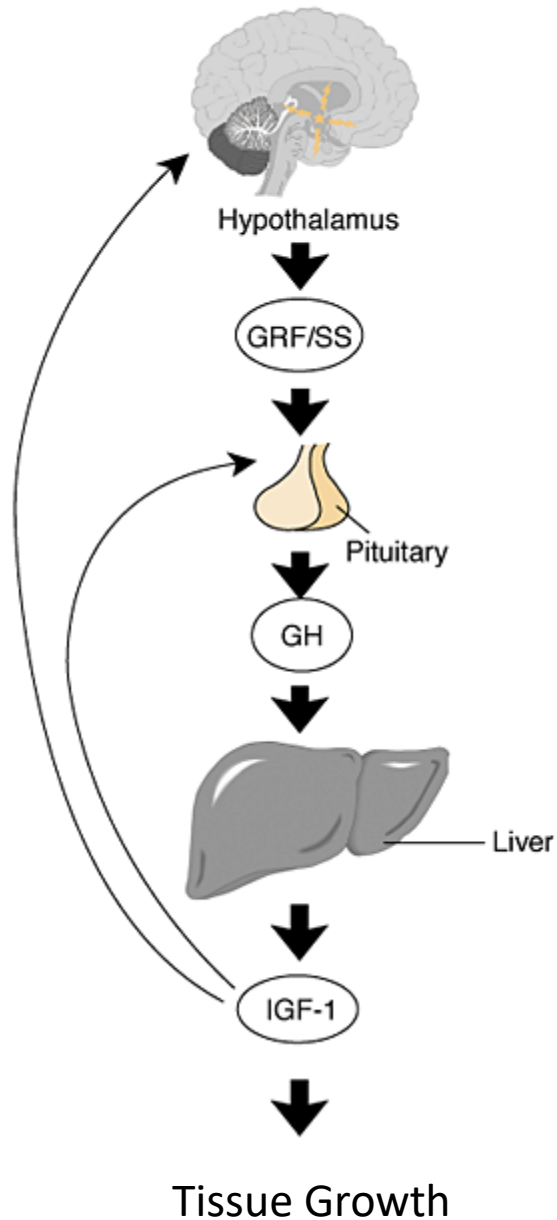
Exercise is Essential for Healthy Growth and Development

CRITICAL PERIODS OF GROWTH:

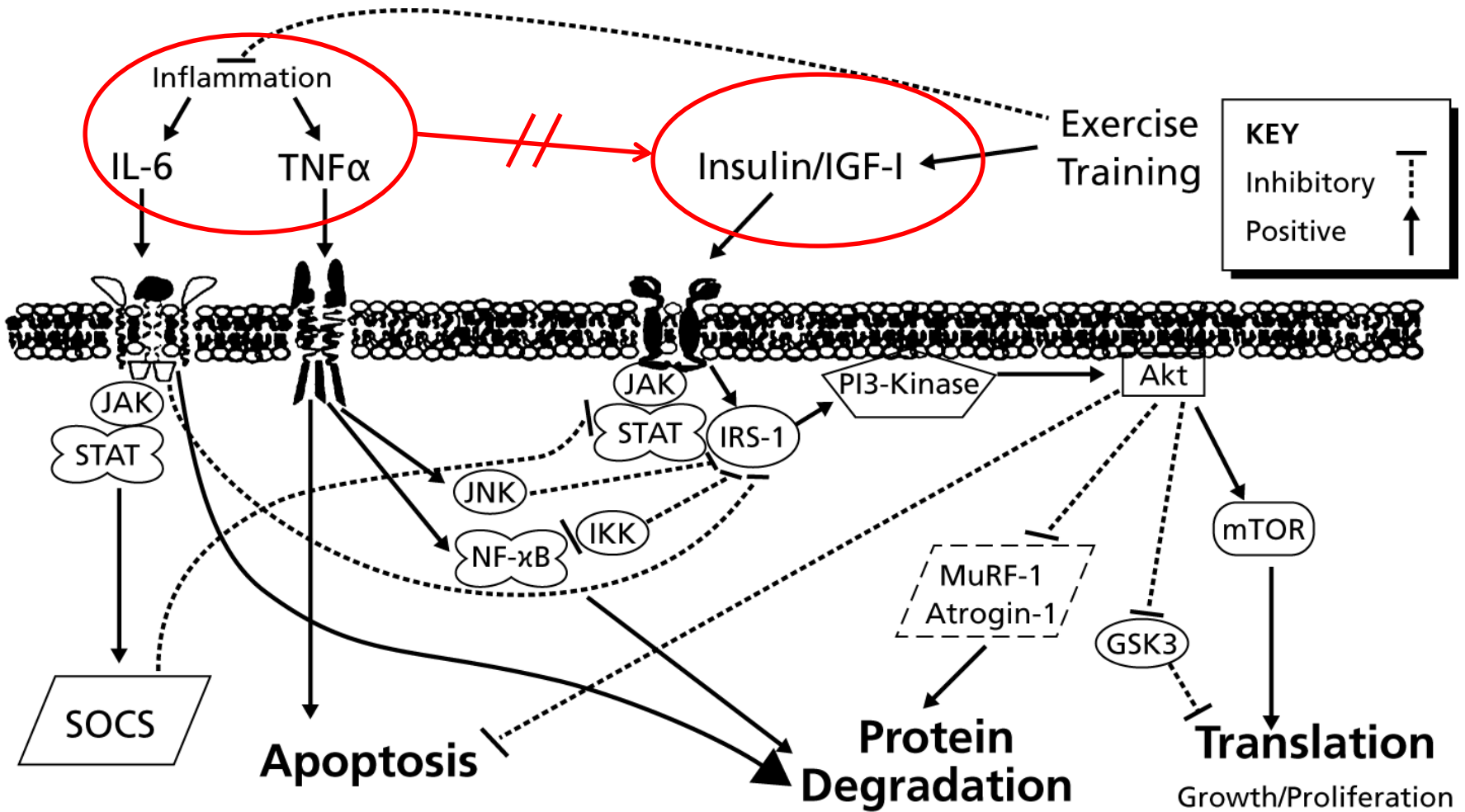
Exercise In Neonatal Rats Increases Muscle Mass Later In Life



Buchowicz et al. Pediatr Res. 2010 Nov;68(5):399-404



A Simple View of
Growth Regulation:
Circa late 1980s





Thanks for
your
attention!