Behavioural Determinants of Health: Fitness, Nutrition and Weight Management

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CHEO
Research Institute
Healthy Active Living and Obesity Research

Institut de recherche
Recherche sur les saines habitudes de vie et l'obésité

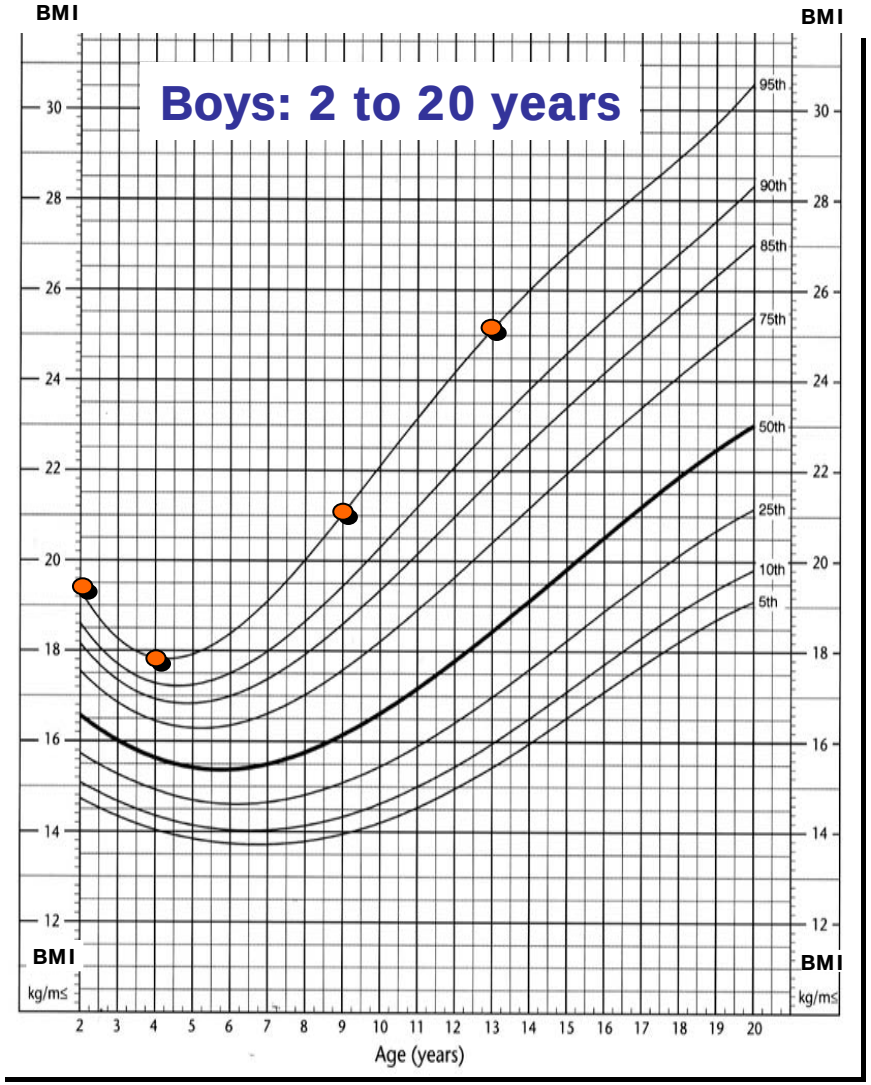
Sobering Stats

- Obesity is the 5th leading cause of death globally
  - 44% of diabetes attributed to OB
  - 23% of heart disease
  - 7-41% of certain cancers
- 65% of the world's population live in countries where overweight and obesity causes more deaths than underweight

Who is overweight and obese?

- BMI is wt/ht^2 (kg/m^2)
- Kids
  - OBESE >95th %ile BMI-for-age
  - OW 85-95th %ile BMI-for-age
- Adults (≥ 20 years)
  - Overweight: BMI ≥ 25 < 30
  - Obesity: BMI ≥ 30

For Children, BMI Changes with Age

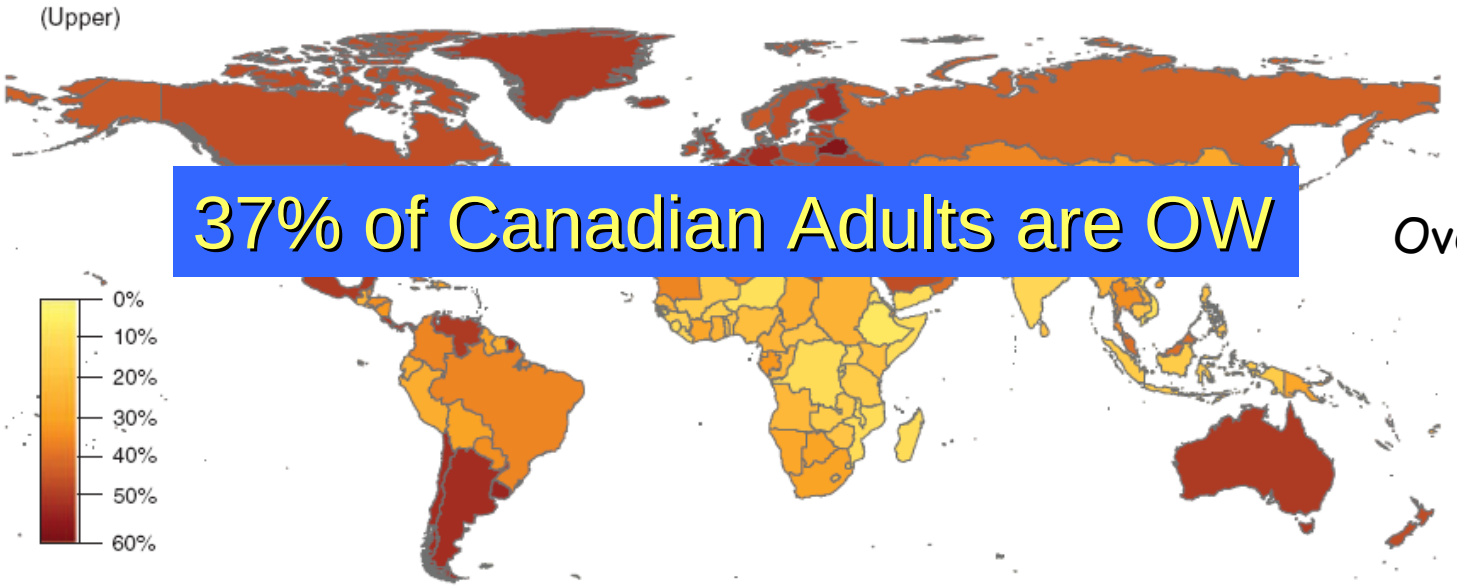


Example: 95th %ile Tracking

Age	BMI
2 yrs	19.3
4 yrs	17.8
9 yrs	21.0
13 yrs	25.1

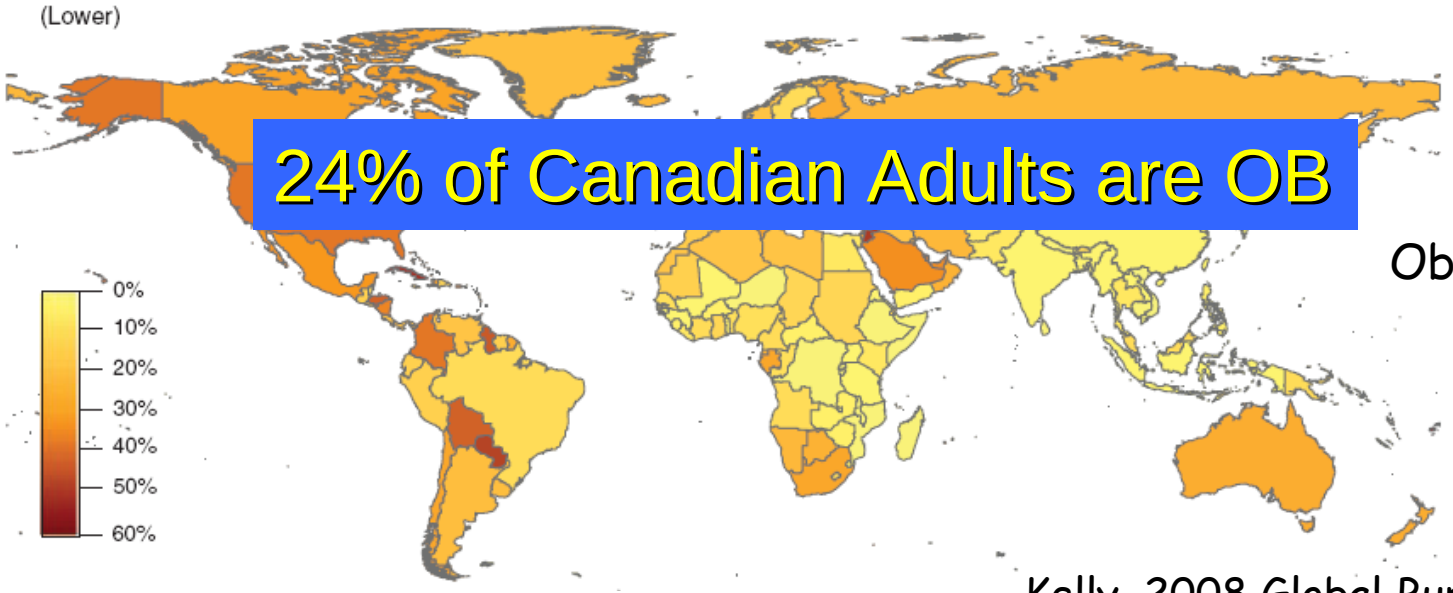
How big is the problem?

'GLOBESITY'



37% of Canadian Adults are OW

Overweight

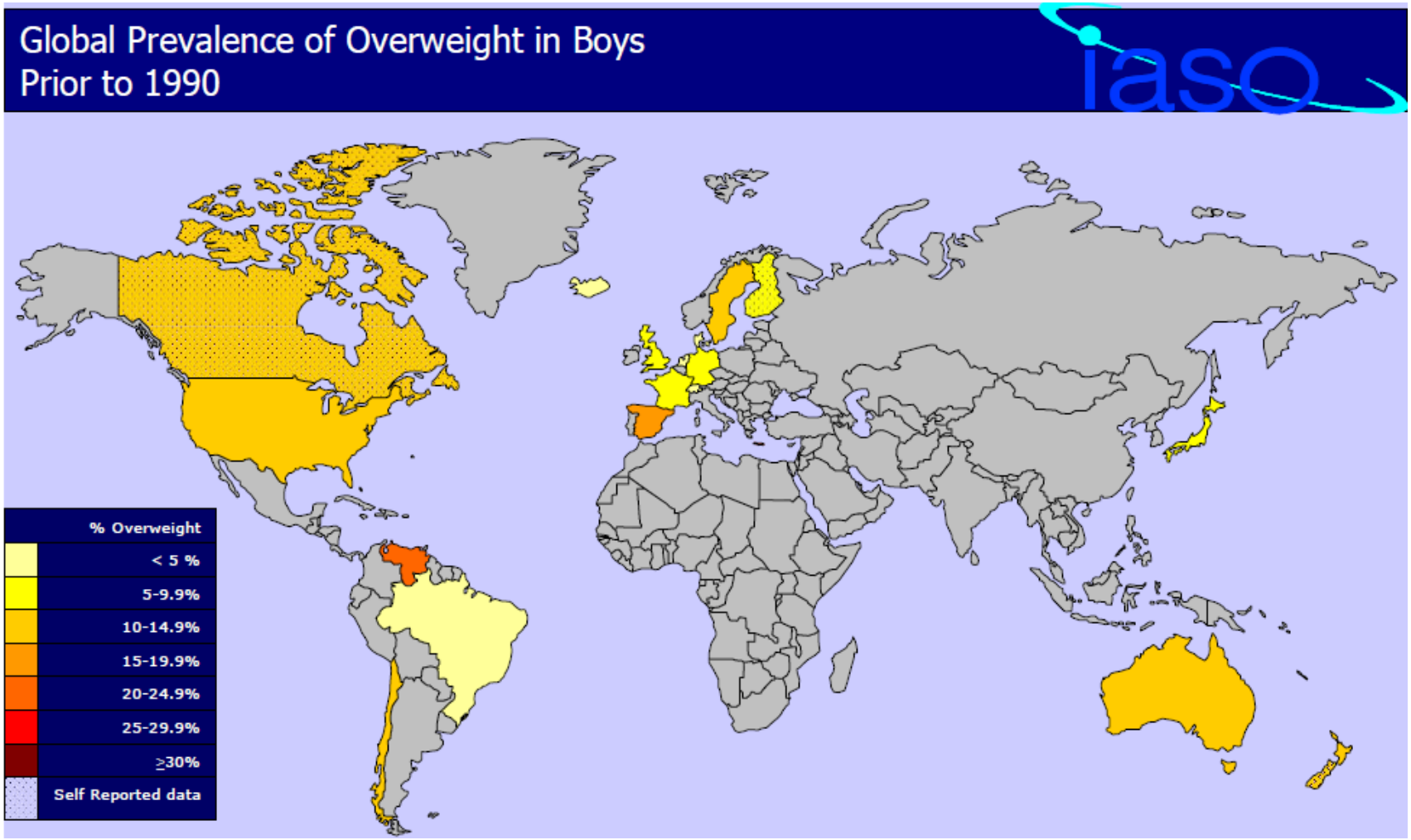


24% of Canadian Adults are OB

Obese

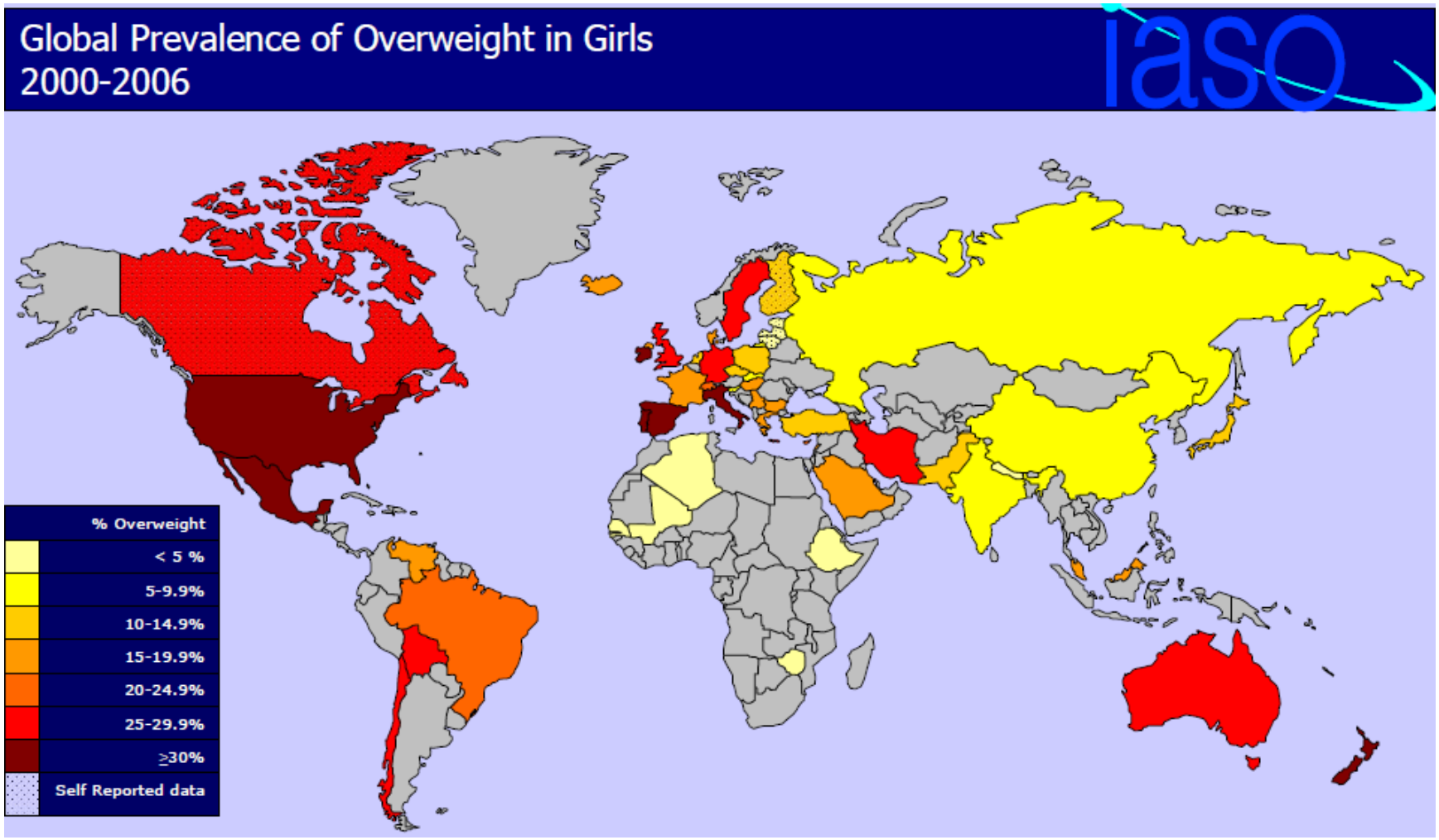
Kelly, 2008 Global Burden

Global Trends in Childhood Overweight



International Obesity Taskforce. **http://www.iotf.org/database/index.asp.**

Global Trends in Childhood Overweight



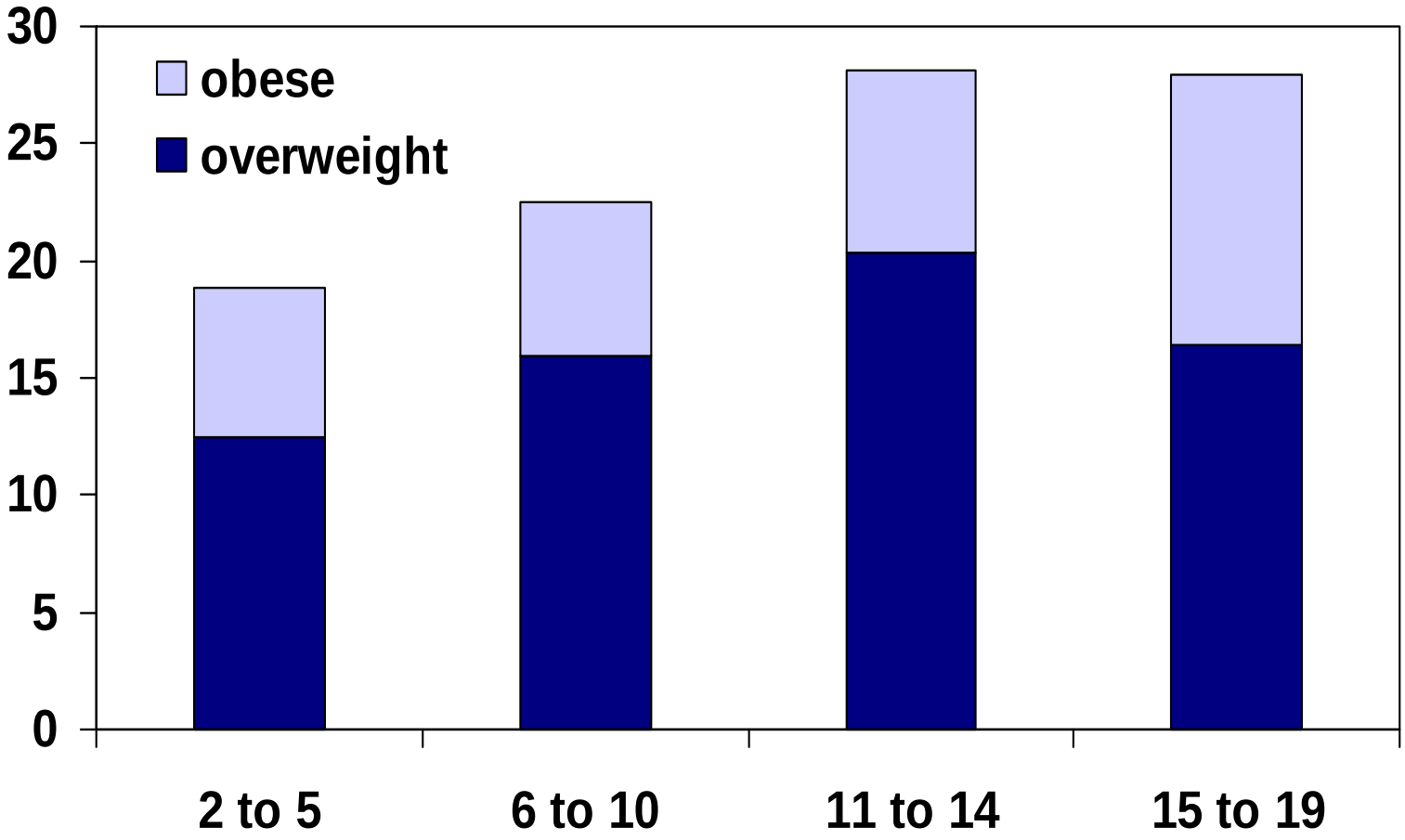
International Obesity Taskforce. **http://www.iotf.org/database/index.asp.**

Childhood Obesity – A Global Problem

Country	OW or OB
USA 	35%
Canada 	26%
Australia 	23%
Kenya 	12% (urban)

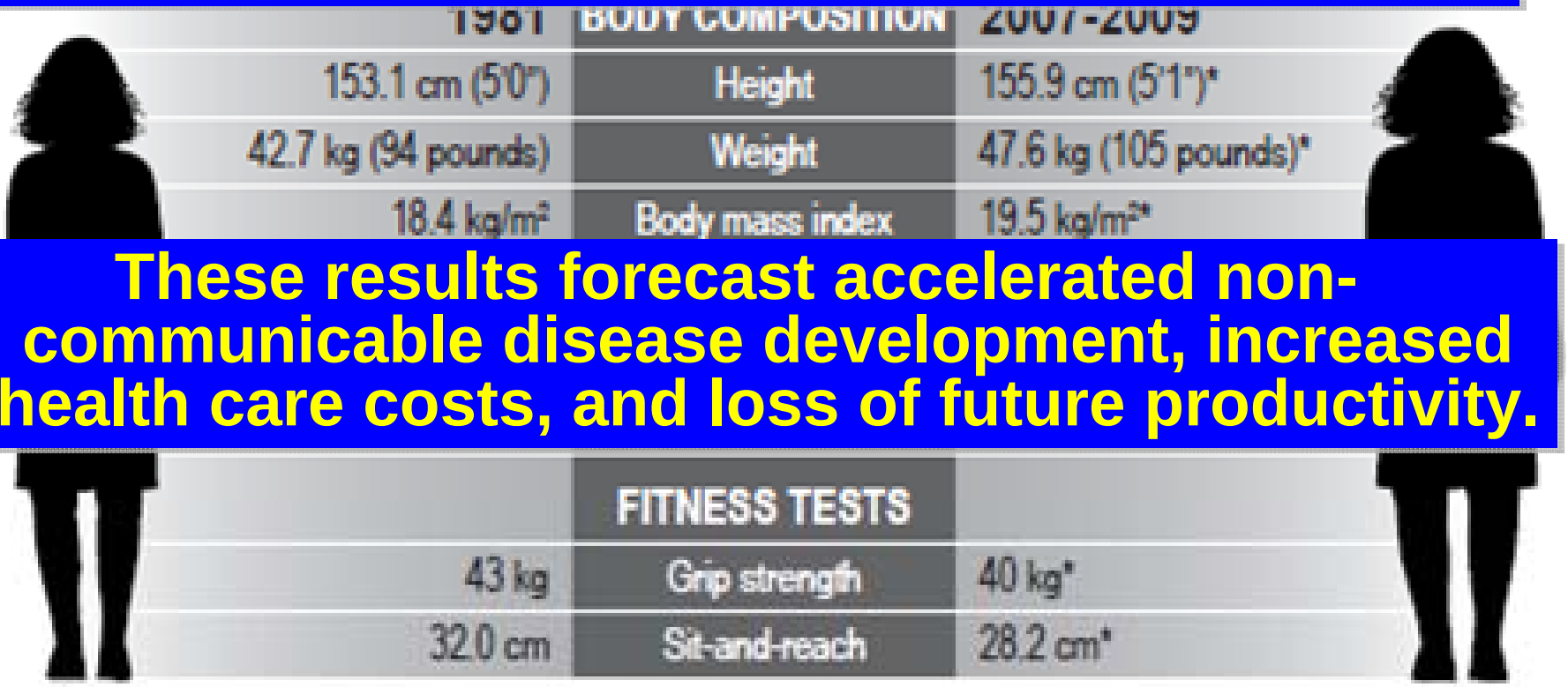
~25% of the world's children are overweight or obese

Percentage of Canadian Children aged 2-19 years Overweight or Obese



Portrait of a typical Canadian 12 year

Canadian children today are taller, heavier, fatter, rounder, weaker and less flexible than in 1981.

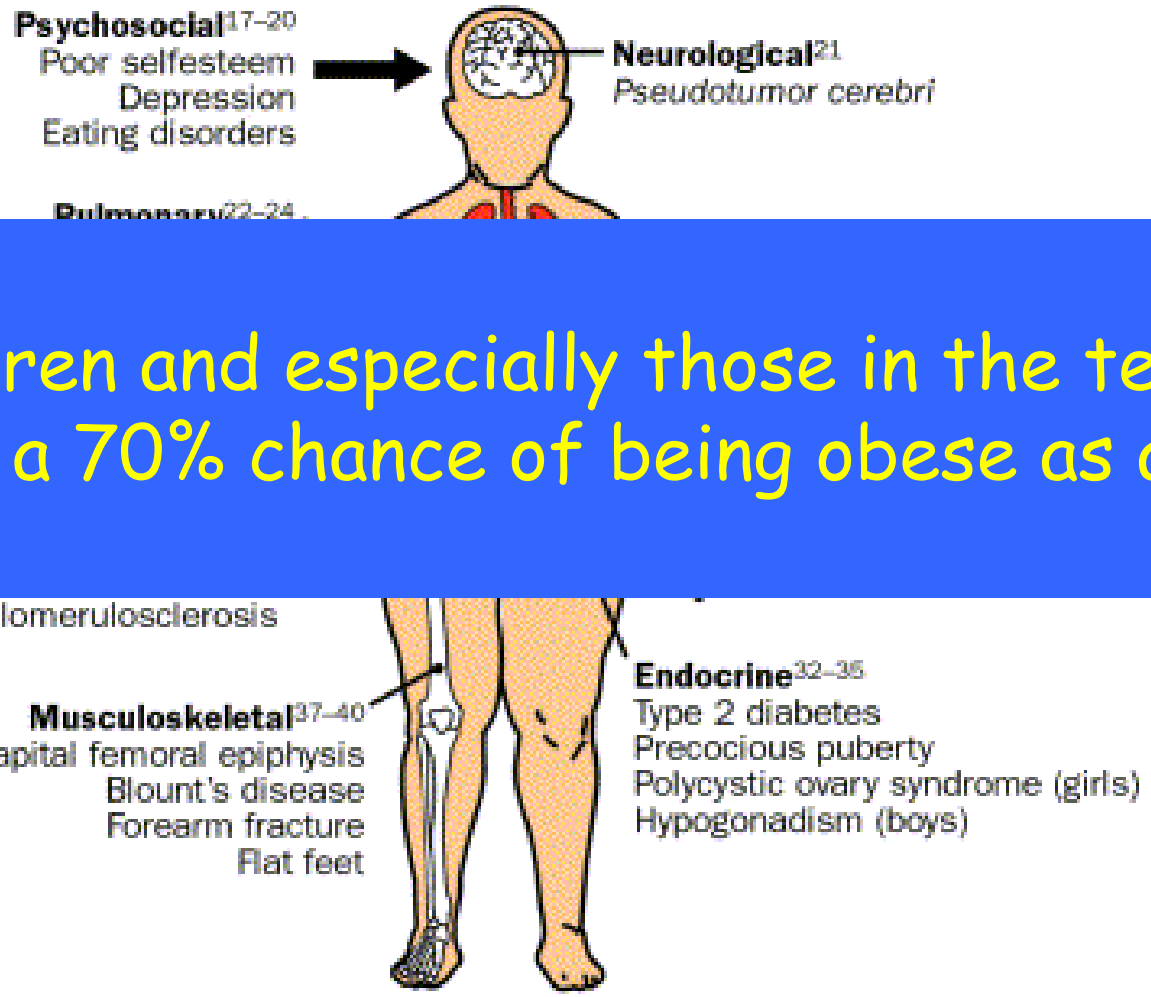


1981	BODY COMPOSITION	2007-2009
153.1 cm (5'0")	Height	155.9 cm (5'1")*
42.7 kg (94 pounds)	Weight	47.6 kg (105 pounds)*
18.4 kg/m²	Body mass index	19.5 kg/m²*
	FITNESS TESTS	
43 kg	Grip strength	40 kg*
32.0 cm	Sit-and-reach	28.2 cm*

These results forecast accelerated non-communicable disease development, increased health care costs, and loss of future productivity.

Tremblay et al. Health Reports, 2010

Overweight leads to health problems, even in kids



obese children and especially those in the teenage years have a 70% chance of being obese as adults

Ebbeling CB, et al. *Lancet.* 2002;360:473-482.

Not all obesity is the same: Distribution of fat

Metabolically Healthy Obese (MHO)

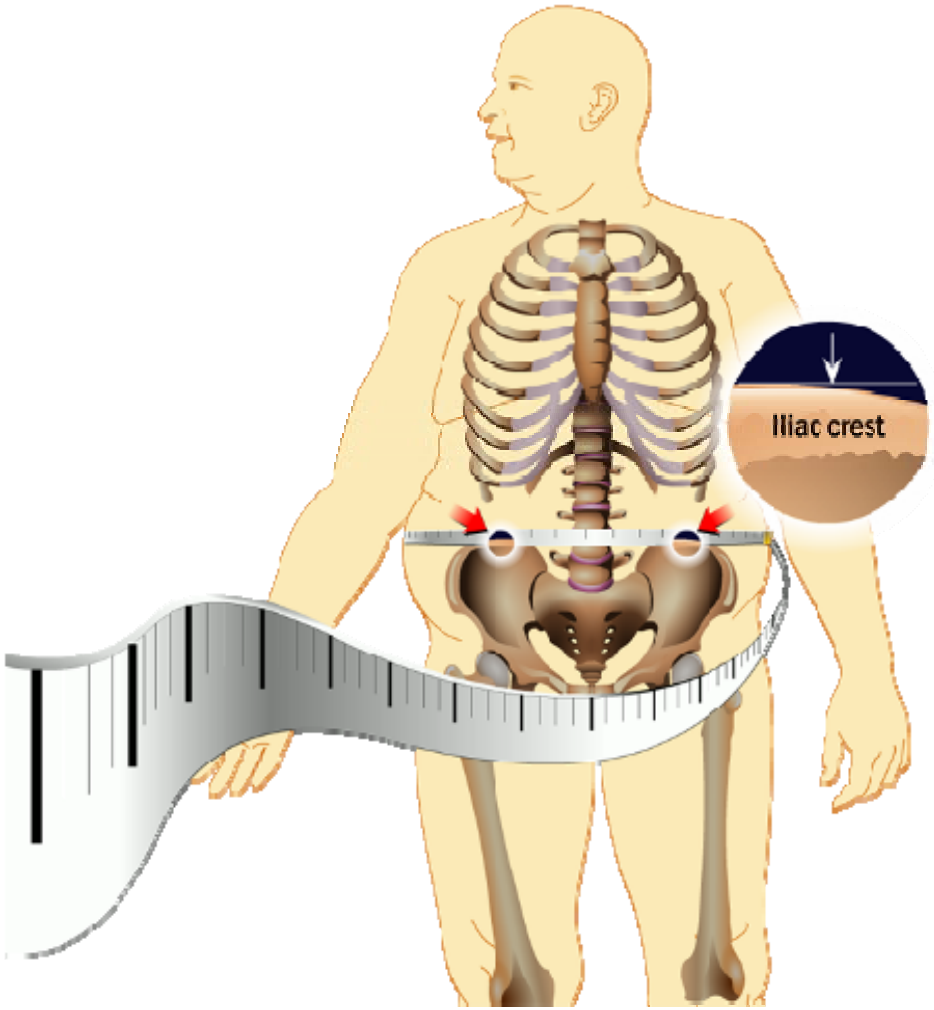
Low Visceral Fat
High BMI
High Fat mass
High Insulin Sensitivity
High HDL
Low Triglycerides

"At Risk" Obese

High Visceral Fat
High BMI
High Fat mass
Low Insulin Sensitivity
Low HDL
High Triglycerides

- A preponderance of fat in the abdomen, upper body and trunk is predictive of diabetes and CVD
- Increased visceral fat results in worsening of insulin resistance

Waist circumference measurement

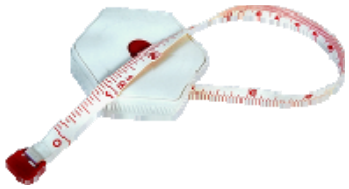


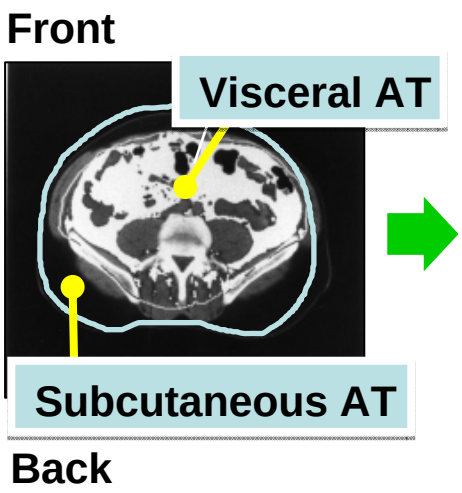
The waist circumference is measured by locating the upper hip bone and the top of the right iliac crest and placing a measuring tape in a horizontal plane around the abdomen at the level of the iliac crest.

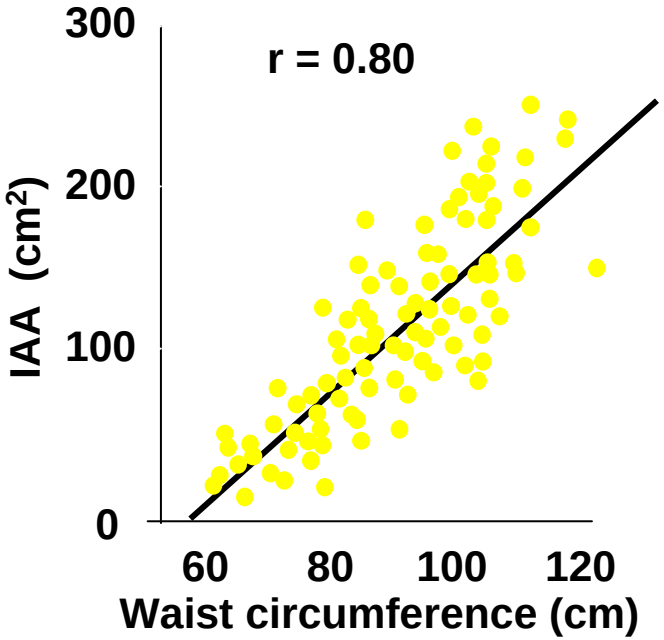
The measurement is made at the end of normal expiration.

Douketis JD, et al. *CMAJ.* 2005;172:995-998.

Waist Circumference Correlates Closely with Intra-Abdominal Adiposity (IAA)





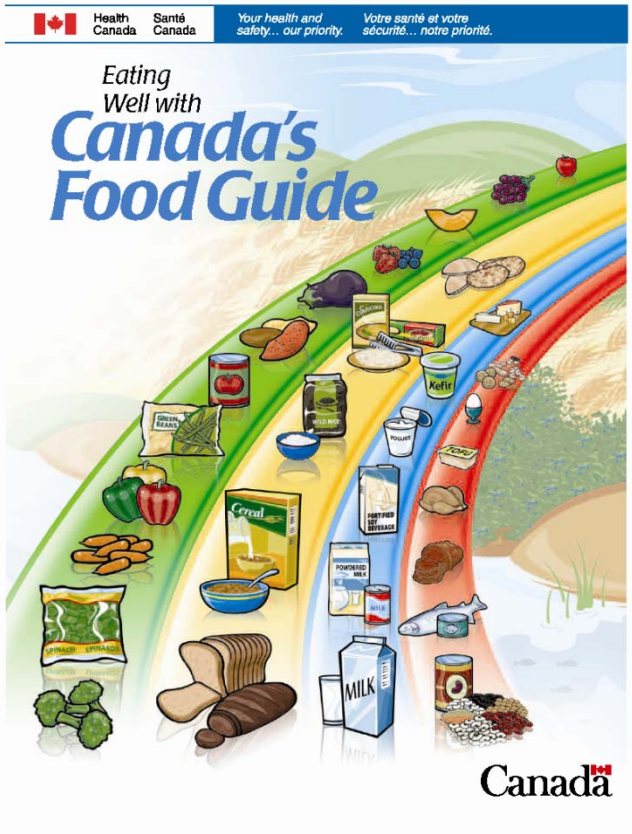


To assess IAA, the simplest anthropometric index is the measurement of waist circumference, which is strongly correlated with direct measurement of IAA by CT scan or MRI, considered to be the gold standard

AT: adipose tissue

Pare A et al. *Obes Res*. 9(9):526-34; 2001

NUTRITION FOR HEALTH



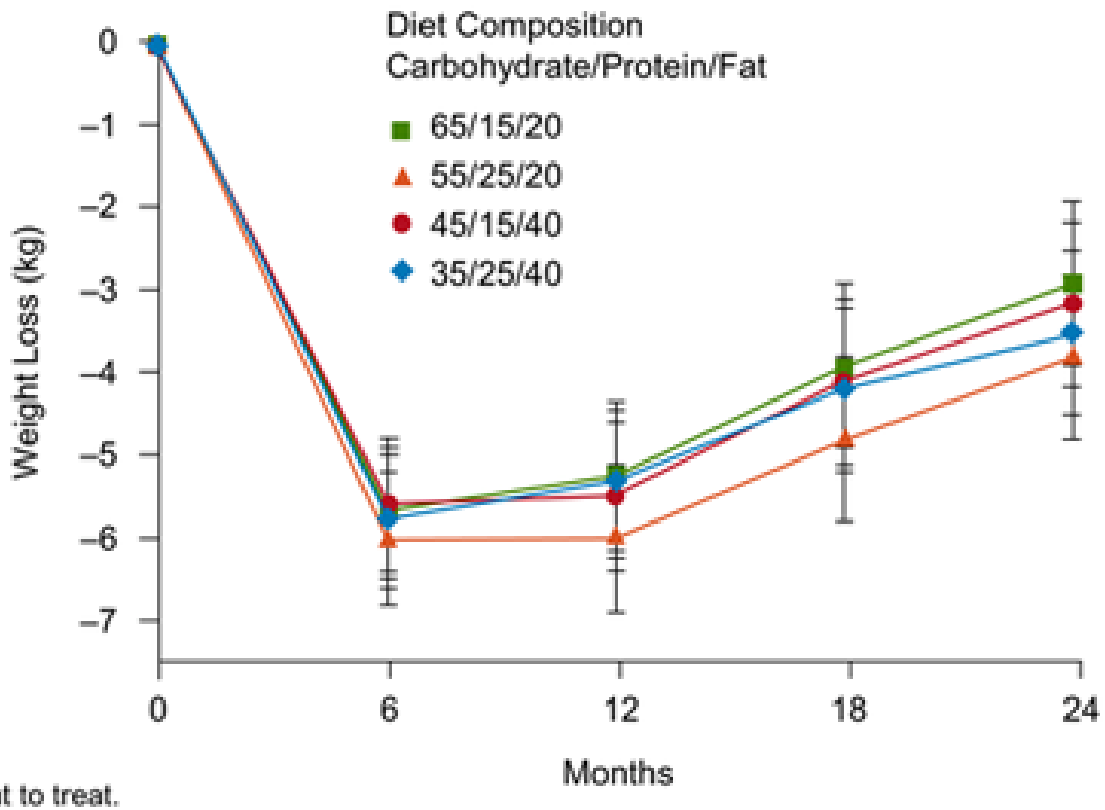
OBTAINING ESSENTIAL NUTRIENTS

Macronutrients

- **CHO = ~ 4 kcal/g**
  - Simple (sugar), complex (grains, cereal, fruit, starch)
  - Glycogen- storage form
  - Fibre (25g/d recommended for females and 38g/d for males)
- **Proteins = ~ 4 kcal/g**
  - Made up of amino acids (essential & non-essential)
- **Fat = 9 kcal/g (alcohol = 7 kcal/g)**
  - Unsaturated + polyunsaturated, Saturated, processed or trans fat

Does diet composition matter?

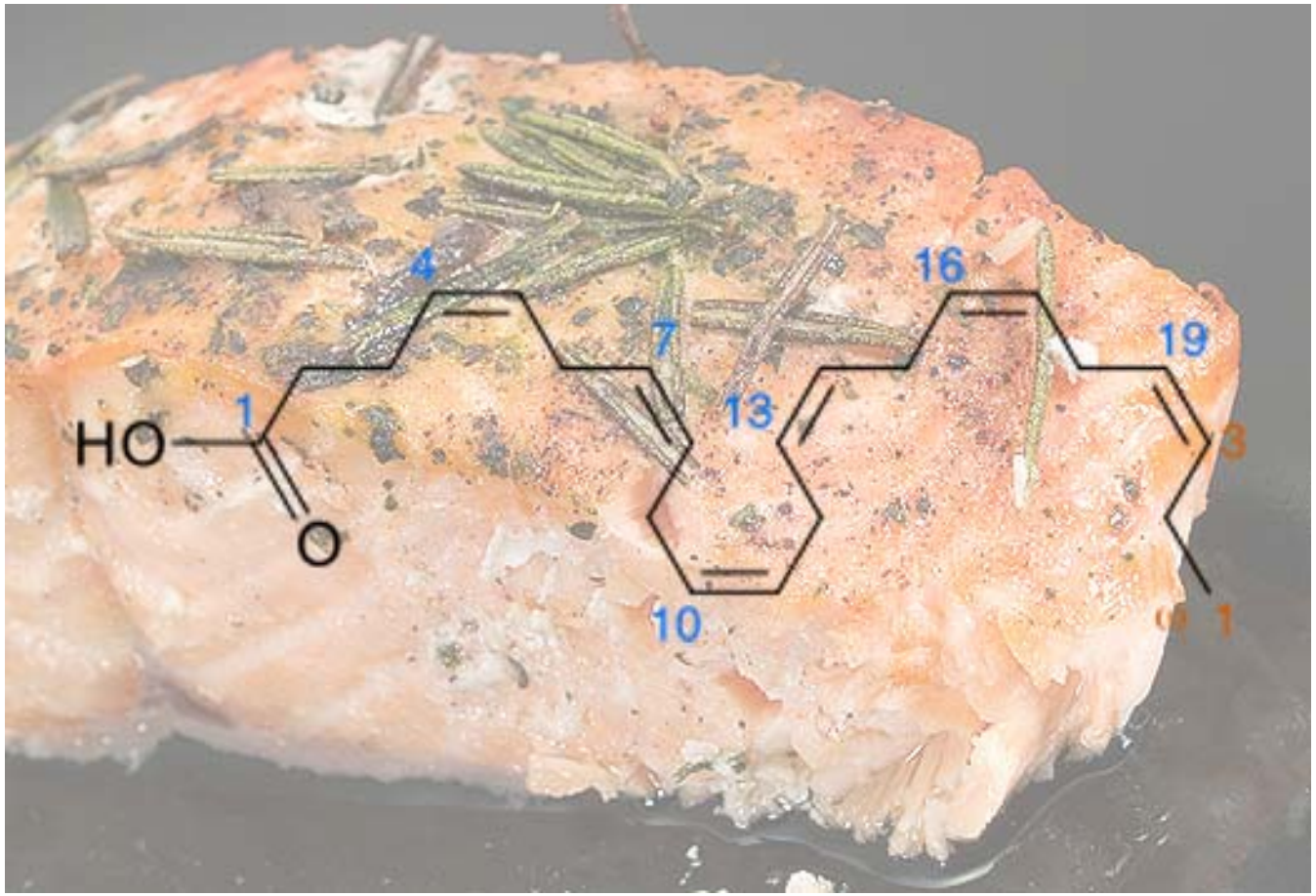
POUNDS LOST: Weight Loss (ITT)



ITT, intent to treat.

Sacks FM et al. *N Engl J Med.* 2009;360(9):859–873.

Protecting Cardiovascular Health With Fish

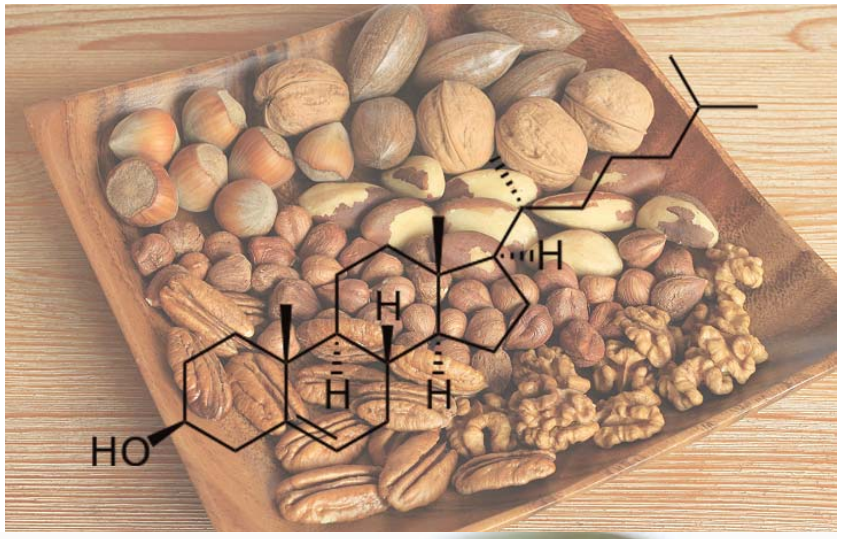


fish high in omega-3 fatty acids can cut heart disease risk

Dietary Antioxidants Reduce Stroke Risk

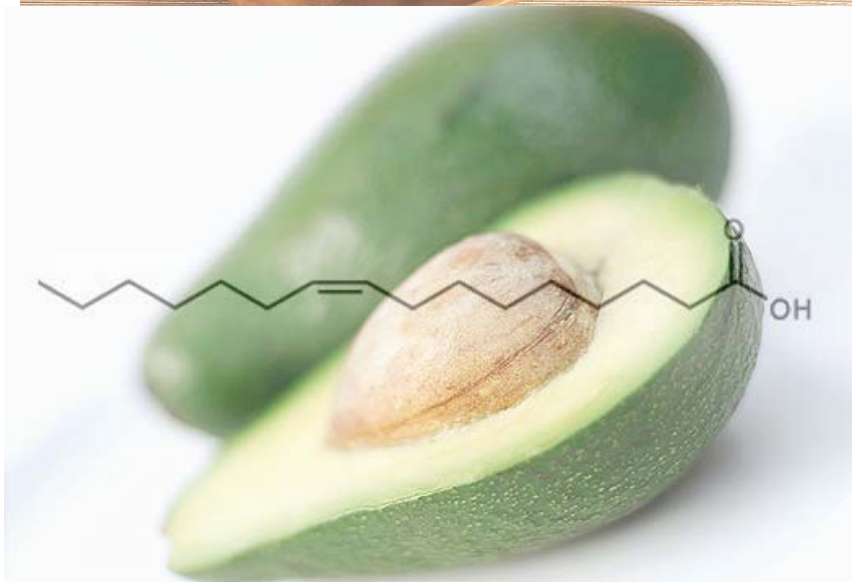
diet high in antioxidants (fruits, vegetables, whole grains, tea, and even chocolate) was linked to 17% lower stroke risk in healthy women.

Fat: The Good and the Bad



daily consumption of 2.4 oz of nuts – any type of nuts – has been shown to improved lipids.

Adding pistachios to a high-glycemic meal can lower postprandial glucose and insulin levels.



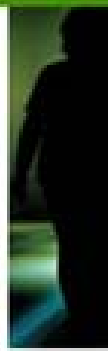
Studies report that consumption of both polyunsaturated fatty acids (found in nuts, seeds, fish, and leafy green vegetables) and monounsaturated fatty acids (found in olive oil, avocados, and nuts) decreases the risk for depression over time

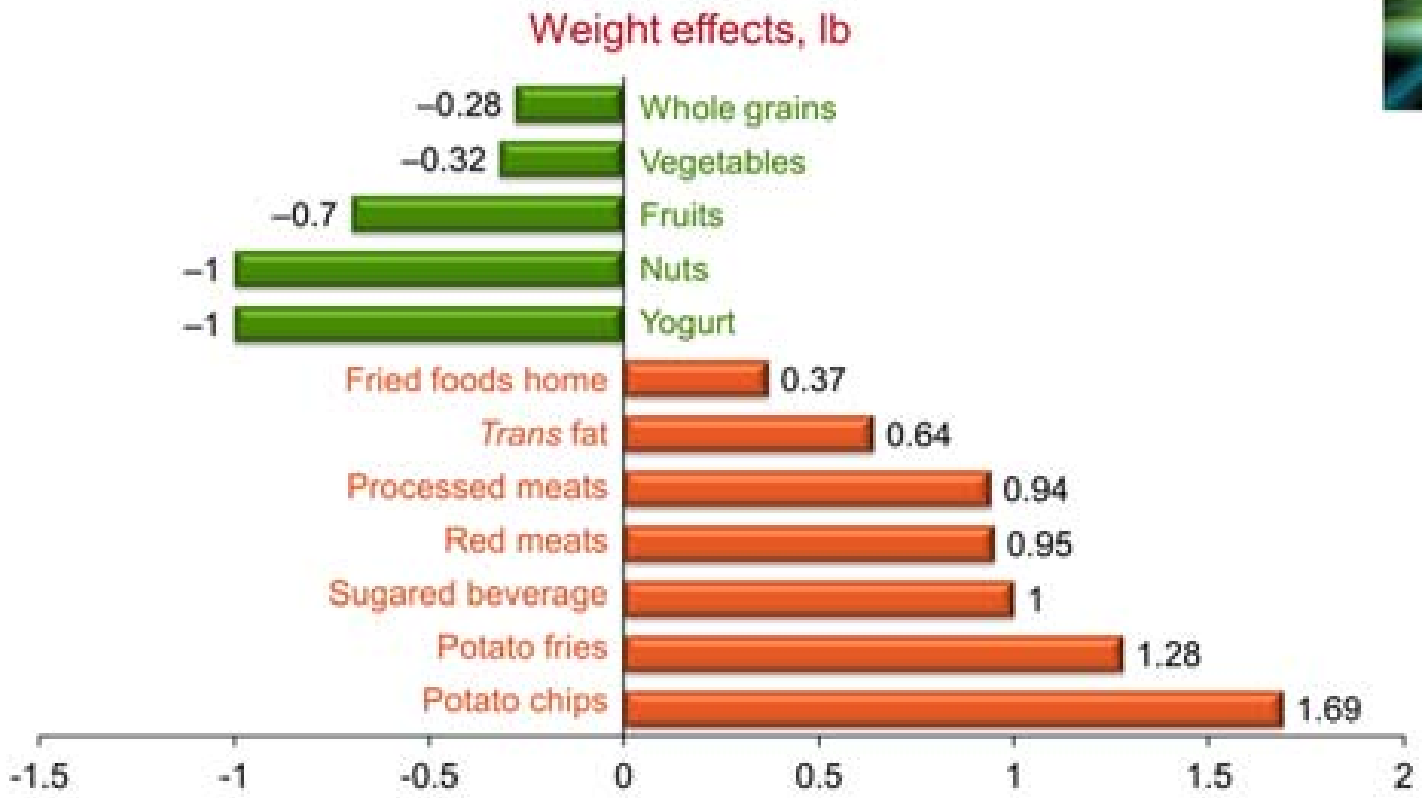
Fat: The Good and the Bad

-dose-response relationships between dietary intake of trans fats and depression risk

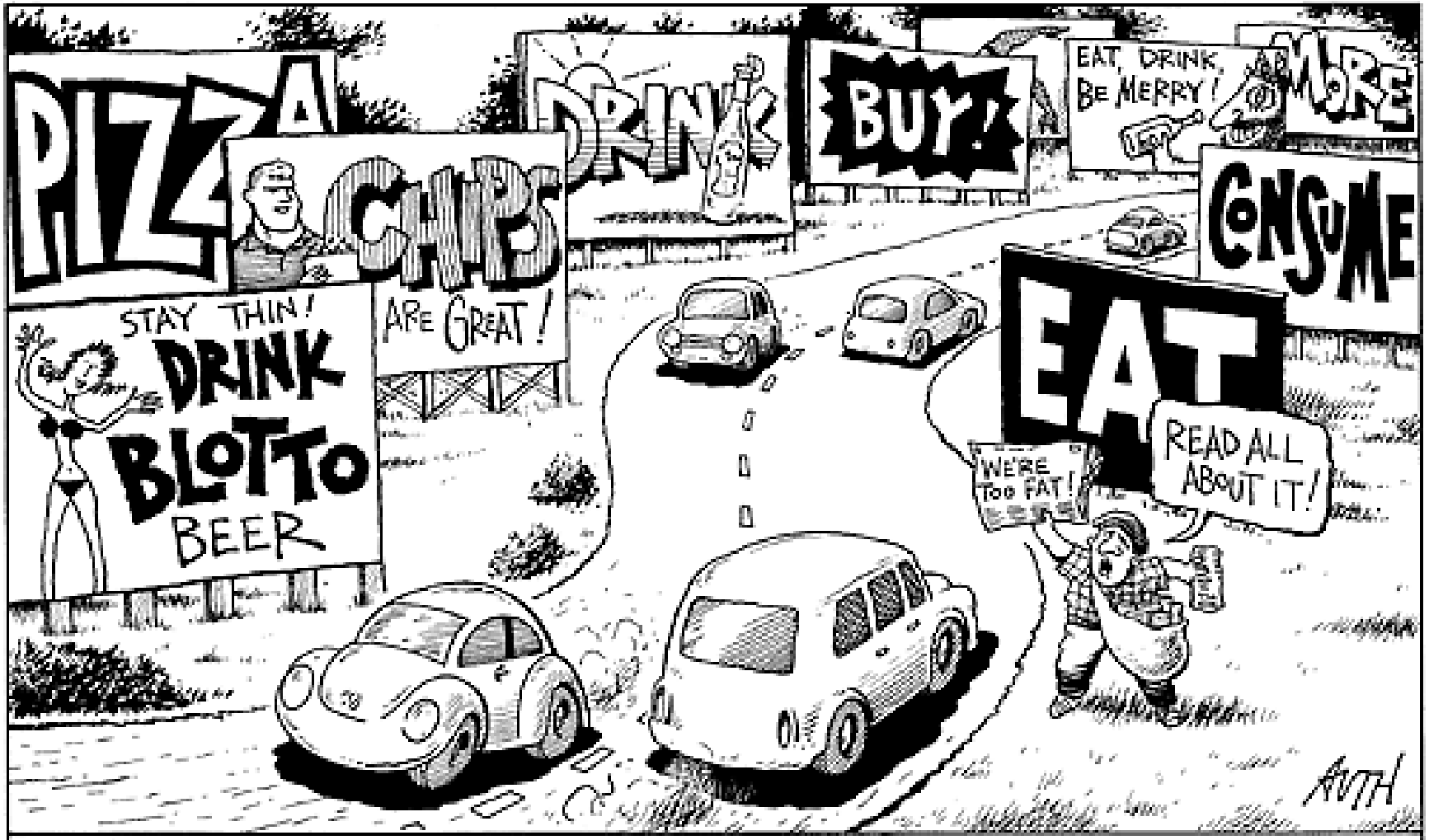
- data also support an association between trans fats and ischemic stroke risk

Dietary Components That Predict 4-Year Changes in Body Weight





Mozafferian D et al. *N Engl J Med.* 2011;364(25):2392–2404.



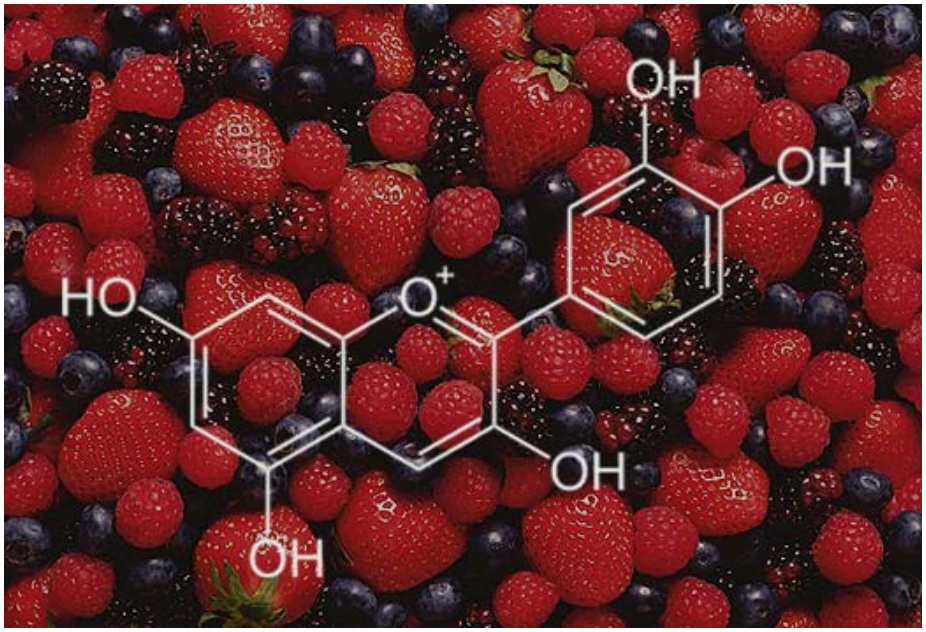
$11 BILLION IS SPENT YEARLY ADVERTISING CONVENIENCE FOODS, SNACKS AND ALCOHOLIC BEVERAGES.

SOFT DRINKS = "LIQUID CANDY"

- North America: soft drink consumption has increased by 500% over the past 50 years
- Increase in soft drink consumption coincides with increase in childhood obesity

- AMONG CHILDREN: Total energy intake is related to amount of soft drinks consumed

Berries for Oxidative Stress



- Polyphenols, namely anthocyanins, found in berries and other darkly pigmented fruits and vegetables may slow cognitive decline through antioxidant and anti-inflammatory properties

Studies have linked colorful fruits and vegetables to reduced CVD risk by reducing oxidative stress and attenuating inflammatory gene expression

Verdict on Vitamins: Less Is More?

A large epidemiological study has shown that instead of promoting health, dietary supplements, including multivitamins, vitamin B_6, folic acid, magnesium, and copper, were linked to increased risk for death

Almost always better to get your vitamins through a varied and healthful diet than in pill form !!!

Assessing Body Composition

- Research/medical facility techniques
  - Dual energy X-ray absorptiometry (DEXA)
  - Magnetic resonance imaging (MRI)
  - Computed tomography (CT)

Assessing Body Composition

- More common techniques
  - Hydrostatic weighing
  - Air displacement – Bod Pod
  - Skinfold thickness
  - Girth measurements
  - Bioelectrical impedance

DEXA

- Dual energy X-ray absorptiometry (DEXA)
- Frequently used by research and medical facilities
- Considered by many as the standard technique for body composition assessment
- Uses low-dose beams of X-ray energy
- Measures fat mass, fat distribution pattern, and bone density

- Procedure is simple; takes only 15 minutes to administer
- Not readily available to most individuals

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NURTURING THE CHILD

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REGULAR ARTICLE

Body composition measured by dual-energy X-ray absorptiometry half-body scans in obese children

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3.Faculty of Medicine, Pediatrics, University of Ottawa, Ottawa, ON, Canada

Keynotes

- Evaluation of body composition is an important step in characterizing the health-risk profile of an obese child.
- The present study supports the use of a left or right half body scan methodology as a valid alternative to full body analysis or percent fat, total mass, fat mass, lean mass, and bone mineral content (BMC) in obese children and youth whose dimensions are outside of the scanning surface.

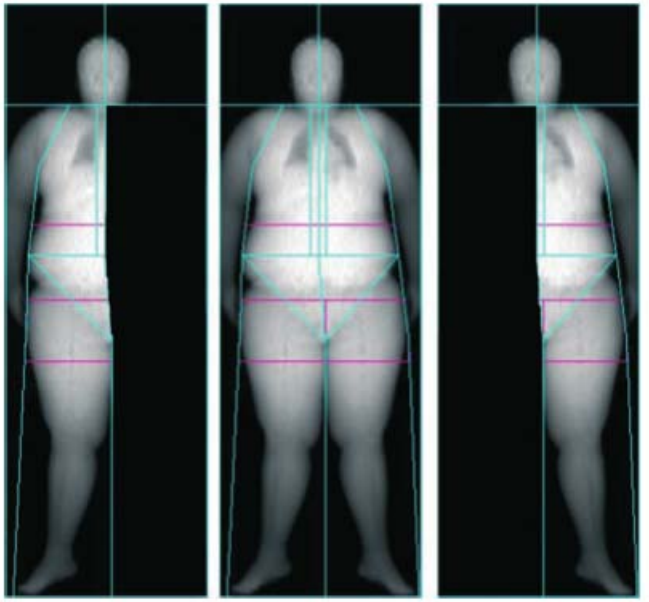
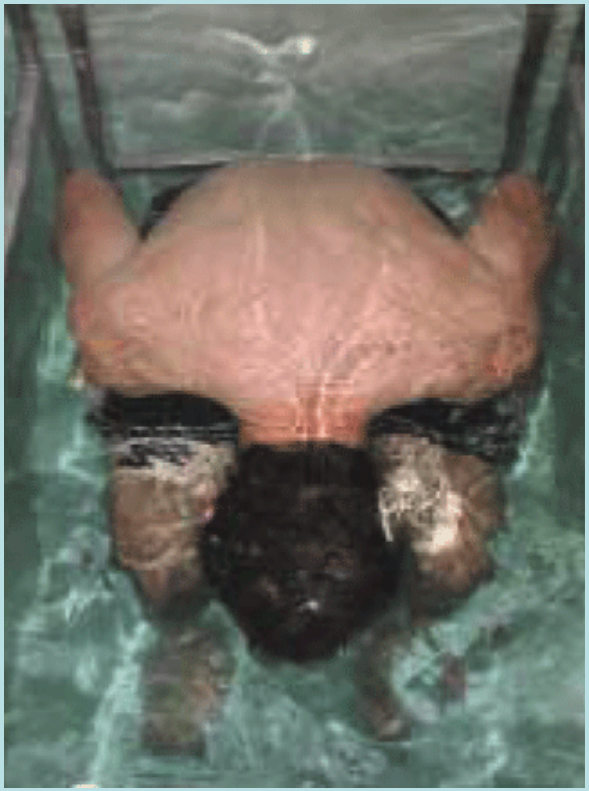


Figure 1 Example of full-body, left and right half-body scans used for analysis.

Hydrostatic Weighing



- Most common technique used for decades
- A person's "regular" weight is compared with underwater weight
- Fat is more bouyant than lean tissue or lean tissue is more dense
- Almost all other indirect techniques have been validated against hydrostatic weighing

Whole Body Pethysmography

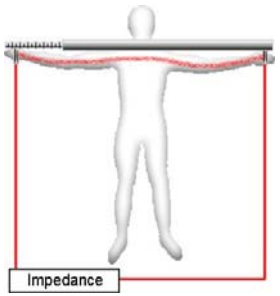
- Measures body volume by air displacement
  - actually measures pressure changes with injection of known volume of air into closed chamber
- Large body volume displaces air volume in chamber
  - results in bigger increase in pressure with injection of known volume of air

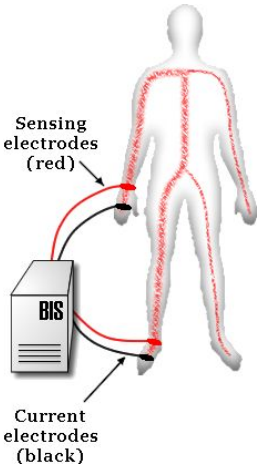
Skinfold Thickness

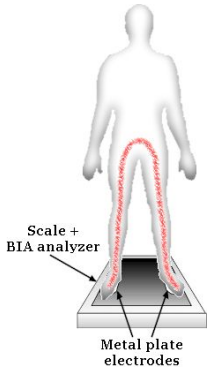
- Based on the principle that approximately half of the body's fatty tissue is directly beneath skin
- Reliable measurements of this tissue give a good indication of percent body fat
- Skinfold test is done with pressure calipers
- Several sites are measured and percent fat is estimated from the sum of various three sites
- All measurements should be taken on the right side of the body

Bioelectrical Impedance Analysis

- BIA measures impedance by body tissues to the flow of a small (<1mA) alternating electrical current (50kHz)
- Impedance is a function of:
  - electrical resistance of tissue
  - electrical capacitance (storage) of tissue (reactance)







Bioelectrical Impedance

- Simpler to administer, but accuracy is questionable
- Sensors are applied to the skin and a weak electrical current is run through the body to estimate body fat, lean body mass, and body water
- Based on the principle that fatty tissue is a less-efficient conductor of an electrical current
  - Fat impedes the current
  - Muscle rapidly conducts the current
- The easier the conductance, the leaner the individual
- Degree of hydration???

How did we get here?

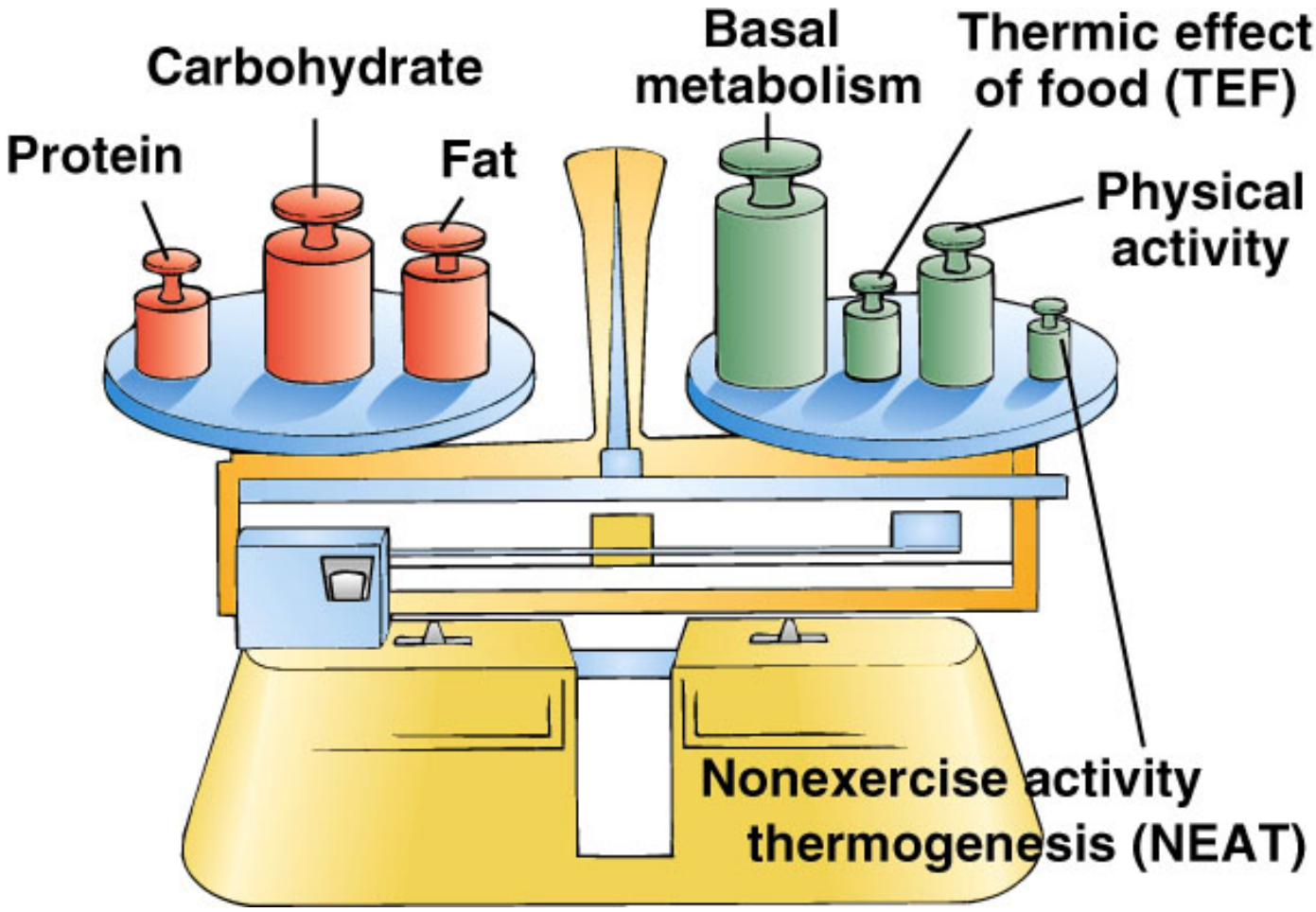
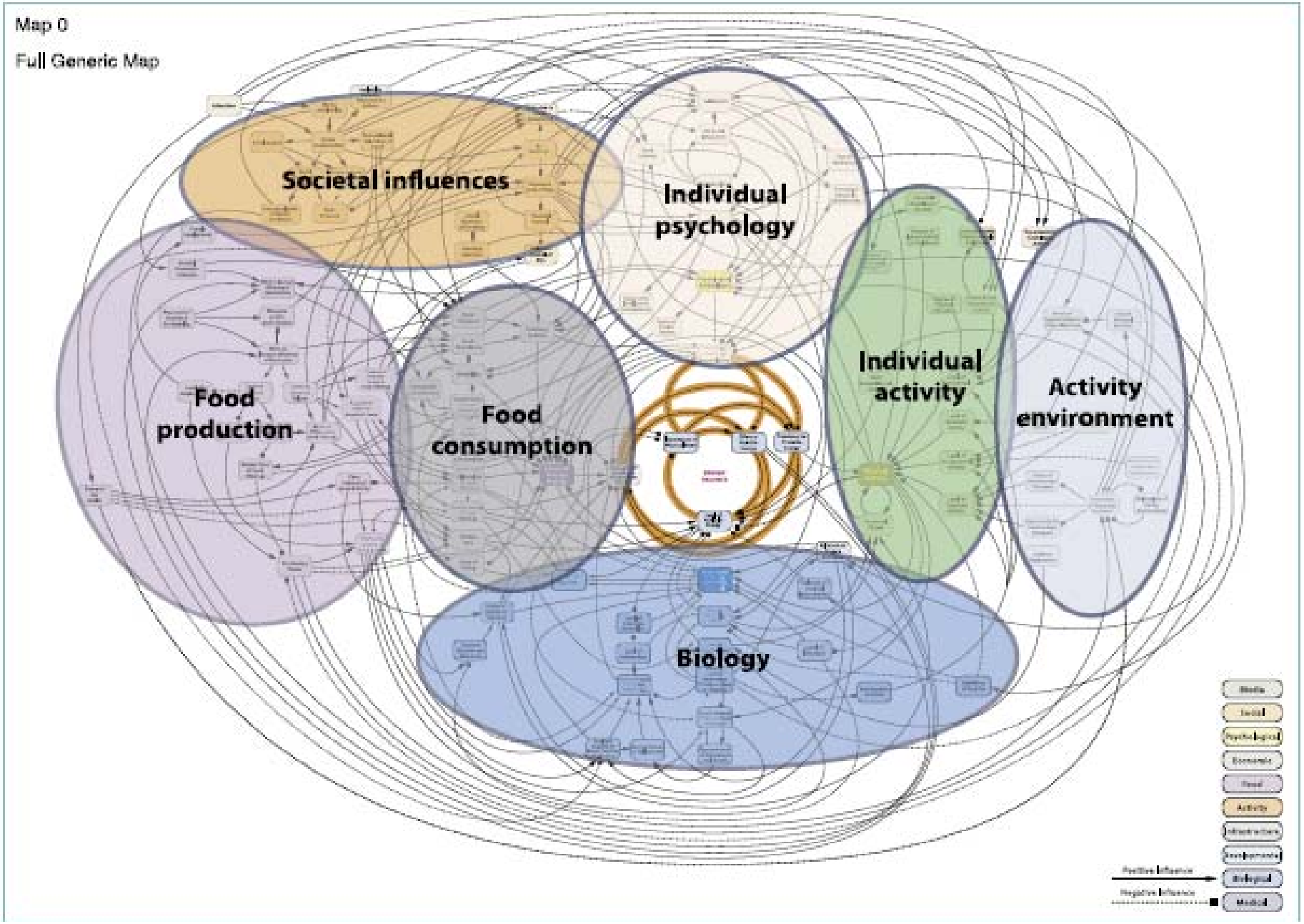


Figure 8.1: The full obesity system map with thematic clusters (see Section 4 for discussion). Figure highlights broader determinants of health such as drivers of food production and components of the physical activity environment.



What are the modifiable lifestyle risk factors?

What is Physical Activity?

Physical activity (PA) is defined as a complex set of behaviours that encompass any bodily movement produced by skeletal muscles that result in energy expenditure

Vs. Fitness?

Physical fitness: a set of attributes that are either health- or performance-related

Requires particular exercises for a particular length of time at a specific intensity and for a certain number of times each week

The Benefits of Active Living

PREVENTION

- It is commonly known that physical inactivity and poor fitness are independent risk factors for obesity, metabolic disorders, and cardiovascular disease in youth.

PROMOTION OF GOOD HEALTH

- Because PA levels track from early childhood to adulthood, increasing PA levels in kids may alter their activity trajectory and increase the likelihood they will be physically active throughout development and into adulthood.

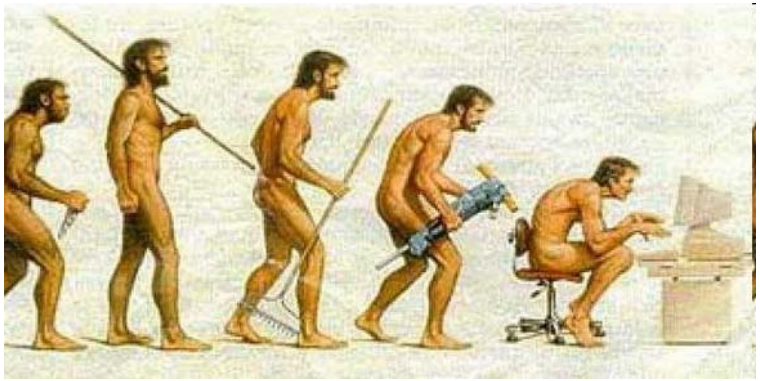
A recent meta-analysis by Kodama et al. (2009) found that for every 1 MET ($3.5\ ml.kg^{-1}.min^{-1}$) increase in aerobic fitness there was a decrease in all-cause and cardiovascular disease mortality of 13% and 15%, respectively.

Furthermore, they reported this level of risk reduction was equivalent to a 7 cm reduction in waist girth, a 5 mmHg decrease in systolic blood pressure, a 1 $mmol.L^{-1}$ reduction in triglycerides, a 1 $mmol.L^{-1}$ decrease in fasting blood glucose and a 0.2 $mmol.L^{-1}$ increase in HDL cholesterol.

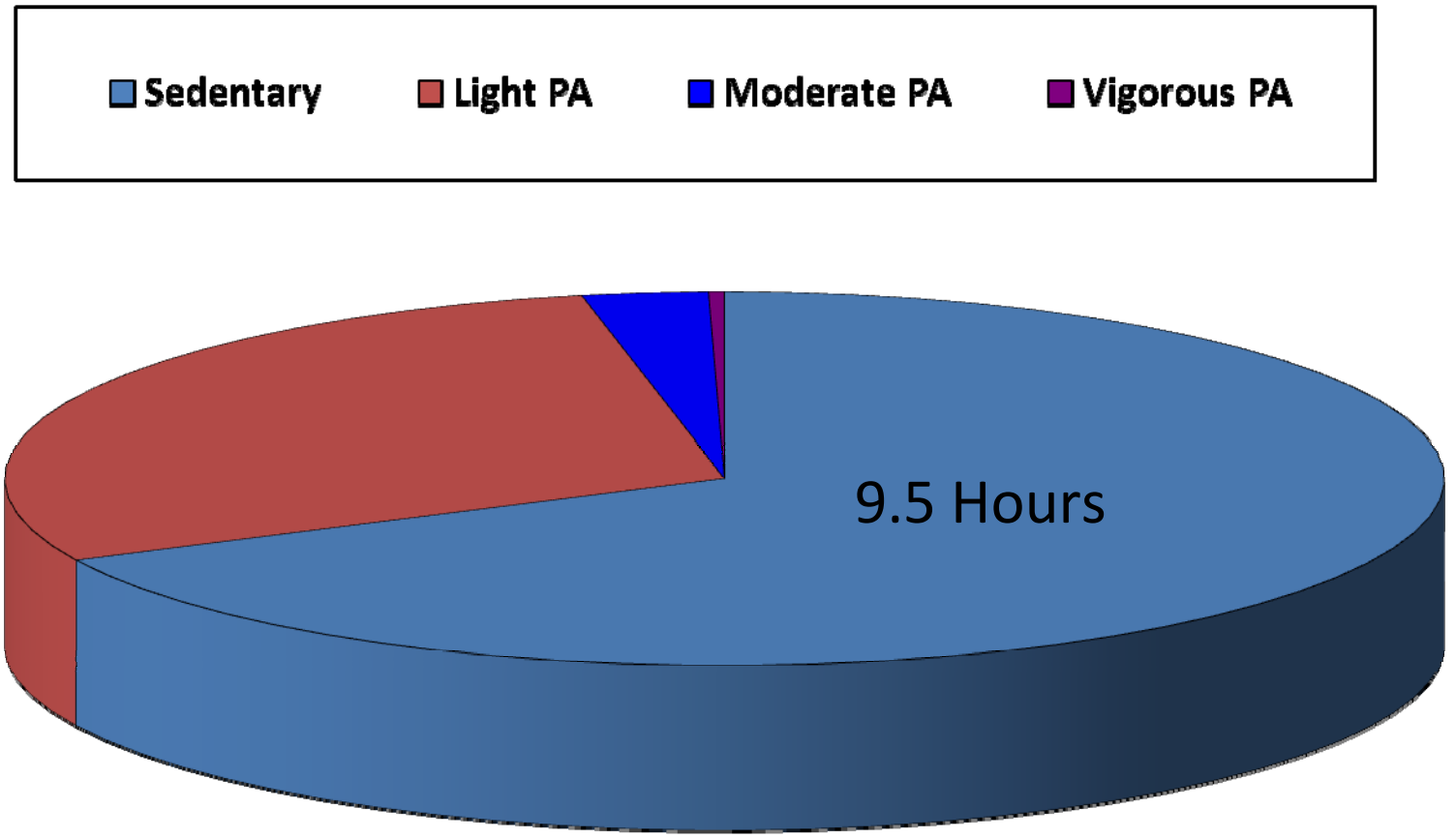
Physical Activity Levels & Sedentary Behaviour

- According to CHMS data only 15% of adults are meeting the Canadian Physical Activity Guidelines

- 68% of adult walking hours are spent sedentary or 9.6 hrs/d



How Sedentary Are Canadian Adults?



Colley et al. 2011 *(Health Reports*)

What should adults be doing?

Guidelines

To achieve health benefits, adults aged 18-64 years should accumulate at least 150 minutes of moderate- to vigorous-intensity aerobic physical activity per week, in bouts of 10 minutes or more.

It is also beneficial to add muscle and bone strengthening activities using major muscle groups, at least 2 days per week.

More physical activity provides greater health benefits.

Canadian Society for Exercise Physiology

Physical Activity Levels

Grade F

- According to CHMS data only 7% of our children (5 + yrs) are meeting the Canadian Physical Activity Guidelines
  - Boys are more active than girls (9% versus 4% meet the guidelines)
  - Physical activity declines with increasing age
  - Physical activity declines with increasing adiposity in boys
  - Canadian children and youth are sedentary for ~8.6 hours per day (62% of waking hours)

What should children be doing?

Guidelines

For health benefits, children aged 5-11 years should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily. This should include:

Vigorous-intensity activities at least 3 days per week.

Activities that strengthen muscle and bone at least 3 days per week.

More daily physical activity provides greate

Guidelines

For health benefits, youth aged 12-17 years should accumulate at least 60 minutes of moderate- to vigorous-intensity physical activity daily. This should include:

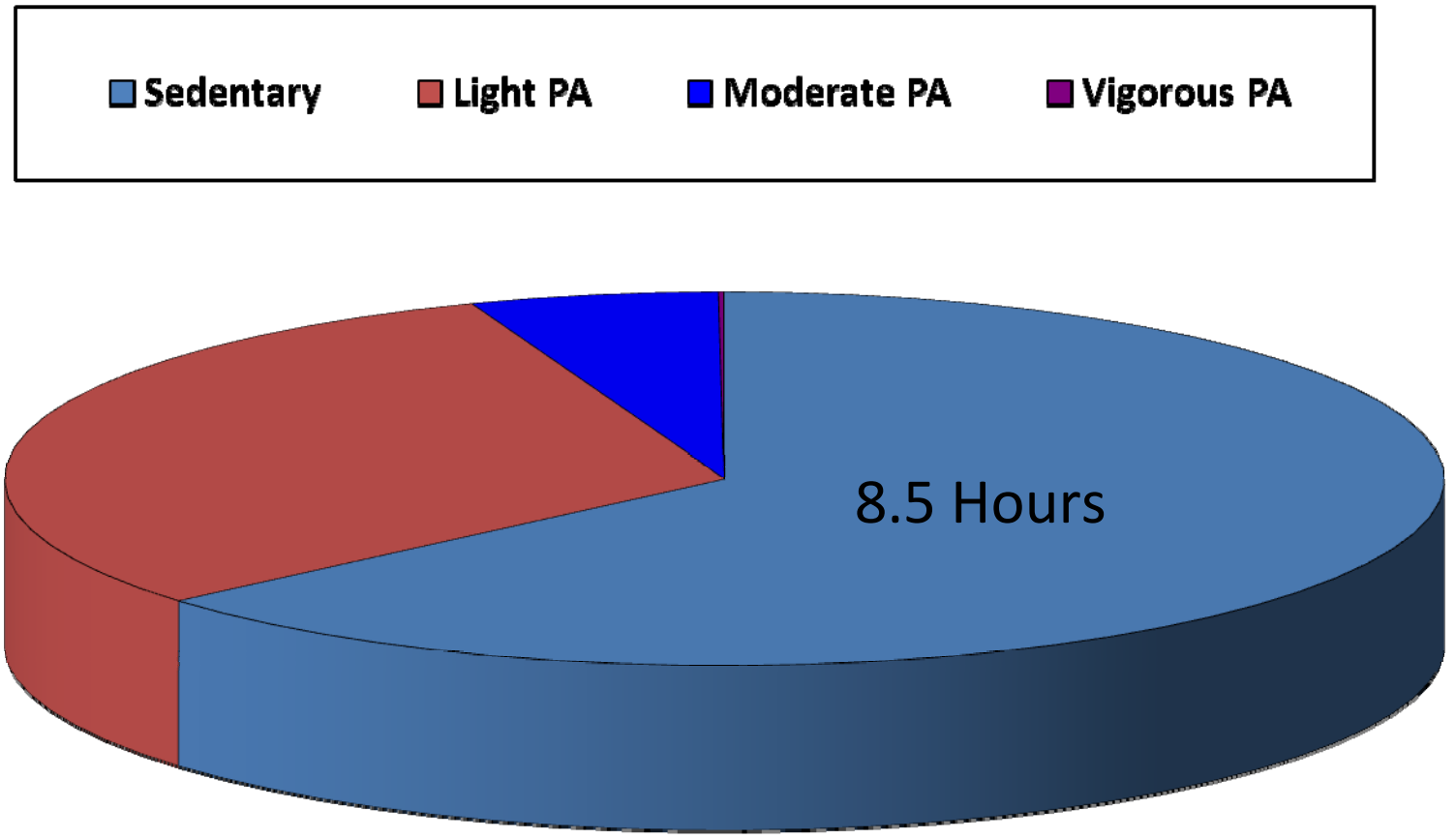
Vigorous-intensity activities at least 3 days per week.

Activities that strengthen muscle and bone at least 3 days per week.

More daily physical activity provides greater health benefits.

Canadian Society for Exercise Physiology

How Sedentary Are Canadian Kids?

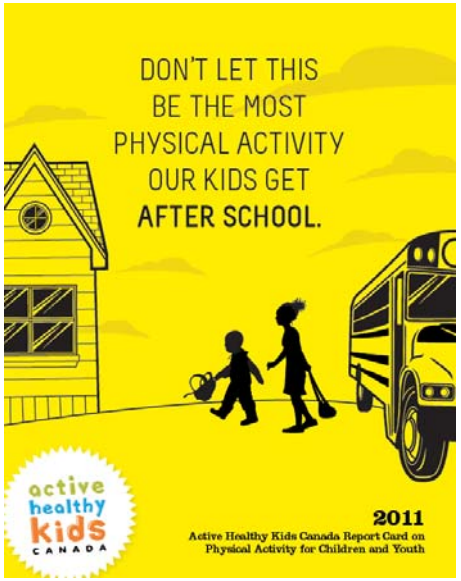


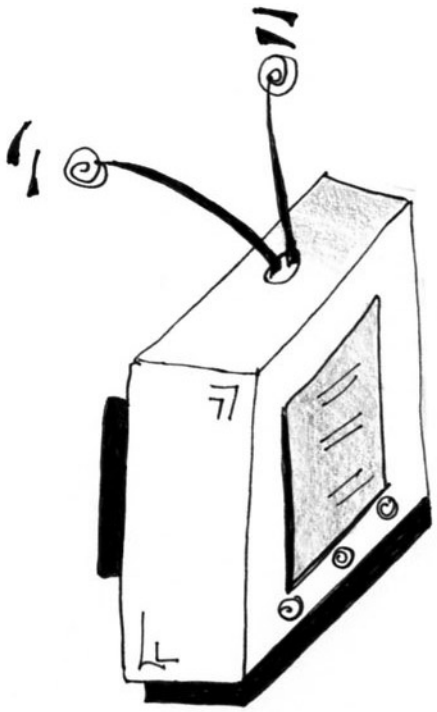
Colley et al. 2011 *(Health Reports*)

Screen-Based Sedentary Behaviours

Grade F

Children and youth are getting an average of 6 hours per day of screen time outside of school hours, and over 7 hours on weekend days.



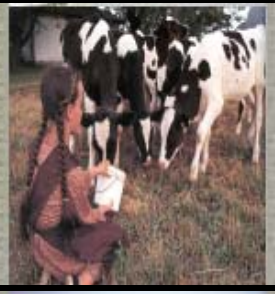


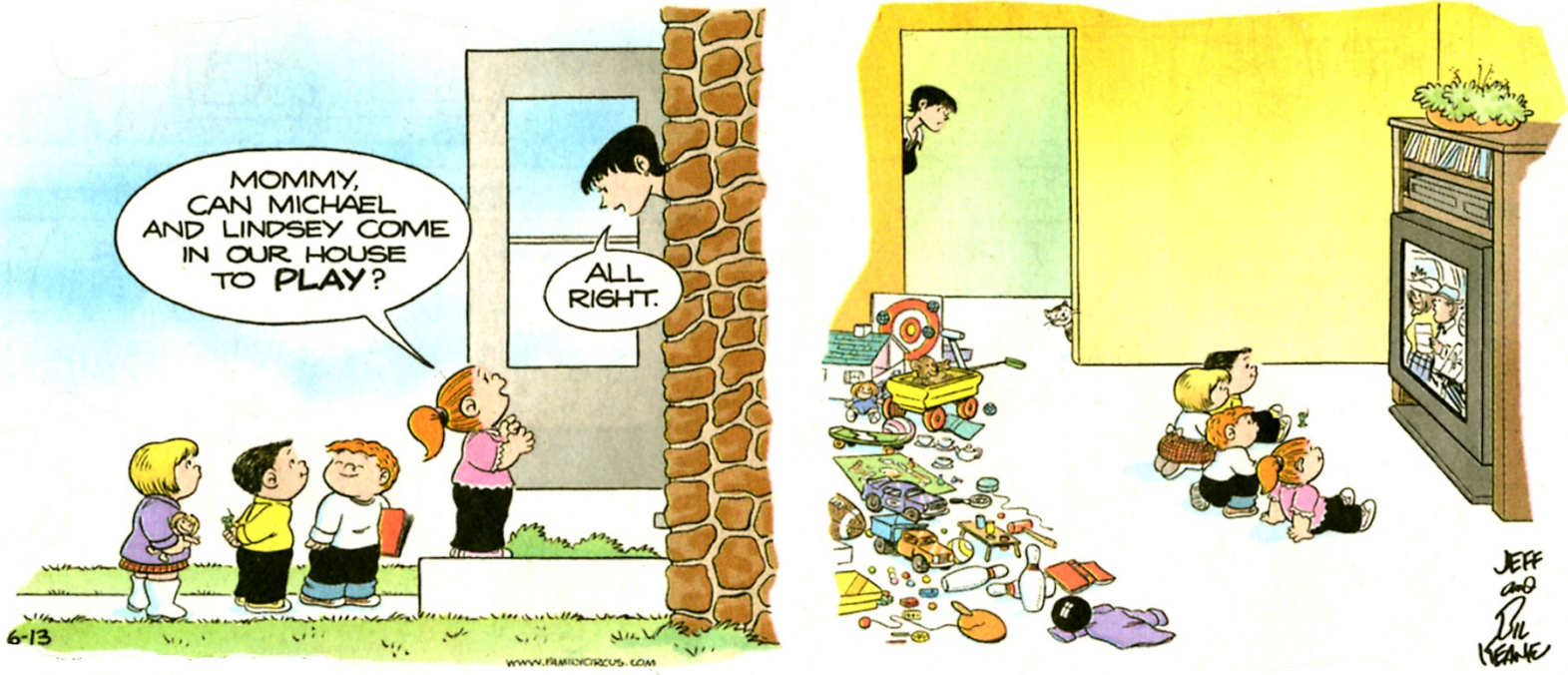
Non-Screen Sedentary Behaviours

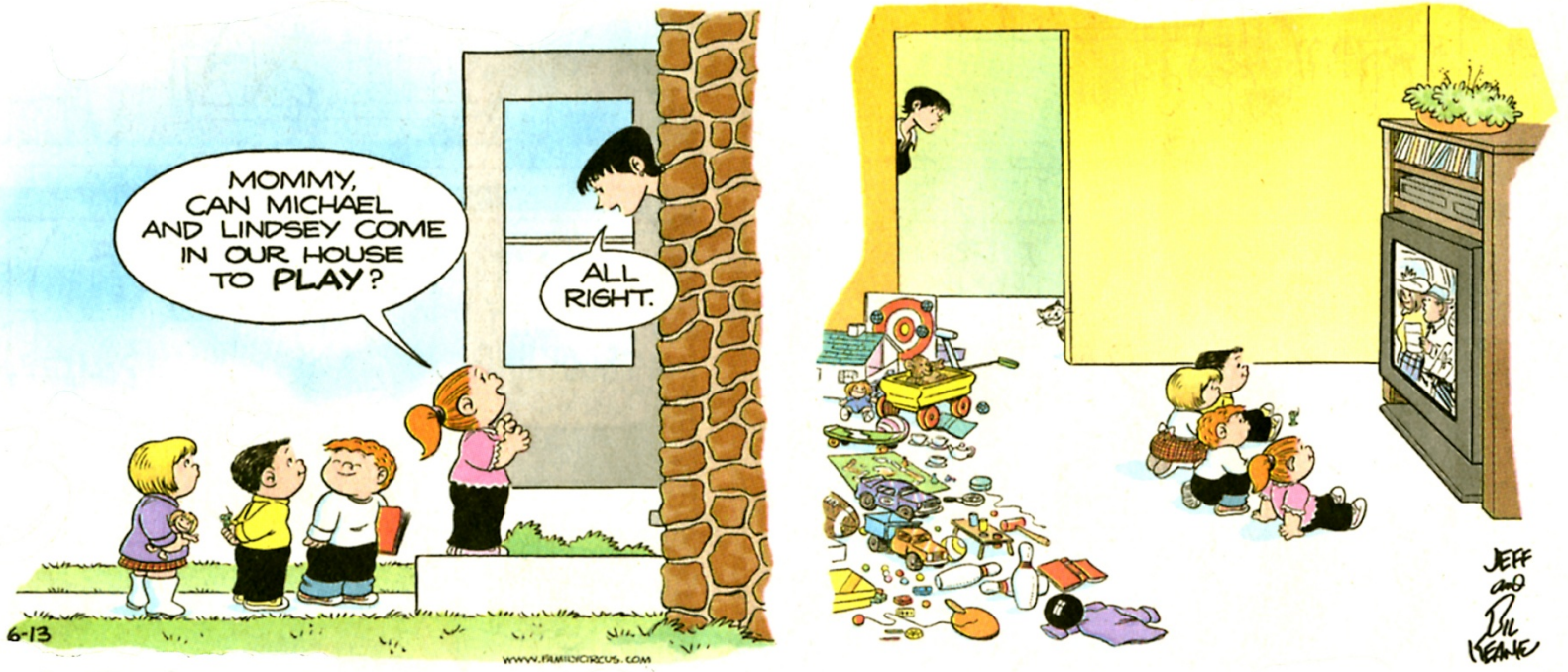
- Total daily sedentary time for Canadian children and youth averages 8.6 hours, or 62% of their waking hours.
- Evidence shows that increased levels of sedentary behaviours, *independent of physical activity levels*, are associated with various physical and mental health risks.

The Nutrition/Physical Activity Transition?

The Physical Activity Transition.

Traditional			Contemporary	
		Commuting		
		Chores		
		Sports		
		Free Time		


MOMMY, CAN MICHAEL AND LINDSEY COME IN OUR HOUSE TO PLAY?
ALL RIGHT.
6-13
JEFF and DAN KEANE



Low physical activity level in the early years predicts downstream health problems

Sedentary preschoolers are more likely to become obese in childhood and as adults

Dehghan 2005, Hassan 2005

Is "Active Gaming" a solution?

Dance Dance Revolution at school!!!

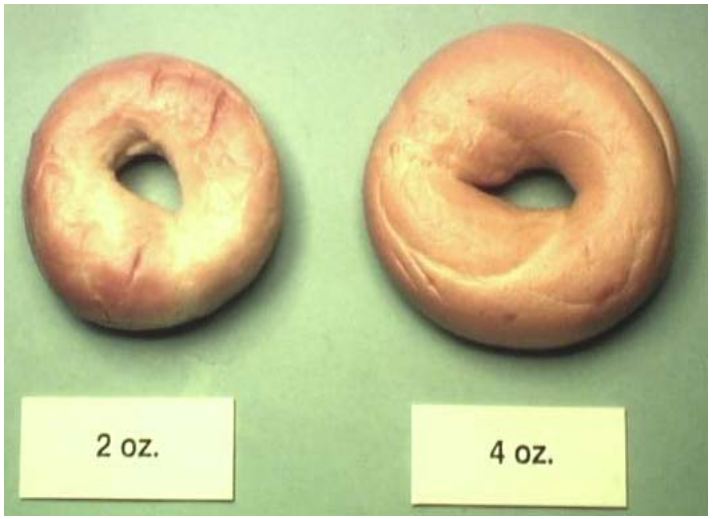
Nintendo Wii at home!!!

Exergames in Physical Education????

Have we gone too far in ensuring our kids are safe?


BALL
AND
HOCKEY
PLAYING
PROHIBITED
BY-LAW 522-78

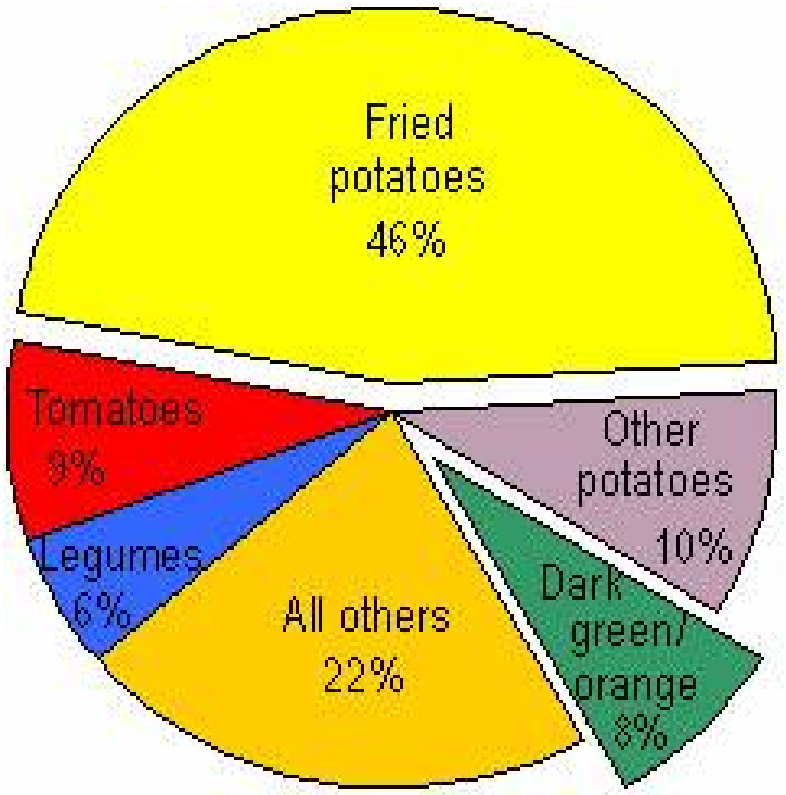
Nutrition Transition

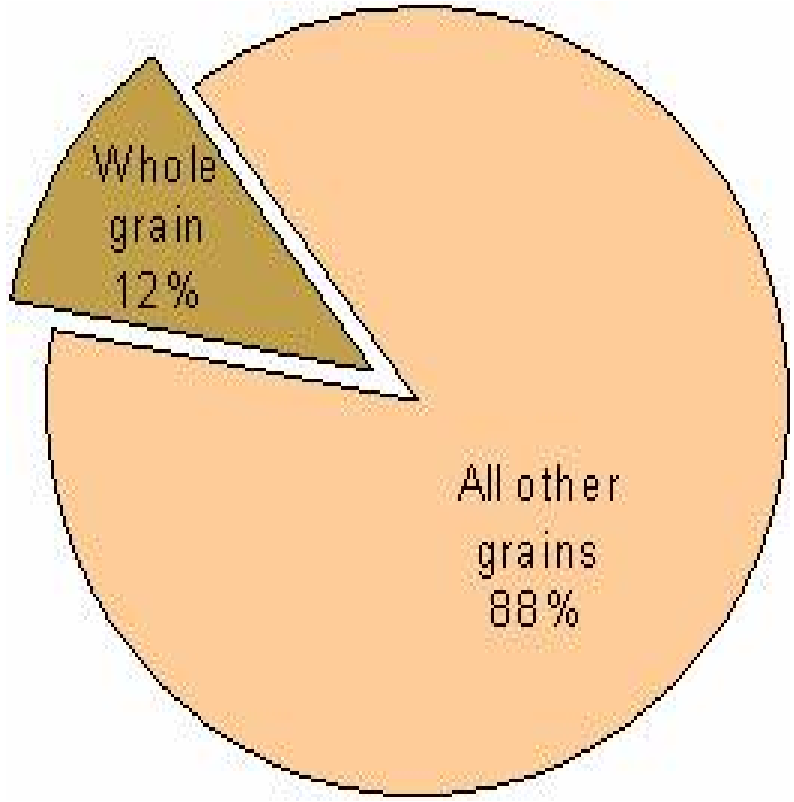


Access to Food has changed

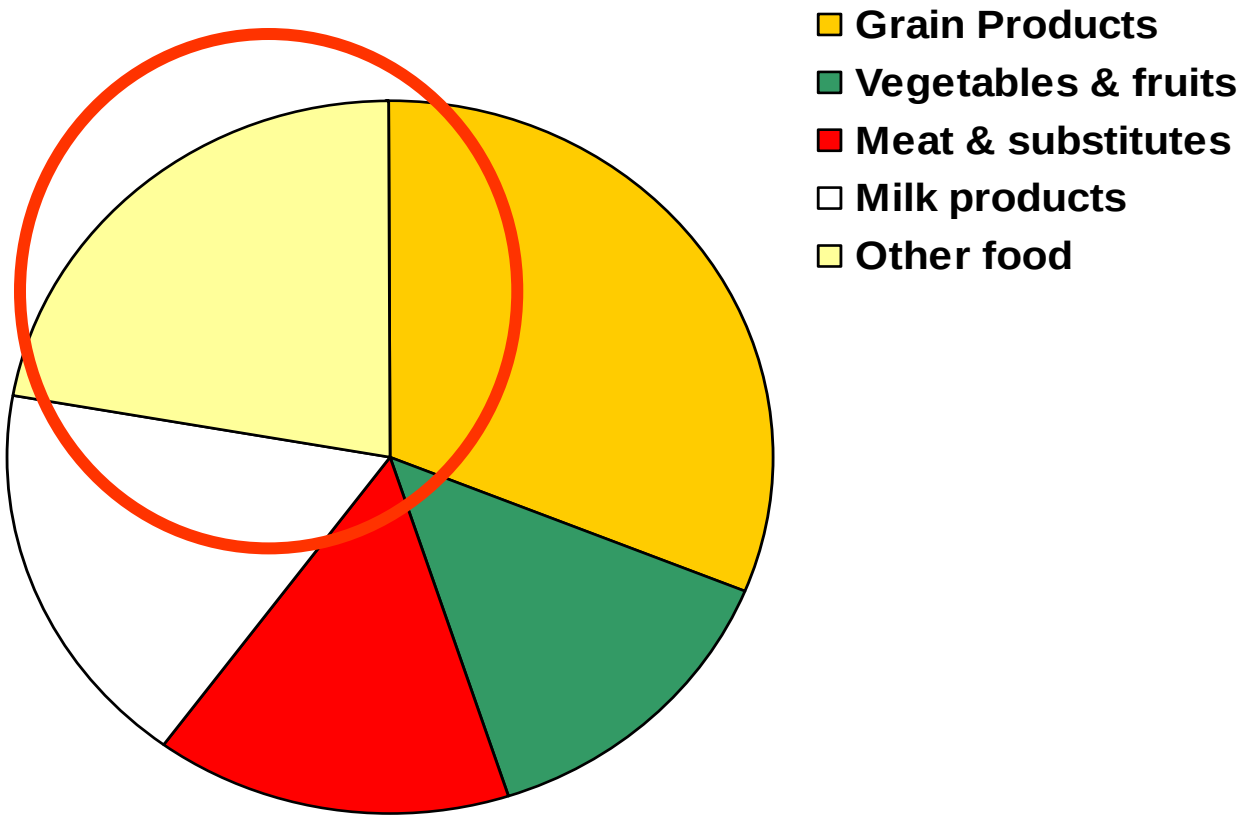
All you can eat
BUFFET
$6.95 !

Proportion of Vegetable & Grain Servings **children 2-19 yrs**



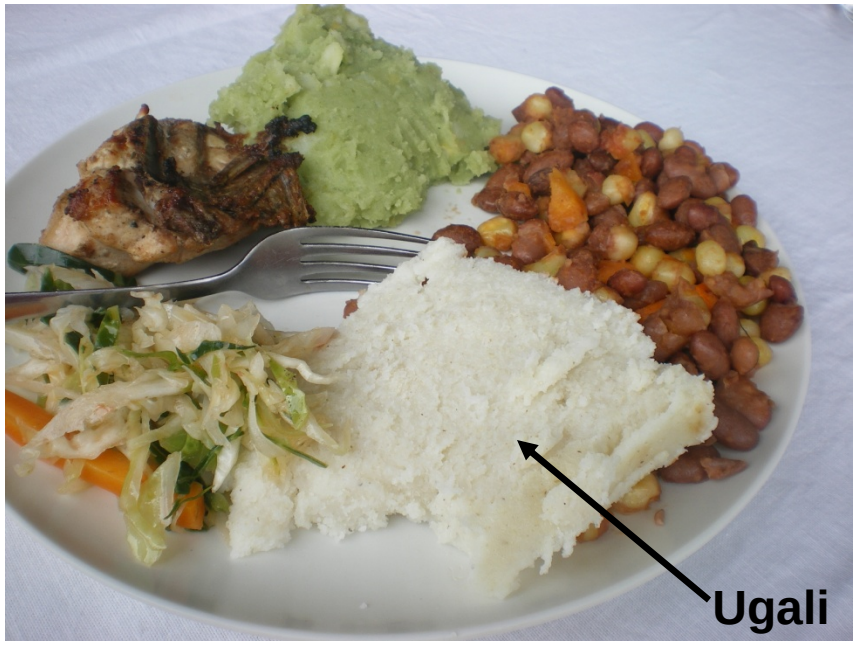


Percentage distribution of sources of calories, by food group children aged 4 – 18 years, 2004



D. Garriguet. CCHS Nutrition, 2004

Typical Meals




Lotikipi Plain
great rift valley north africa to tanzania
Lake Chew Bahir
Ethiopia
Malka Mari National Park
Mande
Sibiloi National Park
Lake Turkana
Loima Hills
Huri Hills
Lodwar
Moyale
South Island N.P
Mt. Kulal
Chalbi Desert
Bokhol Plain
South Turkana Nat. Res.
Marsabit National Reserve
Lake Bisina
Saiwa Swamp
Ndoto Hills
Losai Nat Reserve
Somali
Kitale
Kenya
Wajir
Mt. Elgon Nat. Park
Mt. Elgon
Lake Baringo
Samburu
Shaba
Kisima
Eldoret
Kakamega Forest
Lake Bogoria
Laikipia
Meru Nat. Park
Busia
(Mt. Kenya Nat. Park)
Equator
Kisumu
Aberdare Nat. Park
Mt. Kenya
Lorian Swamp
Nakuru
Garissa
Ruma N.P
Lake Nakuru Nat. Park
Nyeri
Embu
Lake Naivasha
Ol Donyo Sabuk
Arawale Nat. Reser
Nairobi
Masai Mara Game Reserve
Kitui
South Kitu
Lake Magadi
Serengeti National Park
Tsavo East
Tana
Lake Natron
Namanga
Chyulu Hills
Amboseli
Ngorongoro Crater
Taita hills
Voi
Mt. Kilimanjaro
Tsavo West
Lake Manyara
Arusha
ania
Tarangire National Park
Lossogonoi Plateau
Shimba Hills Nat. Park

United States: The Revis family of North Carolina Food expenditure for one week $341.98

Italy: The Manzo family of Sicily
Food expenditure for one week: $260.11

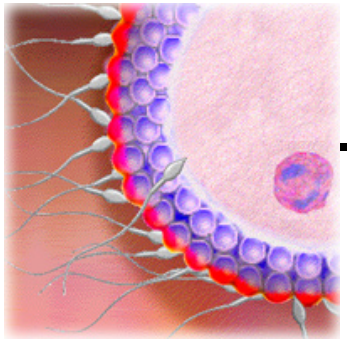
Ecuador: The Ayme family of Tingo
Food expenditure for one week: $31.55

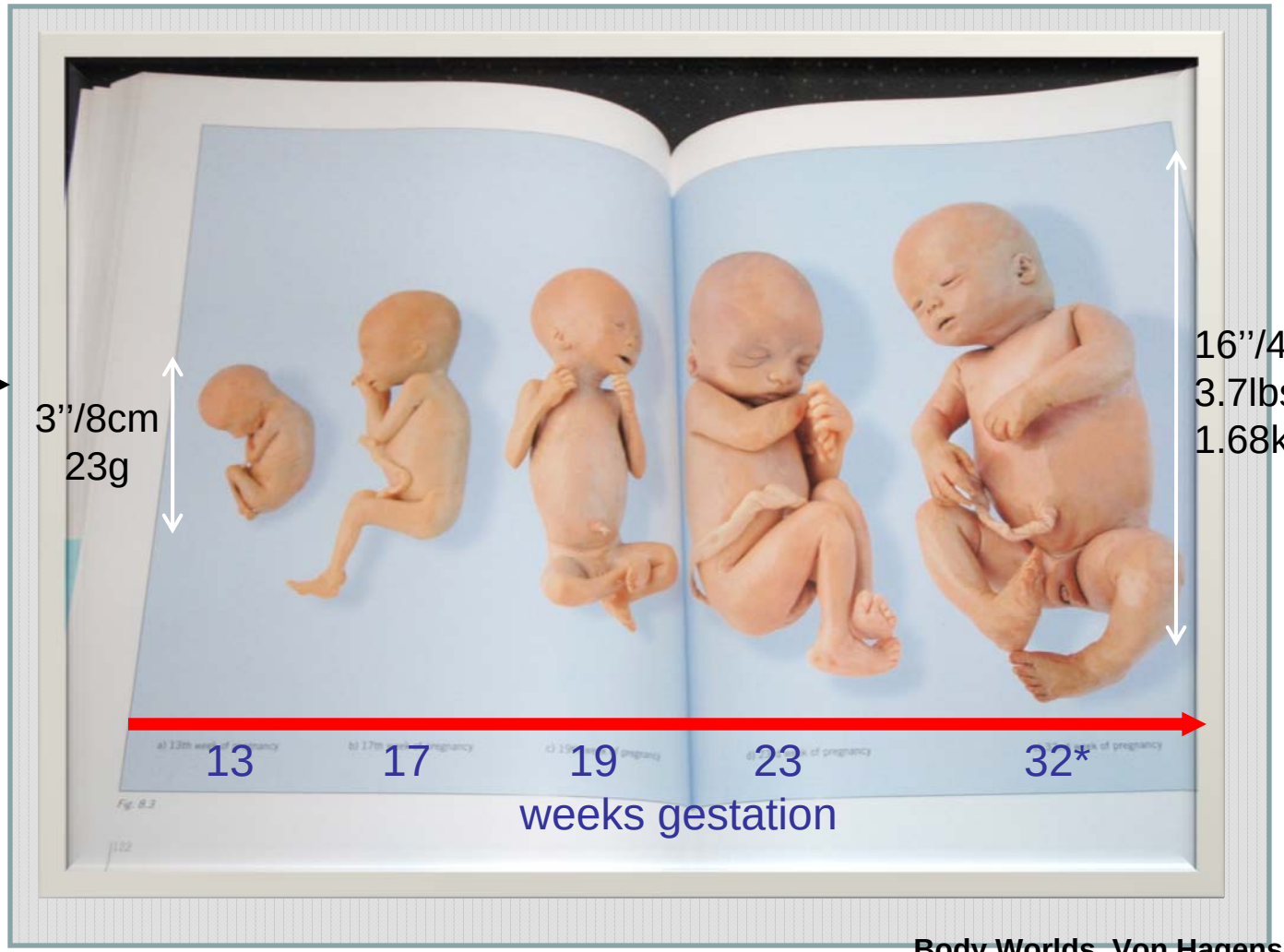
Chad: The Aboubakar family of Breidjing Camp food expenditure for one week: $1.23

Prevention is the only feasible solution.

Tackling childhood obesity- starting with MOM!

Is there a more important or dramatic developmental period?





*fat forms at 8m, 34-7 wks

Body Worlds, Von Hagens, 2005

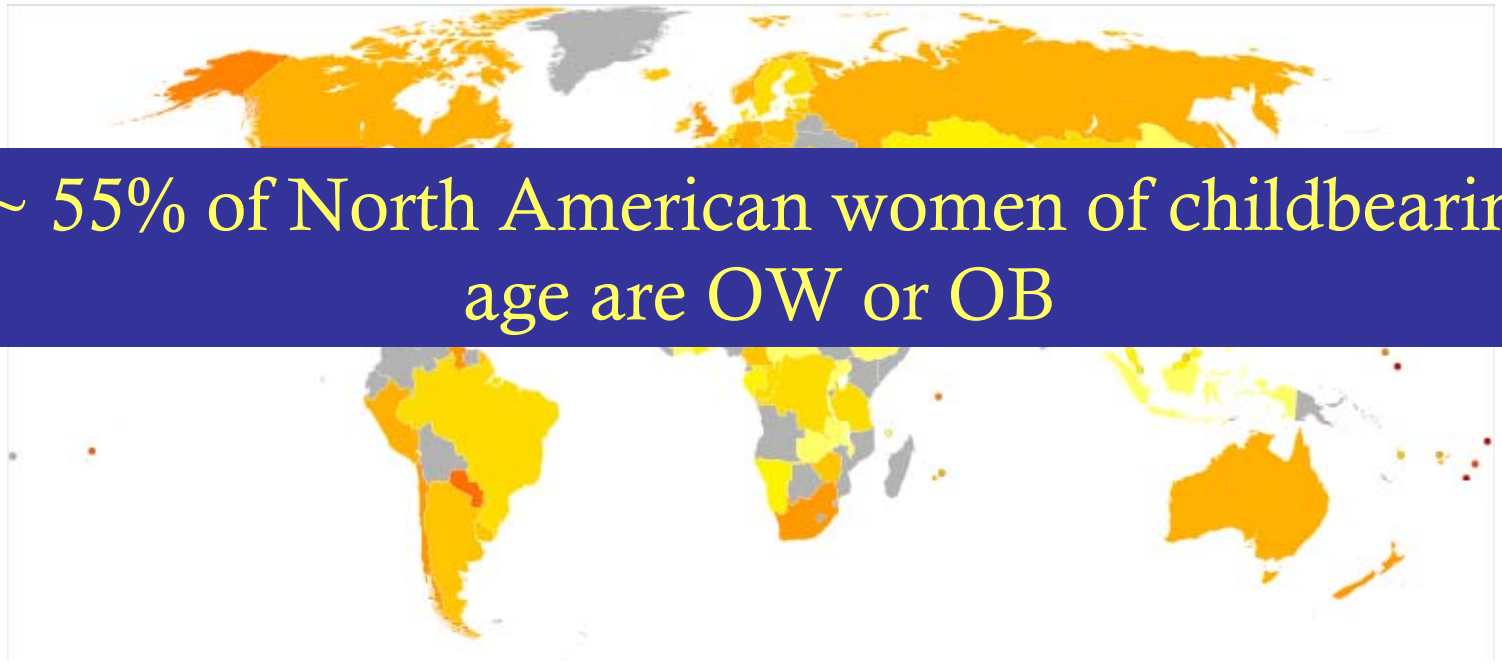
PREGNANT AND OVERWEIGHT/OBESE: SO WHAT?

"LIFE IN THE WOMB WILL BE WRITTEN ON YOUR TOMB"

Developmental Programming identifies how adverse environmental factors operating *in utero* may program or 'affect' susceptibility to downstream diseases

WE KNOW…

Obesity in Female Adults- 2008



~ 55% of North American women of childbearing age are OW or OB

< 5% to > 55%

** 1.8 billion are of childbearing age (26% of world population)*

WE KNOW…

Both maternal OB and excessive gestational weight gain are associated with:

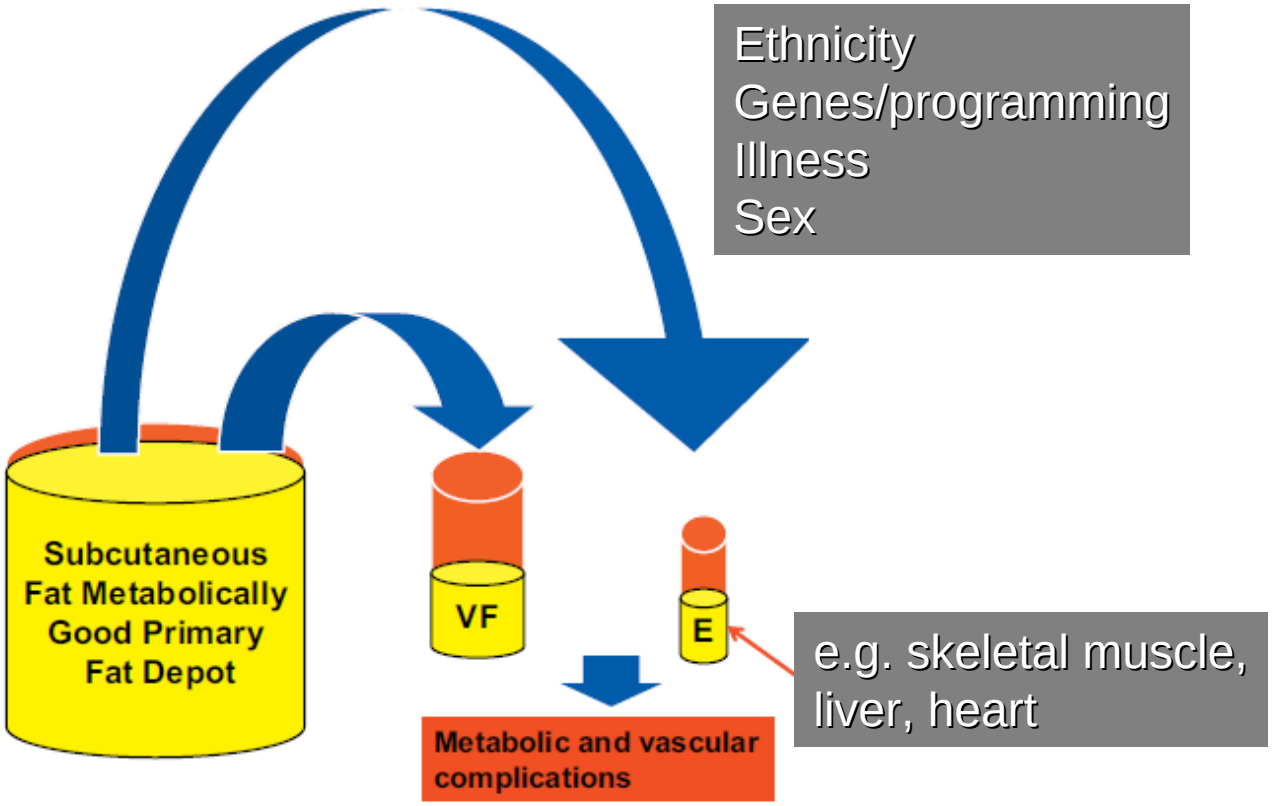
- High Infant birth weight or macrosomia

- Downstream child OW/OB as well as adolescent and adult OB

Mom and ‘newborn’?

Comparison to average

Perils of GWG- potential mechanism?



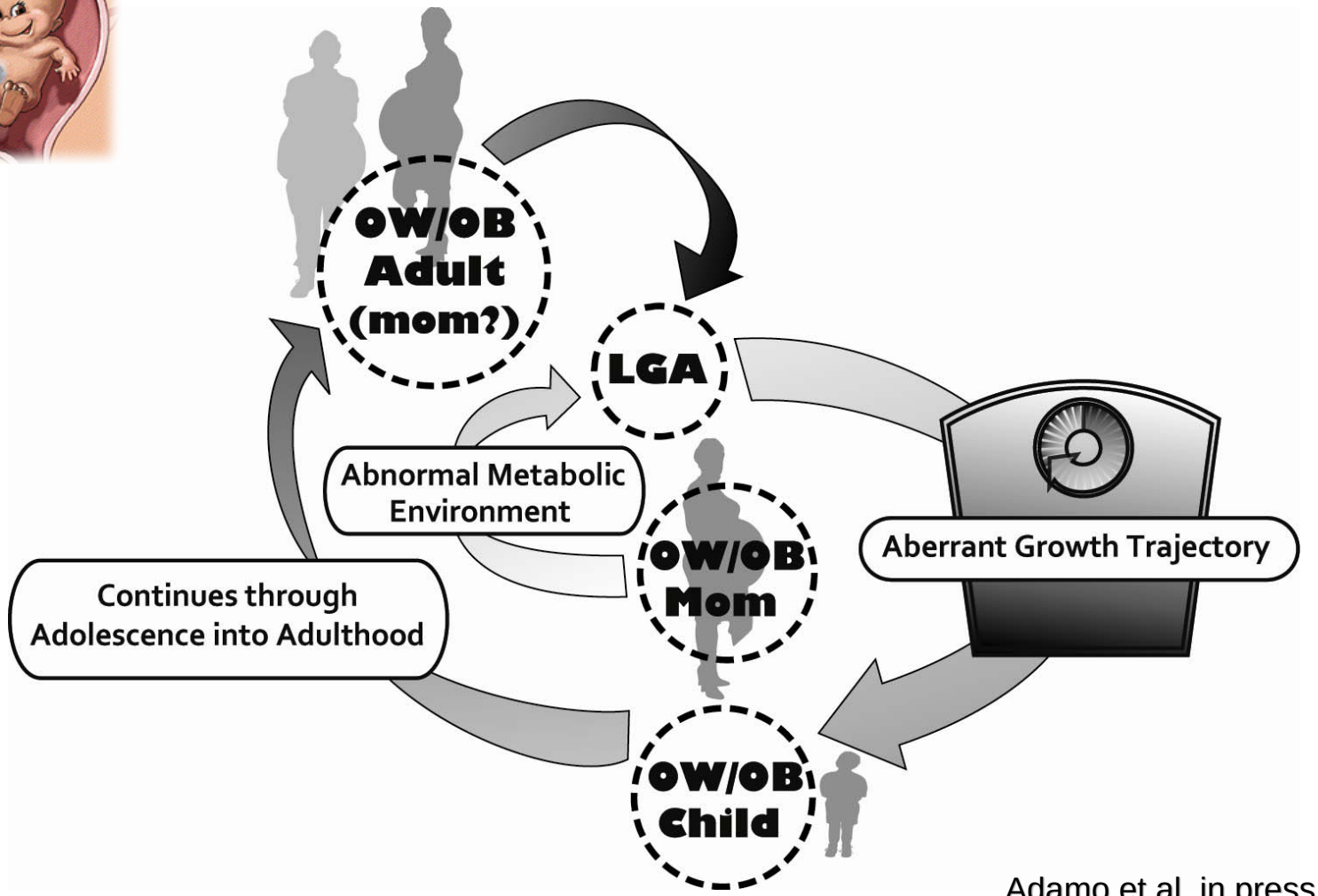
Adapted from
Huda et al. 2010

If the SC stocks are already full- the spill over into other stores could be detrimental

WE KNOW…

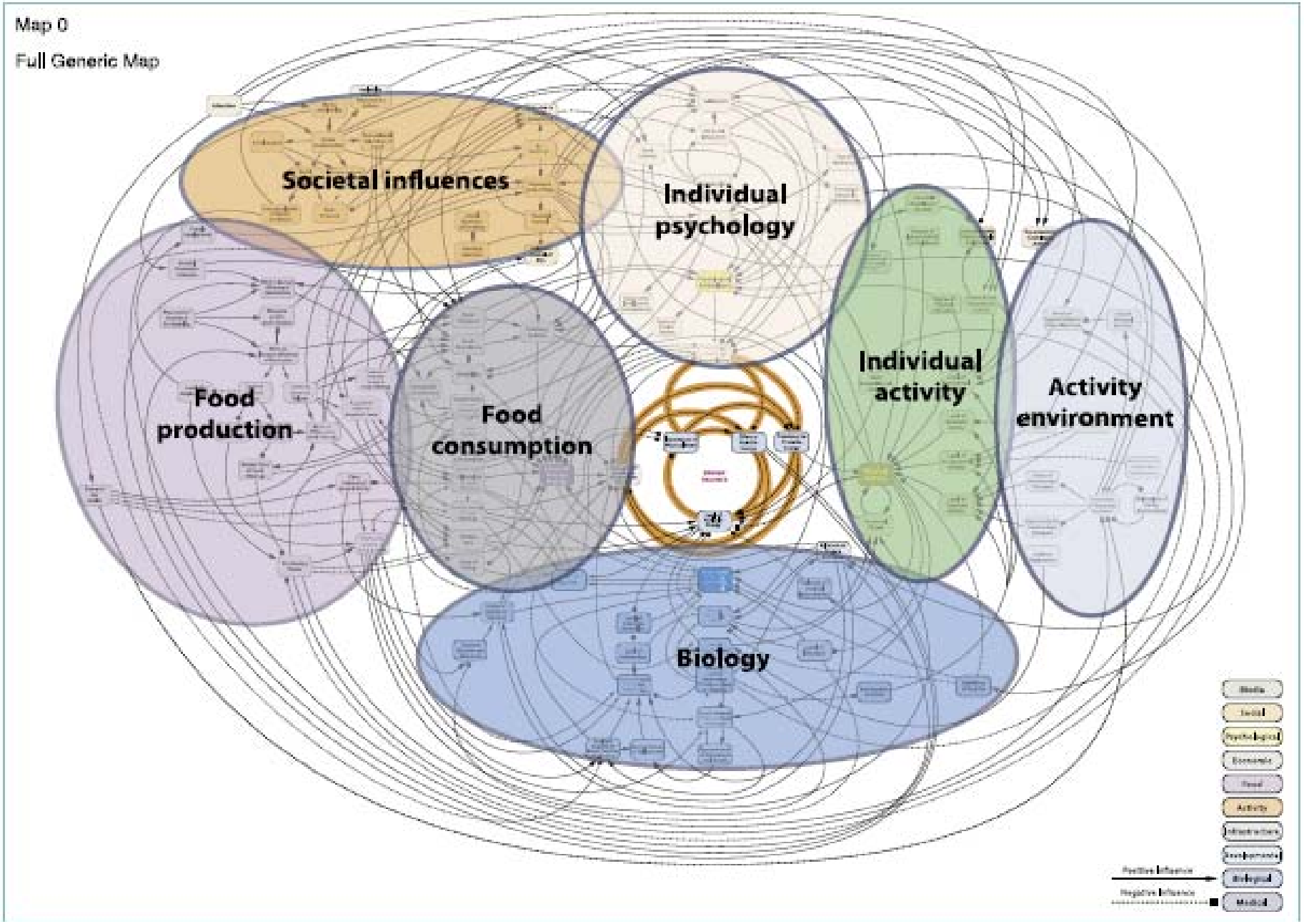
- Overweight women are more likely, by a ratio of nearly 3 to 1, to experience excessive GWG than are normal-BMI women (Olson 2003, Stotland 2006, Wells 2006)
- Maternal OW/OB more than doubles the risk of OB in offspring at 24 months of age (Whitaker 2004)
- offspring born to OW mothers are at greater risk for rapid weight gain during first 2 years of life (Karaolis-Danckert 2008)
- children with higher range BMIs, as early as 24 months, are more likely to be overweight at age 12 (Nader 2006)

Intergenerational cycles

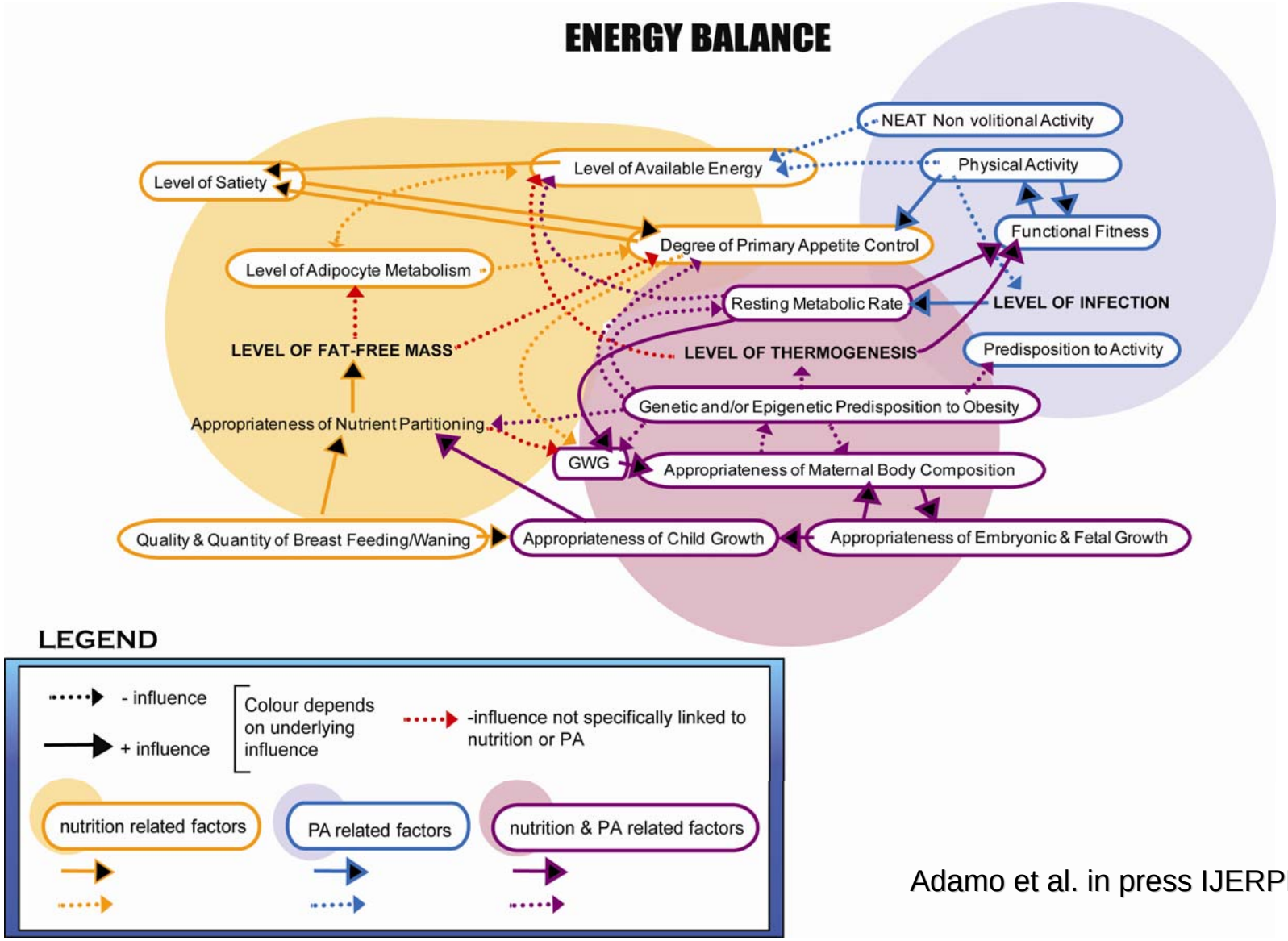


Adamo et al. in press IJERPH

Figure 8.1: The full obesity system map with thematic clusters (see Section 4 for discussion). Figure highlights broader determinants of health such as drivers of food production and components of the physical activity environment.



Physiological Systems Linking Maternal Adiposity to the Development of Pediatric Obesity



Adamo et al. in press IJERPH

Fallacy #1: Pregnancy is a time you can 'eat like 2' because the growing baby needs extra nourishment

- NOT so… human pregnancy is slow and thus has very modest nutritional requirements
  - Most can be obtained from healthy, balanced diet (~10-15% extra kcal in last trimester)
  - No special requirements for additional fat, CHO or protein

Maternal Diet & Offspring Obesity

Study: Pregnant Mothers' Diets Linked to Child Obesity

Published April 19, 2011 | NewsCore

Print Email Share Comments (0) Recommend 12 32

IStock

AUCKLAND, NEW ZEALAND – An expectant mother's diet during pregnancy can alter her baby's DNA in the womb, increasing its risk of obesity, heart disease and diabetes in later life, a team of international scientists has claimed.

Researchers from the UK, New Zealand and Singapore, said the study, to be published next week, provided the first scientific evidence linking pregnant women's diet to childhood obesity.

"We have shown for the first time that susceptibility to obesity cannot simply be attributed to the combination of our genes and our lifestyle, but can be triggered by influences on a baby's development in the womb, including what the mother ate," said Southampton University's Professor Keith Godfrey, who led the research.

Godfrey et al. Diabetes 2011

BBC NEWS

HEALTH

18 April 2011 Last updated at 13:51 ET

Mother's diet during pregnancy alters baby's DNA

By James Gallagher
Health reporter, BBC News

A mother's diet during pregnancy can alter the DNA of her child and increase the risk of obesity, according to researchers.

How diet, genes and pregnancy programme poor health

Tuesday April 19th, 2011

A woman's poor diet during pregnancy may cause changes to the DNA that will mean her child piling on fat later in life, researchers have revealed.

A woman does not have to be overweight to put her child at risk - all she has to do is to eat the wrong foods, scientists say.

Researchers at Southampton University worked with others in New Zealand and Singapore on the project.

They say diet during pregnancy can trigger "epigenetic" changes - which alter the way genes function.

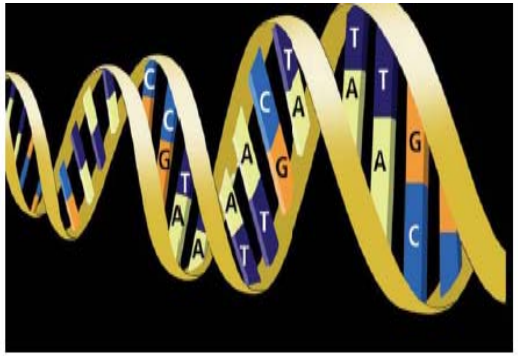
The decade long study found that changes to DNA at birth were linked to the development of obesity by the age of nine.

The research is due to be published next week in the journal Diabetes.

Epigenetics- where lifestyle and biology collide

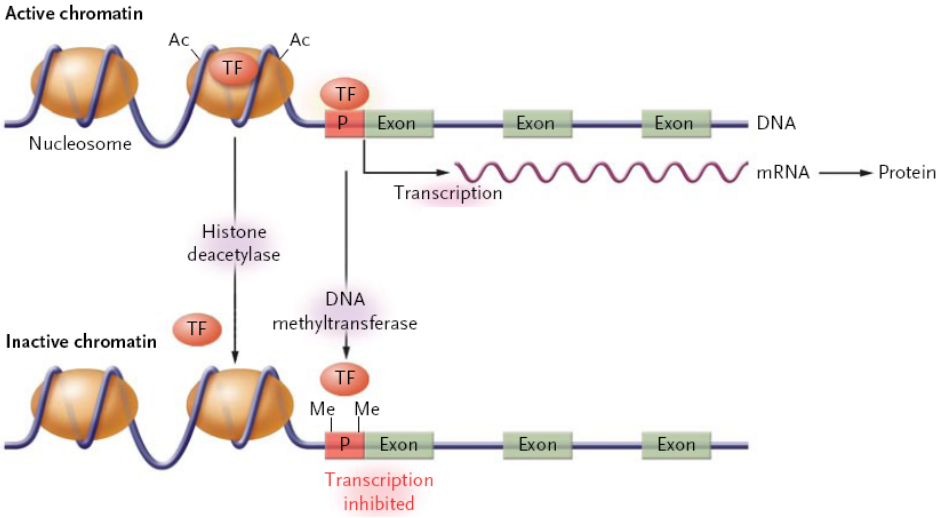
If genetics is the alphabet of life….

- Letters of DNA sequence carry the information



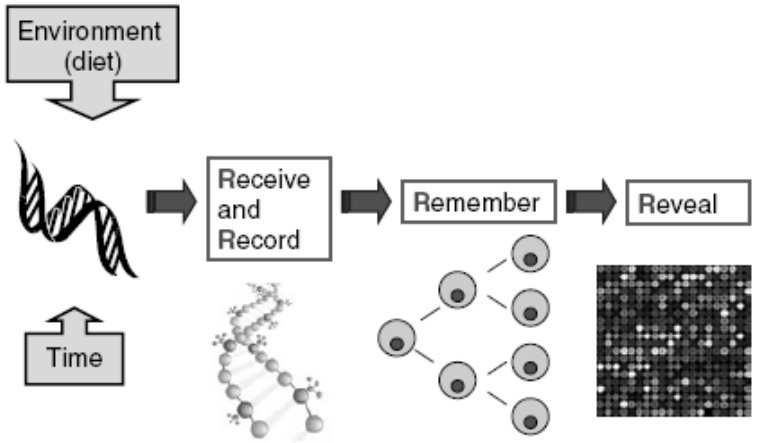
EPIGENETICS is the grammar of life!!!

- Markings can modify the message



Why is this important?

- Challenges during pregnancy/early neonatal life may result in changes in promotor methylation
  - Directly/indirectly affecting gene expression
- Maternal nutrition/behaviour can target the promotor regions of specific genes
- The changes in gene expression/promotor methylation can then be transmitted to future offspring



Mathers, 2008

Fallacy #2: Pregnant women should not engage in physical activity

- Joint CSEP-SOGC guidelines encourages aerobic & strength-conditioning exercise in pregnant women in the absence of contraindications (Davies et al, 2003)
- ACOG also recommends 30 + min of moderate exercise (aerobic & strength) on most if not all days of the week (ACOG 2002)
- Specific guidelines available for OW/OB pregnant women (Mottola et al, 2009) as a way to prevent onset and/or manage excess weight and co-morbidities (eg, GDM)

Pregnancy exercise 'slims babies'

Light exercise during pregnancy may improve the future health of a child by controlling weight in the womb, New Zealand and US researchers say.

Aerobic exercise during pregnancy 'can benefit baby'

Overweight or obese mums are more likely to have larger babies which could be at higher risk of health problems later in life.

A study of 84 first-time mothers found exercise was associated with slightly lighter babies.

UK guidelines recommend regular light exercise for pregnant women.

Potential Benefits of Exercise during Pregnancy

- Regular exercise is touted to have many positive maternal effects:
  - Decreased pains/discomforts and depression, shorter labour and delivery, fewer complications, and faster recovery postpartum (Clapp, 2006)
  - Less post partum weight retention
  - Protective effects with regard to Pre-eclampsia and GDM (Dempsey et al, 2005)

- *Possible fetal benefits include:
  - Decreased risk for SGA and LGA (Juhl M et al, 2010)
  - 'training' effects similar to adaptations in adults (ie, lower HR and increase HR variability) in offspring of exercising (30mins 3x/wk) mothers (May L et al, 2010)

Healthy Habits Start Earlier Than You Think

- The early years are a critical period for growth and development.
- Why bother – aren't all kids that age really active?
- Less than half of Canadian kids under five are getting regular physical activity part of their daily routine

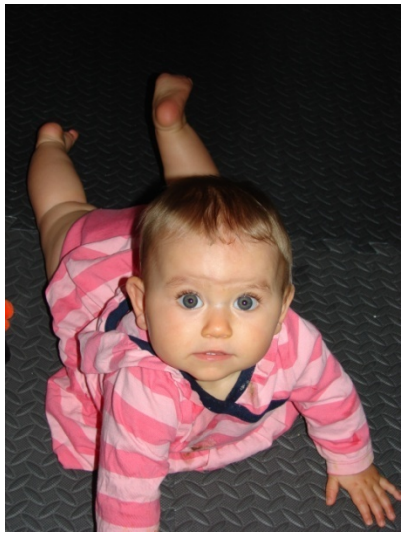
active healthy kids CANADA

The Power to Move Kids™

Start Young, Start Strong

- Although work is ongoing to fill the gap, Canada does not have physical activity guidelines for children under 5.
- We will discuss the National Association for Sport and Physical Education (NASPE) guidelines

NAPSE guidelines for infants



- Infants should interact with parents and/or caregivers in daily physical activities that are dedicated to promoting the exploration of their environment.

- Infants should be placed in safe settings that facilitate physical activity and do not restrict movement for prolonged periods of time.

- Infants' physical activity should promote the development of movement skills.

- Infants should have an environment that meets or exceeds recommended safety standards for performing large muscle activities.

- Individuals responsible for the well-being of infants should be aware of the importance of physical activity and facilitate the child's movement skills.

NAPSE guidelines for toddlers/Preschoolers

- Toddlers should accumulate **at least 30 min** daily of **structured** physical activity; preschoolers **at least 60 min**.
- Toddlers and preschoolers should engage in **at least 60 min** and up to several hours of daily, **unstructured** physical activity and should **not be sedentary for more than 60 min** at a time except when sleeping.
- Toddlers should develop movement skills that are building blocks for more complex movement tasks; preschoolers should develop competence in movement skills that are building blocks for more complex movement tasks.
- Toddlers and preschoolers should have indoor and outdoor areas that meet or exceed recommended safety standards for performing large muscle activities.
- **Individuals responsible for the well-being of toddlers and preschoolers should be aware of the importance of physical activity and facilitate the child's movement skills**.

Active play is fun, but not frivolous.

- In the early years, active play is required for healthy development, as it builds confidence and basic movement skills, and fosters social interaction, imagination and self-esteem.

Active Play

Grade

F

- Children in the early years are increasingly spending a large proportion of their time in childcare centres where active play should be commonplace.

- However, recent research indicates centre settings are predominantly sedentary.

Sedentary Pastimes

In 1971, the average age at which children began to watch TV was 4 years; today, it is 5 months.

- More than 90% of kids begin watching TV before the age of two, despite recommendations that screen time should be zero for children under 2, and limited to 1 hour for kids 2-5.

CHEO RESEARCH INSTITUTE

Activity Begins in Childhood

a randomized controlled trial to inspire healthy active behaviour in preschoolers

HEART&STROKE FOUNDATION OF ONTARIO

Ontario

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada

Why intervene in the daycare setting?

- Children spend most of their waking hours in this setting
- Studies have shown that preschoolers do not meet PA recommendations and are sedentary for most of the day
- physical inactivity and poor fitness are independent risk factors for obesity, metabolic disorders, and cardiovascular disease in youth
- gross motor skills develop in the preschool years
- PA levels track from early childhood to adulthood
- altering health behaviours in young children is considerably easier than in older children, adolescents or adults

Can we intervene in the daycare setting to:

1) Increase PA levels so that preschoolers meet guidelines?

2) Decrease sedentary time ?

3) Improve gross motor skills?

4) Improve anthropometrics?

5) Improve daycare providers attitudes, control beliefs, and self-efficacy toward incorporating PA into the day care curriculum?

Thank you

Canada Foundation for Innovation
Fondation canadienne pour l'innovation

Ottawa Dragonboat Festival Foundation

Heart & Stroke Foundation of Ontario

Ontario

CPMA ACDFL

CIHR IRSC
Canadian Institutes of Health Research
Instituts de recherche en santé du Canada