

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

”يُثَبِّتُ اللَّهُ الَّذِينَ آمَنُوا بِالْقَوْلِ الثَّابِتِ
فِي الْحَيَاةِ الدُّنْيَا وَفِي الْآخِرَةِ وَيُضِلُّ اللَّهُ
الظَّالِمِينَ وَيَفْعَلُ اللَّهُ مَا يَشَاءُ“

صدق الله العظيم

OBESITY



OMAYMA SALEH

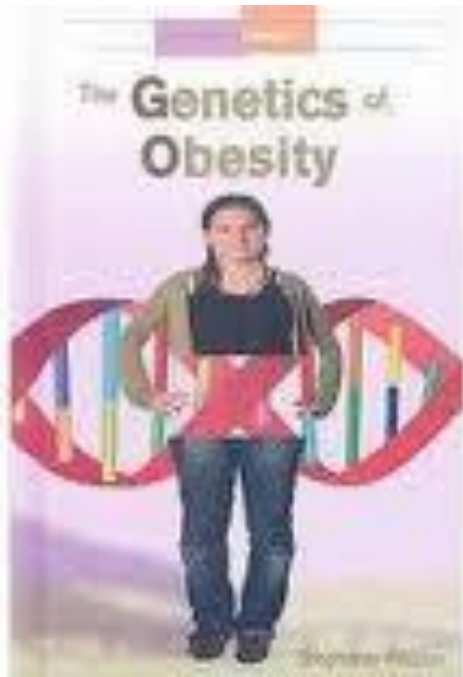
Prof Of internal medicine

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FACTS

GENETICS AND OBESITY



Although genetics play a large role , however environmental changes is important to promote significant reduction in obesity.

GENETICS AND OBESITY:

Some subjects are genetically susceptible to the **obesigenic effects of the environment.**

There are rare monogenic disorders of obesity.

Obesigenic environment:

Sum of influences that the surrounding conditions of life have promoting obesity in individuals and populations.

Obesity Treatment Pyramid



DIET AND OBESITY

- **Dietary modifications aiming at reducing energy intake are very effective in reducing weight .**



- **attempting to diet and telling someone to diet are not necessarily the same thing.**

Dietary interventions in adults (Recommendations)

= produce a 600 kcal/day energy deficit.

= Programmes should be tailored to the dietary preferences of the individual patient (A).

= loss of 1 to 2 pounds (about 0.5-1 KG) /week ??

= 10 percent weight loss in 6 months .

EXERCISE



FAT & FIT

- Physical activity does help in promoting weight loss and has health benefits even in the absence of weight loss

Benefits of exercise

- 1-it is associated with long-term weight loss maintenance.
- 2- Decrease loss of fat free mass associated with weight loss.
- 3- has beneficial health effects, such as decreasing coronary heart disease and diabetes, that are independent of weight loss itself. (FAT but FIT)



Successful weight loss

Life long effort



- **Obesity is a chronic condition requiring on going management to maintain long term weight loss.**
- **For overweight children, involving the family and home environment in weight-loss efforts is ideal.**
- **Providing actual meals or meal replacements works better for weight loss than does general advice about food choices**

PHARMACOTHERAPY

- **Some pharmaceutical agents can help in weight loss and weight maintenance as long as they continue to be used.**



= Indicated when BMI 30 kg/m² after trial of life style modification.

= Peripherally acting drugs: e.g. Orlistat.

Bariatric surgery

- In appropriate patients , bariatric surgery results in long term weight loss and reduction in the rate of incident diabetes and mortality.



Adjustable
Gastric Band
(AGB)



Roux-en-Y
Gastric Bypass
(RYGB)



Vertical Sleeve
Gastrectomy
(VSG)



Biliopancreatic
Diversion With a
Duodenal Switch
(BPD-DS)

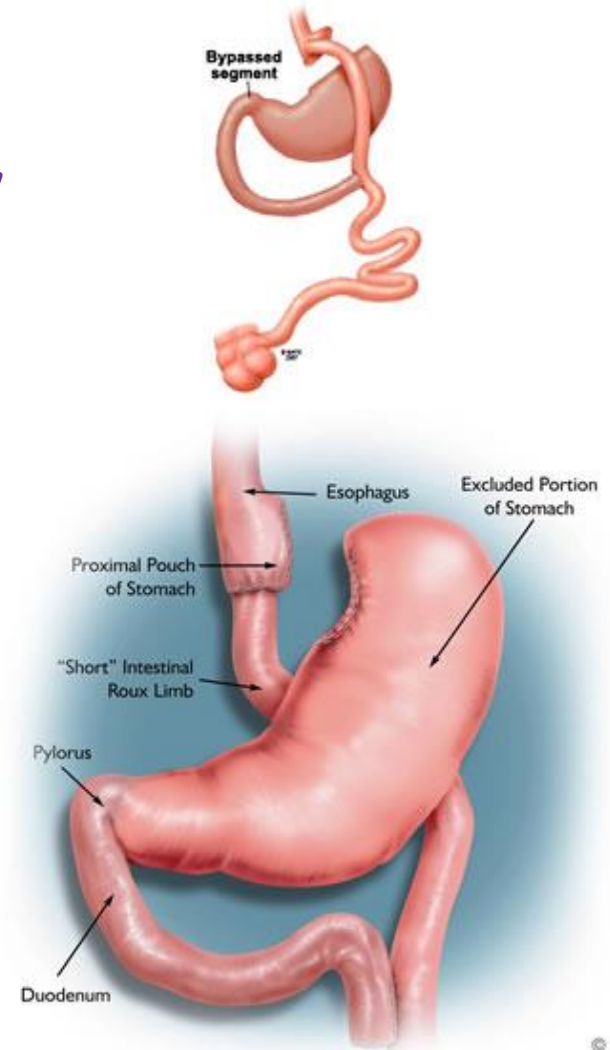
Bariatric surgery



Sleeve Gastrectomy



Gastric Banding



Roux-en-Y Gastric Bypass

Health benefits of weight loss in adults

- Improved lipid profile (A)
- Reduced osteoarthritis related disability (A)
- Lowered all cause, cancer, and diabetes mortality in some patient groups(B)
- Reduced blood pressure (B)
- Improved glycemic control (B)
- Reduction in risk of type 2 diabetes (B)
- Potential for improved lung function in patients with asthma (B)



MYTHS

Myths about obesity

- **False and scientifically unsupported beliefs about obesity are pervasive in both scientific literature and the popular press**

Krista Casazza & colleagues

N Engl J Med. 2013;368:446-454

Small sustained changes in energy intake or expenditure will produce large, long-term weight changes

- **Based on the old idea**

3500 cal = 1 pound of weight

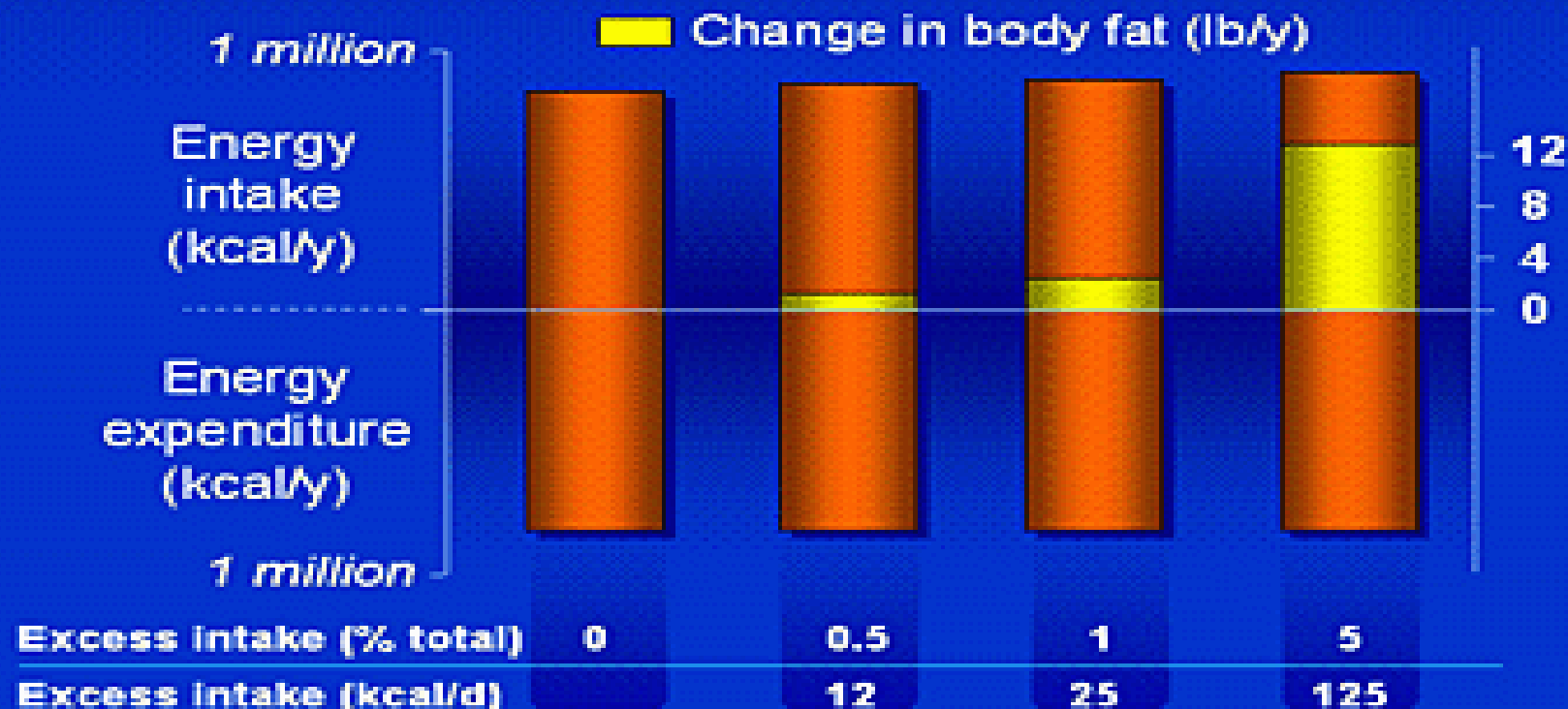
The myth:

It does not take into account the changes of energy requirements changes over time with changes in BMI.

So, as weight is lost , more exercise and dietary modifications to increase the weight loss.

Consistent differences, even if very minor, between energy intake and energy expenditure can lead to large changes in body fat mass over time.

Cumulative Effect of Small Daily Imbalances in Energy Intake on Body Fat Mass



Rosenbaum M et al. *N Engl J Med.* 1997;337:396-408.

Obesity Online Slide Library
www.obesityonline.org

**Setting realistic goals for weight loss
is important, because otherwise
patients will become frustrated and
lose less weight**

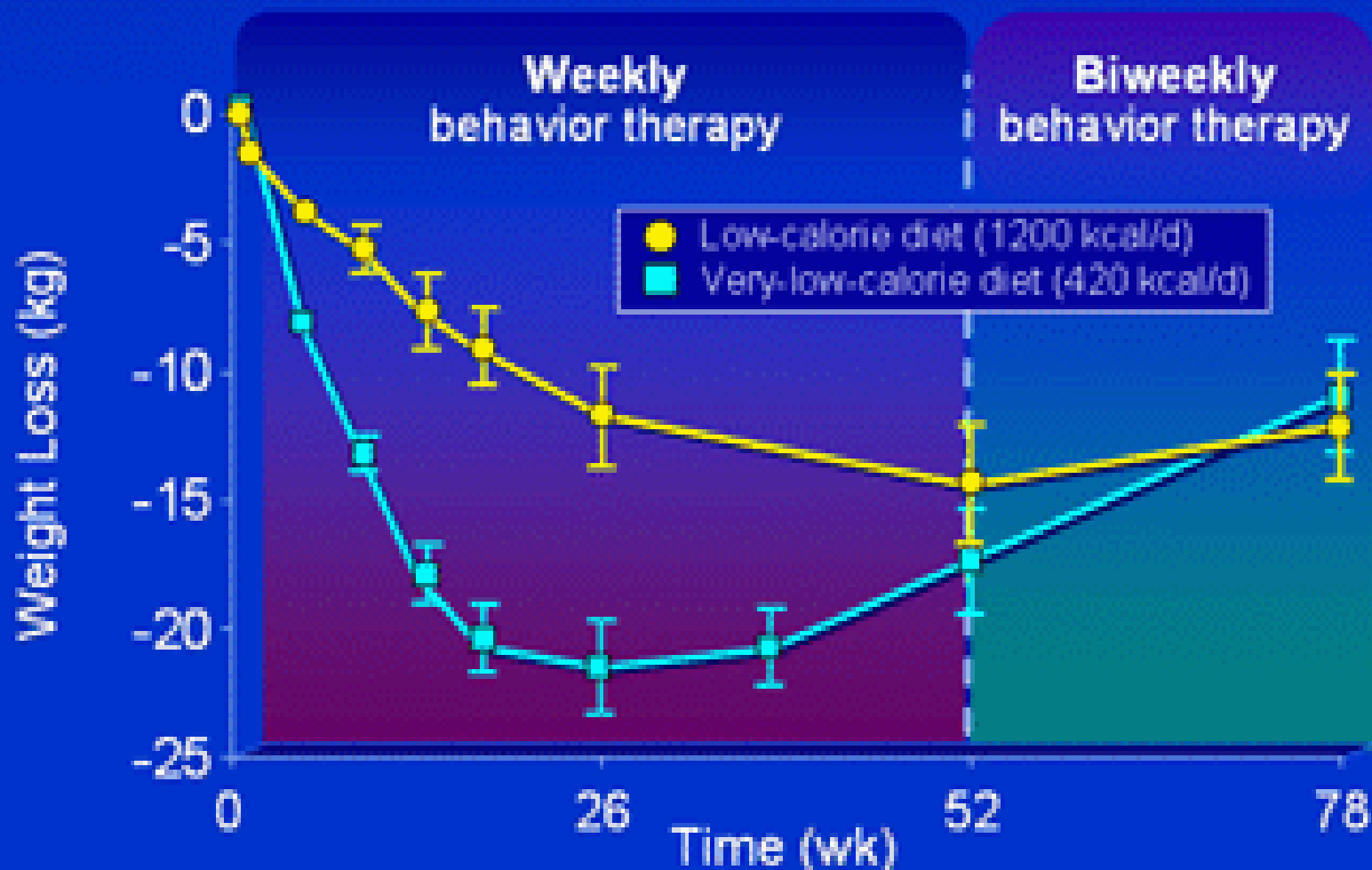
**Realistic weight goals seem reasonable idea to
keep people motivated.**

**Not supported by evidence,
observations and studies showed that people
with very ambitious goals lose more weight.**

Large, rapid weight loss is associated with poorer long-term weight-loss outcomes, as compared with slow, gradual weight loss

Against this , a meta-analysis of randomized, controlled weight-loss trials found that rapid weight loss via very-low-calorie diets resulted in significantly more weight loss (16% vs 10% of body weight) at 6 months, and differences in weight loss persisted up to 18 months

VLCDs Do Not Produce Greater Long-term Weight Loss Than LCDs



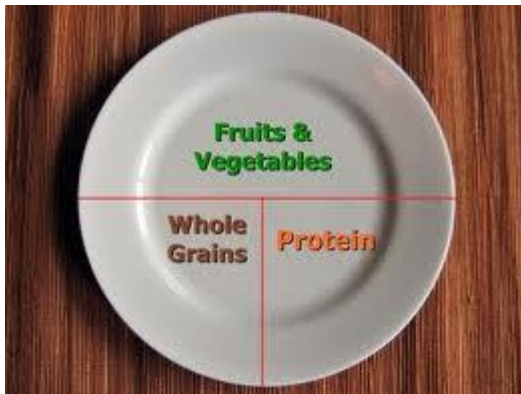
Wadden et al. *J Consult Clin Psychol* 1994;62:165. Copyright 1994 by the American Psychological Association. Reprinted with permission.

Source:
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It is important to assess the stage of change or diet readiness in order to help patients who request weight-loss treatment??



Physical-education classes, in their current form, play an important role in reducing or preventing childhood obesity??



Breast-feeding is protective against obesity ??

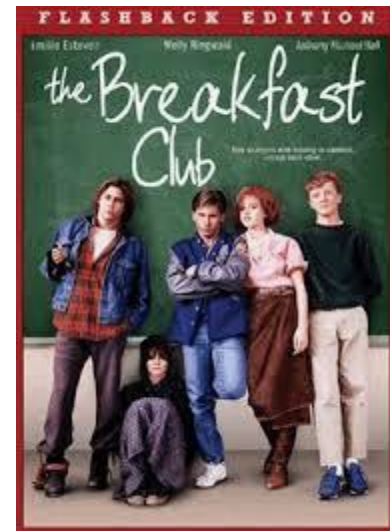




Presumptions

Value of Breakfast

- Regularly eating (versus skipping) breakfast is protective against obesity.



Cardinal Behaviors of Successful Long-term Weight Management

National Weight Control Registry Data

- **Self-monitoring:**
 - Diet: record food intake daily, limit certain foods or food quantity
 - Weight: check body weight ≥ 1 x/wk
- **Low-calorie, low-fat diet:**
 - Total energy intake: 1300-1400 kcal/d
 - Energy intake from fat: 20%-25%
- **Eat breakfast daily**
- **Regular physical activity: 2500-3000 kcal/wk**
(eg, walk 4 miles/d)

- **Against :**
2 studies found no difference
- **Higher eating frequency was associated with lower body weight status in children and adolescents, mainly in boys.**
- **Eating Frequency and Overweight and Obesity in Children and Adolescents: A Meta-analysis** .[Panagiota Kaisari](#), [Mary Yannakoulia](#), and [Demosthenes B. Panagiotakos](#), *Pediatrics*. April 8, 2013.

Early Childhood Habits and Weight

- Early childhood is the period in which we learn exercise and eating habits that influence our weight throughout life.



Value of Fruits and Vegetables



Adding fruits and vegetables to the diet results in weight loss —

Adding more calories of any type without making any other changes is likely to cause weight gain.

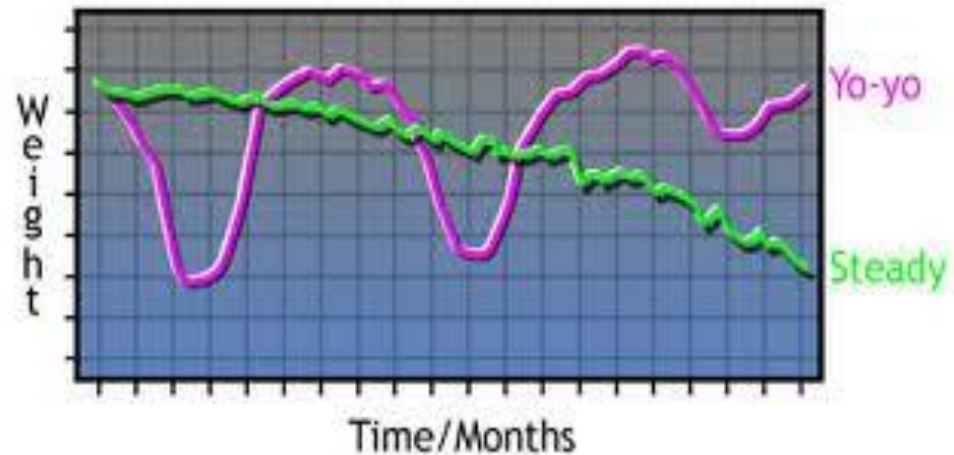
Eating fruits and vegetables is healthful, however.

Eatwell plate



Weight Cycling and Mortality

- **Weight cycling (i.e., yo-yo dieting) is associated with increased mortality**



The data are from observational studies and likely confounded by health status

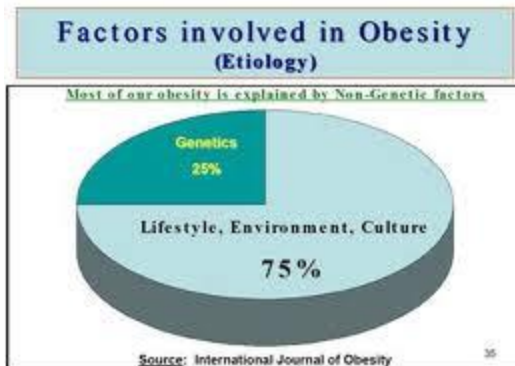
Snacking and Weight Gain

- **Snacking contributes to weight gain and obesity**



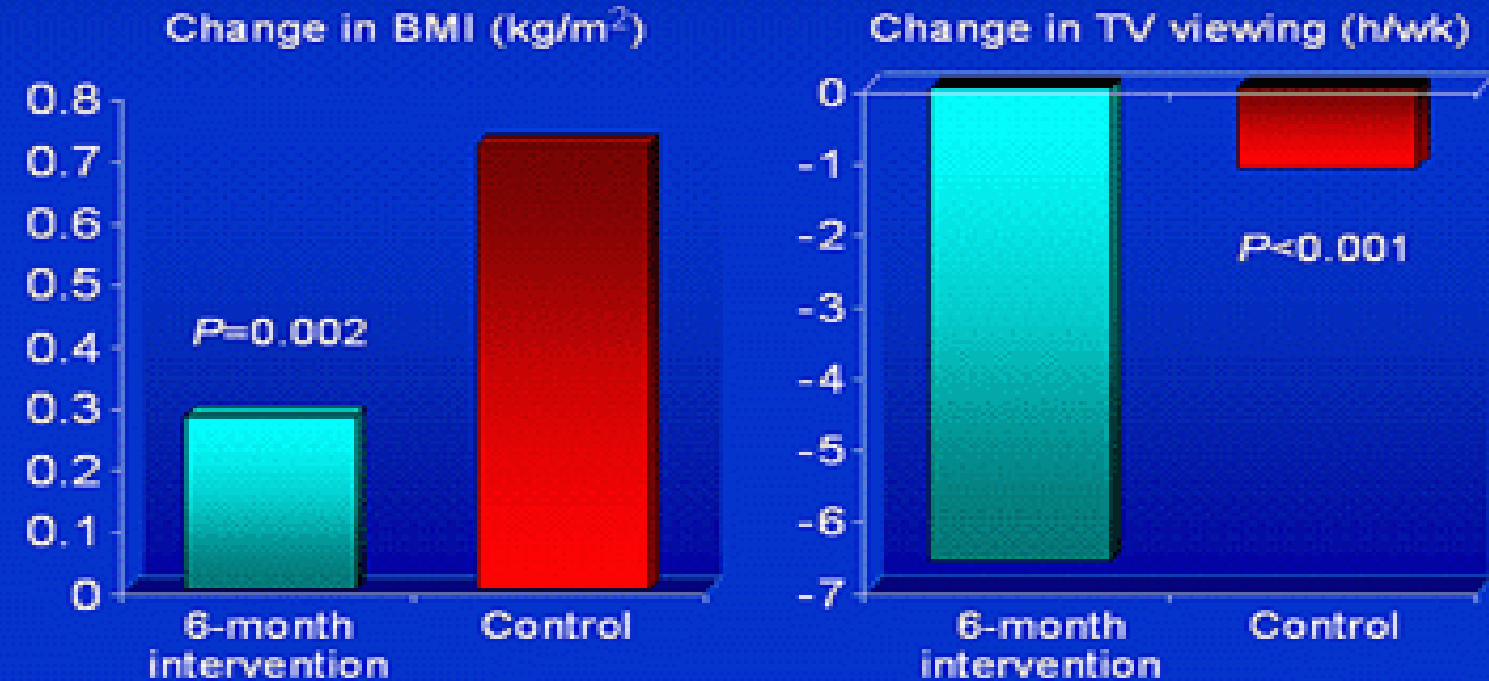
Built Environment and Obesity

- The built environment, in terms of sidewalk and park availability, influences the incidence or prevalence of obesity.



A program to reduce television viewing among a cohort of normal-weight children demonstrated beneficial effects on body weight .

Decreasing Television Viewing Leads to improved Body Mass Index in Children



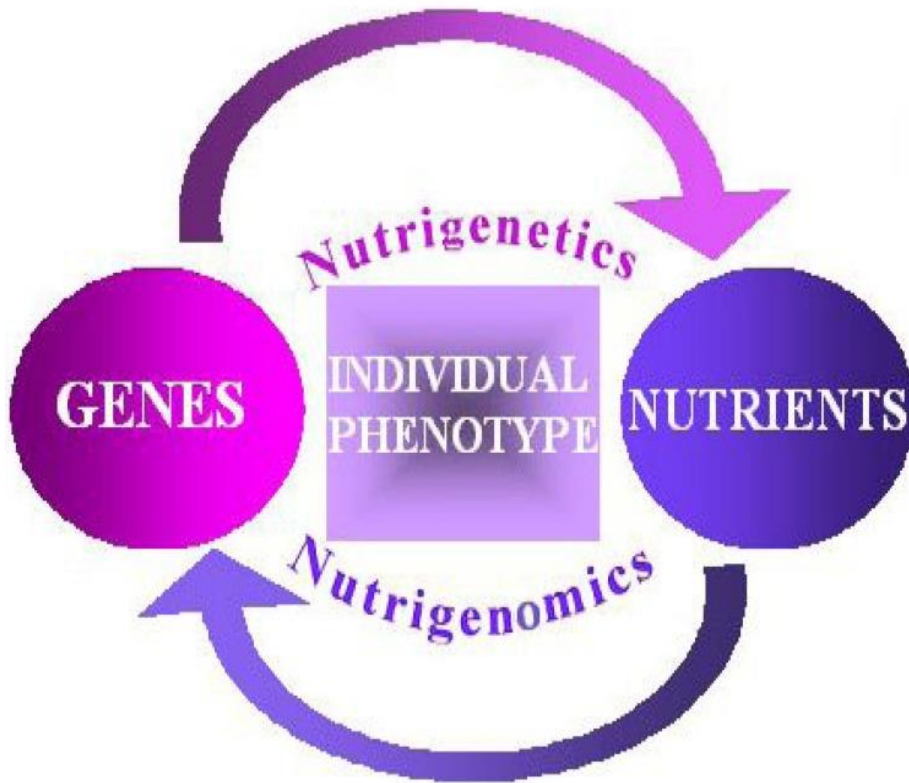
Robinson JAMA 1999;282:1561.

Source:
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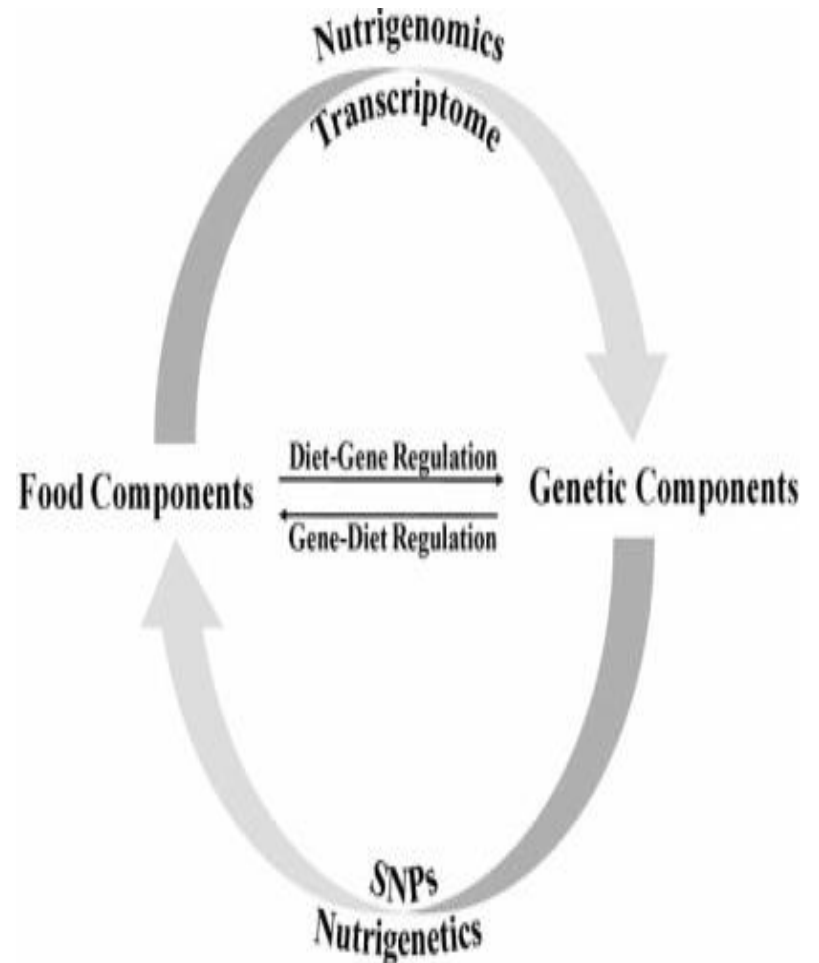
FUTURE PERSPECTIVES

Nutrigenomics & Nutrigenetics

Polymorphic and Mutant Genes
(Changed enzymatic and hormonal activities)



Macronutrients (proteins, lipids, etc)
Micronutrient (minerals, vitamins, etc)



- The investigation of how food components modulate changes in gene expression profile or transcriptome is defined as **nutrigenomics**.
- On the other hand, **nutrigenetics** is defined as the study of how genetic variations such as single nucleotide polymorphism (SNP) among individuals affect their response to specific food components.

- **Do we know enough? A scientific and ethical analysis of the basis for genetic-based personalized nutrition.** [Görman U](#), [Mathers JC](#), [Grimaldi KA](#), [Ahlgren J](#), [Nordström K](#). [Genes Nutr](#). 2013 Mar 8.

THERMOGENESIS

BAT

Brown adipose tissue functions in humans

- **Human adults have functionally active BAT. The metabolic function can be reliably measured in vivo using modern imaging modalities (namely PET/CT).**
- **Cold seems to be one of the most potent stimulators of BAT metabolic activity but other stimulators (for example insulin) are actively studied.**
- **Obesity is related to lower metabolic activity of BAT but it may be reversed after successful weight reduction such as after bariatric surgery**

Pharmacological and nutritional agents promoting browning of white adipose tissue.

- **Recently, interest in this tissue has re-emerged due to the realization of active brown-like adipose tissue in adult humans and inducible brown-like adipocytes in white adipose tissue depots in response to appropriate stimuli ("browning process").**
- **Brown-like adipocytes that appear in white fat depots have been called "brite" (from brown-in-white) or "beige" adipocytes and have characteristics similar to brown adipocytes, in particular the capacity for uncoupled respiration**

Capsinoids and related food ingredients activating brown fat thermogenesis and reducing body fat in humans

- As human BAT may be inducible, a prolonged ingestion of capsinoids would recruit active BAT and thereby increase energy expenditure and decrease body fat. I**
- In addition to capsinoids, there are numerous food ingredients that are expected to activate BAT and so be useful for the prevention of obesity in daily life**

Brown, white, beige: the color of fat and new therapeutic perspectives for obesity

- **Many studies have focused on identifying factors involved in brown adipocyte lineage, the site of adaptive thermogenesis.**
- **Very recently, the concept of "beigeing", defined as the occurrence of thermogenic brown adipocytes in white adipose tissue, has emerged, leading to the identification, by Bruce Spiegelman's group, of a new muscular hormone, called **irisin**, which is able to stimulate the "beigeing".**

- **Direct targeting of adipose tissue is still far from being a magic bullet for the treatment of obesity and type 2 diabetes.**
- **However, new options arise by targeting BAT to increase energy expenditure.**
- **It is still not clear if chronic BAT activation leads to sufficient energy expenditure to achieve the therapeutic goal of weight loss.**
- **Furthermore, it is not known if compensatory mechanisms such as increased appetite might countervail increased energy expenditure.**
- **Well-directed cold exposure appears to be the most physiological stimulus to activate BAT. Optimum conditions for a targeted cold exposure of an anticipated “cold-therapy” need to be further elucidated.**

Circadian disruption and the development of obesity

Sleep/wake cycle, circadian disruption and the development of obesity:

Recent evidence shows that circadian clock is a crucial factor in the development of obesity and related metabolic disease.

- **Genetic disruption of clock genes in mice displayed metabolic dysfunctions of specific tissues at distinct phases of the sleep/wake cycle.**
- Masaki T. Sleep/wake cycle, circadian disruption and the development of obesity. *Nihon Rinsho*. 2012 Jul;70(7):1183-7.

Control of circadian disruption in the management of obesity:

Circadian des-synchrony, a characteristic of shift work and short sleep, are associated with obesity in human.

Improving the correspondence between biological and social clocks will contribute to the management of obesity.

Recent experimental evidence of the pharmacologic modulation of circadian rhythms — centrally, peripherally, and (in various organs and tissues) differentially.

Conclusions

The clinical approach to obesity can be viewed as a pyramid consisting of several levels of therapeutic options.

All patients should be involved in an effort to change their lifestyle behaviors, to decrease energy intake, and increase physical activity.

Lifestyle modification also should be a component of all other levels of therapy.

Pharmacotherapy can be a useful adjunct measure for properly selected patients.

Bariatric surgery is an option for patients with severe obesity who have not responded to less intensive interventions.

Ongoing research involving circadian clock modulation, BAT and nutrient gene interactions are promising for future directions

(وكلوا واشربوا ولا تسرفوا)

صدق الله العظيم

THANK YOU