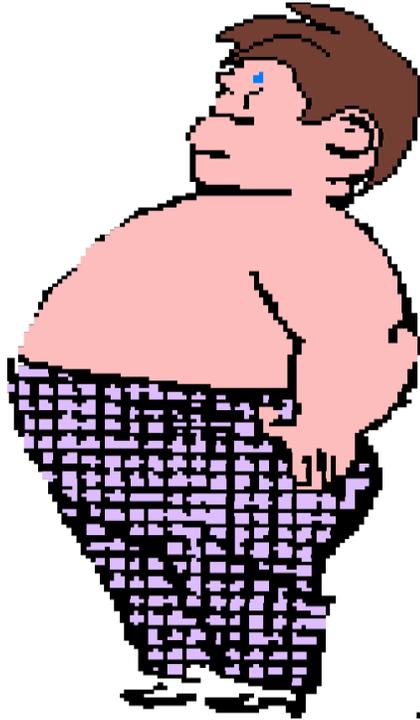


Childhood Obesity



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Outline

- Introduction to obesity epidemics worldwide.
- Escalating rates of pediatric obesity.
- Possible etiological factors contributing to obesity.
- Microbiota & obesity.
- Prevention.
- Management strategies.

Introduction

- Obesity & overweight among children & adolescents is increasing at an alarming rate, which lead to the increase in the incidence of their related co-morbidities.
- The prevalence of obesity worldwide 18.5% & affected 13.7 million children & adolescents.
- Obesity prevalence is lower in the highest income than low socioeconomics group.
- Physicians should avoids blaming a patient or family with obesity, while still strongly encouraging them to invest in lifestyle change.
- Physicians should use the words "unhealthy weight" or "weight problem" as more motivating and less stigmatizing than the terms "obese" or "fat".

Rising rate of childhood overweight is ALARMING!

1 every 4 children in the United States is considered overweight



Prevalence of overweight & obesity in Saudi children & adolescents

Mohammad I. El Mouzan,^a Peter J. Foster,^b Abdullah S. Al Herbish,^a Abdullah A. Al Salloum,^a Ahmad A. Al Omer,^c Mansour M. Qurachi,^d and Tatjana Kecojevic^b

***Ann Saudi Med.* 2010 May–Jun;3(30) 208–203)**

- The national sample size, was 19 317 healthy children & adolescents from 5 - 18 years of age.
- The prevalence of overweight 23.1%, obesity 9.3%, severe obesity 2 % in all age groups.

Possible etiological factors!!

Prenatal & Perinatal Influences

Perinatal factors “Epigenetics”:

- Women who are overweight pre or in early pregnancy increases, the effects of this altered metabolism on the fetus with intra-uterine programming for childhood obesity.
 - In UK study, increased **pre-pregnancy BMI** of the mother were significantly associated with rapid weight gain between the ages of 3 and 5 years.

Post-natal factors:

- Rapid postnatal weight gain.
- Small for gestational age (SGA) infants are prone to rapid weight gain & later obesity.
- Babies born with C/S are more risk to have obesity later on life.
- Bottle feeding is another well-studied postnatal risk factor of obesity.

Genetic Factors

- Children are at increased risk for obesity if their parents have obesity: there is a 30% chance of obesity if one parent has obesity and a 90% chance if both parents have obesity.
- More than 200 genes or gene markers are associated in some way with obesity.

Genetics

- In recent years, progress was made in identifying genes that may contribute to this effect.
- The **FTO gene** (fat mass & obesity-associated) is a large gene on chromosome 16; reported in 2007.
- A defect in the **melanocortin 4 receptor gene (MC4R)** is associated with a severe, early form of monogenic obesity in children.
- MC4R deficiency is characterized by hyperphagia, hyperinsulinemia, & increased fat mass .
- **Leptin hormone deficiency.**
- **Leptin receptor mutation.**

Environmental Factors

Life style changes “Modernization”



ENERGY IN

EXCEEDS



ENERGY OUT!!



Eat too much & Move too little !!!





Super Sized Fast Food



Endocrine / Syndromes

Endocrine Causes:

Cushing's syndrome, Pseudohypoparathyroidism, Hypothyroidism, Panhypopituitarism, Hypothalamic tumors

Syndromes:

Prader-willi, Bardet-Beidil syndrome, Carpenter syndrome, Cohen syndrome & Turner syndrome

Medication related obesity

- **Glucocorticoids** :Prednisone
- **Antidepressants**: Amitriptyline, desipramine
Anticonvulsants: Valproic acid
- **Antipsychotic drugs**: Risperidol, Haldol
- **Recreational drugs**: marijuana

Psychological stress

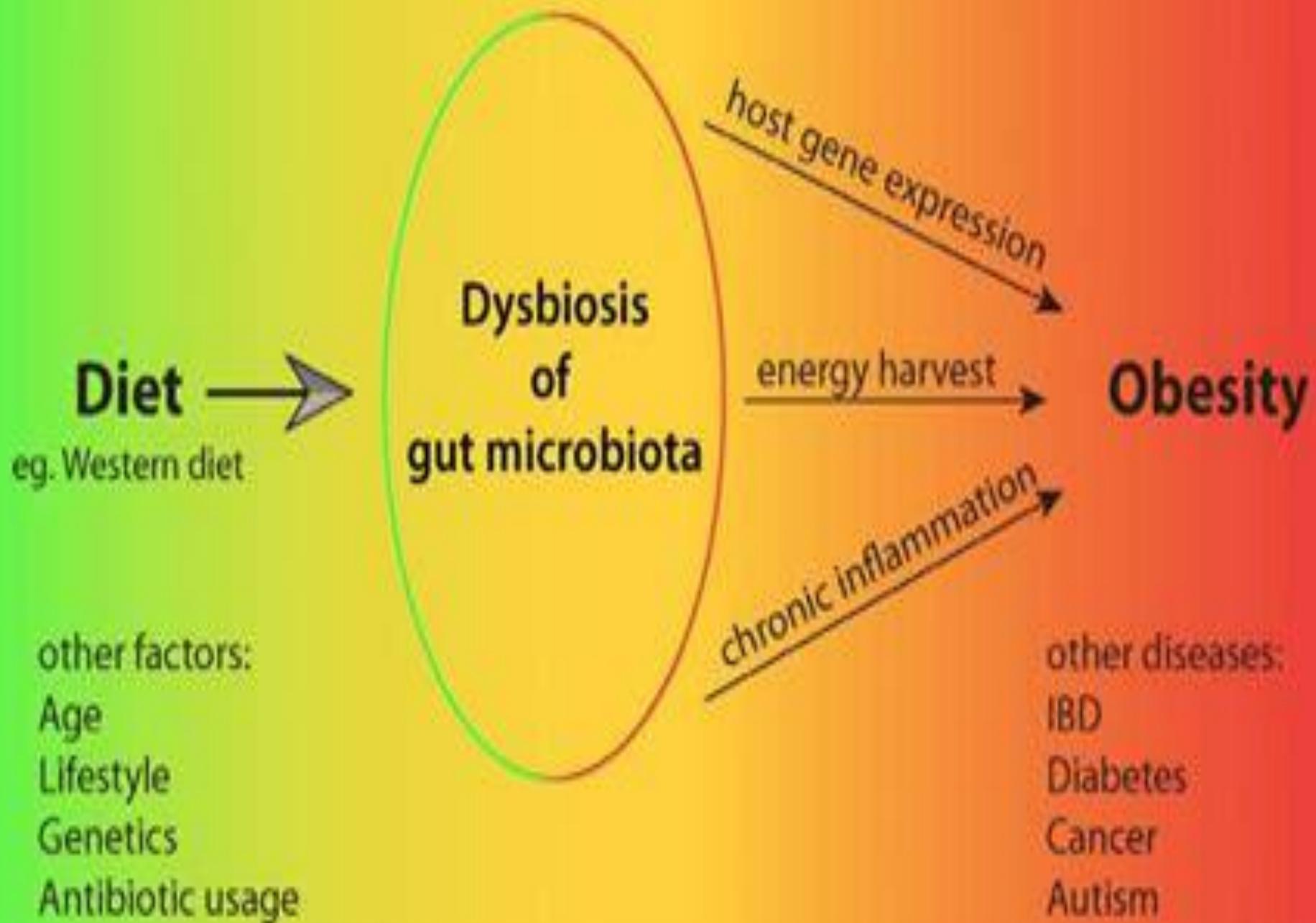
- Stress factors in the environment may trigger the onset of obesity
- In children, these factors can include:
 - Death of a parent.
 - Parental divorce or separation.
 - Learning or school problems.
 - Emotional problems.
 - Medical illnesses.

من حكم الأطباء، قيل إن أول من قالها هو: الحارث بن كلدة:
المعدة بيت الداء، والحمية رأس الدواء.



Gut Microbiota

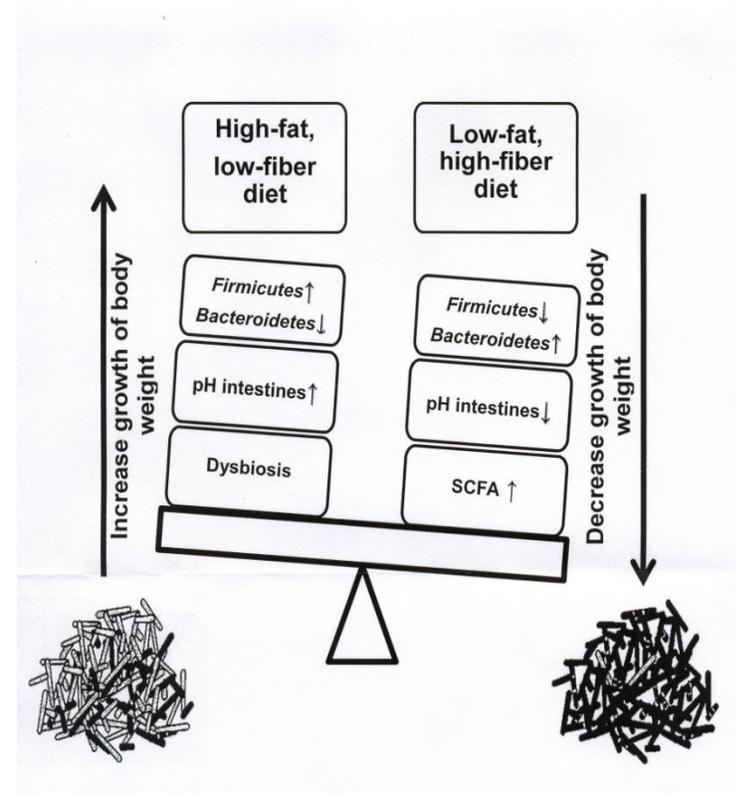
A healthy gut is the sign of healthy life

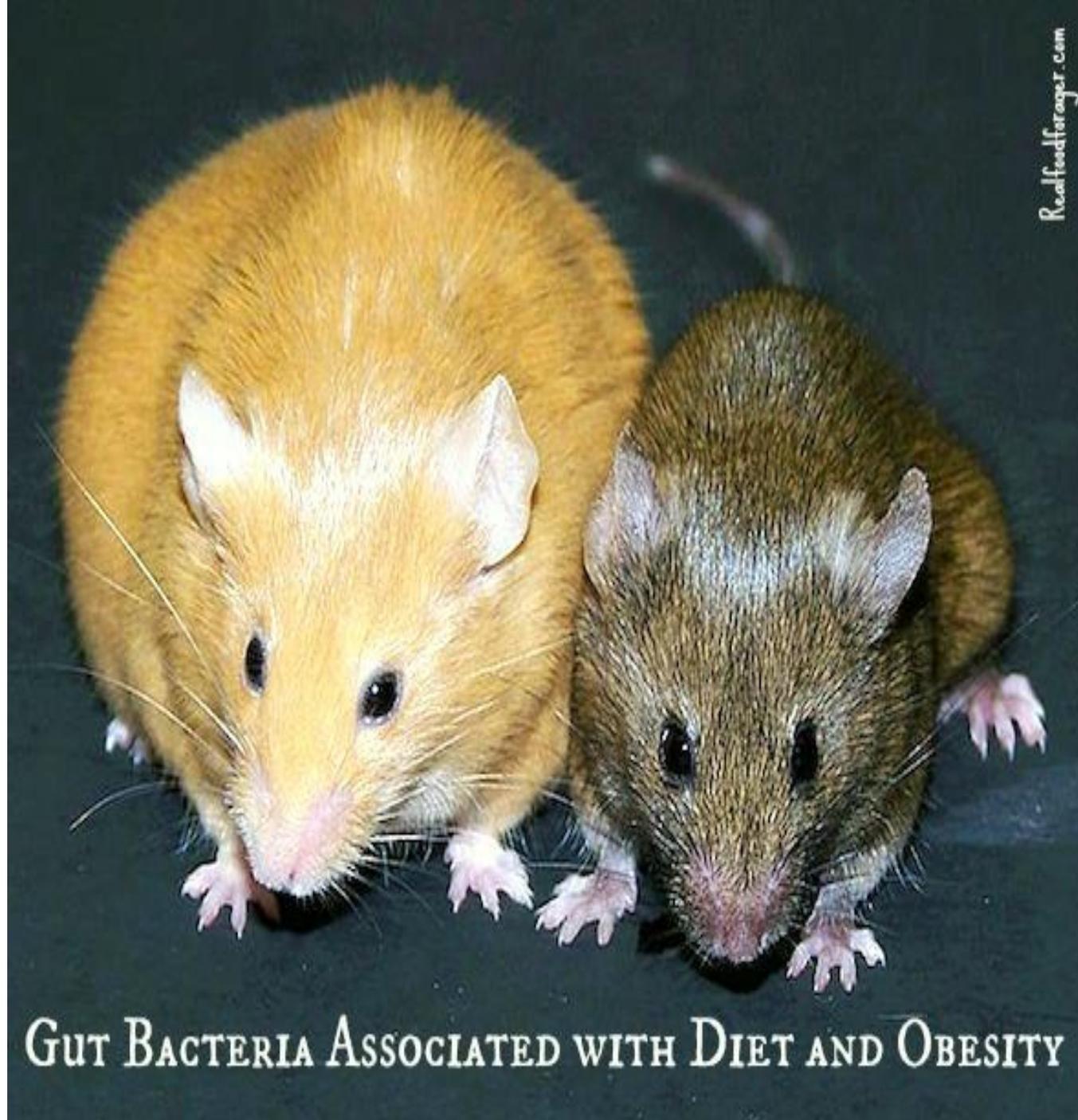


Metabolic Endotoxemia Phenomenon

- High-fat diet (HFD) is known to translocate microbiota into a lipopolysaccharide (LPS)-enriched intestinal microbiota with a consequently elevated plasma concentration of LPS, which characterizes a state of metabolic Endotoxemia.
 - Cani P, Bibiloni R, Knauf C, Waget A, Neyrinck A, Delzenne N, et al. Changes in gut microbiota control metabolic endotoxemia-induced inflammation in high-fat diet-induced obesity and diabetes in mice. *Diabetes* (2008) 57:1470–81.10.2337/db07-1403

High Fiber diet will increase proportion and function of gut Microbiota

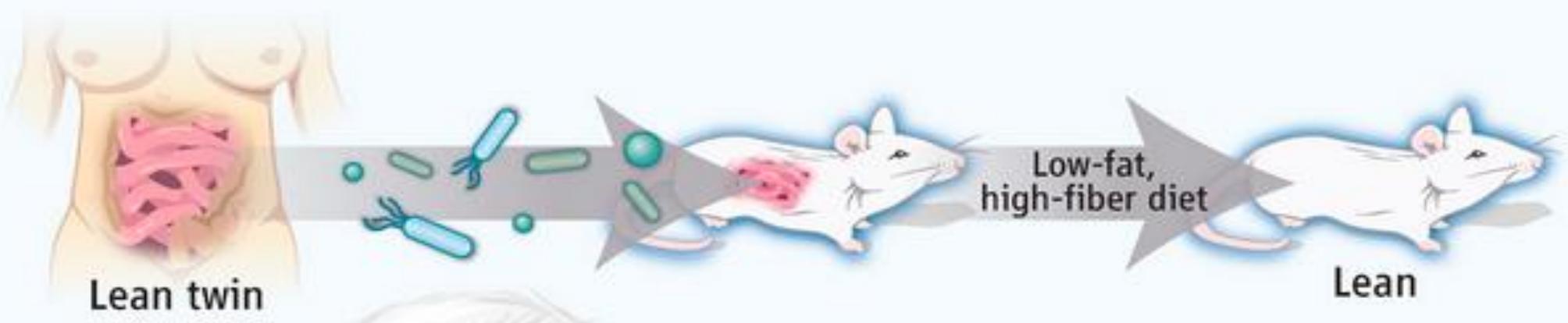
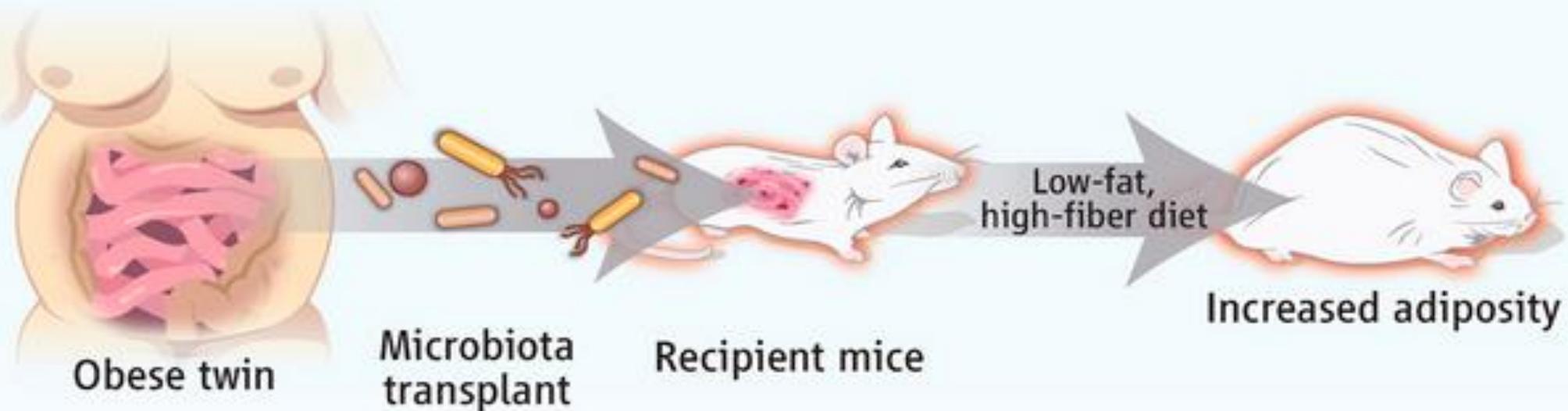




Realfoodforages.com

GUT BACTERIA ASSOCIATED WITH DIET AND OBESITY

A

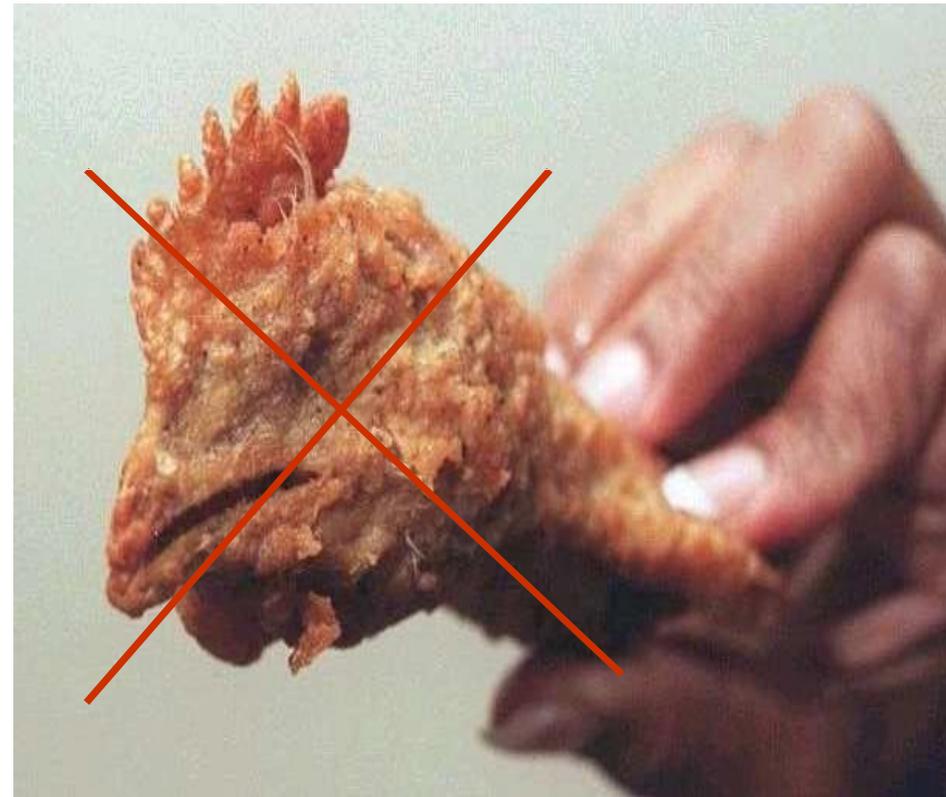


Strategies for promoting healthy eating, exercise & parent Involvement

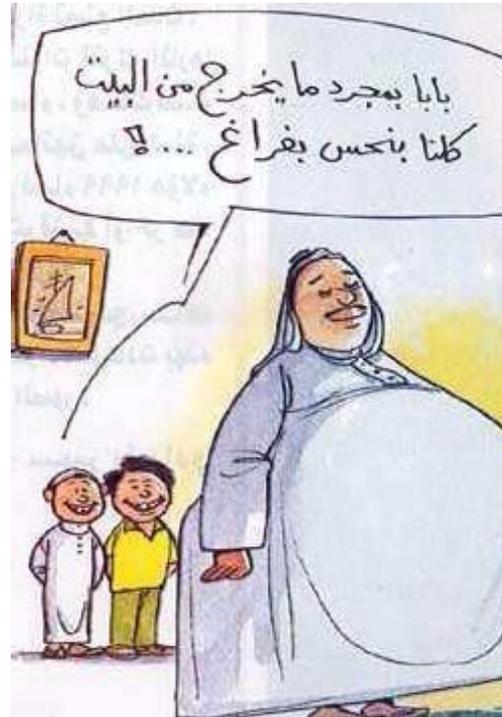


Prevention of obesity & its complications

عن المقدم بن معدي كرب قال : سمعت رسول الله صلى الله عليه وسلم يقول : ما
ملا آدمي وعاء شرا من بطن ، بحسب ابن آدم أكالات يقمن صلبه ، فإن كان لا محالة
، فتلت لطعامه ، وتلت لشرا به ، وتلت لنفسه رواه الإمام
أحمد والترمذي والنسائي وابن ماجه ،



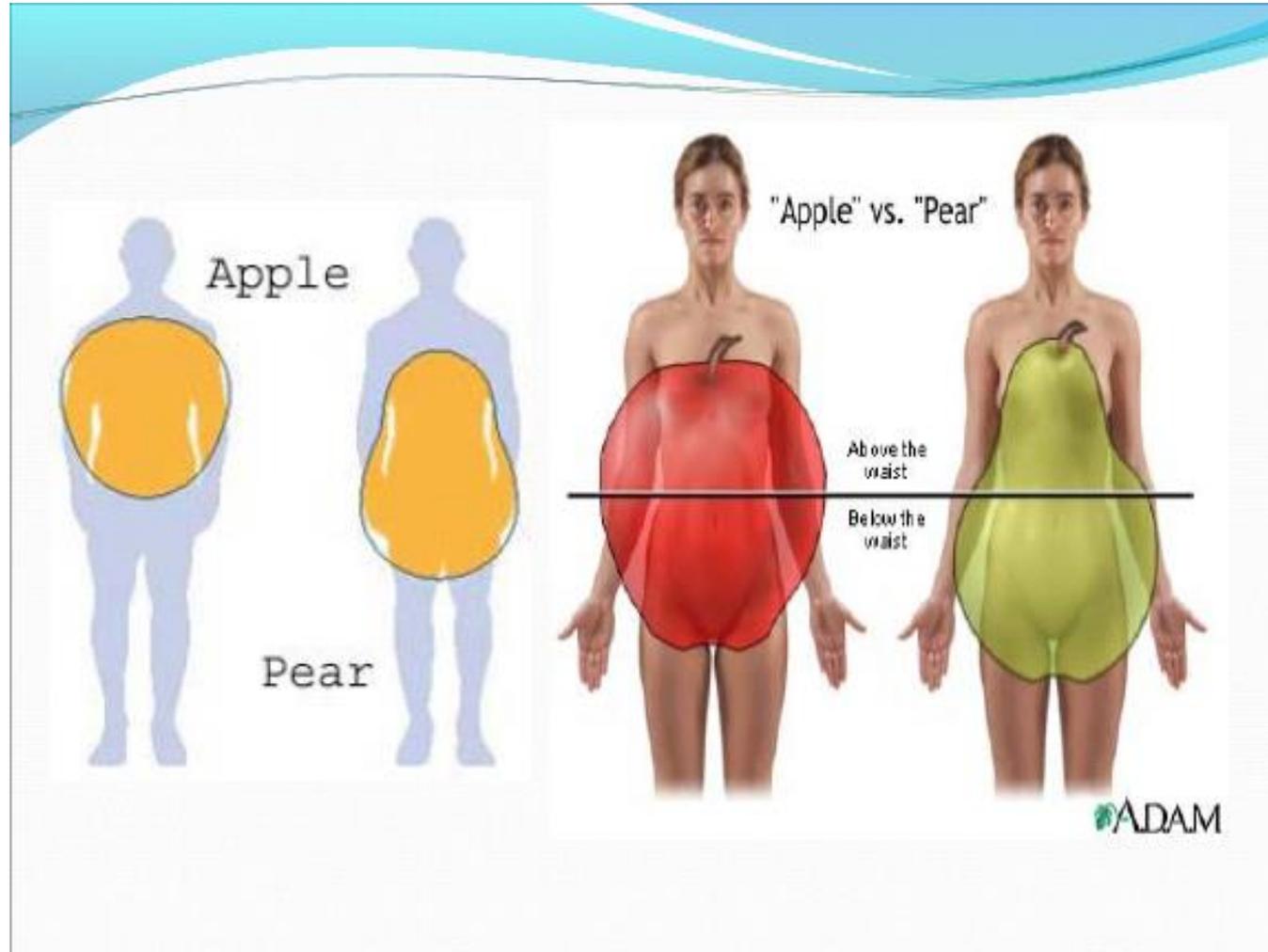
Modeling can not be underestimated!



Complications

- Insulin resistance / Type 2 DM
- HTN
- Dyslipidemia
- Sleep disorders
- Fatty liver disease
- Metabolic syndrome
- In female adolescents: PCOS
- Psychological / Behavioral changes

Android Vs Gynecoid Obesity



Obesity is a major factor for insulin resistance



Acanthosis nigricans

Management of Obesity

Goals of treatment

- Dietary management.
- Exercise.
- Behavior modification.
- Treatment of Complications.
- Medical & surgical managements.

General Strategies

- Maternal health & weight reduction pre & throughout pregnancy.
- Encourage breast feeding.
- Increase consumption of fruits & vegetable
- Reduce screen time.
- Reduce soft drink consumption.
- Increase physical activity.

Metformin: reduces hepatic glucose production and fasting insulin concentrations and inhibits fat cell lipogenesis.

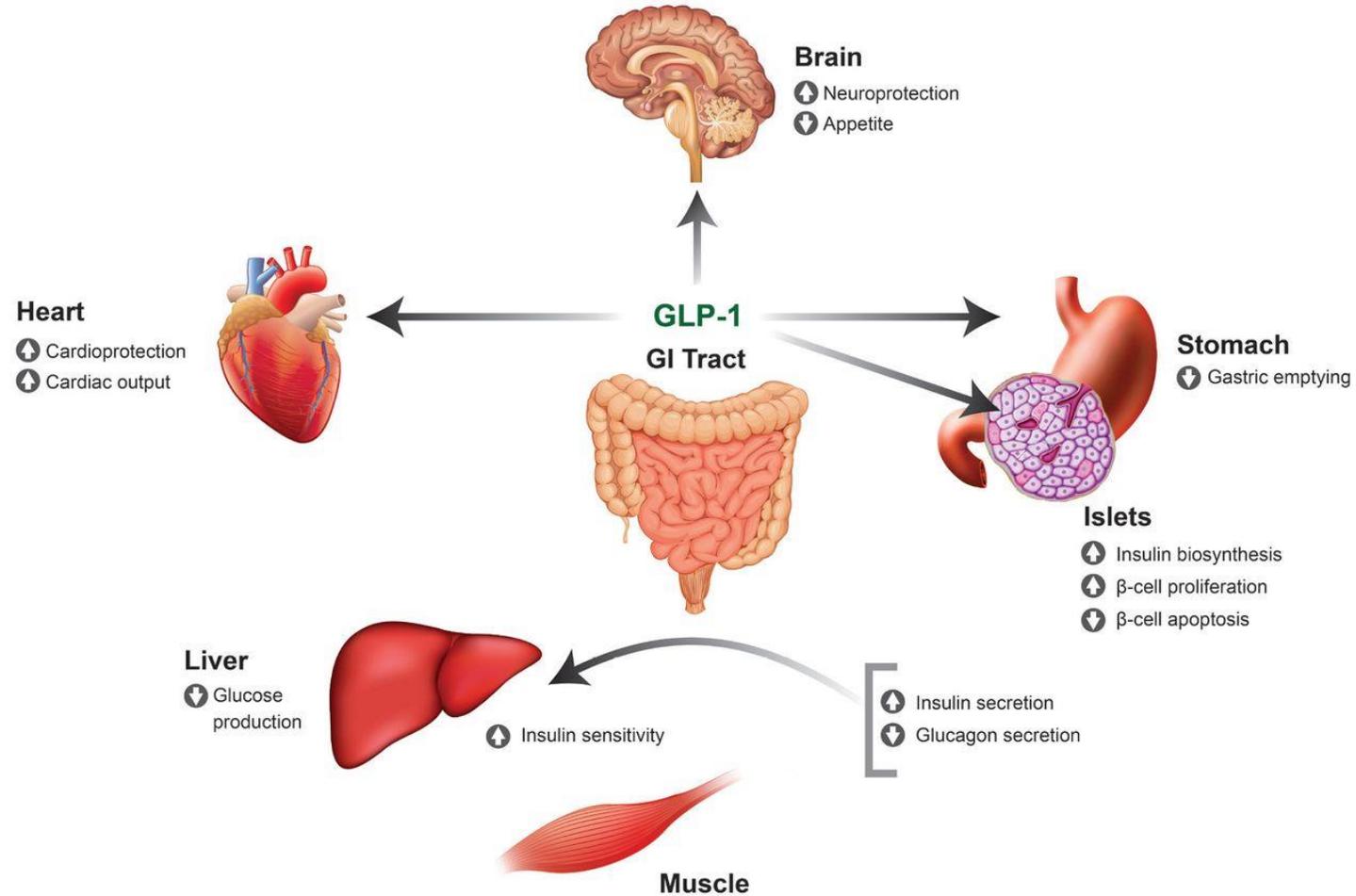
Incretins: can increase peripheral insulin sensitivity and may reduce food intake by raising levels of glucagon-like peptide 1 and /or reducing hypothalamic expression of neuropeptide Y.

ORIGINAL ARTICLE

Liraglutide in Children and Adolescents with Type 2 Diabetes

William V. Tamborlane, M.D., Margarita Barrientos-Pérez, M.M.S.C.I.,
Udi Fainberg, M.D., Helle Frimer-Larsen, M.Sc., Mona Hafez, M.D.,
Paula M. Hale, M.D., Muhammad Y. Jalaludin, M.D., Margarita Kovarenko, M.D.,
Ingrid Libman, M.D., Jane L. Lynch, M.D., Paturi Rao, Ph.D.,
Naim Shehadeh, M.D., Serap Turan, M.D., Daniel Weghuber, M.D.,
and Timothy Barrett, Ph.D., for the Ellipse Trial Investigators*

Beneficial effects of GLP-1 receptor agonist



Conclusions

- Obesity & its co-morbidities are prevalent among Saudi pediatric patients.
- We recommend preventing excessive weight gain through the promotion of:
 - Healthy lifestyle.
 - Family educational seminars.
 - Reinforcement of indoor exercises.

Conclusions

- •Prevention of pre-gravid maternal by educate & improve the health habits of young women before or near the time that they decide to bear children, we could shift the epidemic.
- Breast feeding is important preventive strategy.
- High fiber, low fat diet is essential (not only for low calories, but also to keep gut microbiota healthy.
- Medication & surgical intervention should be kept last option in obese adolescents.

THANKS

