Obesity

Objectives:

- Why to study obesity?
- What is obesity?
- Body weight regulation?
- Why do people come obese?
- How to manage obesity?

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Resources: 435 team + Davidson + kumar + Recall questions step up to medicine.

- Editing file
- Feedback

Obesity

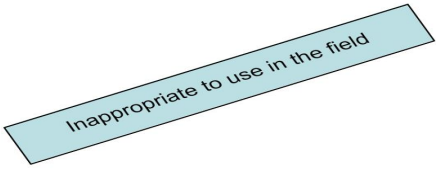
★ Definition:

WHO:

- "Abnormal or excessive fat accumulation in adipose tissue, to the extent that health is impaired"
- Presence of an abnormal absolute amount or relative proportion of body fat.
- Obesity means excess accumulation of fat in the body 20% or more over an individual's ideal body weight.
- Once it develops it is difficult to 'cure' and usually persists throughout life.
  -They go into depression, why? because they are obese, so they get depressed and then they tend to eat more and gain more weight and depressed again and go on.
  -33% of saudis are obese and 33% are overweight.

★ Amount of adipose tissue in human body:

- Possible
- Difficult
- Time consuming
- Expensive



★ Surrogate measures of adiposity:

- Ideal body weight (Not used anymore)
- Weight
- Anthropometric measures
- Body mass index(BMI): (Most accurate)(the most Reliable, easiest)
- Recommended by WHO.

  Relatively reliable exception:
  - Extremes of age or height
  - Very fit individuals with muscular build

★ WHO recommended definition of obesity(2000): in adults

Classification	BMI (kg/m2)	Risk of comorbidities
Underweight	<18.5	Low (but risk of other clinical problems increases)
Normal Range	18.5-24.9	Average
Overweight Pre-Obese	>25.0 25-29.9	Mildly increase
Obese Class I Class II Class III	>30 30-34.9 35-39.9 >40.0	 Moderate Severe Very Sever

From 30 and above it is start to be considered as obese
So usually the BMI & waist circumference are based on the ethnic background
But the Asian population (china/ japan), their cut off less than this due to their small body built.

★ Production of ethnic-specific cut-points for obesity:

difference in ethnicity leads to changes in BMI cutoff points and hence buddy fatness and morbidity and mortality:

Additional interim cut-point of BMI of 23kg/m^2 or greater to indicate overweight

in Asian populations and a BMI of 25kg/m^2 to represent a higher level of risk equivalent to obesity
You have to know it, and be careful the height in meters not cm.

★ Classification of obesity as per fat distribution

- **Android (or abdominal or central, males)**
  - Collection of fat mostly in the abdomen (above the waist)
  - apple-shaped
  - Associated with insulin resistance and heart disease
- **Gynoid(below the waist, females)**
  - Collection of fat on hips and buttocks
  - pear-shaped
  - Associated with mechanical problems

★ Obesity-prevalence In SA, the studies were centric only such as in Riyadh and did not considered other area to see the distributions.

- Well recognized as a serious and growing public health problem
- WHO estimates that over 1.7 billion people around the world are overweight, 310 million are obese
- Rates of obesity have tripled in the last 20 years in the developing world
- In US, 33.3 % of men and 35 % of women are obese in 2007
- 15-25 % of American children are obese
- In SA: study done between 1995-2000 in age group between 30-70 on 17000 subjects
- Prevalence of overweight: 36.9 % : 42% male, 31.8 % female More obese females and more overweight males
- Prevalence of obesity: 35.5 % , severe obesity 3.2 % with female of 44 %, male 26.4 %
- The prevalence of overweight and obesity was higher amongst a group of married women than among a group of single women in Saudi Arabia

Central Obesity

★ Definition:

Excessive accumulation of abdominal fat around the stomach and abdomen.

★ Association with disease:

- Central or visceral obesity is associated with more metabolic disease:
  - DM_2
  - Hypertension
  - Dyslipidemia
- How to assess central or visceral obesity?

★ Ways to assess central obesity: CT is the most accurate.

- MRI
- Dual X-ray absorptiometry(DEXA)
- Single CT slice L4/L5
- Waist: hip ratio
- Waist circumference: waist circumference and BMI are the most used. waist circumference is the vital sign for obesity.

- The narrowest circumference midway between the lower border of the ribs and the upper border of the iliac crest, taken from the side.

★ Waist Measurement or BMI?

★ Waist circumference (measure of visceral obesity)

waist circumference, it's variable based on the ethnic background.

Population	Risk of Metabolic Complications of Obesity	
	Increased	Substantially Increased
Caucasian (WHO)		
Mem	>94 cm	>102 cm
Women	>80 cm	>88 cm
Asia (IASO/OTF/WHO)		
Men		>90 cm
Women		>80 cm
China (WGOC)		
Men		>85 cm
Women		>80 cm

★ **Obesity in Children:** In assessing obesity in children, we need to take into account weight, height AND growth

- Growthcharts
- BMI-for-age reference charts
- "International standard"BMI-for-age:

Cole et al. (BMJ 2000;320:1240-1243) Combined sample of seven countries By tracking the percentile representing a BMI of 25kg/m^2 and 30kg/m^2 at 18 years back through to birth. It's use will provide a standard definition and enable meaningful comparisons to be made between countries.

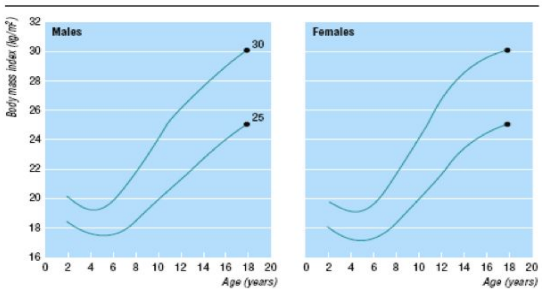
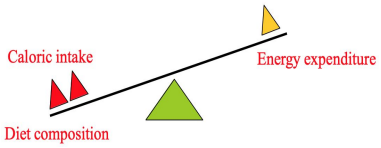


Fig 6 International cut off points for body mass index by sex for overweight and obesity, passing through body mass index 25 and 30 kg/m² at age 18 (data from Brazil, Britain, Hong Kong, Netherlands, Singapore, and United States)

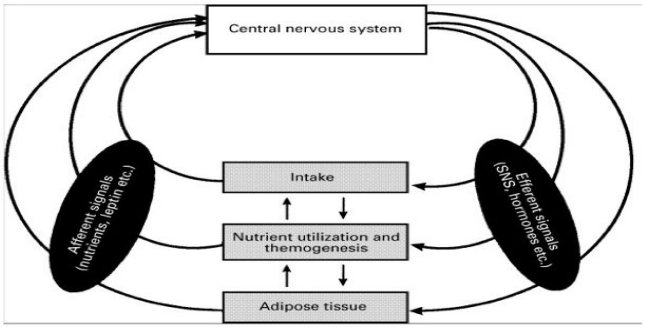
	Body mass index 25 kg/m²		Body mass index 30 kg/m²	
Age (years)	Males	Females	Males	Females
2	18.41	18.02	20.09	19.81
2.5	18.13	17.76	19.80	19.55
3	17.89	17.56	19.57	19.36
3.5	17.69	17.40	19.39	19.23
4	17.55	17.28	19.29	19.15
4.5	17.47	17.19	19.26	19.12
5	17.42	17.15	19.30	19.17
5.5	17.45	17.20	19.47	19.34
6	17.55	17.34	19.78	19.65
6.5	17.71	17.53	20.23	20.08
7	17.92	17.75	20.63	20.51
7.5	18.16	18.03	21.09	21.01
8	18.44	18.35	21.60	21.57
8.5	18.76	18.69	22.17	22.18
9	19.10	19.07	22.77	22.81
9.5	19.46	19.45	23.39	23.46
10	19.84	19.86	24.00	24.11
10.5	20.20	20.29	24.57	24.77
11	20.55	20.74	25.10	25.42
11.5	20.89	21.20	25.58	26.05
12	21.22	21.68	26.02	26.67
12.5	21.56	22.14	26.43	27.24
13	21.91	22.58	26.84	27.76
13.5	22.27	22.98	27.25	28.20
14	22.62	23.34	27.63	28.57
14.5	22.96	23.66	27.98	28.87
15	23.29	23.94	28.30	29.11
15.5	23.60	24.17	28.60	29.29
16	23.90	24.37	28.88	29.43
16.5	24.19	24.54	29.14	29.56
17	24.46	24.70	29.41	29.69
17.5	24.73	24.85	29.70	29.84
18	25	25	30	30

Etiology & Pathogenesis

- Multifactorial
- Biochemical/Dietary/behavioral pathways.
- Imbalance between energy intake and energy expenditure

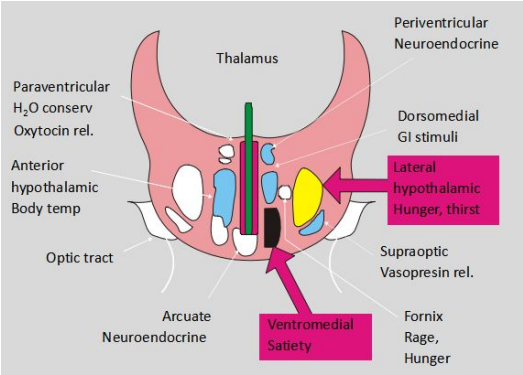


★ Body weight and composition regulation



★ Hypothalamic modulators of food intake:

Orexigenic (Increase Appetite)	**Anorexigenic** (Decrease Appetite)
NPY	**CART**
AGRP	**CCK**
MCH	**CRH**
Galanin	***a*-MSH**
Orexin	**Insulin**
Ghrelin The hormone of hunger	**GLP-1**
Noradrenaline	**PYY 3-36**
Endocannabinoids	**Leptin,** suppress our appetite
***m*, κ Opioids**	**Urocortin**
Neurotransmitters	**Bombesin**



which is Very important to know these two (lateral hypothalamic which for hunger and thirst, Ventromedial for satiety)

★ Etiology & Pathogenesis

Body weight is ultimately determined by the interaction of:

Genetic (polygenic), Environmental, and Psychosocial factors Acting through several physiological mediators of food intake and energy expenditure.
Is it something rapid and new onset ? So it need more investigation

★ Factors predispose to obesity

- Lifestyle:
  - Sedentary lifestyle lowers energy expenditure
  - 52 % of Saudi women are inactive, < 19 % doing regular physical activity
  - Prolonged TV watching
- Sleep deprivation:
  - < 7 hours of sleep → obesity
  - sleep → ↓ leptin, ↑↑ Ghrelin → ↑ appetite and CHO eating at night
- Cessation of smoking: Because the nicotine suppress the appetite. So they don't eat and maintain their weight, when they were smoking.
  - Average weight gain is 4 kg
  - Due to nicotine withdrawal
  - Can be prevented by calories restriction and exercise program
- Social influences:
  - Obese parents most likely to have obese children
  - Obese individuals are surrounded by obese friends
- Diet:
  - Overeating, frequency of eating, high fat meal, fast food(> 2 fast food/wk)
  - Night eating syndrome: if > 25 % of intake in the evening

★ Etiological classification of obesity:

- Neuroendocrine disease (Hypothyroidism, Cushing). I have to exclude them with any obese patient. Cushing syndrome and using steroid therapy is the most common metabolic and endocrine causing obesity.
- Drug-induced (insulin, sulfonylureas, antipsychotic and antiepileptic, steroids)
- Dietary (here in our society no.1 dietary cause is Carbohydrate-rich diet. Carbs contribute to obesity more than fat does)
- Reduced energy expenditure
- Genetic factors

★ Neuroendocrine Obesity:

- Ventromedial hypothalamus damage:
    - Tumors
    - Inflammatory lesions
    - Other hypothalamic disease, Especially head trauma which affect the centers in hypothalamus
- Cushing disease

★ Drug Induced Obesity:

- Hyperinsulinism
    - Insulin They have excessive insulin which lead to stimulate the appetite to avoid hypoglycemia
    - Sulfonylureas
- Antidepressants
- Antiepileptics (phenytoin)
- Neuroleptics
- Steroids

★ Dietary Obesity:

- High carbohydrate diet
- High fat diet

★ Mechanism of obesity

Food intake and utilization is regulated:

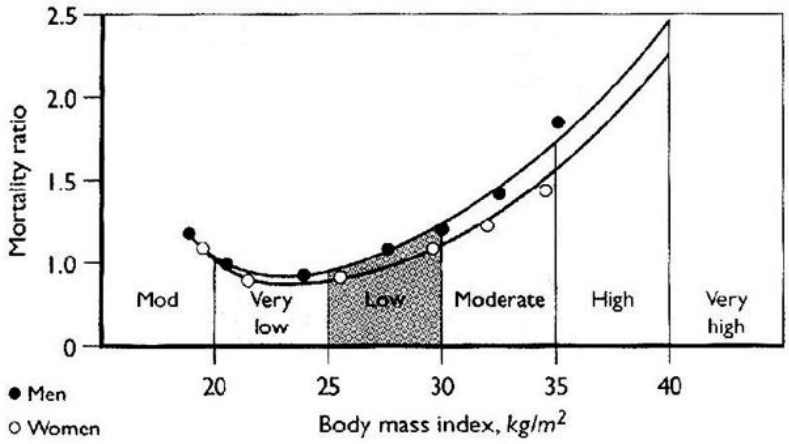
- Hormones
- Neurotransmitters
- Central nervous system
- Signals from peripheries are carried out by neurotransmitters and hormones to CNS in presence or absence of food So the stimulate is the food
- Signal from fat by hormone leptin to hypothalamus to reduce food intake and increase sympathetic activity and energy expenditure Some obese people has leptin resistance so the leptin is high but with no effect like insulin resistance in diabetic people.
- Gastric distension and contraction send signal for satiety and hunger
- Fall in blood sugar send signals to CNS for hunger
- Sympathetic activity from food thermogenesis leads to reduce food intake That's why you see someone who is hungry and feeling cold

Morbidity & Mortality

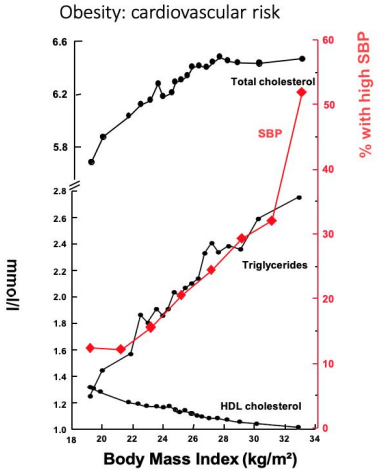
★ Mortality:

-obesity increases mortality rates exponentially.

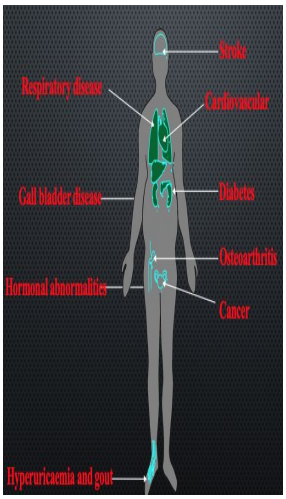
-being emaciated is also dangerous.



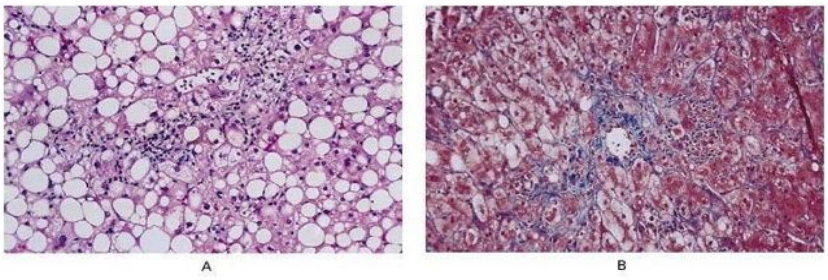
★ Morbidity:



Obesity has showed an association between increased BMI and increased mortality rate. It also showed an increase in comorbidities such as malignancies, diabetes, joint disease, liver, cardiorespiratory, vascular, endocrine, diseases Obesity also causes steatohepatitis which lead to cirrhosis and fibrosis.



★ Nonalcoholic fatty liver disease:

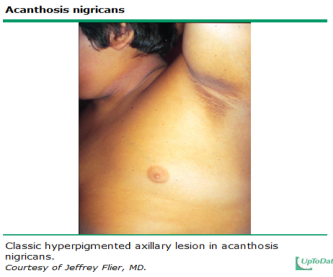


Steatohepatitis **Fibrosis** indication for liver transplant

★ Health consequences of obesity

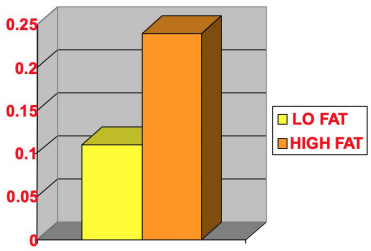
- Greater BMI is associated with increased death from all causes and from CVD
- Although overweight associated with decreased survival
- Each 5 kg/m2 increase in BMI was associated with significant increase in mortality related to:
    - IHD and stroke
    - Diabetes and non-neoplastic kidney disease Diabetes is the most common metabolic complications of obesity
    - Different types of cancer Such as breast and colon cancer
    - Respiratory disease obstructive sleep apnea
- Obesity is associated with reduction in life expectancy during adulthood
- Increase in BMI is associated with increase in morbidity and CVD risk factos
- For both men and women, increasing BMI was associated with higher death rates due to the following cancers:
    - Esophagus
    - Colon and rectum
    - Liver
    - Gallbladder
    - Pancreas
    - Kidney
    - Non-Hodgkin lymphoma
    - Multiple myeloma
- Increase cost rate on obesity
- Increase number of sick leaves for obese subjects
- Increase number of hospitalization
- Early age of retirement
- Increase cost of drugs for DM, CVD, GI disease

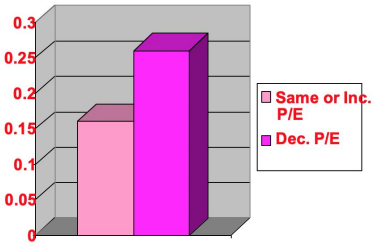
- Poor quality of life due to psychosocial issues They depressed because they don't fit in the CT scan or MRI, so they need special CT and MRI which cost the economy a lot.
- Acanthosis nigricans, Dark skin in folded area such inguinal fold, axilla and back of the neck. This is a sign of insulin resistance which lead to excessive insulin which stimulate the insulin like growth factor which is found in dermis and epidermis and lead to overgrowth of skin tissue and melanin and hyperpigmentation

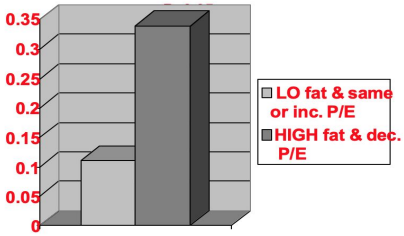


Diet & Expenditure

★ Change in BMI (kg/m^2) from 1989 to 1991







★ Energy expenditure:

- Resting metabolism:
  - 800 to900kcal/m^2/24hr
  - Females <Males
  - Declines with age
- Physical exercise: this one you can control
  - ~ 1/3 of daily energy expenditure
  - Most easily manipulated
- Dietary thermogenesis (thermic effect of food):
  - Energy expenditure which follow the ingestion of meal May dissipate ~ 10% of the ingested calories, In the obese, the thermic effects of food are reduced (especially in patients with diabetes).

- Adaptive thermogenesis:
    - With acute over – or underfeeding Shift in overall metabolism as large as20%

★ Genetic factors in obesity:

- Dysmorphic or syndromic obesity: in all these syndromes change in one gene or two are detected and obesity is a sign.
    - Bardet-Biel syndrome
    - Alström syndrome
    - Carpenter syndrome
    - Cohen syndrome
    - Prader-Willi syndrome. People who are born with prader-willi Syndrome, they face difficulty to control the hunger center due to hormones disturbance, so they feel hungry all the time. And come to us almost always with morbid obese. They have gene defect which make them feel hungry all the time
- Single-gene cause of obesity:
    - Leptin and leptin gene deficiency
    - POMC deficiency
- Genetic defects with non syndromic obesity:
    - Melanocortin receptor system abnormalities
- Genetic susceptibility to obesity:
    - If both parents are obese~80% of the offspring will be obese
    - If only one parent ~ 10% of the offspring will be obese
- Studies with identical twins:
    - Hereditary factors account ~70%
    - Environmental(diet, physical inactivity, or both) account ~ 30% of the variation in the body weight
- The notion that obesity is a genetic disorder is misleading:
    - The prevalence of obesity has increased markedly, world-wide, in recent years,yet genes have not changed.
    - Changes occur within population when migration occurs.

Phenotypic expression of genes for obesity are environment specific Obesity is a disorder of gene-environment interaction

★ Metabolic Consequences Of Deleting The Mitochondrial Glycerol 3-Phosphate Dehydrogenase

Am J Physiol Regul Integr Comp Physiol 287: R147–R156, 2004.
First published March 18, 2004; 10.1152/ajpregu.00103.2004.

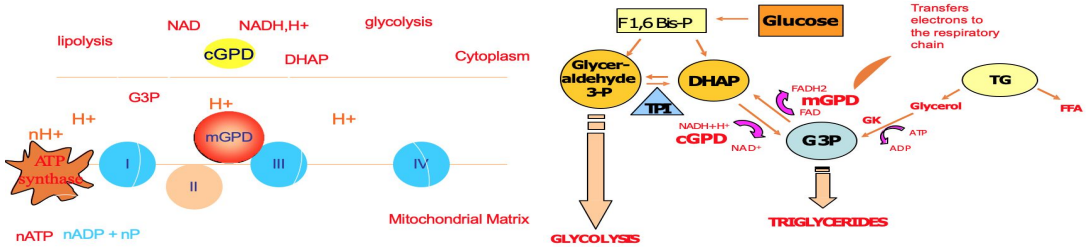
Mice with deletion of the mitochondrial glycerol-3-phosphate dehydrogenase gene exhibit a thrifty phenotype: effect of gender

Assim Alfadda, Rosangela A. DosSantos, Zaruhi Stepanyan, Husnia Marrif, and J. Enrique Silva
Division of Endocrinology, Lady Davis Institute for Medical Research,
Jewish General Hospital, McGill University, Montreal, Quebec, Canada H3T 1E2

Submitted 13 February 2004; accepted in final form 4 March 2004

G3PD is a gene that causes obesity when it was knocked down we had more glycerides and less thermogenesis.

★ The NADH Glycerol 3-Phosphate Shuttle

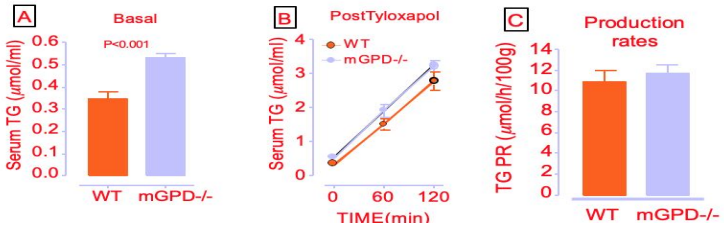


★ Objectives of the study:

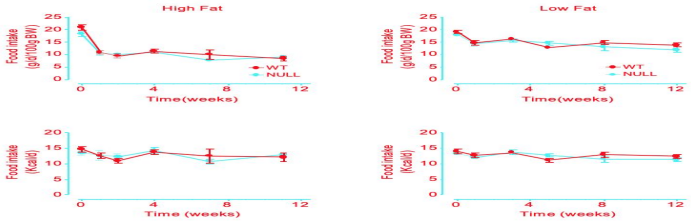
the consequences of deleting the mGPD gene regarding:

- Responses to fat- or carbohydrate-rich diets.
- Tolerance and responses to caloric restriction and fasting.

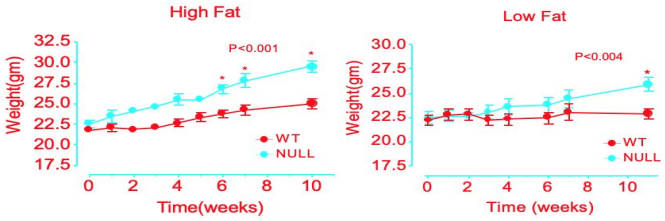
★ Serum triglycerides:



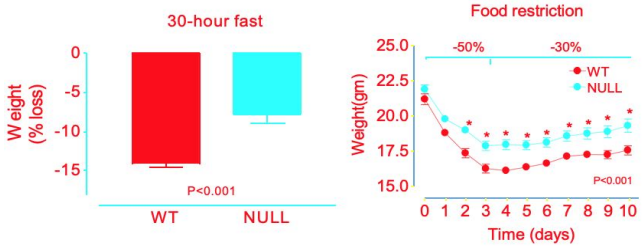
★ Food intake:



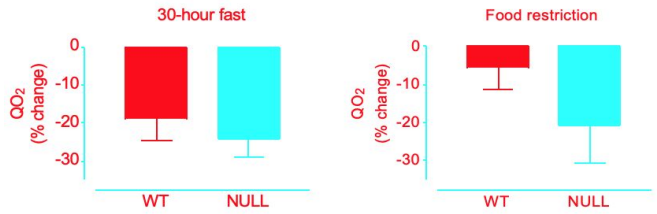
★ Body weight:



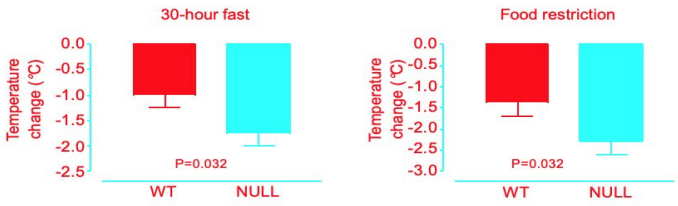
★ Weight Loss:



★ Change in energy expenditure:



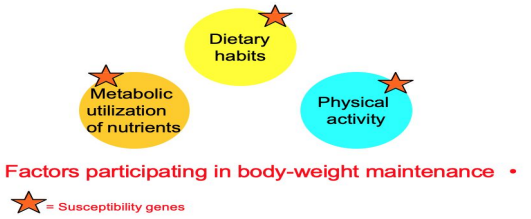
★ Core temperature change at 22°C:



★ Conclusion of study:

Increase weight with high fat diet, resist regimen, keeps thermal value the same.

- Thus, The mGPD can be considered a spendthrift enzyme that significantly contributes to obligatory thermogenesis.
- The mGPD gene may play a role in the development of obesity if we consider the readiness with which some patients gain weight, and the difficulties the have to lose weight when undergoing a low calorie diets



Management of obesity

1-life style modification 2-pharmacotherapy 3-surgery

★ Diet:

- Careful Training in:

Selection of lower fat, lower carb foods Modified food guide pyramid
Increase fruits & vegetables Lower fat preparation techniques Estimation of portion size

★ Atkins diet 6 months results: good.

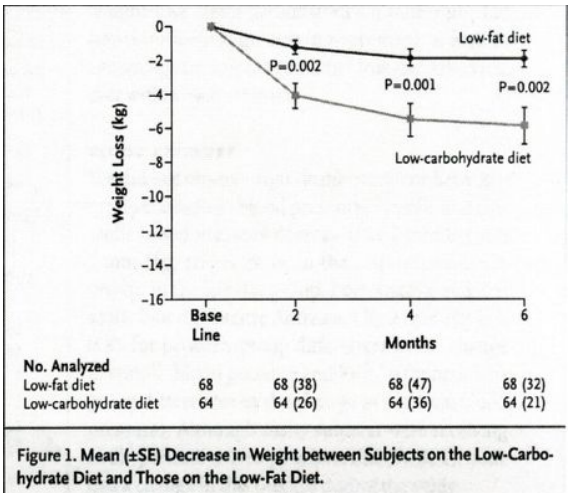
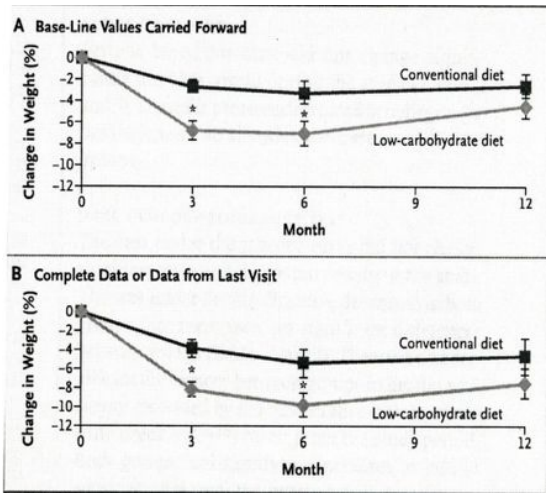


Figure 1. Mean (±SE) Decrease in Weight between Subjects on the Low-Carbohydrate Diet and Those on the Low-Fat Diet.

Atkins diet 24 months results: bad.

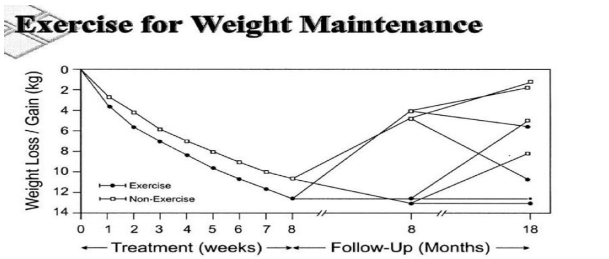


BMI 42.9,40% diabetic. TG, insulin, glucose;p<0.01. 33 each group; 1/3 dropouts; no diabetics, BMI 33; LTG, HHDL.

★ Dangers of Atkins diet:

- High saturated fat and cholesterol:CVD
- High protein:decline in renal function, urinary calcium losses(osteoporosis)
- Lack of fiber: increase colon cancer risk
- Avoidance of carbs results in decreased intakes of essential vitamins (thiamin, folate,B6) and antioxidant phytochemicals

★ Exercise:



Modified from Pavlou KN, et al. *Am J Clin Nutr.* 1989;49:1115-1123.

Exercise is good for weight maintenance and good for fitness. Diet is good for weight reduction
Ideally 30 min 5 times a week moderate intensity exercise is considered as regular exercise.
Initial goal: 10% weight loss Within 6 months

★ Pharmacotherapy

- Indicated in:
    - BMI > 30
    - BMI 27-30 with comorbidities
    - Should not be used for cosmetic weight loss
    - Used only when 6 months trial of weight and exercise fail to achieve weight loss

Average 4-5kg per year which is not effective, but you can give the patient to start with.

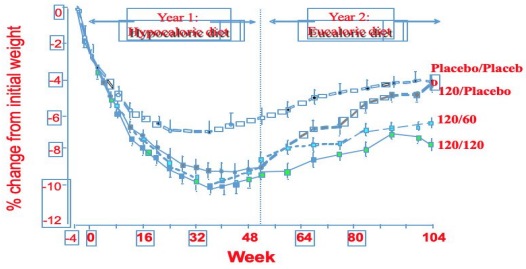
- Sympathomimetics: Took out from marketing due to their side effects (cardiac)
    - Stimulate release of norepinephrine or inhibits its reuptake by nerve terminals
    - Block serotonin and NE reuptake (sibutramine)
    - Directly act upon adrenergic receptor
    - Reduced appetite by early satiety
- Pancreatic lipase inhibitor:
    - Orlistat: inhibits fat absorption
- Antidepressant
- Antiepileptic
- Diabetic drugs: metformin GLP-1 agonist like liraglutide can be used also to treat obesity.

★ Orlistat: moderate weight loss with manageable vitamin absorption issues.

- A lipase inhibitor, reduces the absorption of dietary fat. Lead to steatorrhea and bloating.
- Lowers Cholesterol (4-11%) & LDL(5-10%)
- Major C/I:
  - Chronic malabsorption syndrome
  - Cholestasis
  - Pregnancy and breastfeeding
- Dose:
  - 120 mg/ immediately before, during, or up to 1 hour after each main meal (up to max.360mg/day)
  - Max. period of treatment is 2 years

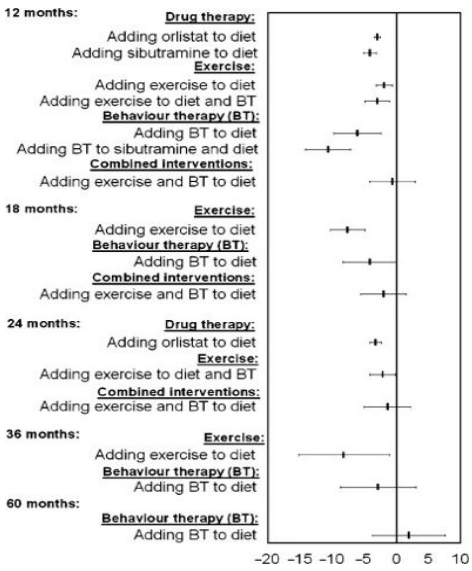
Another drug used for weight reduction is Liraglutide (Saxenda)

★ Body weight over 2 years of treatment with orlistat:



- **What interventions should we add to weight reducing diets in adults with obesity?**

A systematic review of randomized controlled trials of adding drug therapy, exercise, behaviour therapy or combinations of these interventions.



★ For those who don't lose weight:

- Reassess:
  - Understanding and compliance with diet, physical activity, and drug regimen.
  - Accuracy of weight recordings.
  - Possible Fluid retention (salt intake,etc).
  - Changes in medical condition.

- Motivation for change.
- Social and personal stress.
- Is the provider of health care the root of the problem?

★ For those who don't lose weight and There is no Cause Except Noncompliance with Diet & Exercise:

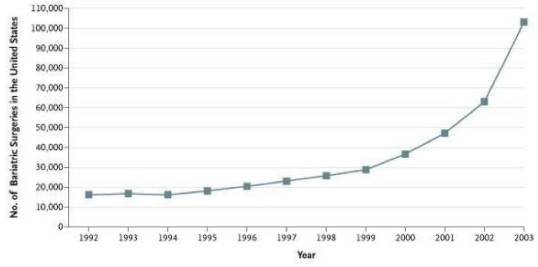
- Consider changing medication
- consider referral to: Dietitian
  - Behavioral counselor
  - Exercise professional
- Reconsider goal: i.e. simple maintenance or a rest from weight loss efforts
- Discuss surgical options if medically or psychologically indicated

Early weight loss is from the visceral fat.

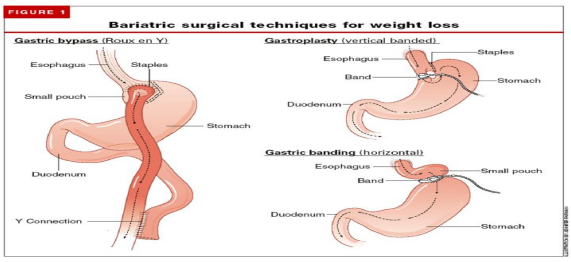
Surgery

three questions must be asked before proceeding to surgery:
-is the patient prepared? (will he stick to a healthy lifestyle after? or will he get depressed by the complications?).
- well motivated patients, Because if he is not , he will gain weight again and not interested to maintain his weight.
-what is the cause of obesity ? (secondary causes can't be treated by surgery like cushing's)

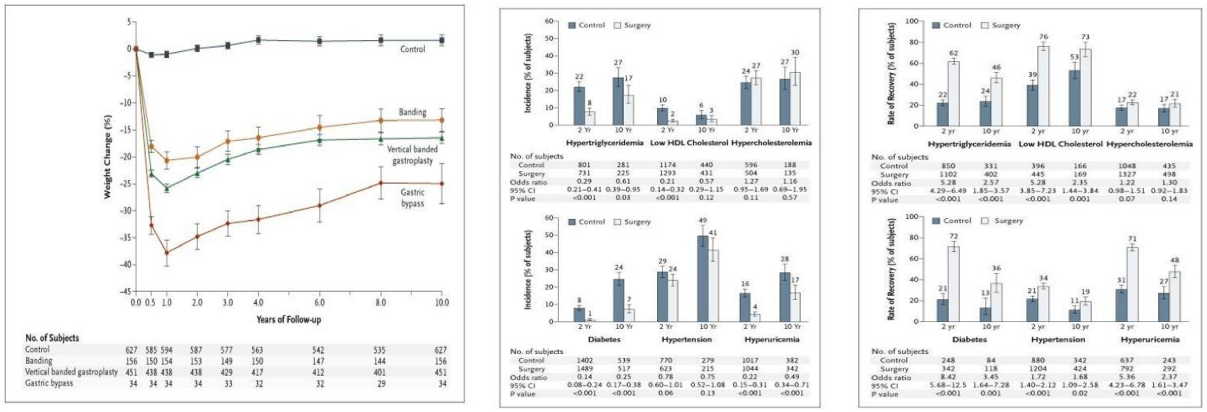
★ Estimated Number of Bariatric Operations Performed in the United States,1992-2003:



★ Types of Bariatric surgery:



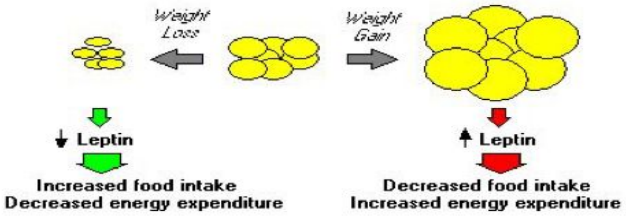
- Restrictive techniques are technically easier, have lower complication rates, but result in less weight loss than malabsorptive techniques.
- Gastric banding With high failure rate, Because the band may distend with heavy meal, and the patient themselves may come to us and ask to deinflate the band when he want to have heavy meal that day.
- Now the sleeve is the most common.
- Follow up is crutial If there is no lifestyle modification, they will gain weight again and stomach get expanded.



Gut to brain signaling (Hormones)

★ Leptin:

from adipocytes and acts on hypothalamus to decrease food intake and stimulate energy expenditure.



★ Ghrelin:

- Ghrelin is a recently discovered orexigenic hormone. increase with hunger decrease with eating
- Secreted primarily by the stomach and duodenum. and acts on hypothalamus to stimulate appetite
- Has been implicated in both mealtime hunger and the long-term regulation of body weight.

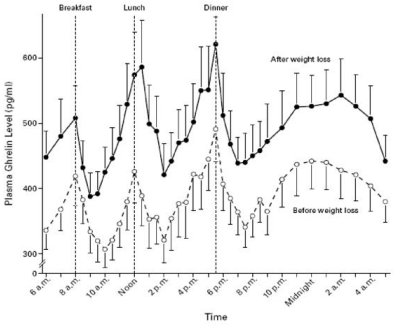


Figure 1. Mean (±SE) 24-Hour Plasma Ghrelin Profiles in 13 Obese Subjects before and after Diet-Induced Weight Loss. Breakfast, lunch, and dinner were provided at the times indicated. To convert ghrelin values to picomoles per liter, multiply by 0.296.

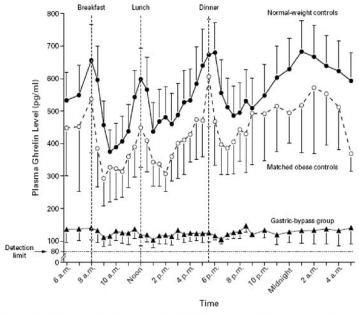
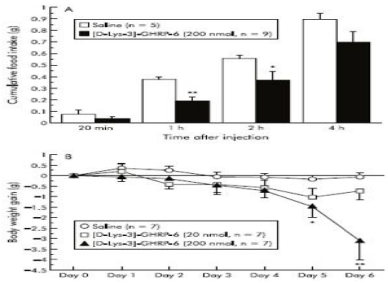


Figure 2. Mean (±SE) 24-Hour Plasma Ghrelin Profiles in Subjects Who Underwent Gastric Bypass and in Controls. The study groups represented are 5 obese subjects who underwent a proximal Roux-en-Y gastric bypass, 10 normal-weight controls, and 5 obese subjects who had recently lost weight by dieting and were matched to the subjects in the gastric-bypass group according to final body-mass index, age, and sex. Breakfast, lunch, and dinner were provided at the times indicated. To convert ghrelin values to picomoles per liter, multiply by 0.296.



(A) Acute effects of intraperitoneally administered[D-Lys-3]-GHRP-6 (200 nmol/mouse) on cumulative food intake in food deprived *ob/ob* obese mice: *p<0.05, **p<0.01compared with physiological saline treated controls. (B) Chronic effects of [D-Lys-3]-GHRP-6 administered intraperitoneally (20–200 nmol/mouse every 12 hours for six days) on body weight gain in non-food deprived *ob/ob* obese mice.

So in obesity you have to know

- the hormones , the ghrelin increase the appetite and leptin decrease it.

-The neurotransmitter signal.

-How to assess the patient with obesity, check BMI & waist circumference and the risk factor to assess.

-Comorbidity with obesity.

-Lifestyle and the indication for pharmacotherapy.

Summary

<table>
<tr><td colspan="3">

- **Obesity** means excess accumulation of fat in the body, usually diagnosed on the basis of calculation of body mass index and measurement of waist-hip ratio.

</td></tr>
<tr><td>Risk factors</td><td colspan="2">

1. Lifestyle
2. Sleep deprivation → less than 7 hours → ↓ leptin, ↑↑ Ghrelin → ↑ appetite
3. Cessation of smoking → due to nicotine withdrawal
4. Social influence
5. Diet

</td></tr>
<tr><td>Classification</td><td>

1. **Android** (males):
   - abdominal or central
   - apple-shaped
   - Associated with insulin resistance and heart diseases

</td><td>

2. **Gynoid** (females):
   - Collection of fat on hips and buttocks
   - pear-shaped
   - Associated with mechanical problems

</td></tr>
<tr><td>Hormones</td><td colspan="2">

Leptin: from adipocytes, acts on hypothalamus to decrease food intake and stimulate energy expenditure
Ghrelin: Secreted in the stomach, acts on hypothalamus to stimulate appetite, peak before meal and decrease after.

</td></tr>
<tr><td>Screening</td><td colspan="2">

1. BMI measurement
2. Waist circumference
3. Evaluation of overall medical risks

</td></tr>
<tr><td>Treatment</td><td colspan="2">

1. Lifestyle intervention:
   - Diet, exercise
   - Initial goal 10% weight loss
   - Slow weight loss is preferred
2. Pharmacotherapy:
   - Indication: BMI above 30, BMI 27-30 with comorbidities.
   - Types: Sympathomimetics (sibutramine), Pancreatic lipase inhibitor (Orlistat), antidepressants, antiepileptic, diabetic drugs (metformin)
3. Surgical intervention:
   - Indication: BMI above 40, BMI above 35 with comorbidities.
   - Types:
     - Restrictive (via a small stomach reservoir): Vertical banded-gastroplasty, and gastric banding.
     - Malabsorptive and restrictive (via decreasing small bowel length: Roux-en-Y gastric bypass (most common procedure), Biliopancreatic diversion

</td></tr>
</table>

Questions

1. Which of the following is the most accurate measure of adiposity or surrogate measure of the amount of fat in human body ?

A. Ideal body weight
B. Leptin level
C. BMI
D. LDL level.

2. Which of the following is a an anorexigenic hormone which suppresses the appetite?

A. Ghrelin
B. NE
C. NPY
D. Leptin

3. Which one of the following is the most common endocrine causes of obesity ?

A. Growth hormone deficiency.
B. Cushing syndrome.
C. Excessive caloric intake.
D. Adrenal insufficiency .

4. What is the most common cause of truncal obesity in young patient who present with purple striae and comorbidity such as high BP, diabetes ?

A. Adrenal cortical adenoma
B. Ectopic ACTH producing tumor
C. Steroid therapy.
D. stress situation.

5. Which of the following is the most common metabolic complications of obesity ?

A. Osteoarthritis .
B. Obstructive sleep apnea .
C. Colon cancer.
D. Diabetes mellitus.

6. Which one of the following is the best option in managing, 53 years old obese male with BMI=46 and known to have comorbidity such as DM and HTN ?

A. Life style modification
B. Surgery
C. Medications such as sibutramine
D. Refer him to dietitian.

7. 30-year old male came to the clinic complaining of fatigue, day sleeping and snoring. He was diagnosed with DM and HTN 1 year ago. On examination, his weight is 140 kg with BMI of 48.8. Which one of the following is the best therapeutic advice and most effective in his case ?

a. Start Orlistat for 2 years.
b. Lifestyle modification and intense exercise.
C. Refer him to dietitian.
D. Refer him to obesity surgical intervention.

8. 36 years old male was evaluated in obesity clinic, he has been overweight since childhood & lately he developed diabetes mellitus, hypertension, obstructive sleep apnea, BMI = 34 . 2 years ago He tried 6 month in the GYM to lose weight but he failed. Which one of the following is the best initial management in his case?

A. strict Lifestyle modification .

B. Pharmacotherapy .

C. Bariatric surgery.

D. Refer him to dietitian**.**

9. Which of the following is NOT used to assess central obesity?

A. MRI
B. BMI
C. Waist: hip ratio
D. Waist circumference

10. Which of the following is a healthy waist circumference for men and women?

A. Less than 94 cm and 80 cm respectively
A. Less than 65cm and 55cm respectively
B. Less than 102 cm and 88 cm respectively
C. Less than 70 regardless of gender

11. Which of the following drugs do not cause weight gain?

A. Metformin
B. Insulin
C. Sulfonylurea
D. Phenytoin

Answers:

1. C
2. D
3. B
4. C
5. D
6. B

7. D
8. B
9. B
10. A
11. A

extra questions

Which ONE of the following is the surrogate measure of the amount of fat in human body?
a) Body mass index.
b) LDL level.
c) Leptin level.
d) Weigh
Ans: A Body mass index the most Reliable, easiest and correlated with percentage of body fat.

Which one of the following hormones suppresses the appetite?
a. Ghalin
b. Glycogen
c. Leptin
d. Somatostatin
Answer:C

Which one of the following is the best determinant of Energy expenditure?

a. Amount of food
b. Basal metabolic rate
c. Body temperature
d. Leptin release
Answer:...>>>> I'm not sure, it could be B

Which one of the following is the most common endocrine causes of obesity ?
A. Growth hormone deficiency.
B. Cushing syndrome.
C. Excessive caloric intake.
D. Adrenal insufficiency.
Ans : B

Which of the following is the most common <u>metabolic</u> complications of obesity ?

A. Osteoarthritis .
B. Obstructive sleep apnea .
C. Colon cancer.
D. Diabetes mellitus.
Ans : D

A 30 year old female patient came to the clinic with truncal obesity, purple striae, hypertension, diabetes and amenorrhea. What is the most common cause of her presentation?
A. Adrenal cortical adenoma
B. Anterior pituitary adenoma
C. Ectopic ACTH producing tumor
D. Steroid or cortisone therapy
Answer: D

A 50 years old man han DM and HTN and his BMI=45 what we should do as management ?
A. Life style modification
B. Surgery
C. Medications
D. Reassure him
Ans: B

30-year old male came to the clinic complaining of fatigue, day sleeping and snoring. He was diagnosed with DM and HTN 1 year ago. On examination, his weight is 140KG with BMI of 48.8. Which one of the following is the best therapeutic advice?
a. Start Orlistat
b. Lifestyle modification
c. Start high air pressure
d. Refer him to obesity surgical intervention
Answer:

36 years old male was evaluated in obesity clinic, he has been overweight since childhood & lately he developed diabetes mellitus, hypertension, obstructive sleep apnea, BMI = 34 . Which one of the following is the best option in managing his obesity ?
A. Lifestyle modification .
B. Pharmacotherapy .
C. Bariatric surgery.
D. Diet .