بسم الله الرحمن الرحيم

Obesity Guidelines
By Omayma Saleh

EVIDENCE BAESD GUIDELINES IN MANAGEMENT OF OBESITY

By

PROF OMAYMA SALEH

WHO dimensions of health care quality

Effective, efficient, accessible,

Acceptable/patient centered,

Equitable, safe

CLINICAL PRACTICE GUIDELINES

A tool for improving quality of health care

Major steps involved in adapting or creating clinical practice guidelines

1- Adapt a CPG:

"the systematic approach for considering the use and or modifying guidelines produced in one cultural and organizational setting for application in a different context"

When CPG is needed , a CPG working group search for suitable CPGs ,assess its quality (using AGREE instrument) and adapt it.

2- Develop a CPG:

If an existing CPG cannot be identified and if sufficient resources and expertise are available.

The working group identify key questions, perform a systematic search, select and appraise the quality of the studies and develop clear recommendations.

Developing recommendation:

using either GRADE,SIGN or SORT approaches for assessment of the quality of evidence , the balance between risks and benefits and a judgement about the strength of recommendation .

Evidence based guidelines

- Evidence component :
- Effects of interventions on a typical patient.
- Requires validity, importance, up to date.
- International published.
- levels of evidence.

Detailed instruction component:

- Exact instructions about what to do with patients.
- Requires local relevance.
- Usually local site of generation.
- Grades of recommendation, protocols or flow charts.

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Strength of evidence
Strength of recommendation grades

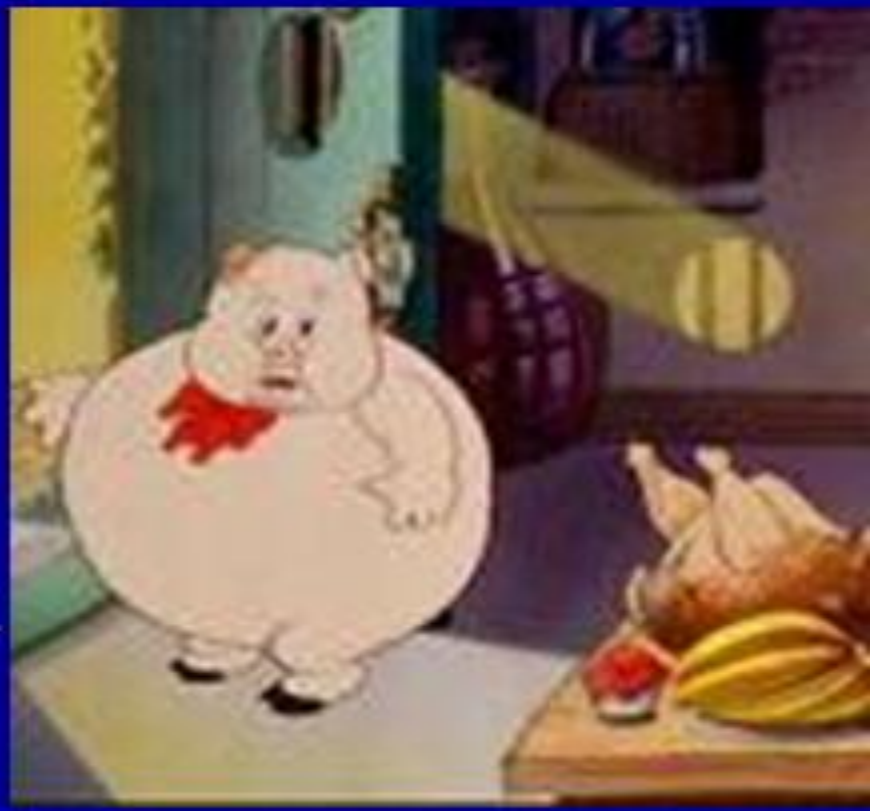
- Grade A: consistent good quality patient oriented evidence. (RCTs or meta-analysis).
- Grade B: (other evidence)Inconsistent or poor quality patient oriented evidence.
- Grade C: Consensus /expert opinion , disease oriented evidence, or case series of studies on diagnosis , treatment , prevention or screening.

EBM by omayma Saleh

OBESITY

Literally, obesity means a condition characterized by excessive body fat.

The body cannot store protein or carbohydrates , so the excess is converted to fat and stored. One pound of fat represents about 3,500 excess Calories.



About 25% of the word population is overweight.

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Weight gain

1-By weight gain we usually mean obesity.

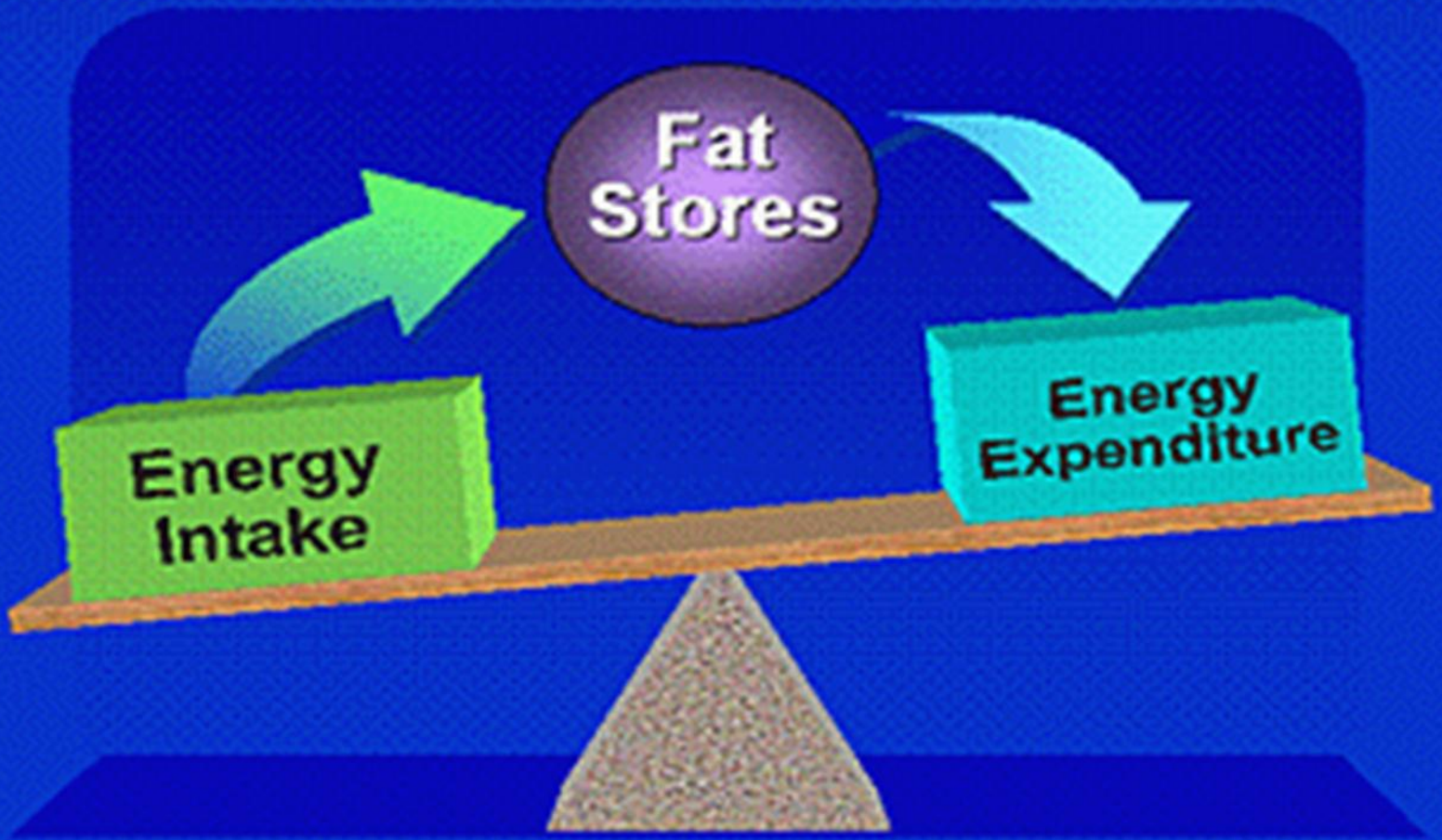
Other causes of weight gain include

2-Fluid retention as in oedematous states such as causes of generalised oedema (heart failure, renal ,hepatic oedema), also by intake of drugs .

3- Rarely increased muscularity and body building could lead to some gain of weight.

- Rapid changes in weight are usually related to changes in body water while changes in fat content develop more slowly.

Obesity Is Caused by Long-Term Positive Energy Balance



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- Identifying causes of obesity:
- Simple obesity

Energy intake(food/drink in kcal)=

energy density × portion size × frequency of intake

(how rich) (how much) (how often)

Energy expenditure (physical activity in kcal)=

frequency × intensity × duration

(how often) (how hard) (how long)

Secondary causes of obesity

1. Hypothyroidism
2. Cushing's syndrome
3. Insulinoma
4. Hypothalamic obesity
5. Polycystic ovarian syndrome
6. Genetic syndromes such as Prader Willi, Alstroms, Bardet Biedl, Cohens, Borjeson Forsmsman Lehmann and Frohlich's syndrome
7. Growth hormone deficiency
8. Oral contraceptive use
9. Pregnancy
10. Medication related: including phenothiazines, sodium valproate, carbamazepine, tricyclic antidepressants, lithium, glucocorticoids, megesterol acetate, the thiazolidine diones, the sulphonylureas, insulin, adrenergic antagonists, serotonin anatagonists especially cyproheptadine.
11. Smoking cessation
12. Eating disorders: especially binge eating disorder, bulimia nervosa and night eating disorder
13. Hypogonadism
14. Pseudohypoparathyroidism
15. Tube feeding related obesity

Syndromes of obesity

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Effects of obesity

Cardiovascular

- **Hypertension**
- Congestive heart failure
- Cor pulmonale
- Varicose veins
- Pulmonary embolism
- Coronary artery disease

Neurologic

- Stroke
- Idiopathic intracranial hypertension
- Meralgia paresthetica

Psychological

- Depression
- Body image disturbance
- Low self-esteem
- Impaired quality of life

Respiratory

- Dyspnea
- Obstructive sleep apnea
- Hypoventilation syndrome
- Pickwickian syndrome
- Asthma

Endocrine

- **Metabolic syndrome**
- **Type 2 diabetes mellitus**
- **Dyslipidemia**
- Polycystic ovary syndrome/androgenicity
- Amenorrhea/infertility/menstrual disorders

Musculoskeletal

- Hyperuricemia and gout
- **Immobility**
- **Osteoarthritis (knees/hips)**
- **Low back pain**
- Carpal tunnel syndrome

Gastrointestinal

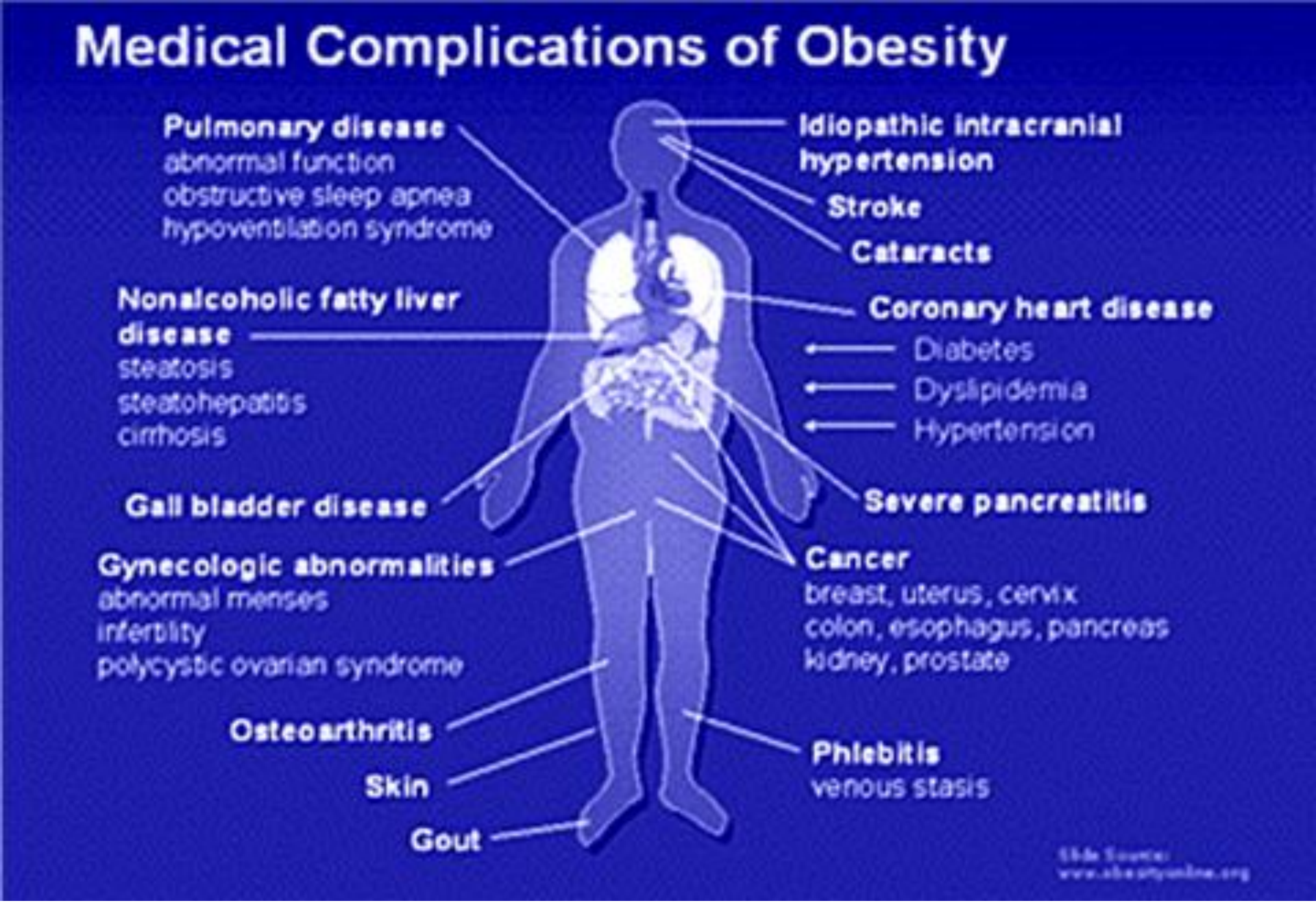
- **GERD**
- **Nonalcoholic fatty liver disease**
- Cholelithiasis
- Hernias
- Colon cancer

Integumentary

- Striae distensae (stretch marks)
- Stasis pigmentation of legs
- Cellulitis
- Acanthosis nigricans/skin tags
- Intertrigo, carbuncles

Genitourinary

- Urinary stress incontinence
- Obesity-related glomerulopathy
- Kidney stones
- Hypogonadism
- Breast and uterine cancer
- Pregnancy complications



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Apples & Pears

Upper Body Obesity

Lower Body Obesity

More Diabetes and Cardiovascular Disease risk

Less Diabetes and Cardiovascular Disease risk

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Guidelines
Summary of recommendations

Body mass index: BMI

BMI should be used to classify overweight and obesity in adults (B)

NB: BMI is a surrogate index not a direct measure of adiposity.

BMI

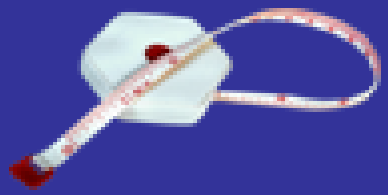
- **1- Estimation of weight and height for calculation of body mass index (BMI):**
- ***BMI = weight (kg)/ height (m2)***

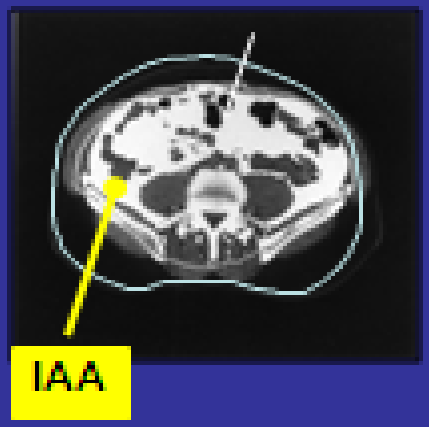
- **Normal 18.5 – 24.9 kg/m2**
- **Overweight 25- 29.9 kg/m2**
- **Obese ≥30 kg/m2**
- **Class I 30-35**
- **Class II 35 -40**
- **Class III ≥40 kg/m2** (extreme or severe obesity)

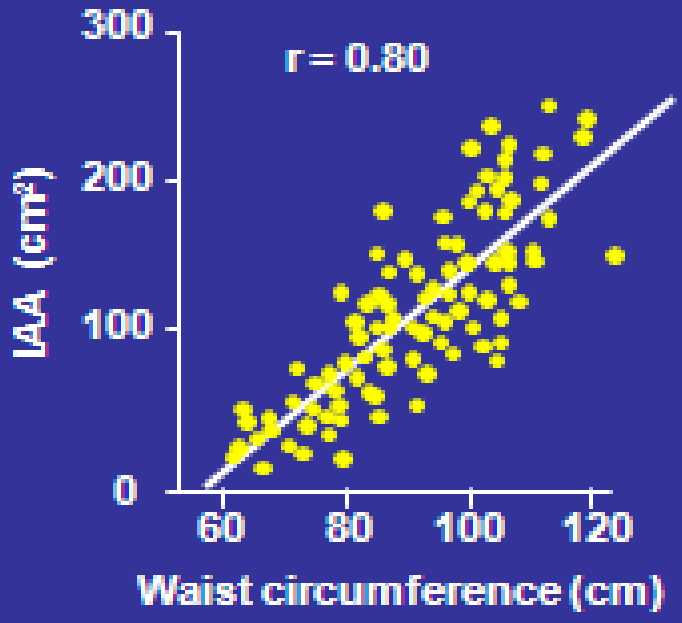
Waist circumference

- Waist circumference may be used , in addition to BMI ,to refine assessment of risk of obesity related comorbidities (C)
- Especially important when BMI 30- 35 kg/m2.

Intra-abdominal adiposity is closely correlated with abdominal obesity







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

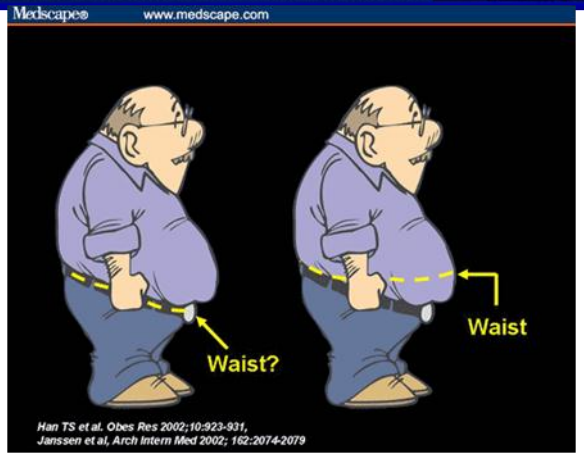
Obesity paradox
By Omayma Saleh Després JP *et al*, 2001; Pouliot MC *et al*, 2004

Waist circumference

Measure waist circumference:

***One method: Measured at the end of normal expiration*.**

- **The measuring tape is placed in a horisontal plane around the abdomen at the level of the iliac crest.**



Other method : ???

midway between iliac crest and last rib.

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Metabolic syndrome

Metabolic Syndrome

- Abdominal obesity
- Hyperinsulinemia
- High fasting plasma glucose
- Impaired glucose tolerance
- Hypertriglyceridemia
- Low HDL-cholesterol
- Hypertension

Table 1. Criteria for Clinical Diagnosis of the Metabolic Syndrome

Measure	Categorical Cut Points
Elevated waist circumference*	Population- and country-specific definitions
Elevated triglycerides (drug treatment for elevated triglycerides is an alternate indicator†)	≥150 mg/dL (1.7 mmol/L)
Reduced HDL-C (drug treatment for reduced HDL-C is an alternate indicator†)	<40 mg/dL (1.0 mmol/L) in males; <50 mg/dL (1.3 mmol/L) in females
Elevated blood pressure (antihypertensive drug treatment in a patient with a history of hypertension is an alternate indicator)	Systolic ≥130 and/or diastolic ≥85 mm Hg
Elevated fasting glucose‡ (drug treatment of elevated glucose is an alternate indicator)	≥100 mg/dL

Table 3: Ethnic-specific values for waist circumference

Country or ethnic group	Waist circumference* (as a measure of central obesity), cm	
	Men	Women
Europid*	≥ 94	≥ 80
South Asian, Chinese†	≥ 90	≥ 80
Japanese‡	≥ 85	≥ 90
South and Central American	Use South Asian cutoff points until more specific data are available	
Sub-Saharan African	Use European cutoff points until more specific data are available	
Eastern Mediterranean and Middle East (Arab)	Use European cutoff points until more specific data are available	

Health benefits of weight loss in adults Recommendations

- 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)

Medical benefits of modest weight loss

Impact of Weight Loss on Risk Factors

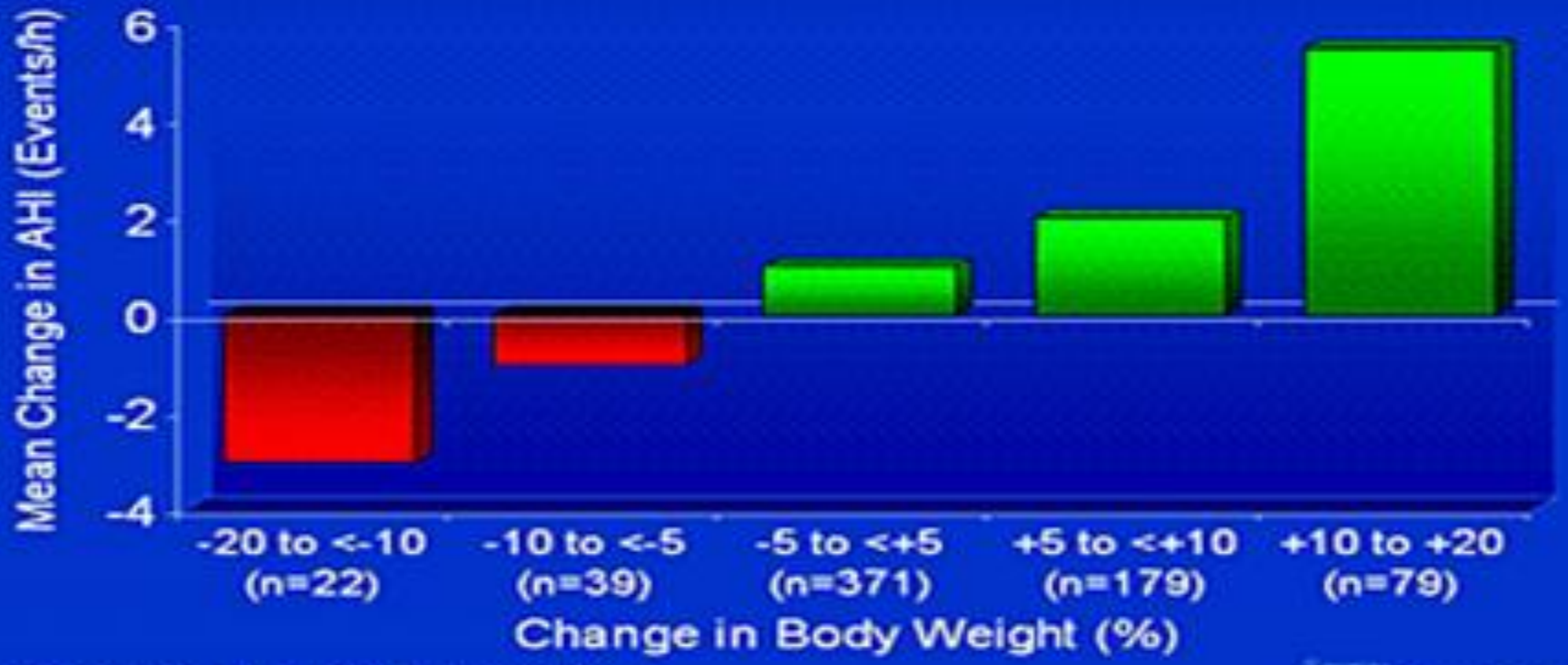
	~5% Weight Loss	5%-10% Weight Loss
HbA1c	↓ 1	↓ 1
Blood Pressure	↓ 2	↓ 2
Total Cholesterol	↓ 3	↓ 3
HDL Cholesterol	↑ 3	↑ 3
Triglycerides		↓ 4

1. Wing RR et al. *Arch Intern Med*. 1987;147:1749-1753.
2. Mertens IL, Van Gaal LF. *Obes Res*. 2000;8:270-278.
3. Blackburn G. *Obes Res*. 1995;3 (Suppl 2):211S-216S.
4. Ditschuneit HH et al. *Eur J Clin Nutr*. 2002;56:264-270.

Source:
Obesity Online Slide Library
www.obesityonline.org

Medical benefits of modest weight loss

Effect of Weight Change on Apnea-Hypopnea Index (AHI)



Peppard et al. *JAMA* 2000;284:3015

Assessment in adults

Assessing motivation for behaviour change.

Assessing the possibililty of binge eating disorder in patients who have difficulty in losing weight and maintaining weight loss (C).

-Assess for comorbidities: CHD, other atherosclerotic diseases, type 2 diabetes, sleap apnea.

-Identify other obesity associated risks such

- **as osteoarthritis , gall stones.**

Life style modification

Diet plus physical activity plus behavioural therapy

Weight management programmes should include physical activity , dietary change and behavioural components (A)

Internet based weight management programmes are considered as part of a range of options for patients with obesity (B) ??

Dietary interventions in adults (Recommendations)

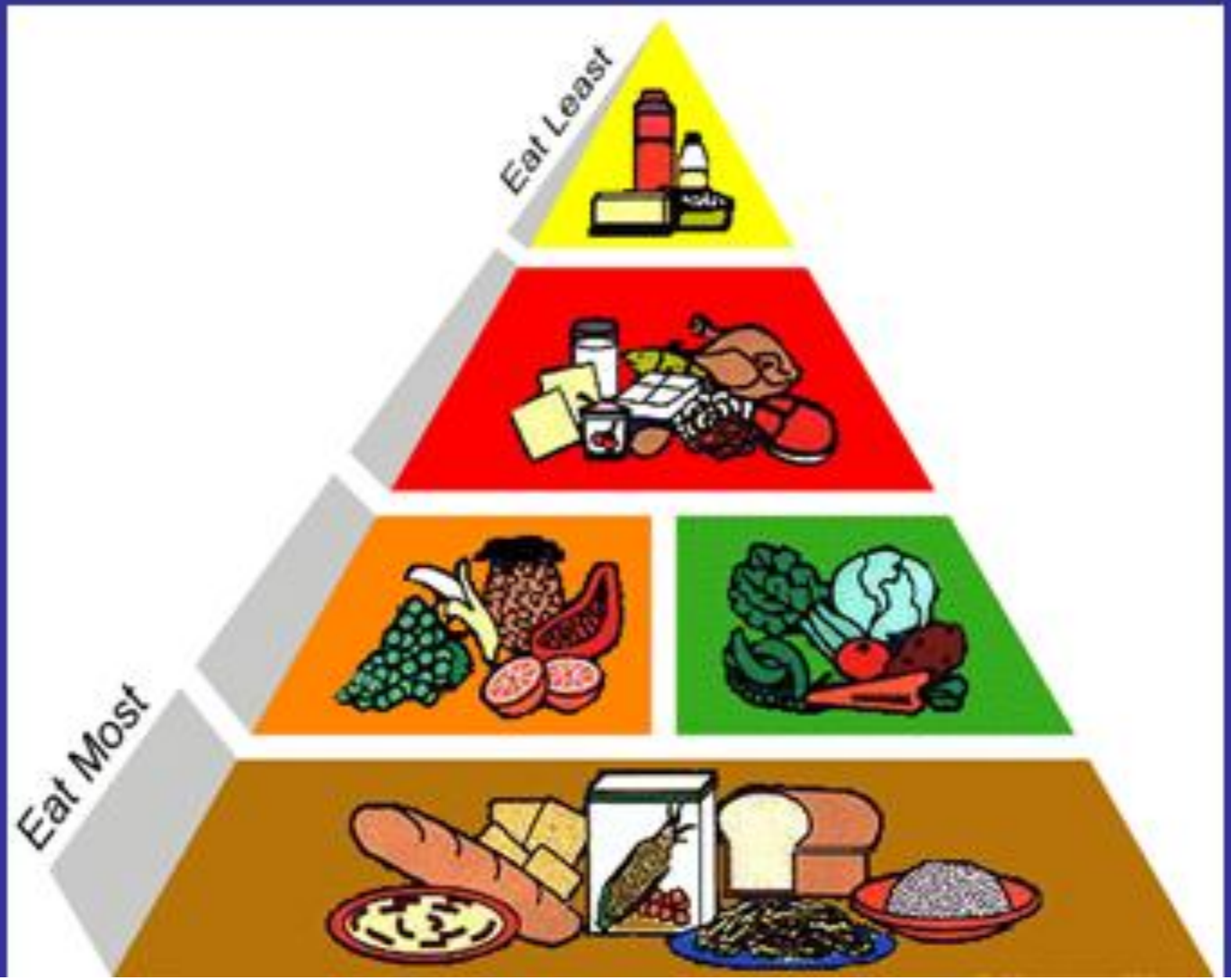
Dietary interventions for weight loss should be calculated to produce a 600 kcal/day energy deficit. Programmes should be tailored to the dietary preferences of the individual patient (A).

In cases where very low calorie diets are indicated for rapid weight loss, these sould be conducted under medical supervision.(D) ?

Weight Loss at 6-Months in RCTs of Low-fat vs Low-Carbohydrate Diets

		Weight Loss (kg)		Difference
Study	n	Low-fat	Low-carb	(kg)
Samaha (2003)	132	-1.9	-5.8	3.9
Brehm (2003)	42	-3.9	-8.5	4.6
Foster (2003)	63	-5.3	-9.6	4.3
Yancy (2004)	120	-6.5	-12.0	5.5

A Balanced Diet - The Pyramid Way



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Eatwell plate

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Physical activity in adults

Overweight or obese individuals should be encouraged to undertake increased physical activity as a part of a multi-component weight management programme (A).

Overweight and obese individuals should be prescribed a volume of physical activity equal to approximately 1800- 2500 kcal/week . This corresponds to approximately 225-300 min/ week of moderate intensity physical activity (5 sessions of 45-60 minutes /week or lesser amounts of vigorous physical activity) (B)

Physical activity in adults

Benefits:

- **1-it is associated with long-term weight loss maintenance.**

- **2- has beneficial health effects, such as decreasing coronary heart disease and diabetes, that are independent of weight loss itself.**

- **3-Decrease loss of fat free mass associated with weight loss**

Behavioural/ psychological interventions in adults

Individual or group based psychological interventions should be included in weight management programmes (A).

These include examining patient's current eating and exercise habits to find out what factors or situations may have contributed to excess weight to start changing these behaviors.

Components of Behavioral Therapy for Obesity

Pharmacological treatment in adults

Orlistat

Orlistat should be considered as an adjunct to life style interventions in the management of obesity. (A)

Patient's with BMI 30kg/m2 or 27 kg/m2(with comorbidities) should be considered should an individual case basis following assessment of risk and benefit. (A)

Bariatric surgery in adults Recommemdations

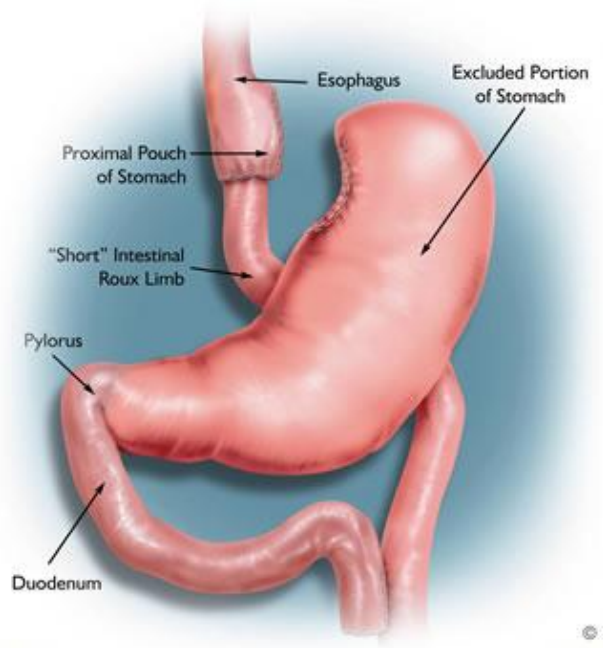
Bariatric surgery

- **should be considered on an individual basis following assessment of risk/benefit in patients who have**
- **BMI 40kg/m2 or**

  BMI 35kg/m2 with the presence of one or more comorbidities which are expected to improve significantly with weight reduction (type 2 DM, severe mobility problems, arthritis). (c)

Bariatric surgery

Binge eating disorder,dysfunctional eating behaviour ,past history of intervention for substance misuse , psychological dysfunction or depression should not be considered absolute contraindications for surgery (c)



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.

Obesity Treatment Pyramid

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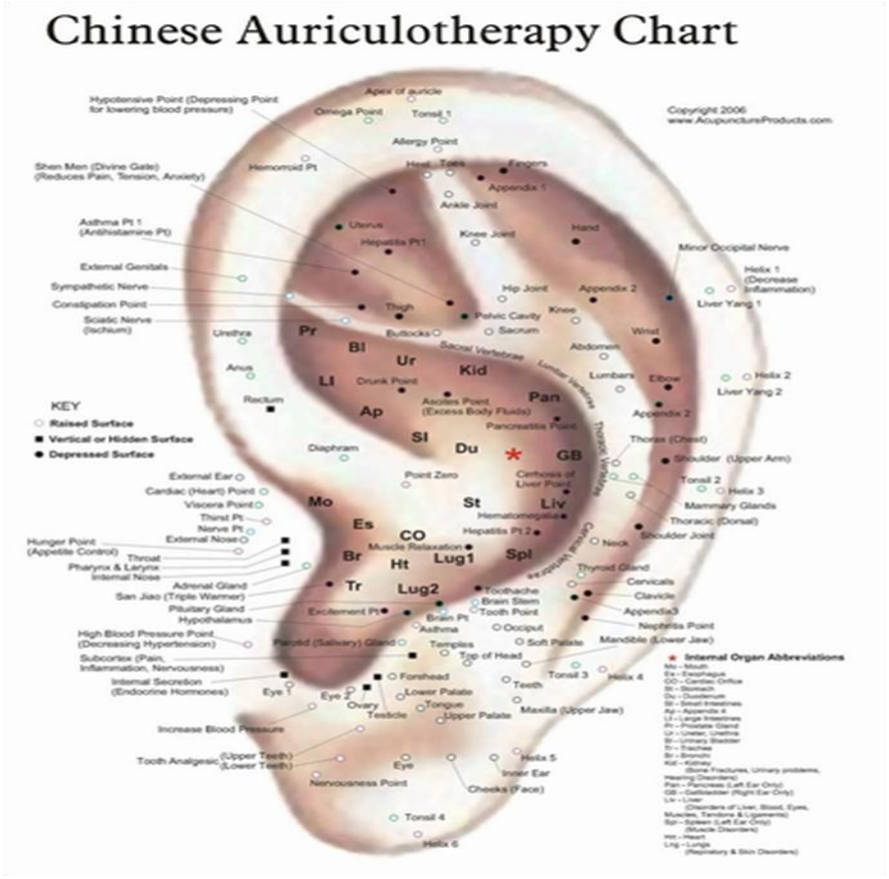
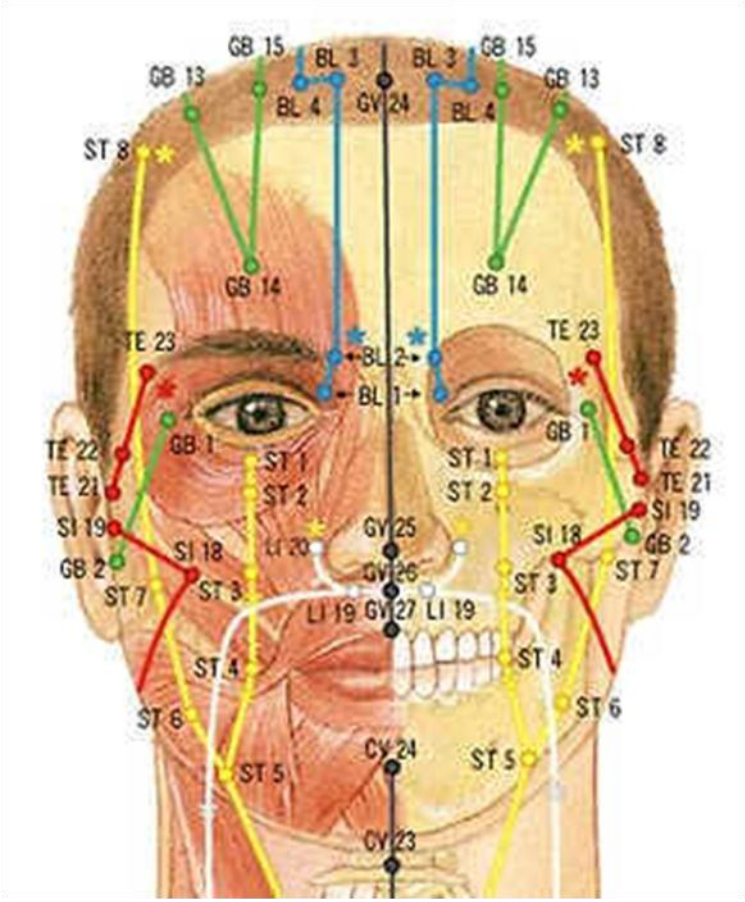
CAM and obesity

Acupuncture





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Acupuncture in obesity

- This review suggests that acupuncture is an effective treatment for obesity. However, the amount of evidence is not fully convincing because of the poor methodological quality of trials reviewed.
- In conclusion, there is an urgent need for well-planned, long-term studies to address the effectiveness of acupuncture for treating obesity.

International Journal of Obesity (2009) 33, 183–196;
doi:10.1038/ijo.2008.269; published online 13 January 2009

EB-CAM by Omayma saleh

ELECTRO ACUPUNCTURE
In treatment of obesity

Electroacupuncture treatment is more effective than sit-up exercise in reducing weight and waist circumference, making it an alternative treatment option for weight and waist circumference control on obese women”

Neurochem Res. 2008 Oct;33(10):2023-7. Epub 2008 Aug 22

EB-CAM by Omayma saleh

Anatomy of My Pyramid

One size doesn't fit all

Activity

Moderation

Personalization

Proportionality

Variety

Gradual Improvement

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(وكلوا واشربوا ولا تسرفوا)
صدق الله العظيم
THANK YOU

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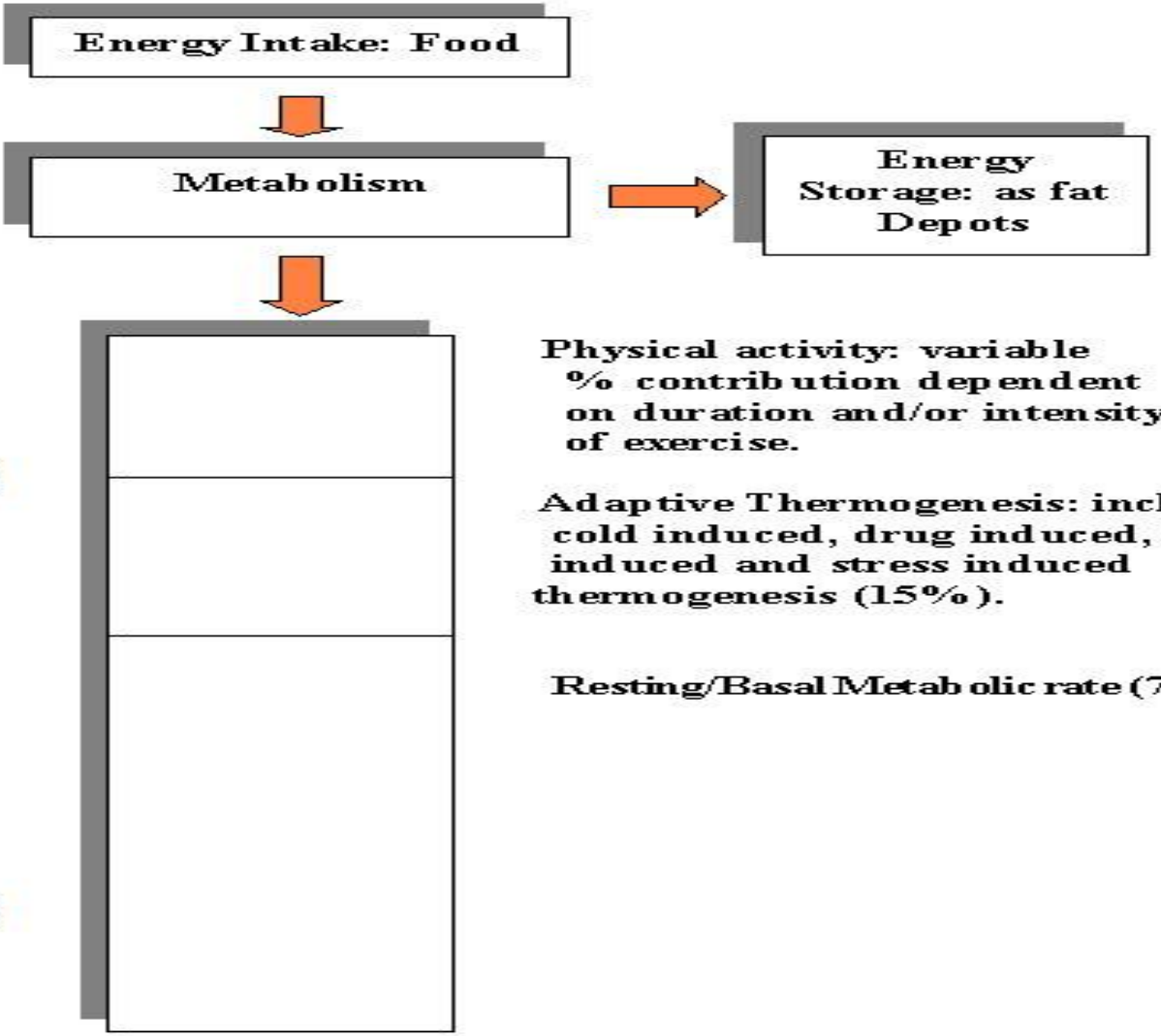
Einstein told us the definition of insanity was "doing the same thing over and over again, and expecting different results."

The Energy balance Equation



Cardiovascular: Essential hypertension, coronary artery disease, left ventricular hypertrophy, cor pulmonale, obesity associated cardiomyopathy, accelerated atherosclerosis, pulmonary hypertension of obesity

Central nervous system: Stroke, idiopathic intracranial hypertension, meralgia paresthetica

Gastrointestinal tract: Gall bladder disease (cholecystitis and cholelithiasis), Non alcoholic steatohepatitis (NASH), fatty liver infiltration, reflux esophagitis.

Respiratory tract: Obstructive sleep apnoea, obesity hypoventilation syndrome (Pickwickian syndrome), increased predisposition to respiratory infections, increased incidence of bronchial asthma.

Malignancies: Association with endometrial, prostate, gall bladder, breast and colon cancer, ?? lung cancer

Psychologic: Social stigmatization, depression

Orthopedic: Osteoarthrosis, Coxa vara, Slipped capital femoral epiphyses, Blount's disease and Legg-Calve-Perthes disease, chronic lumbago

Metabolic: Insulin resistance, hyperinsulinemia, Type 2 Diabetes mellitus, dyslipidemia (characterized by high total cholesterol, high triglycerides, normal or elevated LDL and low HDL)

Reproductive: Anovulation, early puberty, infertility, hyperandrogenism and polycystic ovaries in women, hypogonadotrophic hypogonadism in men.

Obstetric and Perinatal: Pregnancy related hypertension, fetal macrosomia and pelvic dystocia.

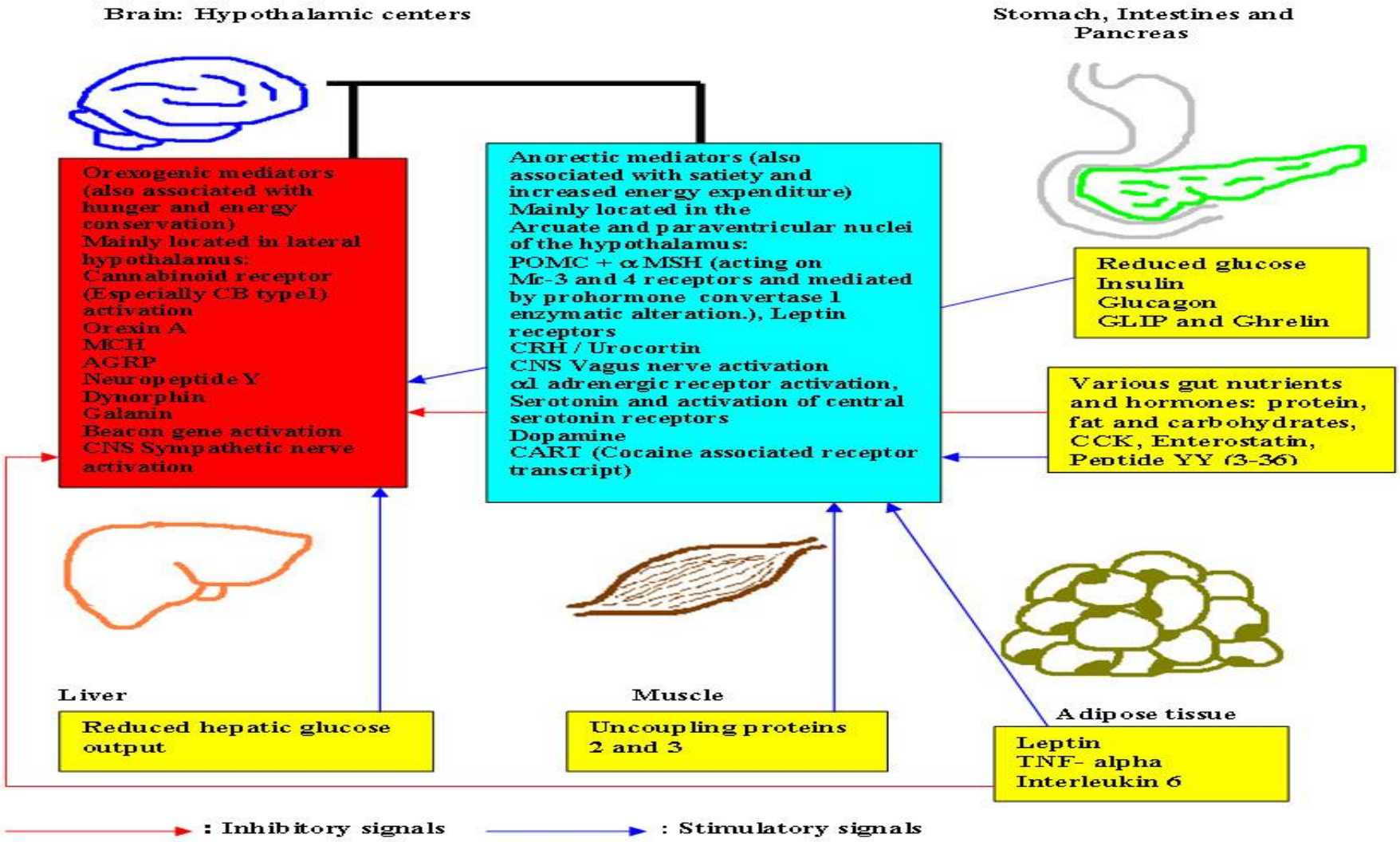
Increased surgical risk and postoperative complications including wound infection, deep venous thrombosis, pulmonary embolism and postoperative pneumomia.

Pelvic problems: Stress incontinence

Cutaneous: Intertrigo (both bacterial and/or fungal), acanthosis nigricans, hirsuitism, increased risk for cellulites, carbuncles.

- Effect of an alpha-amylase inhibitor from white bean (Phaseolus vulgaris) on weight loss and glycemic control.

Neuro-circuits related to the pathogenesis of Obesity and the Feeding Satiety cycle.



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- Satiation signals are derived from the gastrointestinal tract, while adiposity signals are derived from fat cells in the pancreas.
- Whereas the satiation signals serve to regulate short-term calorie balance, that is, meal to meal or day to day, adiposity signals serve to regulate longer-term calorie balance that is week to week.

The gastrointestinal tract

- Ghrelin a 28-amino acid peptide released into the circulation from the fundic region of the stomach is unique since it is the only gut hormone that increases appetite. Circulating ghrelin levels are increased by fasting and fall after a meal.
- Cholecystokinin, or CCK, was the first hormone to be shown to influence food intake. CCK is released postprandially from I cells in the small intestine, and reduces food intake through CCK-1 receptors on the vagus nerve.

GLP-1 is rapidly released after food ingestion into the circulation in response to food intake.

GLP-1 is an incretin hormone that controls blood sugar by stimulating insulin secretion and inhibiting both glucagon secretion and gastric emptying.

GLP-1 administration has been shown to reduce food intake mediated through both peripheral and central mechanisms.

The GLP-1 mimetic agent exenatide and the GLP-1 analogue liraglutide are both being used as drugs for type 2 diabetes, and as an added benefit also cause weight loss.

Amylin, the other hormone that increases satiety, is cosecreted together with insulin from pancreatic islet beta cells.

Plasma levels of amylin increase the response to nutritional stimuli.

Exogenous amylin inhibits gastric emptying and glucagon secretion and reduces short-term food intake.

An amylin mimetic agent pramlintide is used as a drug for type 1 and type 2 diabetes, and also causes weight loss.

Clinically, injury or lesions to the hypothalamus may result in a pattern of weight gain that is characterized as abrupt in onset and rapidly accelerating.

This is known as hypothalamic obesity.

Causes of hypothalamic obesity include craniopharyngioma, head trauma, sarcoidosis, aneurysm, meningioma, metastases, surgery, or radiation to the hypothalamus.

The hypothalamus is the key processing area within the brain for the integration of numerous signals related to appetite and energy balance. Energy homeostasis is maintained by a balance between pathways that stimulate food intake and promote weight gain, and pathways that promote reduced food intake and loss of body weight.

The neurons that coexpress proopiomelanocortin, or POMC, in cocaine- and amphetamine-related transcript, or CART, These neurons reduce appetite and increase energy expenditure.

In contrast, the neurons that coexpress neuropeptide Y, or NPY, and agouti-related protein, or AgRP, increase appetite and reduce energy expenditure.

Both of these neurons are the origins of tracts projecting to other hypothalamic and brain areas.

From a pharmacologic mechanism of action, any drug that selectively increases the activity of POMC and CART in the hypothalamus will serve to reduce appetite.

Note that the 5-HT2C receptors, also known as serotonin 2C receptors, activate POMC neurons and this is the mechanism of action for one of the new weight-loss drugs .

Lorcaserin is a selective serotonin receptor agonist designed to promote weight loss. Serotonin receptor activation of POMC neurons results in alpha-melanocyte-stimulating, or MSH, hormone activation of melanocortin (MC)4 receptors.

Using the serotonin receptor as a pharmacologic target for weight loss was validated by fenfluramine.

Fenfluramine used in combination with phentermine, which was also known as Fen-Phen, was highly efficacious for weight loss, but safety concerns led to its withdrawal.

Activation of the 5-HT2B receptor by fenfluramine was linked to cardiac valvular disease.

The combination of naltrexone and bupropion contains 2 drugs that are already on the market. Bupropion is a weak dopamine-norepinephrine reuptake inhibitor and is currently a widely used antidepressant.

Bupropion is also approved as a smoking cessation agent. This drug has been shown to activate the POMC neuron and enhance the release of alpha-MSH, which results in downstream appetite suppression.

Naltrexone is an opiate receptor antagonist, and it's currently indicated for opiate and ethanol dependence. Naltrexone blocks beta-endorphin-mediated POMC autoinhibition in order to sustain alpha-MSH release.

Thus, there is a synergistic action of the 2 drugs to augment appetite suppression.

Patients receiving the combination of bupropion and naltrexone experienced a greater incidence of nausea, headache, constipation, vomiting, and dry mouth.

More patients in the study groups also discontinued treatment compared with placebo. The most common reason was nausea .

When the incidence and severity of nausea were analyzed by study week, it was noted that it occurred early during the titration phase of the study.

Phentermine is a sympathomimetic agent that is currently approved for the treatment of obesity.

Topiramate is currently approved by the FDA as an anticonvulsant for the treatment of epilepsy and for the prophylaxis of migraine headaches.

Weight loss was seen as an unintended side effect during clinical trials for epilepsy.

The mechanism of action responsible for weight loss is uncertain but thought to be mediated through modulation of gamma-aminobutyric acid, or GABA receptors; inhibition of carbonic anhydrase; and antagonism of glutamate to reduce food intake.

Using a new controlled-release formulation, lower doses of topiramate and phentermine are combined to improve the tolerability of topiramate.