

PBL-X

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Obesity



Obesity

What Causes Obesity?



- Energy imbalance over a long period of time.
- Energy in > Energy out.
- Excess calories and lack of physical activity.

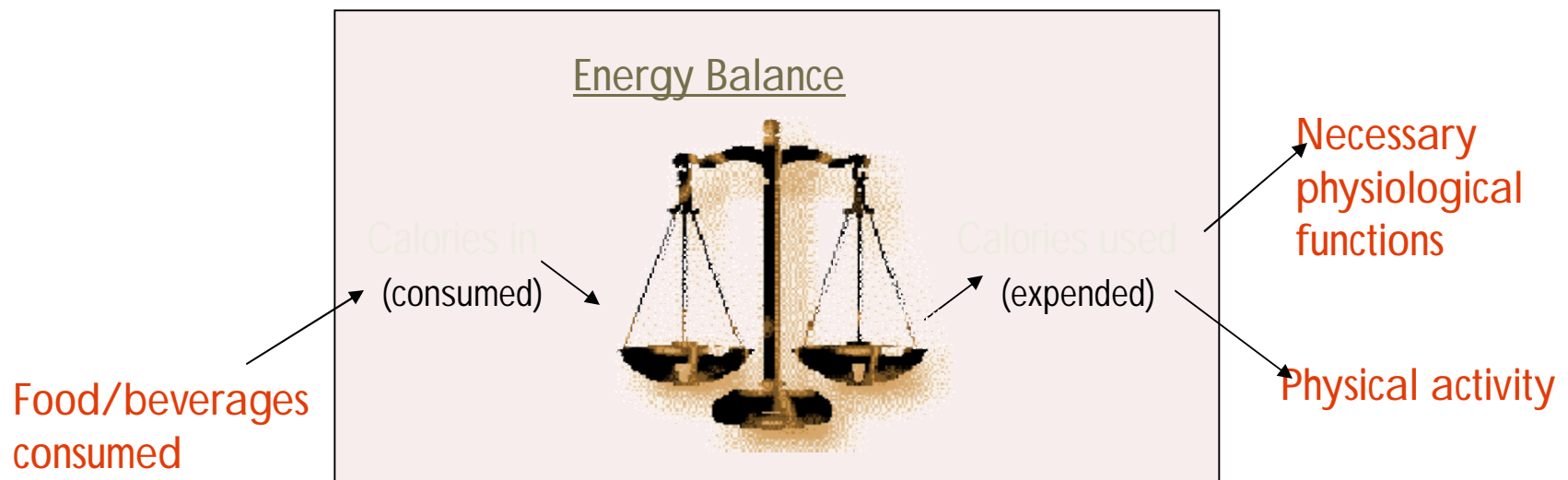


Energy balance is like a scale. When calories consumed are greater than calories used, weight gain is the result.

Calories Used



- Eating, digestion, sleeping, breathing, and movement.
- Excess calories.
- Physical activity.



	BMI (kg/m²)	Obesity Class
Underweight	<18.5	
Normal	18.5-24.9	
Overweight	25.0-29.9	
Obesity	30.0-34.9	I
	35.0-39.9	II
Extreme Obesity	40.0 +	III



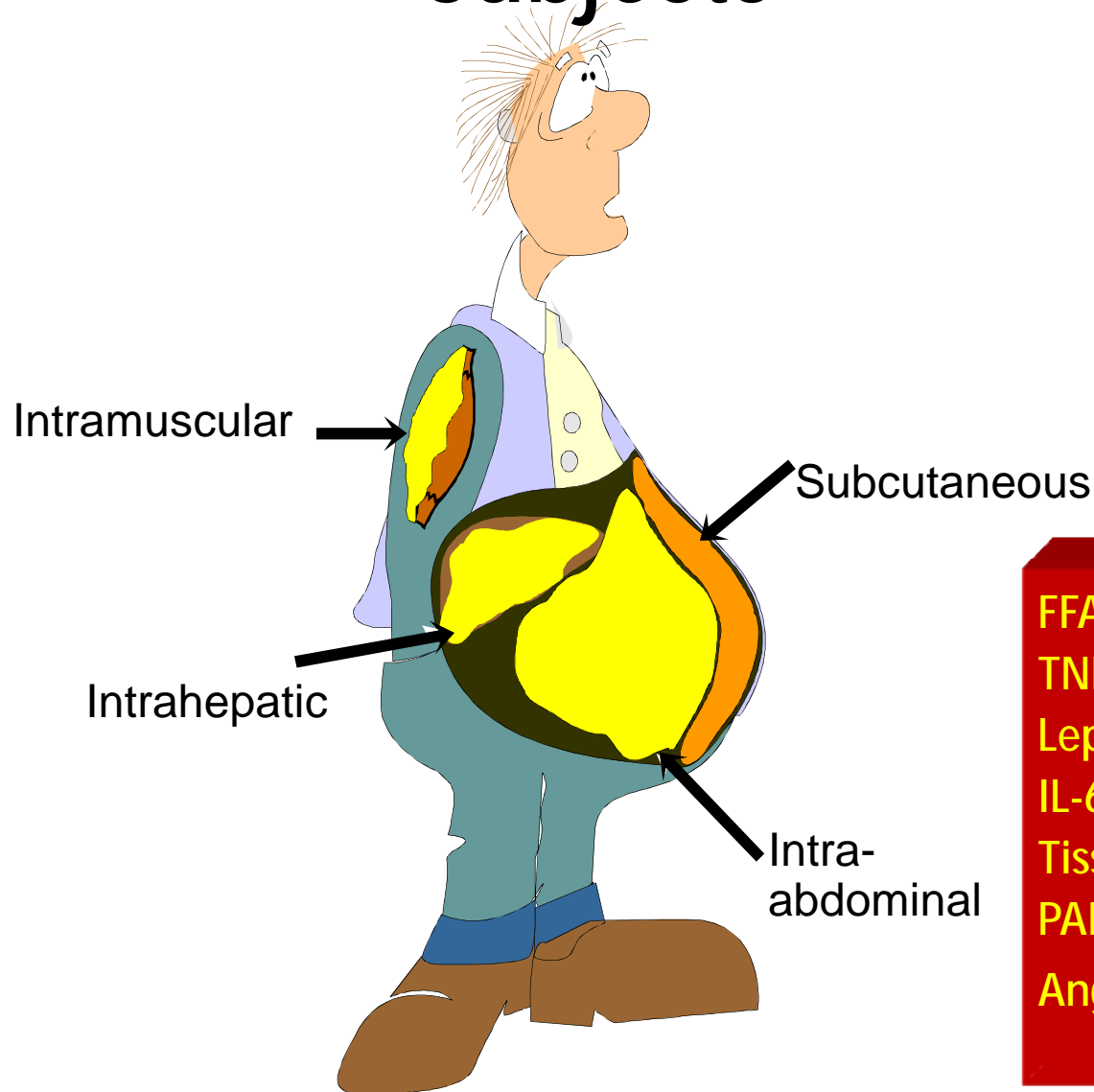
Low BMI is Associated with:

- Osteoporosis
- Eating disorders
- Under-nutrition
- Pregnancy complications

Central Obesity

- IDF:
 - Central obesity - waist circumference >94 cm for European men, >80 European women with ethnicity specific values for other groups
- WHO:
 - Waist-hip ratio >0.9 - men or >0.85 - women
- ATP III:
 - Waist circumference >40 in. - men,
 > 35 in. - women

Fat Topography In Type 2 Diabetic Subjects



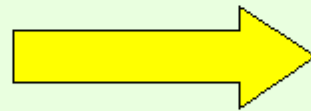
FFA*
TNF-alpha*
Leptin*
IL-6 (CRP)*
Tissue Factor*
PAI-1*
Angiotensinogen*

Central obesity: a driving force for cardiovascular disease & diabetes

Front



Back



"Balzac" by Rodin





Adverse Medical Consequences of Obesity

- Type 2 DM
- CAD
- Stroke
- HTN
- Gallbladder disease
- Non-alcoholic steatohepatitis
- Complications of pregnancy
- Dyslipidemia
- Osteoarthritis
- Sleep apnea
- Certain cancers
- CHF
- Low back pain
- Increased total mortality

Medical Complications of Obesity

Pulmonary disease
abnormal function
obstructive sleep apnea
hypoventilation syndrome

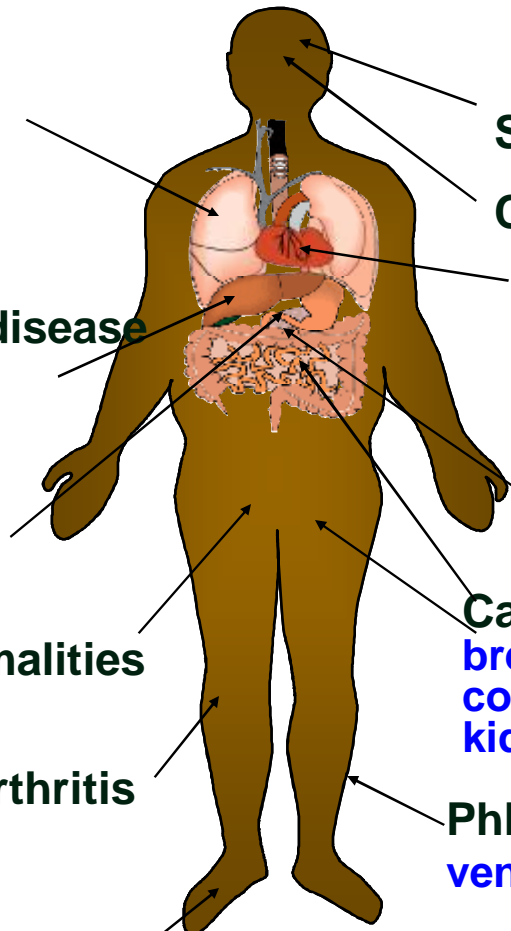
Nonalcoholic fatty liver disease
steatosis
steatohepatitis
cirrhosis

Gall bladder disease

Gynecologic abnormalities
abnormal menses
infertility
PCOS

Osteoarthritis

Gout



Stroke

Cataracts

CHD

Diabetes

Dyslipidemia

Hypertension

Severe pancreatitis

Cancer

breast, uterus, cervix

colon, esophagus, pancreas

kidney, prostate

Phlebitis

venous stasis

Consequences of Obesity

Hippocrates
recognized that :
*“sudden death is more
common in those who
are naturally fat than
in lean.”*





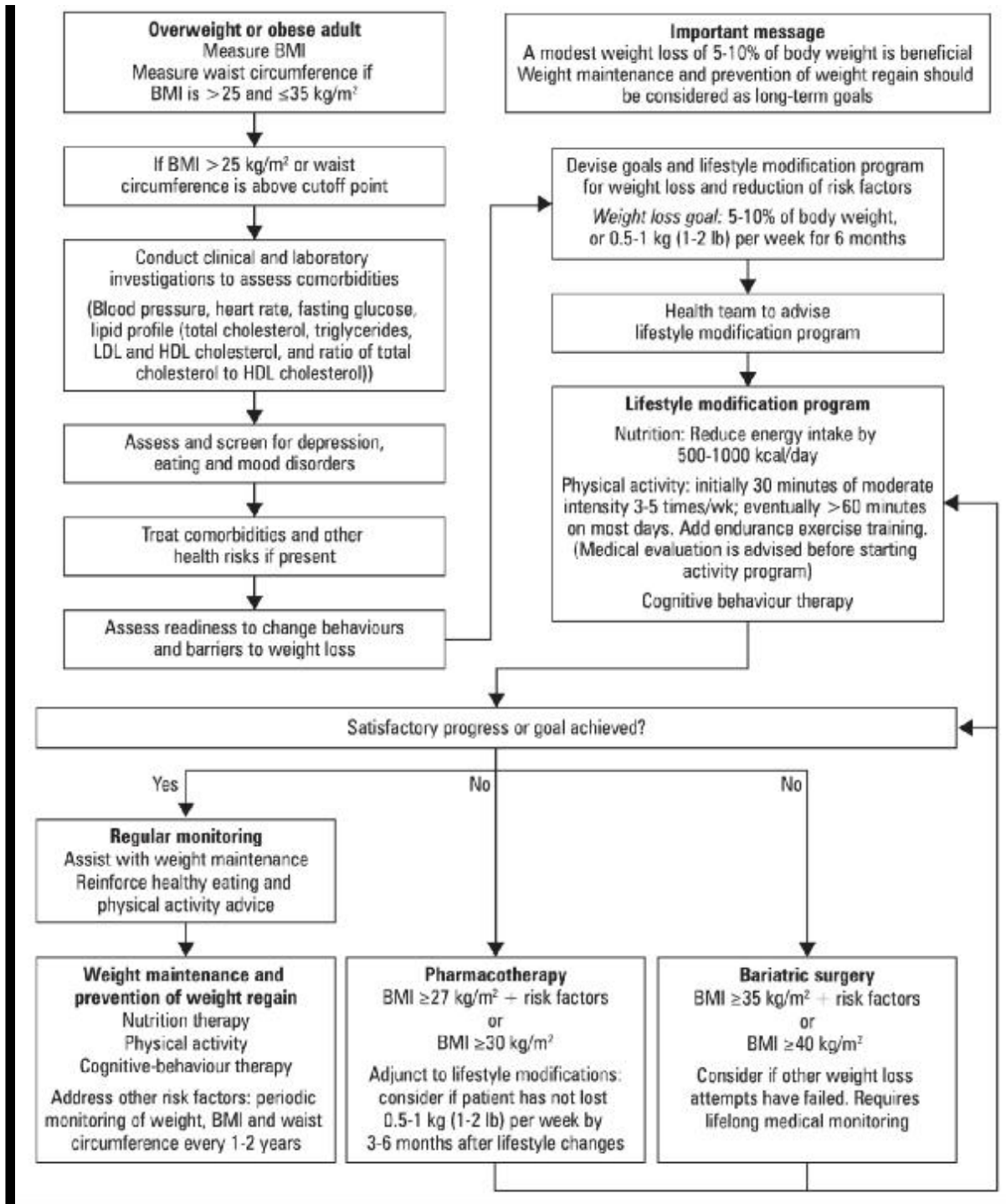
Losing Weight

- Aim for caloric intake 500-1000 kcal/d less than total daily energy expenditure (TDEE)
- Results in 1-2 lb (0.5-1 kg) weight loss per week
- Achieved by combination of increased activity and/or decreased caloric intake



Burning Fat

3500 kcal of energy are produced for every pound of human fat burned during activity.



ICD 9 Codes

- Obesity: 278
- Morbid Obesity: 278.01
- Overweight: 278.02

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Thanks