Vall d'Hebron Barcelona Campus Hospitalari

SEEDO-SEO Sociedad Española de Obesidad

Vall d'Hebron Institut de Recerca VHIR

EASO European Association for the Study of Obesity

EASO SUMMER SCHOOL: MASTERCLASS IN THE PREVENTION AND MANAGEMENT OF OBESITY

Les Pensières at Fondation Mérieux. Annecy, France: 11 - 15 July 2022

OBESITY MANAGEMENT

Clinical evaluation

Dr. Andreea Ciudin

Obesity Unit Coordinator COM- Endocrinology Department, Vall Hebron University Hospital-Barcelona

Tresurer of SEEDO (Spanish Society for the Study of Obesity)

EASOCOM

EASO Collaborating Centre for Obesity Management

VALL D'HEBRON OBESITY UNIT

OBESITY MANAGEMENT IN PRIMARY CARE

Obesity
Build motivation to improve self-esteem, self-confidence and quality of life
Educate patients and evaluate motivation and health risks
Stigma has no place in treatment
Investigate via history taking, clinical and lab examination
Treat co-morbidities
Yield compliance and adherence over the long term

Authors: **Dr Dominique DURRER**, MD & **Prof. Yves Schutz**, MPh & PhD
Geneva University Hospital (HUG) & Faculty Medicine, University Fribourg, Switzerland

Acknowledgment: Euan Woodward & Sheree Bryant, EASO, April 2018

EASO
European Association for the Study of Obesity

OVERVIEW
OBESITY MANAGEMENT IN GENERAL PRACTICE

Patient comes to treat his/her body weight issue.

Avoid any **stigmatisation**.

Patient comes to consultation for another issue.

Avoid any **stigmatisation**.

Ask the patient for permission to 'speak about his weight.'

Begin consultation with empathy and respect, develop a nonjudgmental relationship, and create a partnership with the patient, using **motivational interviewing**.

Evaluate patient expectations and motivation to change.

Use **history-taking** to determine the obesity aetiologies, including lifestyle (eating behaviour, physical activity and inactivity, psychological elements), weight loss history, motivation to change and barriers to weight loss.

Clinical examination: measure height, weight and calculate BMI (kg/m^2), determine degree of obesity, measure waist circumference.

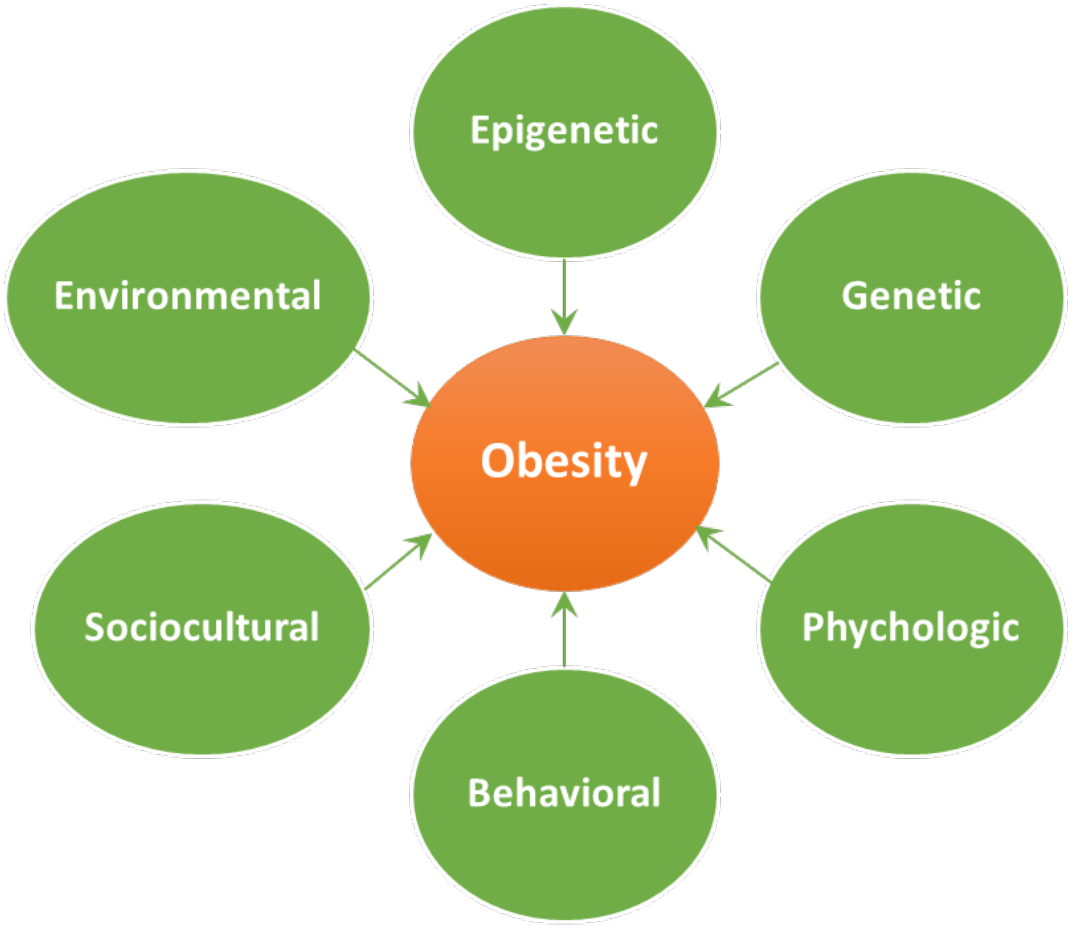
Assess using both general and laboratory examination to determine **comorbidities**.

Assess at regular intervals changes in waist circumference, the improvement in comorbidities, lifestyle modifications and improvements in quality of life.

ARE YOU/WE READY FOR A REAL CHANGE?

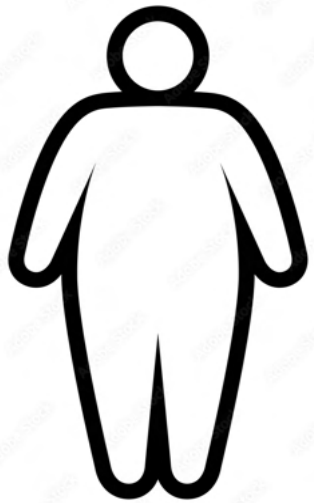
- **WHICH CRITERIA DO YOU USE IN THE CLINICAL PRACTICE TO DIAGNOSE OBESITY?**
- **WHICH CRITERIA DO YOU USE IN THE CLINICAL PRACTICE TO MAKE DECISIONS ON OBESITY:**

(PHARMACOLOGICAL TREATMENT, BARIATRIC SURGERY, ETC.)



Bray GA, et al. *Lancet*. 2016;387:1947-1956.

- Drink less
- Urinate more

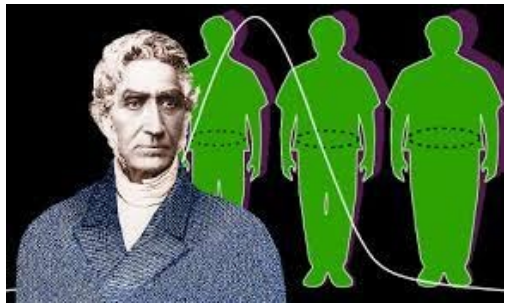


- Eat less
- Exercise more

CLINICAL EVALUATION OF PEOPLE LIVING WITH OBESITY

LET´S UNDERSTAND

The history of Body mass index



Adolphe Quetelet, Belgium
1796-1876

- **Invented by a mathematician in the XIX century: on white, Caucasian population from France and Scotland.**

- **Not designed to assess individual health status, but rather to describe populations and find the characteristics of "*l´homme moyen*".**

The intentions of Quetelet were pure racist

SERIOUS LIMITATIONS

BMI:
Main criteria for obesity and decision making in clinical practice

BMI:
Main criteria for indicating the treatment, including bariàtric surgery

BMI chart with obesity classifications adopted from the WHO 1998 report.

WHO CLASSIFICATION OF WEIGHT STATUS	
WEIGHT STATUS	**BODY MASS INDEX (BMI), kg/m^2**
Underweight	<18.5
Normal range	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	≥ 30
Obese class I	30.0 – 34.9
Obese class II	35.0 – 39.9
Obese class III	≥ 40

Review Article

Page 1 of 12

Definitions and current indications for obesity and metabolic surgery

Ann Laparosc Endosc Surg 2021;6:8 | http://dx.doi.org/10.21037/ales-20-52

Evren Dilektasli[1], Berkay Demir[2]

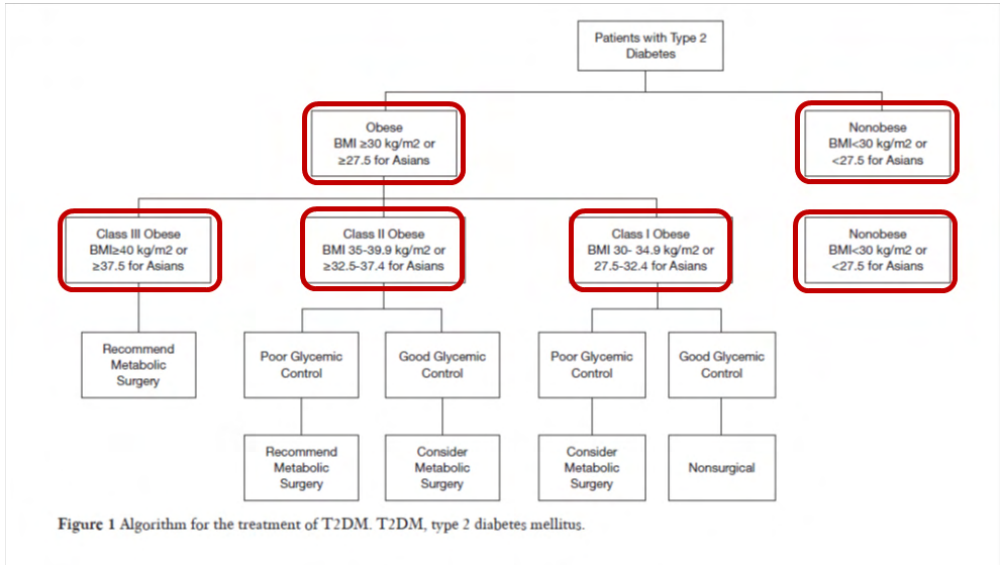
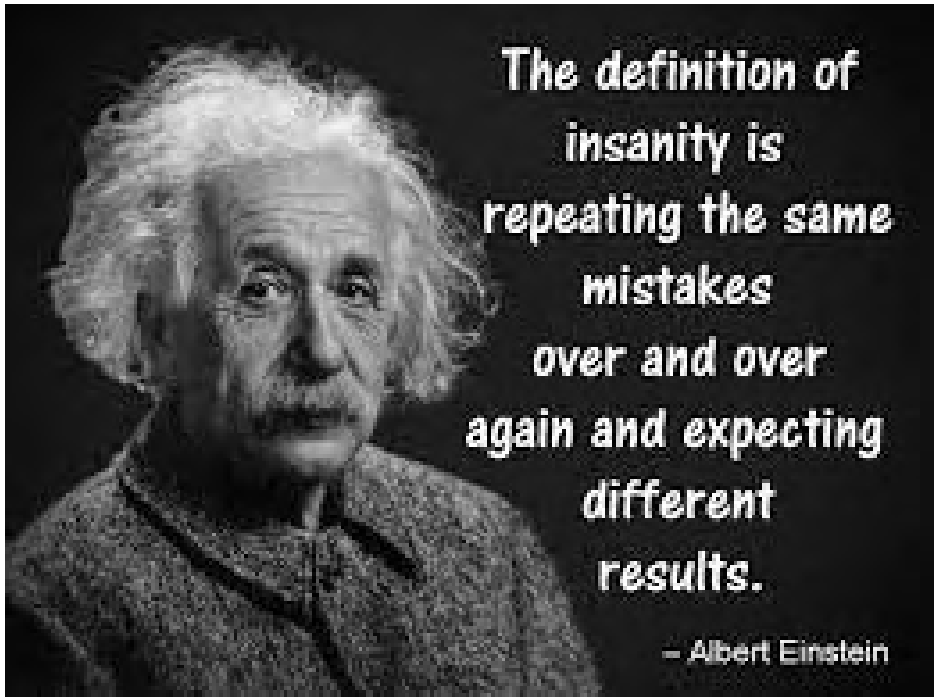
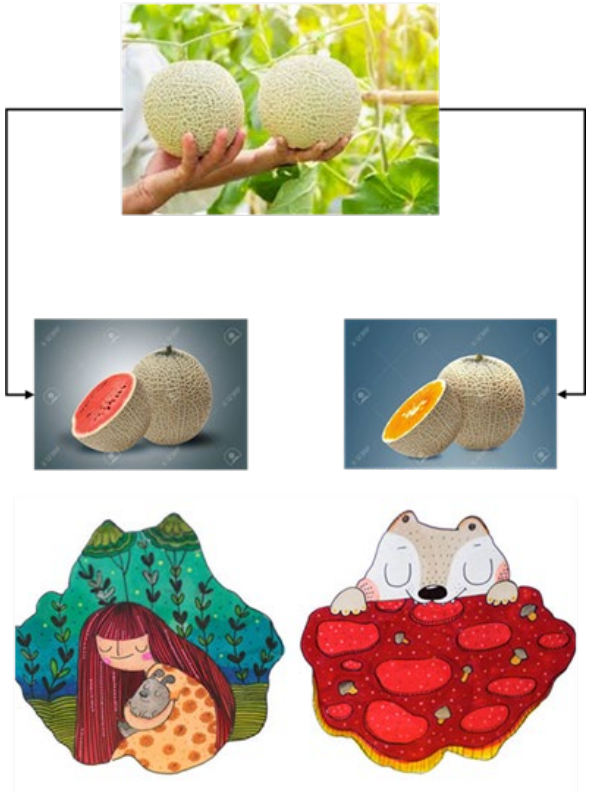


Figure 1 Algorithm for the treatment of T2DM. T2DM, type 2 diabetes mellitus.


The definition of
insanity is
repeating the same
mistakes
over and over
again and expecting
different
results.
– Albert Einstein

BMI




OPEN
YOUR
MIND

2017 AACE (American Association of Clinical Endocrinologists): new definition of obesity

Obesity: Adiposity-based chronic disease

Obesity Facts
The European Journal of Obesity

Obes Facts 2019;12:131–136
DOI: 10.1159/000497124
Received: October 25, 2018
Accepted: January 22, 2019
Published online: March 7, 2019

Guidelines

The ABCD of Obesity: An EASO Position Statement on a Diagnostic Term with Clinical and Scientific Implications

Gema Frühbeck[a, b] Luca Busetto[a, c] Dror Dicker[a, d] Volkan Yumuk[a, e]
Gijs H. Goossens[a, f] Johannes Hebebrand[a, g] Jason G.C. Halford[a, h]
Nathalie J. Farpour-Lambert[a, i] Ellen E. Blaak[a, f] Euan Woodward[a, j]
Hermann Toplak[a, k]

Adiposity: excess of body fat

Based: cause

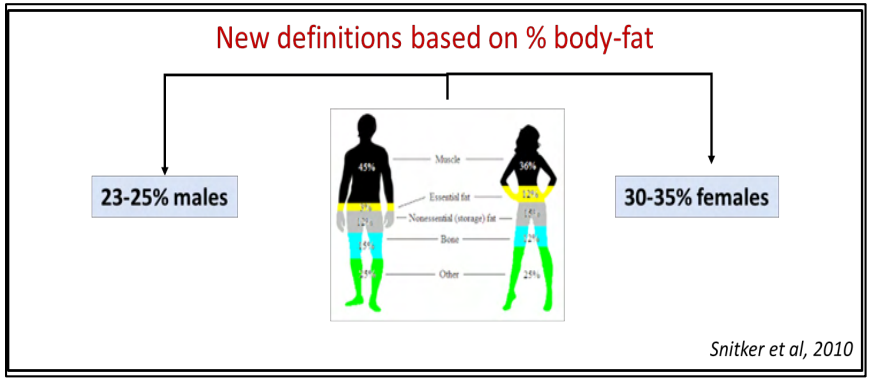
Chronic: >3 months

Disease

Adiposity

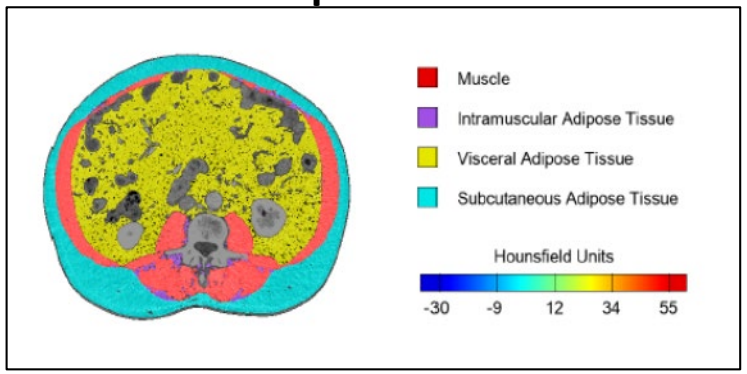
Total amount of fat

Body composition %



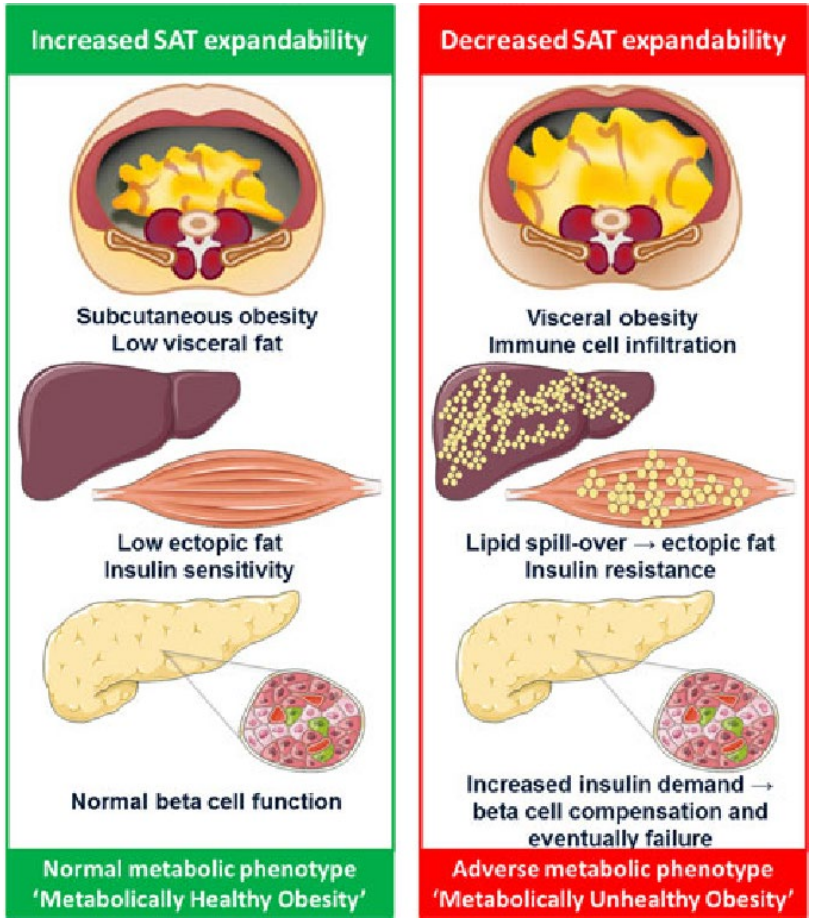
Distribution

- **Subcutaneous**
- **Ectopic**



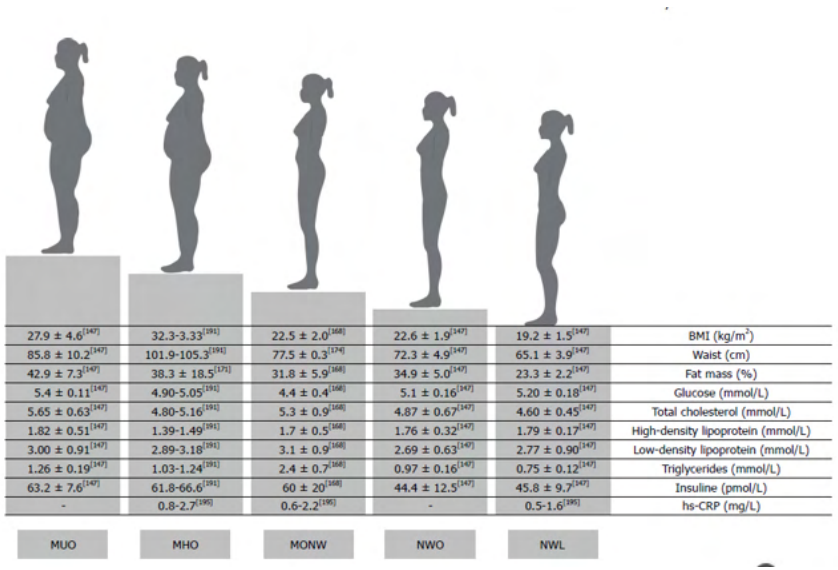
Function

Expandibility (capacity to store TG)

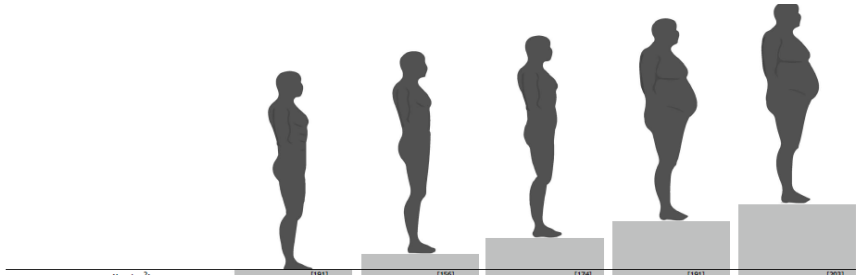


REGARDLESS BMI

Obesity is not defined by one's weight or size, but by whether a person's body fat impairs their health.



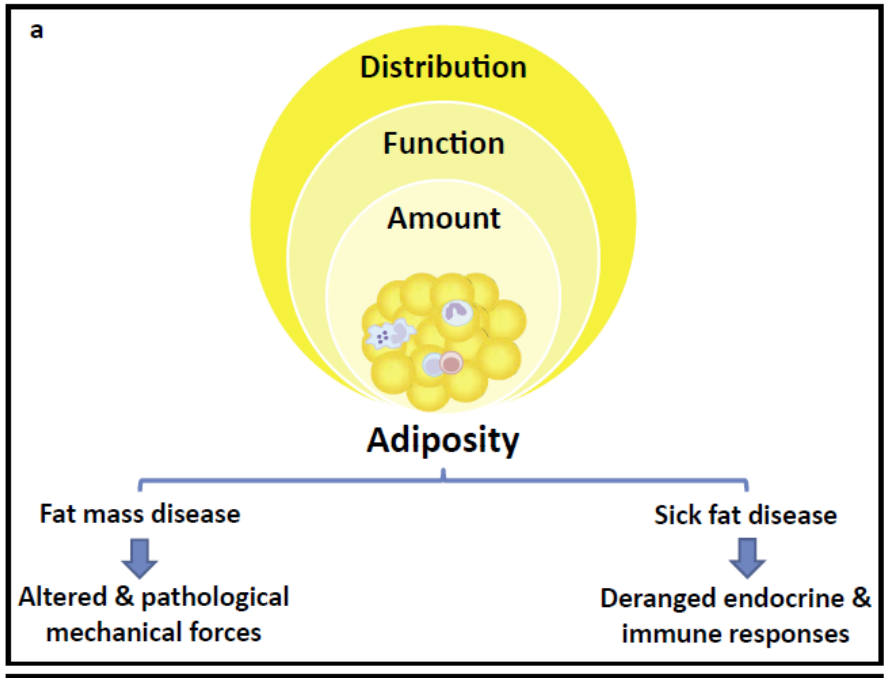
MUO	MHO	MONW	NWO	NWL	
27.9 ± 4.6[147]	32.3-3.33[191]	22.5 ± 2.0[168]	22.6 ± 1.9[147]	19.2 ± 1.5[147]	BMI (kg/m^2)
85.8 ± 10.2[147]	101.9-105.3[191]	77.5 ± 0.3[174]	72.3 ± 4.9[147]	65.1 ± 3.9[147]	Waist (cm)
42.9 ± 7.3[147]	38.3 ± 18.5[171]	31.8 ± 5.9[168]	34.9 ± 5.0[147]	23.3 ± 2.2[147]	Fat mass (%)
5.4 ± 0.11[147]	4.90-5.05[191]	4.4 ± 0.4[168]	5.1 ± 0.16[147]	5.20 ± 0.18[147]	Glucose (mmol/L)
5.65 ± 0.63[147]	4.80-5.16[191]	5.3 ± 0.9[168]	4.87 ± 0.67[147]	4.60 ± 0.45[147]	Total cholesterol (mmol/L)
1.82 ± 0.51[147]	1.39-1.49[191]	1.7 ± 0.5[168]	1.76 ± 0.32[147]	1.79 ± 0.17[147]	High-density lipoprotein (mmol/L)
3.00 ± 0.91[147]	2.89-3.18[191]	3.1 ± 0.9[168]	2.69 ± 0.63[147]	2.77 ± 0.90[147]	Low-density lipoprotein (mmol/L)
1.26 ± 0.19[147]	1.03-1.24[191]	2.4 ± 0.7[168]	0.97 ± 0.16[147]	0.75 ± 0.12[147]	Triglycerides (mmol/L)
63.2 ± 7.6[147]	61.8-66.6[191]	60 ± 20[168]	44.4 ± 12.5[147]	45.8 ± 9.7[147]	Insuline (pmol/L)
-	0.8-2.7[195]	0.6-2.2[195]	-	0.5-1.6[195]	hs-CRP (mg/L)

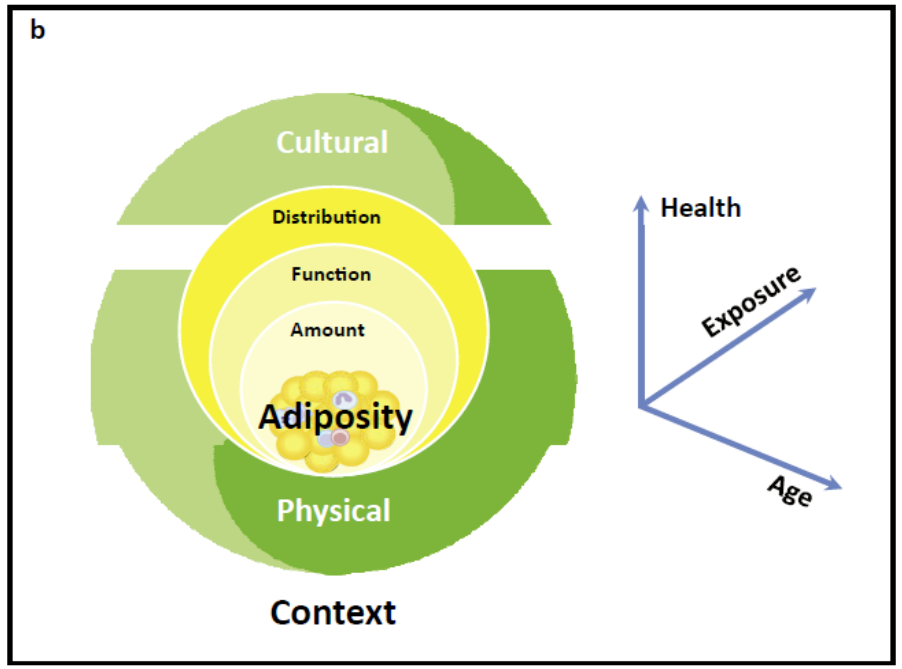


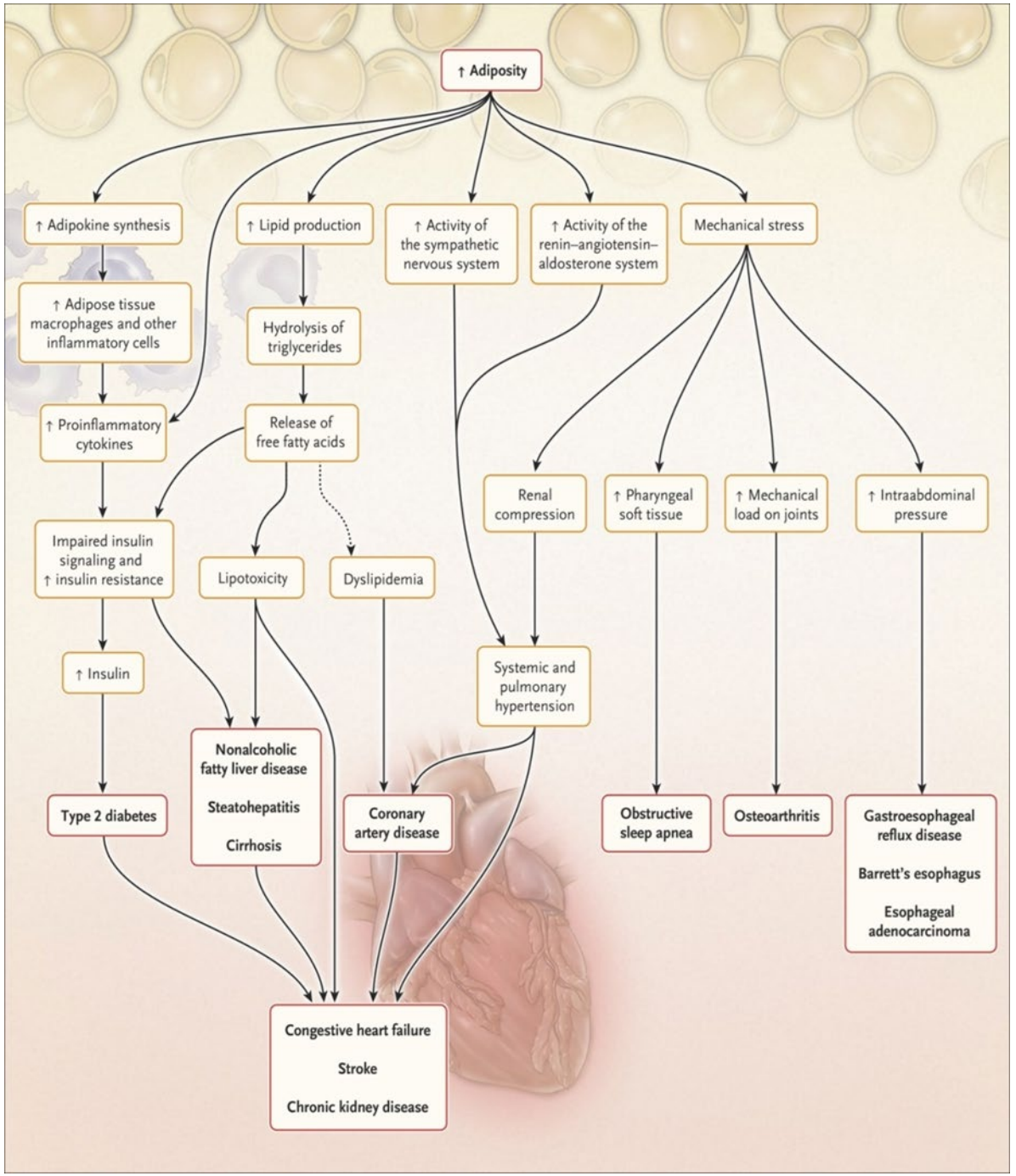
NWL	NWO	MONW	MHO	MUO	
22.4-22.7[191]	24.1 ± 0.7[156]	22.87 ± 0.07[174]	32.3-33.3[191]	31.59 ± 0.74[263]	BMI (kg/m^2)
83.8-85.2[191]	89.4 ± 1.6[156]	82.5 ± 0.3[174]	108.3-112.1[191]	108 ± 7[172]	Waist (cm)
19.4 ± 0.2[174]	26.4 ± 1.3[156]	22.3 ± 0.2[174]	31.1 ± 3.4[181]	26.44 ± 0.53[263]	Fat mass (%)
5.1-5.2[191]	2.53 ± 0.19[156]	5.38 ± 0.02[174]	5.1-5.3[191]	5.44 ± 0.10[263]	Glucose (mmol/L)
4.8-5.0[191]	5.09 ± 0.72[156]	5.08 ± 0.04[174]	4.8-5.2[191]	5.11 ± 0.99[263]	Total cholesterol (mmol/L)
1.3-1.4[191]	1.23 ± 0.24[156]	1.18 ± 0.01[174]	1.2-1.3[191]	1.23 ± 0.36[263]	High-density lipoprotein (mmol/L)
4.8-5.0[191]	3.09 ± 0.62[156]	2.73 ± 0.04[174]	4.8-5.2[191]	3.20 ± 0.94[263]	Low-density lipoprotein (mmol/L)
1.1-1.3[191]	3.84 ± 1.77[156]	2.47-2.64[174]	1.2-1.4[191]	1.86 ± 0.19[263]	Triglycerides (mmol/L)
44.5-48.1[191]	42.3 ± 19.4[156]	52.8-55.8[174]	63.1-73.2[191]	16.37 ± 1.76[263]	Insuline (pmol/L)
0.5-1.6[195]	-	0.6-2.2[195]	0.8-2.7[195]	-	hs-CRP (mg/L)

Figure 2 Characteristic of the four obese phenotypes. A: Women; B: Men. NWO: Normal weight obese; MONW: metabolically obese normal weight; MHO: metabolically healthy obese; MUO: metabolically unhealthy obese; BMI: body mass index; hsP: High-sensitive C-reactive protein. Data are expressed as average ± SD (a ± b), or as minimum-maximum (a-b), according to the references.

Person living with obesity: BMI 26kg/m2 + insulin resistance+ body fat 35%


a
Distribution
Function
Amount
Adiposity
Fat mass disease
Sick fat disease
Altered & pathological mechanical forces
Deranged endocrine & immune responses


b
Cultural
Distribution
Function
Amount
Adiposity
Physical
Context
Health
Exposure
Age


↑ Adiposity
↑ Adipokine synthesis
↑ Lipid production
↑ Activity of the sympathetic nervous system
↑ Activity of the renin–angiotensin–aldosterone system
Mechanical stress
↑ Adipose tissue macrophages and other inflammatory cells
Hydrolysis of triglycerides
↑ Proinflammatory cytokines
Release of free fatty acids
Renal compression
↑ Pharyngeal soft tissue
↑ Mechanical load on joints
↑ Intraabdominal pressure
Impaired insulin signaling and ↑ insulin resistance
Lipotoxicity
Dyslipidemia
↑ Insulin
Systemic and pulmonary hypertension
Nonalcoholic fatty liver disease
Steatohepatitis
Cirrhosis
Type 2 diabetes
Coronary artery disease
Obstructive sleep apnea
Osteoarthritis
Gastroesophageal reflux disease
Barrett's esophagus
Esophageal adenocarcinoma
Congestive heart failure
Stroke
Chronic kidney disease

Related to obesity

Related to the reward circuit (DA receptor sensitivity)

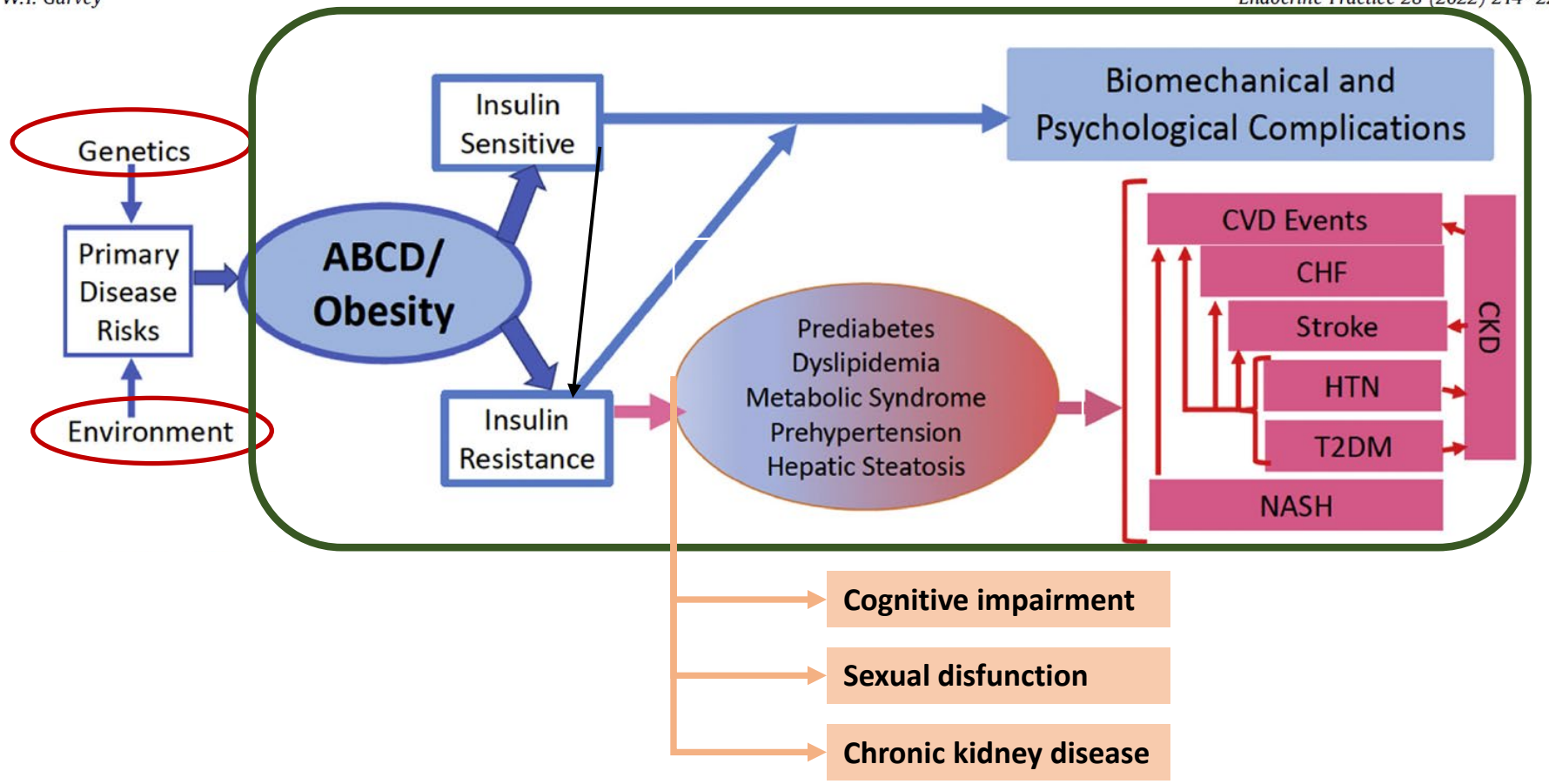
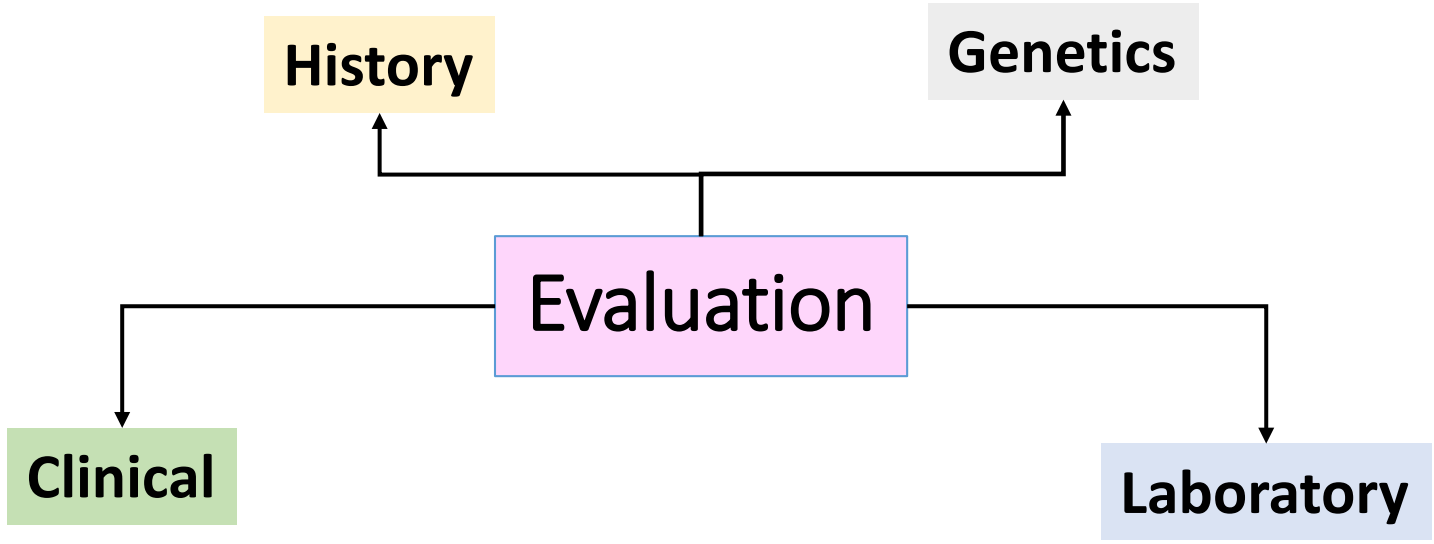


Fig. 4. A chronic care model for the prevention and treatment of ABCD. *ABCD* = adiposity-based chronic disease; *CHF* = congestive heart failure; *CKD* = chronic kidney disease; *CVD* = cardiovascular disease; *HTN* = hypertension; *LDL-c* = low-density lipoprotein-cholesterol; *NASH* = nonalcoholic steatohepatitis; *T2DM* = type 2 diabetes mellitus.

Dietary habits and behaviour, Psychological context, Cognitive context, Sociocultural context, Environmental context



Anthropometry

Body composition

Energy expenditure

Physical examination: Arterial pressure
Movility, etc.

Other: abdominal US, fibroscan, gastroscopy, etc.

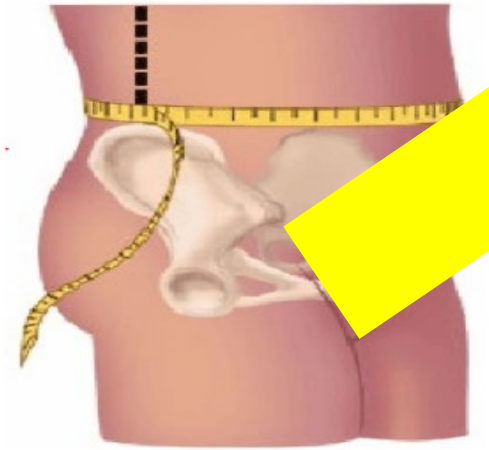
1. Causes of secondary obesity: TSH, Cortisole, GH, etc
2. Consequences of obesity (ABCD):
   - Glucose, HbA1C, insulin levels
   - Lipid profile (+FFA)
   - Liver profile (specific scores of NAFLD)
   - Kidney: glomerular filtrate, microalbuminuria
   - Sex hormones
   - Inflammatory biomarkers

3. GENETICS

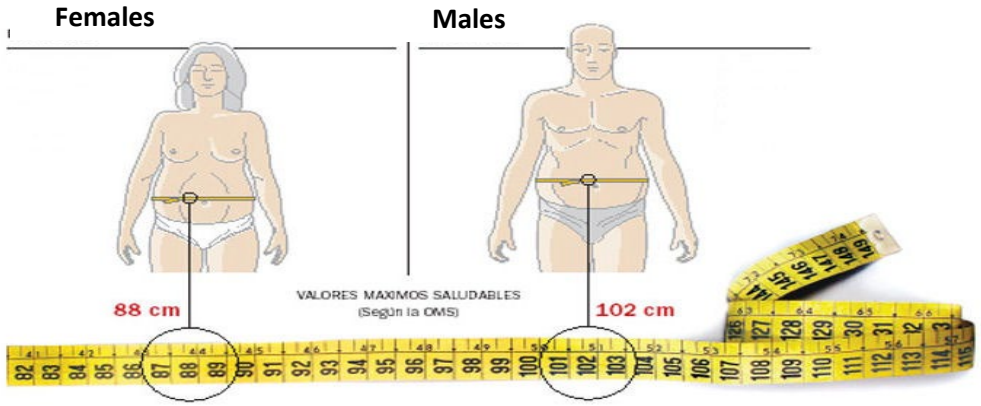
ANTHROPOMETRY

- **BMI (body mass index): weight(kg)/height (m^2)**
- **Waist circumference cm**
- **Hip circumference: cm**
- **Skinfolds: cm**

SUROGATES



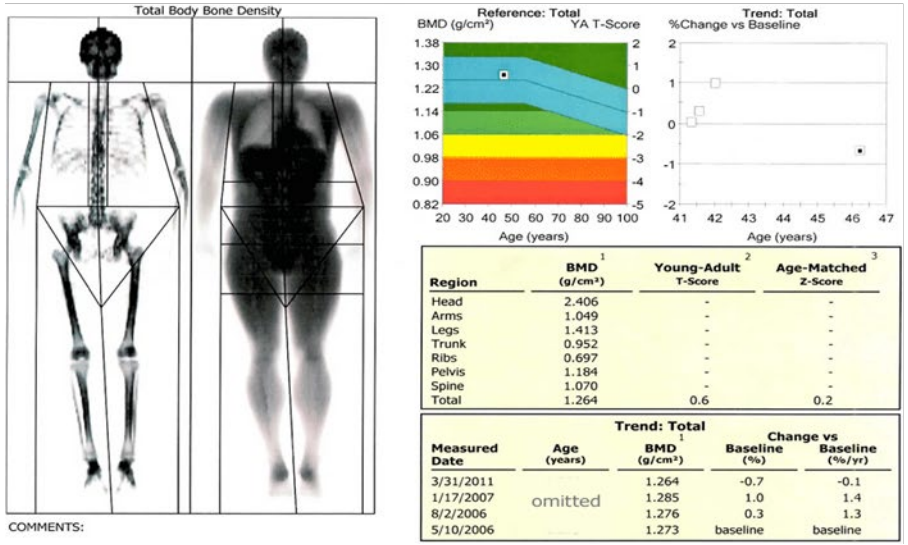
Waist circumference



Estimates visceral obesity and cardiovascular risk

Body composition Dual-X-ray-absorptiometry: DXA

- Quantitative evaluation of body composition.
- Do not evaluate fat compartments.

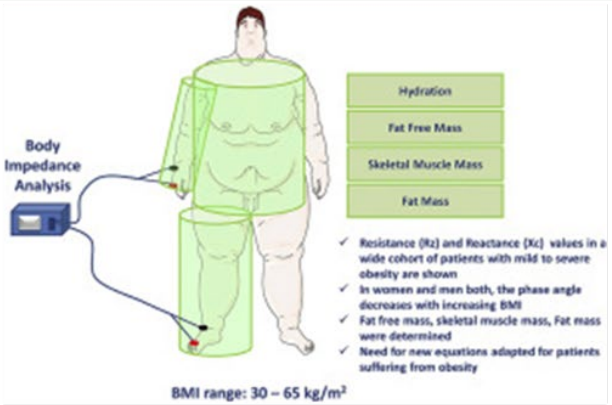


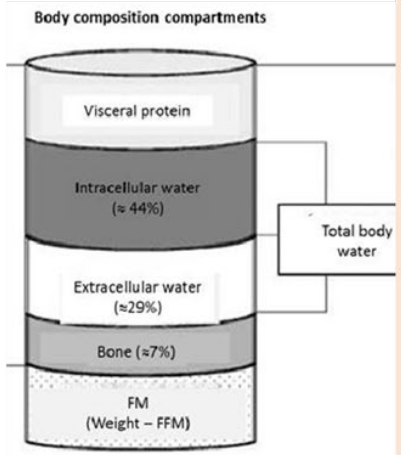
Region	BMD [1] (g/cm²)	Young-Adult [2] T-Score	Age-Matched [3] Z-Score
Head	2.406	-	-
Arms	1.049	-	-
Legs	1.413	-	-
Trunk	0.952	-	-
Ribs	0.697	-	-
Pelvis	1.184	-	-
Spine	1.070	-	-
Total	1.264	0.6	0.2

Trend: Total

Measured Date	Age (years)	BMD [1] (g/cm²)	Change vs Baseline (%)	Change vs Baseline (%/yr)
3/31/2011	omitted	1.264	-0.7	-0.1
1/17/2007		1.285	1.0	1.4
8/2/2006		1.276	0.3	1.3
5/10/2006		1.273	baseline	baseline

Bioimpedance: body impedance analysis

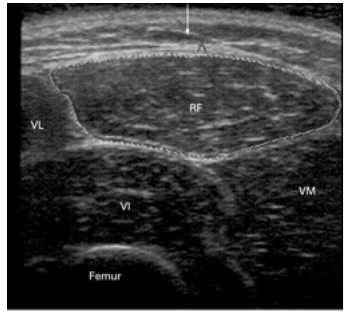


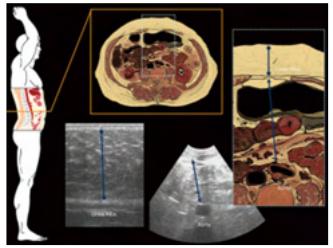


- Estimated the body composition and different compartments.
- Evaluates the tissue quality (angle phase).
- Estimated energy expenditure and basal metabolism

Ultrasound

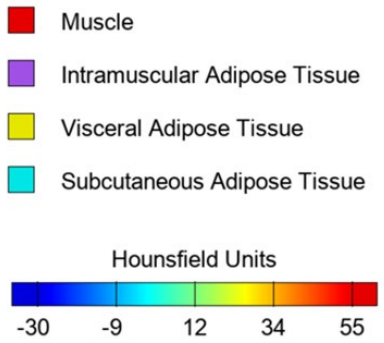
Muscular
Preperitoneal fat





Energy expenditure
Indirect calorimetry

Skeletal CT-scan



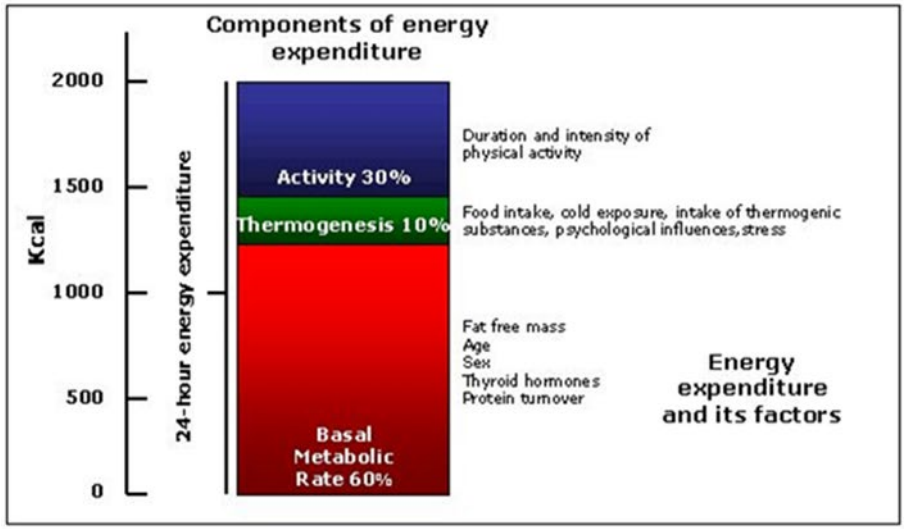


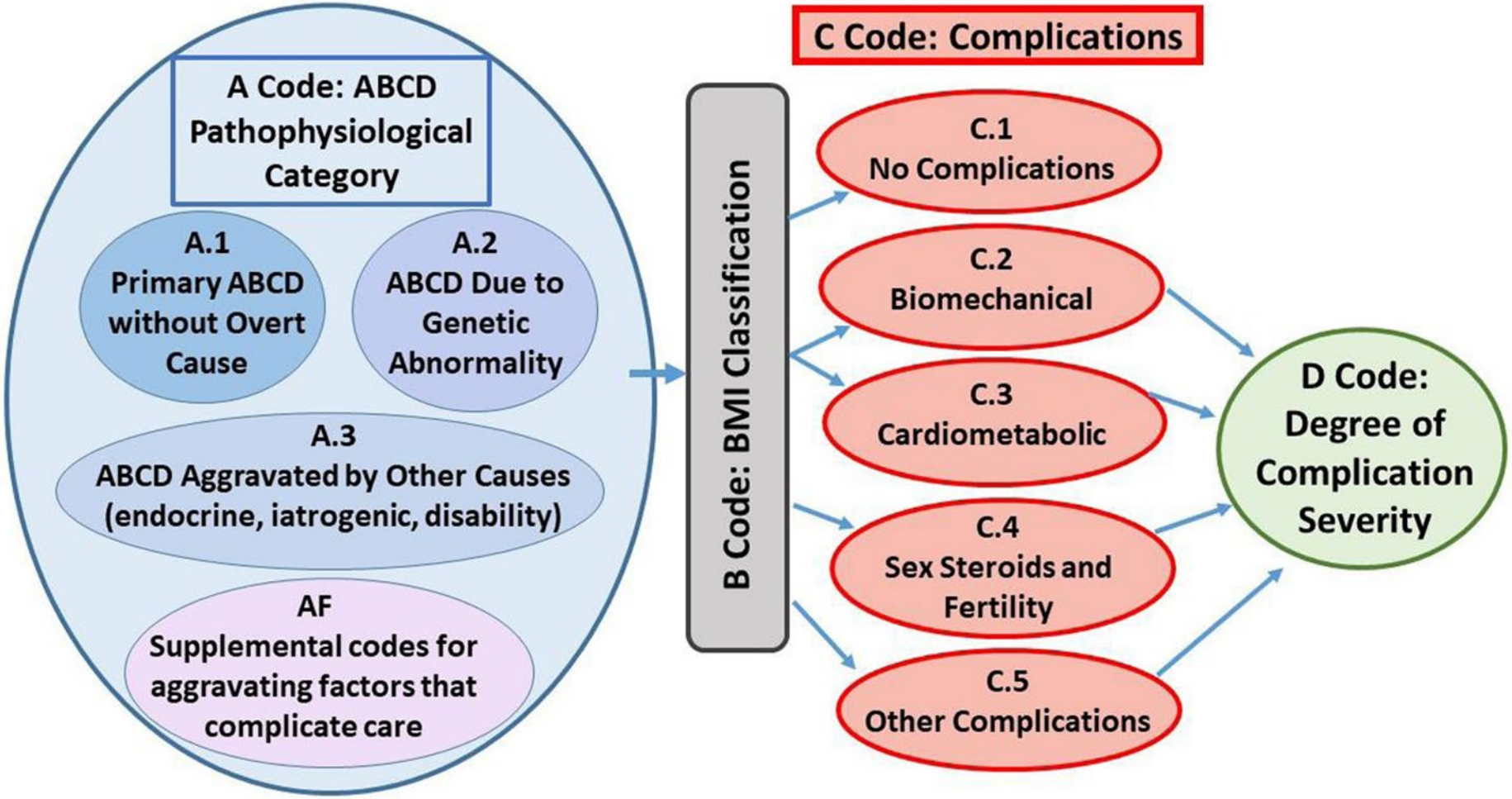
Table 1. Edmonton Obesity Staging System (EOSS) definition.

Stage	Conceptual description (Sharma and Kushner 2009)	Modified study definition*
0	No apparent obesity-related risk factors (e.g., BP, serum lipids, fasting glucose, etc., within normal range), no physical symptoms, no psychopathology, no functional limitations and (or) impairment of well being	No reported EOSS factors
1	• Presence of obesity-related subclinical risk factors (e.g., borderline hypertension, impaired fasting glucose, elevated liver enzymes, etc.) • Mild physical symptoms (e.g., dyspnea on moderate exertion, occasional aches and pains, fatigue, etc.) • Mild functional limitations • Mild psychopathology and (or) • Mild impairment of well being	• BP ≥130/85 and (or) <125/75 mm Hg for individuals with T2D • Fasting glucose ≥100 and <125 mg·dL^{-1} • Cholesterol ≥200 and<240 mg·dL^{-1} • Triglycerides ≥150 and<200 mg·dL^{-1} • HDL <60 mg·dL^{-1} • Shortness of breath during physical activity
2	• Presence of established obesity-related chronic disease (e.g., hypertension, type 2 diabetes, sleep apnea, osteoarthritis, reflux disease, polycystic ovary syndrome, anxiety disorder, etc.) • Moderate limitations in activities of daily living and (or) • Moderate impairment of well being	• Diagnosed hypertension or hypertension medication • BP ≥140/90 mm Hg or 130 /80 for individuals with T2D • T2D • Fasting glucose ≥125 mg·dL^{-1} • Diagnosed hypercholesterolemia • Cholesterol ≥240 mg·dL^{-1} • Diagnosed hypertriglyceridemia • Triglycerides ≥200 mg·dL^{-1} • HDL < 40 mg·dL^{-1} • Gout • Depression • Fatigue • Urinary leakage • Low back pain • Joint stiffness • Reported emotional outlook of "generally sad," or • Self-reported health of "fair"
3	• Established end-organ damage (e.g., myocardial infarction, heart failure, diabetic complications, incapacitating osteoarthritis, etc.) • Significant psychopathology • Significant functional limitations and (or) • Significant impairment of well being	• Reported chest pain • Chest pain during exercise • Heart attack • Calf pain during exercise • Stroke • Shortness of breath when sleeping • Shortness of breath when sitting • Psychiatric or psychological counseling, or • Moderate or severe cardiomegaly • Reported emotional outlook of "often depressed", or • Self-reported health of "poor"
4	• Severe (potentially end-stage) disabilities from obesity-related chronic diseases • Severe disabling psychopathology • Severe functional limitations and (or) • Severe impairment of well being	This stage was not examined as these factors were not available in the ACLS database

Note: BP, blood pressure; HDL, high-density lipoprotein, T2D, type 2 diabetes.
*Based on the availability of data in the Aerobics Center Longitudinal Study (ACLS) dataset.

Appl Phsysiol Nutr Metab, 2011

Proposal for a Scientifically Correct and Medically Actionable Disease Classification System (ICD) for Obesity



Garvey et al, 2020

*Take home message

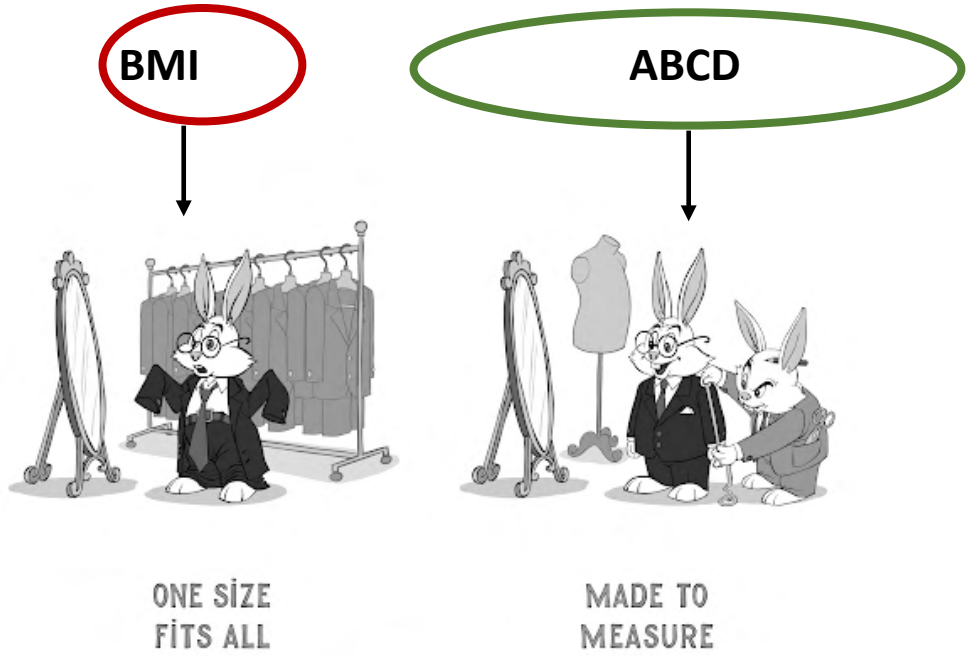
Old habits die hard (but die they can and will)

- Implement reliable techniques of body composition (quantity and quality) in the evaluation of patients with obesity

- Change the strategies from BMI-guided decision making to ABCD based decision making and global context

- Change the current approach

- Personalize



CLINICAL EVALUATION IN OBESITY?

Learn the physiopathology

Understand the mechanisms → **Apply to clinical practice** → **Change the future**