PROGETTO SPECIALE "CARDIO-ONCOLOGIA" 2013-2015
AIOM – ANMCO – AICO – ICOS

I FATTORI DI RISCHIO CARDIOVASCOLARE: OBESITA', SINDROME METABOLICA E DIABETE

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Classificazione del rischio clinico in base all' Indice di massa corporea (body mass index*)*

Classificazione	Body Mass Index Category, kg/m2	Rischio di sviluppare problemi di salute
Sottopeso	18.5	Aumentato
Normopeso	18.5–24.9	Ridotto
Sovrappeso	25.0–29.9	Aumentato
Obesità		
Classe I	30.0–34.9	Elevato
Classe II	35.0–39.9	Molto Elevato
Classe III	40.0	Estremamente Elevato

Modificato da Tchernof A, Després J-P. *Physiol Rev 2013*

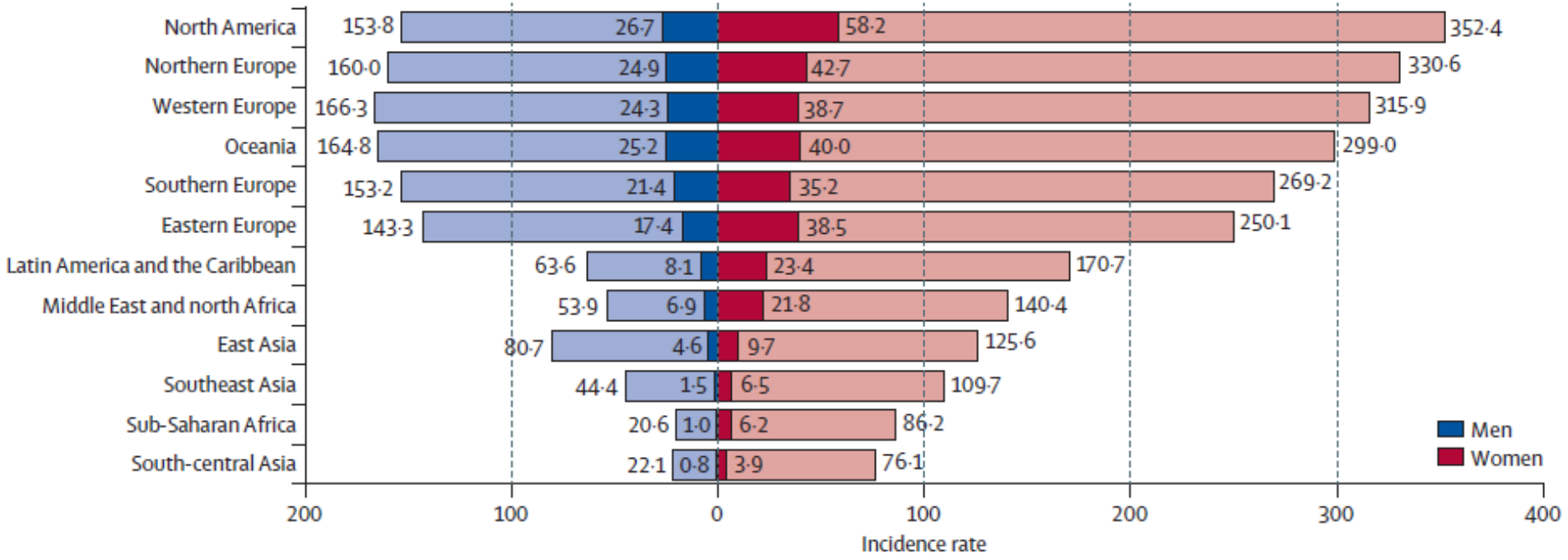
Associazione tra incidenza dei tumori obesità-correlati con l'indice di massa corporea (BMI). Stima nella popolazione del Regno Unito

	New cases per year (UK)*	n (%) cases attributable to overweight and obesity	Projected extra cases per year with a 1 kg/m² population-wide increase in BMI (99% CI)
Colon (C18)	26725	2970 (11·1%)	559 (519–598)
Liver (C22)	4241	661 (15·6%)	145 (135–154)
Gall bladder (C23)	660	134 (20·3%)	36 (35–37)
Breast (post-menopausal, C50)	39 812	2035 (5·1%)	1441 (1417–1465)
Cervix (C53)	2851	214 (7·5%)	51 (50–53)
Uterus (C54–55)	8288	3384 (40·8%)	806 (784–829)
Ovaries (C56)	7011	512 (7·3%)	125 (118–133)
Kidney (C64)	9639	1597 (16·6%)	428 (414–442)
Thyroid (C73)	2654	51 (1·9%)	49 (48–51)
Leukaemia (C91–95)	8257	522 (6·3%)	150 (138–163)

Figura 1

Krishnan Bhaskaran et Al. Lancet 2014

Tasso d'incidenza (X 100.000 persone) aggiustato per l' età dei tumori correlati al sovrappeso / obesità e numero di tumori ad essi correlati attribuibili all' aumento del BMI



I dati d'incidenza sono standardizzati per l'età la popolazione mondiale del 201.
Le barre di colore chiaro mostrano i tassi d'incidenza dei tumori correlati all'obesità/sovrappeso, quelle scure quanti di essi sono attribuibili all'elevato BMI

Figura 2

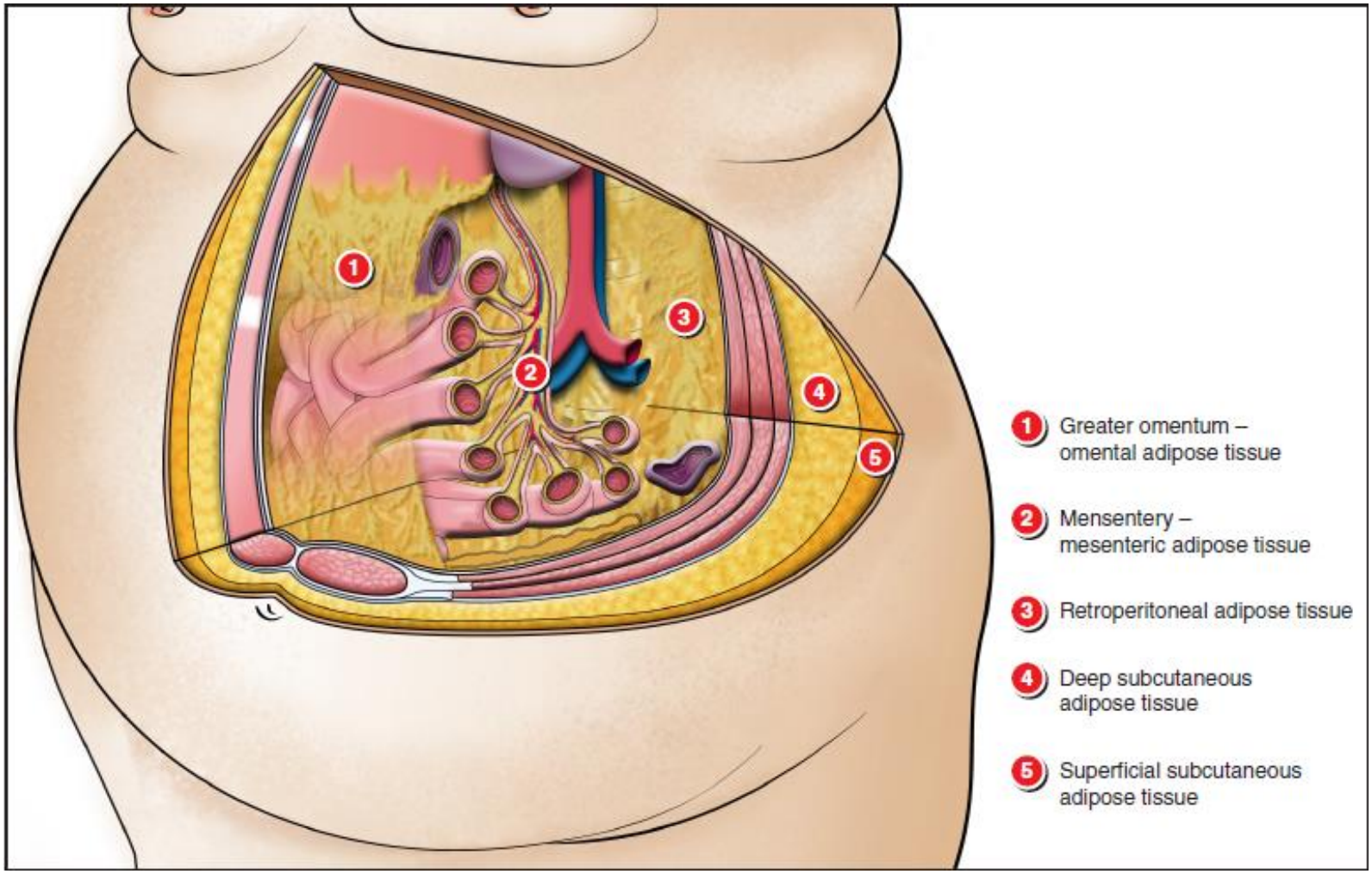
Melina Arnold et AL. Lancet oncol 2015

Tabella II - Proteine associate al tessuto adiposo e con azione enzimatica , paracrina o endocrina

Citochine e proteine correlate alle citochine	Leptina, TNFα, IL-6
Proteine coinvolte nel sistema fibrinolitico	PAI-1
Proteine del sistema immunitario e del Complemento	MCP-1, fattore D del complemento, fattore B del complemento, ASP
Lipidi e proteine per il metabolismo o il trasporto lipidico	Adiponectina, Lipoprotein lipasi (LPL), Cholesterol ester transfer protein (CETP), Apolipoproteina E, NEFA
Enzimi interessati nel metabolismo steroideo	Aromatasi indotta dal Citocromo P450, 17βHSD 11βHSD1
Proteine del sistema Renina- angiotensina	Angiotensina
Altre proteine	Resistina, RBP4

Modificato da Kershaw E.E. - J. of Clin. Endocrinol & Metabolism 2004

Localizzazione anatomica dei principali depositi di tessuto adiposo addominale



TCHERNOF A. e DESPRÉS J-P. Physiol Rev. 2013

Tabella III

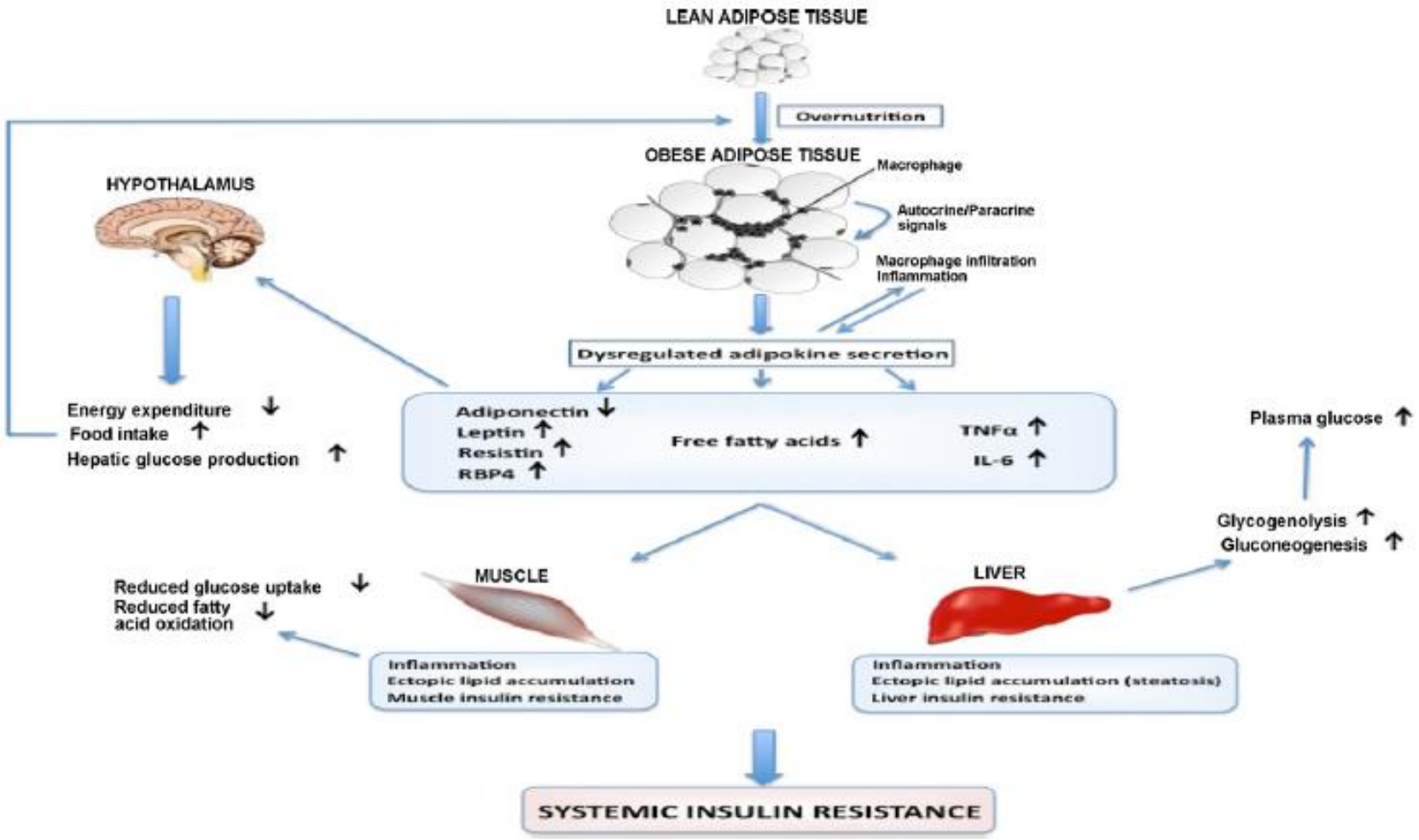
Definizioni della Sindrome metabolica

	WHO (1999)[10]	EGIR (1999)[11]	NCEP ATP III (2001)[12]	ACE (2003)[13]	AHA/NHLBI (2005)[14]	IDF (2006)[15]
Name	Metabolic syndrome	Insulin resistance syndrome	Metabolic syndrome	Insulin resistance syndrome	Metabolic syndrome	Metabolic syndrome
Obligatory components	Diabetes mellitus, or impaired glucose regulation, or insulin resistance*	No diabetes mellitus, and insulin resistance or fasting hyperinsulinaemia (the highest 25%)	..	No diabetes mellitus, and clinical judgement based on the number and severity of the components and taking in account risk factors†	..	Increased waist circumference (ethnicity specific), or body mass index >30 kg/m²
Other components	Two or more of the following:	Two or more of the following:	Three or more of the following:	..	Three or more of the following:	Two or more of the following:
Central obesity	Male waist/hip >0·90, female waist/hip >0·85, or body mass index >30 kg/m²	Male waist ≥94 cm, female waist ≥80 cm	Male waist >102 cm, female waist >88 cm	..	Male waist ≥102 cm, female waist ≥88 cm	..
Dyslipidaemia; triglycerides	≥1·7 mmol/L	>2·0 mmol/L or treatment	≥1·7 mmol/L	>1·7 mmol/L	≥1·7 mmol/L or treatment	≥1·7 mmol/L or treatment
Dyslipidaemia; HDL cholesterol	Male <0·9 mmol/L, female <1·0 mmol/L	<1·0 mmol/L or treatment	Male <1·03 mmol/L, female <1·29 mmol/L	Male <1·03 mmol/L, female <1·29 mmol/L	Male <1·03 mmol/L, female <1·29 mmol/L, or treatment	Male <1·03 mmol/L, female <1·29 mmol/L, or treatment
Blood pressure	≥140/90 mm Hg	≥140/90 mm Hg or treatment	≥130/≥85 mm Hg	>130/85 mm Hg	Systolic ≥130, or diastolic ≥85 mm Hg, or treatment	Systolic ≥130 mm Hg, or diastolic ≥85 mm Hg, or treatment
Glucose/other	Microalbuminuria: urinary albumin excretion ≥20 µg/min or albumin/creatinine ratio ≥30 mg/g	Fasting plasma glucose ≥6·1 mmol/L	Fasting plasma glucose ≥6·1 mmol/L	Fasting plasma glucose 6·1–7·0 mmol/L, or impaired glucose tolerance	Fasting plasma glucose ≥5·6 mmol/L, or treatment	Fasting plasma glucose ≥5·6 mmol/L, or previously diagnosed type 2 diabetes mellitus

EGIR=European Group for the Study of Insulin Resistance. NCEP ATPIII=National Cholesterol Education Program Adult Treatment Panel III. ACE= American College of Endocrinology. AHA/NHLBI=American Heart Association/National Heart, Lung and Blood Institute. IDF=International Diabetes Federation. *Impaired glucose regulation: impaired fasting glucose (plasma glucose ≥6·1 mmol/L) and/or impaired glucose tolerance (oral glucose tolerance test 2 h post glucose load, plasma glucose ≥7·8 mmol/L and <11·1 mmol/L); insulin resistance: under hyperinsulinaemic euglycaemic conditions, glucose uptake below lowest quartile for background population under investigation. †Risk factors: among others, body-mass index >25 kg/m² or increased waist circumference (male waist >102 cm, female waist >88 cm), diagnosis of cardiovascular disease, polycystic ovary syndrome, family history of type 2 diabetes mellitus, sedentary lifestyle, or age >40 years.

Figura 3

Fisiopatologia della Sindrome metabolica



Modificato da Garlic S et Al. Molecular and Cellular Endocrinology 316 (2010) 129–139

Figura 4

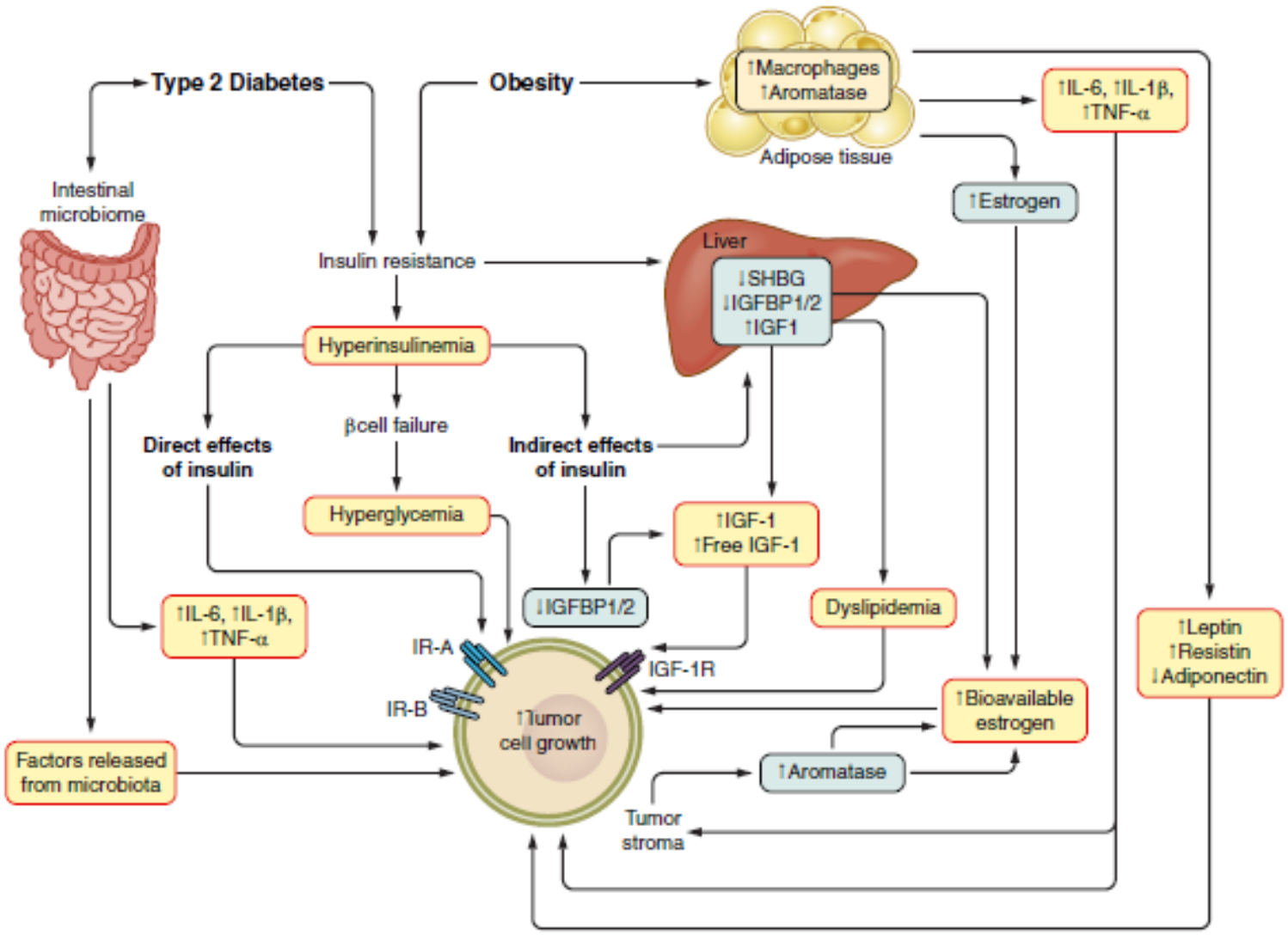

Type 2 Diabetes
Obesity
↑Macrophages
↑Aromatase
Adipose tissue
↑IL-6, ↑IL-1β, ↑TNF-α
Intestinal microbiome
↑Estrogen
Liver
↓SHBG
↓IGFBP1/2
↑IGF1
Insulin resistance
Hyperinsulinemia
βcell failure
Direct effects of insulin
Indirect effects of insulin
Hyperglycemia
↑IGF-1
↑Free IGF-1
↓IGFBP1/2
Dyslipidemia
↑IL-6, ↑IL-1β, ↑TNF-α
IR-A
IR-B
IGF-1R
↑Tumor cell growth
↑Bioavailable estrogen
↑Leptin
↑Resistin
↓Adiponectin
Factors released from microbiota
↑Aromatase
Tumor stroma

Figura 5

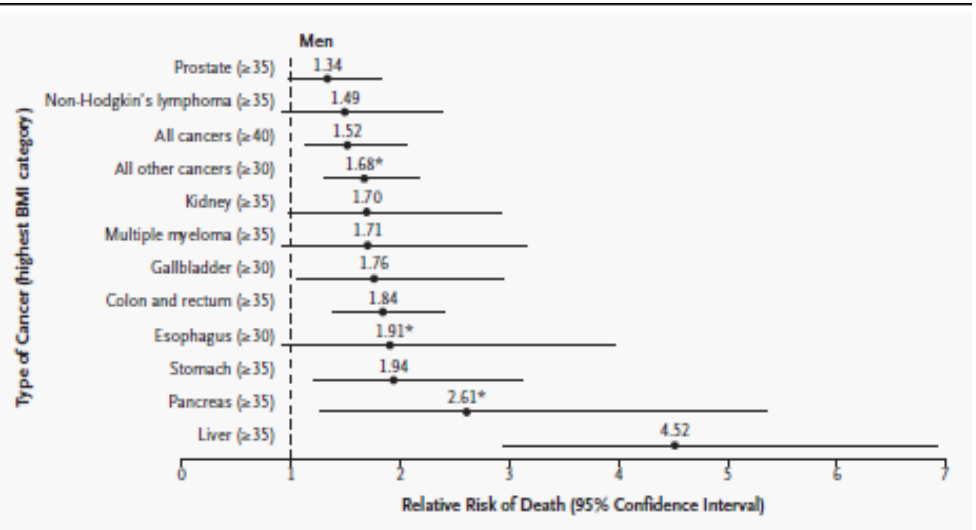


Figure 1. Summary of Mortality from Cancer According to Body-Mass Index for U.S. Men in the Cancer Prevention Study II, 1982 through 1998.

For each relative risk, the comparison was between men in the highest body-mass-index (BMI) category (indicated in parentheses) and men in the reference category (body-mass index, 18.5 to 24.9). Asterisks indicate relative risks for men who never smoked. Results of the linear test for trend were significant (P≤0.05) for all cancer sites.

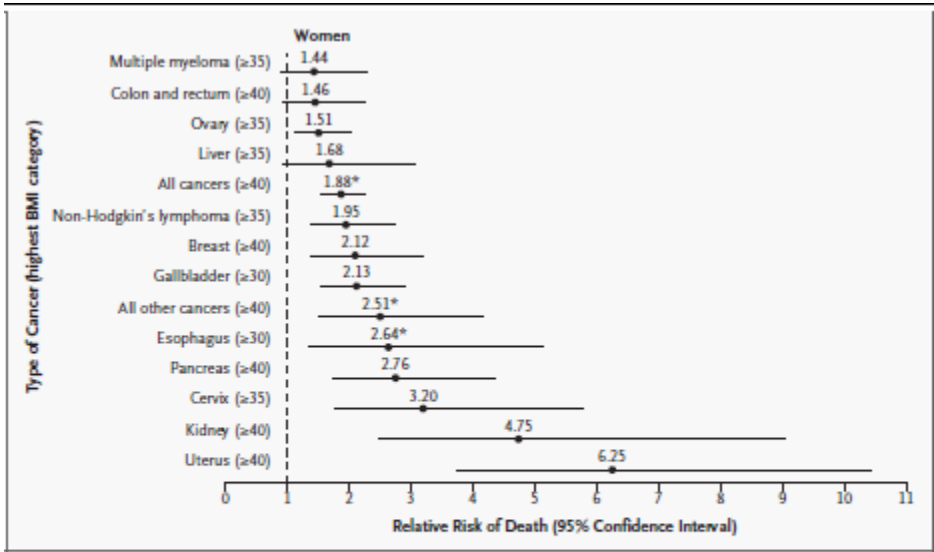
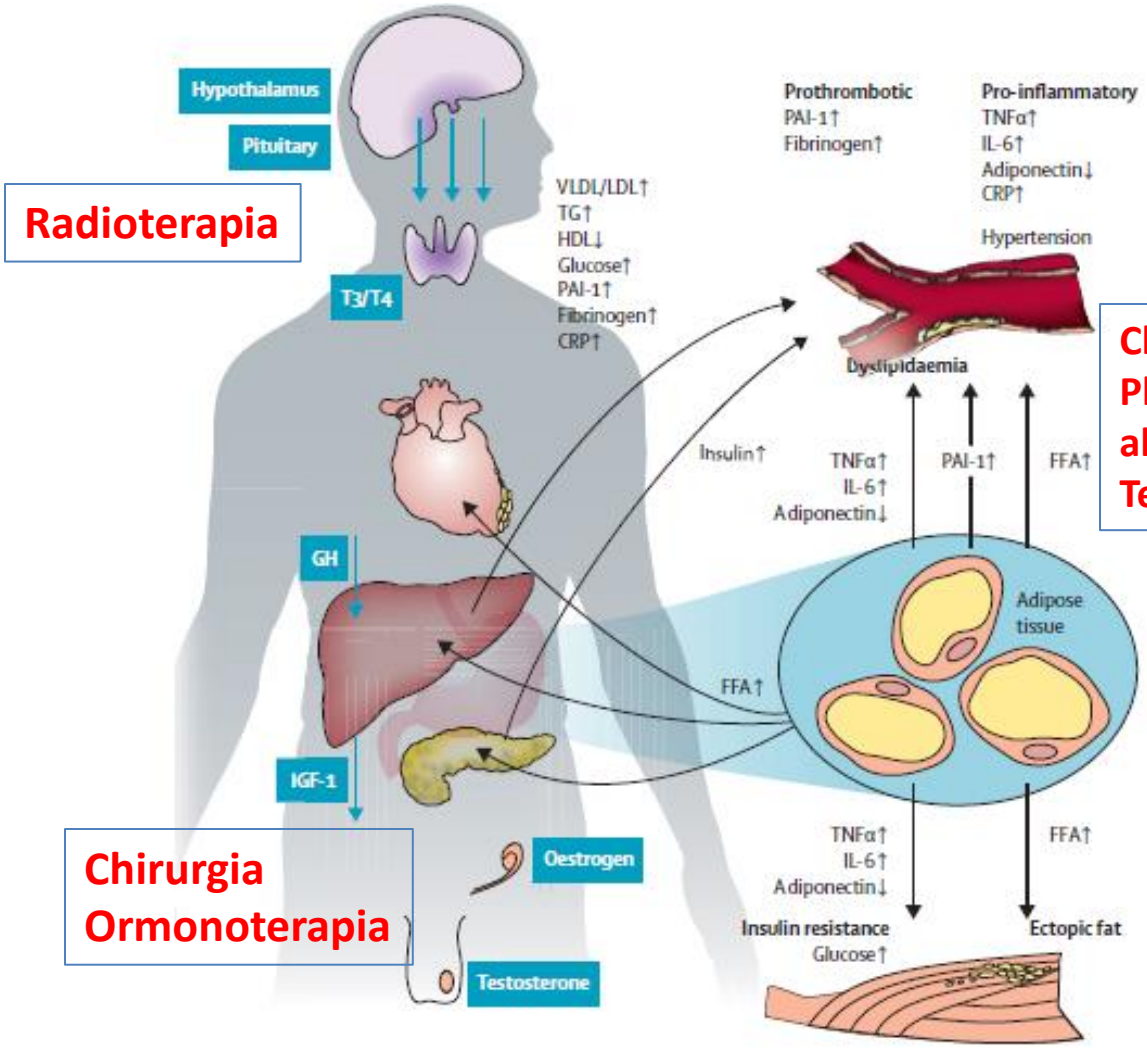


Figure 2. Summary of Mortality from Cancer According to Body-Mass Index for U.S. Women in the Cancer Prevention Study II, 1982 through 1998.

For each relative risk, the comparison was between women in the highest body-mass-index (BMI) category (indicated in parentheses) and women in the reference category (body-mass index, 18.5 to 24.9). Asterisks indicate relative risks for women who never smoked. Results of the linear test for trend were significant (P≤0.05) for all cancer sites.

Mortalità per cancro in funzione del Body mass Index (BMI) e sesso nel Cancer Prevention Study II (USA 1982 – 1998)

Figura 6



Modificato da de Haas EC Lancet Oncology 2010

Comparazione dei criteri diagnostici del 2006 dell'Organizzazione Mondiale della Sanità (World Health Organization , WHO) e dei criteri 2003/2011 and 2012 della American Diabetes Association (ADA)

Diagnose/ measurement	WHO 2006[3]/2011[7]	ADA 2003 and 2012[5,6]
Diabetes		
HbA_{1c}	**Can be used** If measured ≥6.5% (48 mmol/mol)	**Recommended** ≥6.5% (48 mmol/mol)
	Recommended	
FPG	≥7.0 mmol/L (≥126 mg/dL)	≥7.0 mmol/L (≥126 mg/dL)
	or	**or**
2hPG	≥11.1 mmol/L (≥200 mg/dL)	≥11.1 mmol/L (≥200 mg/dL)
IGT		<7.0 mmol/L (<126 mg/dL)
FPG	<7.0 mmol/L (<126 mg/dL)	
		Not required
2hPG	≥7.8–<11.1 mmol/L (≥140–<200 mg/dL)	If measured 7.8–11.0 mmol/L (140–198 mg/dL)
IFG		
FPG	6.1–6.9 mmol/L (110–125 mg/dL)	5.6–6.9 mmol/L (100–125 mg/dL)
	If measured	--
2hPG	<7.8 mmol/L (<140 mg/dL)	

Legenda: FPG = fasting plasma glucose; IGT = impaired glucose tolerance; IFG = impaired fasting glucose; 2hPG = 2-h post-load plasma glucose.

Valori di riferimento per la diagnosi di diabete mellito, ridotta tolleranza ai Carboidrati e iperglicemia a digiuno in base al campione analizzato: plasma venoso (Campione standard), sangue venoso intero, sangue capillare)

Diagnosis	Venous plasma [a] mmol/L (mg/dL)	Venous blood mmol/L (mg/dL)	Capillary blood mmol/L (mg/dL)
IFG–FG	6.1 (110)	5.0 (90)	5.6 (101)
IGT–2hG	7.8 (140)	6.5 (117)	7.2 (130)
Diabetes–FG	7.0 (126)	5.8 (104)	6.5 (117)
Diabetes–2hG	11.1 (200)	9.4 (169)	10.3 (185)

FPG =fasting plasma glucose; FG = Fasting Glucose; IFG = impaired fasting glucose; IGT = impaired glucose tolerance; 2hG = 2-h post-load glucose; 2hPG = 2-h post-load plasma glucose.
aStandard.

Algoritmo gestionale sottolineante i principi per la diagnosi e la gestione della malattie cardiovascolari (CVD) e del diabete nei pazienti con dignosi primitiva di diabete o malattie cardiovascolare. Le indagini raccomandate devono essere effettuate in base alla valutaizone clinica inizale e agli obiettivi (rischio) della cura e non significa che devono essere effettuati tutti in ogni paziente