



GIOVEDÌ 11

**CORSO SICOB III EDIZIONE
MILANO 11-12 APRILE 2024**

IL MANAGEMENT DELL'OBESITÀ

DIRETTORI DEL CORSO: MAURIZIO DE LUCA, GIUSEPPE NAVARRA

Corso sul management nutrizionale, psicologico-psichiatrico, motorio, farmacologico, endoscopico e chirurgico per i pazienti affetti da obesità.

**PROVIDER SICOB
EVENTO ACCREDITATO ECM 401500
15 CREDITI FORMATIVI**

IL PREDIABETE E LE SUE COMPLICANZE

ANGELO AVOGARO

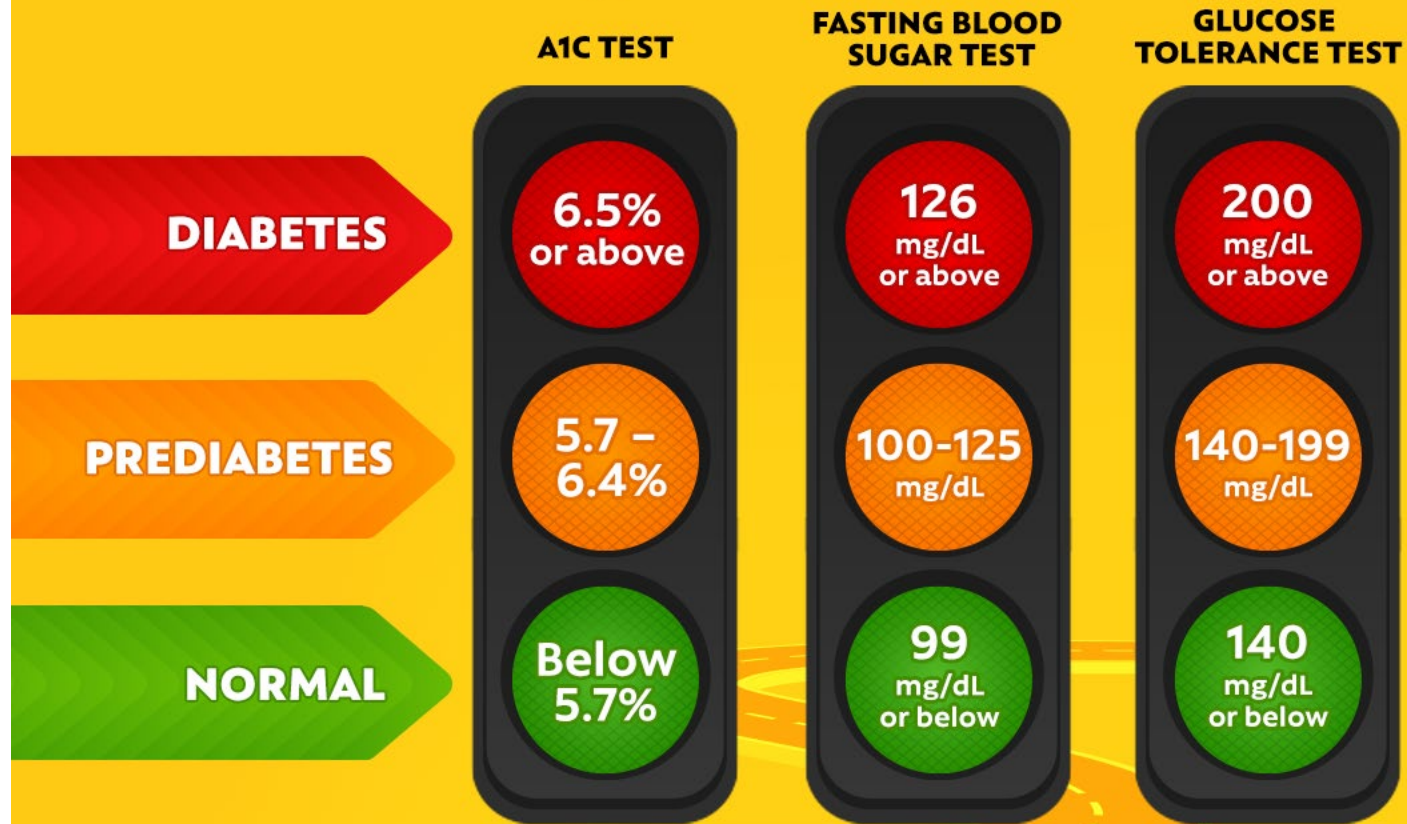
UNIVERSITÀ DI PADOVA

Conflitti di interesse di Angelo Avogaro

Dichiaro di aver ricevuto negli ultimi 2 anni compensi dalle seguenti aziende:

Pharma International Company, AstraZeneca, Boehringer Ingelheim, Bristol Myers Squibb, Eli Lilly, Bruno Farmaceutici, Mundipharma, Neopharmed, Amgen, Servier, GlaxoSmithKline, Merck Sharp & Dohme, Novartis, Novo Nordisk, Sanofi, Takeda.

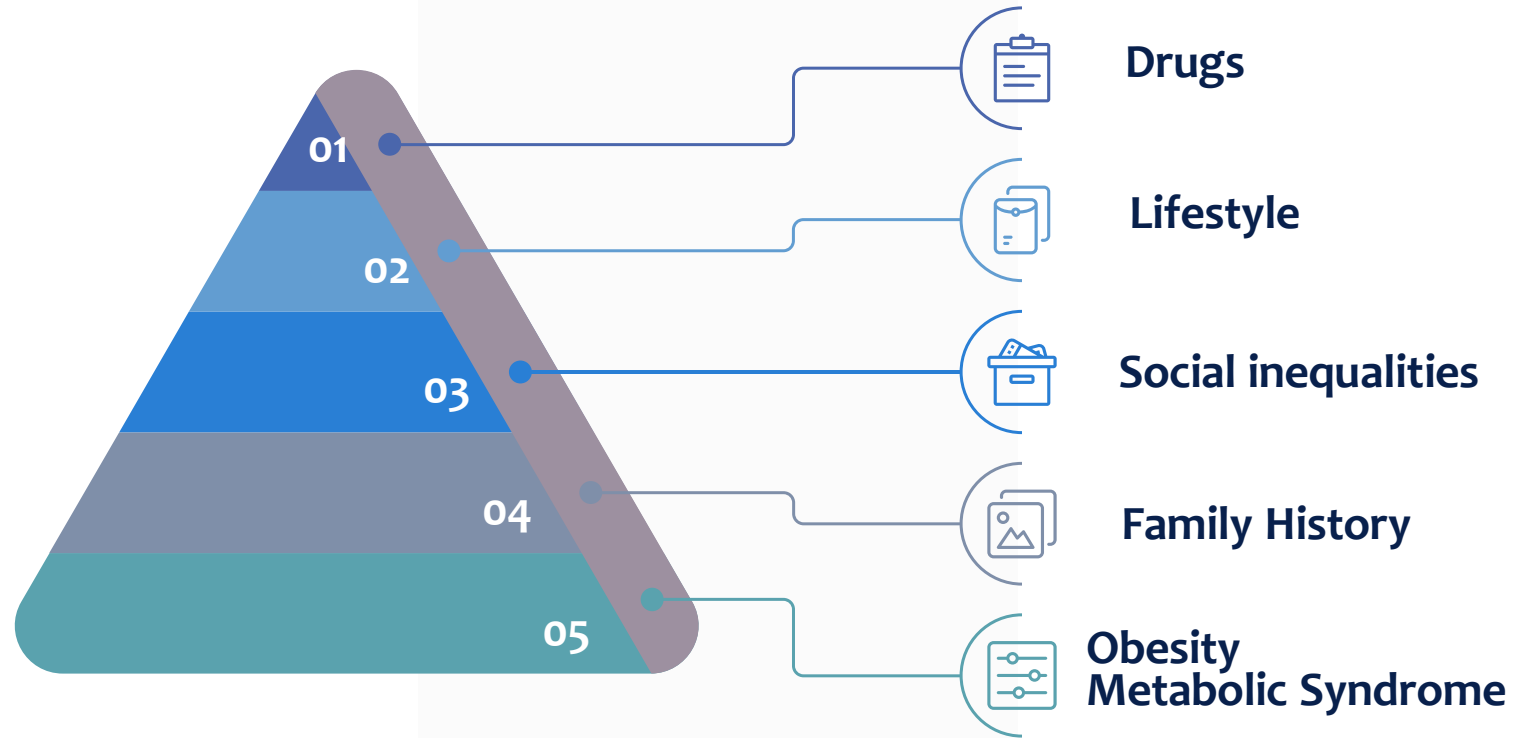
THE ROAD TO TYPE 2 DIABETES



Source: American Diabetes Association

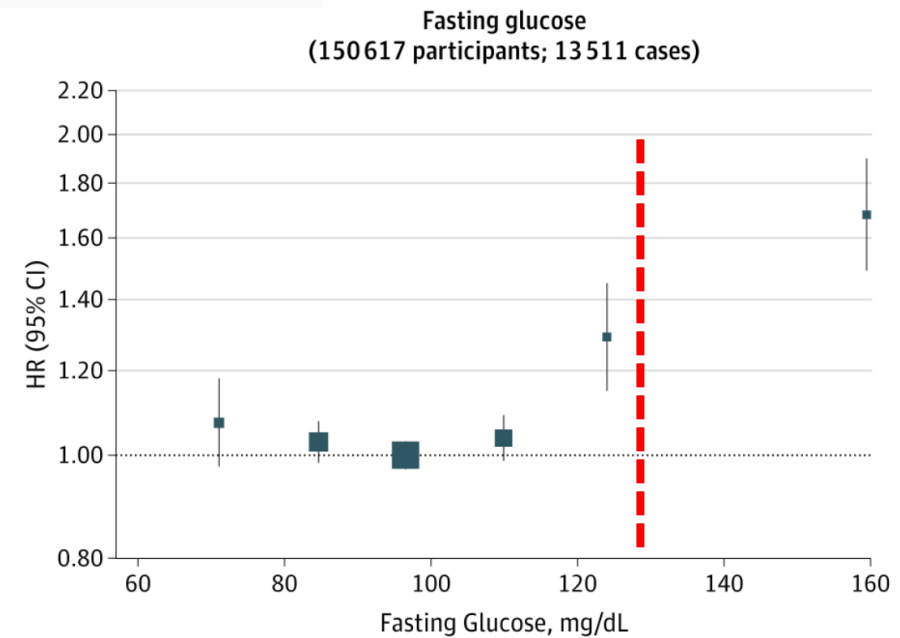
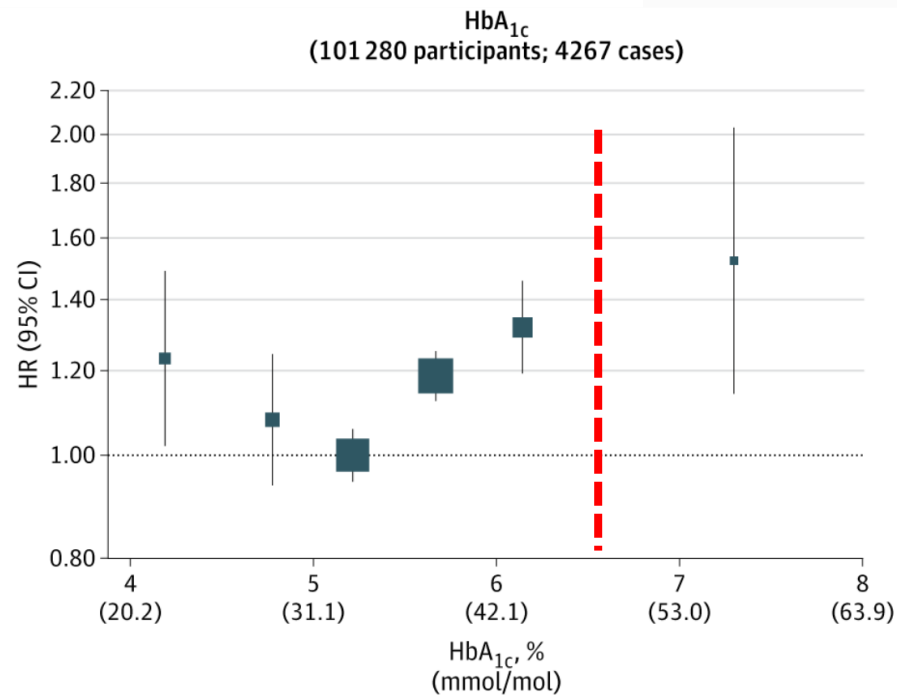


What to consider while approaching Prediabetes



Glycated Hemoglobin Measurement and Prediction of Cardiovascular Disease: CVD starts early and at HbA1c value below the diagnostic threshold

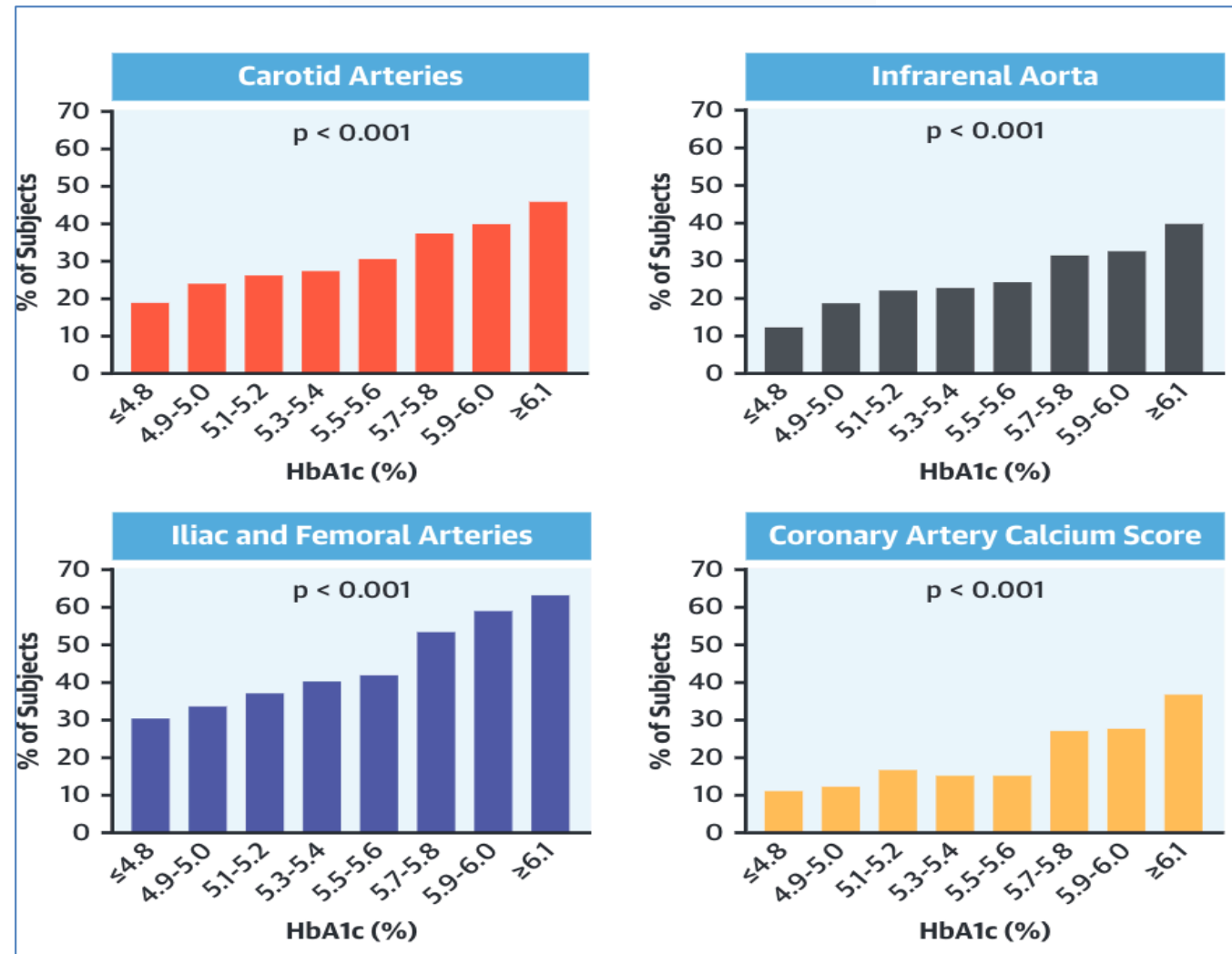
JAMA. 2014;311(12):1225-1233. doi:10.1001/jama.2014.1873



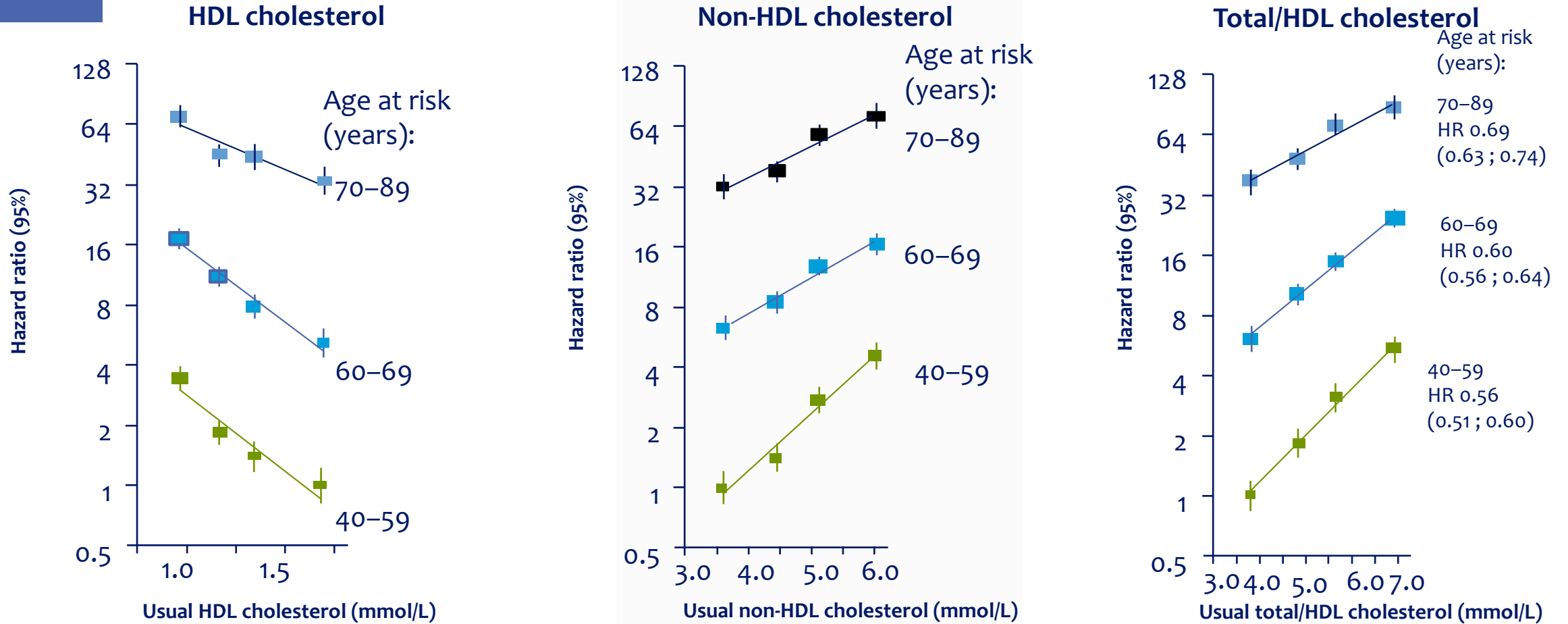
Participants	3639	27 126	42 495	20 189	5528	2303
Incident CVD outcomes	127	615	1382	1264	551	328

8892	48 006	65 038	22 094	4471	2116
696	4116	5417	2307	629	346

Atherotrombosis significantly impact people with pre-diabetes



Ischaemic heart disease (IHD) mortality and cholesterol

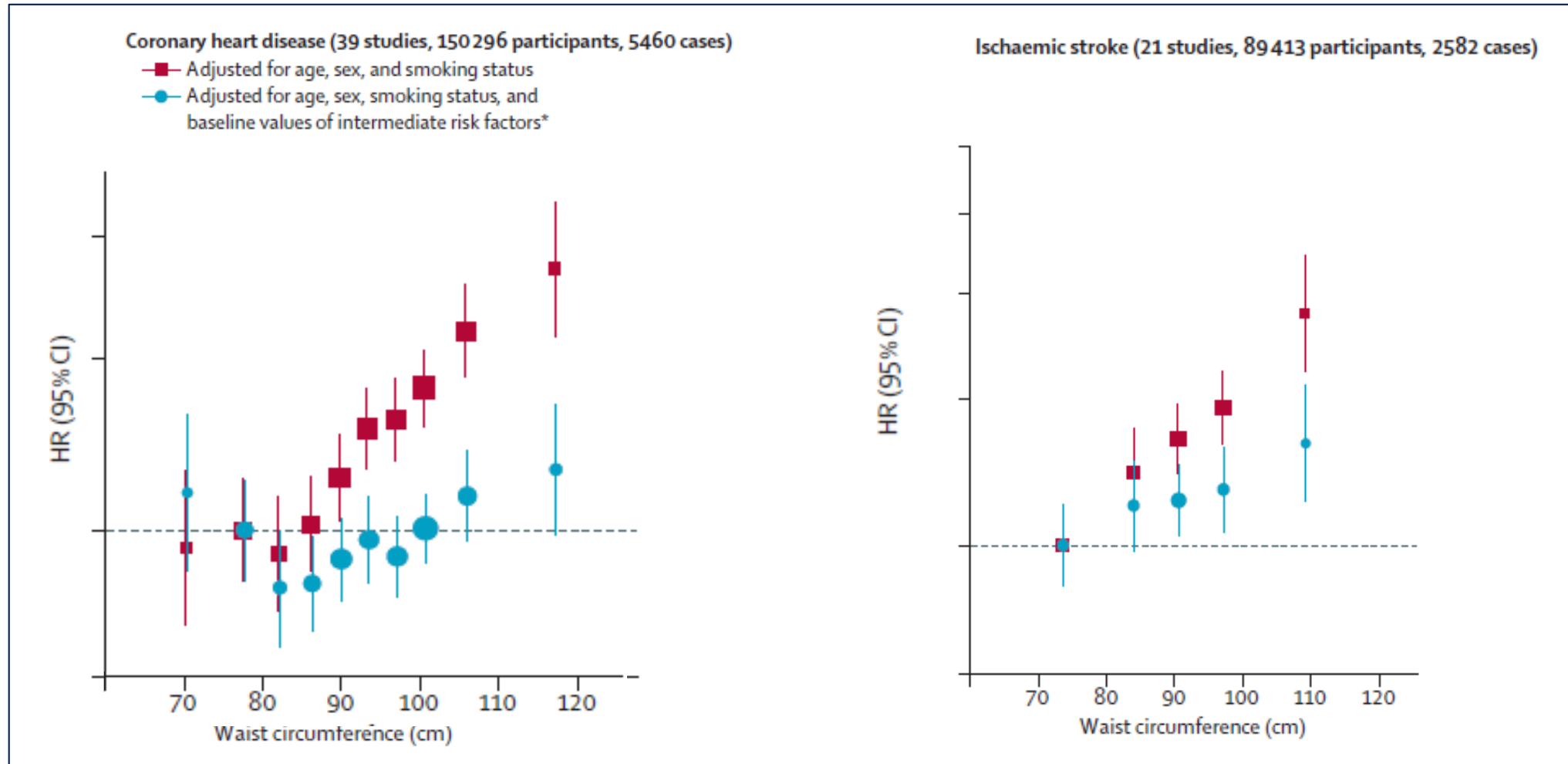


Hazard ratio (95% CI) per 1.33 lower total/HDL cholesterol; IHD mortality (3,020 deaths) vs. usual HDL cholesterol, HDL cholesterol and total/HDL cholesterol. Hazard ratios on the left are plotted on a floating absolute scale of risk (so each log hazard ratio has an appropriate variance assigned to it)

CI, confidence interval; HDL, high density lipoprotein; IHD, ischaemic heart disease

Lewington S et al. *Lancet* 2007; 370: 1829-39

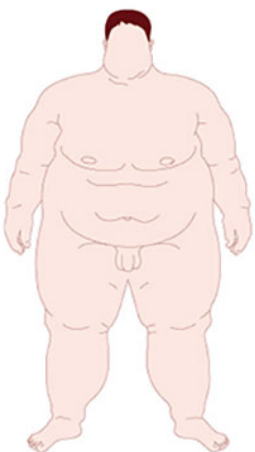
The risk of for coronary heart disease and ischaemic stroke increase across quantiles of waist circumference



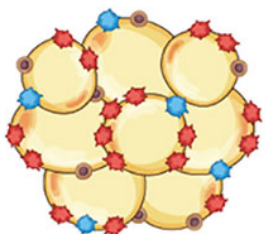
HR: Hazard ratio;

The Emerging Risk Factors Collaboration; Lancet 2011; 377: 1085–95

Obesity



Adipose tissue



Adipokines:

Adiponectin ↓

Leptin ↑

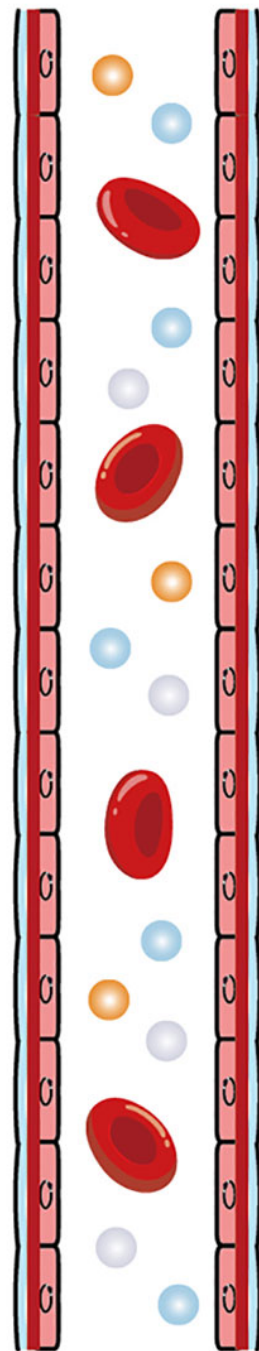
SPX ↓

Adipocyte derived-EVs:

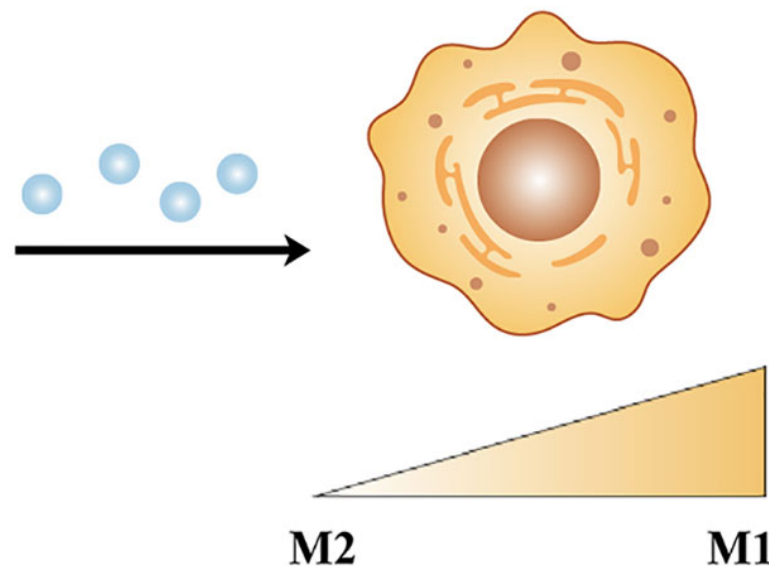
EXO-miR-34a ↑

ADM-miR-155 ↑

Circulation



Phenotypic switch of ATMs



↑: increase

↓: decrease

🔴 M1 Macrophage

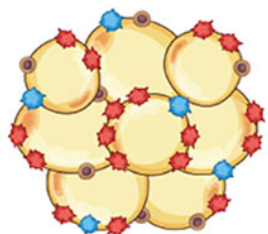
🔵 M2 Macrophage

🟡 other immune cells

Circulation

Obesity

Adipose tissue



Adipokines:

Adiponectin ↓

Leptin ↑

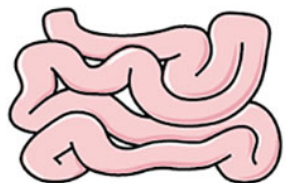
SPX ↓

Adipocyte derived-EVs:

EXO-miR-34a ↑

ADM-miR-155 ↑

Gut



Gut microbiota – derived metabolites:

LPS ↑

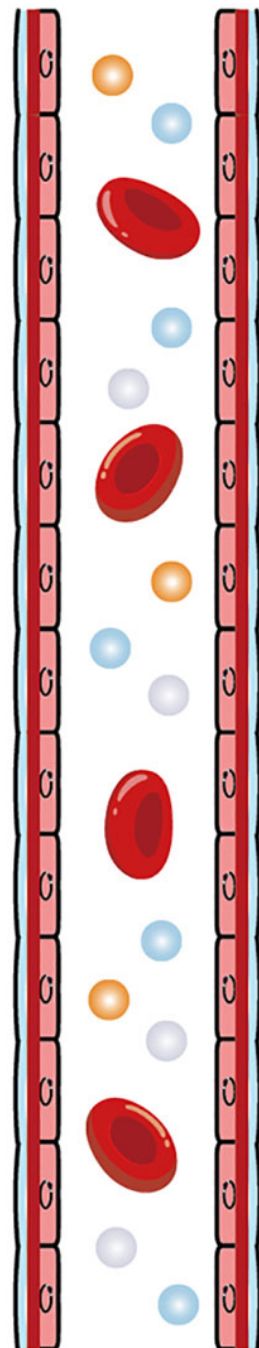
SCFAs ↓

Butyrate ↓

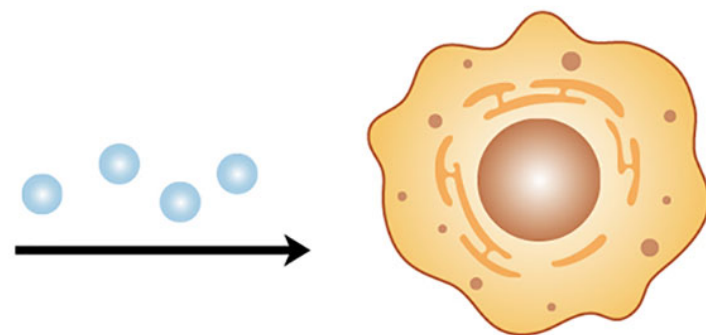
Gut hormones:

GLP-1 ↓

Ghrelin ↑



Phenotypic switch of ATMs



M2

M1

↑: increase

↓: decrease

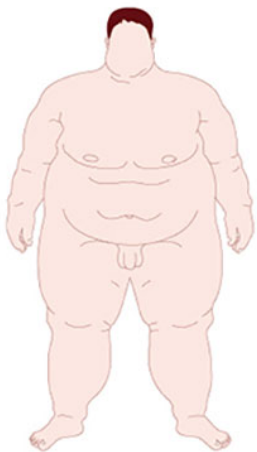
● M1 Macrophage

● M2 Macrophage

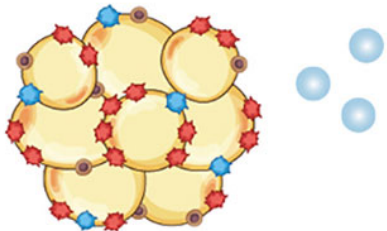
● other immune cells

Circulation

Obesity



Adipose tissue



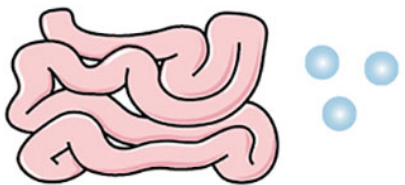
Adipokines:

Adiponectin ↓
Leptin ↑
SPX ↓

Adipocyte derived-EVs:

EXO-miR-34a ↑
ADM-miR-155 ↑

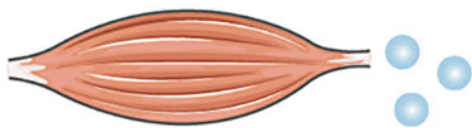
Gut



Gut microbiota – derived metabolites:

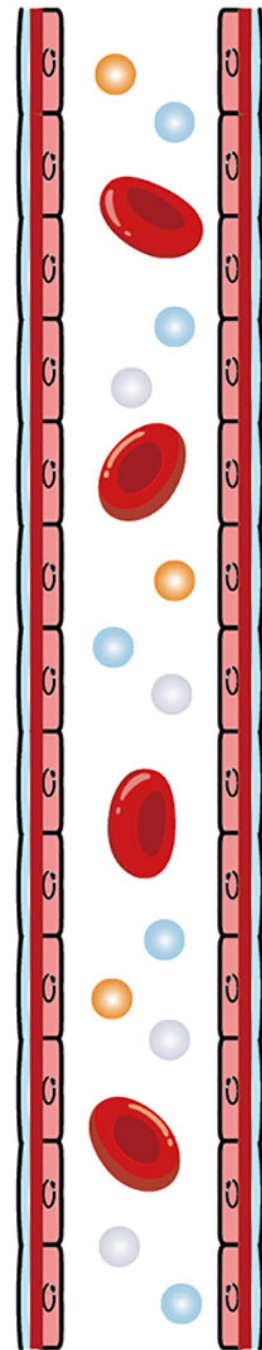
LPS ↑
SCFAs ↓
Butyrate ↓
Gut hormones:
GLP-1 ↓
Ghrelin ↑

Skeletal muscle

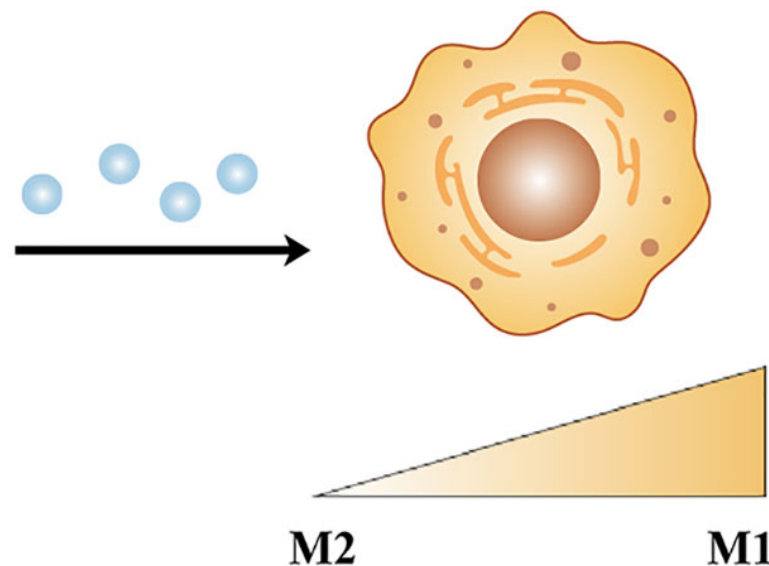


Myokines:

IL-6 ↑
FNDC5 ↑
MSTN ↑
Skeletal muscle-derived exosomes ↑



Phenotypic switch of ATMs



↑: increase

↓: decrease

🔴 M1 Macrophage

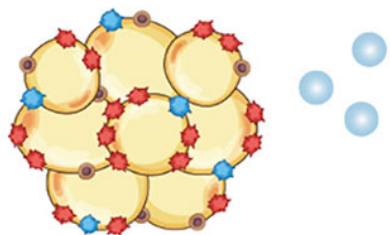
🔵 M2 Macrophage

🟡 other immune cells

Circulation

Obesity

Adipose tissue



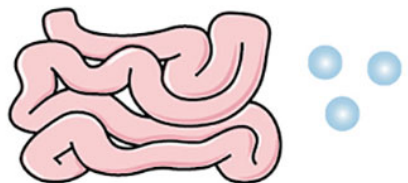
Adipokines:

Adiponectin ↓
Leptin ↑
SPX ↓

Adipocyte derived-EVs:

EXO-miR-34a ↑
ADM-miR-155 ↑

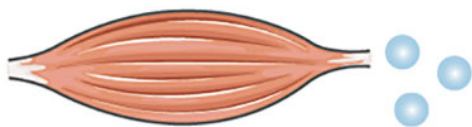
Gut



Gut microbiota – derived metabolites:

LPS ↑
SCFAs ↓
Butyrate ↓
Gut hormones:
GLP-1 ↓
Ghrelin ↑

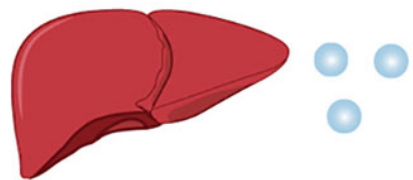
Skeletal muscle



Myokines:

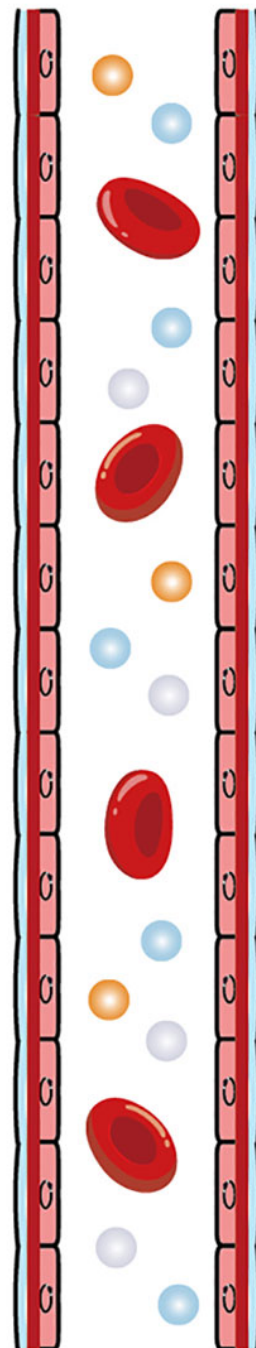
IL-6 ↑
FNDC5 ↑
MSTN ↑
Skeletal muscle-derived exosomes ↑

Liver

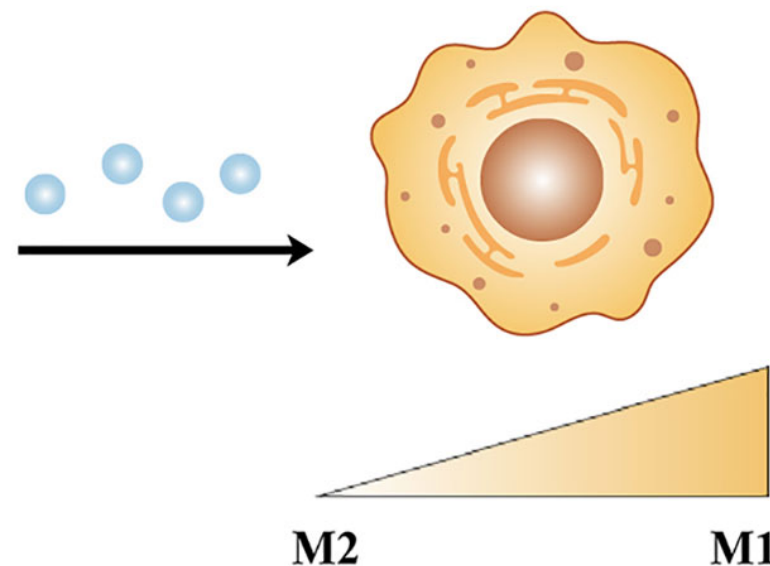


Hepatokines:

Fetuin-A ↑
RBP-4 ↑
Hepatocyte-derived exosomes:
EXO-miR-434-3p ↑



Phenotypic switch of ATMs



↑: increase

↓: decrease

★ M1 Macrophage

★ M2 Macrophage

● other immune cells

Time Course and Mechanisms of Circulating Progenitor Cell Reduction in the Natural History of Type 2 Diabetes

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CARLO AGOSTINI, MD¹
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ANTONIO TIENGO, MD¹
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A relatively novel paradigm of CVD pathogenesis is the loss of normal endothelial turnover caused by a reduction of circulating endothelial progenitor cell (EPCs) (4). EPCs are mainly derived from bone marrow and are involved in the ho

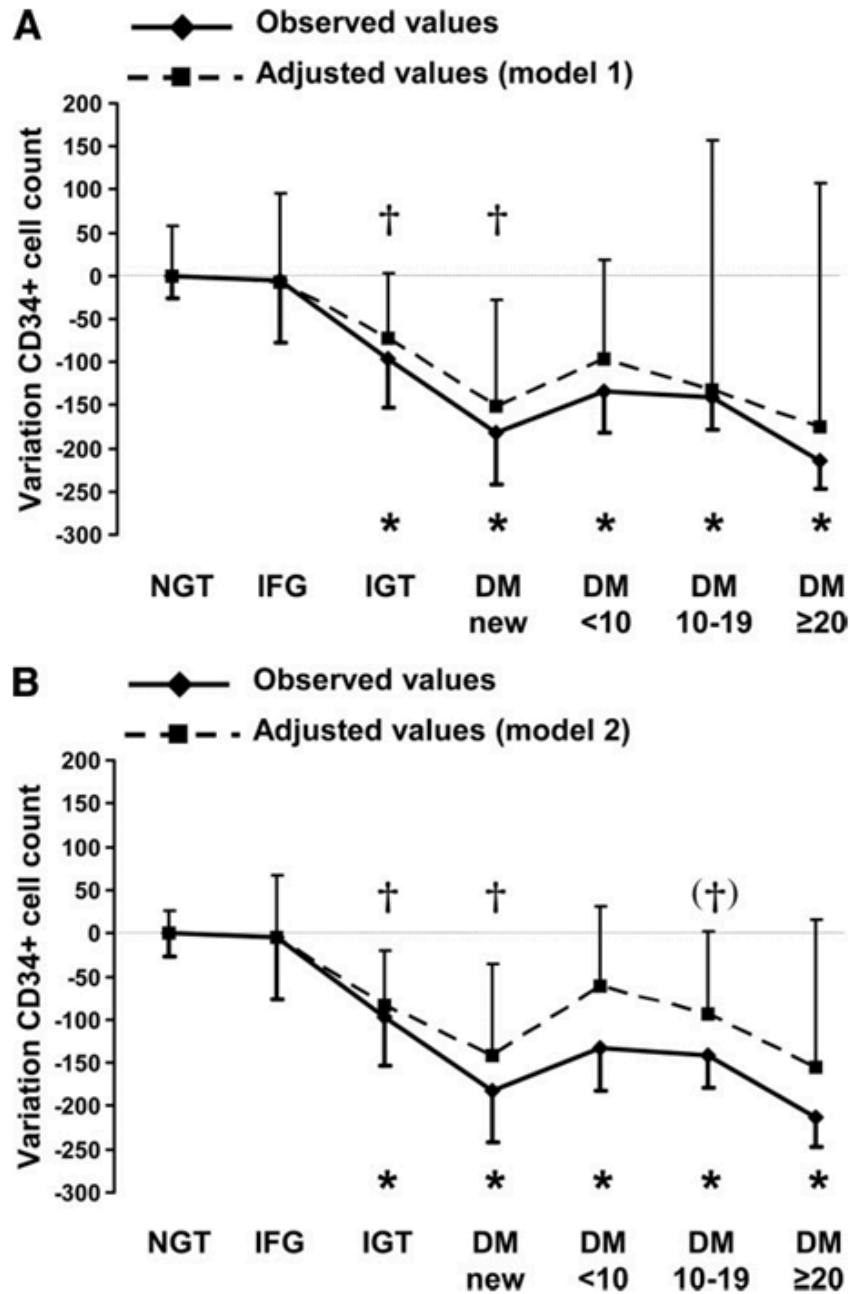
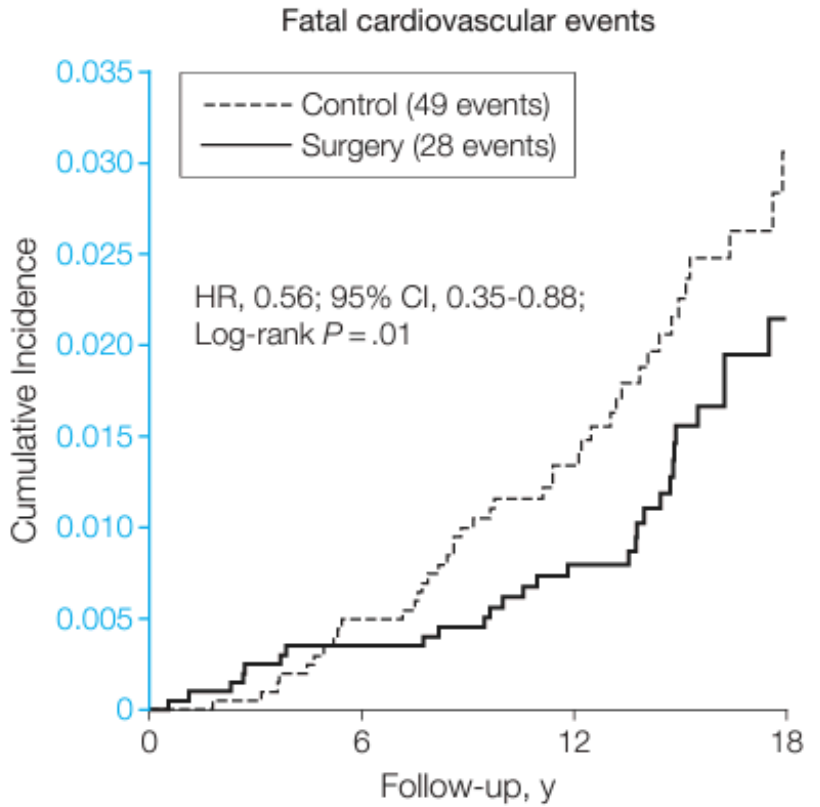
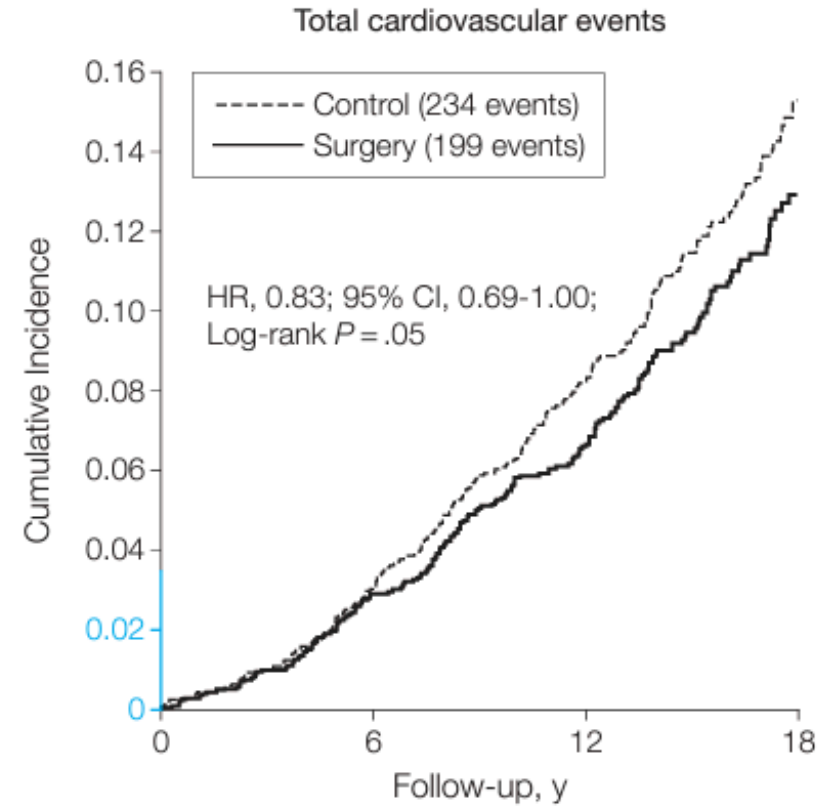


Figure 1. Observed and adjusted variation of circulating CD34+ cells in patients across

Bariatric Surgery and Long-term Cardiovascular Events



No. at risk	0	6	12	18
Control	2037	1993	1423	405
Surgery	2010	1970	1557	412



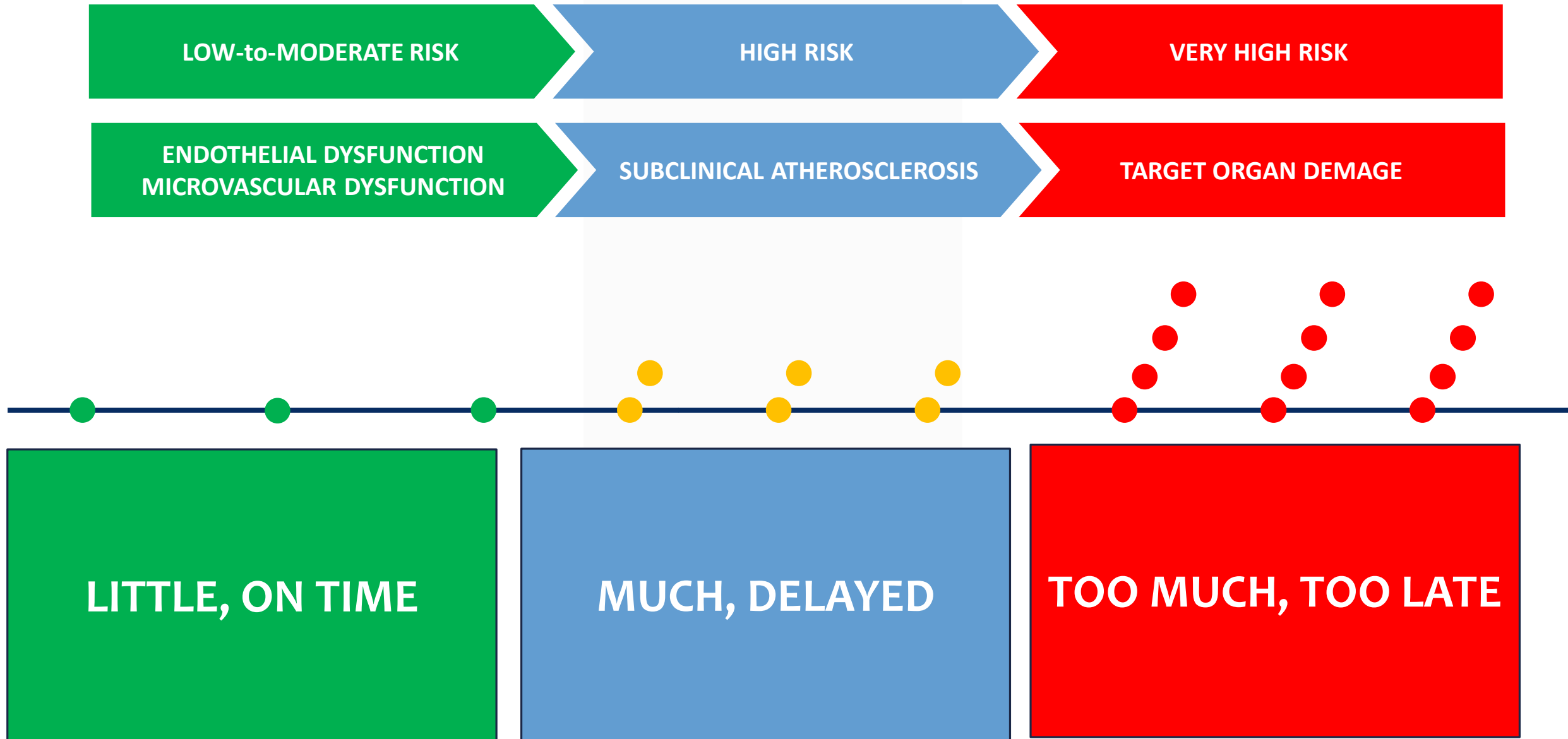
No. at risk	0	6	12	18
Control	2037	1945	1326	361
Surgery	2010	1921	1468	375

Table 3. Metabolic Risk Factor Treatment Interaction Analyses in the Swedish Obese Subjects Study

Risk Factors, Subgrouping at Baseline	Incidence of Cardiovascular Events, IR per 1000 Person-Years ^a						Log- rank <i>P</i> Value ^b	Relative Treatment Effects			Number Needed to Treat (95% CI) ^e
	Surgery			Control				HR (95% CI) ^c	<i>P</i> Value ^c	<i>P</i> for Inter- action ^d	
	No.	Person- Years	IR (95% CI)	No.	Person- Years	IR (95% CI)					
Triglycerides, mg/dL											
≤160	904	13 028	5.1 (4.0-6.4)	1119	15 722	5.6 (4.5-6.9)	] <.001	0.89 (0.64-1.22)	.46	.93	95 (28-∞)
>160	1102	15 609	8.5 (7.1-10.0)	916	12 606	11.6 (9.8-13.6)		0.73 (0.57-0.92)	.007		23 (13-107)
HDL cholesterol, mg/dL											
≤51	1003	14 376	7.4 (6.1-8.9)	1005	14 006	9.7 (8.2-11.5)	] .002	0.75 (0.58-0.97)	.03	.26	32 (16-4631)
>51	920	13 035	5.9 (4.7-7.4)	972	13 536	6.3 (5.1-7.8)		0.93 (0.68-1.26)	.62		142 (29-∞)
Total cholesterol, mg/dL											
≤219	910	12 793	5.0 (3.9-6.4)	1121	15 452	5.5 (4.4-6.8)	] <.001	0.9 (0.65-1.24)	.52	.28	210 (33-∞)
>219	1096	15 843	8.5 (7.1-10.0)	914	12 877	11.6 (9.9-13.6)		0.73 (0.57-0.92)	.007		22 (13-75)
Apo B/Apo A-I ratio											
≤0.901	940	13 803	5.0 (3.9-6.3)	1066	15 264	5.8 (4.7-7.1)	] <.001	0.85 (0.62-1.16)	.31	.23	74 (26-∞)
>0.901	1051	14 616	8.8 (7.4-10.5)	954	12 867	11.2 (9.5-13.2)		0.78 (0.62-0.99)	.04		30 (15-4095)
Blood glucose, mg/dL											
≤81	931	13 389	5.6 (4.5-7.0)	1091	15 469	5.7 (4.6-7.0)	] <.001	0.98 (0.72-1.33)	.89	.13	150 (31-∞)
>81	1071	15 218	8.1 (6.8-9.7)	942	12 832	11.3 (9.6-13.3)		0.71 (0.56-0.90)	.005		25 (13-139)
Plasma insulin, mU/L											
≤17.0	867	12 445	5.2 (4.1-6.7)	1154	16 158	5.6 (4.5-6.8)	] <.001	0.93 (0.67-1.28)	.64	<.001	173 (32-∞)
>17.0	1134	16 136	8.2 (6.9-9.7)	880	12 161	11.7 (9.9-13.8)		0.69 (0.54-0.87)	.002		21 (12-66)
Metabolic syndrome ^f											
No	591	8 477	4.0 (2.9-5.6)	850	11 944	4.9 (3.8-6.3)	] <.001	0.81 (0.53-1.24)	.33	.73	103 (27-∞)
Yes	1397	19 900	8.2 (7.0-9.6)	1170	16 159	10.8 (9.3-12.6)		0.75 (0.60-0.93)	.008		25 (14-94)
SCORE ^g											
≤0.85	1011	14 855	2.9 (2.1-3.9)	999	14 421	3.3 (2.5-4.4)	] <.001	0.85 (0.56-1.28)	.44	.86	125 (36-∞)
>0.85	987	13 678	11.3 (9.6-13.2)	1022	13 716	13.4 (11.6-15.5)		0.83 (0.67-1.03)	.09		33 (15-∞)

Bariatric Surgery and Long-Cardiovascular Events

CARDIOVASCULAR CONTINUUM EARLY TREATMENT



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Key points

1. Come evitare la conversione da prediabete a diabete?

- a. Chirurgia bariatrica?
- b. Lifestyle?
- c. Farmaci?
- d. Empowerment del cittadino?
- e. Media?
- f. Social?