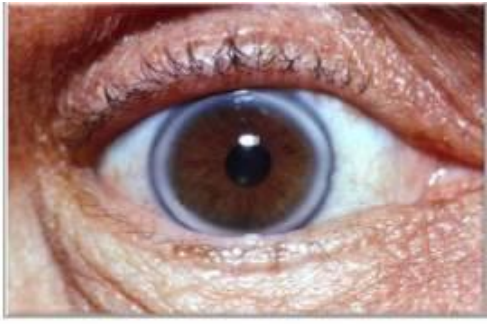
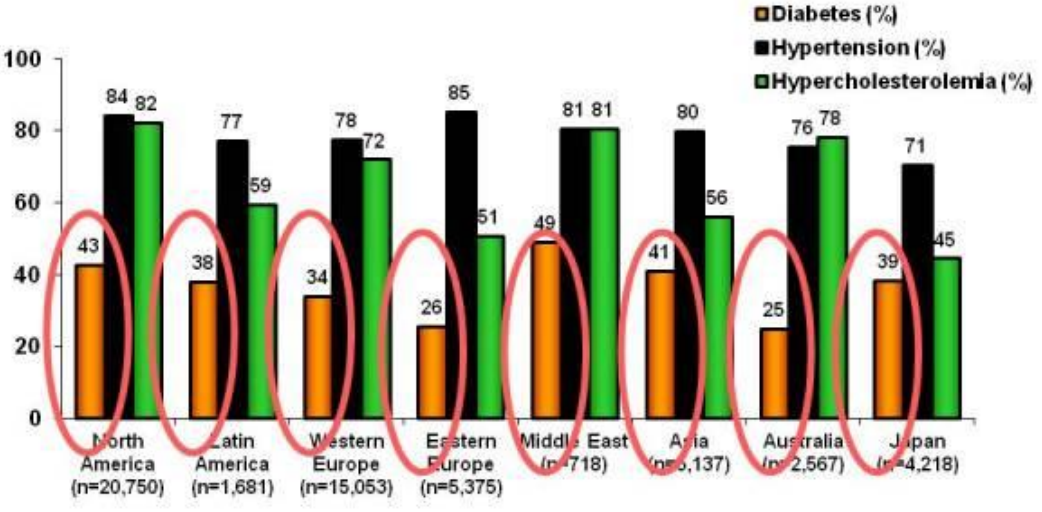


DISLIPIDEMIA DIABETICA

DR ERNESTO REBOLLEDO SANTORO

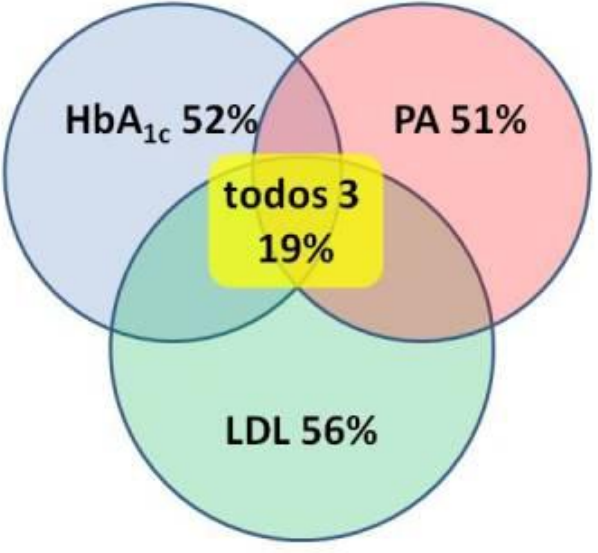
Medico Internista Endocrinologo

Factores de riesgo cardiovascular REACH Registry



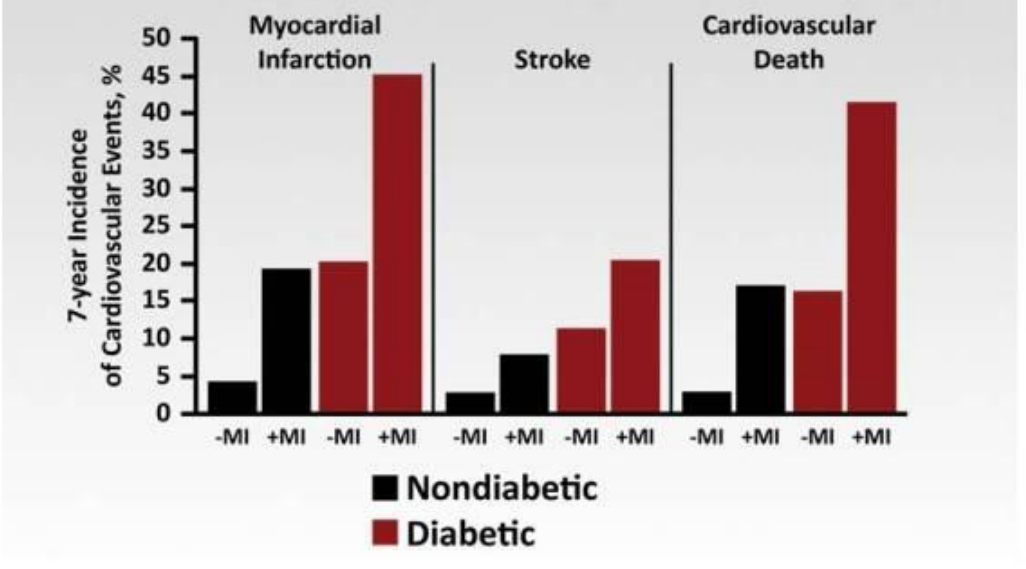
Bhatt DL, Steg PG, Ohman EM, et al. *JAMA* 2006; 295(2): 180-189.

Metas en Diabetes



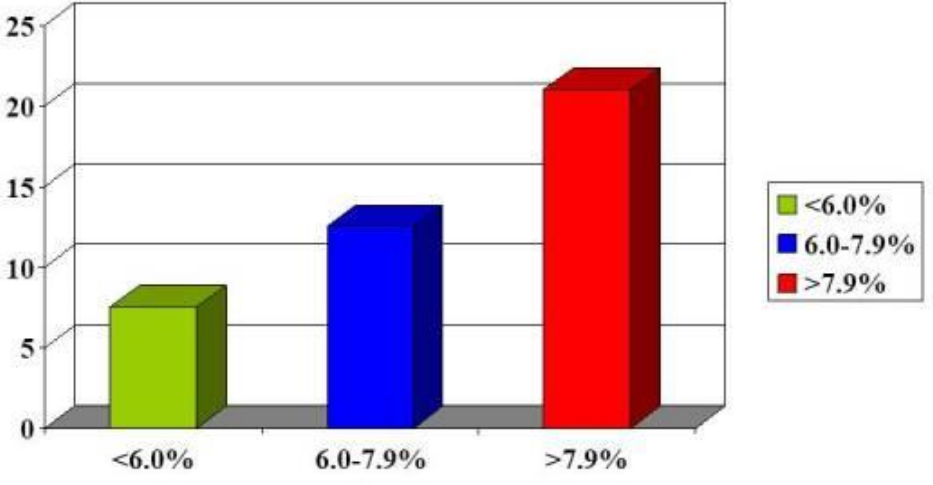
Stark Casagrande S, et al. *Diabetes Care*. 2013;36(8):2271-2279.
Ali MK, et al. *N Engl J Med*. 2013;368(17):1613-1624.

Eventos cardio-vasculares y Diabetes



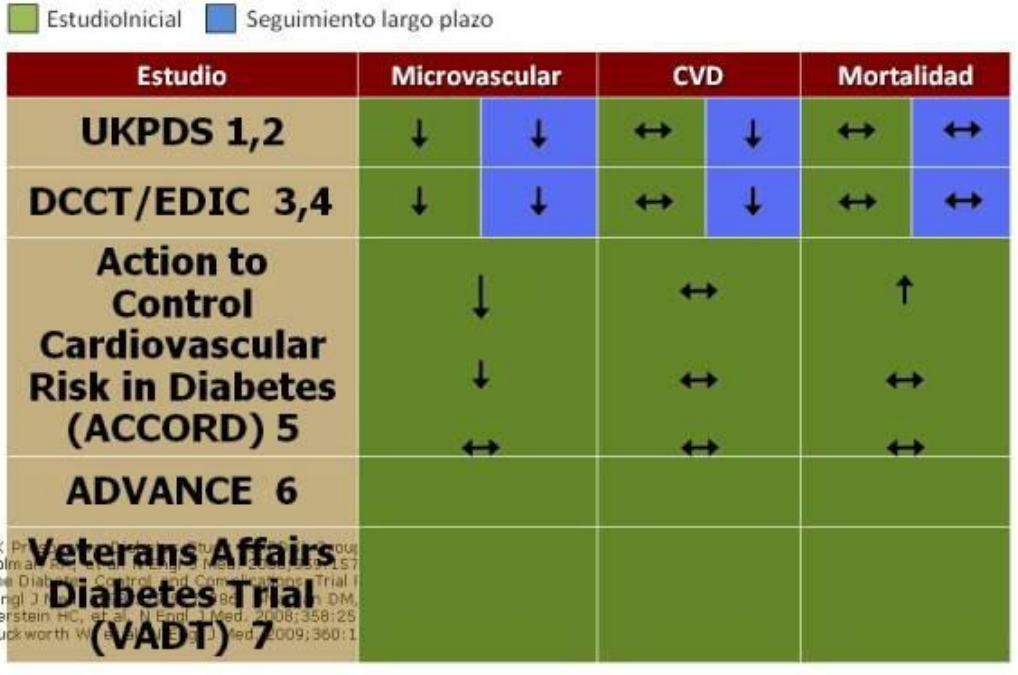
Haffner SM y col. N England J . 1998 ;339 :229-234

HbA1c predice Enf. Arterial Coronaria
Diabetes tipo 2

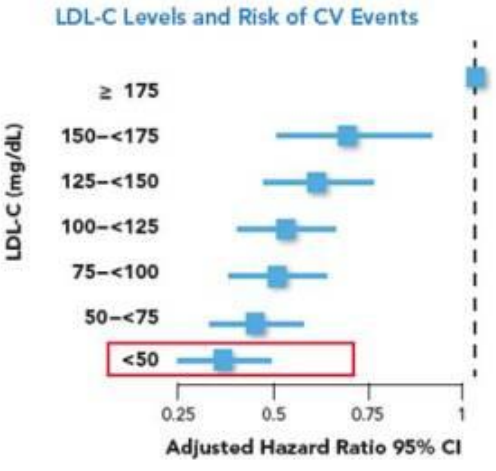


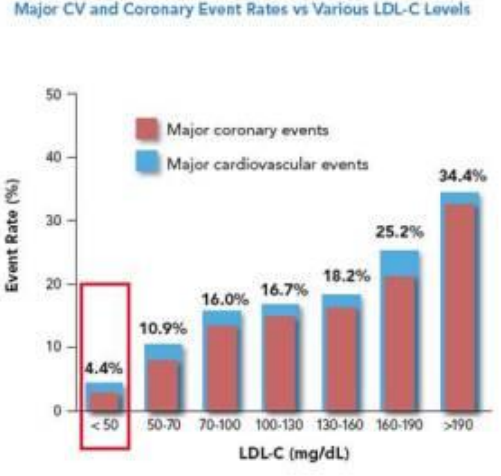
Diabetes 1994, 43:60-67

Impacto del control intensivo de glucosa



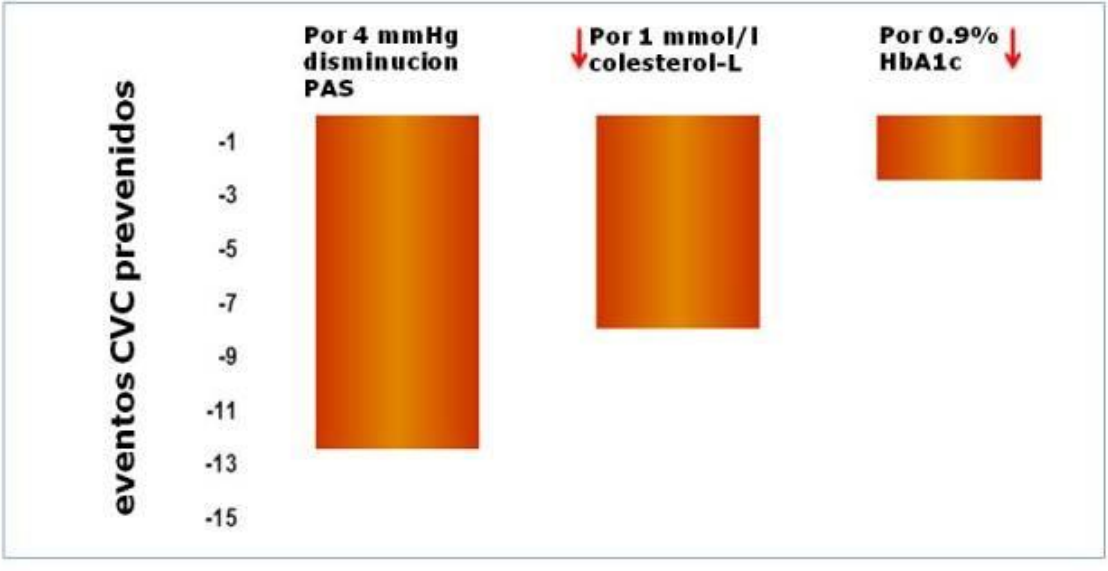
Meta-Analisis Entre mas bajo el LDL-C MEJOR





J Am Coll Cardiol 2014;64:485–94)

Beneficio de Diferentes Intervenciones por 200 Pacientes diabeticos .Tratados por 5 años



Sattar N; Diabetologia 2013

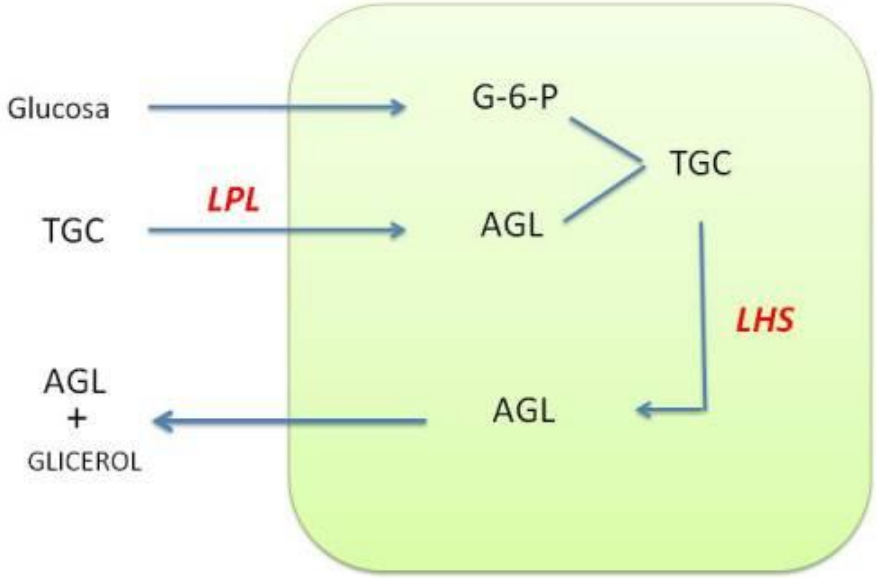
Dislipidemia Diabètica

- *Hipertrigliceridemia*
- *HDL Bajo*
- *LDL pequeñas y Densas*
- *Hiperlipidemia post-prandial*

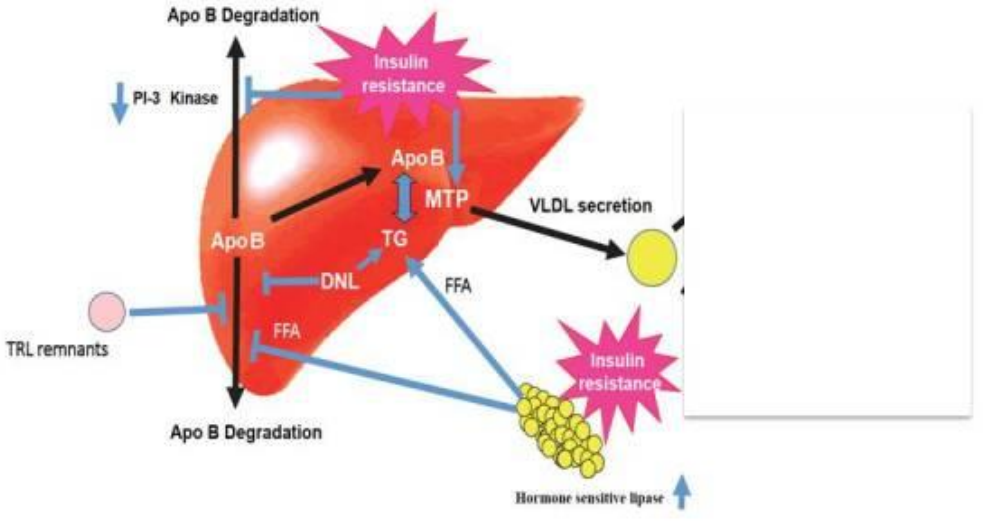
Metabolismo Lipidico y Diabetes

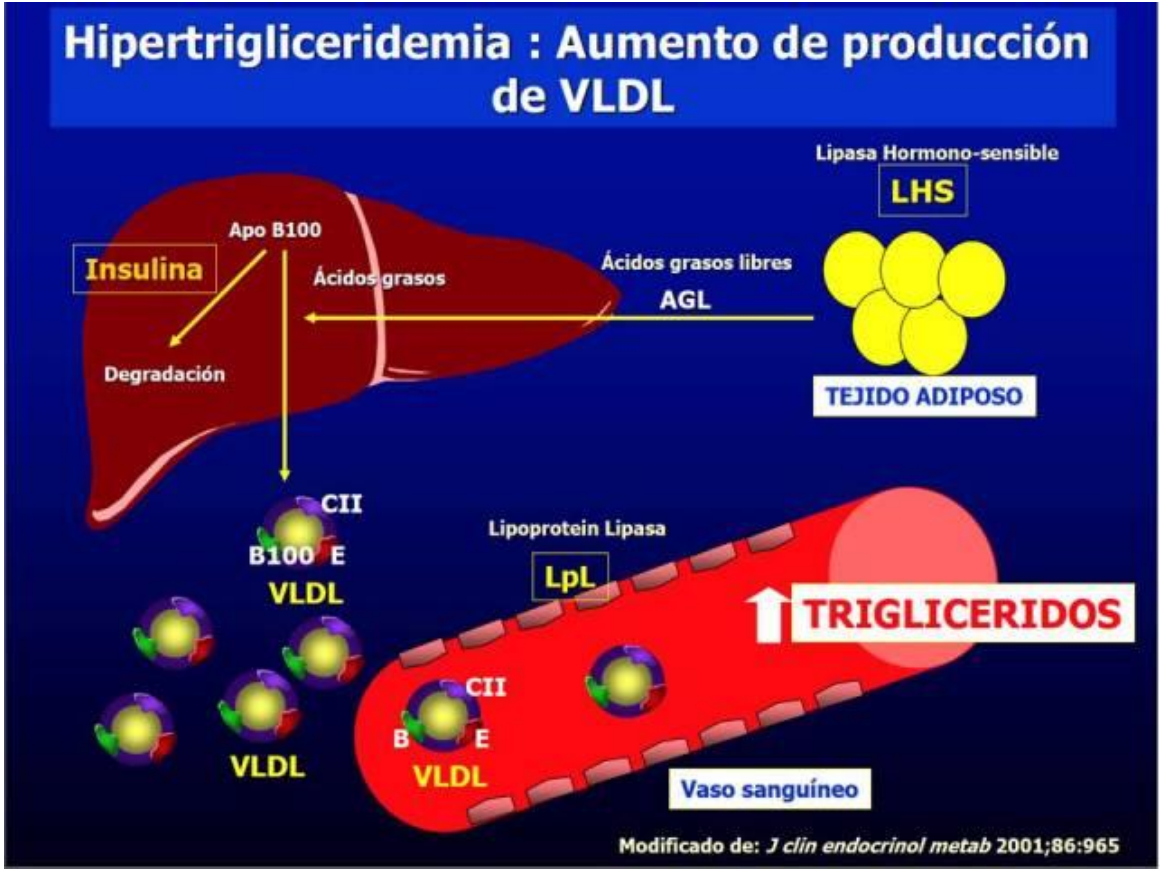
Enzimas	*Funcion*	*Diabetes*
Lipo protein Lipasa (LPL)	Hidrólisis de TGC	↓
Lipasa Hepatica (LH)	Hidrólisis de TGC de HDL y remanentes	↑
Lipasa Hormono Sensible (LHS)	Hidrólisis de TGC de Adipocitos	↑

Celula adiposa



LPL : lipoprotein lipasa LHS : lipasa hormono sensible


Apo B Degradation
Insulin resistance
PI-3 Kinase
Apo B
MTP
VLDL secretion
Apo B
TG
DNL
FFA
TRL remnants
FFA
Insulin resistance
Apo B Degradation
Hormone sensitive lipase


Hipertrigliceridemia : Aumento de producción de VLDL
Lipasa Hormono-sensible
LHS
Apo B100
Insulina
Ácidos grasos
Ácidos grasos libres
AGL
Degradación
TEJIDO ADIPOSO
CII
B100 E
VLDL
Lipoprotein Lipasa
LpL
TRIGLICERIDOS
CII
B E
VLDL
VLDL
Vaso sanguíneo
Modificado de: J clin endocrinol metab 2001;86:965

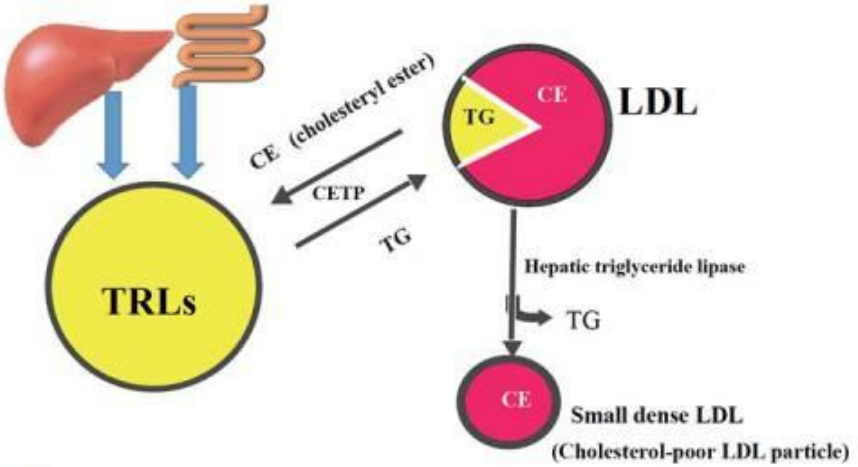


Fig. 2. Overproduction of TG-rich lipoproteins creates small dense LDL.

Production of VLDL and chylomicrons (TG-rich lipoproteins (TRLs)) is stimulated in individuals with type 2 diabetes. The long residence time of TRLs in circulation promotes excessive transfer of TG to LDL and a concomitant transfer of cholesteryl esters (CE) to TRLs via the action of cholesteryl ester transfer protein (CETP). Hepatic TG lipase-mediated hydrolysis of core TG produces cholesterol-poor LDL particles (small dense LDL).

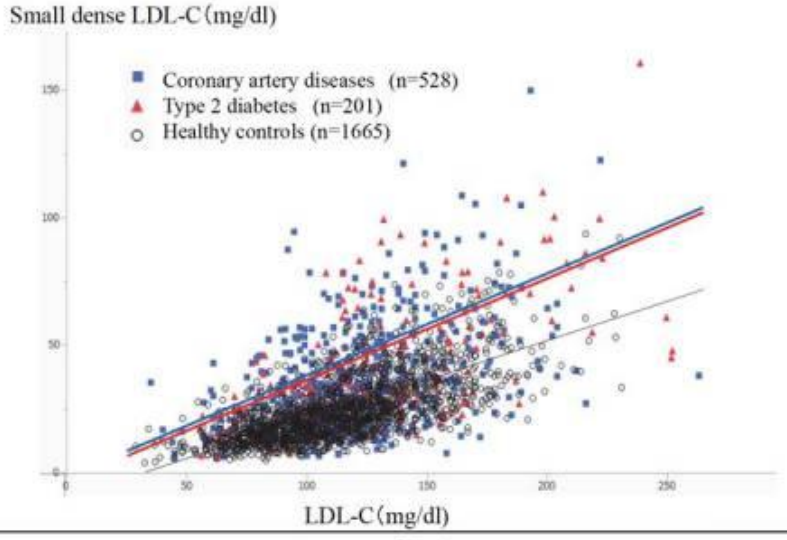
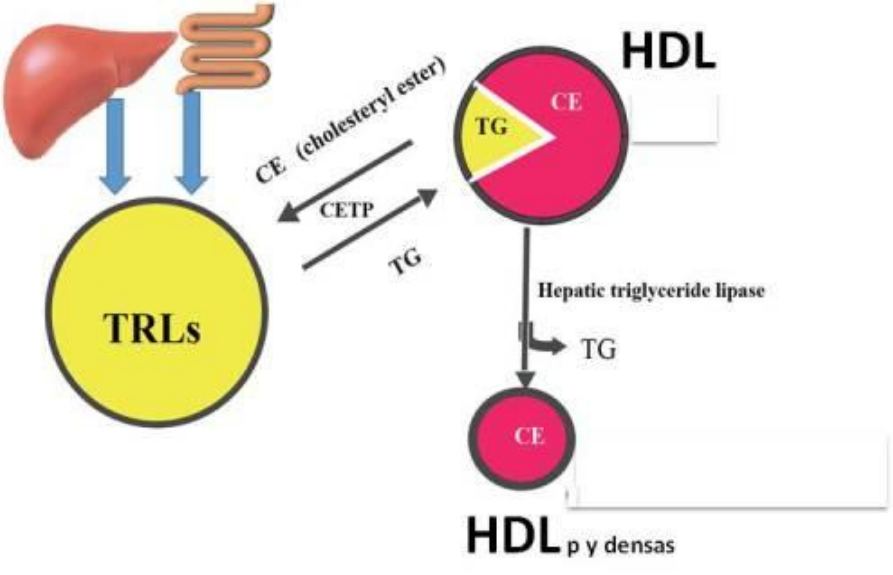
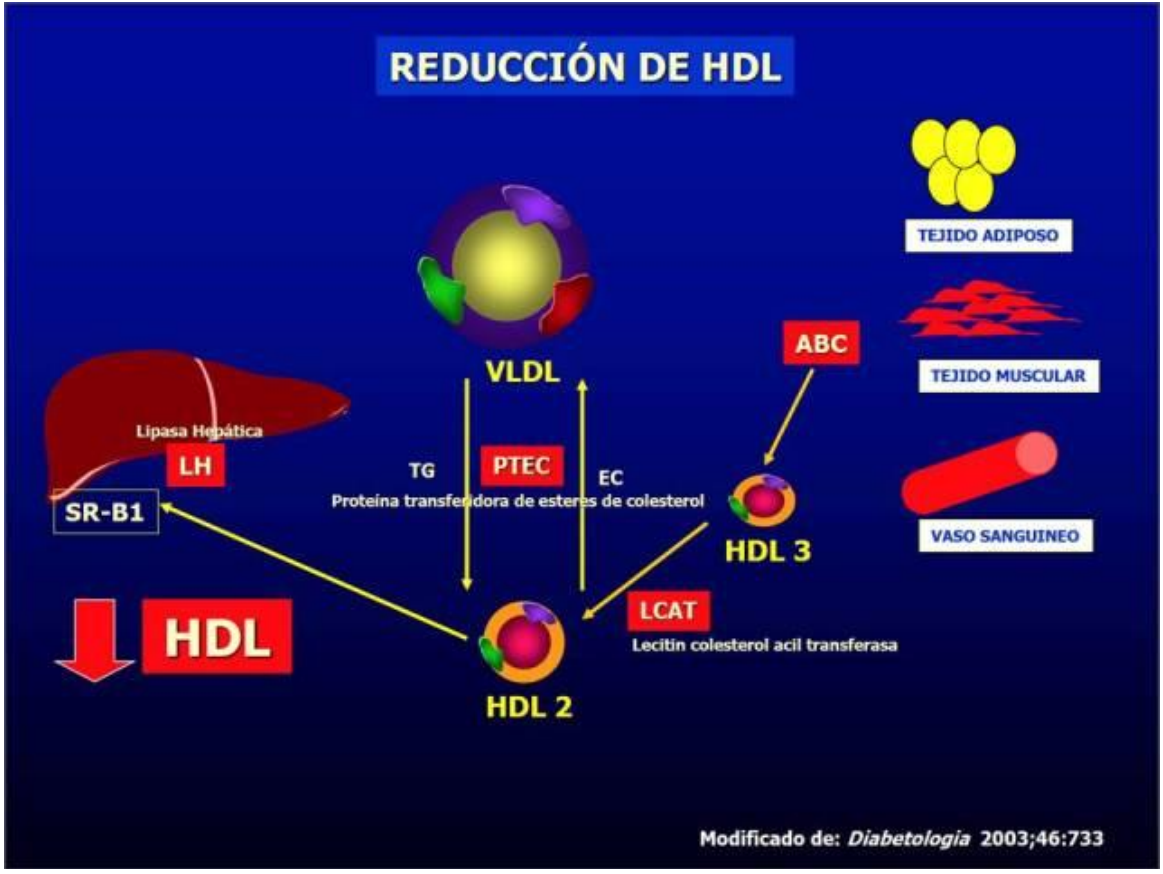


Fig. 3. Relationship between LDL-C and small dense LDL-C concentrations in healthy controls, patients with type 2 diabetes without coronary heart diseases (CAD), and patients with CAD including diabetes.

SdLDL-C levels corresponding to LDL-C levels are higher in patients with diabetes or CAD than in healthy controls. This figure is made based on our original data published in reference (80).


HDL
CE
TG
CE (cholesteryl ester)
CETP
TG
TRLs
Hepatic triglyceride lipase
TG
CE
HDL p y densas


REDUCCIÓN DE HDL
TEJIDO ADIPOSO
TEJIDO MUSCULAR
VASO SANGUINEO
VLDL
ABC
Lipasa Hepática
LH
SR-B1
TG
PTEC
EC
Proteína transferidora de esteres de colesterol
HDL 3
HDL
LCAT
Lecitin colesterol acil transferasa
HDL 2
Modificado de: Diabetologia 2003;46:733

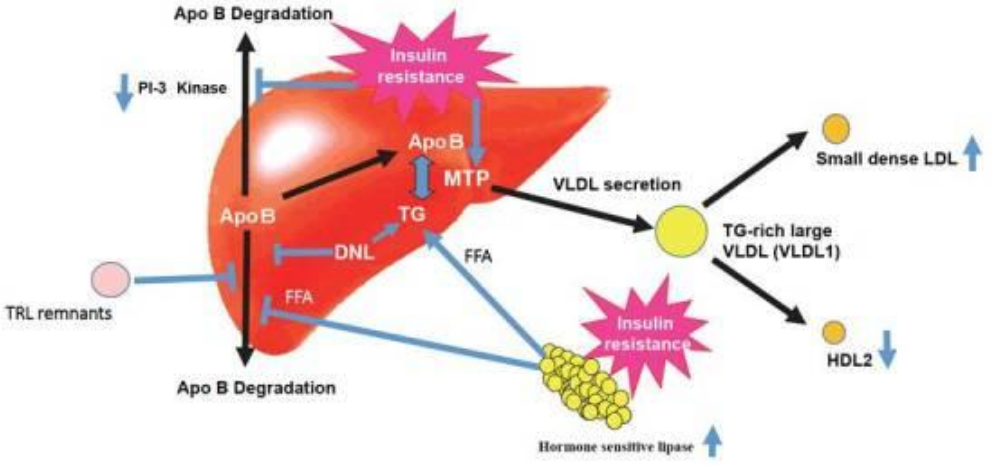


Fig. 1. Pathogenesis of insulin resistance on VLDL overproduction and its related changes in other lipoproteins.

Hepatic VLDL1 production is stimulated by insulin resistance, which is a central lipoprotein abnormality in diabetic dyslipidemia. The major sources of triglyceride (TG) in the liver are 1) free fatty acid (FFA) derived from adipose, 2) fatty acids derived from remnants of TRL (VLDL and chylomicron), and 3) de Novo Lipogenesis (DNL). Newly synthesized TG suppress intracellular apoB degradation. Insulin resistance is associated with reduced inhibition of hormone-sensitive lipase in adipose tissue, thereby augmented portal flux of FFA. TG synthesis from FFA or FFA per se strongly inhibit apoB degradation in the liver, thereby stimulates VLDL production. Hepatic uptake of TG-rich lipoprotein (TRL) remnants and DNL supply TG in the liver, but the contribution of these two factors to suppress apoB degradation are minor. Insulin resistance suppresses phosphoinositide (PI) 3-kinase mediated apoB degradation and enhances the action of microsomal triglyceride transfer protein (MTP), a rate-limiting factor of VLDL assembly. In the insulin-resistant state, VLDL1 production is preferentially increased without affecting VLDL2 production. Overproduction of VLDL1 is metabolically associated with preponderance of small dense LDL and reduced large cholesterol-rich HDL2.

FUNDACION SANTA FE DE BOGOTA

AACE 2017 Guidelines

AMERICAN ASSOCIATION OF CLINICAL ENDOCRINOLOGISTS AND AMERICAN COLLEGE OF ENDOCRINOLOGY GUIDELINES FOR MANAGEMENT OF DYSLIPIDEMIA AND PREVENTION OF CARDIOVASCULAR DISEASE

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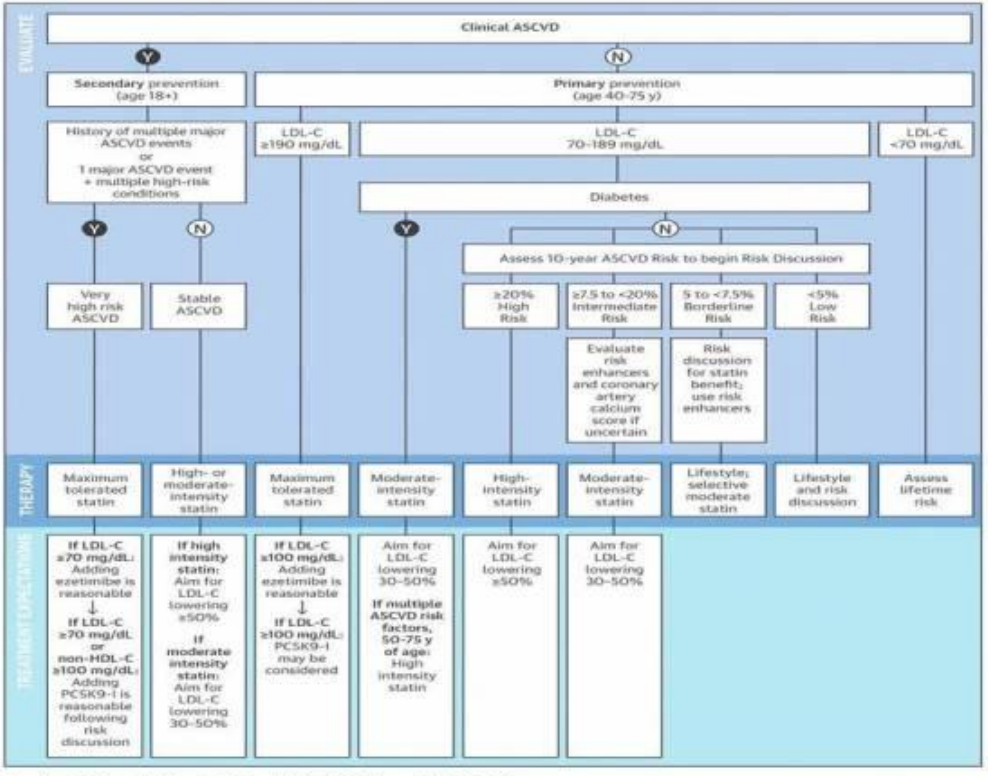
SOCIEDAD COLOMBIANA DE CARDIOLOGIA Y CIRUGIA CARDIOVASCULAR

Atherosclerotic Cardiovascular Disease Risk Categories and LDL-C Treatment Goals				
		Treatment goals		
Risk category	Risk factors[a]/10-year risk[b]	LDL-C (mg/dL)	Non-HDL-C (mg/dL)	Apo B (mg/dL)
Extreme risk	– Progressive ASCVD including unstable angina in patients after achieving an LDL-C <70 mg/dL – Established clinical cardiovascular disease in patients with DM, CKD 3/4, or HeFH – History of premature ASCVD (<55 male, <65 female)	<55	<80	<70
Very high risk	– Established or recent hospitalization for ACS, coronary, carotid or peripheral vascular disease, 10-year risk >20% – Diabetes or CKD 3/4 with 1 or more risk factor(s) – HeFH	<70	<100	<80
High risk	– ≥2 risk factors and 10-year risk 10-20% – Diabetes or CKD 3/4 with no other risk factors	<100	<130	<90
Moderate risk	≤2 risk factors and 10-year risk <10%	<100	<130	<90
Low risk	0 risk factors	<130	<160	NR

Tto del colesterol en DBT2

- Diabetico sin factor de riego asociado se considera de *alto riesgo* y su meta de LDL sera de ***< de 100***
- Diabetico con factores de riesgo asociados se considera de *muy alto riesgo* y su meta sera de ***< de 70***
- Diabetico con enfermedad CVC establecida se considera de *extremado riesgo* y su meta sera ***de < de 55.***

CENTRAL ILLUSTRATION: 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the Management of Blood Cholesterol



Grundy, S.M., et al. J Am Coll Cardiol. 10.1016/j.jacc.2018.11.003.

Table 3. High-, Moderate-, and Low-Intensity Statin Therapy*

	High Intensity	Moderate Intensity	Low Intensity
LDL-C lowering†	≥50%	30%–49%	<30%
Statins	**Atorvastatin (40 mg‡) 80 mg** **Rosuvastatin 20 mg (*40 mg***	**Atorvastatin 10 mg** (20 mg) **Rosuvastatin** (5 mg) **10 mg** **Simvastatin 20–40 mg§**	Simvastatin 10 mg
	…	**Pravastatin 40 mg** (80 mg) **Lovastatin 40 mg** (80 mg) Fluvastatin XL 80 mg **Fluvastatin 40 mg BID** Pitavastatin 1–4 mg	**Pravastatin 10–20 mg** **Lovastatin 20 mg** Fluvastatin 20–40 mg

5. In patients with diabetes (40-75 yrs) and have LDL-C ≥ 70 mg/dL

Begin a moderate intensity statin

- No need to calculate 10-year risk initially
- If a patient has higher risk due to multiple risk factors or is 50 to 75 years old,

  then a high-intensity statin is reasonable to achieve a goal reduction in LDL-C of ≥ 50%.

AMERICAN COLLEGE of CARDIOLOGY

American Heart Association.

4.3. Diabetes Mellitus in Adults

Recommendations for Patients With Diabetes Mellitus Referenced studies that support recommendations are summarized in Online Data Supplements 11 and 12.		
COR	**LOE**	**Recommendations**
I	A	DBT 40 – 75 yr :independiente de medir riesgp CVC , debe recibir tto estatina de moderada intensidad
IIa	B-NR	DBT con LDL > 70 y < 190 : razonable medir riesgo CVC
IIa	B-R	DBT con factores de riesgo o > de 50 años : tto de alta intensidad estatinas (< 50% LDL)
IIa	B-NR	DBT > 75 yr en tto con Estatinas : es razonable continuarla
IIb	C-LD	DBT y riesgo a 10 años > 20 % ,con maxima dosis tolerada de estatinas : razonable usar Ezetimiba.
IIb	C-LD	DBT > 75 yr sin estatina : podria ser discutido con paciente su uso.

Grundy SM, et al.
2018 Cholesterol Clinical Practice Guidelines: Executive Summary

IIb	**C-LD**	En dbt 20 - 39 yr . DBT2 :mas de 10 años enfermedad DBT1 :mas de 20 años enfermedad Si tienen factores de riesgo asociados : Microalbuminuria neuropatia retinopatia o TFG < 60 Puede ser razonable el uso de estatinas.

Gracias