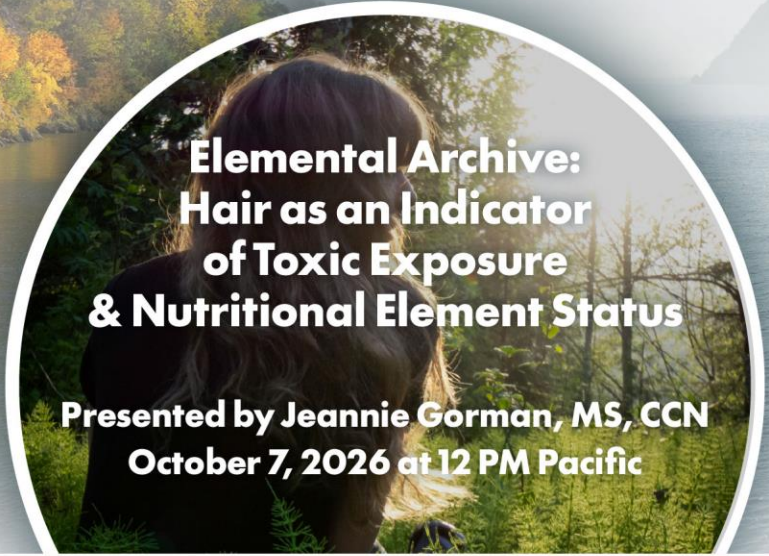


UPCOMING EVENTS



Elemental Archive: Hair as an Indicator of Toxic Exposure & Nutritional Element Status

Presented by Jeannie Gorman, MS, CCN
October 7, 2026 at 12 PM Pacific

Visit doctorsdata.com/Register-for-Webinars



WILL BEGIN SHORTLY



MORE WEB EVENTS

Upgrade Your Cardiometabolic Risk Assessment with the Doctor's Data Cardiometabolic Profile

Heather Hydzik ND
Staff Doctor, Clinical Education Doctor's Data Inc.



Learning Objectives

- 🌱 Recognize the limitations of standard lipid panels and routine labs for assessment of ASCVD and metabolic risk.
- 🌱 Incorporate advanced biomarkers, including those recommended in the updated 2026 American College of Cardiology/American Heart Association (ACC/AHA) guidelines to enhance early detection of cardiometabolic risk and guide personalized treatment strategies.
- 🌱 Appreciate the contribution of nutrition and lifestyle to the balance between atherogenic and anti-atherogenic lipoproteins, to enable counsel on effective therapies including behavior change, supplementation, and medication

Cardiovascular Disease

- 🌱 Leading cause of death *worldwide*
- 🌱 Metabolic syndrome, renal disease, and fatty liver, which develop through shared mechanisms, all increase the risk of cardiovascular disease and mortality.
- 🌱 Microbial dysbiosis has been implicated in the progression and pathogenesis of atherosclerosis, hypertension, and heart failure
- 🌱 At least 40% of cardiovascular cases are potentially avoidable through these 8 modifiable factors:
 - Hypertension, hyperlipidemia, obesity, high blood glucose, nicotine exposure, sleep duration, physical activity, diet

2026 – AHA/ACC Updated Guidelines on Management of Dyslipidemia

- 🔗 New ASCVD Risk Calculator
- 🔗 Reintroduced LDL-C and HDL-C targets (rather than % reduction goals)
- 🔗 Lp(a) measurement once to assess for elevated inherited cardiovascular risk
- 🔗 Earlier lipid screening and intervention to reduce cumulative exposure to atherogenic lipoproteins and lower lifetime ASCVD risk
- 🔗 CAC screening to inform treatment decisions for patients with borderline or intermediate cardiovascular risk

AHA = American Heart Association

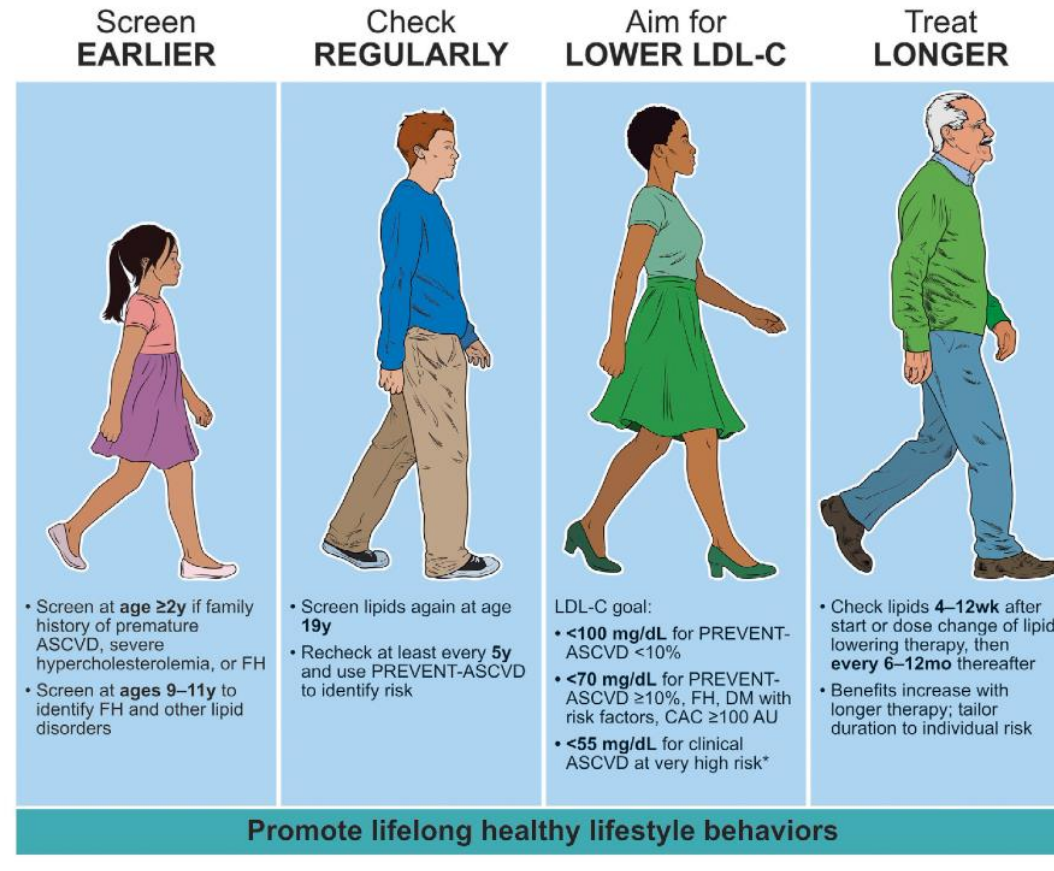
ACC = American College of Cardiology

New Tool for Estimating Heart Disease Risk (2026)

2023 AHA PREVENT™	2013 ACC ASCVD Risk Calculator
Estimates 10 and 30 yr risk of CVD, ASCVD, and heart failure for adults age 30 to 79	Estimated 10 yr risk of CV events for adults age 40 to 79
• Sex • Age • BP • Total and HDL cholesterol • Diabetes, BMI • Smoking • Use of lipid-lowering or anti-hypertensive medications	• Sex • Age • BP • Cholesterol • Diabetes • Smoking
Optional addition of UACR, HbA1c, zip code	Race
Data from both from electronic health records and research studies totaling >6 million U.S. adults from a variety of racial and ethnic, socioeconomic and geographic backgrounds	Data from research participants in the U.S. from the 1960s to the 1990s

CENTRAL ILLUSTRATION: 2026 Dyslipidemia Guideline-at-a-Glance

Lipid Lowering to Reduce ASCVD Risk



Wiggins BS, et al. JACC. 2026;87(19):2617-2623.

New Guidelines on Lipid Screening & Tx (2026)

When to screen lipids?

- 🌱 Age 2+ if FMH of premature ASCVD, severe hyperlipidemia, or Familial Hyperlipidemia (FH)
- 🌱 Ages 9 to 11 to identify FH and other lipid disorders
- 🌱 Age 19 and recheck every 5 yrs
- 🌱 Recheck lipids 4 to 12 weeks after starting lipid-lowering therapy or changing dose; every 6 to 12 mo thereafter.

LDL-C goal:

- 🌱 <100 mg/dl for PREVENT-ASCVD <10%
- 🌱 <70 mg/dl $\geq$ for PREVENT-ASCVD $\geq$ 10%, FH, DM w risk factors, CAC $\geq$ 100 AU
- 🌱 <55 mg/dl for clinical ASCVD at very high risk

CPR Framework for Risk Evaluation

LEGEND	
■	COR 1
■	COR 2a
■	COR 2b
■	COR 3-No Benefit
■	COR 3-Harm
(Class of Recommendation)	

Calculate and Classify

Estimate 10-y risk with
PREVENT-ASCVD 1

Low risk
0%–<3%

Borderline risk
3%–<5%

Intermediate risk
5%–<10%

High risk
≥10%

Personalize

Discuss risk estimate
and therapy options
with patient 1

Discuss risk estimate
and therapy options
with patient 1

AND

Evaluate risk enhancers 2a

Discuss risk estimate
and therapy options
with patient 1

Discuss risk estimate
and therapy options
with patient 1

Reclassify and Reassess

If clinical or patient
uncertainty, consider
CAC score and revise
results 1

If clinical or patient
uncertainty, consider
CAC score and revise
results 1

Decide and Treat

Lifestyle modification 1

Treat with lifestyle
modification and
potential lipid-lowering
therapy 2a

Lifestyle modification
and lipid-lowering
therapy 1



2026 Dyslipidemia

© 2026 by the American College of Cardiology Foundation and the American Heart Association, Inc.

ACC/AHA Recommended Lifestyle Modifications for Dyslipidemia

- 🌱 Moderate-to-vigorous intensity aerobic exercise ≥ 150 min/week plus upper- and lower-body resistance exercise 2 days/week is recommended to improve blood lipids and cardiovascular health
 - Expected lipid effects from a meta-analysis of 148 RCTs: HDL-C +2.11 mg/dL, LDL-C -7.22 mg/dL, TG -8.01 mg/dL
- 🌱 DASH –style eating habits
- 🌱 Avoid nicotine
- 🌱 Maintain a healthy weight
 - Midlife obesity is associated with roughly 15–17 percentage points higher lifetime CVD incidence versus normal BMI
- 🌱 Healthy sleep habits
 - 7h vs 5h sleep associated with 30% lower mortality (PMID: 42454954)
- 🌱 Stress management

What are the risk enhancers?

- **Family history of premature ASCVD** in a parent or sibling (onset <55 y men, <65 y women)
- **Higher-risk ancestry** (e.g., South Asian, Filipino)
- **Chronic inflammatory disease** (SLE, RA, advanced psoriasis, inflammatory arthritis)
- **Lp(a) ≥ 105 nmol/L or ≥ 50 mg/dL**
- **hsCRP ≥ 2 mg/L on more than one occasion**, if measured
- **Triglycerides persistently ≥ 175 mg/dL nonfasting or ≥ 150 mg/dL fasting**
- **Cardiovascular-kidney-metabolic syndrome (CKM syndrome)**: Cardiovascular disease, obesity, diabetes type II, kidney disease
- **LDL-C persistently ≥ 160 – 189 mg/dL, non-HDL-C ≥ 190 – 219 mg/dL, or apoB ≥ 120 mg/dL**
- **Reproductive risk markers** — premature menopause, preeclampsia, gestational diabetes, gestational hypertension, preterm delivery

Apolipoprotein B (ApoB) testing

- Useful to improve risk assessment and guide therapy once LDL-C and non-HDL-C goals are met
- Testing recommended in those with:
 - TG $\geq$ 150 mg/dL
 - Diabetes, CKM syndrome, or established CVD
 - LDL-C $<$ 70 mg/dL (or when LDL-C estimates are unreliable dt calculation errors)
- Helps identify residual elevated lipoprotein-related risk that may be underestimated by the standard lipid profile
- May be useful in the diagnosis of specific lipid and lipoprotein disorders.

- **Very high-risk / clinical ASCVD:** Goal of $<$ 55 mg/dL
- **Moderate-to-high risk / diabetes / high triglycerides:** Goal of $<$ 70 mg/dL
- **Treatment adjustment:** If apoB remains high despite normal standard cholesterol levels, consider intensifying lipid-lowering therapy.

Canadian Cardiovascular Society now strongly recommends using non-HDL-C (total cholesterol minus HDL) or **apoB** instead of LDL-C as the primary risk marker for ASCVD (PMID: 37640407)

Statin Residual Risk

- 🎯 Approximately 56-79% of patients on statin therapy maintain residual cardiovascular disease risk despite achieving LDL-C targets
- 🎯 These patients typically fall into one of these categories:
 - Elevated **Lp(a)**
 - Inflammation (**hsCRP**>2)
 - Residual inflammatory risk was associated with a 31% increased risk of MACE, 168% increased cardiovascular mortality, and 142% increased all-cause mortality
 - Metabolic dysfunction (obesity, insulin resistance, diabetes type II)
 - **Leptin: Adiponectin ratio**
 - **High Triglycerides**
 - Remnant proteins (high **non-HDL**, **apoB** or **sdLDL**)

Moving Beyond total Cholesterol, Triglycerides, HDL, LDL

Particle Burden and Atherogenicity:

- 🔗 Small Dense LDL Cholesterol
- 🔗 Apolipoprotein A-I
- 🔗 Apolipoprotein B (apoB)

Genetic Risk Factor

- 🔗 Lipoprotein(a)

Metabolic Biomarkers

- 🔗 Serum 1,5-anhydroglucitol
- 🔗 *Adipokines*: Leptin, Adiponectin

Markers of Inflammation and Oxidation

- 🔗 PLAC (LP-PLA₂ activity)
- 🔗 Homocysteine
- 🔗 CRP (hs)
- 🔗 Oxidized LDL

Kidney Disease Risk

- 🔗 Cystatin C
- 🔗 Creatinine
- 🔗 eGFR

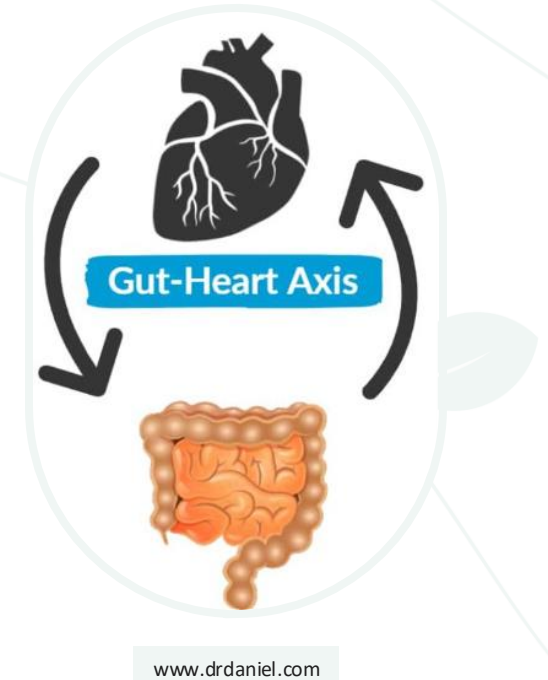
Who could benefit from more comprehensive screening?

Risk factors for atherosclerosis and CVD:

- ✔ Increasing age
- ✔ Hyperlipidemia
- ✔ Hypertension
- ✔ Smoking tobacco or cannabis; Alcohol
- ✔ Insulin resistance
- ✔ Diabetes
- ✔ Obesity (especially central adiposity)
- ✔ Sedentary
- ✔ Poor nutrition
- ✔ Family history (Of CVD, high cholesterol, DMII)
- ✔ Inflammation
- ✔ Sleep apnea
- ✔ Stress
- ✔ Hypothyroidism
- ✔ Hypogonadism
- ✔ Fatty liver disease
- ✔ Inflammatory Bowel Disease

The Gut-Heart-Axis

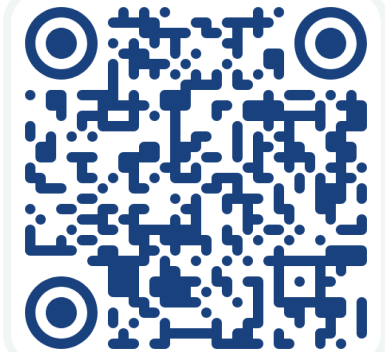
- Microbial dysbiosis has been implicated in the progression and pathogenesis of cardiovascular disease, including atherosclerosis, hypertension and heart failure
- Alteration in diversity and composition of the gut microbiome and its associated metabolites are implicated in cardiovascular and metabolic health outcomes
- Inflammatory bowel disease (IBD) & Myocardial Infarctions
 - People age 18 to 24 are at the highest risk
 - Chronic inflammation in IBD has a role in the development of heart disease
 - Intestinal Permeability
 - Decreased nutrient absorption
 - Monitor cardiovascular markers in those dx c IBD



Inflammatory Dysbiosis

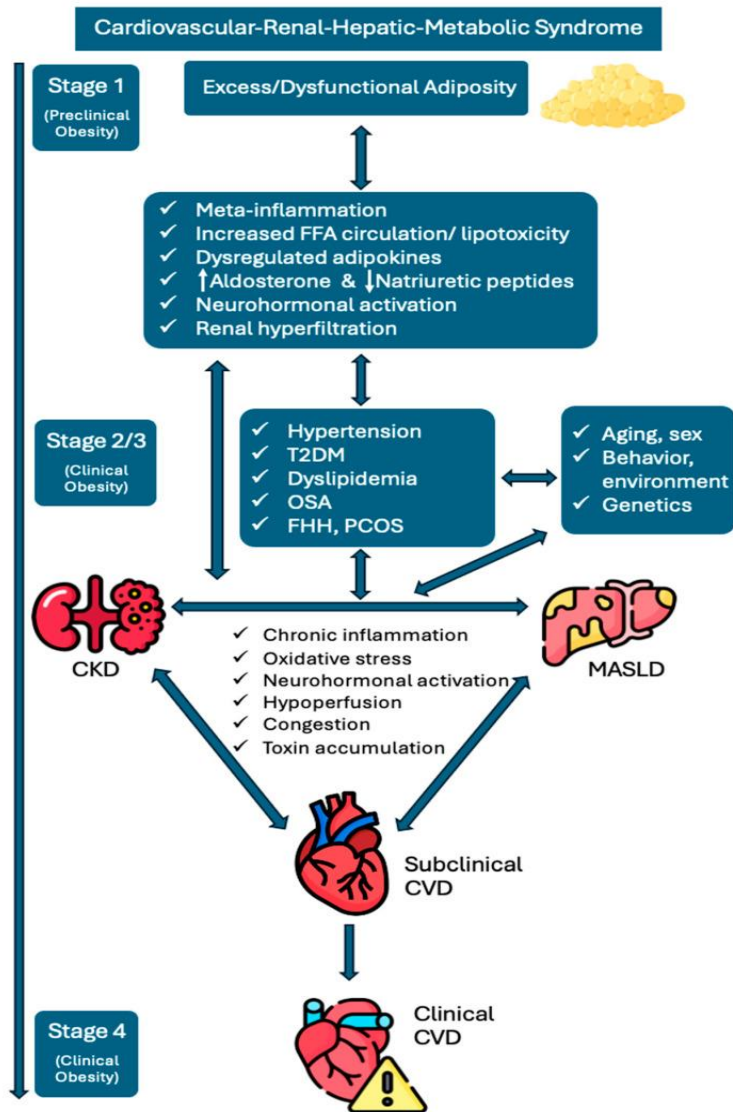
- Inflammatory dysbiosis, and increased permeability associated with obesity, diabetes, excessive gestational weight gain, and high-fat/keto diets, FODMAPS
- High abundance of proinflammatory LPS-rich Proteobacteria, Enterobacteriaceae, Shigella, Escherichia
- Lower abundance of *Faecalibacterium prausnitzii*, *Eubacterium rectale*, *Clostridium* spp., *Bifidobacterium* spp., *Akkermansia muciniphila*, and Lachnospiraceae
- Associated with low saccharolytic fermentation and fecal butyrate (SCFAs)
 - *Compromised mucosal integrity/ function and metabolic disruption*

GI360

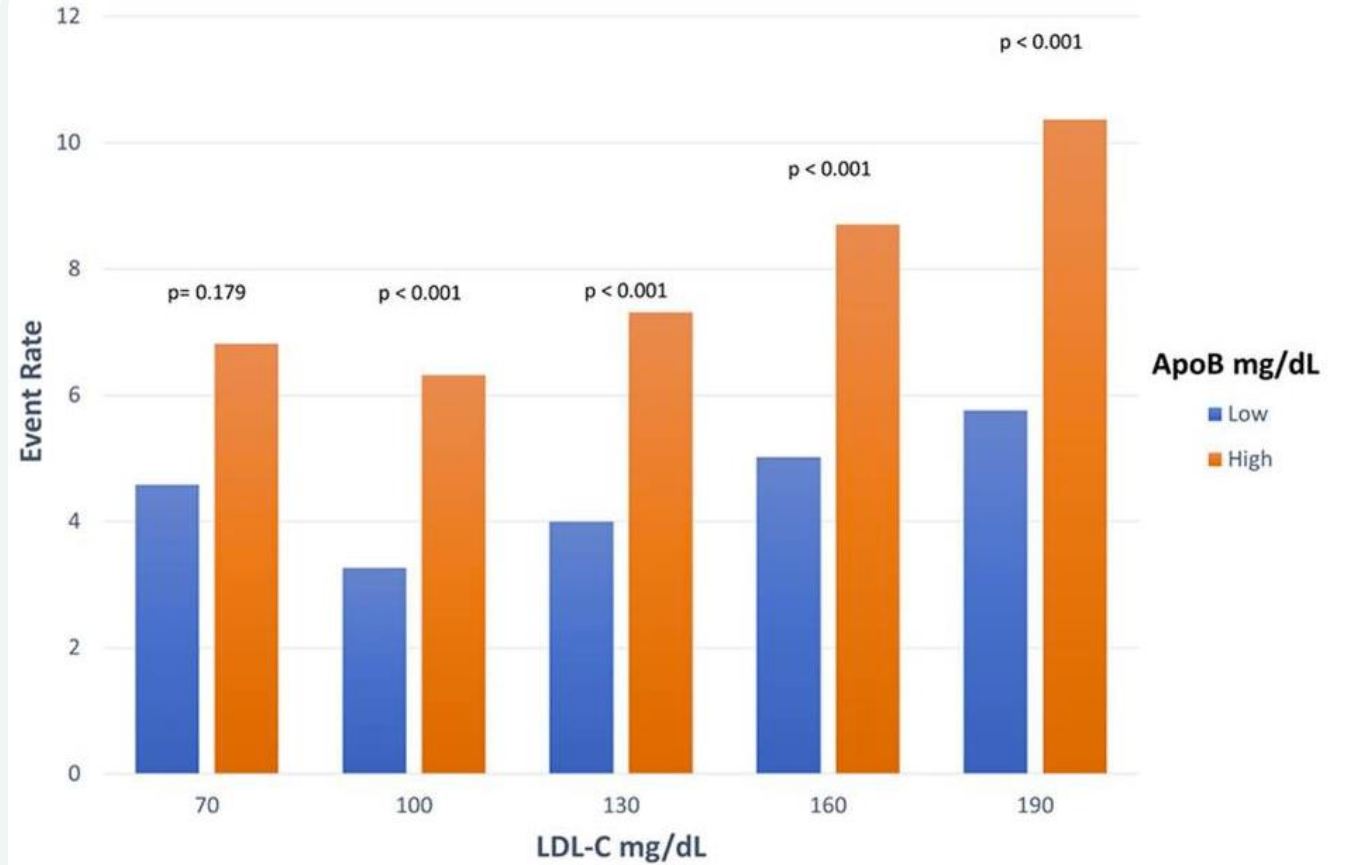


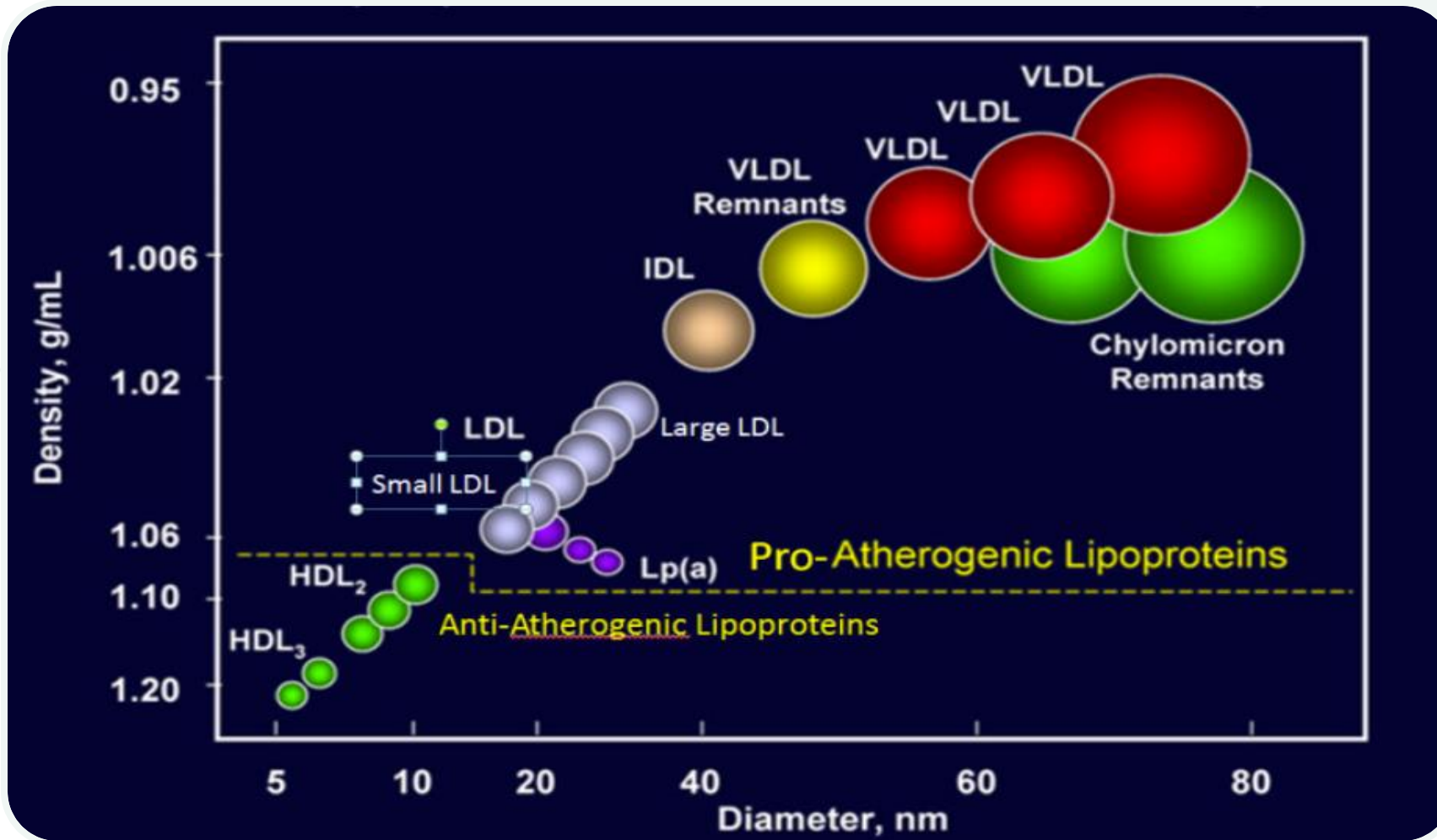
Cardiovascular-Renal-Hepatic-Metabolic Syndrome

- 25% of adults worldwide meet criteria for metabolic syndrome (abdominal obesity, dyslipidemia, hyperglycemia, and hypertension)
- 38% of adults have metabolic associated fatty liver (MASLD)
- Metabolic syndrome (MetS) nearly doubles the risk of developing kidney disease;
55% of individuals with MASLD also suffer from CKD
- Shared underlying pathologies: obesity, insulin resistance, inflammation, hypertension, fat deposition in organs
- Cardiovascular disease is the most common cause of death in patients with MetS, CKD, and MASLD.



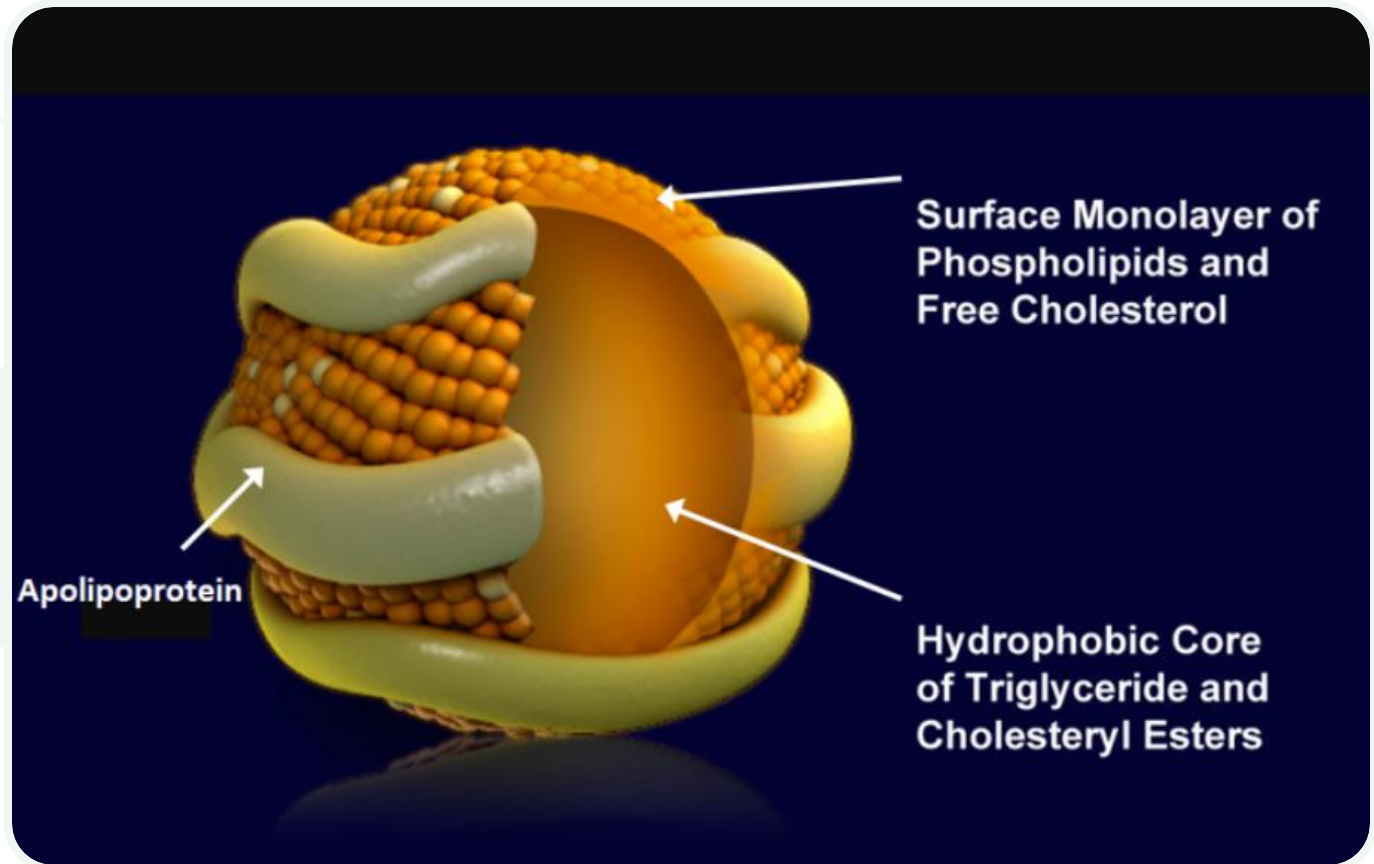
There is a need to modernize our risk markers!





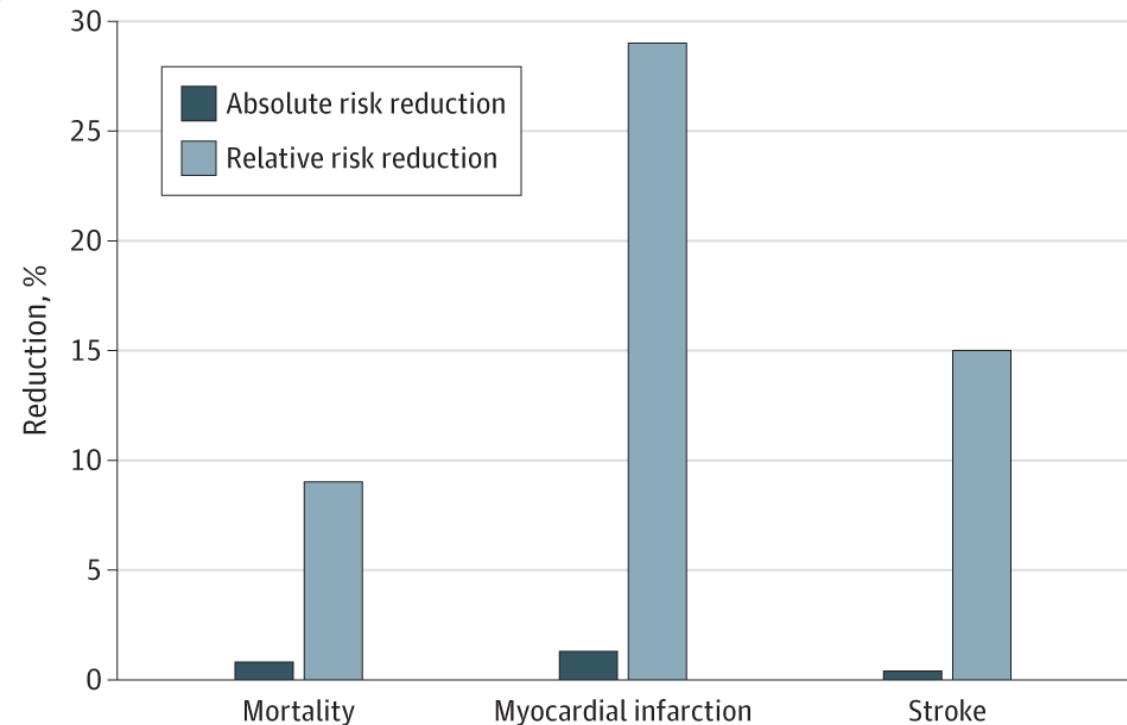


Structure of Lipoproteins



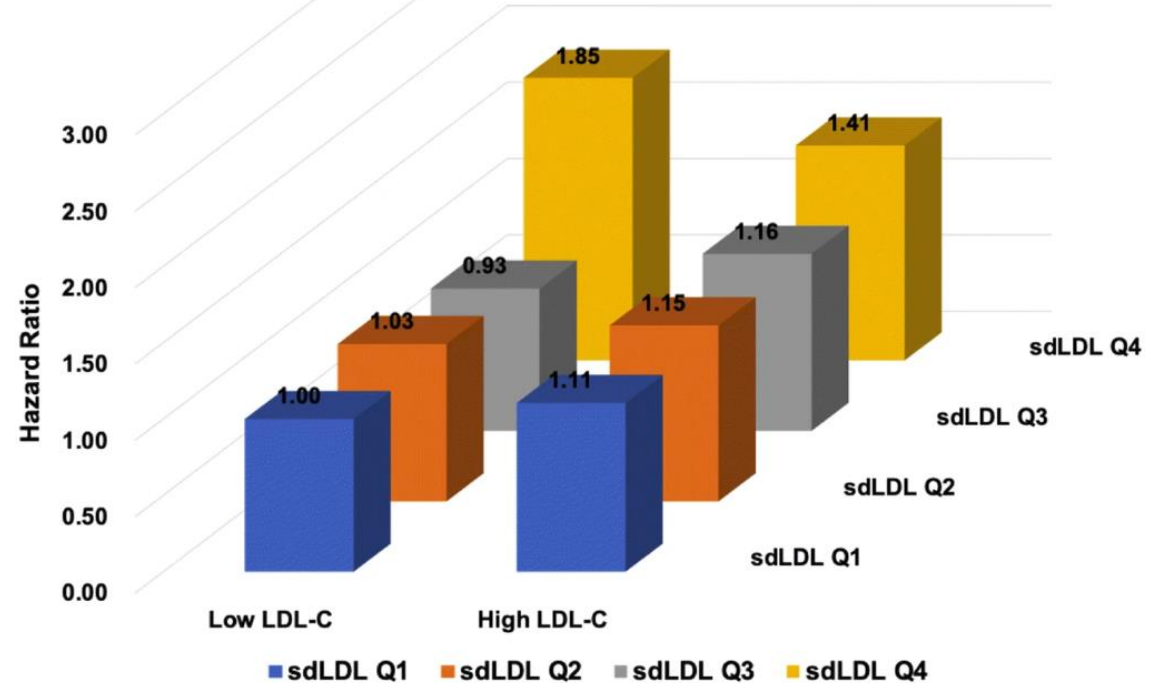
How much do patients benefit from LDL-lowering therapy (statins)?

- 👁️ The **relative risk reduction** for those taking vs not taking statins was:
 - 9% for deaths,
 - 29% for heart attacks
 - 14% for strokes.
- 👁️ Yet the **absolute risk reduction** was
 - 0.8% for deaths,
 - 1.3% for heart attacks
 - 0.4% for strokes



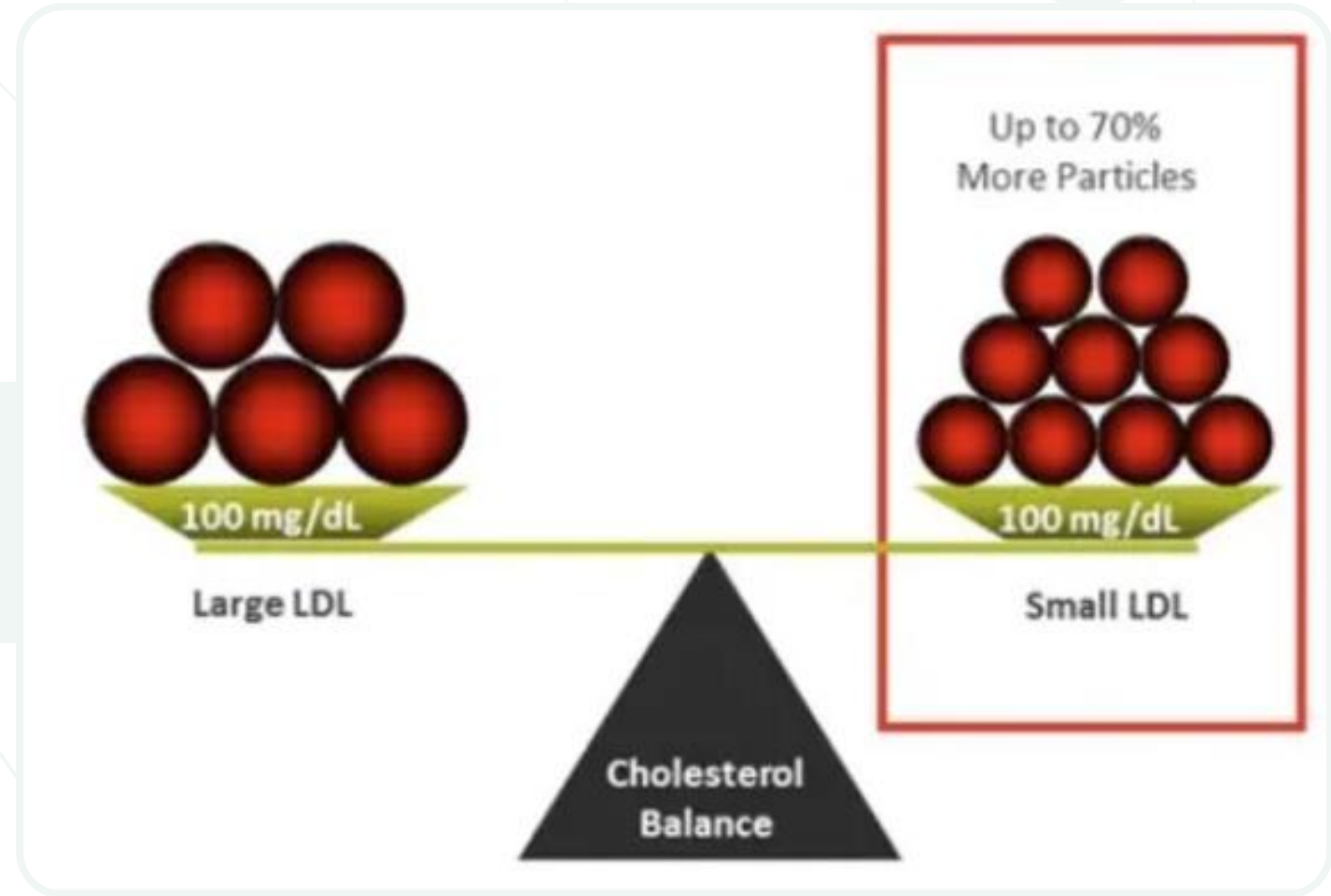
**High sdLDL-c predicts
MACEs even with
low LDL-C!**

a Hazard Ratio for incident MACEs by sdLDL-C quartiles stratified by high/low LDL-C



LDL-C level	HR(95%CI)			
	sdLDL Q1	sdLDL Q2	sdLDL Q3	sdLDL Q4
Low LDL-C	Ref	1.03(0.73-1.45)	0.93(0.60-1.44)	*1.85(1.08-3.16)
High LDL-C	1.11(0.67-1.83)	1.15(0.82-1.62)	1.16(0.85-1.58)	*1.41(1.04-1.92)

sdLDL



	LDL I Large LDL	LDL II Intermediate LDL	LDL III Small LDL	LDL IV Very small LDL
Diameter:	26.0–28.5 nm	25.5–26.4 nm	24.2–25.5 nm	22.0–24.1 nm
Density:	1.019–1.023 g/mL	1.023–1.034 g/mL	1.034–1.044 g/mL	1.044–1.060 g/mL

● Cholesterol esters

● Triglycerides

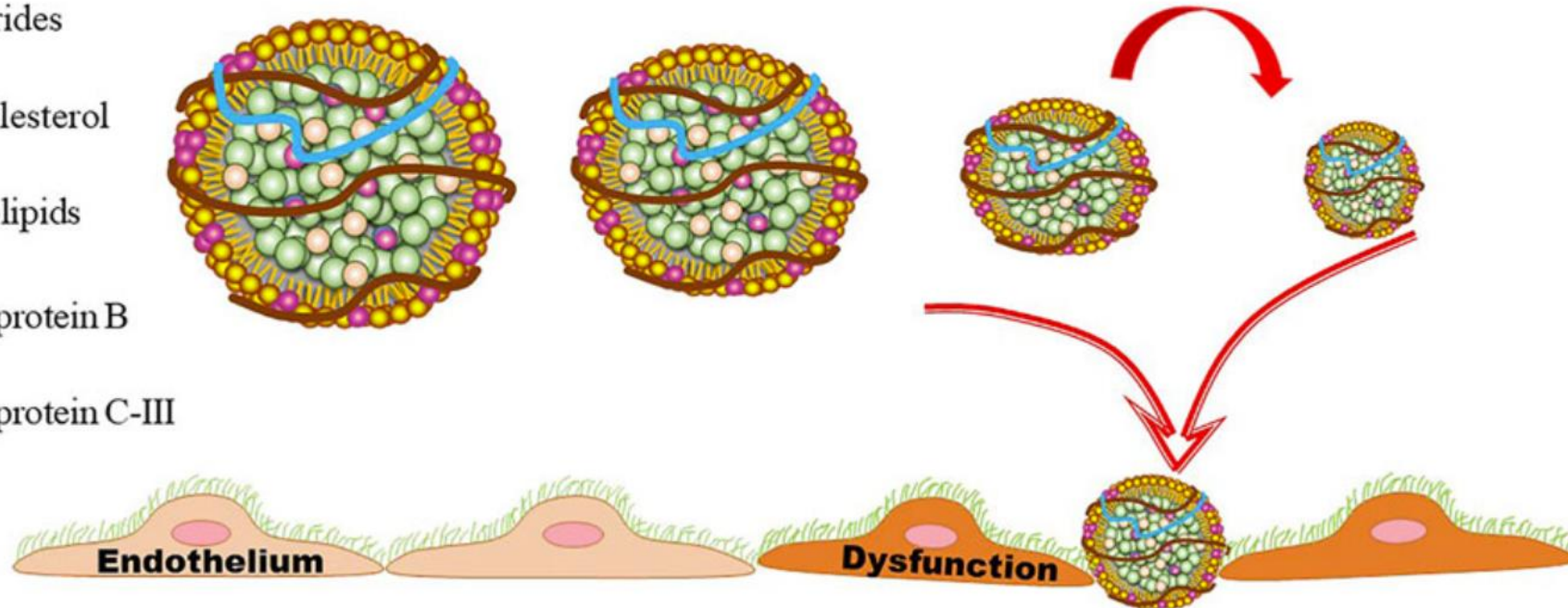
● Free cholesterol

● Phospholipids

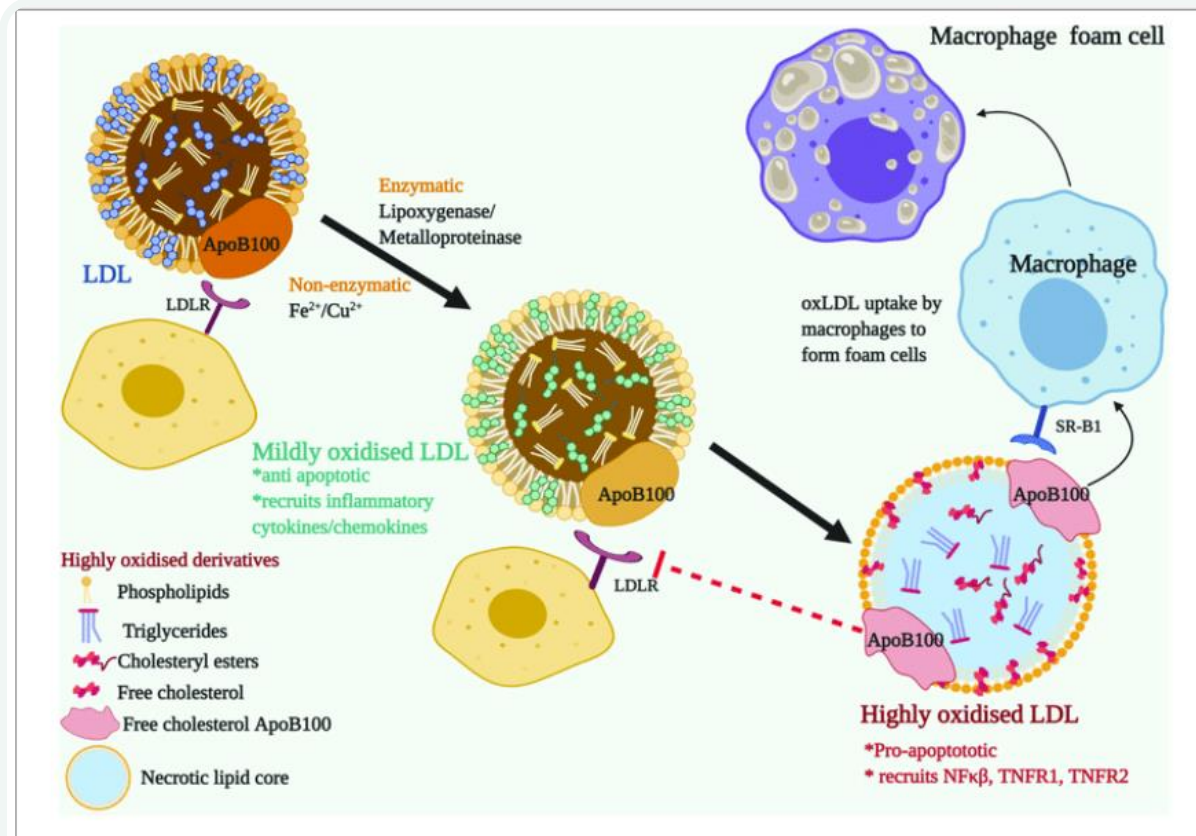
⌘ Apolipoprotein B

⌘ Apolipoprotein C-III

Modifications: Oxidation, desialylation, etc.

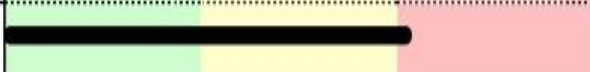


LDL to oxLDL



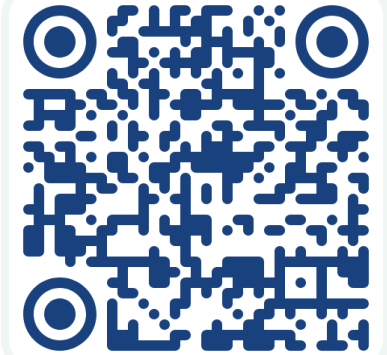
| The transition of LDL to Oxidized Low-Density lipoproteins (ox-LDL)-Nascent LDL are recognized by LDL receptor-bearing cells through their ApoB100 apolipoprotein and do not get modified in the blood plasma due to the surveillance of the antioxidants. On the arterial walls, enzymatic or non-enzymatic modification oxidizes the lipoprotein components. Mildly oxidized LDL, though modified, can still bind to LDLR and recruits inflammatory cytokines and chemokines. LDLR fails to recognize the modified ApoB100, but it is recognized by the scavenger receptor, SR-B1 located on macrophages. Ox-LDL accumulated macrophages develop into foam cells. Pro-apoptotic and inflammatory signals are triggered with the recruitment of $NF\kappa\beta$ and TNFRs.

The Real LDL Culprits - not proportional to LDL-C

Oxidized LDL	67	U/L	<	45	
Small dense LDL	47	mg/dL	<	35	

Ox-LDL- Strong *independent* risk factor for CVD

- 🔗 Initiation and progression of atherogenesis
- 🔗 Can trigger inflammation through the activation of macrophages and other cells
- 🔗 Associated with acute MI, angina, MetS, and hypothyroidism
 - Life style- trans-fatty acids, smoking, toxicant exposures, oxidative stress
 - Insufficient antioxidants (endogenous, dietary and/or supplemental)

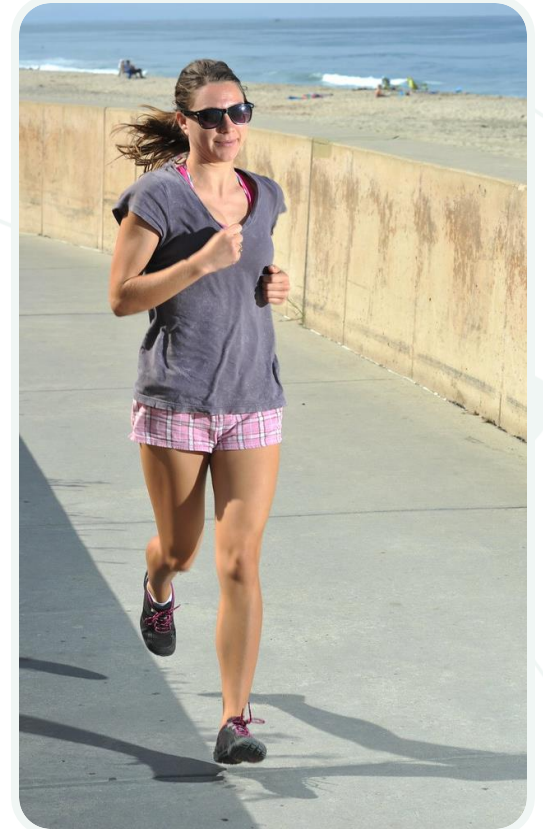


Ox-LDL

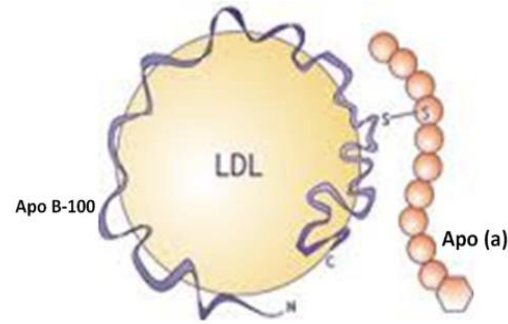
Small Dense LDL (s_D LDL)

Small Dense LDL Cholesterol	47	mg/dL	<	35	
-----------------------------	----	-------	---	----	---

- 🔗 Extremely atherogenic, strong *independent* risk factor
- 🔗 Lower affinity with LDL receptor -> longer circulation time
- 🔗 Cholesteryl ester *depleted*, readily penetrate endothelium, carry less GSH & tocopherols, readily oxidized and taken up by macrophages
- 🔗 Associated with ***elevated triglycerides*** and ***low HDL (apo A-1)***
- 🔗 Intervention: exercise & weight reduction, avoid simple carbs, niacin (1g-2g/d) plus fibrates, and EPA/DHA 3g to 4g/d



Lipoprotein (a)



Lp(a)	110	mg/dL	<	30	
-------	-----	-------	---	----	--

As of 2024, the National Lipid Association recommends measuring Lp(a) in every adult at least once for cardiovascular risk assessment

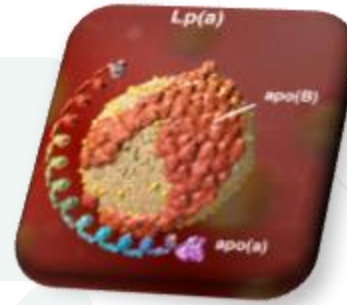
Genetic, independent risk factor for premature heart disease, **thrombosis** and stroke

- 🔗 **Impedes the break down of clots**
- 🔗 *Accelerates platelet aggregation (can lead to strokes and heart attack)*
- 🔗 Carries oxidized phospholipids, which are inflammatory

Therapeutic Strategies for elevated Lipoprotein (a)

- 🌱 Statins increase Lp(a), but might be used (+/- ezetimibe) to **aggressively lower LDL**
- 🌱 Rx's that lower Lp(a): **PCSK9 inhibitors**
- 🌱 **Lifestyle** to decrease LDL, inflammation and ASCVD risk – exercise, Mediterranean Diet
- 🌱 Fish oil to decrease cardiovascular risk.
- 🌱 Aspirin, not specifically targeted at reducing Lp(a) levels, may be utilized as a preventative measure for MACEs
- 🌱 Supplements: CoQ10 , RYR, niacin, pectin, L-carnitine, ginkgo biloba

Lipoprotein (a)



Supplement	Dose	Duration	↓Lp(a) by
CoQ10	120 to 140mg/d		30%
Red Yeast Rice	1.2 gm/d	6 weeks	23%
Pectin	15 gm/d	4 weeks	27% (in pts w hyperlipidemia)
L-carnitine	1 to 4 gm/d	1 to 24 weeks	13% to 29%
Ginkgo biloba	120 mg BID	2 months	24 %
Niacin (extended release)	1 to 3 g/d		20 to 40%

LDL-C (mg/dL)





SPORTY GOODS OUTLET

123 Playfield Lane
Game City, ST 45678
(555) 123-4567
www.sportygoods.com

Cashier: JAMIE Register: 4
Date: 04/23/2025 03:17 PM

ITEM	QTY	PRICE	TOTAL
Tennis Balls (can of 3)		2.99	\$9.98
Golf Balls (pack of 12)		14.99	114.99
Football (standard size)		24.99	244.99
Volleyball (pro series)		19.99	199.99
Soccer Ball (regulation)		22.99	222.99

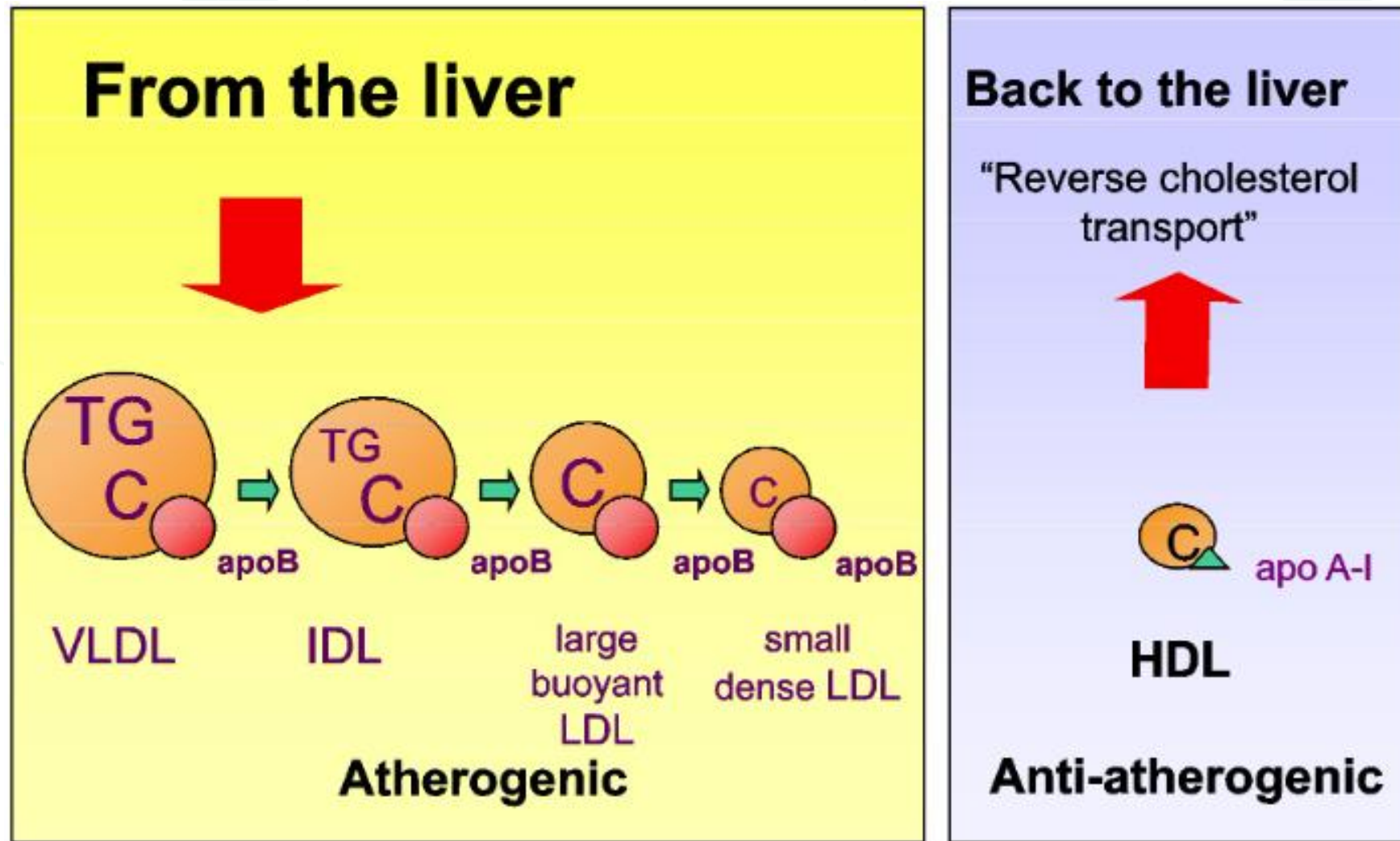
Subtotal: \$92.94
Tax (6.5%): \$6.04
Total: \$98.98

Total Items: 6

THANK YOU FOR PLAYING!

Keep your receipt for 30 days
Returns require original packaging

● Total Items: 6



Apolipoprotein A-I and Cardiometabolic Syndrome

Apolipoprotein A-I	133 mg/dL	115- 220	
Apolipoprotein B	138 mg/dL	50- 130	

Apo A-I (only on HDL species)

Primary protein component of HDL

Suppresses recruitment of monocytes into plaque

Ameliorates inflammation (vascular and gestational)

Increases insulin-dependent and insulin-independent glucose disposal

Apo B (non-HDL particles)

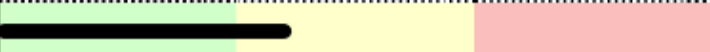
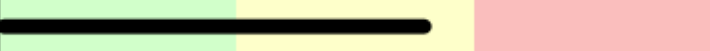
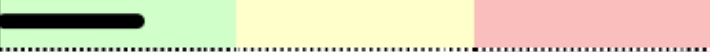
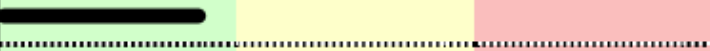
Chylomicron remnants, IDL, LDL, OxLDL, sdLDL, and Lp(a)

Therapeutics for Elevated ApoB

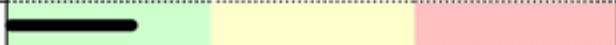
- 🌿 Statins - reduce cholesterol synthesis
 - 🌿 Lower LDL-C more so than apoB
 - 🌿 **Rosuvastatin** is best statin at lowering apoB by up to 45% and doesn't cross the BBB
 - 🌿 Combining with **ezetimibe** (reduces cholesterol absorption) lowers apoB up to 56%
- 🌿 **Niacin** to increase hepatic degradation of apoB
- 🌿 **Red yeast rice** – 1 to 2 gm extended release may reduce apoB by 15 to 20%
 - Not recommended to combine w statins because works by the same mechanism
- 🌿 **Plant sterols and stanols** compete for cholesterol absorption – 2 to 3 grams/day reduce apoB by 5 to 10%
- 🌿 **EPA and DHA** – 2 to 4 grams per day may reduce apoB by 5 to 10%
- 🌿 **Prebiotics, beta glucan, soluble fiber, psyllium husk** increase cholesterol excretion -10 to 15 gms per day reduces apoB by 5 to 10%
- 🌿 **Berberine** 500mg 2 to 3 times per day with food – reduce apoB by 10 – 15%
- 🌿 **Moderate intensity strength and endurance exercise (PMID: 35699182), achieve healthy weight, address insulin resistance/hypothyroid, decrease sat fat and sugar/HFCS/refined carbs, increase plants and fiber (PMID: 34523396), sleep >7hrs**

Ratios

- More sensitive risk markers than individual analytes of a lipid profile
- In general, lower is better

Total Cholesterol : HDL-C	4.8	<	4.0	
LDL-C : HDL-C	3.2	<	2.0	
Oxidized LDL : LDL-C	0.5	<	0.8	
Small dense LDL-C : LDL-C	0.30	<	0.34	
Apo B : Apo A-1	1.0	<	0.8	

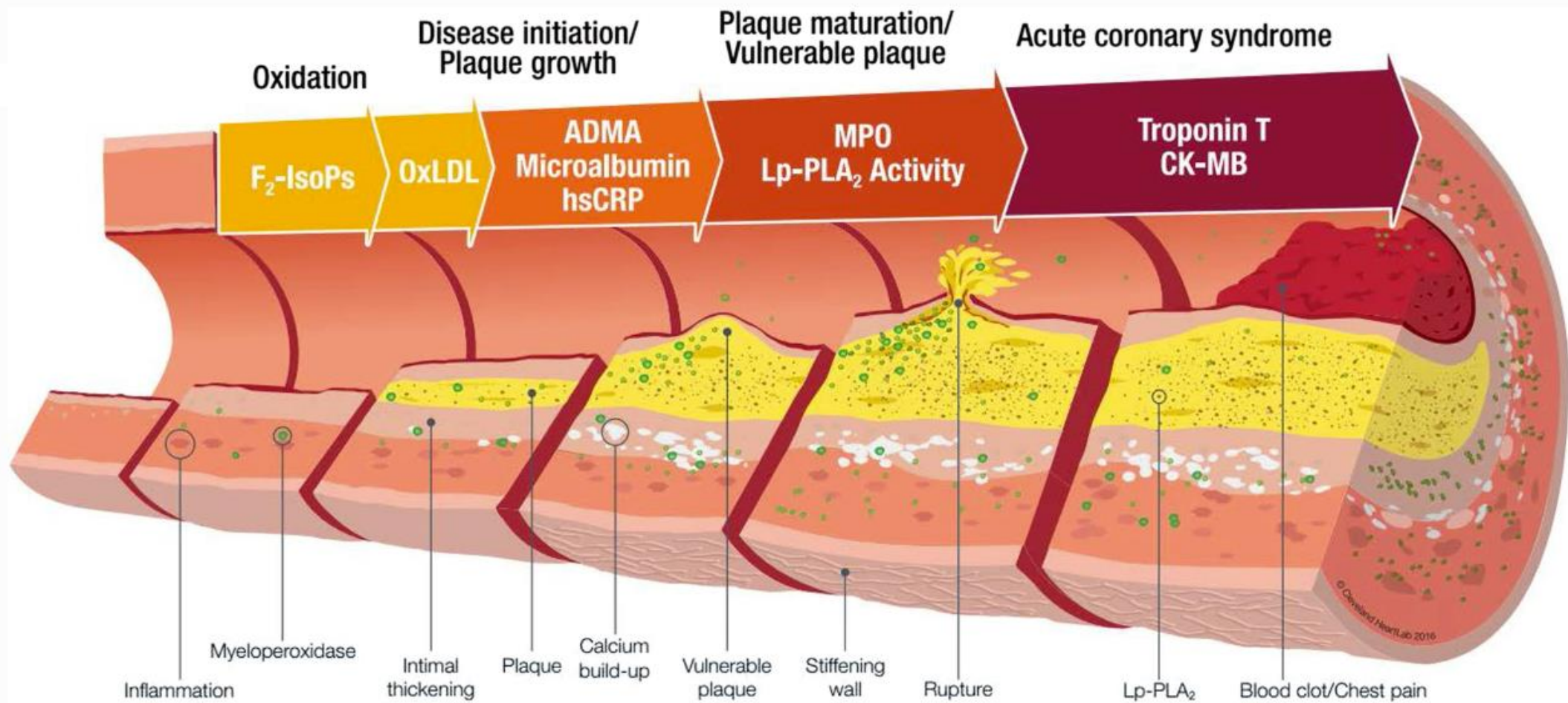
Markers of Inflammation

PLAC (LP-PLA ₂ activity)	199	nmol/min/mL	< 151	
Homocysteine	23.5	μmole/L	< 11.0	
CRP (hs)	5.9	mg/L	< 1.0	

Activity of Lipoprotein-associated phospholipase A2 (LP-PLA₂)

- Macrophage-derived, interacts with LDL and Ox-LDL, furthering endothelial inflammation
- High PLAC indicates 2x risk of CAD; risk of plaque rupture and MI morbidity and mortality
- If high consider:
 - Life style: diet/exercise/weight reduction
 - RBC fatty acid analysis; DHA+EPA may ↓ LP-PLA₂ activity (DBPCT, 3.4 gm/day)
 - If apo-A1 low, assess CoQ10 (supplement if low)
 - Lower all other cardiometabolic risk factors

2025 American College of Cardiology Scientific Statement: **hsCRP** can be used in routine clinical practice to identify individuals at increased inflammatory risk as long as patient is not acutely ill.



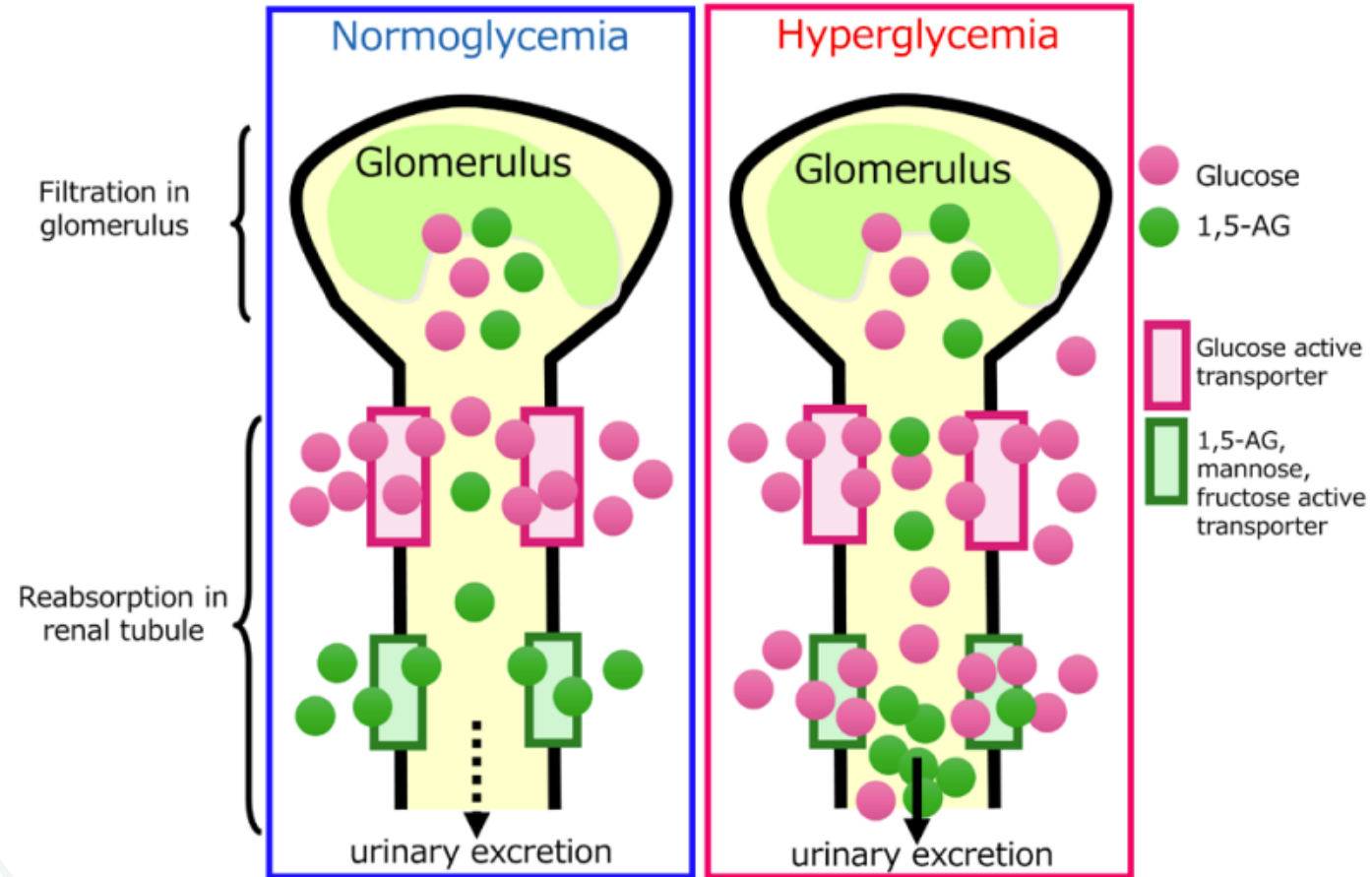
Inflammatory Biomarkers and their Association with Atherosclerosis. Atherosclerosis is associated with specific inflammatory biomarkers, which can be measured to help evaluate a patient's risk for heart disease and cardiac events

What About Hyperglycemic Excursions?

1,5-anhydroglucitol [1,5-AG]

- 🌱 *Beyond* fasting glucose, insulin and HbA1c...
- 🌱 Serum 1,5-anhydroglucitol
 - Natural food-derived, non-metabolized glucose-like polyol
 - Competes* with glucose for renal **resorption**
- 🌱 **Low serum 1,5-AG indicates *hyperglycemic episodes*** (>180 mg/dl) over past 1-2 weeks
 - Episodes not evident from HgA1c levels
 - Episodes highly correlated with CVD and diabetic complications

Reabsorption of 1,5-AG



Traditional: Total Cholesterol, Triglycerides, HDL, LDL

Specific: VLDL, Non-HDL, Ox LDL, Small dense LSL, Lp(a)

Ratios

Inflammatory Markers:
PLAC[®], Homocysteine, hsCRP

Metabolic Risk:
1,5-Anhydroglucitol

CardioMetabolic Profile; serum

LIPIDS/RATIOS	RESULT / UNIT	REFERENCE INTERVAL	CARDIOVASCULAR RISK		
			LOW RISK	MODERATE RISK	HIGH RISK
Total Cholesterol	251 mg/dL	< 200			
Triglycerides	155 mg/dL	< 150			
HDL Cholesterol	52 mg/dL	> 60			
LDL Cholesterol (calculated)	168 mg/dL	< 100			
VLDL Cholesterol (calculated)	31.0 mg/dL	< 30.0			
Non-HDL Cholesterol (calculated)	199 mg/dL	< 130			
Oxidized LDL	92 U/L	< 45			
Small dense LDL Cholesterol*	57 mg/dL	< 35			
Lp(a)	16 mg/dL	< 30			
Total Cholesterol : HDL-C	4.8	< 4.0			
LDL-C : HDL-C	3.2	< 2.0			
Oxidized LDL : LDL-C	0.5	< 0.8			
Small dense LDL-C : LDL-C	0.30	< 0.34			
Apo B : Apo A-1	1.0	< 0.8			
RISK FACTORS/INFLAMMATORY MARKERS					
PLAC (LP-PLA ₂ Activity)	160 nmol/min/mL	< 151			
Homocysteine	11.2 μmole/L	< 11.0			
CRP (hs)	2.0 mg/L	< 1.0			
APOLIPOPROTEINS			PERCENTILE		
			2.5 th	16 th	50 th
Apolipoprotein A-1	153 mg/dL	115 - 220			
Apolipoprotein B	149 mg/dL	50 - 130			
METABOLIC RISK MARKERS					
Insulin	6.1 μIU/mL	2.8 - 14.0			
Glucose	97.5 mg/dL	70.0 - 100			
1,5-Anhydroglucitol (1,5 AG)	15 mcg/mL	6.8 - 29			
*Leptin	38 ng/mL	4.0 - 39			
*Adiponectin	7.8 μg/mL	4.0 - 20			
Leptin : Adiponectin ratio	4.8	1.5 - 3.2			
Cystatin C	0.7 mg/L	0.5 - 1.5			
Creatinine	0.6 mg/dL	0.6 - 1.3			
eGFR	98 mL/min	> 60			

Cystatin C



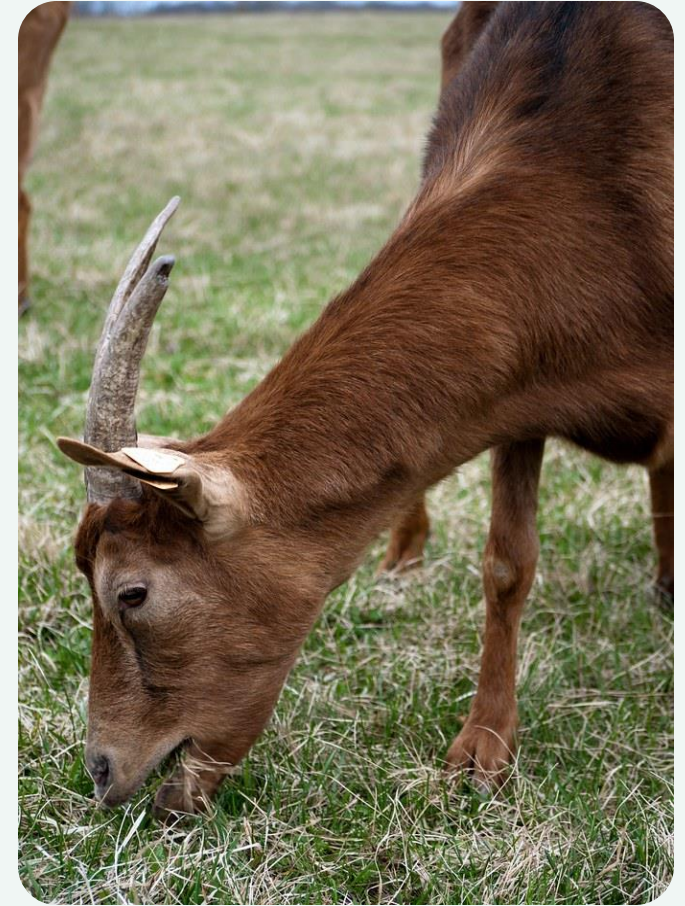
In 2021, National Kidney Foundation (NKF) and the American Society of Nephrology (ASN) recommended routine use of cystatin C to confirm estimated GFR in adults who are at risk for or have chronic kidney disease, because combining filtration markers (creatinine and cystatin C) is more accurate and would support better clinical decisions than either marker alone.

- 🌱 A protein produced by all cells in the body
- 🌱 **Catches kidney disease sooner than creatinine or BUN.**
- 🌱 Elevated Cystatin C reflects reduced kidney function and is predictive of chronic kidney disease, major cardiovascular events and mortality
- 🌱 The glomerular filtration rate (kidney function) is typically estimated using creatinine, but is less reliable when muscle mass is very low or very high
- 🌱 Cystatin C can be used instead because it is **not altered by muscle mass, hydration or diet**

- Fernando S, Polkinghorne KR. Cystatin C: not just a marker of kidney function. J Bras Nefrol. 2020;42(1):6-7. doi:10.1590/2175-8239-JBN-2019-0240
- West M, Kirby A, Stewart RA, et al. Circulating Cystatin C Is an Independent Risk Marker for Cardiovascular Outcomes, Development of Renal Impairment, and Long-Term Mortality in Patients With Stable Coronary Heart Disease: The LIPID Study. J Am Heart Assoc. 2022;11(5):e020745. doi:10.1161/JAHA.121.020745
- Delgado C, Baweja M, Crews DC, et al. A Unifying Approach for GFR Estimation: Recommendations of the NKF-ASN Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Disease. Am J Kidney Dis. 2022;79(2):268-288.e1. doi:10.1053/j.ajkd.2021.08.003

Case 1

- 🌱 83 yo F
- 🌱 Vegetarian
- 🌱 Has personal chef
- 🌱 Lives on an ecofarm
- 🌱 Generally sedentary



This Photo by Unknown Author is licensed under CC BY-SA-NC

CardioMetabolic Profile; serum

				CARDIOVASCULAR RISK				
LIPIDS/RATIOS	RESULT / UNIT		REFERENCE INTERVAL	LOW RISK	MODERATE RISK	HIGH RISK		
Total Cholesterol	202	mg/dL	< 200					
Triglycerides	305	mg/dL	< 150					
HDL Cholesterol	53	mg/dL	> 60					
LDL Cholesterol (calculated)	99.0	mg/dL	< 100					
VLDL Cholesterol (calculated)	50.0	mg/dL	< 30.0					
Non-HDL Cholesterol (calculated)	149	mg/dL	< 130					
OxLDL Cholesterol	57	U/L	< 60					
sdLDL Cholesterol (calculated)	46	mg/dL	< 35					
Lp(a)	46	mg/dL	< 30					
Total Cholesterol : HDL-C	3.8		< 4.0					
LDL-C : HDL-C	1.9		< 2.0					
OxLDL-C : LDL-C	0.58		< 0.45					
sdLDL-C : LDL-C	0.46		< 0.34					
Apo B : Apo A-1	0.80		< 0.80					
RISK FACTORS/INFLAMMATORY MARKERS								
PLAC (LP-PLA ₂ Activity)	160	U/L	< 151					
Homocysteine	11.0	μmol/L	< 11.0					
hsCRP	3.4	mg/L	< 1.0					
APOLIPOPROTEINS				PERCENTILE				
				2.5 th	16 th	50 th	84 th	97.5 th
Apolipoprotein A-1	132	mg/dL	115 - 220					
Apolipoprotein B	110	mg/dL	50 - 130					
METABOLIC RISK MARKERS								
Insulin	17.2	μIU/mL	2.8 - 18.0					
Glucose	105	mg/dL	70.0 - 100					
1,5-Anhydroglucitol (1,5 AG)	17	ug/mL	6.8 - 29					
*Leptin	42	ng/mL	4.0 - 39					
*Adiponectin	11	μg/mL	4.0 - 20					
Leptin : Adiponectin ratio	3.90		0.20 - 3.40					
Cystatin C	1.3	mg/L	0.5 - 1.5					
Creatinine	0.7	mg/dL	0.6 - 1.3					
eGFR (calculated)	75	mL/min	> 60					

High TGs sdLDL, glucose, LAR, UR insulin
= impaired hepatic insulin signaling; carbohydrate-driven lipogenesis

OxLDL: LDL ratio high = oxidative stress

High PLAC and hsCRP = vascular inflammatory activity & inflammaging

Low creatinine = possible sarcopenia, reduced glucose disposal capacity

83 yo F; Vegetarian Lipid Panel

Decrease oxidative stress and inflammation:

- 🌱 Increase intake of low-carbohydrate vitamin C-containing foods: strawberries, bell peppers, broccoli, and cauliflower
- 🌱 Antioxidant supplements (vit E, vit C, NAC)
- 🌱 High fiber foods: Non-starchy vegetables, avocado, nuts and seeds
- 🌱 Prioritize monounsaturated fats (oxidation-resistant): Olive, peanut, and avocado oils
- 🌱 Anti-inflammatory foods: leafy greens, berries, omega-3 fatty acids

Improve insulin sensitivity:

- 🌱 Walk for 10 minutes after each meal; 150 minutes of moderate physical activity per week
- 🌱 Increase fiber, healthy fats, avoid refined sugar and white flour
- 🌱 10 hour eating window
- 🌱 Berberine, chromium

Build muscle:

- 🌱 25 grams of protein minimum at B, L, D; Resistance training 2 to 3x per week (gradually increasing load); creatine 5 grams per day after a workout; consider salivary hormone testing (DHEA and T)



Case 2

- 👁️ 51 yo M
- 👁️ SAD
 - 👁️ Consumes fast food regularly for lunch and sometimes dinner
 - 👁️ Diet green tea instead of water for health benefits
- 👁️ Atorvastatin (Lipitor) to address elevated cholesterol
- 👁️ “Too tired for exercise”

CardioMetabolic Profile; serum

LIPIDS/RATIOS	RESULT / UNIT	REFERENCE INTERVAL	CARDIOVASCULAR RISK		
			LOW RISK	MODERATE RISK	HIGH RISK
Total Cholesterol	131 mg/dL	< 200			
Triglycerides	92.0 mg/dL	< 150			
HDL Cholesterol	38 mg/dL	> 50			
LDL Cholesterol (calculated)	74.0 mg/dL	< 100			
VLDL Cholesterol (calculated)	18.0 mg/dL	< 30.0			
Non-HDL Cholesterol (calculated)	93 mg/dL	< 130			
Oxidized LDL	43 U/L	< 60			
Small dense LDL Cholesterol*	24 mg/dL	< 35			
Lp(a)	23 mg/dL	< 30			
Total Cholesterol : HDL-C	3.4	< 4.0			
LDL-C : HDL-C	1.9	< 2.0			
Oxidized LDL : LDL-C	0.58	< 0.55			
Small dense LDL-C : LDL-C	0.32	< 0.34			
Apo B : Apo A-1	0.80	< 0.80			
RISK FACTORS/INFLAMMATORY MARKERS					
PLAC (LP-PLA ₂ Activity)	145 nmol/min/mL	< 151			
Homocysteine	12.3 μmole/L	< 11.0			
CRP (hs)	4.3 mg/L	< 1.0			
APOLIPOPROTEINS			PERCENTILE		
			2.5 th	16 th	50 th
Apolipoprotein A-1	110 mg/dL	115 - 220			
Apolipoprotein B	88 mg/dL	50 - 130			
METABOLIC RISK MARKERS					
Insulin	18.8 μIU/mL	2.8 - 14.0			
Glucose	96.8 mg/dL	70.0 - 100			
1,5-Anhydroglucitol (1,5-AG)	15 ug/mL	10 - 32			
*Leptin	32 ng/mL	1.8 - 20			
*Adiponectin	1.8 μg/mL	3.0 - 16			
Leptin : Adiponectin ratio	18	0.4 - 2.0			
Cystatin C	0.9 mg/L	0.5 - 1.5			
Creatinine	0.8 mg/dL	0.7 - 1.5			
eGFR (calculated)	100 mL/min	> 60			

Looks like the statin is working as expected.

Inflammation

🌿 Low HDL & low apolipoprotein A1

- 🌿 Associated with an increased risk of cardiovascular disease.
- 🌿 Omega-3 fatty acids, niacin (vitamin B3), and soluble fiber
- 🌿 Decrease oxidative stress
- 🌿 30 minutes of moderate-intensity exercise most days of the week

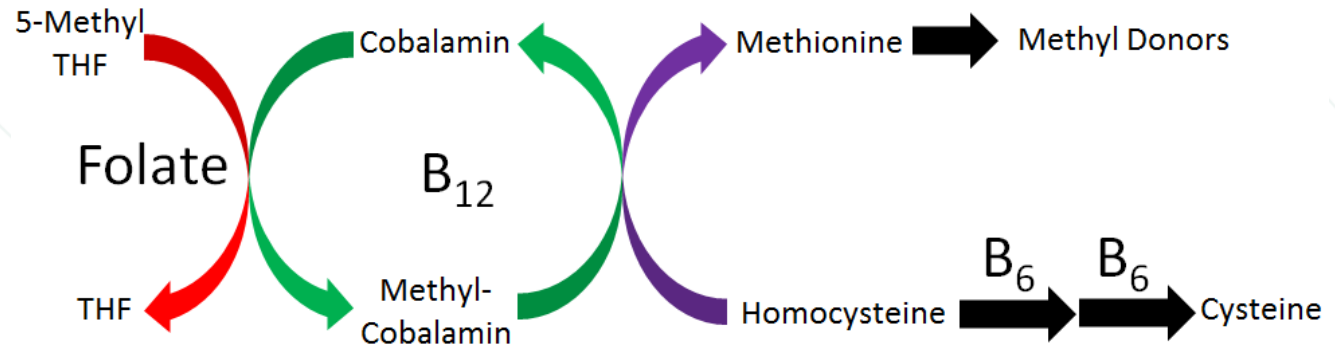
🌿 Elevated hsCRP

- 🌿 Lifestyle changes; Mediterranean diet, movement/exercise (at least 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity exercise per week)
- 🌿 Decrease oxidative stress (etoh, smoking)
- 🌿 Omega-3 fatty acids; salmon, mackerel, and sardines, flaxseeds, chia seeds, and walnuts
- 🌿 Consider vitamin D deficiency
- 🌿 Normalize blood pressure, assess for periodontal disease, consider imaging (CIMT or CAC)
- 🌿 Statin therapy in individuals with elevated hsCRP, even with normal lipid levels, significantly reduces risk for heart attack, stroke and death

CVD & Homocysteine



This Photo by Unknown Author is licensed under CC BY-NC

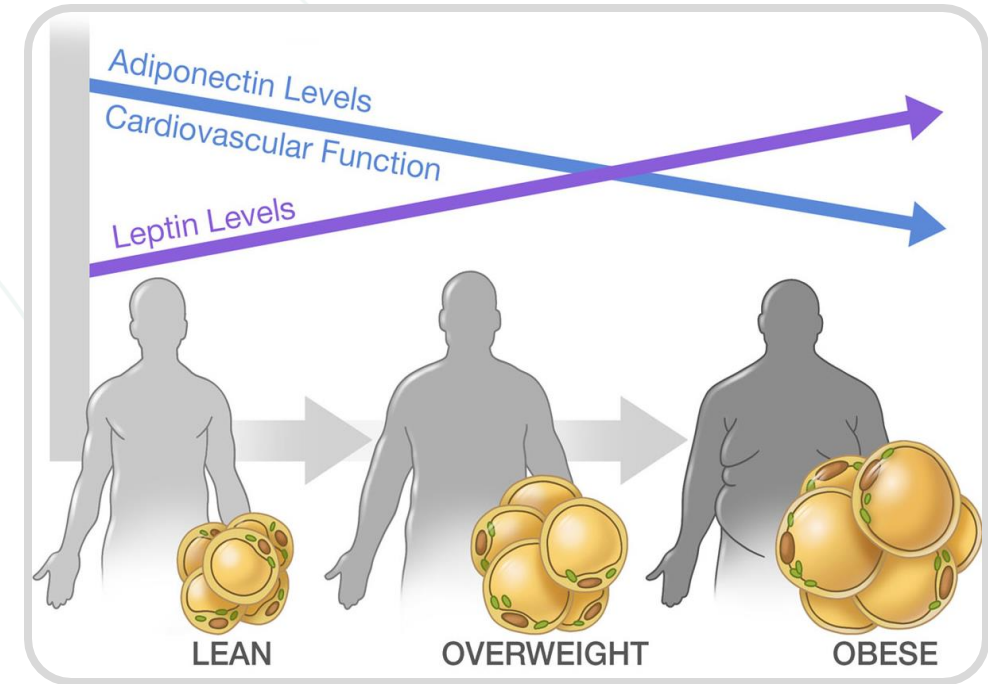


Elevated homocysteine

- Marker of atherogenic disease, risk factor for CAD, stroke, MI, thrombosis, dementia
- B6, B12, and folate (B9)
 - Leafy greens, legumes, citrus fruits, poultry, fish, and lean meats
 - Supplements or medications
- Rule out kidney disease or hypothyroidism
- Consider functional evaluation of methylation cycle

Leptin to Adiponectin Ratio (LAR)

- Adiponectin regulates blood glucose, insulin sensitivity, and is antioxidant, anti-inflammatory
- Leptin promotes satiety but prolonged elevation can lead to leptin resistance
- Low adiponectin leads to less mitochondrial energy production and allows inflammation to develop
- High LAR indicates increased risks of MetS, DMII, and CVD

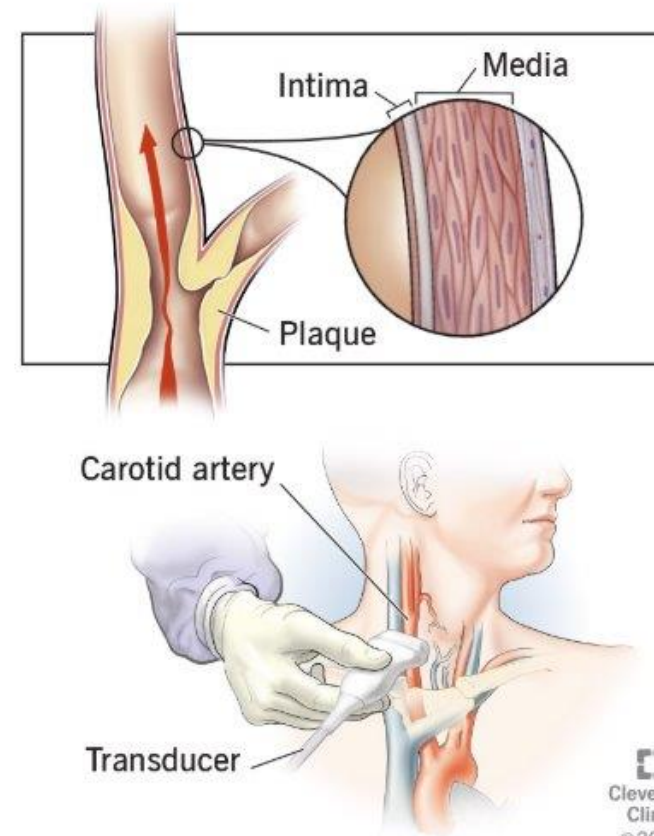


Zhao S, Kusminski CM, Scherer PE. Adiponectin, Leptin and Cardiovascular Disorders. Circ Res. 2021;128(1):136-149. doi:10.1161/CIRCRESAHA.120.314458

Leptin to Adiponectin Ratio (LAR)

- High LAR is more clinically sensitive for risks of metabolic syndrome, type II diabetes and CVD than levels of leptin or adiponectin alone
- Independent predictor of arterial intimal media thickness
- Even more concern for risk of CVD in conjunction with high hsCRP

Carotid Intima-Media Thickness Test (CIMT)



Leptin and Adiponectin Clinical Considerations

🌿 Elevated leptin

- 🌿 Decrease BMI, especially visceral adiposity (mindset, habits, medications, nutraceuticals, gut microbiome)
- 🌿 Lifestyle changes; Mediterranean diet, movement/exercise (at least 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity exercise per week)
- 🌿 Decrease fructose consumption, address insulin
- 🌿 Stress management: Chronic stress can contribute to elevated leptin levels and leptin resistance
- 🌿 Address sleep: Poor sleep habits and sleep deprivation have been linked to disruptions in leptin levels and appetite regulation

🌿 Low adiponectin

- 🌿 Considerations - weight reduction, regular exercise, and a diet rich in produce, fiber and unsaturated fats.
- 🌿 Improving insulin sensitivity and reduce inflammation

Case 3

🍏 71 yo F

🍏 Family hx:

- MGM died of MI in her 60s
- Mother died age 52 coronary artery disease
- M.aunt MI in her 40s and died of stroke in 60s

🍏 Familial hypercholesterolemia treated with 2 medications

🍏 BMI: 18.5



CardioMetabolic Profile; serum

LIPIDS/RATIOS	RESULT / UNIT	REFERENCE INTERVAL	CARDIOVASCULAR RISK		
			LOW RISK	MODERATE RISK	HIGH RISK
Total Cholesterol	131 mg/dL	< 200			
Triglycerides	53.0 mg/dL	< 150			
HDL Cholesterol	62 mg/dL	> 60			
LDL Cholesterol (calculated)	58.0 mg/dL	< 100			
VLDL Cholesterol (calculated)	8.0 mg/dL	< 30.0			
Non-HDL Cholesterol (calculated)	69 mg/dL	< 130			
OxLDL Cholesterol	20 U/L	< 60			
sdLDL Cholesterol (calculated)	16 mg/dL	< 35			
Lp(a)	130 mg/dL	< 30			
Total Cholesterol : HDL-C	2.1	< 4.0			
LDL-C : HDL-C	0.9	< 2.0			
OxLDL-C : LDL-C	0.35	< 0.45			
sdLDL-C : LDL-C	0.28	< 0.34			
Apo B : Apo A-1	0.40	< 0.80			
RISK FACTORS/INFLAMMATORY MARKERS					
PLAC (LP-PLA ₂ Activity)	111 U/L	< 151			
Homocysteine	6.3 µmol/L	< 11.0			
hsCRP	0.4 mg/L	< 1.0			
APOLIPOPROTEINS			PERCENTILE		
			2.5 th	16 th	50 th
Apolipoprotein A-1	153 mg/dL	115 - 220			
Apolipoprotein B	66 mg/dL	50 - 130			
METABOLIC RISK MARKERS					
Insulin	4.0 µIU/mL	2.8 - 18.0			
Glucose	85.6 mg/dL	70.0 - 100			
1,5-Anhydroglucitol (1,5 AG)	9.9 ug/mL	6.8 - 29			
*Leptin	1.6 ng/mL	4.0 - 39			
*Adiponectin	24 µg/mL	4.0 - 20			
Leptin : Adiponectin ratio	0.10	0.20 - 3.40			
Cystatin C	0.8 mg/L	0.5 - 1.5			
Creatinine	0.6 mg/dL	0.6 - 1.3			
eGFR (calculated)	100 mL/min	> 60			



Elevated Lp(a) - lipoprotein (a)

Genetic Lp(a)

- 🌱 LDL target <50
- 🌱 Niacin, aspirin

Suboptimal 1,5-AG (hyperglycemia)

- 🌱 Substitute allulose for ½ of the sugar in a recipe

Low creatinine

- 🌱 Include resistance training 2 to 3x per week
- 🌱 Protein 25 grams 3x per day

Retest in 4 to 6 months



CardioMetabolic Profile; serum

				CARDIOVASCULAR RISK				
LIPIDS/RATIOS	RESULT / UNIT		REFERENCE INTERVAL	LOW RISK	MODERATE RISK	HIGH RISK		
Total Cholesterol	153	mg/dL	< 200					
Triglycerides	66.0	mg/dL	< 150					
HDL Cholesterol	39	mg/dL	> 50					
LDL Cholesterol (calculated)	102	mg/dL	< 100					
VLDL Cholesterol (calculated)	11.0	mg/dL	< 30.0					
Non-HDL Cholesterol (calculated)	115	mg/dL	< 130					
OxLDL Cholesterol	53	U/L	< 60					
sdLDL Cholesterol (calculated)	25	mg/dL	< 35					
Lp(a)	20	mg/dL	< 30					
Total Cholesterol : HDL-C	4.0		< 4.0					
LDL-C : HDL-C	2.6		< 2.0					
OxLDL-C : LDL-C	0.52		< 0.45					
sdLDL-C : LDL-C	0.25		< 0.34					
Apo B : Apo A-1	0.90		< 0.80					
RISK FACTORS/INFLAMMATORY MARKERS								
PLAC (LP-PLA ₂ Activity)	187	U/L	< 151					
Homocysteine	10.1	μmol/L	< 11.0					
hsCRP	6.3	mg/L	< 1.0					
APOLIPOPROTEINS				PERCENTILE				
				2.5 th	16 th	50 th	84 th	97.5 th
Apolipoprotein A-1	104	mg/dL	115 - 220					
Apolipoprotein B	88	mg/dL	50 - 130					
METABOLIC RISK MARKERS								
Insulin	5.4	μIU/mL	2.8 - 18.0					
Glucose	85.8	mg/dL	70.0 - 100					
1,5-Anhydroglucitol (1,5 AG)	16	ug/mL	10 - 32					
*Leptin	4.6	ng/mL	1.8 - 20					
*Adiponectin	10	μg/mL	3.0 - 16					
Leptin : Adiponectin ratio	0.40		0.15 - 2.50					
Cystatin C	1.1	mg/L	0.5 - 1.5					
Creatinine	0.8	mg/dL	0.7 - 1.5					
eGFR (calculated)	96	mL/min	> 60					

Case 4

58yo M

Rx: GLP-1 agonist

58yo M on GLP-1 agonist

GLP-1 agonists have been associated with

- 🌱 Modest reductions in LDL-C, total cholesterol, and triglycerides
- 🌱 No significant improvement in HDL-C

Room for improvement:

- 🌱 Low HDL and Apo A-1
- 🌱 **High OxLDL: LDL**
- 🌱 **High hsCRP** and upper range PLAC
- 🌱 Suboptimal creatinine mbdt **low muscle mass**

Protect/build muscle:

- 🌱 Protein minimum 1.2gm per kg bodyweight
- 🌱 Resistance training 2 to 3 x per week all major muscle groups, progressively increasing load

Inflammation & Oxidative Stress

	Low HDL & ApoA1	High PLAC	High hsCRP	High OxLDL:LDL Ratio
Omega-3s	✓		✓	
Mediterranean Diet, soluble fiber	✓	✓	✓	✓
Exercise (150 min moderate intensity or 75 min vigorous intensity /wk)	✓	✓	✓	✓
Antioxidants (Vit E, Vit C, flavonoids, carotenoids, polyphenols, coQ10, glutathione)		✓		✓
Statins		✓	✓	✓

What if I don't like Mediterranean food?

Portfolio Diet:

- 🌱 The 2026 ACC/AHA dyslipidemia guideline cites the Portfolio diet as producing the largest diet-based LDL-C reduction (~26 mg/dL) among healthy eating patterns
- 🌱 Plant protein — soy and pulses/legumes (~50 g/day of soy protein in original trials)
- 🌱 Tree nuts and peanuts (~45 g/day)
- 🌱 Viscous (soluble) fiber — from oats, barley, psyllium, eggplant, okra (~20 g/day)
- 🌱 Plant sterols/stanols — ~2 g/day (sterol-enriched foods)
- 🌱 Monounsaturated fats and low saturated fat and dietary cholesterol

Prudent Diet:

- 🌱 Highest adherence decreased CVD incidence by 31% vs lowest, outperforming DASH and Mediterranean
- 🌱 High intake of fruits, vegetables, legumes, whole grains, fish, poultry, and low-fat dairy, with low intake of red/processed meat, refined grains, and sugar-sweetened beverages

Oxidized LDL; serum

RESULTS				
	Within	Outside	Reference Range	
Oxidized LDL		69	< 45	U/L

Cardiac Profiles

Cardiovascular Risk Profile; serum

LIPIDS/RATIOS	RESULT / UNIT	REFERENCE INTERVAL	CARDIOVASCULAR RISK		
			LOW RISK	MODERATE RISK	HIGH RISK
Total Cholesterol	196 mg/dL	< 200			
Triglycerides; serum	90.0 mg/dL	< 150			
HDL Cholesterol	81 mg/dL	> 60			
LDL Cholesterol (calculated)	97.0 mg/dL	< 100			
VLDL Cholesterol (calculated)	18.0 mg/dL	< 30.0			
Non-HDL Cholesterol (calculated)	115 mg/dL	< 130			
Oxidized LDL	35 U/L	< 45			
Small dense LDL Cholesterol*	62 mg/dL	< 35			
Lp(a)	< 5 mg/dL	< 30			
Total Cholesterol : HDL-C	2.4	< 4.0			
LDL-C : HDL-C	1.2	< 2.0			
Oxidized LDL : LDL-C	0.4	< 0.8			
Small dense LDL-C : LDL-C	0.64	< 0.34			
Apo B : Apo A-1	0.9	< 0.8			
RISK FACTORS/INFLAMMATORY MARKERS					
PLAC (LP-PLA ₂ Activity)	166 nmol/mn/mL	< 151			
Homocysteine; serum	18.9 µmole/L	< 11.0			
CRP (Hs); serum	0.4 mg/L	< 1.0			
APOLIPOPROTEINS					
Apolipoprotein A-1; serum	161 mg/dL	115– 220			
Apolipoprotein B; serum	148 mg/dL	50– 130			

Metabolomic Profile; serum

	RESULT / UNIT		REFERENCE INTERVAL		LOW		RISK MODERATE		HIGH	
CRP(hs)	2.1	mg/L	<	1.0						
					HIGH	MOD	RISK LOW		MOD	HIGH
Glucose	110	mg/dL	70.0–	100						
1,5-Anhydroglucitol (1,5 AG)	7.6	ug/mL	10–	32						
Insulin	5.9	µIU/mL	2.8–	14.0						
*Leptin	1.1	ng/mL	1.8–	20						
*Adiponectin	4.1	µg/mL	3.0–	16						
Leptin : Adiponectin ratio	0.3		0.4–	2.0						
Body Mass Index (BMI)	22.8		18.5–	30.0						
Cystatin C	0.8	mg/L	0.5–	1.5						
Creatinine	1.2	mg/dL	0.7–	1.5						
eGFR (calculated)	60	mL/min	>	60						

Metabolomic Profile: Risk of developing MetS



BLOOD DRAW SERVICES

NOW AVAILABLE - U.S. ONLY

MOMS
MY ONE MEDICAL SOURCE®



SCAN HERE TO LEARN MORE

Step 1

Schedule Your Appointment

If your doctor has prescribed bloodwork or if you need to have a specimen collection performed by a medically trained specialist, please type the name of the lab or client the order is for to begin:

Doctor's Data, Inc.



Step 2

Select Panel

Please enter your panels in the field below.

Add Panel

Step 3

Select a Location

Please enter your zip code to view availability at a MAP: Medical Access Point/Provider™. You may also select Mobile Options and have the specimen collection performed out of the comfort of your home or office.

MAP Visit

Please enter a valid Zip Code/Address

☐ I agree to MOMS [Patient Privacy Policy](#) and [Terms of Service](#).

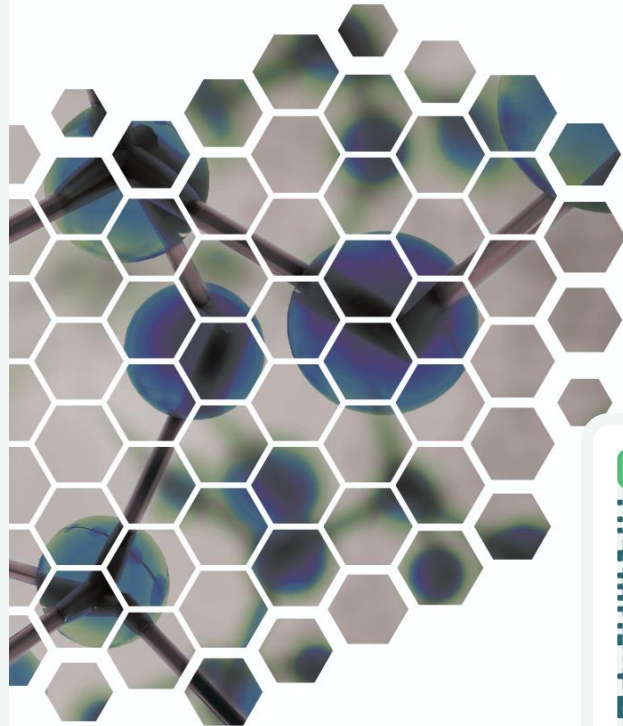
NEXT

Additional Considerations

- GI360
- Toxic & Essential Elements (Urine, Hair, Blood)
- HuMap
- Comprehensive Hormone Profile
- Vitamin D
- Methylation Profile



CardioMetabolic Profile
RESOURCE GUIDE



**CardioMetabolic Profile
Resource Guide**



Questions?

Thank you for your time.