

HEART ATTACK PREVENTION

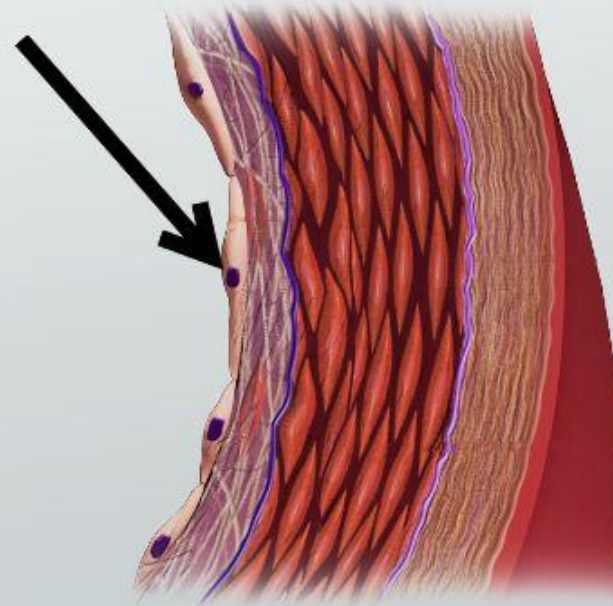
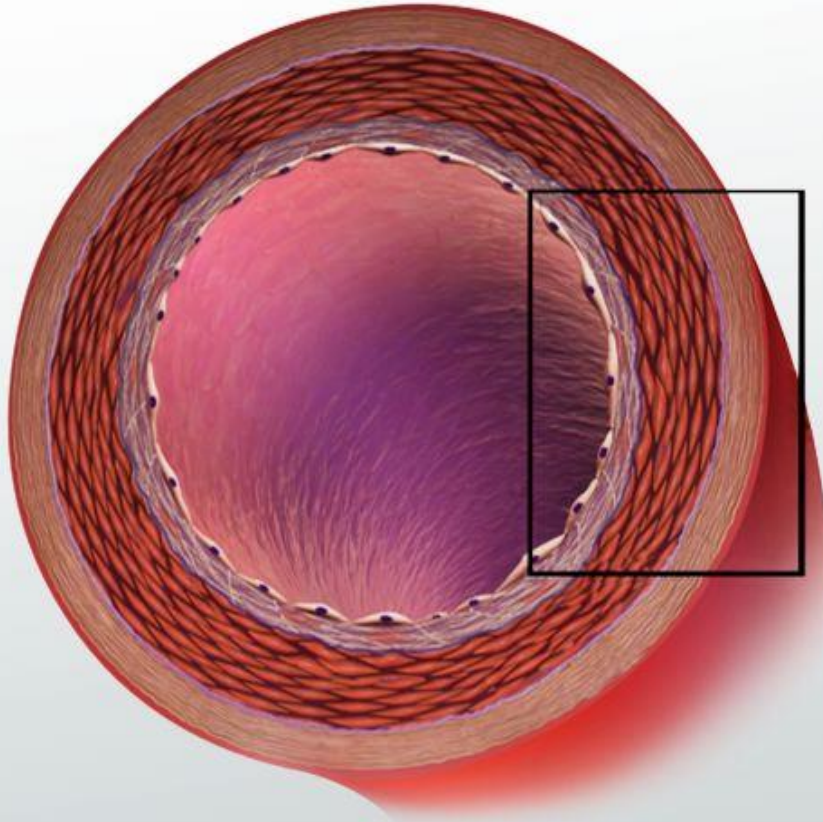
WORKSHOP

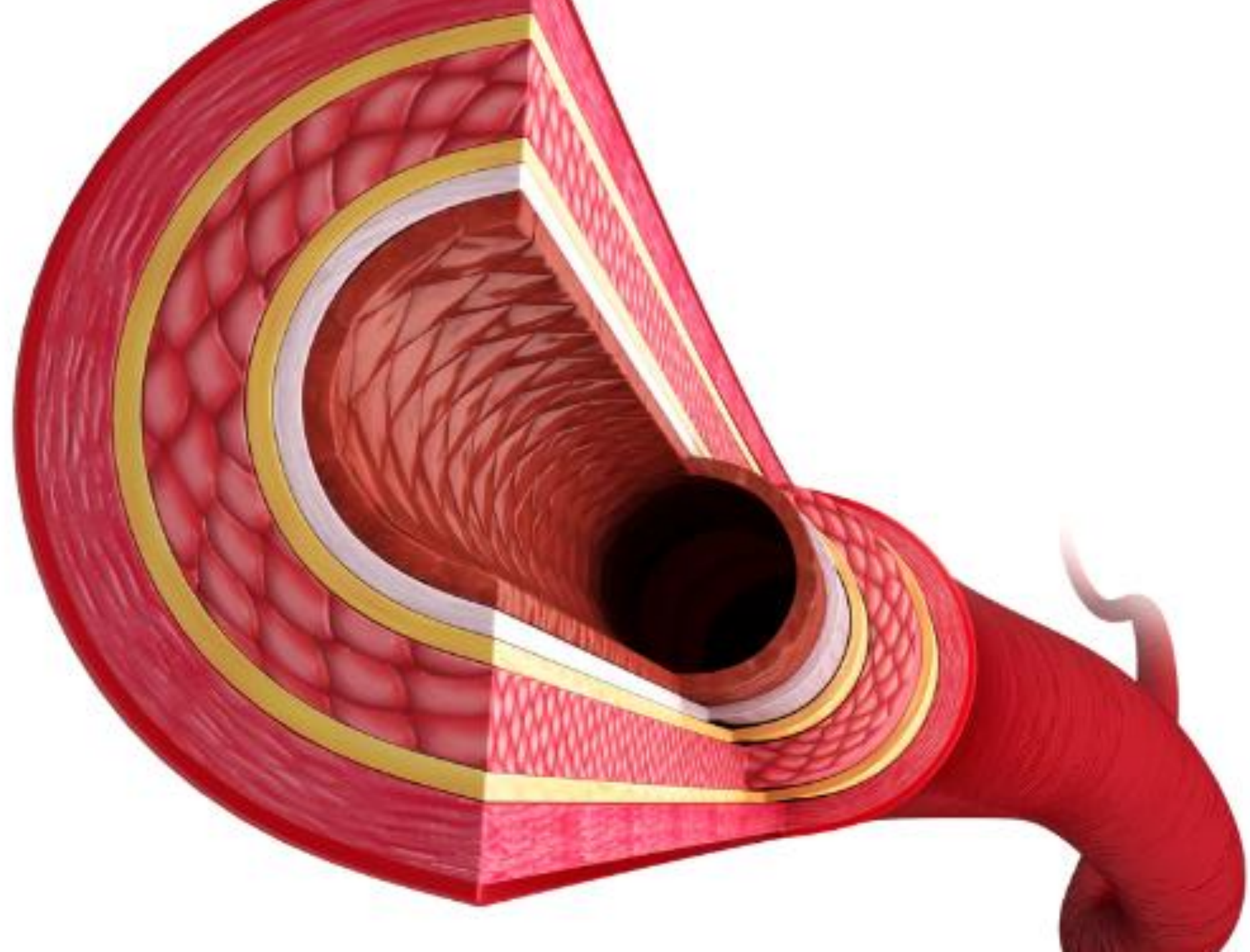


WHAT ARE ENDOTHELIAL CELLS?

endothelium

they form a one-cell-thick



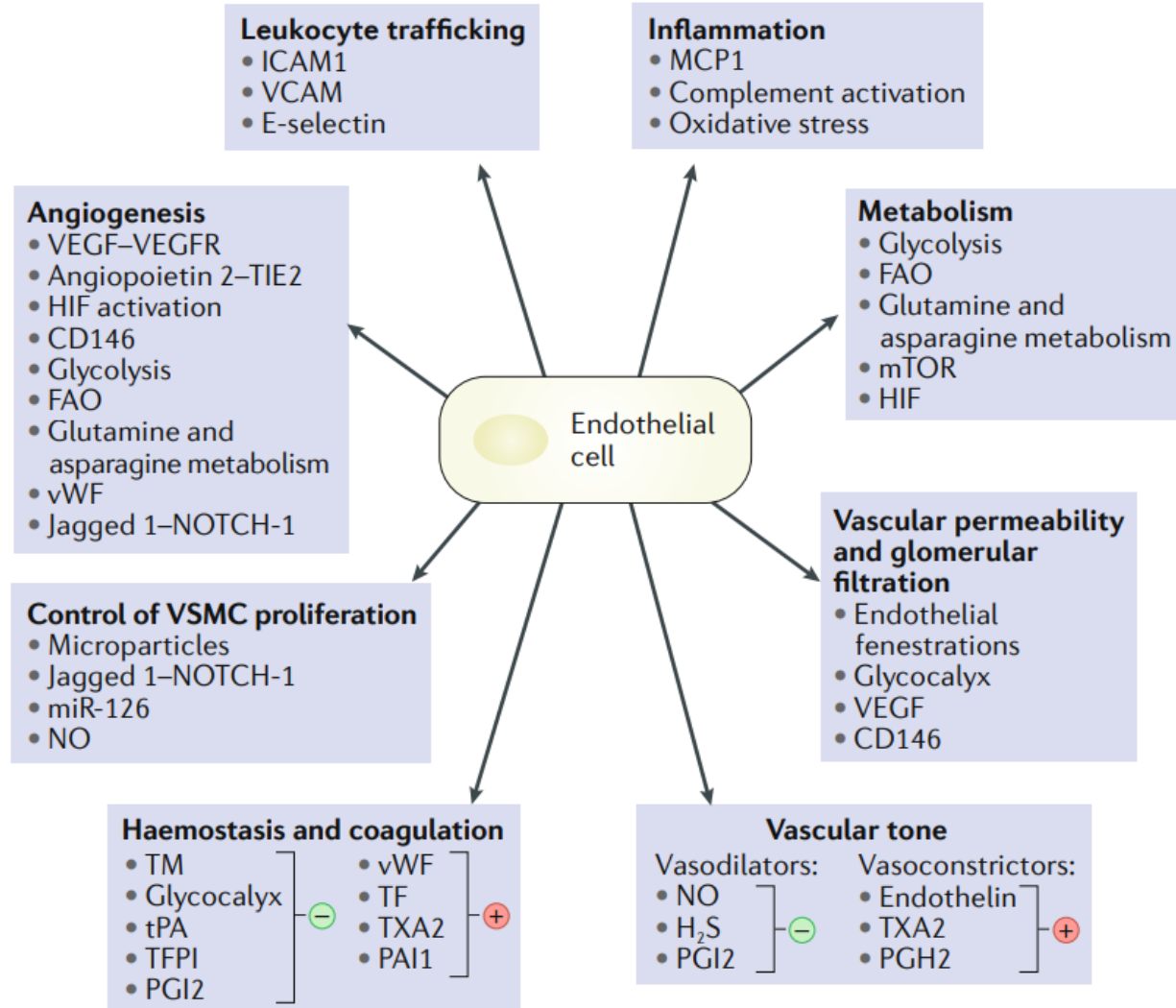


Surface Area of Vascular Endothelium

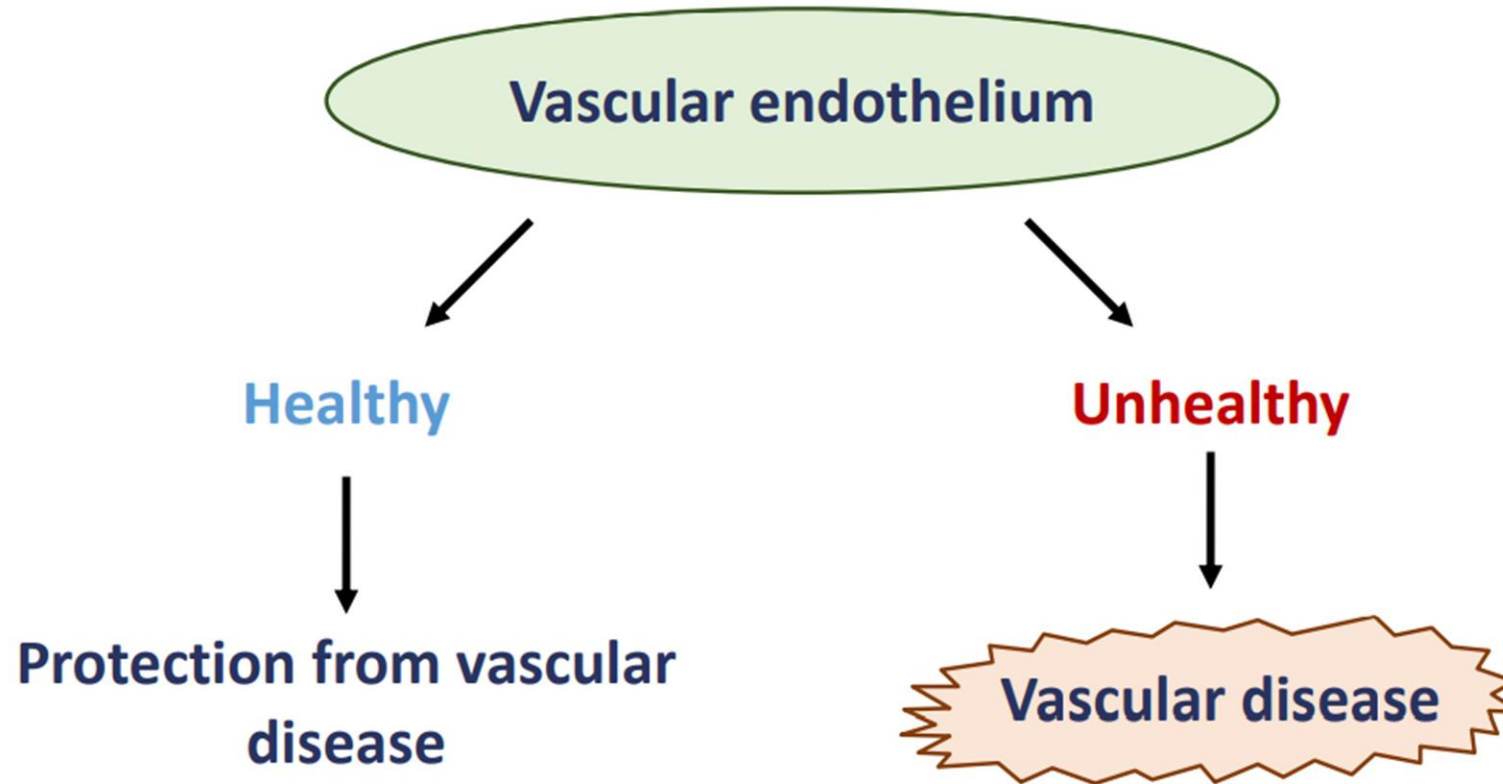
The vascular endothelium makes up 14,000 square feet of surface area (6 ½ tennis courts).



Your endothelium is an ENDOCRINE grand



Vascular Disease Simplified



The expression of vascular disease, primarily atherosclerosis, is a response to inflammation and injury within the arterial wall only after the endothelium has lost its ability to maintain structure and function.

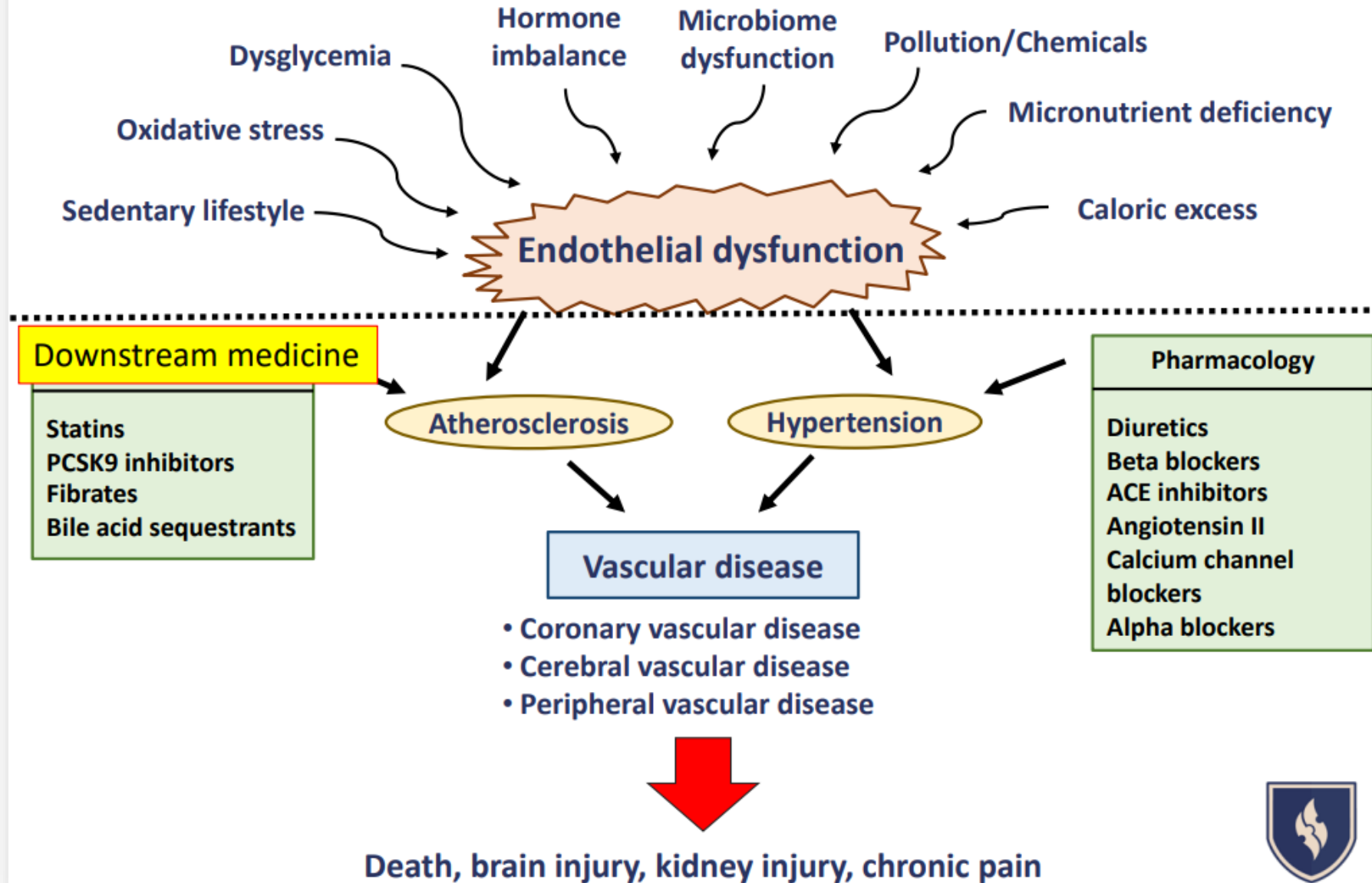
The Top 10 Most Common Drugs by Total Prescriptions in U.S.A.

Red font = Cholesterol lowering or blood pressure lowering medication

- 1. Lisinopril: 104 million prescriptions**
- 2. Atorvastatin: 104 million prescriptions**
3. Levothyroxine: 101.9 million prescriptions
4. Metformin: 78.6 million prescriptions
- 5. Amlodipine: 72.5 million prescriptions**
- 6. Metoprolol: 68 million prescriptions**
7. Omeprazole: 58.8 million prescriptions
- 8. Simvastatin: 56.7 million prescriptions**
- 9. Losartan: 52 million prescriptions**
10. Albuterol: 50 million prescriptions

Annual Cost of Cardiovascular Disease in U.S.A. = \$363,000,000,000

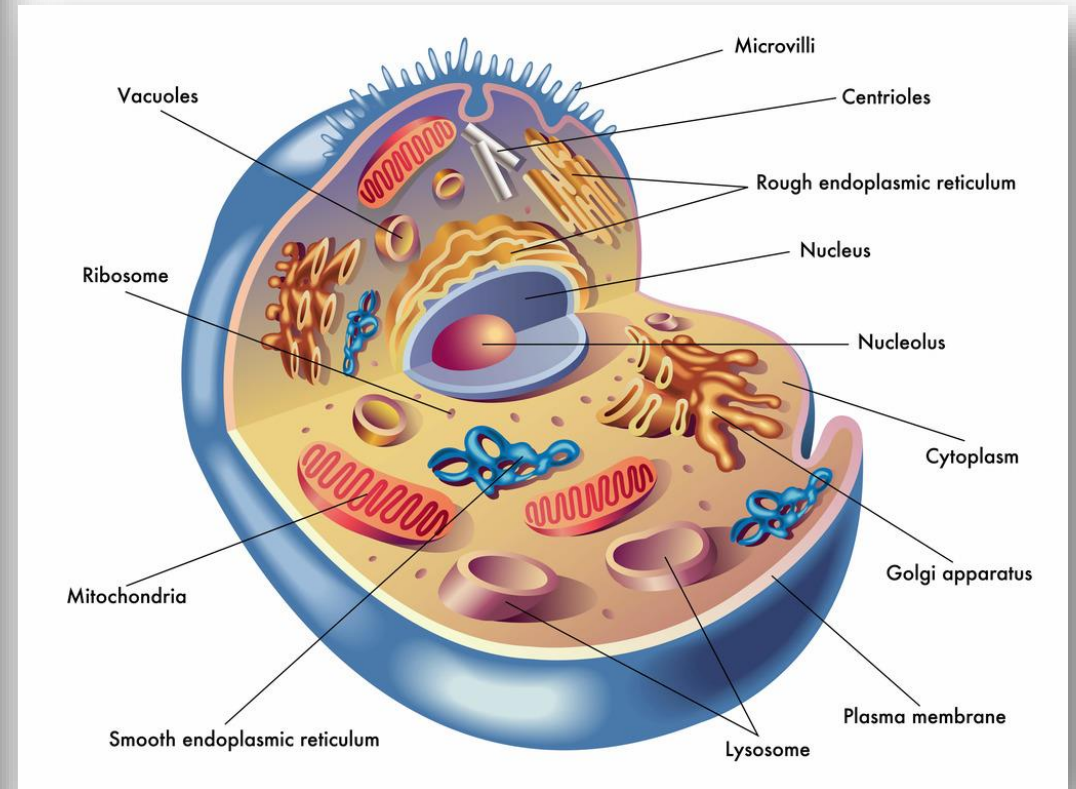
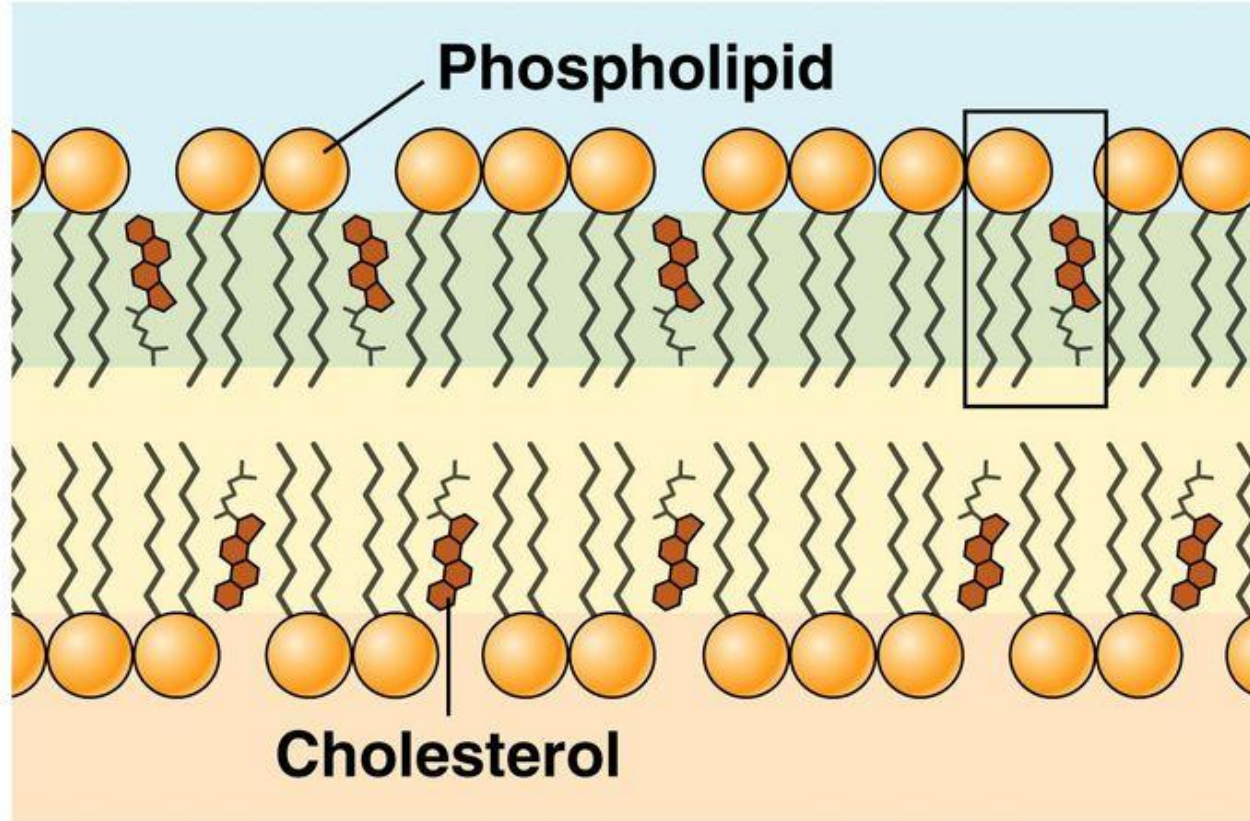
Ignoring Upstream Mechanisms of CVD



Key Concept

Vascular disease is not about cholesterol levels, special diets, statins, nutritional supplements, etc.

It is all about keeping the vascular epithelium healthy!!!!

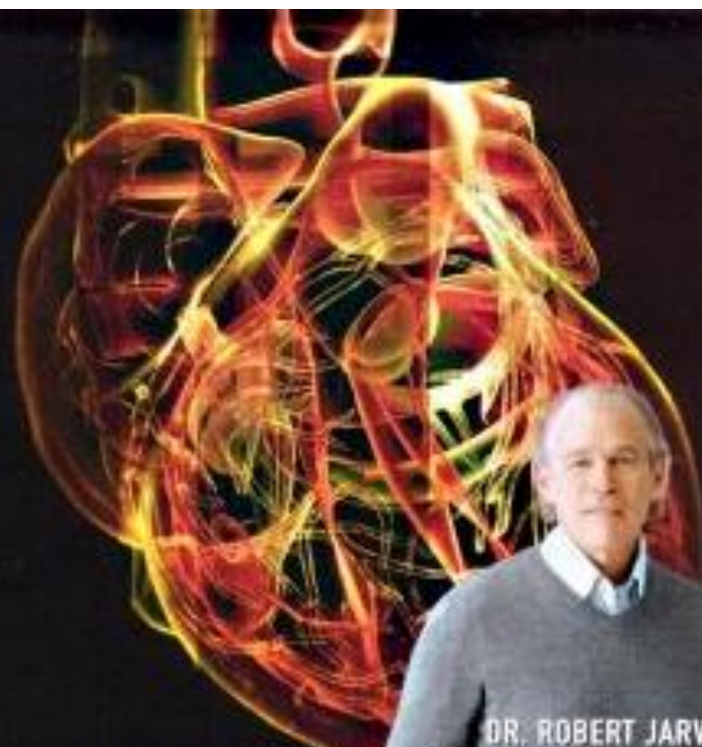




In patients with multiple risk
factors for heart disease,

Lipitor
reduces risk *of*
heart attack
by **36%***

If you have risk factors such as family
history, high blood pressure, age, low
HDL ('good' cholesterol) or smoking.



DR. ROBERT JARVIK
~Inventor of the Jarvik Artificial Heart
and Lipitor User

*That means in a large clinical study,
3% of patients taking a sugar pill or
placebo had a heart attack compared
to 2% of patients taking Lipitor.



LIPITOR®
atorvastatin calcium
tablets

*That means in a large clinical study, 3% of patients taking a sugar pill or placebo had a heart attack compared to 2% of patients taking Lipitor.

IF YOU HAVE HIGH CHOLESTEROL,

Important Safety Information about CRESTOR:

In adults, CRESTOR is prescribed along with diet for lowering high cholesterol. CRESTOR is also prescribed along with diet to slow the progression of atherosclerosis (the buildup of plaque in arteries) as part of a treatment plan to lower cholesterol to goal. CRESTOR has not been determined to prevent heart disease, heart attacks, or strokes.

can start in early adulthood

- High cholesterol, family history of early heart disease, diabetes, and high blood pressure may play a role in the buildup of plaque
- CRESTOR® (rosuvastatin calcium), along with diet, ▼ lowers bad cholesterol and ▲ raises the good. And CRESTOR is approved to slow the progression of atherosclerosis in adults as part of a treatment plan to lower cholesterol to goal

Talk to your doctor – and find out if it's time for CRESTOR.

Important Safety Information about CRESTOR:

In adults, CRESTOR is prescribed along with diet for lowering high cholesterol. CRESTOR is also prescribed along with diet to slow the progression of atherosclerosis (the buildup of plaque in arteries) as part of a treatment plan to lower cholesterol to goal. CRESTOR has not been determined to prevent heart disease, heart attacks, or strokes.

CRESTOR is not right for everyone, including anyone who has previously had an allergic reaction to CRESTOR, anyone with liver problems, or women who are nursing, pregnant, or who may become pregnant. Your doctor will do blood tests before and during treatment with CRESTOR to monitor your liver function. Unexplained muscle pain and weakness could be a sign of a rare but serious side effect and should be reported to your doctor right away. The 40-mg dose of CRESTOR is only for patients who do not reach goal on 20 mg. Be sure to tell your doctor if you are taking any medications. Side effects occur infrequently and include headache, muscle aches, abdominal pain, weakness, and nausea.

Please read the important product information about CRESTOR on the adjacent page.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch, or call 1-800-FDA-1088.

If you can't afford your medication, AstraZeneca may be able to help.

IT'S TIME.™

800-CRESTOR CRESTOR.COM



CRESTOR®
rosuvastatin calcium

AstraZeneca

Review

How statistical deception created the appearance that statins are safe and effective in primary and secondary prevention of cardiovascular disease

David M Diamond  & Uffe Ravnskov

Pages 201-210 | Published online: 12 Feb 2015

 Download citation  <https://doi.org/10.1586/17512433.2015.1012494>



<https://www.tandfonline.com/doi/abs/10.1586/17512433.2015.1012494?journalCode=ierj20>

May 22, 2017 | 2 min read

SAVE 

Statins yielded no benefit for primary cardiovascular prevention in older adults

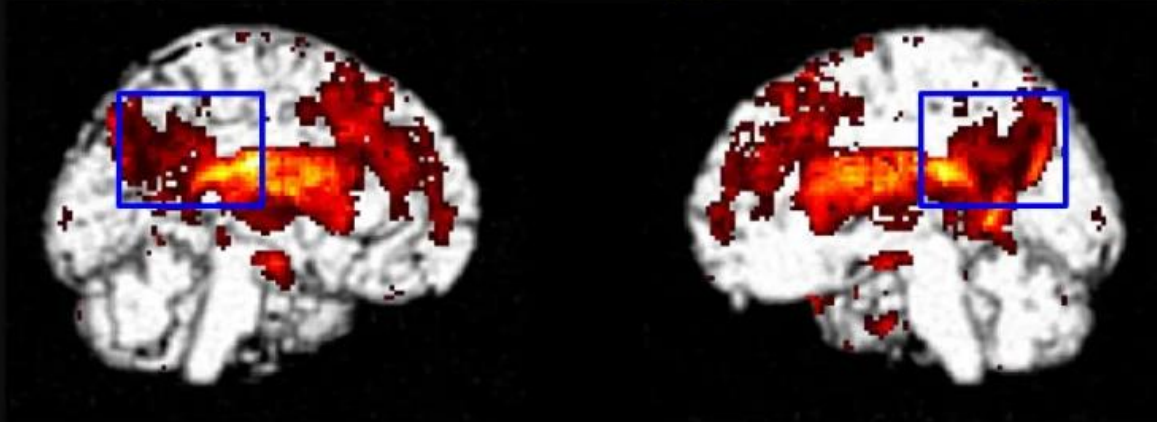
<https://www.healio.com/news/primary-care/20170522/statins-yielded-no-benefit-for-primary-cardiovascular-prevention-in-older-adults>

Statins Used to Lower Cholesterol Linked to Doubled Risk of Developing Dementia

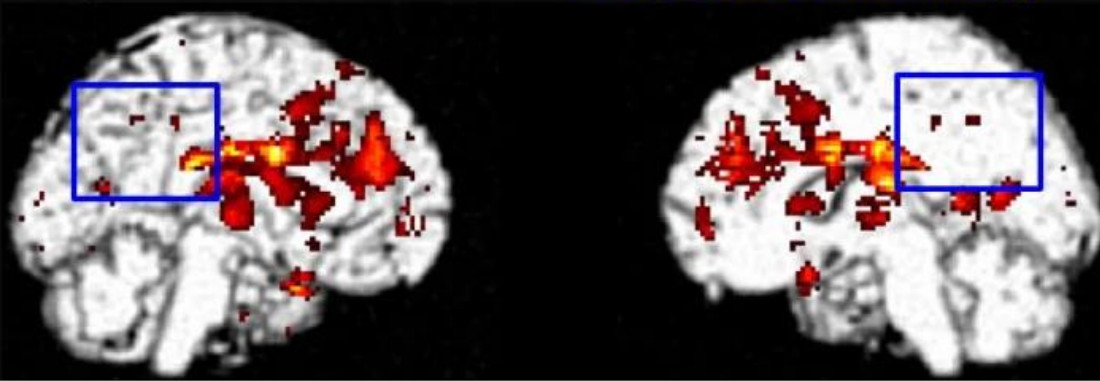
TOPICS: Alzheimer's Brain Cardiology Cholesterol Dementia Neuroscience Popular

By SOCIETY OF NUCLEAR MEDICINE AND MOLECULAR IMAGING JUNE 28, 2021

Significant metabolic decline, **lipophilic statin therapy**

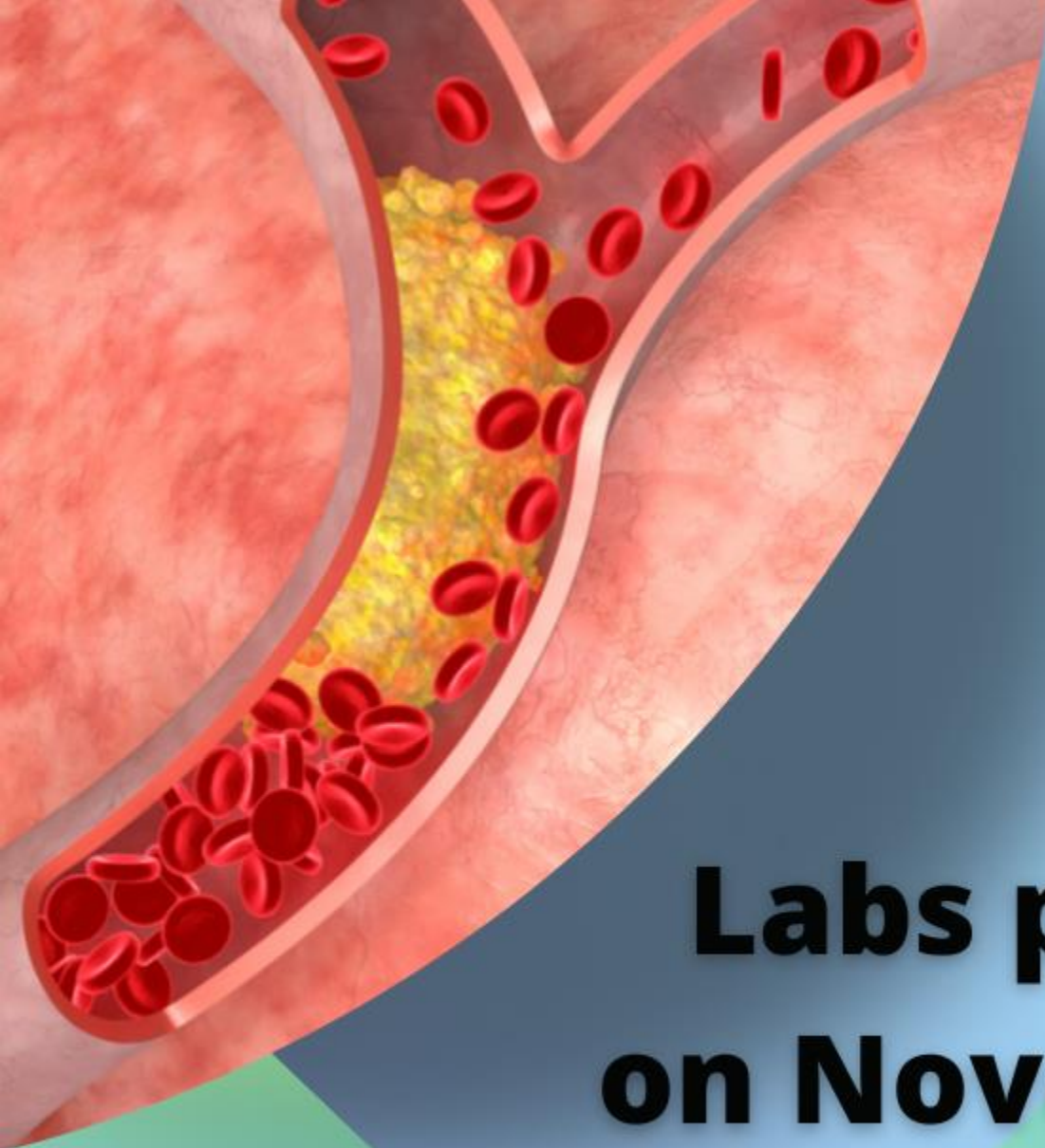


Significant metabolic decline, **no lipophilic statin therapy**



June 28th 2021

<https://scitechdaily.com/statins-used-to-lower-cholesterol-linked-to-doubled-risk-of-developing-dementia/>



NMR \$50

Homocysteine \$18

Insulin \$10

CRP\$ 12

A1c \$8

Magnesium \$12

draw fee \$10

**Labs plus group review
on Novemeber 2nd at 6pm**

\$250



**Quest
Diagnostics**

Do not use address below:

P.O. Box 7306
Hollister, MO 65673-7306

Laboratory Invoice

Page 2 of 2

For services not included in your physician's bill

Invoice Date:	Amount Due:	Due Date:
Sep. 18, 2013	\$1,586.17	Oct. 09, 2013

Invoice Number	Lab Code
2039581956	WDL

Patient Name:	HUGH WEGWERTH
Responsible Party:	HUGH WEGWERTH
Date of Service:	September 13, 2013

**Lab Results and Diagnosis Questions Must Be
Answered By Your Physician.**

Date	CPT Code *	Test Description	Charge	Insurance Discount	Insurance Paid	Medicare/Medicaid Paid	Patient Paid	Patient Owes
09/13/13	84439	THYROXINE, FREE	\$140.61					
09/13/13	84436	THYROXINE	\$47.59					
09/13/13	84478	TRIGLYCERIDES	\$41.10					
09/13/13	84443	TSH	\$125.47					
09/13/13	84550	URIC ACID (SR)	\$41.10					
09/13/13	36415	VENIPUNCTURE	\$20.55					
09/13/13	85025	CBC, PLT, DIFF	\$40.56					
09/13/13	86141	CRP; HIGH SENSITIVITY	\$50.00					
09/13/13	82306	25-OH VITAMIN D-3	\$232.54					
09/13/13	84481	T-3, FREE	\$217.40					
09/13/13	84100	PHOSPHORUS	\$20.03					
09/13/13	80053	COMPREHEN METABOLIC PANEL	\$44.64					
Tax ID: 36-4257926 ICD-9 Codes:			\$1,586.17	\$0.00	\$0.00	\$0.00	\$0.00	\$1,586.17

Services Performed by: QUEST DIAGNOSTICS WOOD DALE WOOD DALE, IL

Services Performed by: QUEST DIAGNOSTICS NEW BRIGHTON PSC/RRL NEW BRIGHTON, MN

* The CPT codes provided are based on AMA guidelines and without regard to specific payor requirements

3700 Silver Lake Rd NE, St Anthony, MN 55421
5 minute drive





FATING INSULIN LEVELS

Healthy range for fasting insulin is around 5. **This person in at 41!!!**




Insulin (004333)		\$10.00
------------------	--	---------



Review

Hyperinsulinemia and Its Pivotal Role in Aging, Obesity, Type 2 Diabetes, Cardiovascular Disease and Cancer

Joseph A. M. J. L. Janssen 

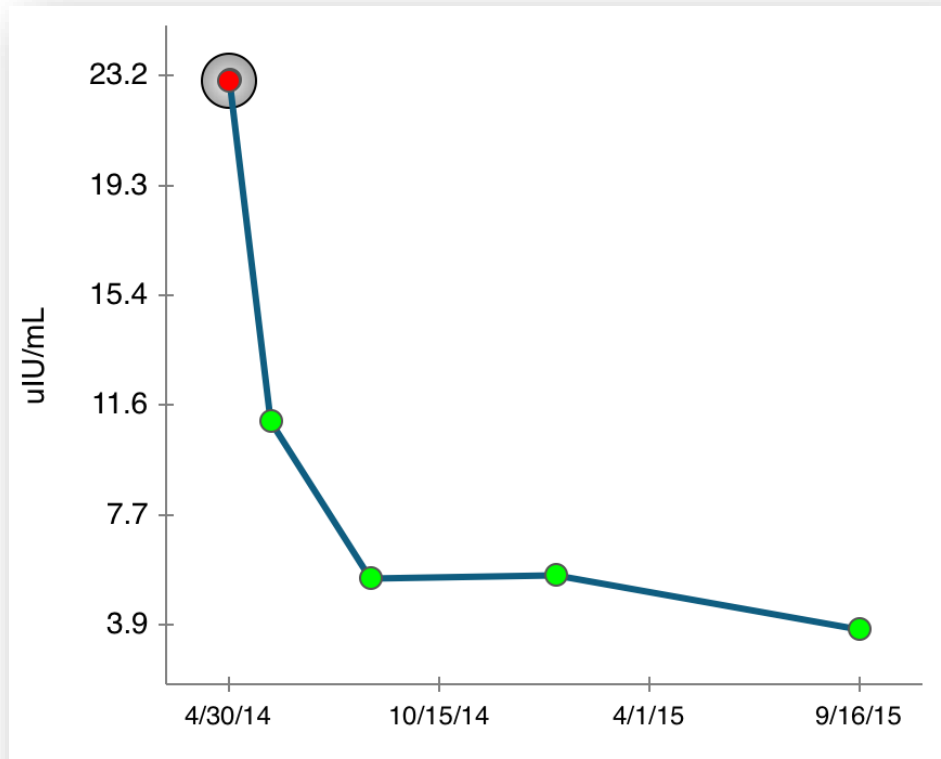
186 references

<https://www.mdpi.com/1422-0067/22/15/7797>

May 2021

“There is considerable evidence that hyperinsulinemia is the common factor in the development of metabolic syndrome, type 2 diabetes, cardiovascular disease, cancer and premature mortality and also plays an essential role in age-related decline. Therefore, interventions that reduce hyperinsulinemia might play a key role in the prevention and treatment of age-related decline, obesity, type 2 diabetes, cardiovascular disease and cancer. ***An important component of future research should be to study which (new) strategies are the best for preventing/managing hyperinsulinemia***

<https://www.mdpi.com/1422-0067/22/15/7797>



9/16/15, 11:26 AM

3.7

2.0-19.6 uIU/mL

1/16/15, 10:19 AM

5.6

2.0-19.6 uIU/mL

8/21/14, 11:27 AM

5.5

2.0-19.6 uIU/mL

6/2/14, 10:51 AM

11

<23 uIU/mL



4/30/14, 12:34 PM

23 H
<23 uIU/mL



Insulin

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ Insulin ⁰¹	41.8	High		uIU/mL	2.6-24.9

2

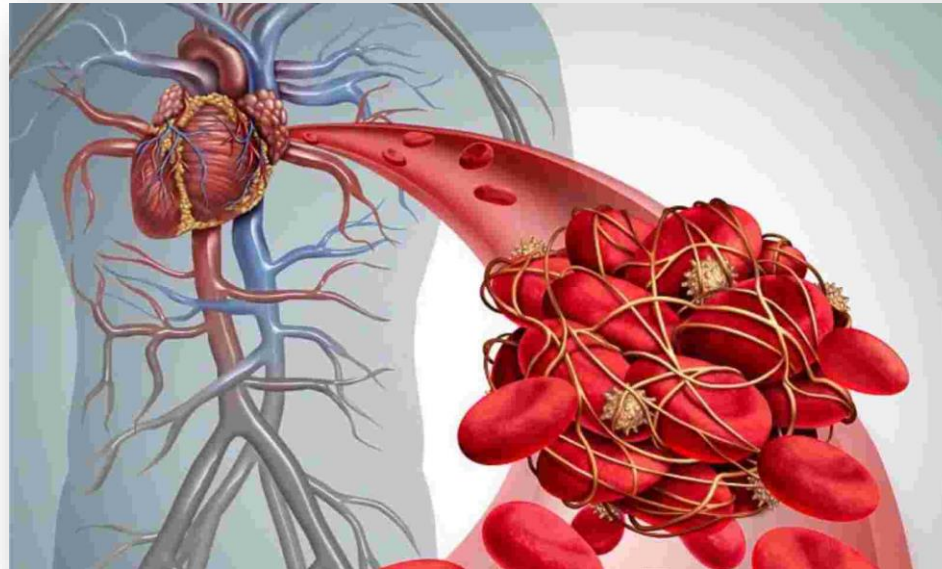
HOMOCYSTEINE

Healthy range in 5 to 6. This is a brain inflammatory marker. **This person is at 41!**



Homocyst(e)ine (706994)

\$18.00



[Nutr J.](#) 2015; 14: 6.

Published online 2015 Jan 10. doi: [10.1186/1475-2891-14-6](https://doi.org/10.1186/1475-2891-14-6)

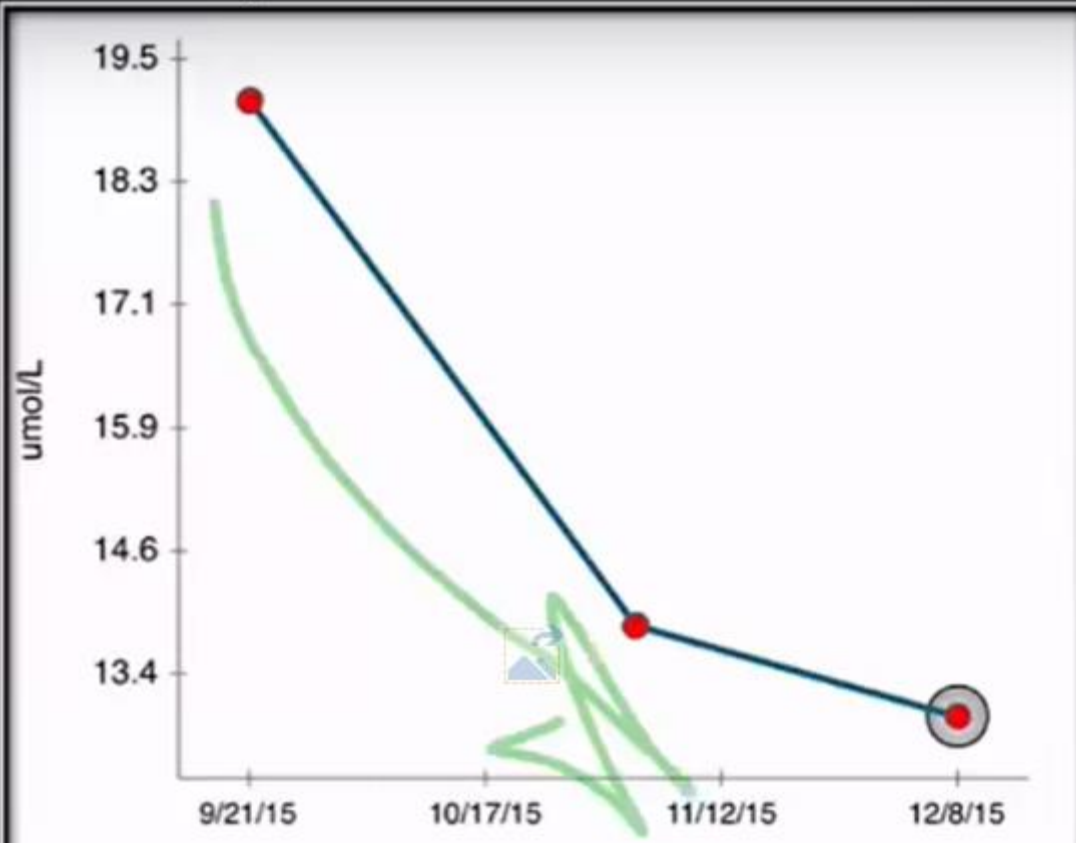
Role of homocysteine in the development of cardiovascular disease

[Paul Ganguly](#) and [Sreyoshi Fatima Alam](#)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4326479/>

The published literature indicates that homocysteine is an independent cardiovascular disease risk factor modifiable by nutrition and exercise. However, it is now widely accepted that food sources alone cannot consistently supply the levels of nutrients necessary to sustain optimal homocysteine metabolism. In fact, emerging studies are uncovering novel nutritional strategies for lowering high homocysteine levels offering new possibilities for preventing cardiovascular disease.

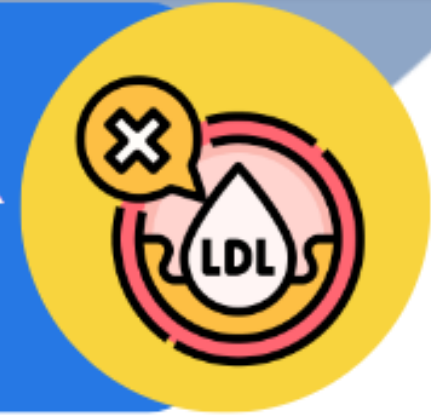
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4326479/>



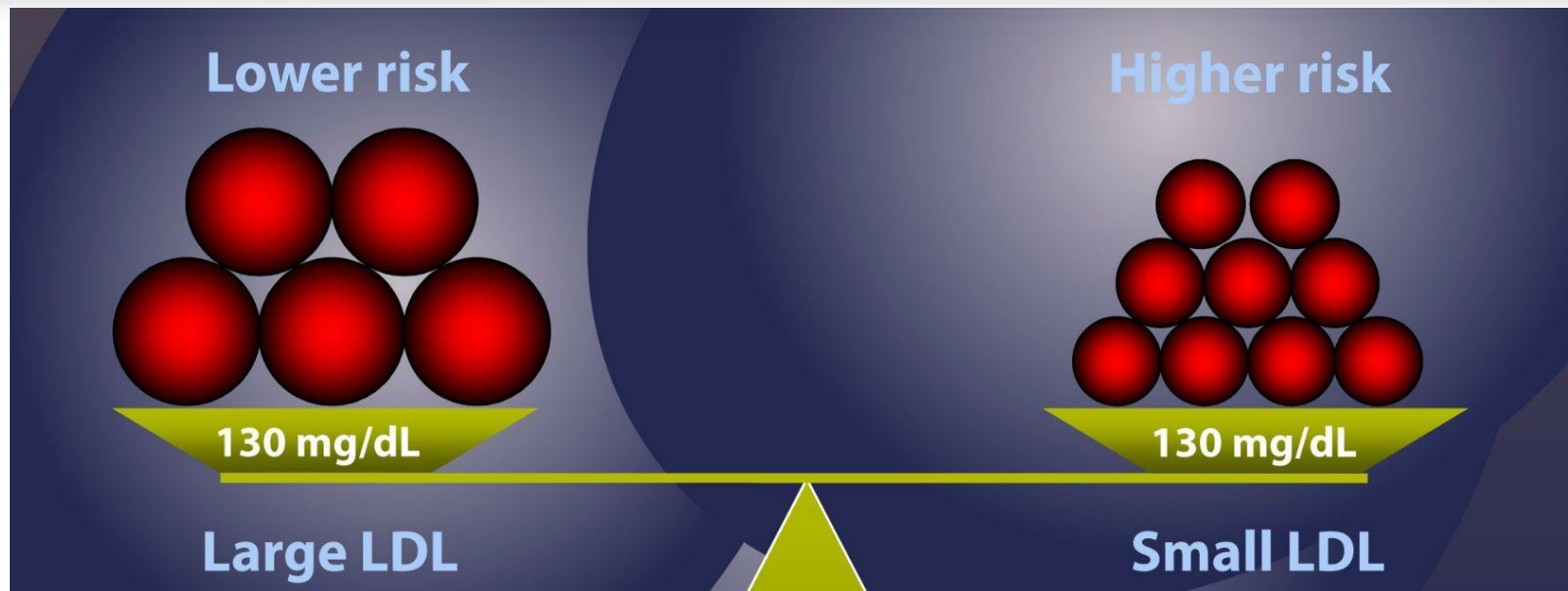
⚠	12/8/15, 9:19 AM	13.0 H <11.4 $\mu\text{mol/L}$	✓
⚠	11/3/15, 12:00 AM	13.9 H <11.4 $\mu\text{mol/L}$	
⚠	9/21/15, 3:00 PM	19.1 H <11.4 $\mu\text{mol/L}$	

3

LDL PARTICLE NUMBER "THE BAD"

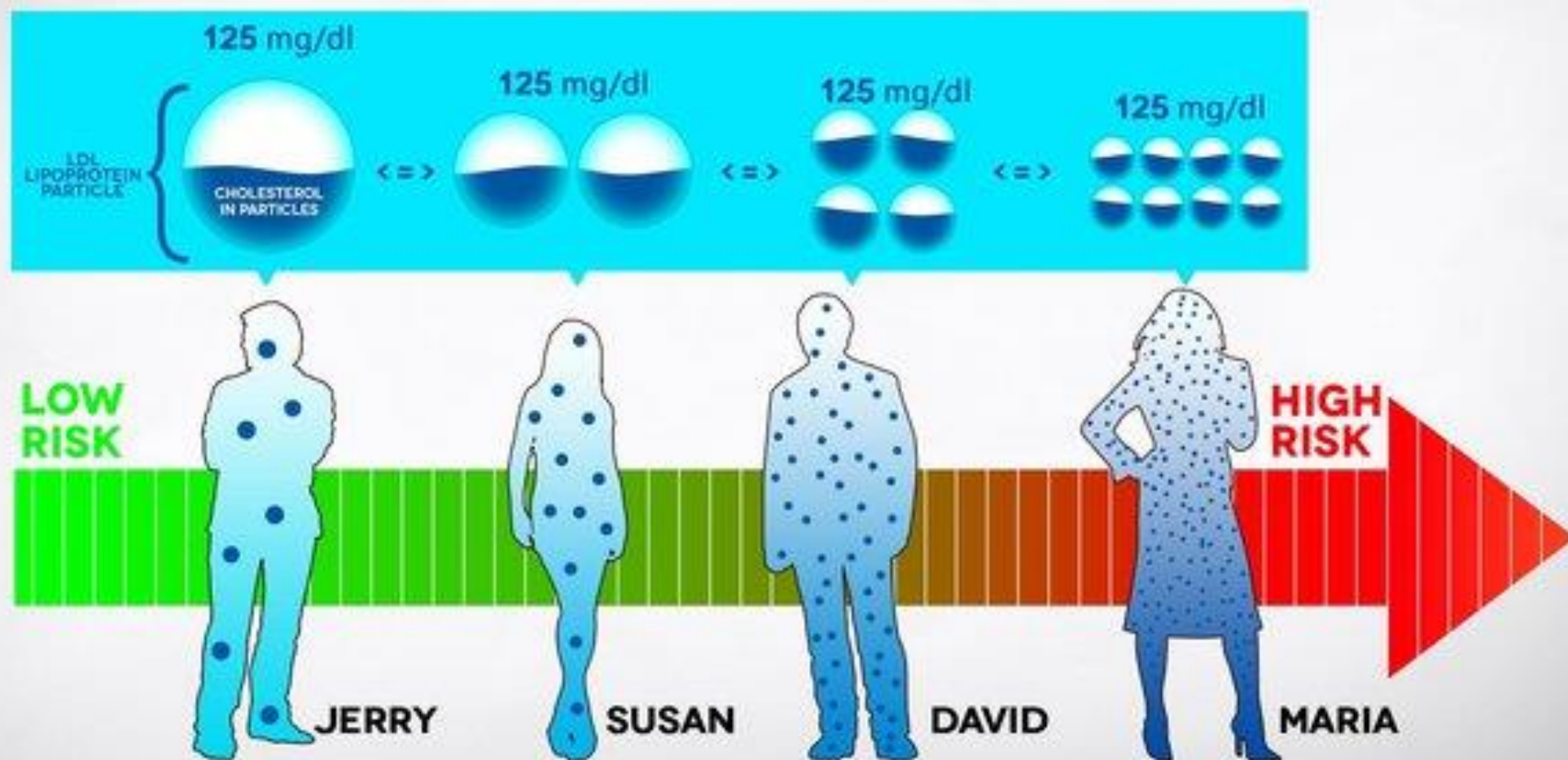


768 NMR LipoProfile® With Insulin Resistance Markers (With Graph) (123638) \$50.00



LIPOPROTEIN PARTICLES VS. CHOLESTEROL

EACH PATIENT SHOWN HAS THE SAME LDL CHOLESTEROL OF 125 mg/dL (3.25 mmol/L)
MARIA HAS THE HIGHEST RISK BECAUSE HER LDL PARTICLES ARE SMALLEST AND SHE HAS A LOT OF THEM



LIPID PANEL WITH RATIOS

CHOLESTEROL, TOTAL

203 H

<200 mg/dL

HDL CHOLESTEROL

47

> OR = 40 mg/dL

TRIGLYCERIDES

65

<150 mg/dL

LDL-CHOLESTEROL

140 H

mg/dL (calc)

Reference range: <100

Desirable range <100 mg/dL for primary prevention;
<70 mg/dL for patients with CHD or diabetic patients
with > or = 2 CHD risk factors.

LDL-C is now calculated using the Martin-Hopkins
calculation, which is a validated novel method providing
better accuracy than the Friedewald equation in the
estimation of LDL-C.

Martin SS et al. JAMA. 2013;310(19): 2061-2068

(<http://education.QuestDiagnostics.com/faq/FAQ164>)

NMR LipoProfile® test

NMR LipoProfile® test		Reference Range ¹				
		Percentile ¹	20th	50th	80th	95th
nmol/L		Low	Moderate	Borderline High	High	Very High
LDL-P (LDL Particle Number)	1600	< 1000	1000 - 1299	1300 - 1599	1600 - 2000	> 2000

1. Reference population (5,362 men and women) not on lipid medication enrolled in the Multi-Ethnic Study of Atherosclerosis (MESA). Mora, et al. Atherosclerosis 2007.



[PLoS One](#). 2020; 15(11): e0241993.

PMCID: PMC7652325

Published online 2020 Nov 9. doi: [10.1371/journal.pone.0241993](https://doi.org/10.1371/journal.pone.0241993)

PMID: [33166340](https://pubmed.ncbi.nlm.nih.gov/33166340/)

Association of small, dense LDL-cholesterol concentration and lipoprotein particle characteristics with coronary heart disease: A systematic review and meta-analysis

[Lathan Liou](#), Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft* and [Stephen Kaptoge](#), Supervision, Validation, Writing – review & editing

Andreas Zirlik, Editor

► [Author information](#) ► [Article notes](#) ► [Copyright and License information](#) [Disclaimer](#)

Associated Data

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7652325/>

The findings show a positive association between small dense LDL levels and CHD.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7652325/>

LDL-C \neq LDL-P

For many people, LDL-C does not accurately estimate LDL-P.
Two people with the same LDL-C can have different LDL-P.

Alex, 42

LDL-C : 94

LDL-P : 923



Bryan, 42

LDL-C : 94

LDL-P : 1806



4

LDL SIZE

size matters



768 NMR LipoProfile® With Insulin Resistance Markers (With Graph) (123638)

\$50.00

Review

➤ Curr Opin Lipidol. 2022 Jun 1;33(3):160-166. doi: 10.1097/MOL.0000000000000824.

Epub 2022 Mar 11.

Small dense low-density lipoprotein particles: clinically relevant?

Ronald M Krauss ¹

Affiliations + expand

PMID: 35276699 PMCID: PMC9197986 (available on 2023-06-01)

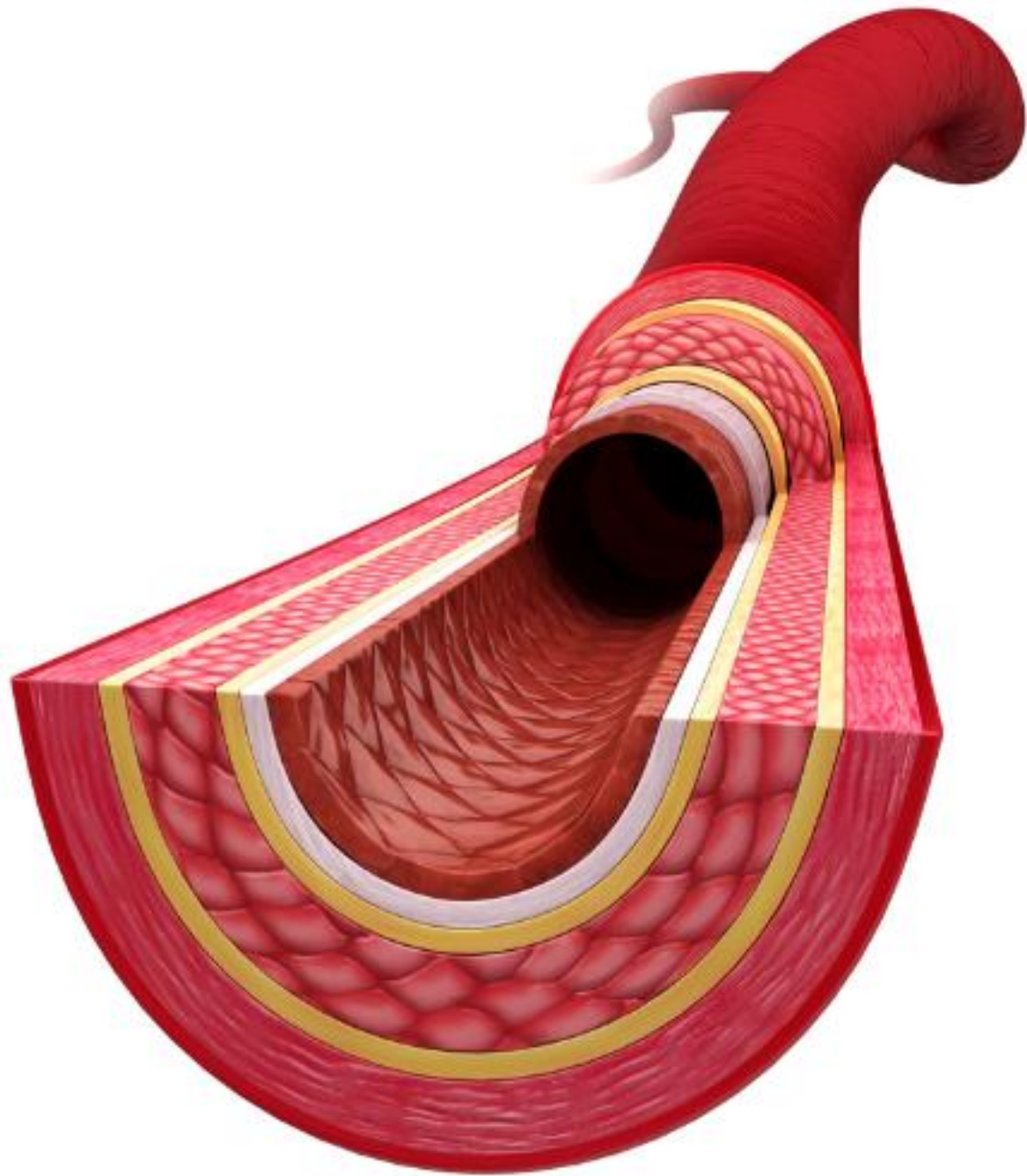
DOI: 10.1097/MOL.0000000000000824

<https://pubmed.ncbi.nlm.nih.gov/35276699/>

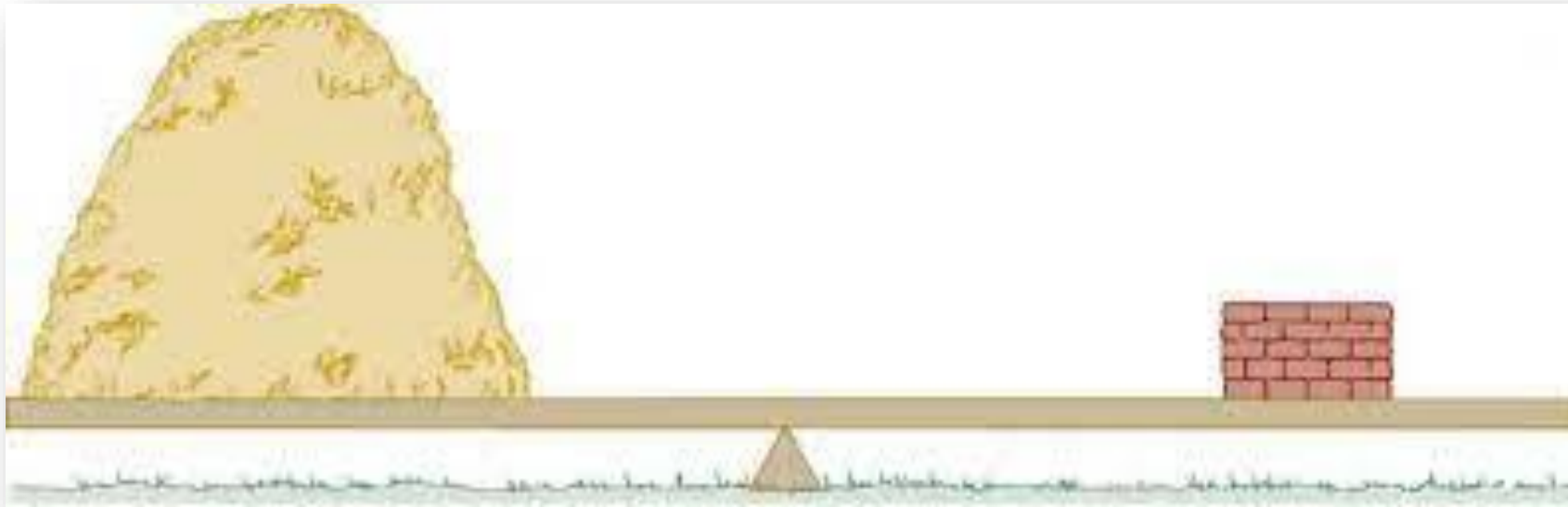
Summary: A growing body of data points to small dense LDL concentration as a significant determinant of CVD risk. Although future studies should be aimed at determining the clinical benefit of reducing small dense LDL levels, there is sufficient evidence to warrant consideration of small dense LDL measurement in assessing and managing risk of cardiovascular disease

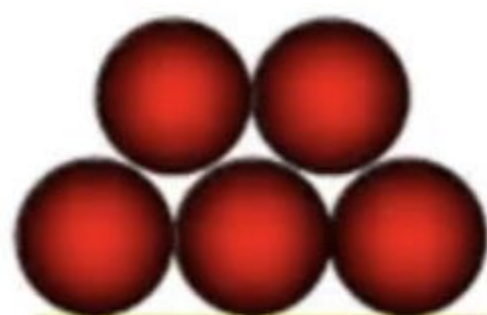
<https://pubmed.ncbi.nlm.nih.gov/35276699/>





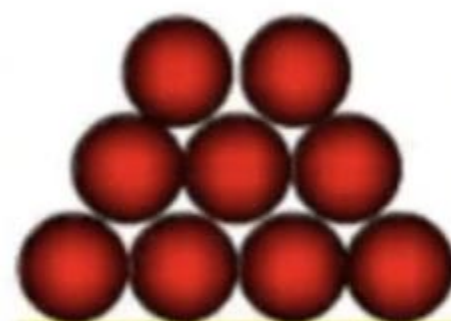
What weighs more a ton of brick or
a ton of feathers?





100 mg/dL

Large LDL



100 mg/dL

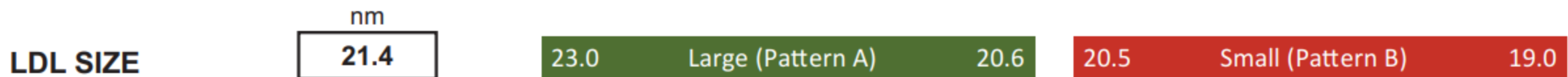
Small LDL

Up to 70%
More Particles

Cholesterol
Balance

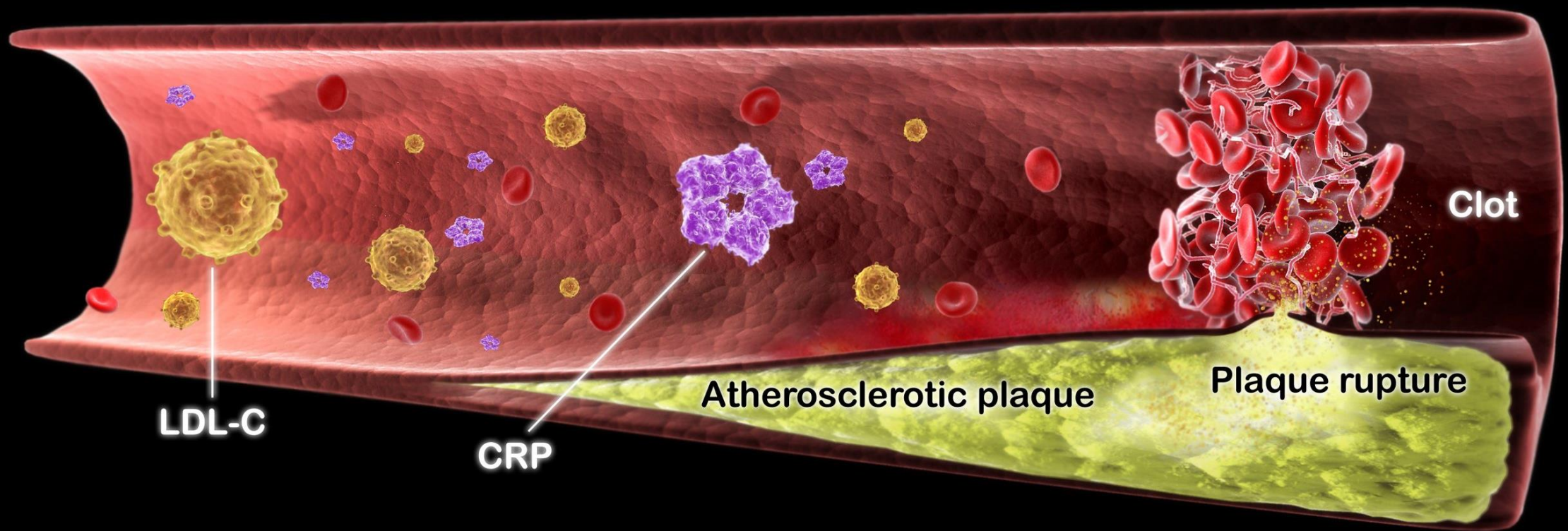


Small LDL-P and LDL Size are associated with CVD risk, but not after LDL-P is taken into account.



Small LDL-P and LDL Size are associated with CVD risk, but not after LDL-P is taken into account.

High Sensitivity C-reactive protein



Meta-Analysis > J Int Med Res. 2022 Feb;50(2):3000605221079547.

doi: 10.1177/03000605221079547.

Predictive role of C-reactive protein in sudden death: a meta-analysis of prospective studies

Ruhua Zhou¹, Jingjing Xu², Jiaochen Luan², Weiyun Wang², Xinzhi Tang¹, Yanling Huang³,
Ziwen Su¹, Lei Yang³, Zejuan Gu²

Affiliations + expand

PMID: 35225715 PMCID: PMC8894975 DOI: 10.1177/03000605221079547

Free PMC article

<https://pubmed.ncbi.nlm.nih.gov/35225715/>

Objective: C-reactive protein (CRP) is a powerful predictor of and risk factor for cardiovascular disease. However, the relationship between CRP and sudden death (SD) is controversial. Therefore, we performed a meta-analysis to evaluate the association between CRP and SD.

Conclusions: This meta-analysis confirmed that CRP is an independent predictor of SD. These results support the recommendation of recording the CRP concentration for risk assessment of SD in clinical practice.

<https://pubmed.ncbi.nlm.nih.gov/35225715/>

C-Reactive Protein, Cardiac

Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ C-Reactive Protein, Cardiac ⁰¹	12.40	High		mg/L	0.00-3.00
Relative Risk for Future Cardiovascular Event					
Low				<1.00	
Average				1.00 - 3.00	
High				>3.00	

Dietary and supplement modifications

Low Carb

Effect of carbohydrate-restricted dietary interventions on LDL particle size and number in adults in the context of weight loss or weight maintenance: a systematic review and meta-analysis

Kaja Falkenhain¹, Lauren A Roach², Sara McCreary¹, Eric McArthur³, Ethan J Weiss⁴,
Monique E Francois², Jonathan P Little¹

Affiliations + expand

PMID: 34159352 DOI: [10.1093/ajcn/nqab212](https://doi.org/10.1093/ajcn/nqab212)

Conclusions

The available evidence indicates that dietary interventions restricted in carbohydrates increase LDL peak particle size and decrease the numbers of total and small LDL particles.

<https://academic.oup.com/ajcn/article/114/4/1455/6308082?login=false>



<https://www.drhughwegwerth.com/post/the-autoimmune-paleo-lifestyle>

Magnesium IV Drip

Meta-Analysis

> BMJ Open. 2020 Mar 19;10(3):e032240. doi: 10.1136/bmjopen-2019-032240.

Association of magnesium intake with type 2 diabetes and total stroke: an updated systematic review and meta-analysis

Binghao Zhao¹, Lianli Zeng², Jiani Zhao², Qian Wu², Yifei Dong², Fang Zou³, Li Gan⁴, Yiping Wei¹, Wenxiong Zhang⁵

Affiliations + expand

Conclusions: Magnesium intake has significantly inverse associations with T2D and total stroke in a dose-dependent manner.

<https://pubmed.ncbi.nlm.nih.gov/32198298/>

Review

> J Cardiovasc Pharmacol. 2019 Dec;74(6):516-527. doi: 10.1097/FJC.0000000000000739.

Quantitative Association Between Serum/Dietary Magnesium and Cardiovascular Disease/Coronary Heart Disease Risk: A Dose-Response Meta-analysis of Prospective Cohort Studies

Lingyun Zhao^{1 2}, Meng Hu¹, Lei Yang³, Haoming Xu¹, Wenyan Song¹, Yazhi Qian¹,
Meimi Zhao¹

<https://pubmed.ncbi.nlm.nih.gov/31815866/>

Serum/dietary Mg level
comparisons presented a 7%-10%
decrease in CVD/CHD risk.

<https://pubmed.ncbi.nlm.nih.gov/31815866/>

Magnesium, RBC

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Magnesium, RBC ^{B, 01}	4.5		mg/dL	4.2-6.8

Antinuclear Antibodies, IEA

Magnesium, RBC

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Magnesium, RBC ^{A, 02}	6.1		mg/dL	4.2-6.8



<https://www.drhughwegwerth.com/post/we-compare-different-magnesium-powders>

Fish oil

Circulation

[AHA Journals](#)[Journal Information](#)[All Issues](#)[Subjects](#)[Features](#)[Resources & Education](#)

This site uses cookies. By continuing to browse this site you are agreeing to our use of cookies.

[Click here for more information.](#)

[Home](#) > [Circulation](#) > [Vol. 132, No. 22](#) > [Omega-3 Fatty Acids and Heart Health](#)



FREE ACCESS

RESEARCH ARTICLE



PDF/EPUB



Tools




Share

Omega-3 Fatty Acids and Heart Health

Ashish Chaddha  and Kim A. Eagle

Originally published 1 Dec 2015 | <https://doi.org/10.1161/CIRCULATIONAHA.114.015176> | Circulation. 2015;132:e350–e352

is corrected by 

<https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.114.015176>

Several studies have shown that individuals who consumed fatty fish a few times per week had almost one-half the risk of death from coronary heart disease and almost one-third the risk of death from a heart attack in comparison with those who consumed no fish

<https://www.ahajournals.org/doi/full/10.1161/CIRCULATIONAHA.114.015176>



<https://www.drhughwegwerth.com/post/chronic-pain-inflammation-~the-importance-of-omega-3-fish-oil-for-proper-cell-membrane-health>



Page 1 of 1

Clinician

Patient Name	Sex	Age
GARY G	M	64

Client Name and Address

LabCorp-Kansas City (KC) 3455/
1706 N Corrington Ave
Kansas City, MO 64120
Phone: (816)483-1177 Fax: (816)483-5760

Patient ID	Birth Date	Accession Number
	09/22/1947	

Date Collected	Date Received	Rep
01/11/2012	01/13/2012	

NMR LipoProfile® test

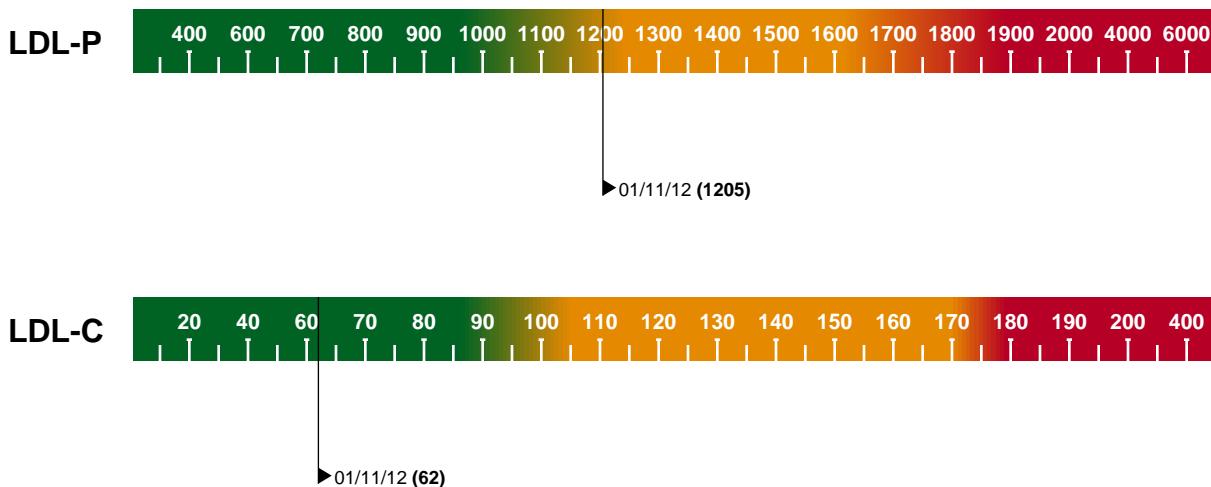
Reference Range¹

	Percentile ¹	20th	50th	80th	95th	
	Low	Moderate	Borderline-High	High	Very High	
LDL-P (LDL Particle Number)	nmol/L	< 1000	1000-1299	1300-1599	1600-2000	> 2000

Lipids

		Optimal	Near or above optimal	Borderline-High	High	Very High
LDL-C (calculated)	mg/dL	< 100	100-129	130-159	160-189	≥ 190
HDL-C	mg/dL	49				
	Desirable ≥ 40					
Triglycerides	mg/dL	130				
	Desirable < 150					
Total Cholesterol	mg/dL	137				
	Desirable < 200					

Current Results



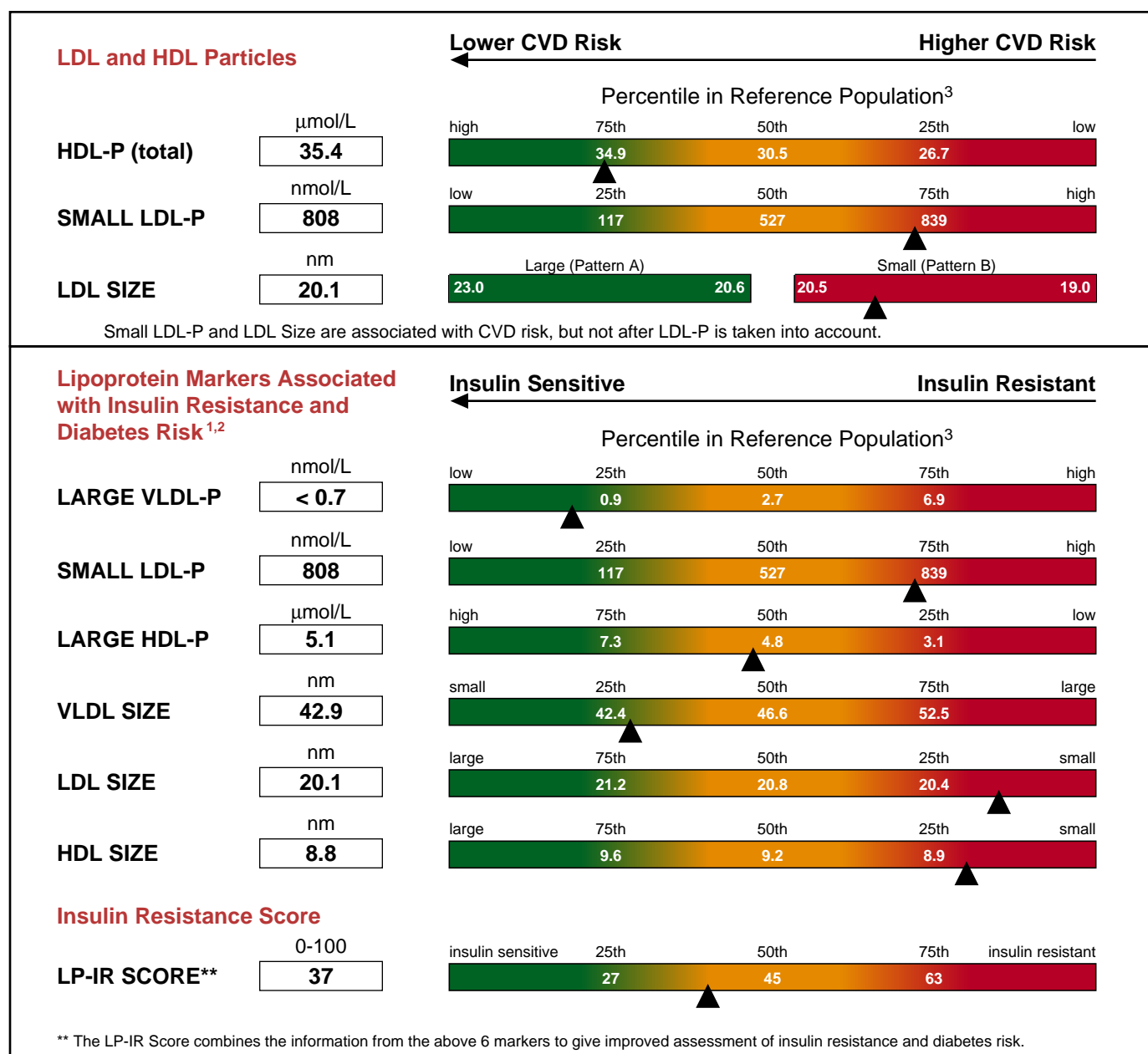
1. Reference population comprises 5,362 men and women not on lipid medication enrolled in the Multi-Ethnic Study of Atherosclerosis (MESA). Mora, et al. *Atherosclerosis* 2007.

Page 1 of 1

Clinician

Patient Name		Sex	Age	^DAVIS, A	
[REDACTED]					
Client Name and Address					
LabCorp-Kansas City (KC)				3455/	
1706 N Corrington Ave					
MO 64120					
[REDACTED] 483-1177				Fax: (816)483-5760	
Date Collected	Date Received	Report Date and Time		Requisition Number	Fasting Status
[REDACTED]					

PARTICLE CONCENTRATION AND SIZE



These laboratory assays, validated by LipoScience, have not been cleared by the US Food and Drug Administration. The clinical utility of these laboratory values has not been fully established.