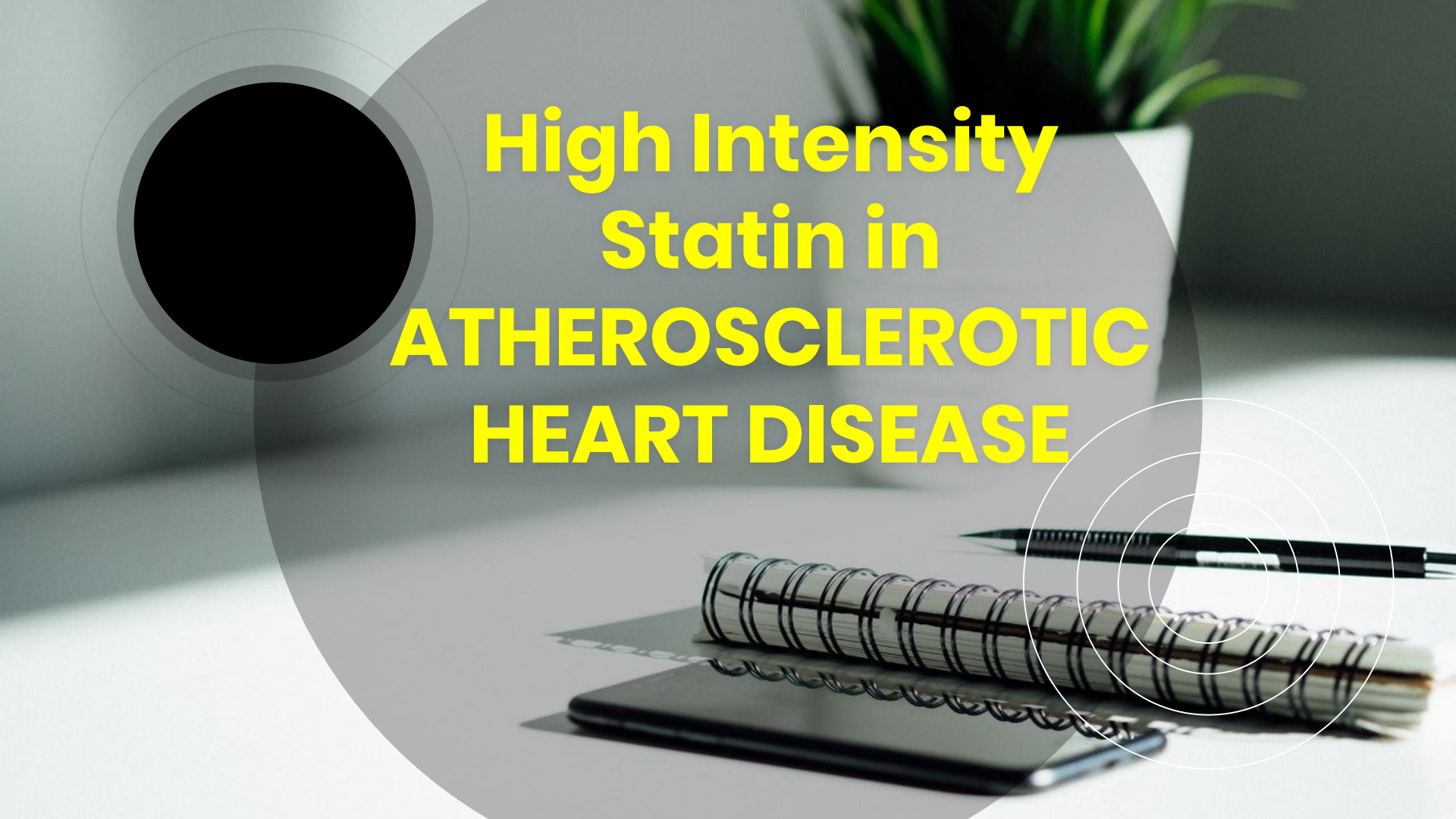
High Intensity Statin in ATHEROSCLEROTIC HEART DISEASE



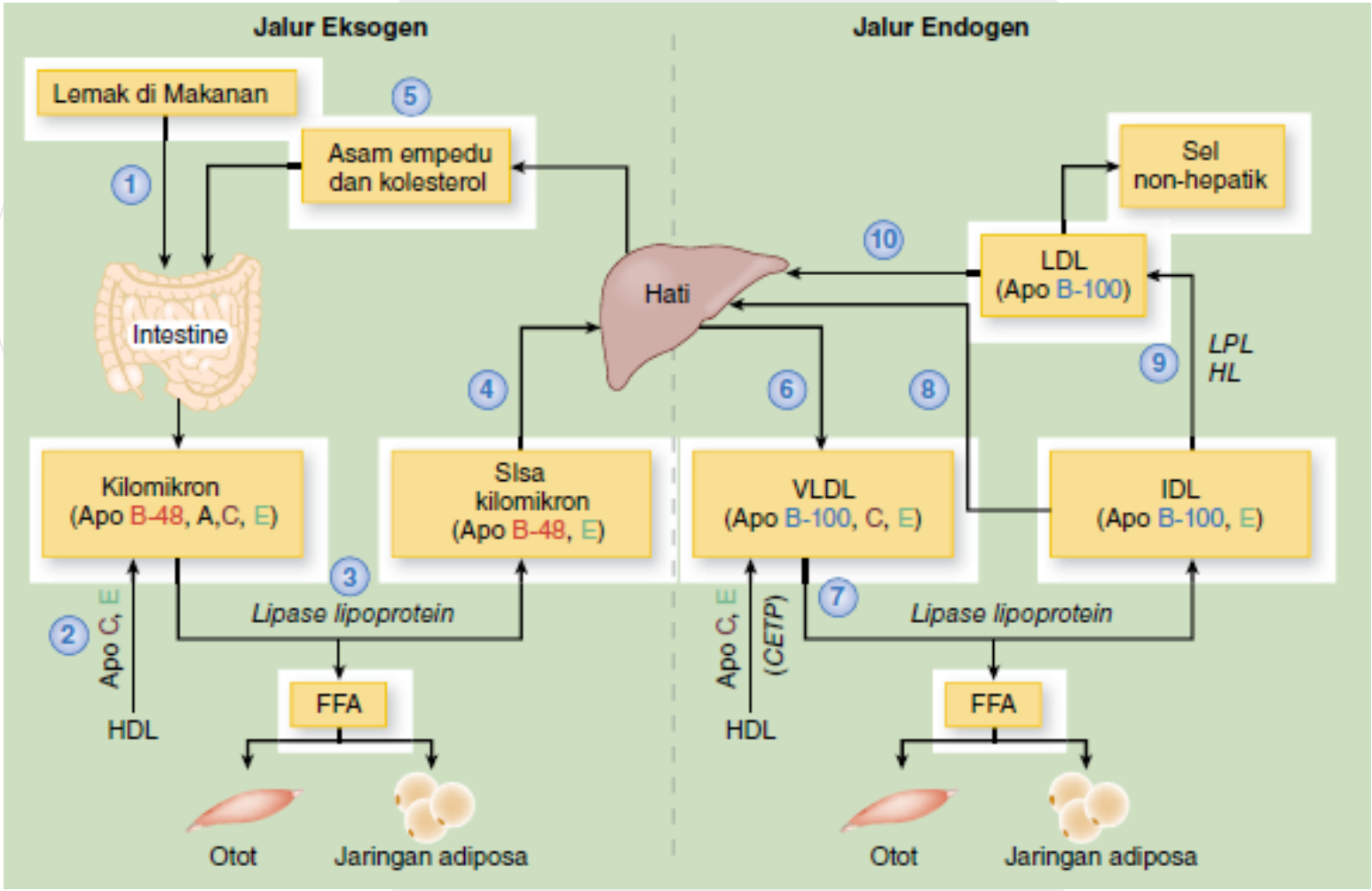
Dr. med. dr. Denio Ridjab, SpJP, FIHA, FESC

OUTLINE

- Refreshment Cholesterol
- Cholesterol and Morbidity - Mortality
- Who is at Risk for Atherosclerotic CVD
- Lipid Parameters as Target Therapy
- Steps to Treat
  - Perform Risk Assessment
  - Identify LDL-C Goal and Therapy
  - Follow-up
- Conclusion

OUTLINE

- Refreshment Cholesterol


Jalur Eksogen
Jalur Endogen
Lemak di Makanan
Asam empedu dan kolesterol
Intestine
Hati
Sel non-hepatik
LDL (Apo B-100)
LPL
HL
Kilomikron (Apo B-48, A,C, E)
Sisa kilomikron (Apo B-48, E)
VLDL (Apo B-100, C, E)
IDL (Apo B-100, E)
Lipase lipoprotein
Lipase lipoprotein
Apo C, E
HDL
Apo C, E
(CETP)
HDL
FFA
FFA
Otot
Jaringan adiposa
Otot
Jaringan adiposa
1
2
3
4
5
6
7
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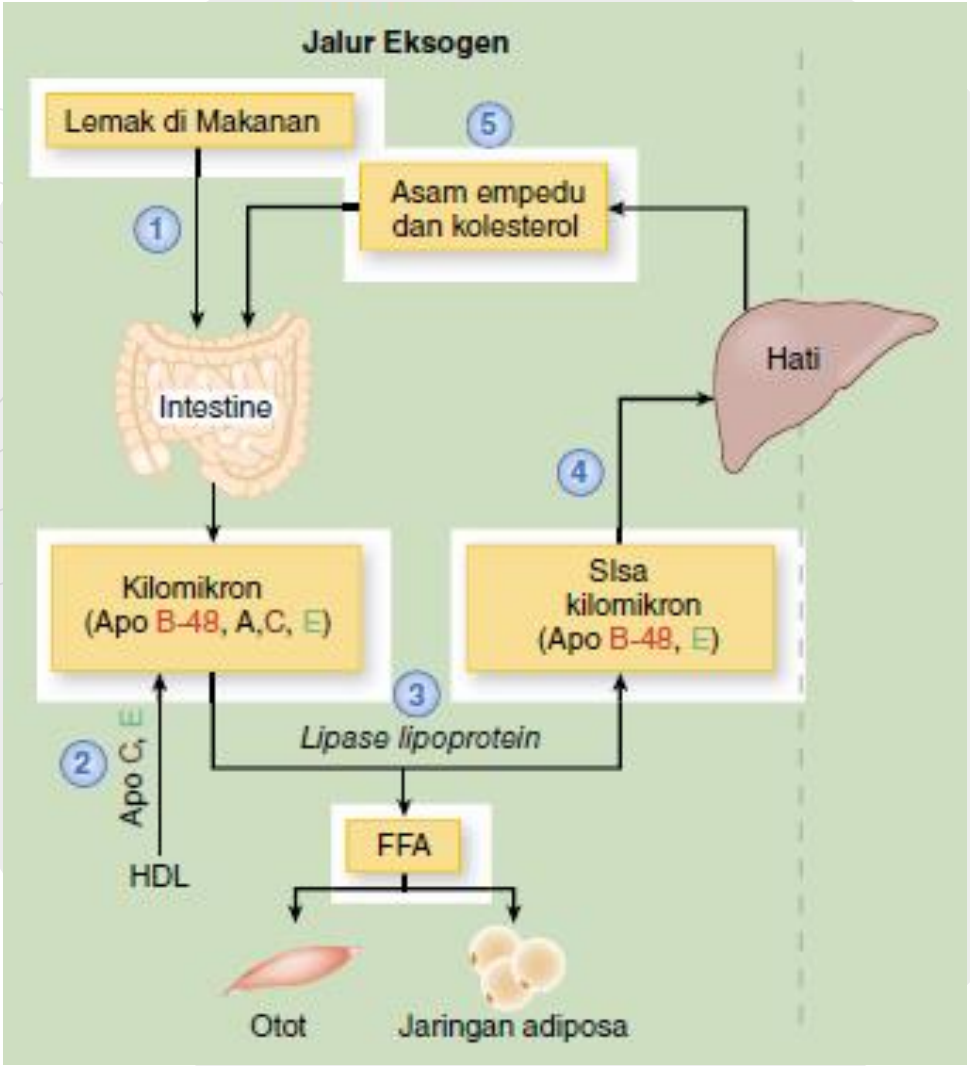
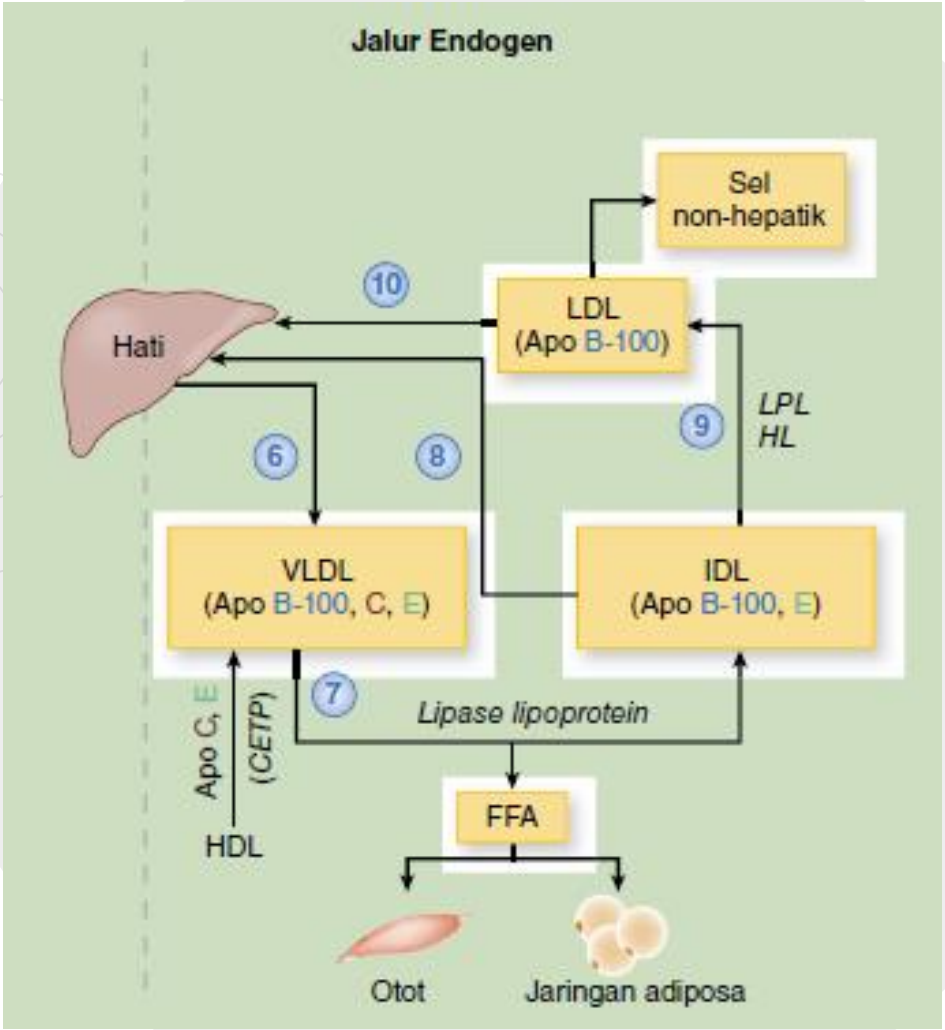
9
10

“


Jalur Eksogen
Lemak di Makanan
5
Asam empedu dan kolesterol
1
Intestine
Hati
4
Kilomikron (Apo B-48, A,C, E)
Slsa kilomikron (Apo B-48, E)
3
Lipase lipoprotein
2
Apo C, E
HDL
FFA
Otot
Jaringan adiposa

“


Jalur Endogen
Sel non-hepatik
10
LDL (Apo B-100)
Hati
LPL
HL
9
6
8
VLDL (Apo B-100, C, E)
IDL (Apo B-100, E)
7
Lipase lipoprotein
Apo C, E
(CETP)
HDL
FFA
Otot
Jaringan adiposa

> **Endogenous (Hepatic) Pathway is needed because dietary fat availability is not constant. Endogenous pathway provides a reliable supply of triglycerides for tissue energy needs**

Cholesterol

- a part of cell membranes
- a raw material for bile acids and certain hormones, such as testosterone and estrogens
- plasma cholesterol concentrations are strongly associated with cardiovascular disease risk.

“

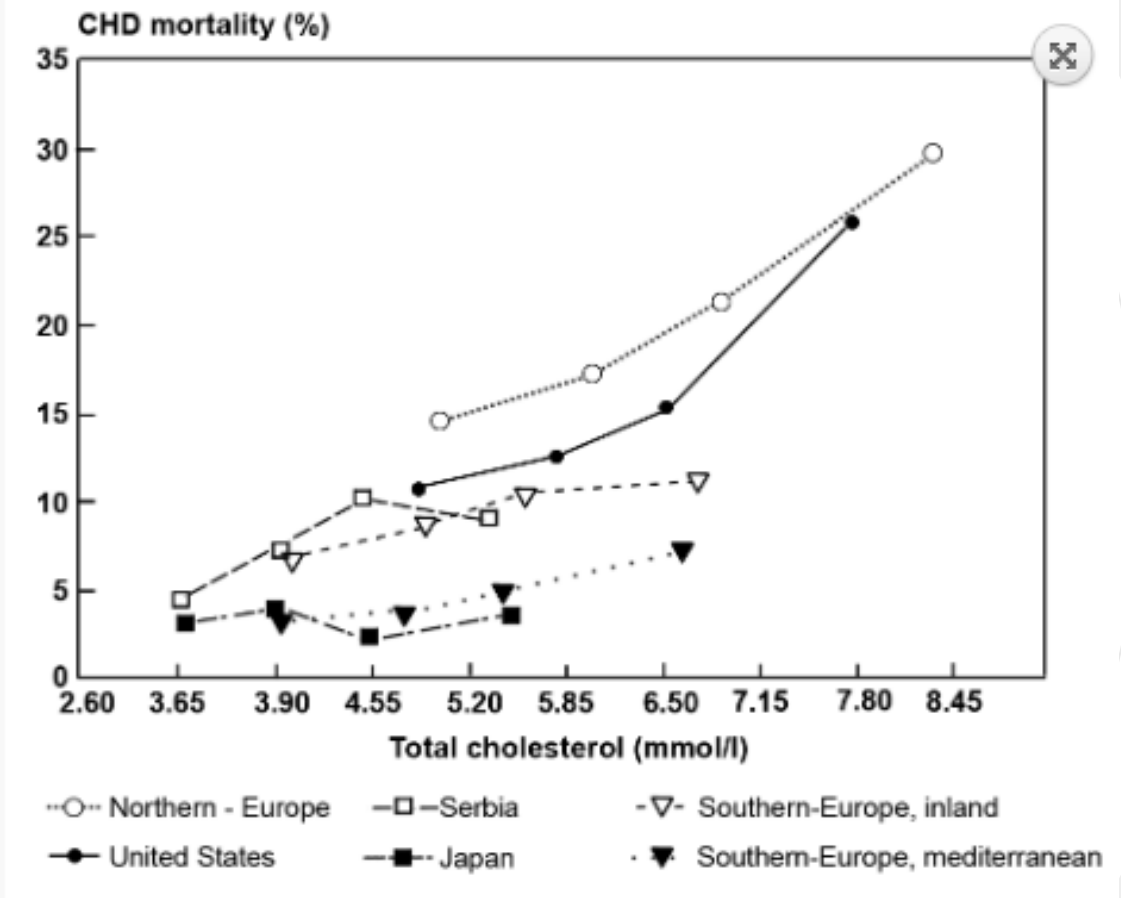
Without cholesterol, cell membranes would be too fluid, not firm enough, and too permeable to some molecules.

OUTLINE

- Cholesterol and Morbidity - Mortality

Twenty-five Years Follow-up of the Seven Countries Study :

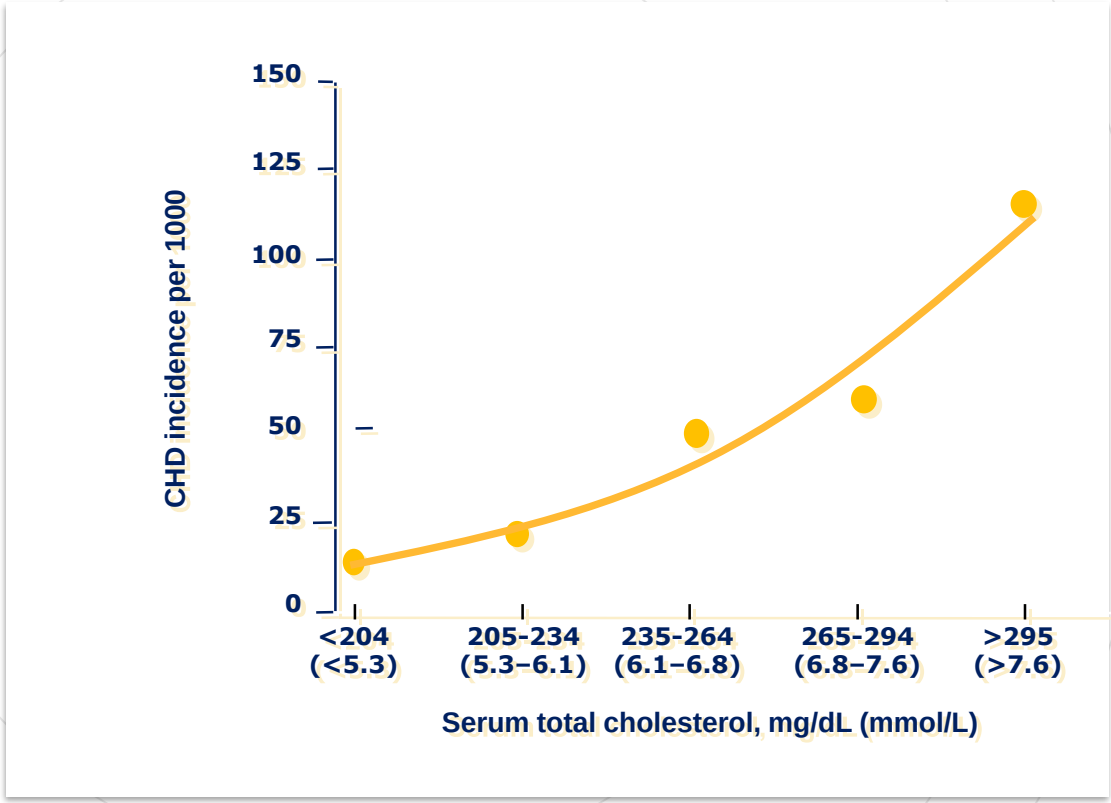
Cholesterol linearly related to CHD mortality



Serum cholesterol and coronary heart disease; Seven Countries. VerschurenWM et al. J Arm Med Assoc 1995

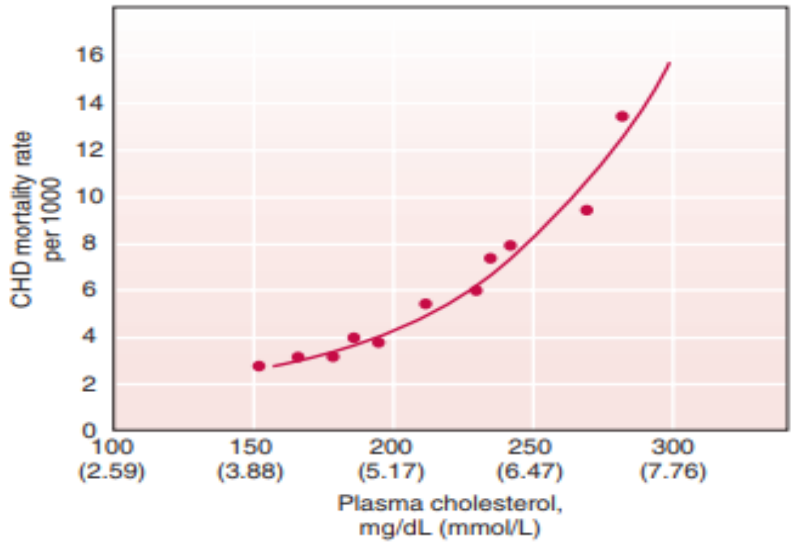
The Framingham Study:

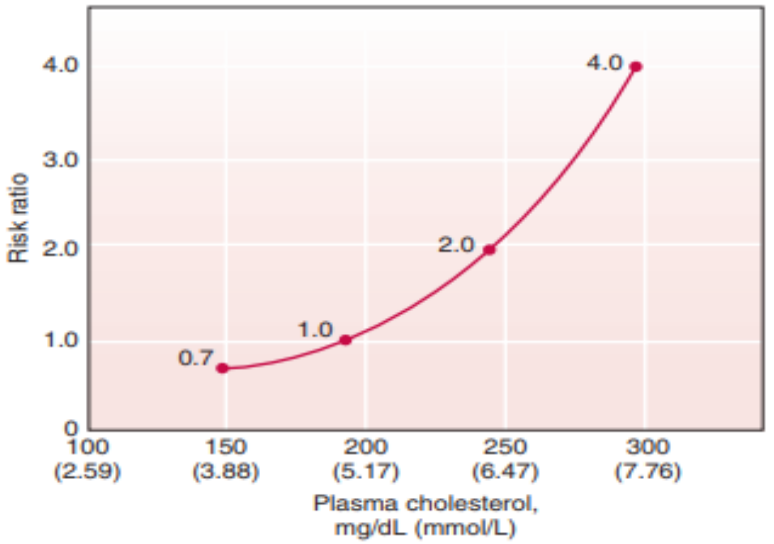
Increased level of **total cholesterol** is associated with incidence of coronary heart disease (CHD)



Adapted from Cas

Multiple Risk Factor Intervention Trial [MRFIT]





Relationship between cholesterol concentration and coronary heart disease mortality, expressed by yearly rate per 1000 and risk ratios

The Washington Post
Democracy Dies in Darkness

Sign In

Economic Policy

The U.S. government is poised to withdraw longstanding warnings about cholesterol

The Washington Post

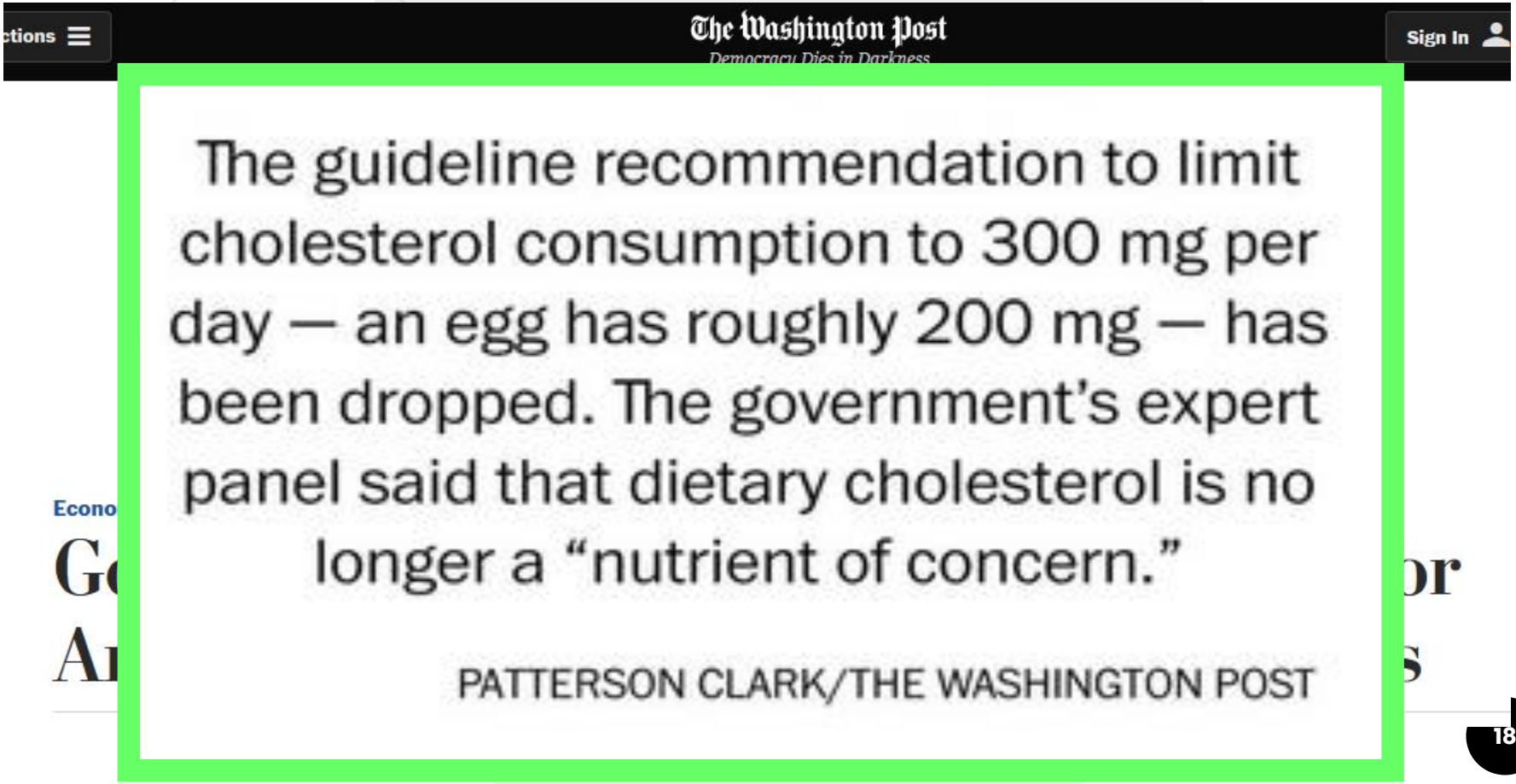
By **Peter Whoriskey**

February 10, 2015

The nation's top nutrition advisory panel has decided to drop its caution about eating cholesterol-laden food, a move that could undo almost 40 years of government warnings about its consumption.

Economic Policy

Government revises Dietary Guidelines for Americans: Go ahead and have some eggs

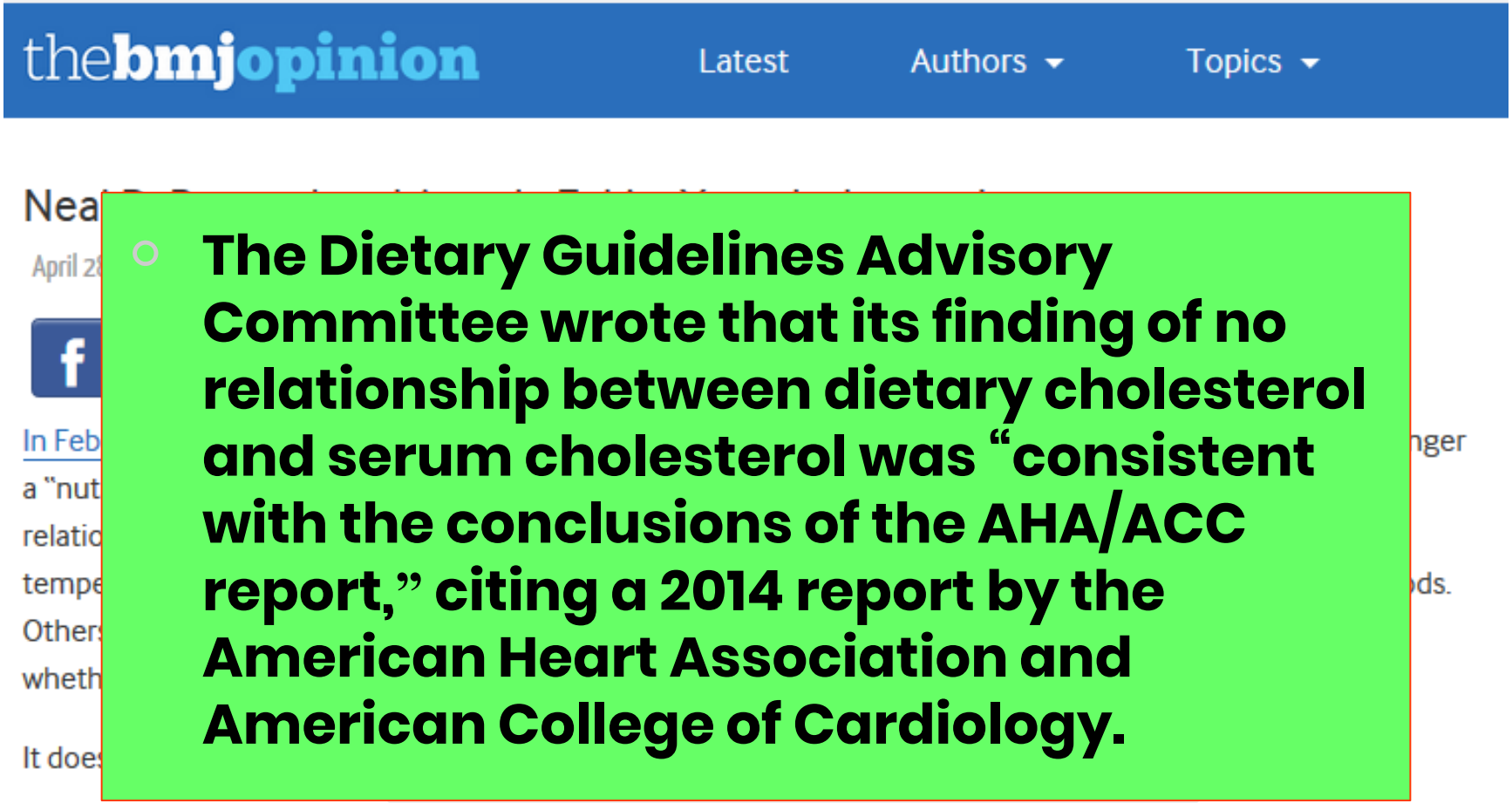

ctions
The Washington Post
Democracy Dies in Darkness
Sign In
The guideline recommendation to limit cholesterol consumption to 300 mg per day — an egg has roughly 200 mg — has been dropped. The government's expert panel said that dietary cholesterol is no longer a "nutrient of concern."
PATTERSON CLARK/THE WASHINGTON POST

Neal D. Barnard and Angela Eakin: Yes, cholesterol matters

April 28, 2015

In February 2015, the US Dietary Guidelines Advisory Committee reported that dietary cholesterol was no longer a "nutrient of concern." According to the Committee's report, "available evidence shows no appreciable relationship between consumption of dietary cholesterol and serum cholesterol...." In the ensuing media tempest, some food writers saw a green light for indulgence in eggs, sausage, and other high cholesterol foods. Others went further, exonerating high *blood cholesterol* levels, and patients began asking their physicians whether cholesterol matters.

It does, and here is why: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The Dietary Guidelines Advisory Committee wrote that its finding of no relationship between dietary cholesterol and serum cholesterol was “consistent with the conclusions of the AHA/ACC report,” citing a 2014 report by the American Heart Association and American College of Cardiology.

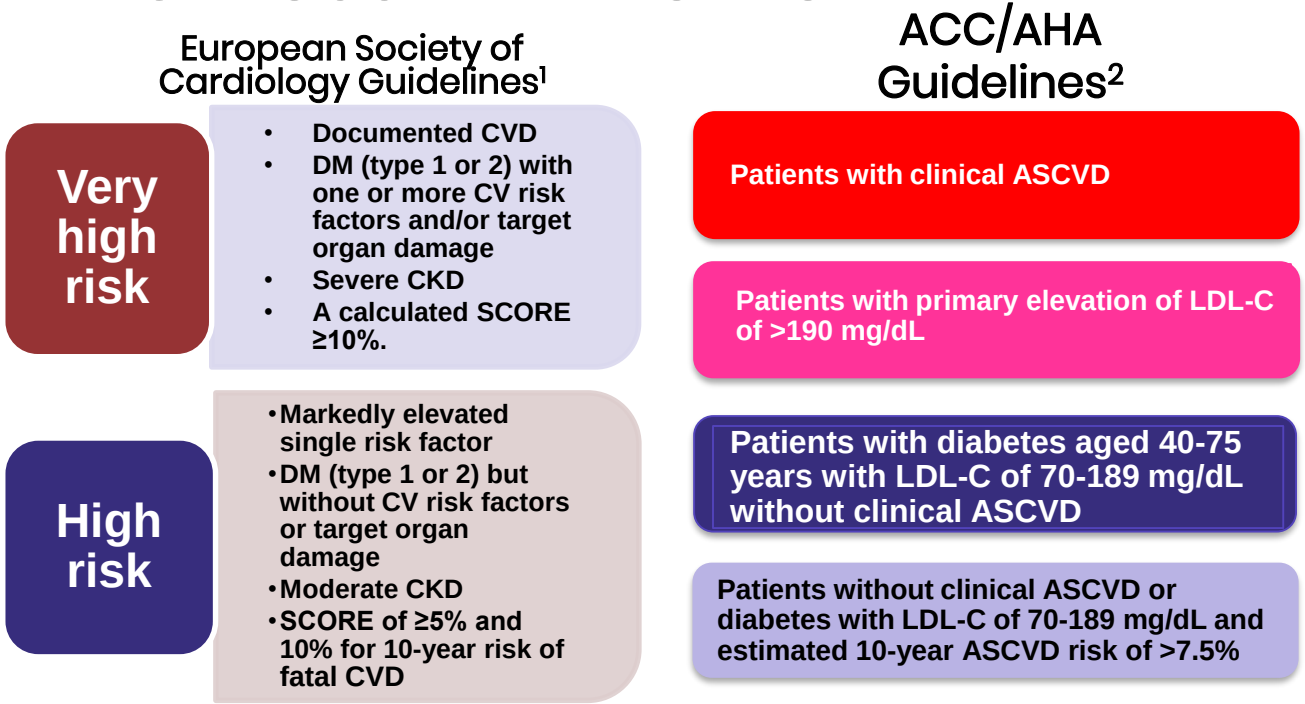
- A 1988 National Institutes of Health conference arrived at the same conclusion as Hegsted, and a meta-analysis published in 1992 and two more published in 1997 agreed: cholesterol you eat raises cholesterol levels in your blood.
- In 2002, the Institute of Medicine reviewed the evidence, concluding that cholesterol consumed in foods clearly raises blood cholesterol levels.

- most cholesterol-containing foods also contain saturated fat—and both raise LDL cholesterol concentrations.
- In dismissing the risks of dietary cholesterol, the committee may have inadvertently further confused an already bewildered public, many of whom do not differentiate dietary cholesterol from blood cholesterol, or cholesterol from saturated fat.

OUTLINE

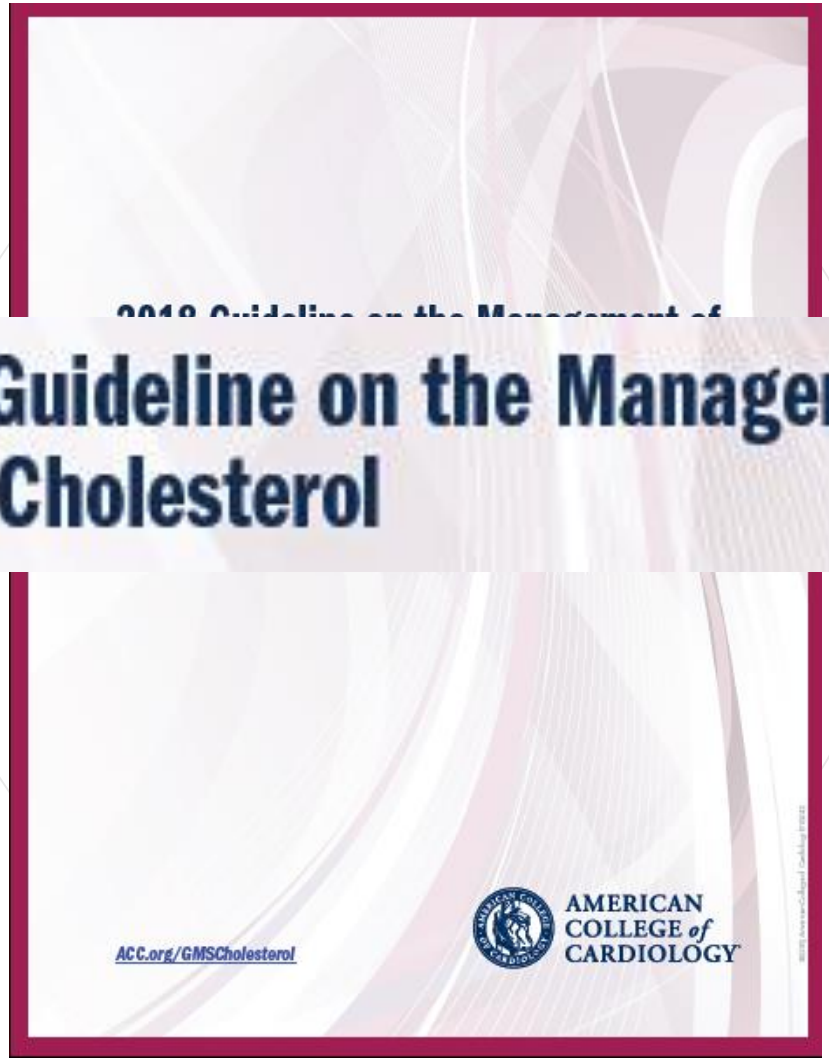
- Who are at Risk for Atherosclerotic CVD

Who Are At Risk Of Atherosclerotic Cardiovascular Disease?



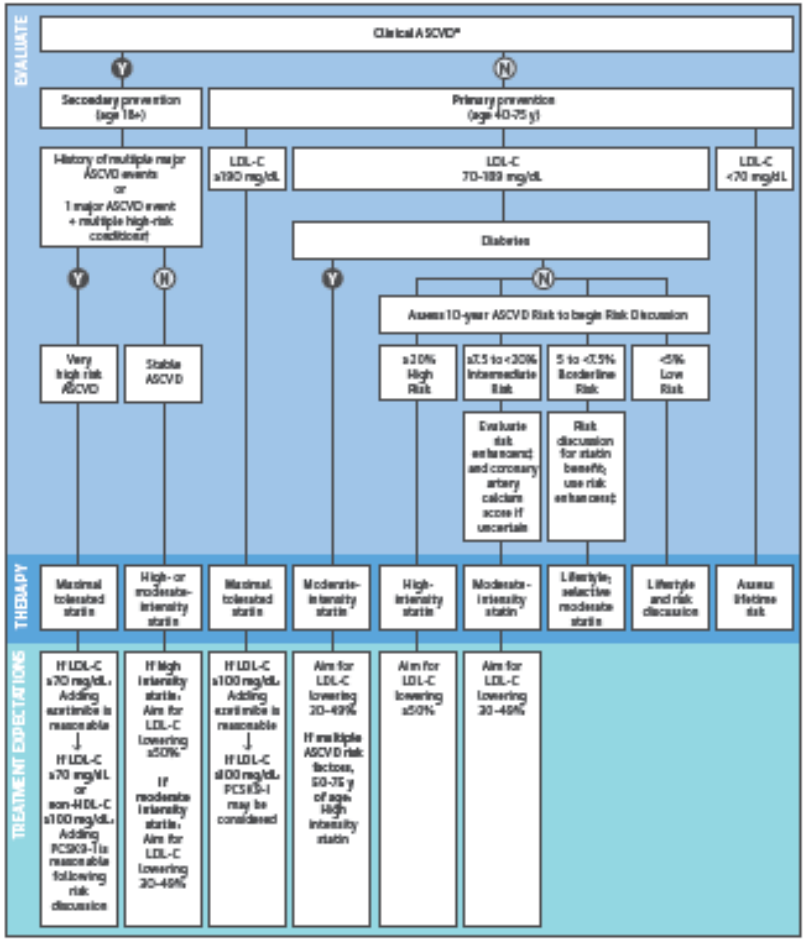
ACC, American College of Cardiology; AHA, American Heart Association; ASCVD, atherosclerotic cardiovascular disease ; CKD, chronic kidney disease; CV, cardiovascular; CVD, cardiovascular disease; DM, diabetes mellitus; LDL-C, Low density lipoprotein- cholesterol; SCORE, Systematic Coronary Risk Evaluation Project.

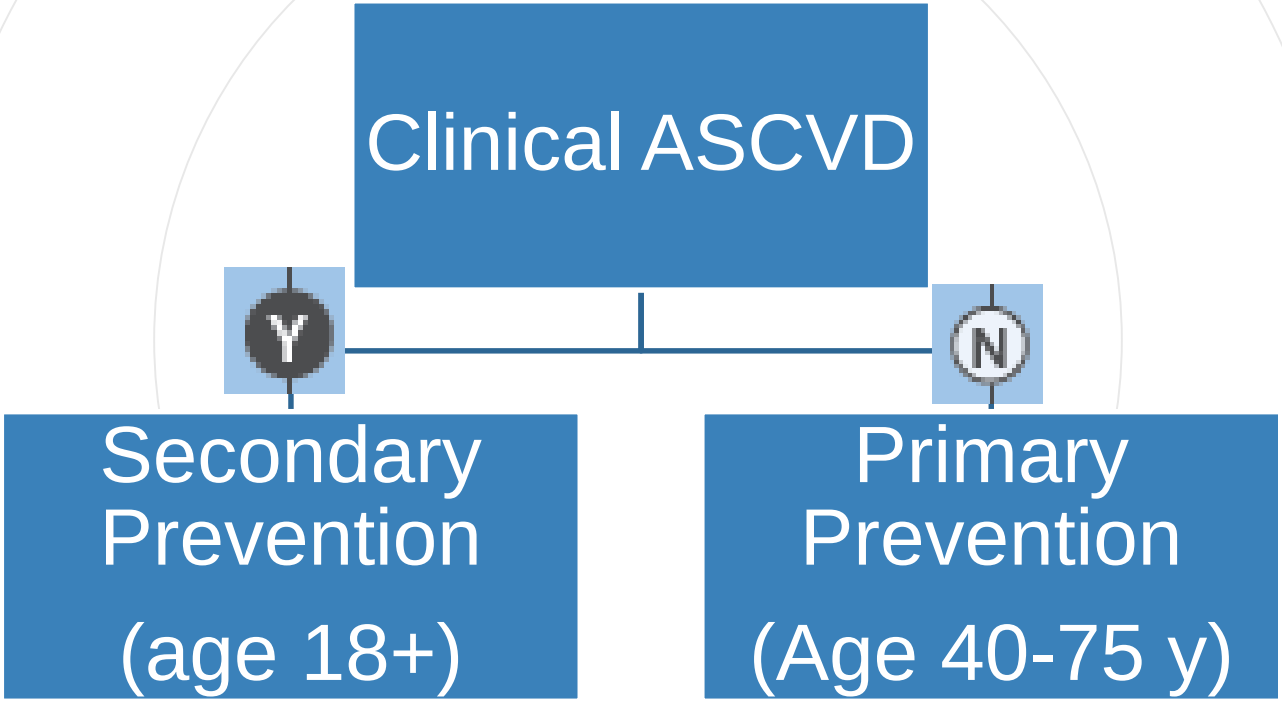
1. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). *Eur Heart J*. 2012;33:1635–1701.
2. Stone NJ, Robinson J, Lichtenstein AH et al. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: A report of the American College of Cardiology/American Heart Association Task Force on practice guidelines. 2013. Accessed December 16, 2013.

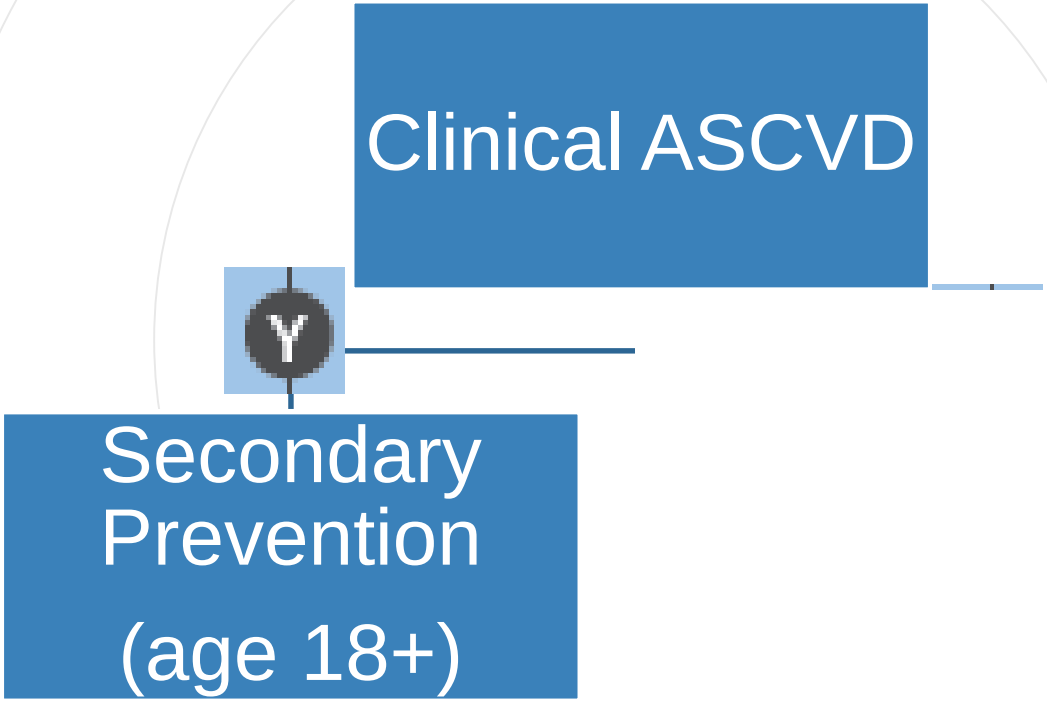

2018 Guideline on the Management of Blood Cholesterol
ACC.org/GMSCholesterol
AMERICAN COLLEGE of CARDIOLOGY

Overview of Primary and Secondary ASCVD Prevention

This tool provides a broad overview of the 2018 Cholesterol Guideline.
Please refer to the full guideline document for specific recommendations.




Clinical ASCVD
Y
N
Secondary Prevention
(age 18+)
Primary Prevention
(Age 40-75 y)

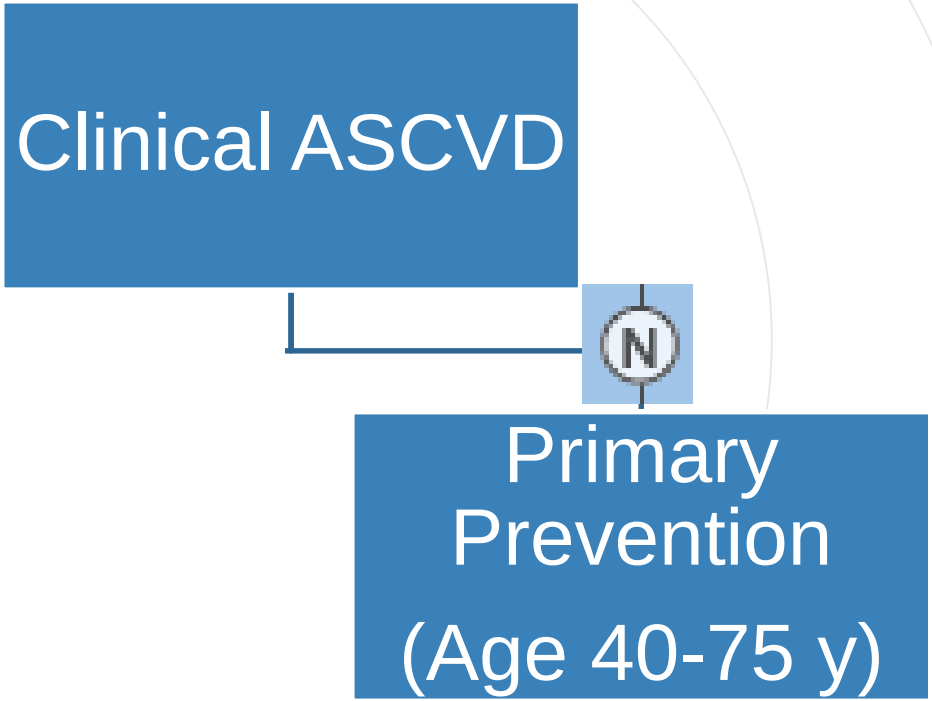

Clinical ASCVD
Secondary Prevention
(age 18+)

Very High-Risk for Future ASCVD Events*

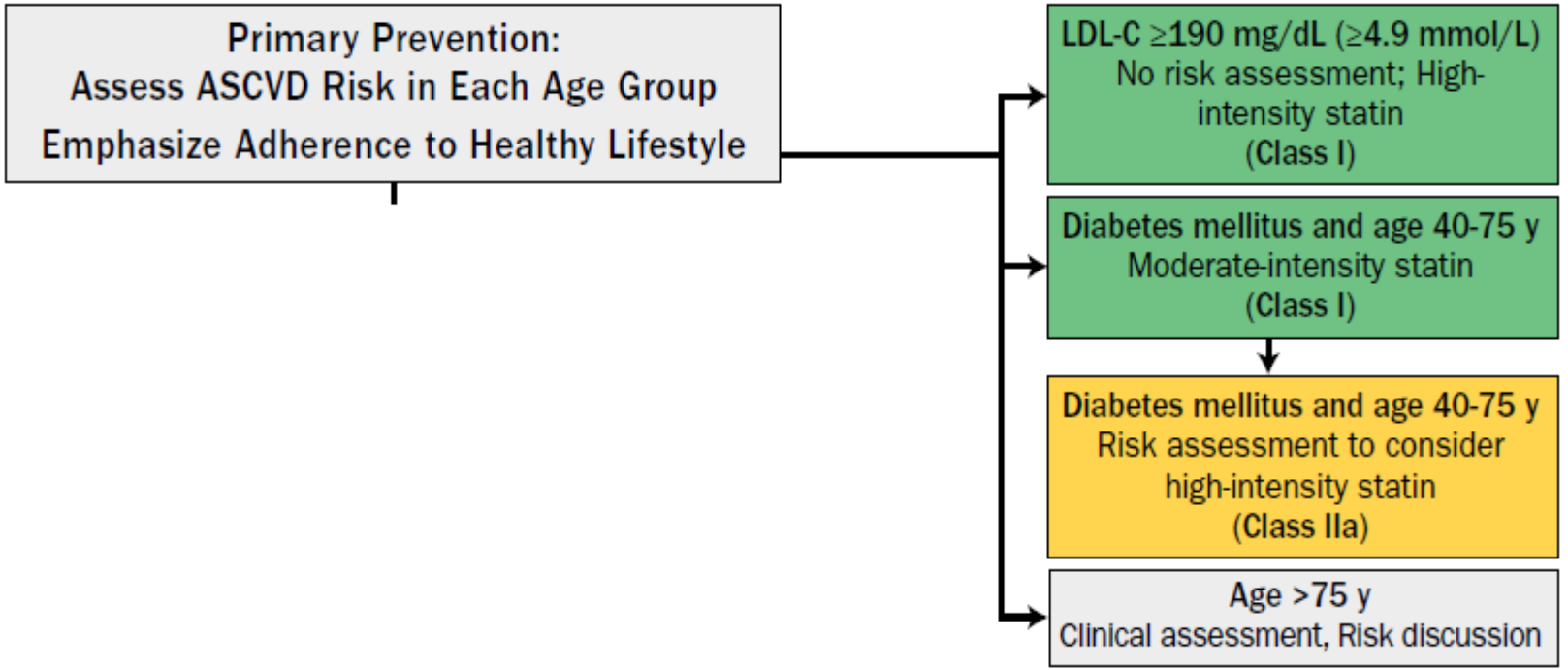
Table 4

Major ASCVD Events
Recent acute coronary syndrome (within the past 12 months)
History of myocardial infarction (other than recent acute coronary syndrome event listed above)
History of ischemic stroke
Symptomatic peripheral arterial disease (history of claudication with ankle brachial index <0.85, or previous revascularization or amputation)

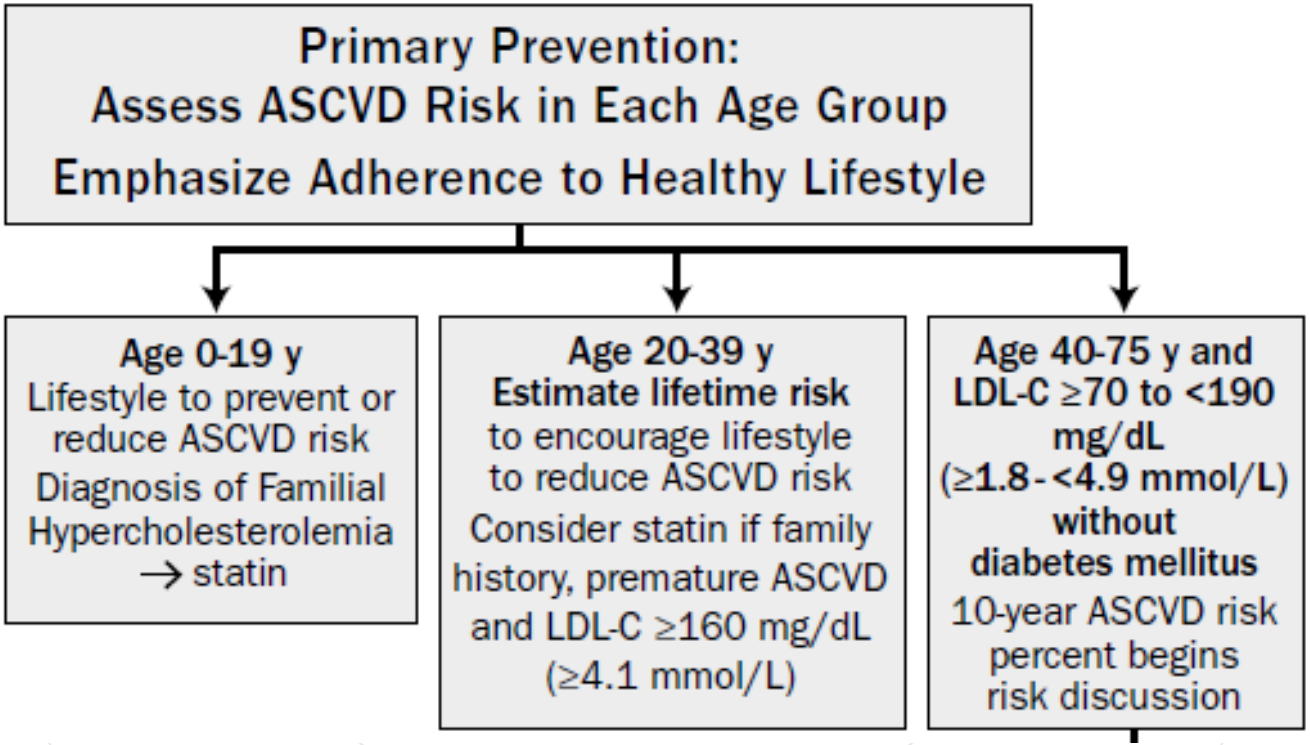
High-Risk Conditions
Age ≥65 years
Heterozygous familial hypercholesterolemia
History of prior coronary artery bypass surgery or PCI outside of the major ASCVD event(s)
Diabetes Mellitus
Hypertension
Chronic kidney disease (eGFR 15-59 mL/min/1.73 m^2)
Current smoking
Persistently elevated LDL-C (LDL-C ≥100 mg/dL (≥2.6 mmol/L)) despite maximally tolerated statin therapy and ezetimibe
History of congestive heart failure


Clinical ASCVD
N
Primary Prevention
(Age 40-75 y)

Primary Prevention



Primary Prevention



ASCVD Risk Enhancers:

- Family history of premature ASCVD
- Persistently elevated LDL-C ≥160 mg/dL (≥4.1 mmol/L)
- Chronic kidney disease
- Metabolic syndrome
- Conditions specific to women (e.g. preeclampsia, premature menopause)
- Inflammatory diseases (especially rheumatoid arthritis, psoriasis, HIV)
- Ethnicity factors (e.g. South Asian ancestory)

Lipid/Biomarkers:

- Persistently elevated triglycerides (≥175 mg/mL)

In selected individuals if measured:

- hs-CRP ≥2.0 mg/L
- Lp(a) levels >50 mg/dL or >125 nmol/L
- apoB ≥130 mg/dL
- Ankle-brachial index (ABI) <0.9

OUTLINE

- Lipid Parameters As Target Therapy

EAS

2016 ESC/EAS Guidelines for the Management of Dyslipidaemias

The Task Force for the Management of Dyslipidaemias of the European Society of Cardiology (ESC) and European Atherosclerosis Society (EAS)
Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR)

Recommendations	Class[a]	Level[b]	Ref[c]
LDL-C is recommended as the primary target for treatment.	I	A	64, 68
TC should be considered as a treatment target if other analyses are not available.	IIa	A	64, 123
Non-HDL-C should be considered as a secondary treatment target.	IIa	B	103
ApoB should be considered as a secondary treatment target, when available.	IIa	B	103, 124
HDL-C is not recommended as a target for treatment.	III	A	92, 93
The ratios apoB/apoA1 and non-HDL-C/HDL-C are not recommended as targets for treatment.	III	B	103

Primary target:

LDL-C

Secondary target:

Non-HDL-C

(TC – HDL-C)

Apo = apolipoprotein; CVD = cardiovascular disease; HDL-C = high-density lipoprotein-cholesterol; LDL-C = low-density lipoprotein-cholesterol; Lp = lipoprotein; TC = total cholesterol; TG = triglycerides.
a.Class of recommendation.
b.Level of evidence.

Other Targets

- **ApoB, non-HDL-C**
- **Non-HDL-C**
  - has recently been proposed by locally developed guidelines such as NICE using the QRISK2 risk calculator)
  - used as an estimation of the total amount of atherogenic lipoproteins in plasma (VLDL, VLDL remnants, intermediate-density lipoprotein (IDL), LDL, Lp(a)) and relates well to apoB levels.
  - =TC minus HDL-C

Fasting or non-fasting?

Non-fasting = Fasting

- ❑ Fasting and non-fasting sampling give similar results for:
- TC, LDL-C and HDL-C
- ❑ TGs are affected by food
- higher by ~0.3mmol/L (27mg/dl) depending on the composition and the time frame of the last meal
- ❑ For risk estimation:
- non-fasting has a prediction strength similar to fasting
- ❑ DM patients had up to 0.6mmol/L lower LDL-c in non fasting state

Recommendation:
to characterize severe dyslipidemias further, and for follow-up of patients with HTG, FASTING SAMPLES are used

OUTLINE

- Steps to Treat
  - Perform Risk Assessment
  - Identify LDL-C Goal and Therapy
  - Follow-up

High-, Moderate-, and Low-Intensity Statin Therapy*

	High-Intensity	Moderate-Intensity	Low-Intensity
LDL-C Lowering†	≥50%	30% to 49%	<30%
Statins	Atorvastatin (40 mg‡) 80 mg Rosuvastatin 20 (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

1st STEP

Total Cardiovascular Risk Estimation

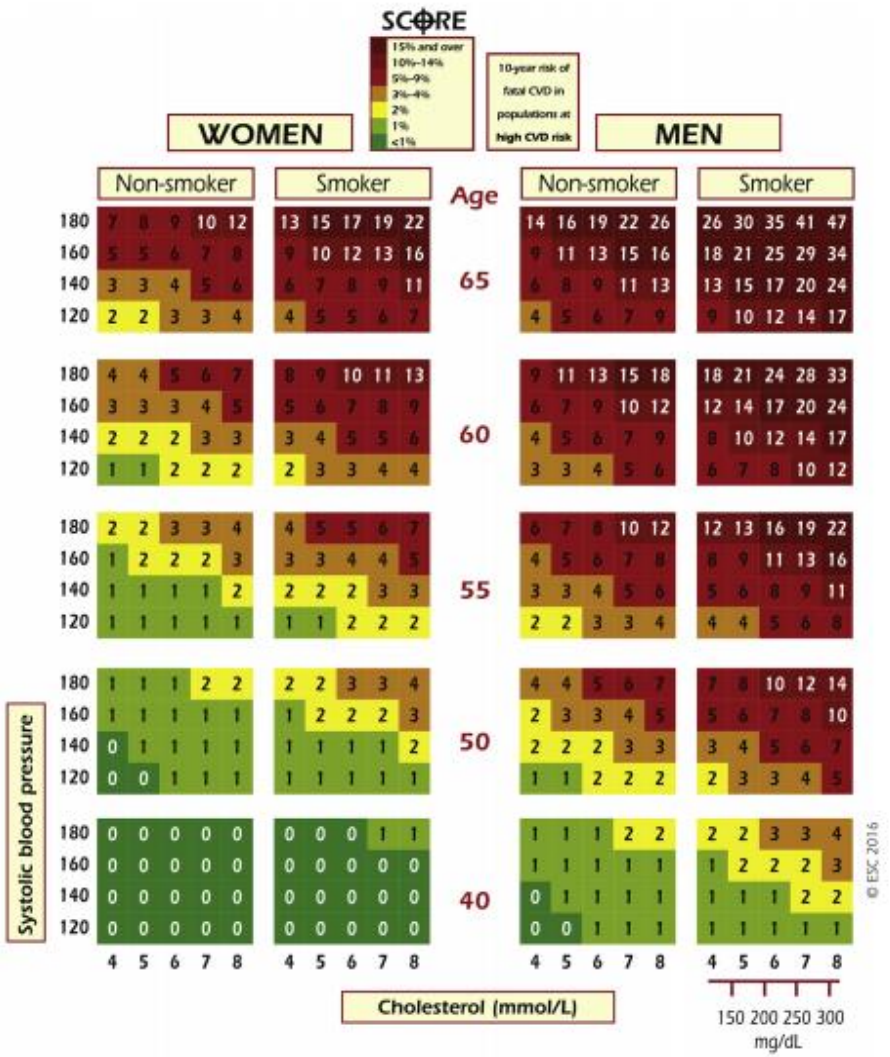
- ❑ CV risk
  - the likelihood of a person developing a fatal or non-fatal atherosclerotic CV event over a defined period of time
- ❑ Comprehensively reviewed:
- Framingham models
- Systemic Coronary Risk Estimation (SCORE)
- ASSIGN (CV risk estimation model from the Scottish Intercollegiate Guidelines Network)
- Q-Risk
- Prospective Cardiovascular Munster Study (PROCAM),
- Reynolds
- CUORE
- Pooled Cohort equations
- Globorisk

HIGH CVD RISK

10-year Risk Of Fatal Cardiovascular Disease (CVD) In Populations At High CVD Risk

Risk Factors

- Age
- Gender
- Smoking
- Systolic Blood Pressure
- Total Cholesterol

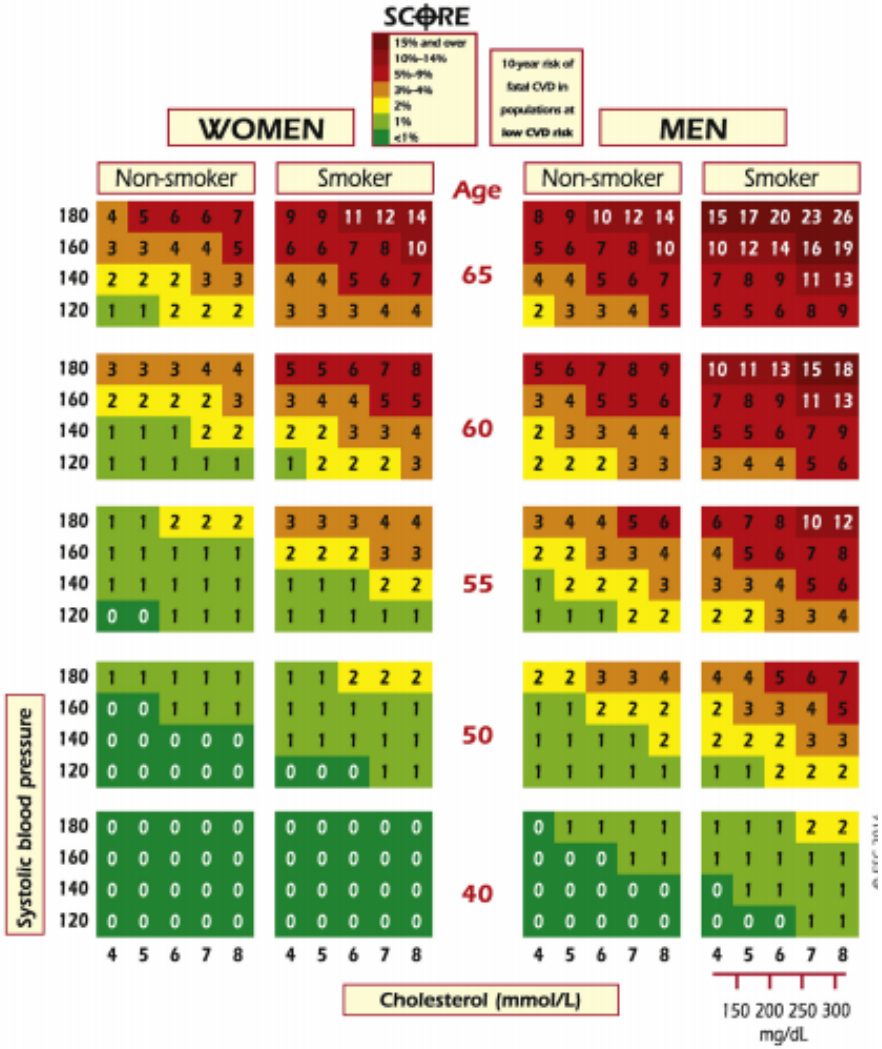


LOW CVD RISK

10-year Risk Of Fatal Cardiovascular Disease (CVD) In Populations At Low CVD Risk

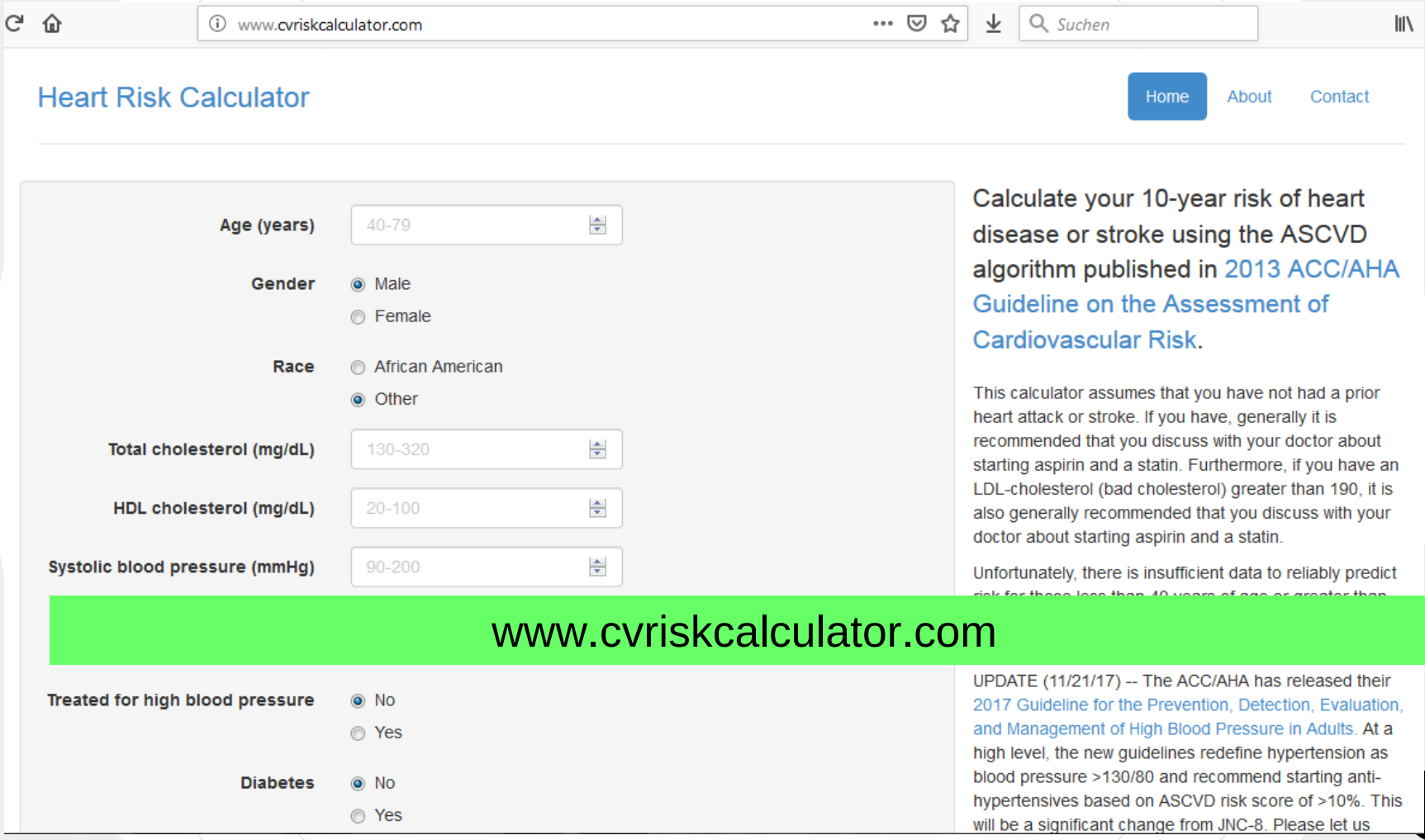
Risk factors:

- Age
- Gender
- Smoking
- Systolic Blood Pressure
- Total Cholesterol



Risk Categories

Very High-Risk	Subjects with any of the following: ➢ Documented cardiovascular disease (CVD), clinical or unequivocal on imaging. • Documented CVD: Previous Myocardial Infarction (MI) Acute Coronary Syndrome (ACS) Coronary Revascularization (PCI) and other revascularization procedures, Peripheral Arterial Disease (PAD) • Unequivocal Imaging Significant plaque on coronary angiography or carotid ultrasound ➢ DM with target organ damage such as proteinuria or with a major risk factor such as smoking, hypertension or dyslipidemia ➢ Severe CKD (GFR <30mL/min/1.73m^2 ➢ A calculated SCORE ≥10% for 10-year risk of fatal CVD
High-risk	Subjects with: ➢ Markedly elevated single risk factors, in particular cholesterol >8mmol/L (>310mg/dL) (e.g. in familial hypercholesterolemia or BP ≥ 180/110mmHg ➢ Most other people with DM (some young people with type 1 diabetes may be at low or moderate risk). ➢ Moderate CKD (GFR 30-59 mL/min 1.73m^2) ➢ A calculated SCORE ≥ 5% and <10% for 10-year risk of fatal CVD
Moderate-risk	SCORE is >1% and <5% for 10-year risk of fatal CVD
Low-risk	SCORE <1% for 10-year risk of fatal CVD



www.cvriskcalculator.com

tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/calculate/estimate/

AMERICAN COLLEGE of CARDIOLOGY

ASCVD Risk Estimator Plus

Estimate Risk

Current Age *

Age must be between 20-79

Sex *

Male | Female

Race *

White | African American | Other

Systolic Blood Pressure (mm Hg) *

Value must be between 90-200

Diastolic Blood Pressure (mm Hg)

Value must be between 60-130

Total Cholesterol (mg/dL) *

Value must be between 130 - 320

HDL Cholesterol (mg/dL) *

Value must be between 20 - 100

LDL Cholesterol (mg/dL)

Value must be between 30-300

History of Diabetes? *

Yes | No

Smoker? *

Current | Former | Never

On Hypertension Treatment? *

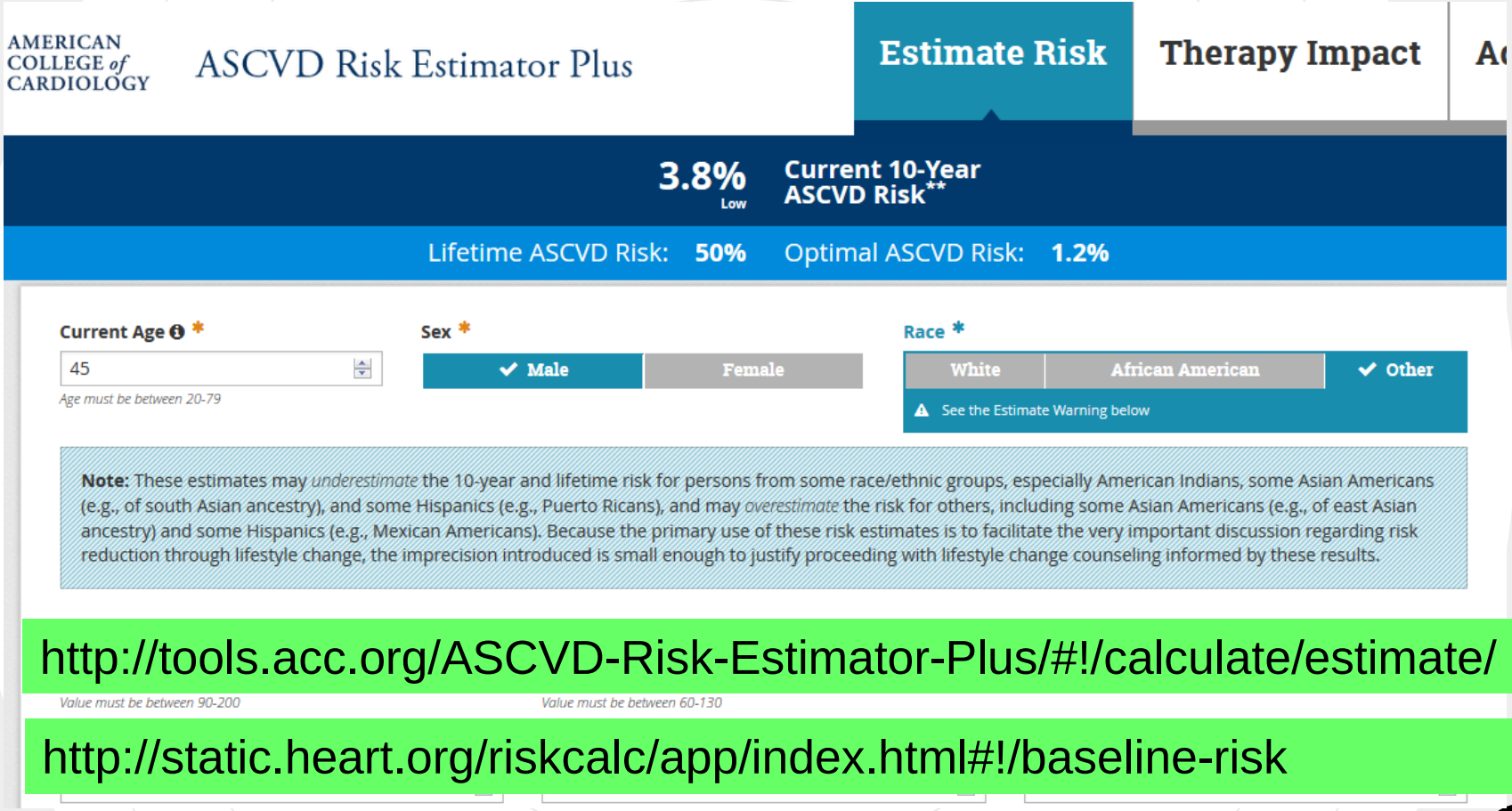
Yes | No

On a Statin?

Yes | No

On Aspirin Therapy?

Yes | No


AMERICAN COLLEGE of CARDIOLOGY
ASCVD Risk Estimator Plus
Estimate Risk
Therapy Impact
3.8%
Low
Current 10-Year ASCVD Risk**
Lifetime ASCVD Risk: 50%
Optimal ASCVD Risk: 1.2%
Current Age *
45
Age must be between 20-79
Sex *
Male
Female
Race *
White
African American
Other
See the Estimate Warning below
Note: These estimates may underestimate the 10-year and lifetime risk for persons from some race/ethnic groups, especially American Indians, some Asian Americans (e.g., of south Asian ancestry), and some Hispanics (e.g., Puerto Ricans), and may overestimate the risk for others, including some Asian Americans (e.g., of east Asian ancestry) and some Hispanics (e.g., Mexican Americans). Because the primary use of these risk estimates is to facilitate the very important discussion regarding risk reduction through lifestyle change, the imprecision introduced is small enough to justify proceeding with lifestyle change counseling informed by these results.
http://tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/calculate/estimate/
Value must be between 90-200
Value must be between 60-130
http://static.heart.org/riskcalc/app/index.html#!/baseline-risk

2nd STEP

Treatment targets and goals for cardiovascular disease prevention (1)

Smoking	No exposure to tobacco in any form.
Diet	Healthy diet low in saturated fat with a focus on whole grain products, vegetables, fruit and fish.
Physical activity	2.5–5 h moderately vigorous physical activity per week or 30–60 min most days.
Body weight	BMI 20–25 kg/m^2, waist circumference <94 cm (men) and <80 cm (women).
Blood pressure	<140/90 mmHg.

European Heart Journal 2016; 37: 2999–3058 - doi: 10.1093/eurheartj/ehv272
Atherosclerosis 253 (2016) 281-344-d oi: 10.1016/j.atherosclerosis.2016.08.018

Treatment targets and goals for cardiovascular disease prevention (2)

Lipid LDL-C is the primary target	**Very high-risk: LDL-C <1.8 mmol/L (70 mg/dL)** or a reduction of at least 50% if the baseline is between 1.8 and 3.5 mmol/L (70 and 135 mg/dL).
	High-risk: LDL-C <2.6 mmol/L (100 mg/dL) or a reduction of at least 50% if the baseline is between 2.6 and 5.2 mmol/L (100 and 200 mg/dL).
	Low to moderate risk: LDL-C <3 mmol/L (115 mg/dL).
	Non-HDL-C secondary targets are <2.6, 3.4 and 3.8 mmol/L (100, 130 and 145 mg/dL) for very high-, high- and moderate-risk subjects, respectively.
	HDL-C: no target, but >1.0 mmol/L (40 mg/dL) in men and >1.2 mmol/L (48 mg/dL) in women indicates lower risk.
	TG: no target but <1.7 mmol/L (150 mg/dL) indicates lower risk and higher levels indicate a need to look for other risk factors.
Diabetes	HbA1c: <7% (<8.6 mmol/L).

EAS

www.escardio.org/guidelines

European Heart Journal 2016; 37: 2999–3058 - doi: 10.1093/eurheartj/ehv272
Atherosclerosis 253 (2016) 281-344-d oi: 10.1016/j.atherosclerosis.2016.08.018

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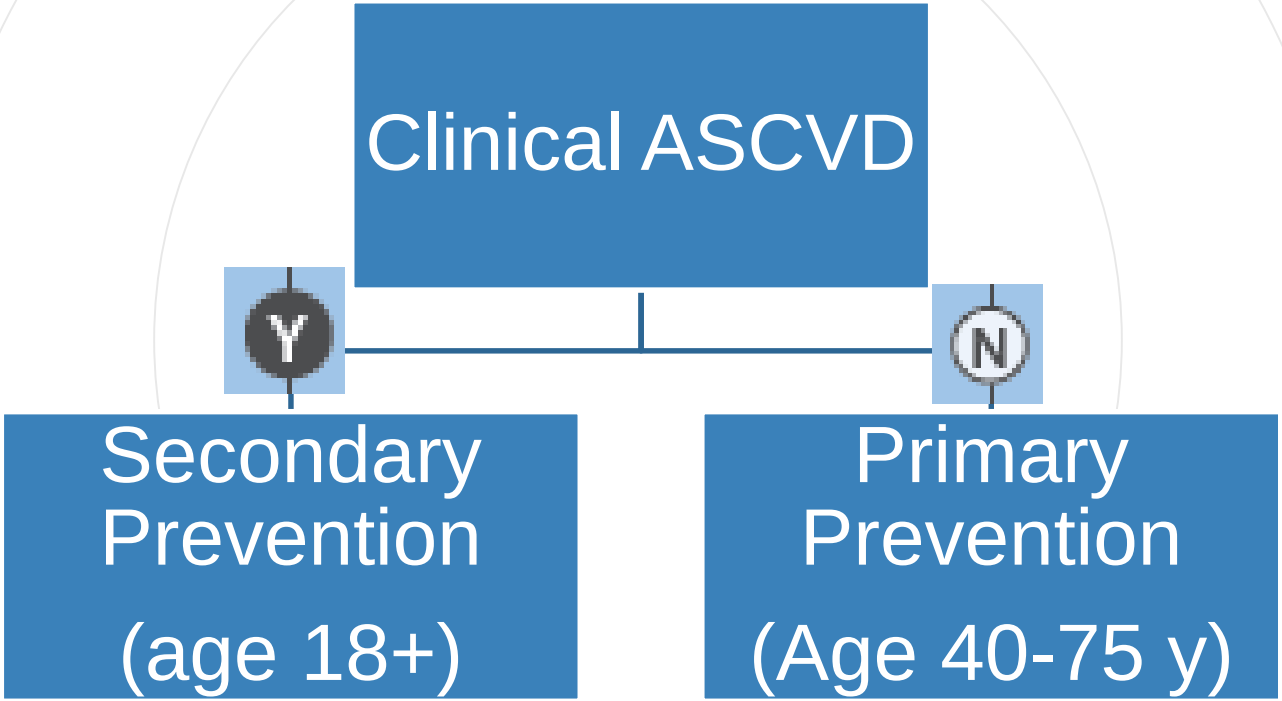
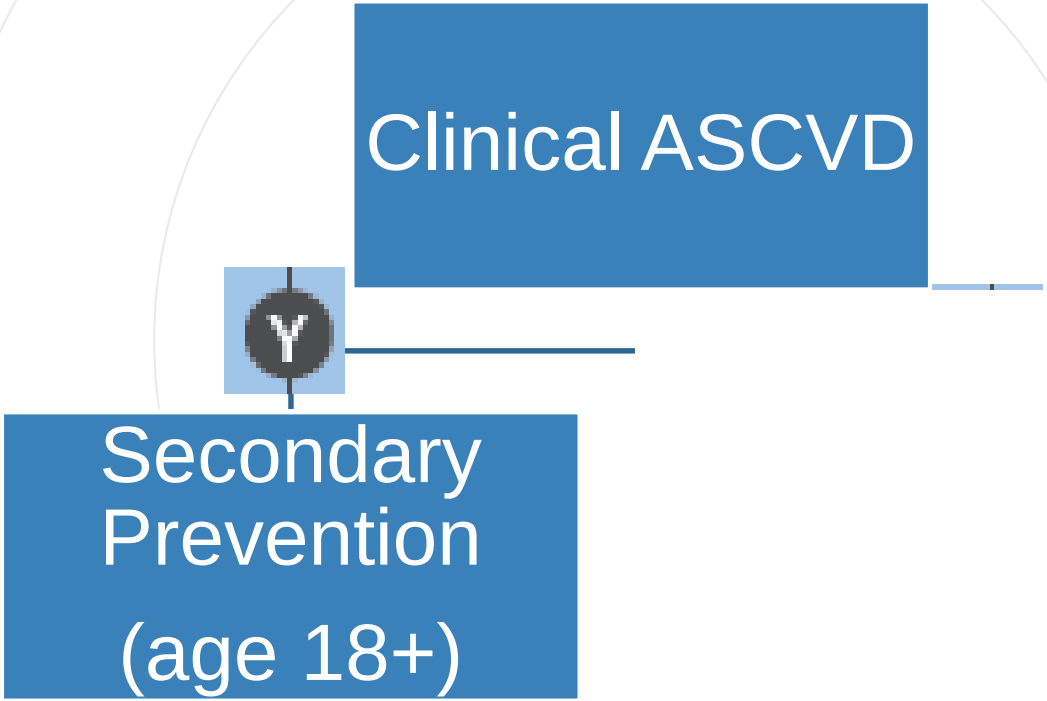
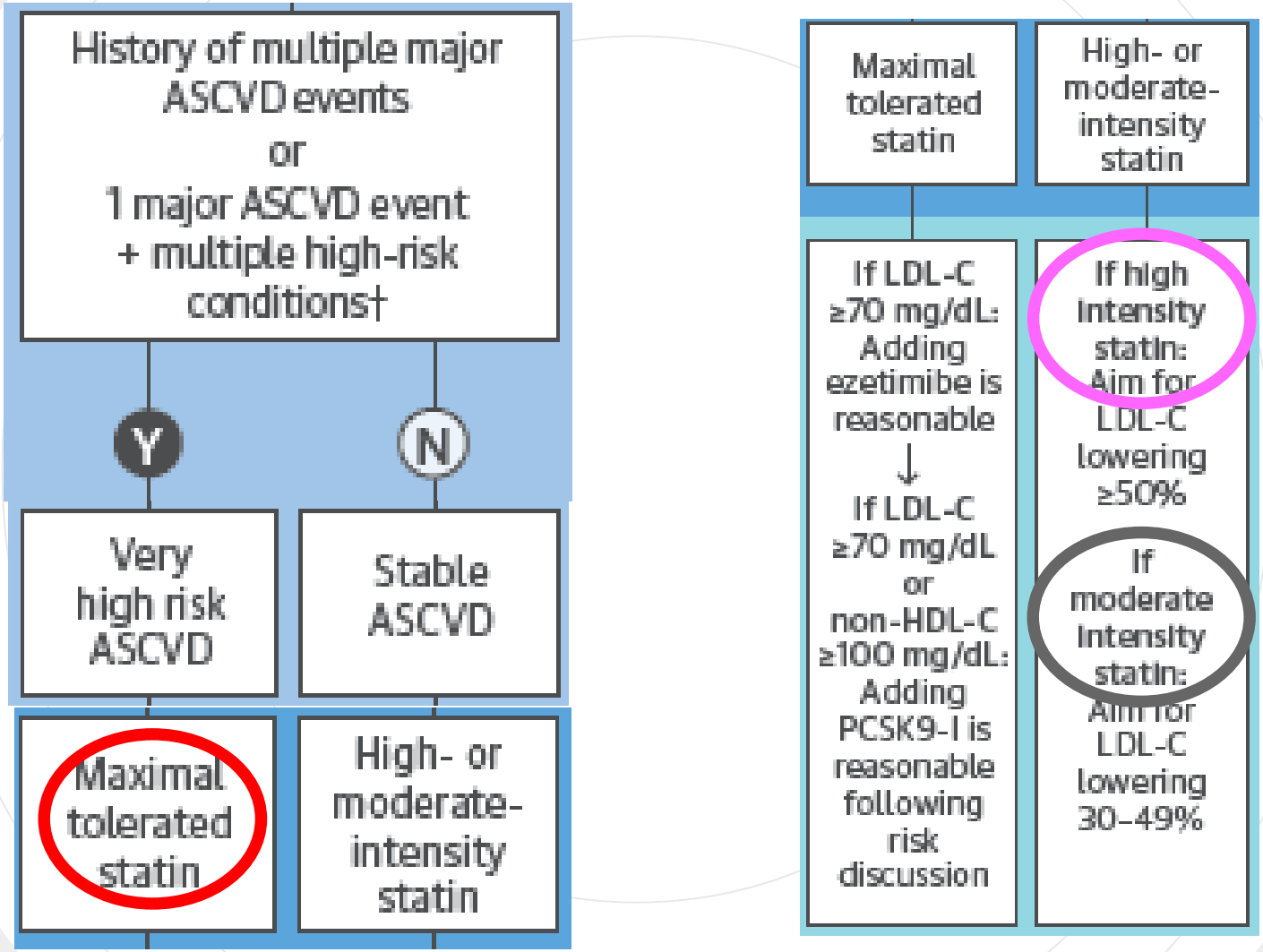
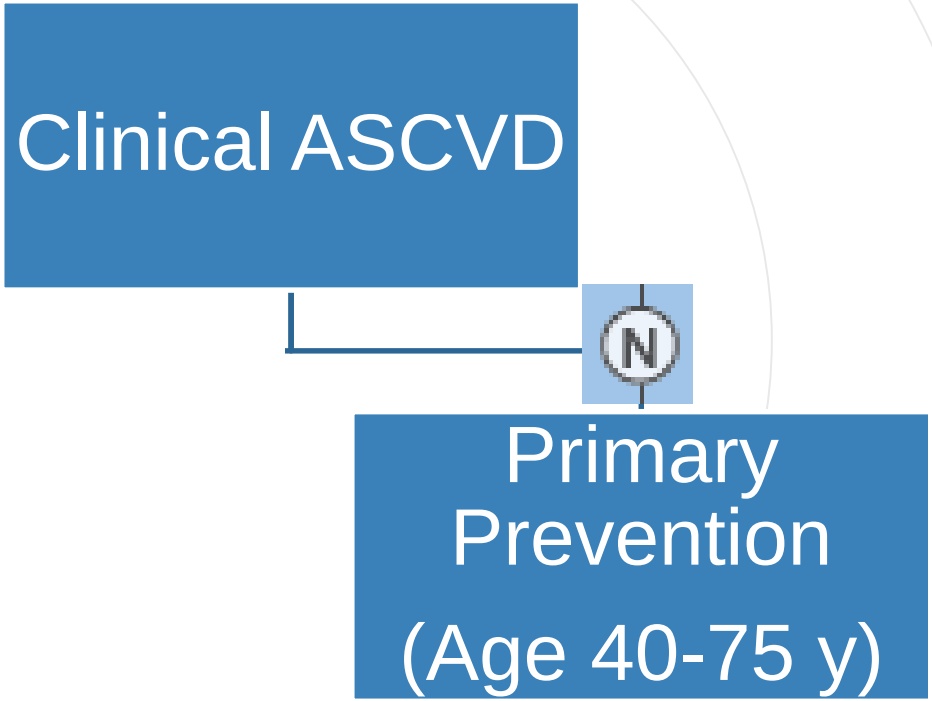
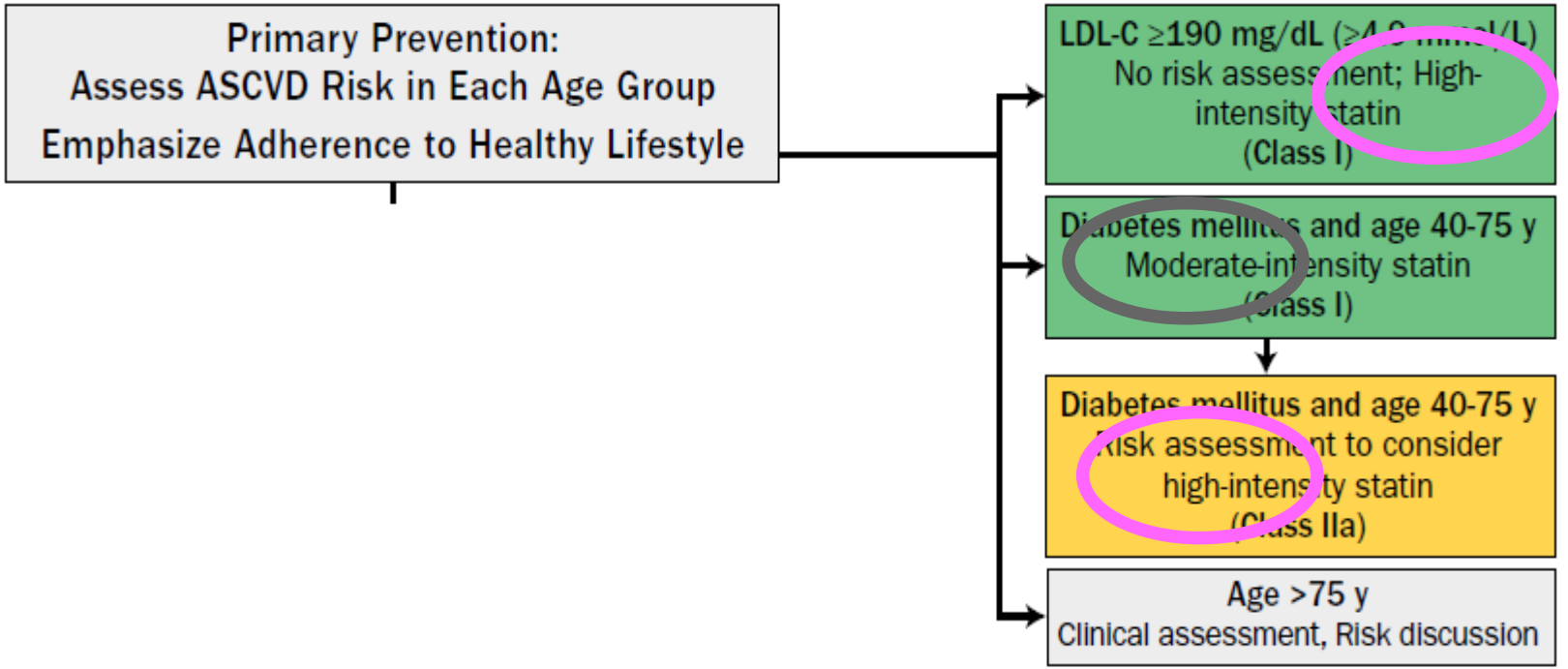

Clinical ASCVD
Y
N
Secondary Prevention
(age 18+)
Primary Prevention
(Age 40-75 y)


Clinical ASCVD
Secondary Prevention
(age 18+)

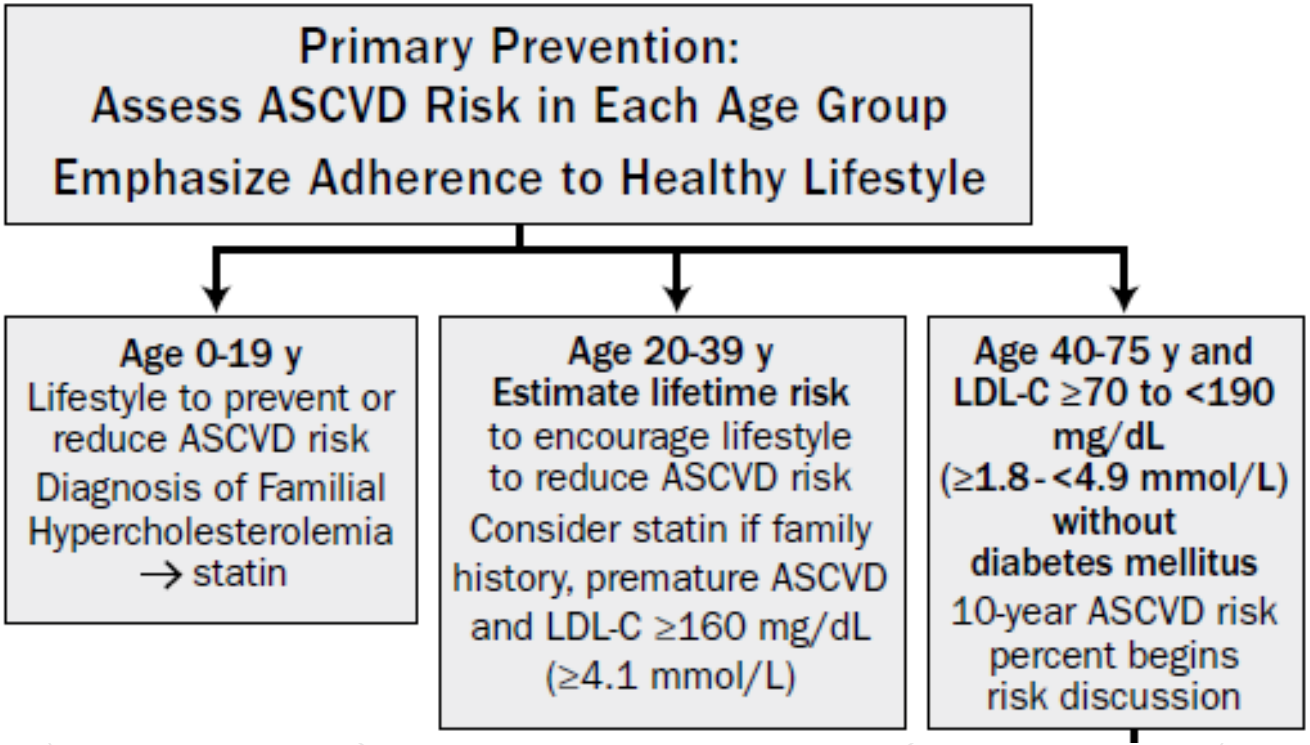

History of multiple major ASCVD events
or
1 major ASCVD event + multiple high-risk conditions†
Y
N
Very high risk ASCVD
Stable ASCVD
Maximal tolerated statin
High- or moderate-intensity statin
Maximal tolerated statin
High- or moderate-intensity statin
If LDL-C ≥70 mg/dL: Adding ezetimibe is reasonable
↓
If LDL-C ≥70 mg/dL or non-HDL-C ≥100 mg/dL: Adding PCSK9-I is reasonable following risk discussion
If high intensity statin: Aim for LDL-C lowering ≥50%
If moderate intensity statin: Aim for LDL-C lowering 30–49%

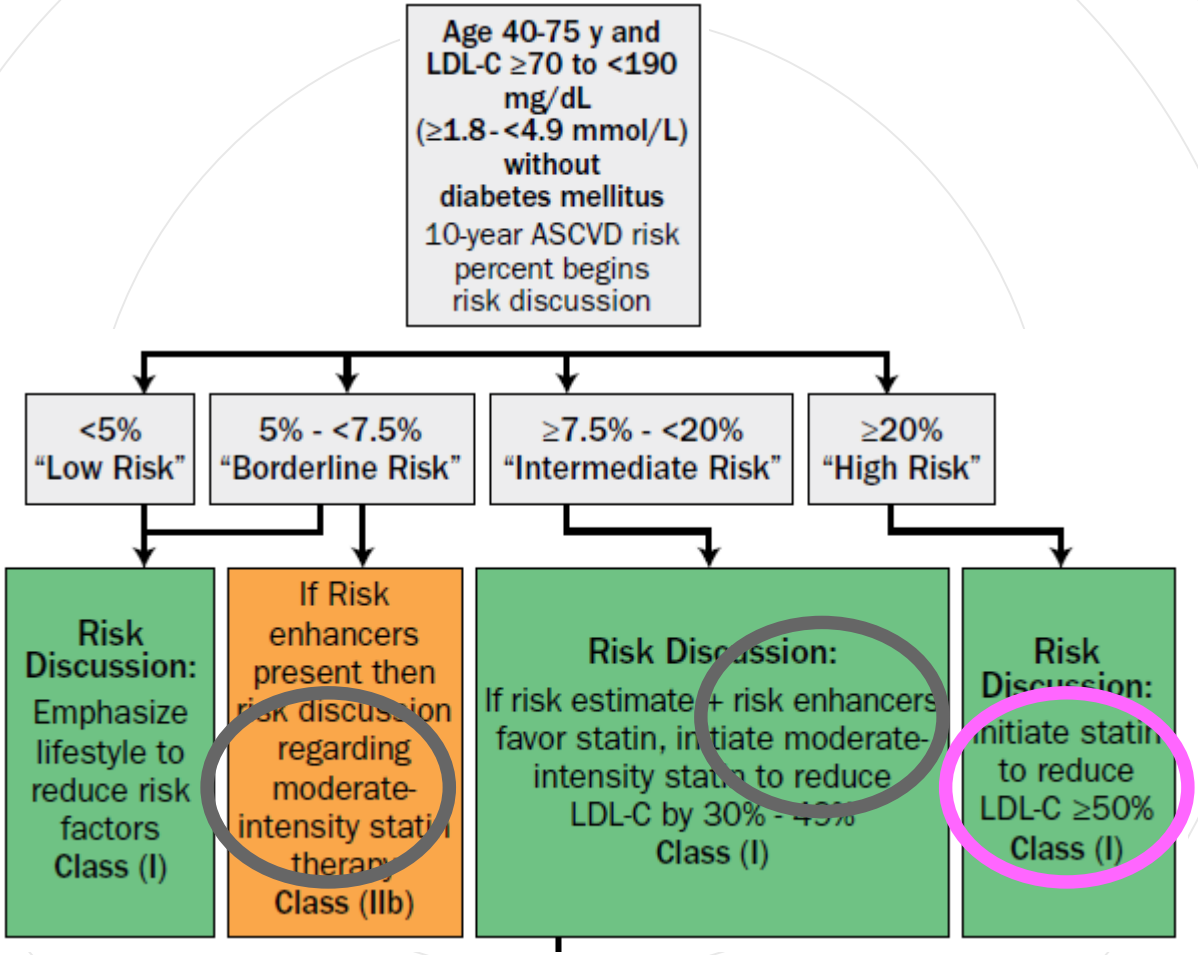

Clinical ASCVD
N
Primary Prevention
(Age 40-75 y)

Primary Prevention



Primary Prevention




Age 40-75 y and LDL-C ≥70 to <190 mg/dL (≥1.8 - <4.9 mmol/L) without diabetes mellitus
10-year ASCVD risk percent begins risk discussion
<5% "Low Risk"
5% - <7.5% "Borderline Risk"
≥7.5% - <20% "Intermediate Risk"
≥20% "High Risk"
Risk Discussion: Emphasize lifestyle to reduce risk factors Class (I)
If Risk enhancers present then risk discussion regarding moderate-intensity statin therapy Class (IIb)
Risk Discussion: If risk estimate + risk enhancers favor statin, initiate moderate-intensity statin to reduce LDL-C by 30% - 49% Class (I)
Risk Discussion: Initiate statin to reduce LDL-C ≥50% Class (I)

Role of Calcium Scoring

If risk decision is uncertain:

Consider measuring CAC in selected adults:

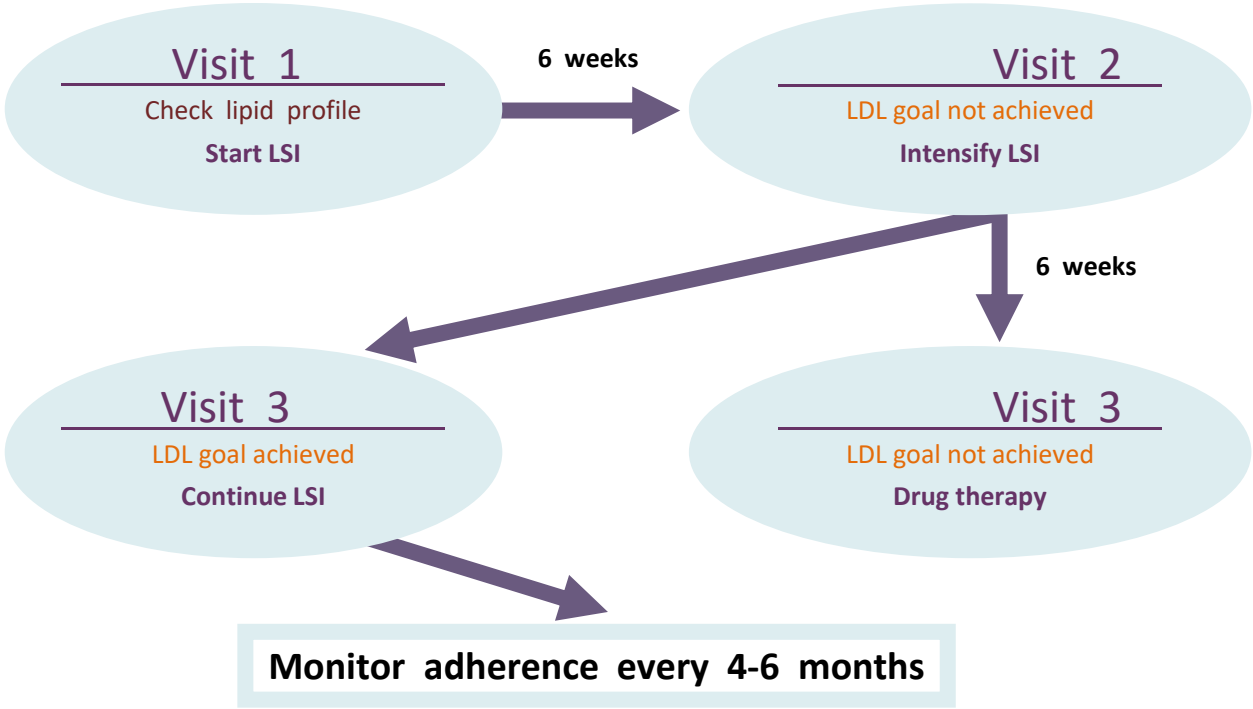
CAC = zero (lowers risk; consider no statin, unless diabetes, family history of premature CHD, or cigarette smoking are present)

CAC = 1-99 favors statin (especially after age 55)

CAC = 100+ and/or $\geq 75^{th}$ percentile, initiate statin therapy

3rd STEP

Strategy for LOW and MODERATE Risk Patients



* Patients on statin should be monitored for muscle injury, hepatic injury, new-onset diabetes, and other safety concerns

Recommendations	Evidence Rating
MIST should be used in patients who are in HIST group if they have severe renal or liver function impairment, statin intolerance or muscle disorder, unexplained elevated ALT > 3x ULN, > 75 years of age, history of hemorrhagic stroke, Asian ancestry.	A
CK should not be measured routinely	A
Baseline ALT should be checked before initiation of statin therapy	B
Evaluate for new-onset diabetes while on statin therapy	B
Statin should not be used in women of childbearing potential (pregnancy category X) unless effective contraception is used and they are not nursing	A

Note :
A = There is high certain based on evidence that the net benefit is substantial.
B = There is moderate certainty based on evidence that the net benefit is moderate to substantial or there is high certainty that the net benefit is moderate

Statin Associated Side Effects	Frequency	Predisposing Factors	Quality of Evidence
Statin Associated Muscle Symptoms (SAMS) • Myalgias (CK normal)	Infrequent (1%–5%) in RCTs/frequent (5%–10%) in observational studies and clinical setting	Age, female, low BMI, high- risk medications (CYP3A4 inhibitors, OATP1B1 inhibitors), comorbidities (HIV, renal, liver, thyroid, pre-existing myopathy), Asian descent, excess alcohol, high levels of physical activity and trauma.	RCTs cohorts/observational
• Myositis/Myopathy (CK >ULN) with concerning symptoms/objective weakness	Rare		RCTs cohorts/observational
• Rhabdomyolysis (CK >10xULN + renal injury)	Rare		RCTs Cohorts/observational
• Statin-associated autoimmune myopathy (SAAM) (HMGCR Ab's, incomplete resolution)	Rare		Case reports

Statin Associated Side Effects	Frequency	Predisposing Factors	Quality of Evidence
Liver • Transaminase elevation 3xULN	Infrequent		RCTs/cohorts/observational Case reports
• Hepatic Failure	Rare		
CNS • Memory/Cognition	Rare/Unclear		Case reports; no increase in memory/cognition problems in three large scale RCTs
Cancer	No definite association		RCTs/meta-analyses

Statin Associated Side Effects	Frequency	Predisposing Factors	Quality of Evidence
New onset Diabetes Mellitus	Depends on population; more frequent if diabetes mellitus risk factors such as BMI ≥30, fasting blood sugar ≥100 mg/dL; metabolic syndrome or A1c ≥6% are present	Diabetes risk factors/ metabolic syndrome High-intensity statin therapy	RCTs/Meta-analyses
Other • Renal Function • Cataracts • Tendon Rupture • Hemorrhagic Stroke • Interstitial Lung Disease • Low Testosterone	 Unclear/unfounded Unclear Unclear/unfounded Unclear Unclear/unfounded Unclear/unfounded		

OUTLINE

- Relation of Cholesterol to Morbidity and Mortality
- At Risk for Atherosclerotic CVD
- Lipid Parameters As Target Therapy
- Steps To Achieve Primary And Secondary Lipid Targets
  - Perform Risk Assessment
  - Identify LDL-C Goal
  - Make a Strategy to Reach LDL-C Goal
- Algorithm for Practice
- Conclusion

Take Home Message

High-intensity statins associated with significant survival advantage compared with moderate-intensity statins, even among older adults[3]

1 mmol/L (39 mg/dl) reduction in LDL-C reduces CHD risk by 22%[1]

0.03 mmol/L increase in HDL-C associated with 1.1% reduction in CHD risk[2]

Maximal doses of high-intensity statins were associated with a further survival benefit in patients with ASCVD[3]

1. CTT Collaborators et al. *Lancet*. 2010; 376: 1670–1676
2. Barter P et al. *NEJM* 2007; 357: 1301–1310
3. Rodriguez F, Maron DJ, Knowles JW, Virani SS, Lin S, Heidenreich PA. Association Between Intensity of Statin Therapy and Mortality in Patients With Atherosclerotic Cardiovascular Disease. JAMA Cardiol. 2017;2(1):47-
doi:10.1001/jamacardio.2016.4052

AMERICAN COLLEGE of CARDIOLOGY

Chol GUIDELINES MADE SIMPLE

2018 Guideline on the Management of Blood Cholesterol

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Top 10 Take-Home Messages to Reduce Risk of Atherosclerotic Cardiovascular Disease (ASCVD) through Cholesterol Management

1. *In all individuals, emphasize heart-healthy lifestyle across the life-course.*

2. *In patients with clinical ASCVD, reduce low-density lipoprotein cholesterol (LDL-C) with high-intensity statin therapy or maximally tolerated statin therapy*

3. *In very high-risk ASCVD, use a LDL-C threshold of 70 mg/dL (1.8 mmol/L) to consider addition of nonstatins to statin therapy.*

4. *In patients with severe primary hypercholesterolemia (LDL-C level ≥190 mg/dL [≥4.9 mmol/L]), without calculating 10-year ASCVD risk, begin high-intensity statin therapy without calculating 10-year ASCVD risk.*

5 *In patients 40 to 75 years of age with diabetes mellitus and LDL-C ≥70 mg/dL (≥1.8 mmol/L), start moderate-intensity statin therapy without calculating 10-year ASCVD risk.*

6 *In adults 40 to 75 years of age evaluated for primary ASCVD prevention, have a clinician–patient risk discussion before starting statin therapy.*

7 *In adults 40 to 75 years of age without diabetes mellitus and with LDL-C levels ≥70 mg/dL (≥1.8 mmol/L), at a 10-year ASCVD risk of ≥7.5%, start a moderate-intensity statin if a discussion of treatment options favors statin therapy.*

8 *In adults 40 to 75 years of age without diabetes mellitus and 10-year risk of 7.5% to 19.9% (intermediate risk), risk-enhancing factors favor initiation of statin therapy (see #7).*

9 *In adults 40 to 75 years of age without diabetes mellitus and with LDL-C levels ≥70 mg/dL- 189 mg/dL (≥1.8-4.9 mmol/L), at a 10-year ASCVD risk of ≥7.5% to 19.9%, if a decision about statin therapy is uncertain, consider measuring CAC.*

10 *Assess adherence and percentage response to LDL-C–lowering medications and lifestyle changes with repeat lipid measurement 4 to 12 weeks after statin initiation or dose adjustment, repeated every 3 to 12 months as needed.*

THANK YOU

CASE STUDY #1

The patient is a 58-year-old Hispanic male who presents for a routine evaluation. With a body mass index (BMI) of 29, the patient is overweight; he also has central adiposity with a waist circumference of 101 cm His cardiac exam and peripheral pulses are both normal. The patient's medical history is significant for hypertension (HTN) for which he takes lisinopril/hydrochlorothiazide (HCTZ). His blood pressure (BP) on medication is 130/80 mm Hg.

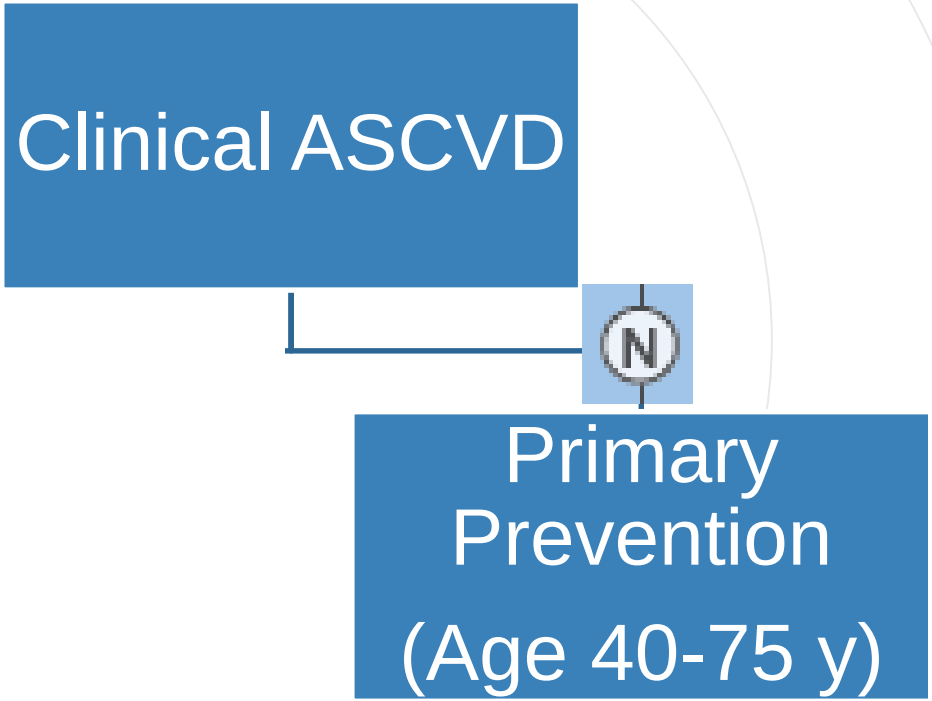
- Lipid panel
  - TC: 178 mg/dL
  - TG: 160 mg/dL
  - HDL-C: 39 mg/dL
  - LDL-C: 106 mg/dL
  - Non-HDL-C: 139 mg/dL
- A1C: 6.0%

Based on a comprehensive assessment of risk factors, select the most appropriate level of cardiovascular risk in this patient:

A. Moderate
B. Moderate to high since most risk factors are borderline
C. Moderately high
D. High
E. Depends predominately on nonmodifiable risk factors

Based on the risk, should statin therapy initiated?

A. no
B. Yes, with high intensity
C. Yes, with moderate intensity
D. Yes, with low intensity
E. I don’t know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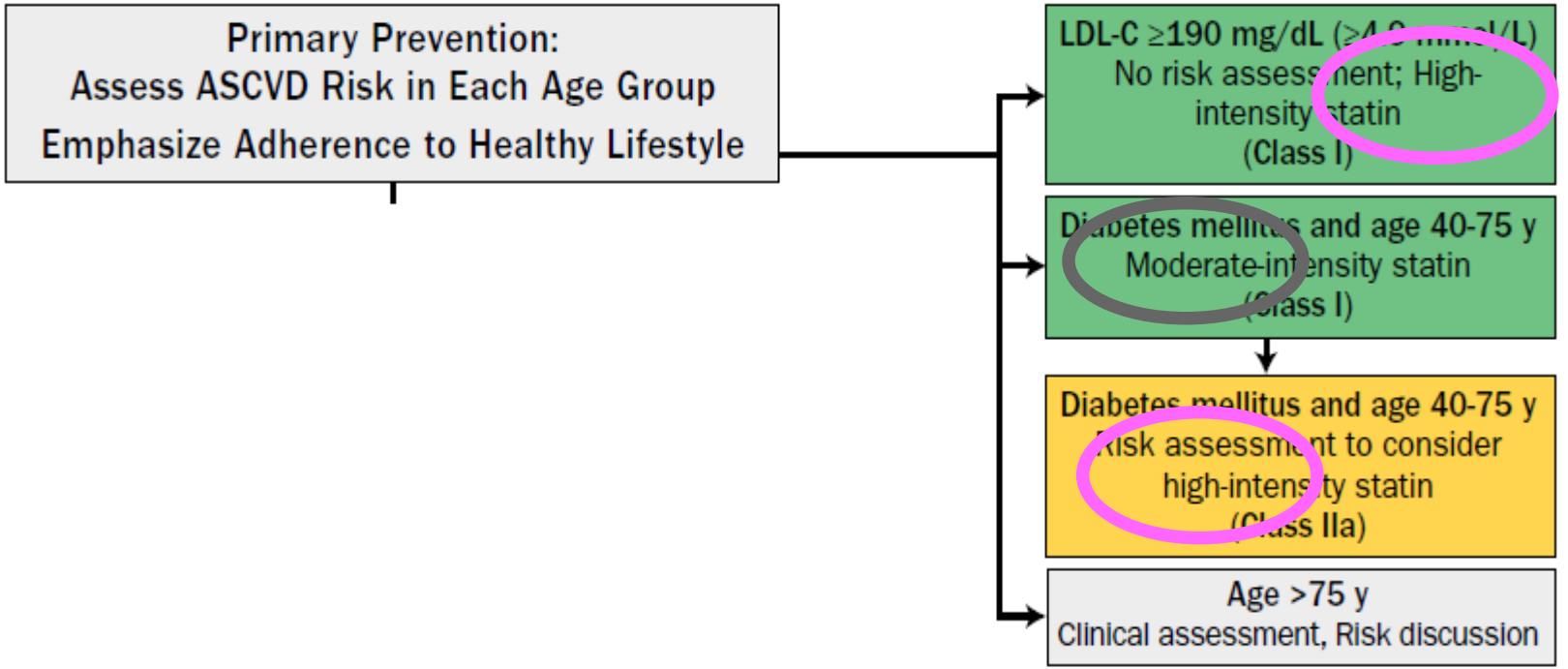

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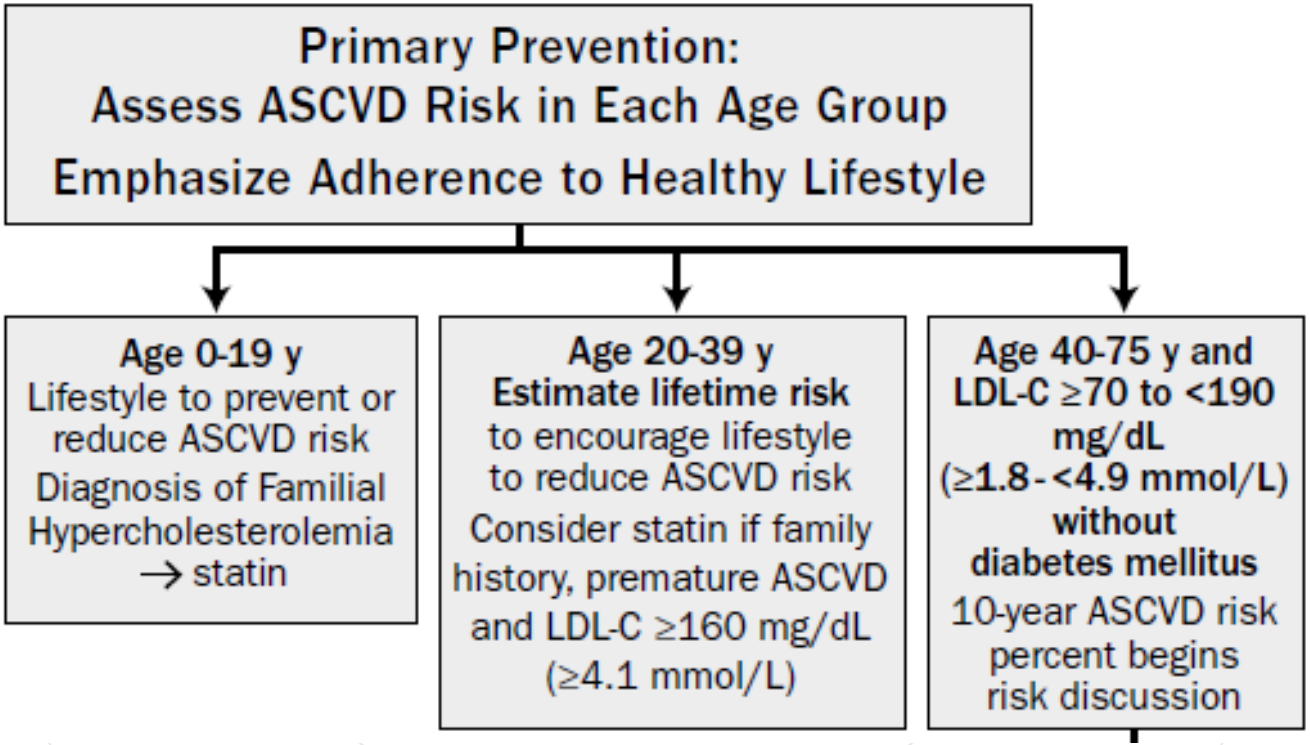

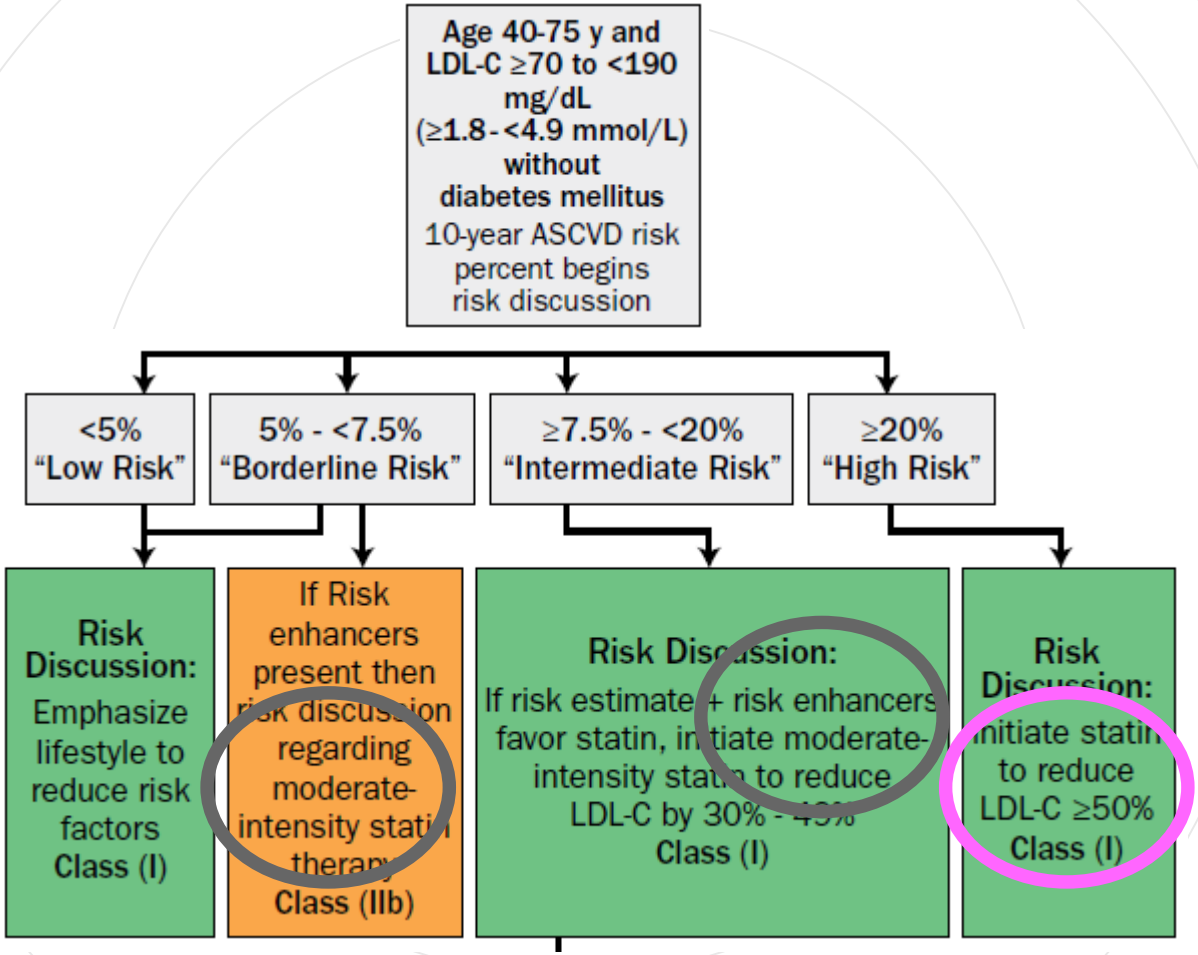
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ASCVD Risk Enhancers:

- Family history of premature ASCVD
- Persistently elevated LDL-C ≥160 mg/dL (≥4.1 mmol/L)
- Chronic kidney disease
- Metabolic syndrome
- Conditions specific to women (e.g. preeclampsia, premature menopause)
- Inflammatory diseases (especially rheumatoid arthritis, psoriasis, HIV)
- Ethnicity factors (e.g. South Asian ancestory)

Lipid/Biomarkers:

- Persistently elevated triglycerides (≥175 mg/mL)

In selected individuals if measured:

- hs-CRP ≥2.0 mg/L
- Lp(a) levels >50 mg/dL or >125 nmol/L
- apoB ≥130 mg/dL
- Ankle-brachial index (ABI) <0.9

CASE STUDY #2

The patient is a 45-year-old indonesian male who presents for a routine evaluation. With a body mass index (BMI) of 26, the patient is overweight; he also has central adiposity with a waist circumference of 92 cm His cardiac exam and peripheral pulses are both normal. The patient's medical history is significant for hypertension (HTN) for which he takes Amlodipin/Telmisartan. His blood pressure (BP) on medication is 130/80 mm Hg.

- Lipid panel
  - TC: 199 mg/dL
  - TG: 149 mg/dL
  - HDL-C: 32 mg/dL
  - LDL-C: 130 mg/dL
- A1C: 5.2%

Based on a comprehensive assessment of risk factors, select the most appropriate level of cardiovascular risk in this patient:

A. Moderate
B. Moderate to high since most risk factors are borderline
C. Moderately high
D. High
E. Depends predominately on nonmodifiable risk factors

Based on the risk, should statin therapy initiated?

A. no
B. Yes, with high intensity
C. Yes, with moderate intensity
D. Yes, with low intensity
E. I don’t know

CASE STUDY #3

The patient is a 43-year-old indonesian male who presents after having an ACS (STEMI) 4 months ago. He has on treatment for diabetes with Metformin. His cardiac exam and peripheral pulses are both normal. The patient's is taking dual antiplatelet therapy, candesartan, atorvastatin 20 mg. His blood pressure (BP) on medication is 120/70 mm Hg.

- Lipid panel
  - TC: 230 mg/dL
  - TG: 133 mg/dL
  - HDL-C: 34 mg/dL
  - LDL-C: 89 mg/dL
- A1C: 6.2%

Based on a comprehensive assessment of risk factors, select the most appropriate level of cardiovascular risk in this patient:

A. Moderate
B. Moderate to high since most risk factors are borderline
C. Moderately high
D. High
E. Depends predominately on nonmodifiable risk factors

Based on the risk, should statin therapy be modified?

A. no, adequate dose
B. Yes, higher dose
C. Yes, lower dose
D. Stop the medicatioin
E. I don’t know

Who to Treat: 2013 US Guidelines

Group 1

Clinical ASCVD

CHD, stroke, and peripheral arterial disease, all of presumed atherosclerotic origin

Group 2

LDL-C ≥190 mg/dL (~5 mmol/L)

Group 3

Diabetes mellitus

+ age of 40–75 years
+ LDL-C 70–189 mg/dL (~1.8–5 mmol/L)

Group 4

ASCVD risk ≥7.5%

No diabetes
+ age of 40–75 years
+ LDL-C 70–189 mg/dL (~1.8–5 mmol/L)

Stone NJ, et al. J Am Coll Cardiol 2013 Nov 7. Epub ahead of print