Primary Prevention in Cardiovascular Disease

ASCVD risk scoring and its importance

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Case

53yo male presents for preventive assessment . Father had a heart attack age 54. Fairly sedentary, eats out frequently.

HR:80, SBP:140/85, BMI 31kg/m2
Meds: None
TC:180mg/dL, LDL-C:121, HDL-C:30,
HBA1C :6
estimated ASCVD risk?

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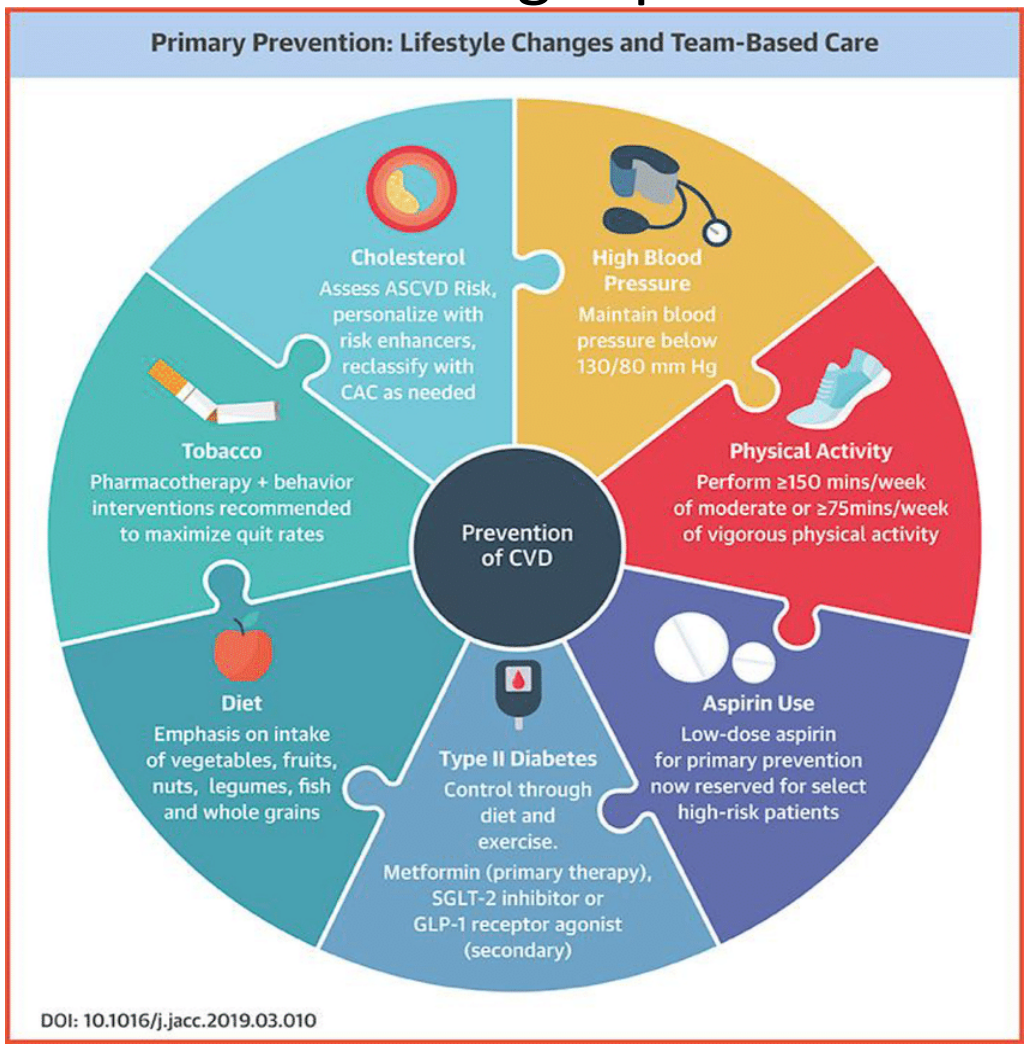
- The prevention of ASCVD outcomes related to the following topic areas:

- **Risk assessment,**
- Diet,
- Exercise/Physical activity,
- Obesity and weight loss,
- Smoking cessation,
- Diabetes mellitus (DM),
- Blood cholesterol,
- Hypertension,
- Aspirin use.



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- All current guidelines on the prevention of CVD in clinical practice recommend the assessment of total CVD risk.

- Prevention of CVD in an individual should be adapted to his or her total CV risk:

The higher risk, the more intense action should be.

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APPROACH TO CVD RISK ASSESSMENT

❑ Who needs CVD risk assessment?

- Asymptomatic adults 20 to 75 years of age

- For adults >75 years of age, the clinician and patient should engage in a discussion about the possible benefits of preventive therapies appropriate to the age group in the context of comorbidities and life expectancy.

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❑ How to assess CVD risk?

- It is essential for clinicians to be able to assess CV risk rapidly and with sufficient accuracy.

- CV risk in the context of these Guidelines means the likelihood of a person developing an atherosclerotic CV event over a defined period of time.

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- Identify risk factors:

  For **all individuals**, the first step in assessing CVD risk is to determine whether one or more of the traditional risk factors for CVD is present.

- Estimate ASCVD risk using a risk calculator:

  Adults aged **40 to 75 years** being evaluated for CVD prevention should have a 10-year ASCVD risk estimation.

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- Choosing a calculator for risk scoring:

- There are several CVD risk calculators in widespread use, and the field is dynamic, with new algorithms being developed on a regular basis which are adopted by societies that focus on CVD prevention.

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Some region-specific recommendations include:

- United States: Pooled cohort equations , Framingham, Reynolds Risk Score,
- Canada: Framingham risk score .
- Western Europe other than United Kingdom: SCORE or JBS3 risk estimator
- China: China-PAR CVD risk calculator .

- Users in other regions choose the most relevant CVD risk calculator.

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ASCVD Risk Calculator: Pooled Cohort Equations

ESC

CVD Risk

HeartScore

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ACC/AHA

PCE (Pooled Cohort Equations)

- Outcomes Predicted:
  10-year risk ASCVD
  (CHD death, nonfatal MI,
  fatal or nonfatal stroke)
- (<5%, 5-7.5%, 7.5-20%, >20%)
- cut off :75y

ESC

SCORE (Systematic Coronary Risk Evaluation)

- Outcomes Predicted:
  10-year risk of CVD mortality
- (<1%, 1-5%, 5-10%, >10%)
- cut off :70y

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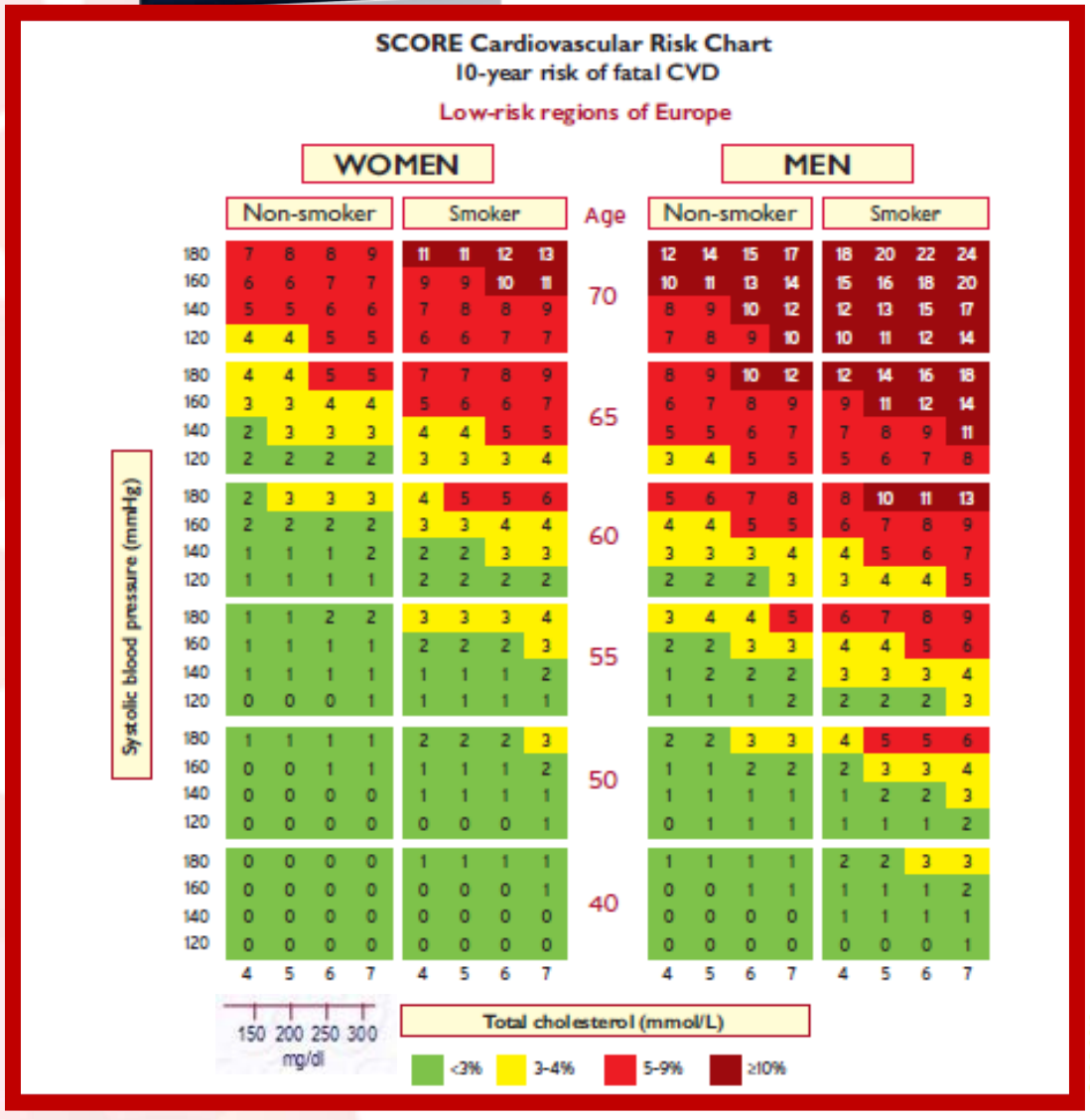

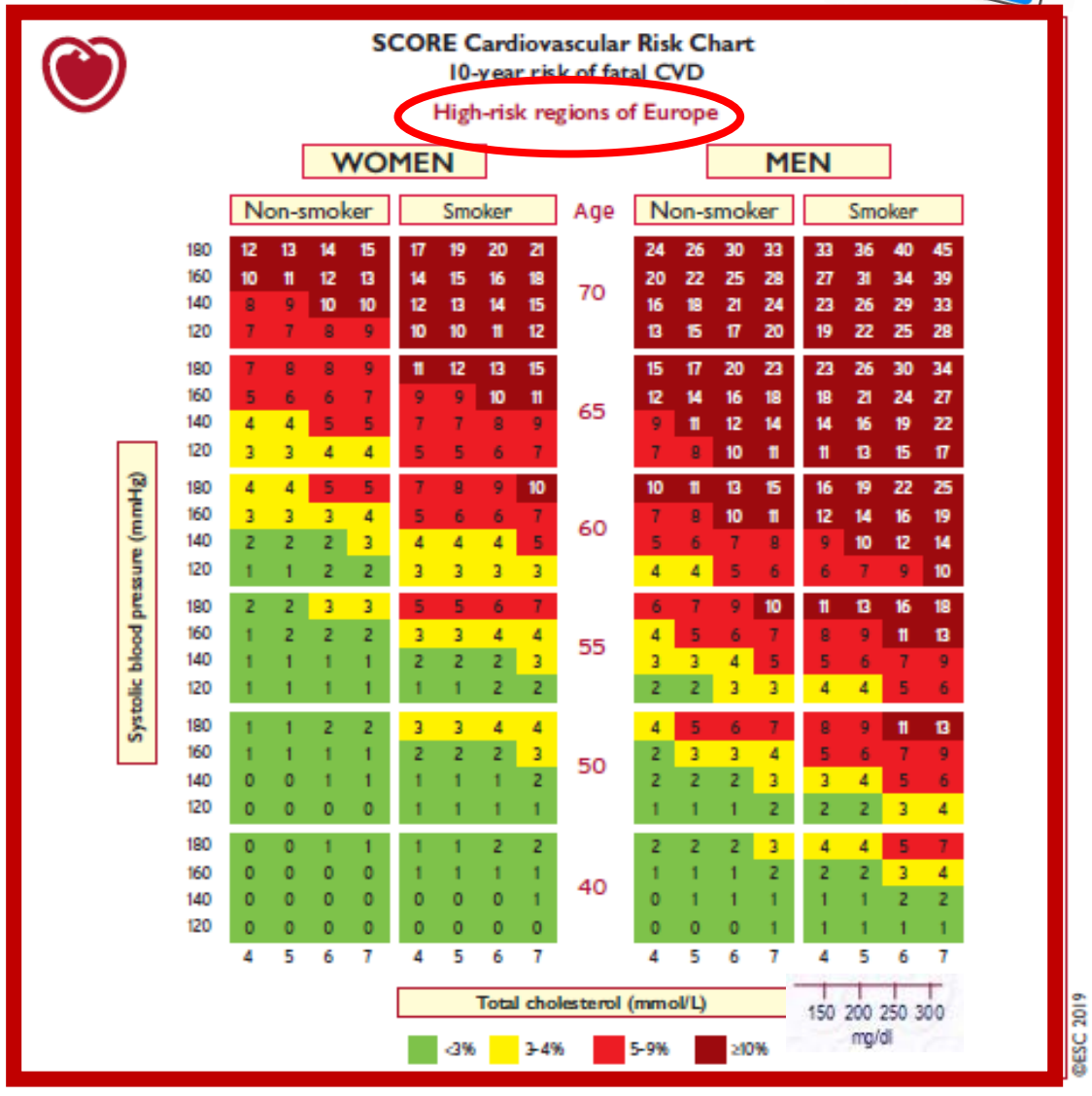

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ACC/AHA CLINICAL PRACTICE GUIDELINE

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease

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ASCVD Risk Calculator: Pooled Cohort Equations

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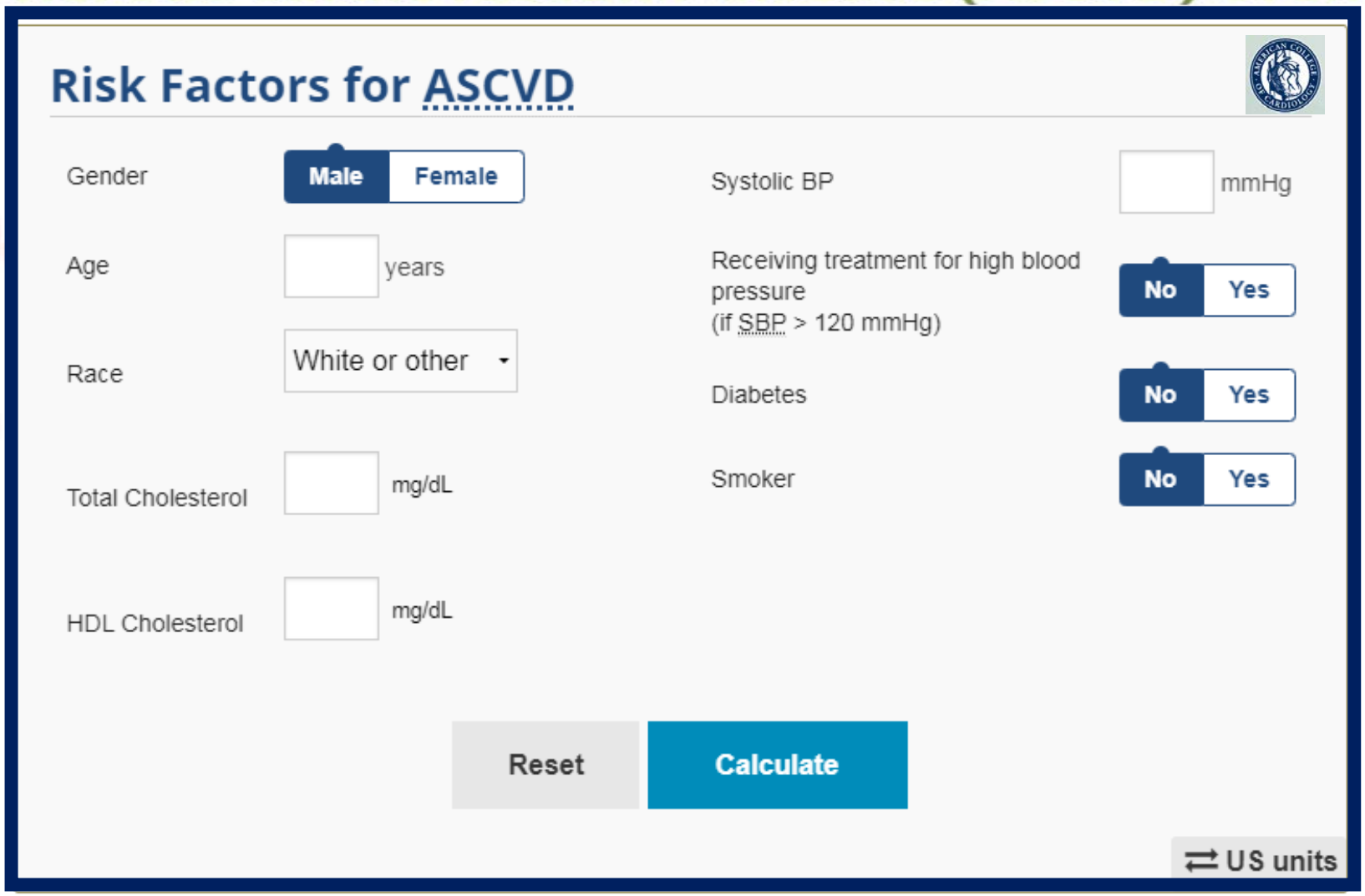
Risk Factor	Units	Value	Acceptable range of values	Optimal values
Sex	M or F		M or F	
Age	years		20-79	
Race	AA or WH		AA or WH	
Total Cholesterol	mg/dL		130-320	170
HDL-Cholesterol	mg/dL		20-100	50
Systolic BP	mm Hg		90-200	110
Treatment for High BP	Y or N		Y or N	N
Diabetes	Y or N		Y or N	N
Smoker	Y or N		Y or N	N

ASCVD 10-Year Risk Calculation for Excel Files

Secure, online tool for calculating 10-year risk of a first atherosclerotic cardiovascular disease (ASCVD) event



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- **The PCE have been shown to overestimate or underestimate ASCVD risk for certain subgroups.**

- *Underestimation :*

  - chronic inflammatory conditions, autoimmune disease,
  - lower socioeconomic status

- *Overestimation :*

  - higher socioeconomic position and those with continual access to care and preventive services

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- Current US prevention guidelines for **blood pressure** and **cholesterol** management recommend use of the pooled cohort equations to start a process of shared decision-making between clinicians and patients in primary prevention.

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COR	LOE	Recommendations
I	B-NR	1. For adults 40 to 75 years of age, clinicians should routinely assess traditional cardiovascular risk factors and calculate 10-year risk of ASCVD by using the pooled cohort equations (PCE).[S2.2-1,S2.2-2]
IIa	B-NR	2. For adults 20 to 39 years of age, it is reasonable to assess traditional ASCVD risk factors at least every 4 to 6 years.[S2.2-1–S2.2-3]

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- For adults **20 to 39** years of age, limited data exist on the performance and utility of 10-year risk estimation tools.

- Because age is a major driver of risk, most in this age range are unlikely to have a sufficiently elevated 10-year risk to warrant pharmacological therapy.

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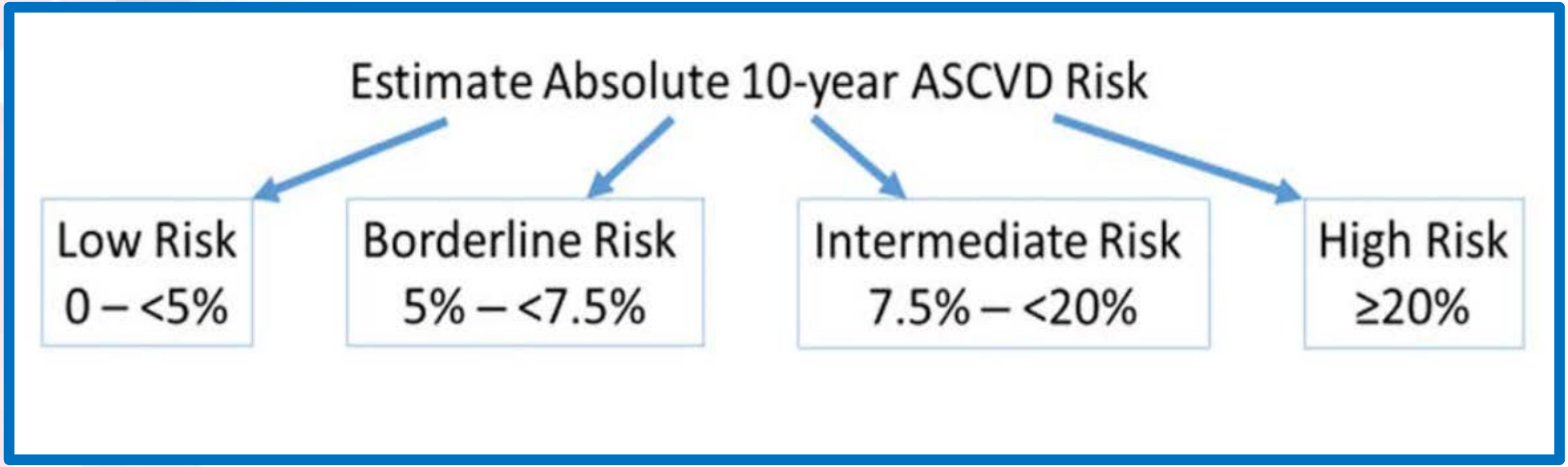

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Risk Factors for ASCVD

Gender	Male / Female	Systolic BP	140 mmHg
Age	53 years	Receiving treatment for high blood pressure (if SBP > 120 mmHg)	No / Yes
Race	White or other	Diabetes	No / Yes
Total Cholesterol	180 mg/dL	Smoker	No / Yes
HDL Cholesterol	30 mg/dL		

Reset | Calculate

⇄ US units

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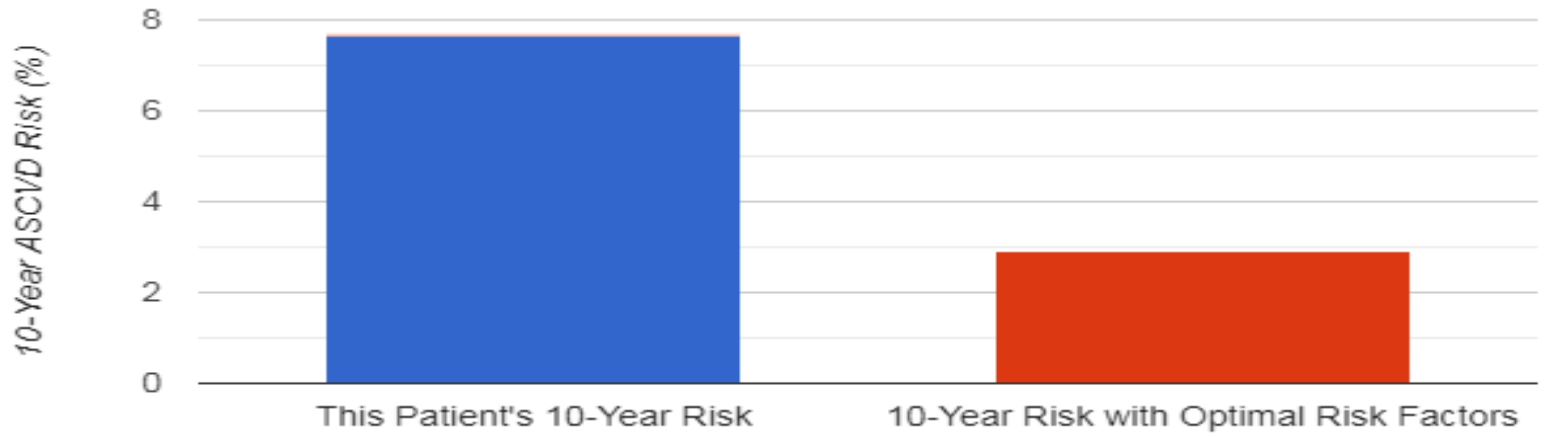
ASCVD Risk Evaluation

Print

10-year risk of atherosclerotic cardiovascular disease:	7.7%
10-year risk in a similar patient with optimal risk factors ?:	2.9%

Save Image



Lifetime risk of atherosclerotic cardiovascular disease ?:	46% (95% CI 38% to 53%)
Lifetime risk for a 50-year-old with optimal risk factors ?:	5% (95% CI 0% to 12%)

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ASCVD Risk Interpretation [1,2]

- This patient is at ELEVATED 10-year risk (≥ 7.5%) for atherosclerotic cardiovascular disease (ASCVD)
- Consider a moderate-to-high intensity statin in patients with a 10-year ASCVD risk of 7.5% or higher (assuming no clinical ASCVD or diabetes, aged 40 to 75 years, and LDL 70 to 189 mg/dL)
- In individuals not receiving cholesterol-lowering drug therapy, recalculate the 10-year ASCVD risk every 4 to 6 years (assuming age 40-75 years, no clinical ASCVD or diabetes, and LDL 70-189 mg/dL)

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❑ Why assess CVD risk?

- Patients with **low 10-year CVD risk** can be reassured and encouraged to maintain healthy lifestyles (eg, regular exercise, healthy diet, etc).

- Patients with **high 10-year CVD risk** can be started on appropriate primary preventive therapies.

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IIa	B-NR	3. In adults at borderline risk (5% to <7.5% 10-year ASCVD risk) or intermediate risk (≥7.5% to <20% 10-year ASCVD risk), it is reasonable to use additional risk-enhancing factors to guide decisions about preventive interventions (eg, statin therapy).[S2.2-4–S2.2-14]

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Risk-Enhancing Factors
Family history of premature ASCVD (males, age <55 y; females, age <65 y)
Primary hypercholesterolemia (LDL-C, 160–189 mg/dL [4.1–4.8 mmol/L]; non–HDL-C 190–219 mg/dL [4.9–5.6 mmol/L])*
Metabolic syndrome (increased waist circumference [by ethnically appropriate cutpoints], elevated triglycerides [>150 mg/dL, nonfasting], elevated blood pressure, elevated glucose, and low HDL-C [<40 mg/dL in men; <50 mg/dL in women] are factors; a tally of 3 makes the diagnosis)
Chronic kidney disease (eGFR 15–59 mL/min/1.73 m^2 with or without albuminuria; not treated with dialysis or kidney transplantation)
Chronic inflammatory conditions, such as psoriasis, RA, lupus, or HIV/AIDS
History of premature menopause (before age 40 y) and history of pregnancy-associated conditions that increase later ASCVD risk, such as preeclampsia
High-risk race/ethnicity (eg, South Asian ancestry)
Lipids/biomarkers: associated with increased ASCVD risk
Persistently elevated* primary hypertriglyceridemia (≥175 mg/dL, nonfasting)
If measured:
Elevated high-sensitivity C-reactive protein (≥2.0 mg/L)
Elevated Lp(a): A relative indication for its measurement is family history of premature ASCVD. An Lp(a) ≥50 mg/dL or ≥125 nmol/L constitutes a risk-enhancing factor, especially at higher levels of Lp(a).
Elevated apoB (≥130 mg/dL): A relative indication for its measurement would be triglyceride ≥200 mg/dL. A level ≥130 mg/dL corresponds to an LDL-C >160 mg/dL and constitutes a risk-enhancing factor
ABI (<0.9)

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IIa	B-NR	4. In adults at intermediate risk (≥7.5% to <20% 10-year ASCVD risk) or selected adults at borderline risk (5% to <7.5% 10-year ASCVD risk), if risk-based decisions for preventive interventions (eg, statin therapy) remain uncertain, it is reasonable to measure a coronary artery calcium score to guide clinician–patient risk discussion.[S2.2-15–S2.2-31]

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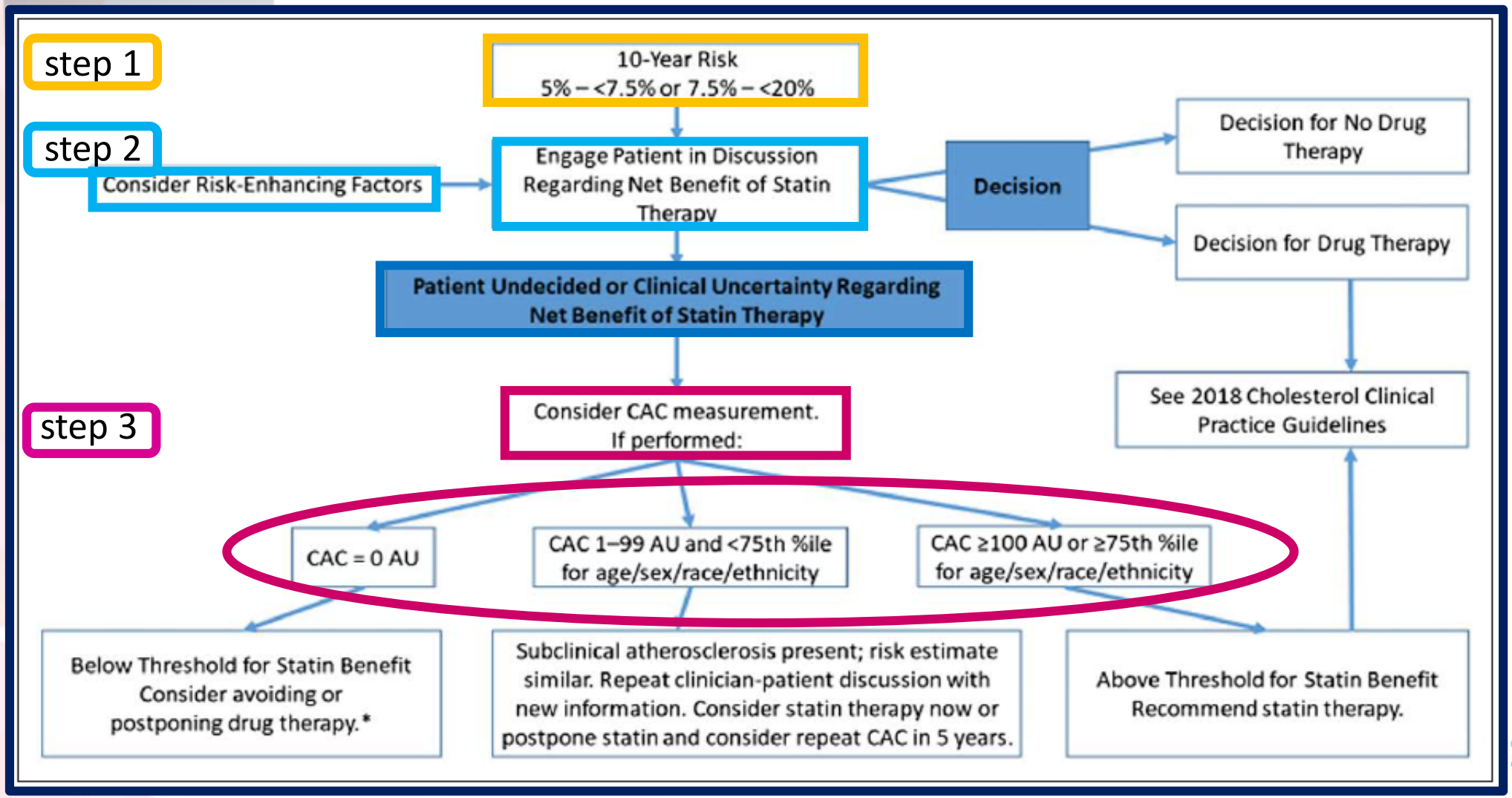

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Patients with familial hypercholesterolemia are at significant risk of having an early ASCVD event, and the use of risk calculators is not applicable to these patients.

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Recommendations for Assessment of Cardiovascular Risk (Continued)		
COR	**LOE**	**Recommendations**
IIb	B-NR	5. For adults 20 to 39 years of age and for those 40 to 59 years of age who have <7.5% 10-year ASCVD risk, estimating lifetime or 30-year ASCVD risk may be considered.[S2.2-1,S2.2-2,S2.2-32–S2.2-35]

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- **Calculation of lifetime risk** with the ACC/AHA 30 year/ lifetime risk estimator for those 20 to 59 years of age (not at high short-term risk) may be reasonable to consider as a communication strategy for reinforcing adherence to lifestyle recommendations.

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❑ When reassess CVD risk assessment ?

We reassess CVD risk:

- **every four to six years** for low-risk patients,
- **more frequently** for patients at intermediate or greater risk, or following the identification of a new risk factor.

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Take home message

ASCVD RISK

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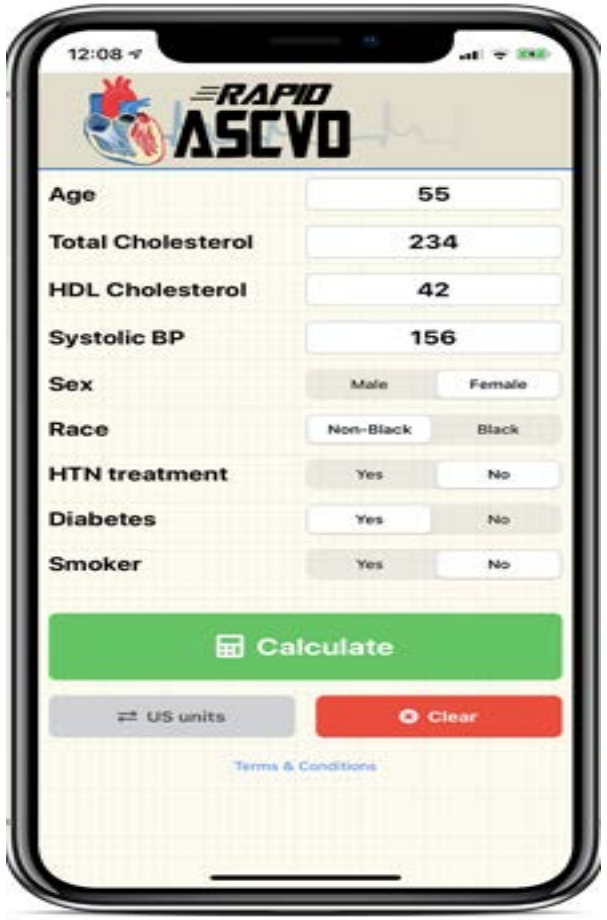

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ASCVD Risk Estimator

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