

4.2.1 Role of non-invasive cardiovascular imaging techniques in the assessment of total cardiovascular disease risk

Non-invasive imaging techniques can detect the presence, estimate the extent, and evaluate the clinical consequences of atherosclerotic vascular damage. Detection of coronary artery calcification with non-contrast computed tomography (CT) gives a good estimate of the atherosclerotic burden and is strongly associated with CV events.¹⁸ A recent meta-analysis from the US Preventive Services Task Force summarized the available evidence on the value of non-traditional risk factors for risk prediction, and found that, although there are no randomized trials showing that the use of CAC reduces health outcomes, nevertheless it improves both discrimination and

reclassification.¹⁹ Assessment of carotid or femoral plaque burden with ultrasound has also been demonstrated to be predictive of CV events, comparable to CAC,^{20–23} while the measurement of the carotid intima-media thickness is inferior to CAC score and carotid plaque detection.^{16,24,25}

In asymptomatic patients at low or moderate risk who would be eligible for statin therapy (see Table 5), assessment of ASCVD with imaging may have an impact on medical treatment, both from the physician's and the patient's points of view. Data from the Multi-Ethnic Study of Atherosclerosis (MESA) showed that 41–57% of individuals who would be eligible for statin therapy had a CAC score of zero and the rate of atherosclerotic CVD events in the 10 year

Table 5 Intervention strategies as a function of total cardiovascular risk and untreated low-density lipoprotein cholesterol levels

	Total CV risk (SCORE) %	Untreated LDL-C levels					
		<1.4 mmol/L (55 mg/dL)	1.4 to <1.8 mmol/L (55 to <70 mg/dL)	1.8 to <2.6 mmol/L (70 to <100 mg/dL)	2.6 to <3.0 mmol/L (100 to <116 mg/dL)	3.0 to <4.9 mmol/L (116 to <190 mg/dL)	≥4.9 mmol/L (≥190 mg/dL)
Primary prevention	<1, low-risk	Lifestyle advice	Lifestyle advice	Lifestyle advice	Lifestyle advice	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention and concomitant drug intervention
	Class ^a /Level ^b	I/C	I/C	I/C	I/C	I/a/A	I/a/A
	≥1 to <5, or moderate risk (see Table 4)	Lifestyle advice	Lifestyle advice	Lifestyle advice	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention and concomitant drug intervention
	Class ^a /Level ^b	I/C	I/C	I/a/A	I/a/A	I/a/A	I/a/A
	≥5 to <10, or high-risk (see Table 4)	Lifestyle advice	Lifestyle advice	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention
	Class ^a /Level ^b	I/a/A	I/a/A	I/a/A	I/A	I/A	I/A
Secondary prevention	≥10, or at very-high risk due to a risk condition (see Table 4)	Lifestyle advice	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention
	Class ^a /Level ^b	I/a/B	I/a/A	I/A	I/A	I/A	I/A
	Very-high-risk	Lifestyle intervention, consider adding drug if uncontrolled	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention	Lifestyle intervention and concomitant drug intervention
	Class ^a /Level ^b	I/a/A	I/A	I/A	I/A	I/A	I/A

CV = cardiovascular; LDL-C = low-density lipoprotein cholesterol; SCORE = Systematic Coronary Risk Estimation.

^aClass of recommendation.

^bLevel of evidence.