EDITORIALS

Current European guidelines on cardiovascular disease prevention in clinical practice: an American perspective

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The recently updated European Society of Cardiology (ESC) guidelines on cardiovascular disease prevention in clinical practice [1,2] and management of cardiovascular risk in peri-menopausal women represent an impressive effort to assimilate and apply the growing body of evidence on preventive interventions and treatment strategies from multiple strata of healthcare providers. Like their predecessors, [3] the revised guidelines present multidisciplinary recommendations and, importantly, focus on primary prevention, appropriate given the current epidemic of obesity and its association with cardio-metabolic risk factors.

The ESC guidelines bear many similarities to the American College of Cardiology (ACC) and American Heart Association (AHA) guidelines but with many important differences. ACC/AHA guidelines are available for primary [4-6] and secondary [7,8] prevention, and separate statements are available for a wide range of circumstances, including primary and secondary prevention in women, [9,10] primary prevention beginning in childhood, [11] and community health interventions [12] among others.

Cardiovascular disease is highly prevalent in both Europe and the United States, but because the population characteristics differ, the respective guidelines depend on different risk estimation mechanisms. Since 2003, the ESC guidelines have used the SCORE charts [13] to estimate risk with country-specific variations, whereas the ACC/AHA guidelines generally have relied on Framingham data [14]. Both guidelines acknowledge the difficulties of accurate, generalizable risk estimation and there is ongoing concern that both approaches may inaccurately predict cardiovascular risk in certain populations, such as underrepresented socio-ethnic groups and patients with type 2 diabetes mellitus [15]. Application of the SCORE charts in Europe is individualized for each country depending on national prevalences of and trends in cardiovascular disease, whereas the ACC/AHA guidelines do not specifically provide for state-specific risk estimation.

The goals for cardiovascular risk factor management in patients without established cardiovascular disease or diabetes mellitus are compared in Table 1.

The goals in patients with established cardiovascular disease or diabetes mellitus are compared in Table 2.

Specific strategies for risk factor modification reflect cultural differences. For example, the ESC guidelines recommend involving patients' families in the smoking cessation process; such a recommendation could be hindered by privacy concerns at American medical centers due to the Health Insurance Portability and Accountability Act of 1996 [16]. The ESC guidelines also incorporate additional recommendations from other disciplines, including suggestions for addressing depression and stress.

Probably the most significant changes in the latest updates to the ESC and ACC/AHA guidelines are in the realm of lipid management for patients with established coronary artery disease or diabetes mellitus. Evidence has continued to accumulate supporting the potential benefits of intensive reduction of low-density lipoprotein cholesterol levels and the use of high-dose 3-hydroxy-3-methyl-glutaryl-CoA reductase inhibitor therapy, particularly for secondary prevention either in the context of an acute coronary syndrome [17,18] or stable coronary artery disease [19,20].

Regarding optional lower targets for low-density lipoprotein cholesterol, there is a small difference between the ESC guidelines (2.0 mmol/l or 76.9 mg/dl) and AHA/ACC guidelines (1.8 mmol/l or 70 mg/dl) which likely reflects the desire to use integers to facilitate communication and advocacy. The other differences in the guidelines suggest a slightly more stringent approach in the ESC guidelines with respect to blood pressure and blood sugar control, at least in the secondary prevention and higher risk (diabetic) subgroups.

Although specific treatment targets may differ slightly, the concept of comprehensive preventive therapies is similar between the various guidelines. This emphasizes the growing recognition at an international level of the critical need for implementation of comprehensive preventive strategies to reverse the growing prevalence of cardiovascular disease [21,22].

Table 1. Comparison of goals for primary prevention

	ESC guidelines	AHA guidelines
Blood pressure	<140/90 mmHg	<140/90 mmHg <130/85 mmHg if HF or RI present <130/80 mmHg if diabetes present
Total cholesterol	<5 mmol/l (~190 mg/dl)	<200 mg/dl
LDL-C	<3 mmol/l (~115 mg/dl)	<160 mg/dl, <130 mg/dl if ≥2 risk factors and 10-year CHD risk is estimated at >20%
HDL-C		>40 mg/dl in men, >50 mg/dl in women
Triglycerides		<150 mg/dl
Fasting glucose	<6 mmol/l (~110 mg/dl)	<110 mg/dl
Hemoglobin A_{1c}		<7%
Physical activity	>30 minutes per day >5 days per week	>30 minutes per day on most (or all) days of the week
BMI	<25 kg/m²	<25 kg/m²
Nutrition	Total fat <30% of energy Saturated fat <33% of total fat Reduce salt intake	Saturated fats <10% of calories Cholesterol <300 mg/24h Salt <6 g/24h (< 2.3 g/24h in women) Alcohol < 2 drinks/24h in men and <1 drink/24h in women Minimize trans-fatty acid intake

BMI – body mass index, CHD – coronary heart disease,
HDL-C – high-density lipoprotein cholesterol, HF – heart failure,
LDL-C – low-density lipoprotein cholesterol, RI – renal insufficiency

Table 2. Comparison of goals for prevention in patients with high-risk features or established coronary artery disease

	ESC guidelines	AHA/ACC guidelines
Blood pressure	<130/80 mmHg*	<140/90 mmHg <130/80 mmHg if DM or CKD present
Total cholesterol	<4.5 mmol/l (~175 mg/dl), with option of <4 mmol/l (~155 mg/dl)*	<5 mmol/l (~ 200 mg/dl)
LDL-C	<2.5 mmol/l (~100 mg/dl), with option of <2.0 mmol/dl (~80 mg/dl)*	<100 mg/dl, with option of <70 mg/dl
Triglycerides		If triglycerides >200 mg/dl, non-HDL-C should be <130 mg/dl
Fasting glucose	<6 mmol/l (~110 mg/dl)	
Hemoglobin A_{1c}	<6.5%*	<7%
Physical activity	>30 minutes per day >5 days per week	>30 minutes per day 5–7 days per week
BMI	<25 kg/m²	<25 kg/m²

* denotes "if feasible"

Abbreviations: CKD – chronic kidney disease, DM – diabetes mellitus, others – see Table 1

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