

Recommendations on Pre-Participation Physical Evaluation (2013):

Part 1: Self-Assessment Questionnaire:

Medical Assessment is recommended if the participant has one of the followings:

1. chest pain/discomfort on exercise
2. Unexplained fainting/near-fainting
3. Excessive breathlessness /fatigue, associated with exercise
4. Prior recognition of a heart murmur
5. Family history of premature death (before age 50 years) due to heart disease or family history of inheritable heart disease.
6. History of heart disease, stroke or peripheral artery disease
7. Major coronary risk factors including Diabetes, Smoking, Hypertension and high lipid level
8. Men over 45 or women over 55

Part 2: Four Steps Simplified version for Pre-Participation Physical Evaluation

Step 1: General Medical history and Physical Examination

Personal history

1. Exertional chest pain/discomfort
2. Unexplained syncope/near-syncope (except typical vasovagal)
3. Excessive exertional and unexplained dyspnea/fatigue, associated with exercise
4. Prior recognition of a heart murmur
5. Elevated systemic blood pressure

Family history

6. Premature death (sudden and unexpected, or otherwise) before age 50 years due to heart disease, in ≥ 1 relative
7. Disability from heart disease in a close relative > 50 years of age
8. Specific knowledge of certain cardiac conditions in family members: hypertrophic or dilated cardiomyopathy, long-QT syndrome or other ion channelopathies, Marfan syndrome, or clinically important arrhythmias

Physical examination

9. Heart murmur (supine and standing or with Valsalva maneuver)
10. Femoral pulses to exclude aortic coarctation
11. Physical stigmata of Marfan syndrome
12. Brachial artery blood pressure (sitting position and over both arms)

Step 2: For older participants (>35 yrs), the followings are considered to be of increased risk:

1, 10 years risk score >10% (according to Framingham Scores or equivalents) or

2, Two or more following major risk factors:

- a, Established atherosclerosis : Coronary Artery Disease, Cerebral Vascular Disease or Peripheral Vascular Disease
- b, Strong family History of premature CAD (<50 yrs)
- c, Diabetic
- d, other major risk factors such as smoker, hypertension or dyslipidemia
- e, Asymptomatic Men>45 or women >55,

Step 3: Resting ECG: identify the high risk pattern (group two, according to the ESC ECG interpretation criteria, see **figure 1**)

Step 4: Subjects are considered at relative low risk to participate in high intensity competitive sports such as marathon if the above check lists are negative. **Positive (abnormal) findings detected in either Steps 1, 2 or 3 warrant further investigations.**

(A) In those **below 35 yrs Echocardiogram** should be considered.

(B) In those **older than 35 yrs, treadmill stress test** is recommended by EACPR guidelines. Currently **Coronary Computed Tomographic Angiography (CCTA)**, when available, is considered as an alternative option or the next line of investigation. Other options include MR or nuclear myocardial perfusion scans. Referral to specialist for further assessment is generally recommended at this stage.

Figure 1: ESC ECG interpretation criteria

Table 2: Classification of abnormalities of the athlete's electrocardiogram (ECG) [15].	
Group 1: common and training-related ECG changes	Group 2: uncommon and training-unrelated ECG changes
Sinus bradycardia	T-wave inversion
First-degree AV block	ST-segment depression
Incomplete RBBB	Pathological Q-waves
Early repolarization	Left atrial enlargement
Isolated QRS voltage criteria for left ventricular hypertrophy	Left-axis deviation/left anterior hemiblock
	Right-axis deviation/left posterior hemiblock
	Right ventricular hypertrophy
	Ventricular pre-excitation
	Complete LBBB or RBBB
	Long- or short-QT interval
	Brugada-like early repolarization

RBBB, right bundle branch block; LBBB, left bundle branch block.