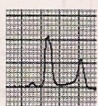
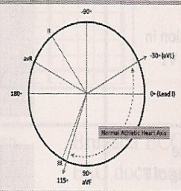
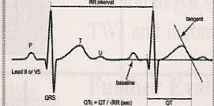
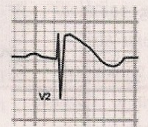



QT Abnormalities

All athletes with a $Q_{tc} > 470$ ms in men or 480 ms in women should undergo further evaluation for long-QT Syndrome. These cutoffs provide the best balance between false-positive and negative findings. Tc intervals shorter and 340 ms should also lead to further evaluation.

Further evaluation for QT abnormalities includes exclusion of secondary causes of prolonged or shortened AT. A 4-generation family pedigree, exercise of medication stress, extended rhythm monitoring, and consideration of genetic testing. A lying and standing 12-lead ECG has recently been shown to uncover prolonged repolarization in a proportion of long-QT patients. A long QT < 500 ms in isolation with evidence to suggest arrhythmia and without a revealing family history represents a true gray area. In such cases, full disclosure is recommended of the unknown nature of risk to the athlete with a personal decision on competition.

LBBB RBBB IVCD	Any QRS > 120 ms	
QRS axis deviation	More leftward than -30° More rightward than 115°	
QTc interval	> 470 ms in males > 480 ms in females < 340 ms in any athlete	
Brugada pattern	Presence of Type 1 pattern: coved ST segment in V1 and V2 gradually descending into inverted T wave	
Pre-Excitation	Delta wave and PR interval < 120 ms	
Ventricular extrasystoles, heart block, and supraventricular arrhythmia	Atrial fibrillation/flutter, supraventricular tachycardia, complete heart block or ≥ 2 PVCs in one 12 lead ECG	