**Table 2: Evaluation of Electrocardiographic Abnormalities**

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| **ECG Abnormality** | **Potential Cardiac Disease\*** | **Recommended Evaluation\*\*** | **Considerations** |
| **T wave inversion in the lateral or inferolateral leads** | HCM  DCM  LVNC  ARVC (with predominant LV involvement)  Myocarditis | Echo  CMR  Exercise ECG test  Minimum 24 hour ECG monitor | Lateral or inferolateral T wave inversion is common in primary myocardial disease. CMR should be a routine diagnostic test for this ECG phenotype and is superior to echocardiography for detecting apical HCM, LVH localized to the free lateral wall, ARVC with predominant left ventricular involvement, and myocarditis.  If CMR is not available, echocardiography with contrast should be considered as an alternative investigation for apical HCM in patients with deep T wave inversion in leads V5-V6.  Consider family evaluation if available and genetic screening.  Annual follow-up testing is recommended throughout athletic career in athletes with normal results. |
| **T wave inversion isolated to the inferior leads** | HCM  DCM  LVNC  Myocarditis | Echo | Consider CMR based on echo findings or clinical suspicion. |
| **T wave inversion in the anterior leads**† | ARVC  DCM | Echo  CMR  Exercise ECG test  Minimum 24 hour ECG monitor  SAECG | The extent of investigations may vary based on clinical suspicion for ARVC and results from initial testing. |
| **ST segment depression** | HCM  DCM  LVNC  ARVC  Myocarditis | Echo | Consider CMR and additional testing based on echo findings or clinical suspicion. |
| **Pathologic Q waves** | HCM  DCM  LVNC  Myocarditis  Prior MI | Echo  CAD risk factor assessment  Repeat ECG for septal (V1-V2) QS pattern; above investigations recommended if septal Q waves are persistent | Consider CMR (with perfusion study if available) based on echo findings or clinical suspicion.  In the absence of CMR, consider exercise stress testing, dobutamine stress echocardiogram, or a myocardial perfusion scan for evaluation of coronary artery disease in athletes with suspicion of prior MI or multiple risk factors for CAD. |
| **Complete left bundle branch block** | DCM  HCM  LVNC  Sarcoidosis  Myocarditis | Echo  CMR (with stress perfusion study)^ | A comprehensive cardiac evaluation to rule out myocardial disease should be considered. |
| **Profound nonspecific intraventricular conduction delay ≥ 140 ms** | DCM  HCM  LVNC | Echo | Consider additional testing based on echo findings or clinical suspicion. |
| **Multiple premature ventricular contractions** | HCM  DCM  LVNC  ARVC  Myocarditis  Sarcoidosis | Echo  24 hour ECG monitor  Exercise ECG test | If > 2,000 PVC’s or non-sustained ventricular tachycardia are present on initial testing, comprehensive cardiac testing inclusive of CMR is warranted to investigate for myocardial disease.  Consider signal averaged ECG (SAECG). |
| **Ventricular pre-excitation** | WPW | Exercise ECG test  Echo | Abrupt cessation of the delta wave (pre-excitation) on exercise ECG denotes a low risk pathway.  Electrophysiological study for risk assessment should be considered if a low risk accessory pathway cannot be confirmed by non-invasive testing.  Consider EP study for moderate to high intensity sports. |
| **Prolonged QTc** | LQTS | Repeat resting ECG on separate day  Review for QT prolonging medication  Acquire ECG of 1st degree relatives if possible | Consider exercise ECG test, laboratory (electrolyte) screening, family screening and genetic testing when clinical suspicion is high.  Consider direct referral to a heart rhythm specialist or sports cardiologist for a QTc ≥ 500 ms. |
| **Brugada Type 1 pattern** | Brugada syndrome | Referral to cardiologist or heart rhythm specialist | Consider high precordial lead ECG with leads V1 and V2 in 2nd intercostal space or sodium channel blockade if Brugada pattern is indeterminate.  Consider genetic testing and family screening. |
| **Profound sinus bradycardia < 30 BPM** | Myocardial or electrical disease | Repeat ECG after mild aerobic activity | Consider additional testing based on clinical suspicion. |
| **Profound 1° AV block ≥ 400 ms** | Myocardial or electrical disease | Repeat ECG after mild aerobic activity  Exercise ECG test | Consider additional testing based on clinical suspicion. |
| **Advanced 2° or 3° atrioventricular block** | Myocardial or electrical disease | Echo  Minimum 24 hour ECG monitor  Exercise ECG test | Consider laboratory screening and CMR based on echo findings. |
| **Atrial tachyarrhythmias** | Myocardial or electrical disease | Echo  Minimum 24 hour ECG monitor  Exercise ECG test | Consider CMR or EP study based on clinical suspicion. |
| **Ventricular arrhythmias**‡ | Myocardial or electrical disease | Echo  CMR  Minimum 24 hour ECG monitor  Exercise ECG test | A comprehensive cardiac evaluation to rule out myocardial disease and primary electrical disease should be considered. |
| **Two or more borderline ECG findings** | Myocardial disease | Echo | Consider additional testing based on clinical suspicion. |

\* This list of disorders for each ECG abnormality represents the primary cardiac disorders of concern and is not intended to be exhaustive.

\*\* Initial evaluation of ECG abnormalities should be performed under the direction of a cardiologist. Additional testing will be guided by initial findings and clinical suspicion based on the presence of symptoms or a family history of inherited cardiac disease or SCD.

† Excludes black athlete repolarization variant and juvenile pattern in adolescents ≤ 16 years.

^ CT coronary angiography if stress perfusion with CMR is unavailable.

‡ Includes couplets, triplets, accelerated ventricular rhythm, and non-sustained ventricular tachycardia.