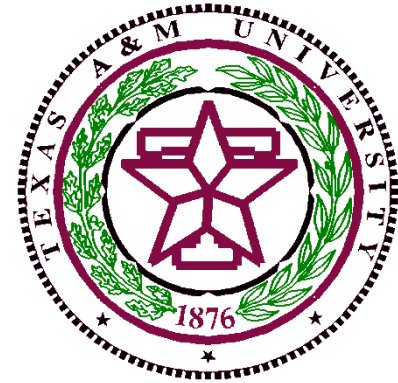




KINE 639 - Dr. Green

Section 2



The Athlete's Heart & ECG

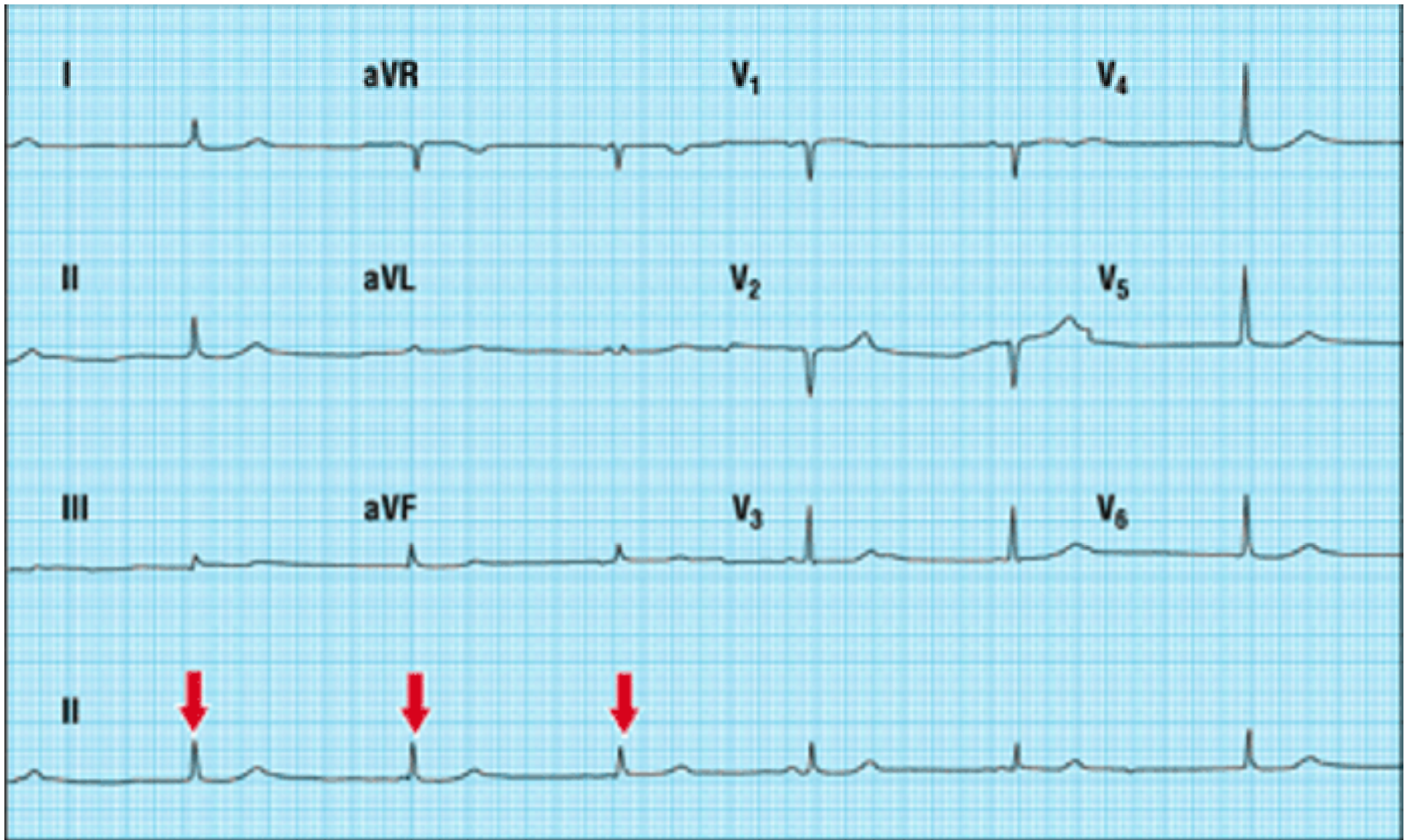
The Athlete's Heart & ECG

Common ECG abnormalities seen in an athlete

- Sinus bradycardia (up to 91%) – may be less than 50 beats / minute
 - reflects predominance of vagal tone
 - may exhibit junctional escape rhythm (slow junctional rhythm)
- Sinus arrhythmia
- 1st and 2nd (type I) degree AV block (10% - 33%)
- Left ventricular hypertrophy (up to 76%)
- Incomplete RBBB (up to 51%) – QRS width between .10 and .12 seconds
- Early repolarization – mild J-point and ST segment elevation
 - differential diagnosis – Brugada Syndrome
 - elevated J-point slides down into a negative T-wave in V1
- Premature atrial & ventricular contractions

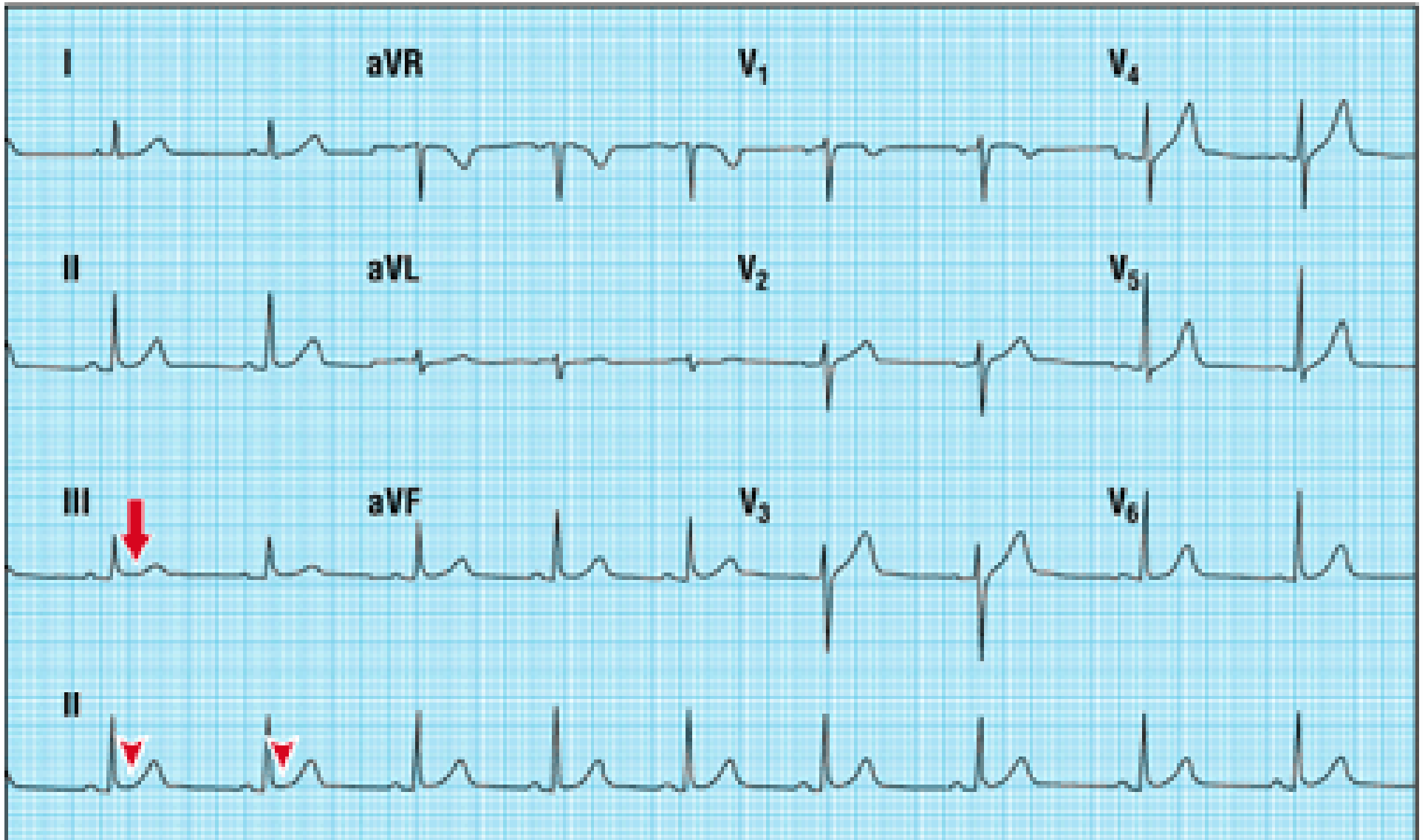
The Athlete's Heart & ECG

38 year old male distance runner with sinus bradycardia (42 bpm) with periods of junctional rhythm (red arrows)



The Athlete's Heart & ECG

41 year old male distance runner with J-point and ST-segment elevation (arrows) depicting early repolarization

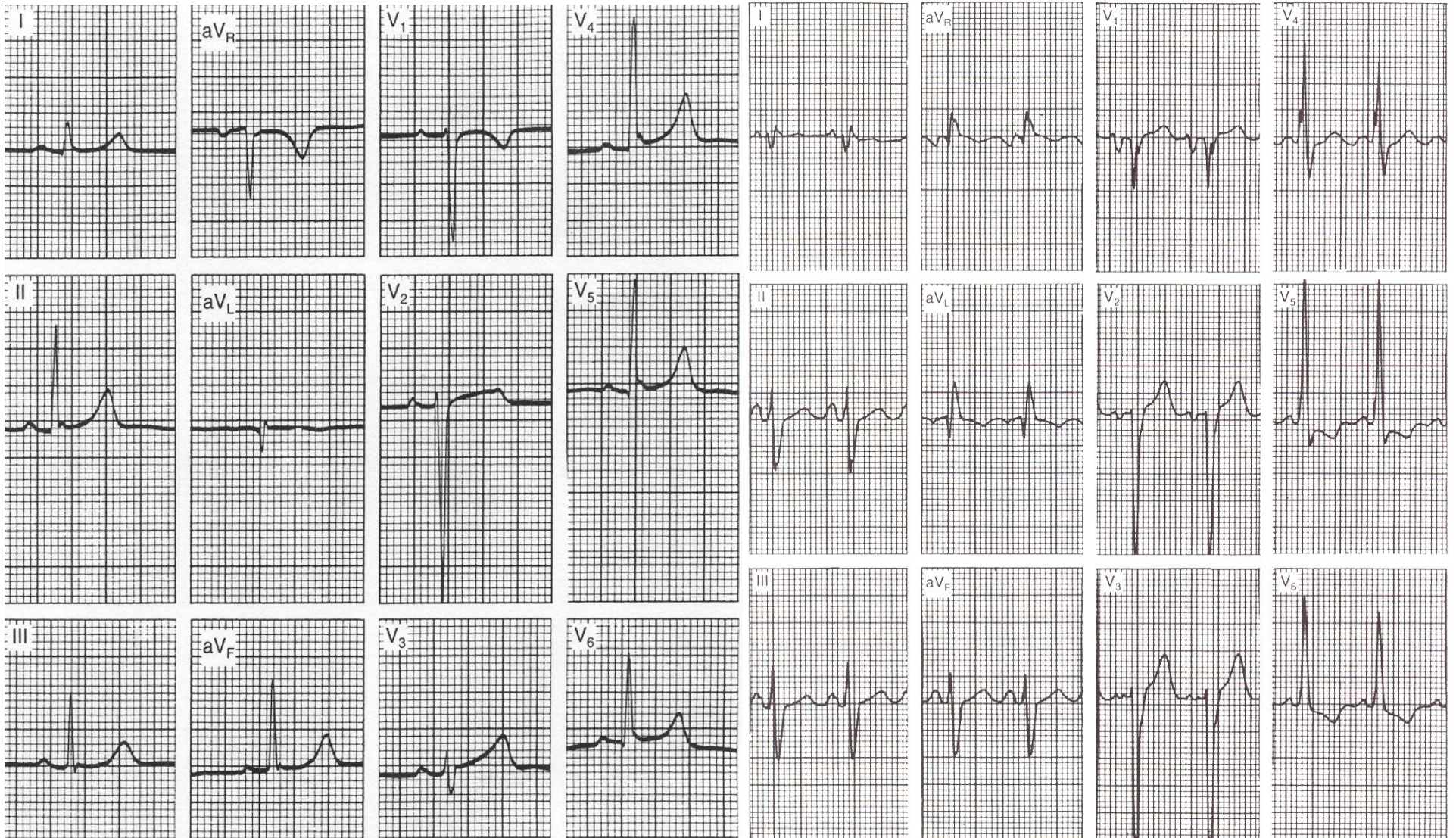


The Athlete's Heart & ECG

Pathological LVH

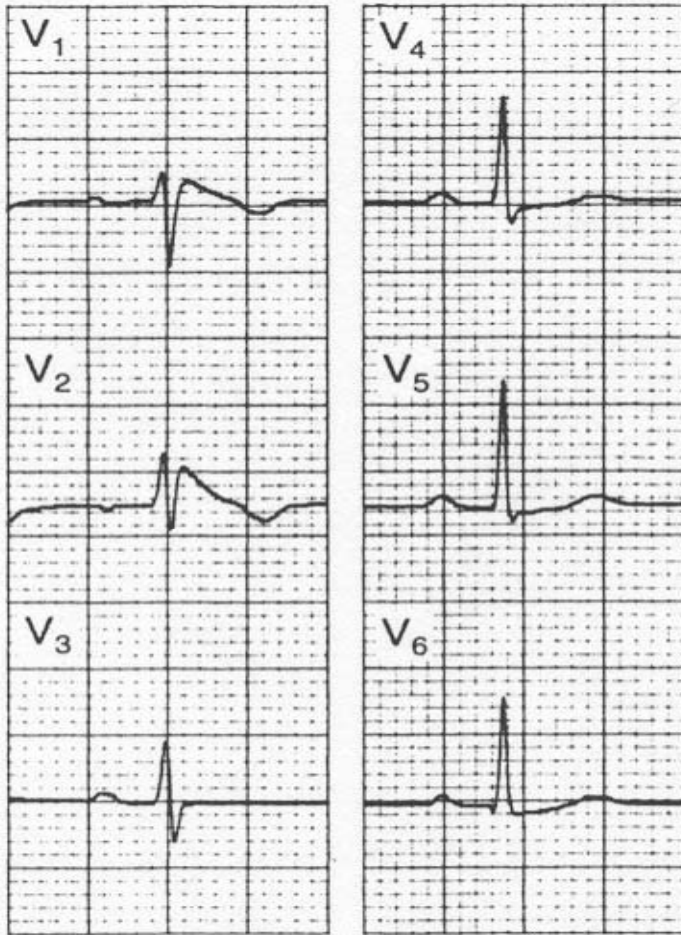
LVH in an athlete

Note "strain" pattern in lateral precordial leads

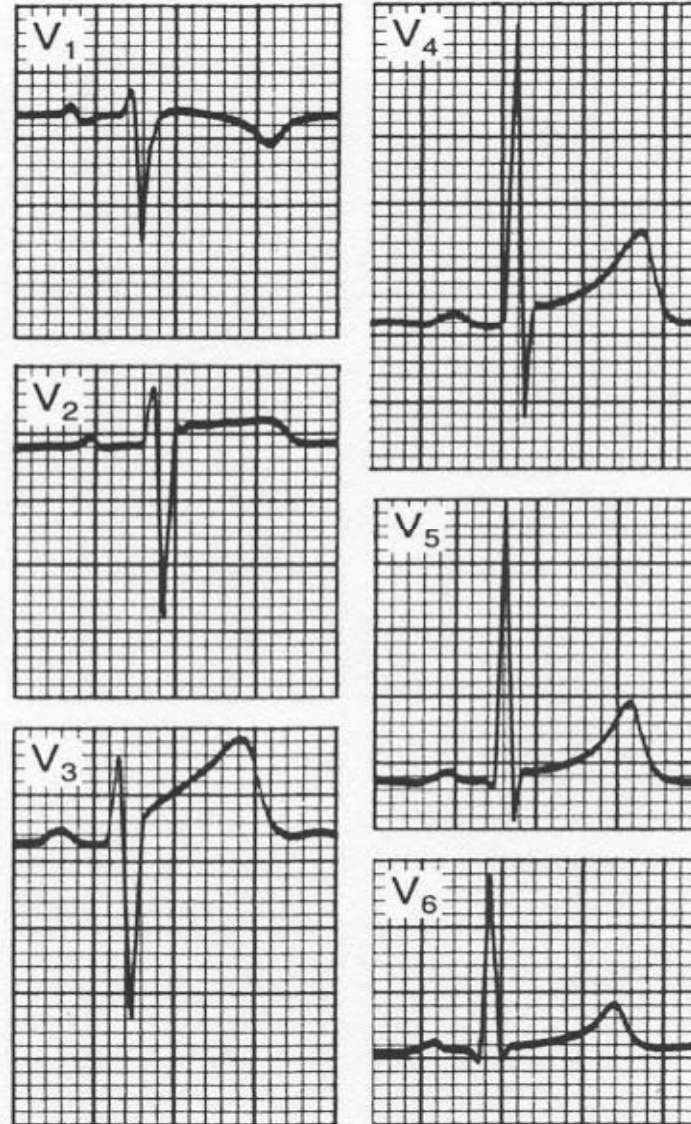


The Athlete's Heart & ECG

Early repolarization pattern of Brugada Syndrome (elevated ST-segment goes into a negative T-wave in V1 and V2)



Early repolarization pattern of an athlete (note voltage criteria for LVH is borderline)

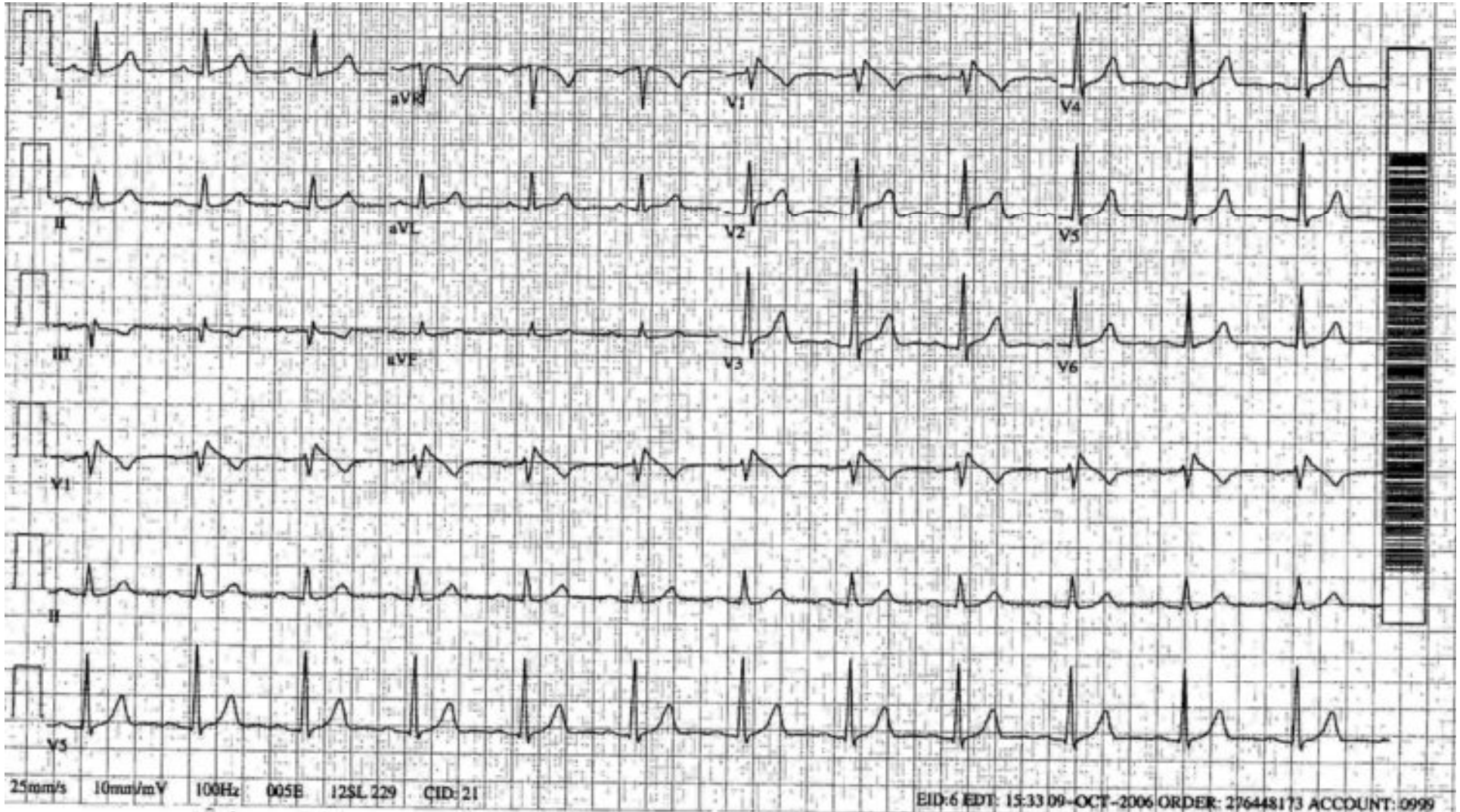


Brugada Syndrome predisposes one to Ventricular Tachycardia / Ventricular Fibrillation.

The Brugada Syndrome – 2nd look

Early repolarization pattern of Brugada Syndrome

Elevated ST-segment goes into a negative T-wave in V1 – note long “steep & sliding” ST segment in V1



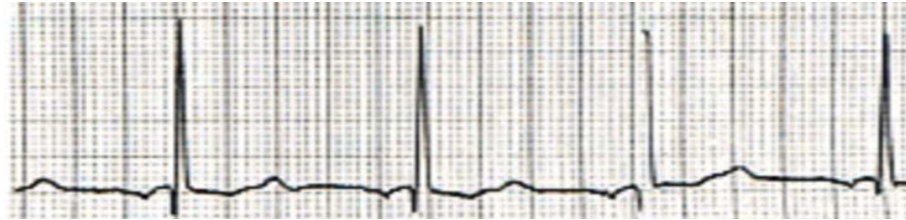
The Athlete's Heart & ECG

Causes of Sudden Death in athletes

- Long QT syndrome – QT interval longer than .44 seconds
 - Predisposition to Torsades de Pointes, a type of V-tach
 - Hank Gathers died in 1990 while playing basketball (went off meds)
- Hypertrophic Cardiomyopathy of the Left Ventricle
 - Symptoms: chest pain, dyspnea, syncope
 - Predisposition to V-Tach
- Arrhythmogenic Cardiomyopathy of the Right Ventricle
 - Familial condition where RV myocardium is replaced by fibro-fatty tissue
 - Predisposition to V-tach
- Congenital Coronary Artery Anomalies
 - Pete Maravich – had no left coronary artery – died of MI at 40 years of age

The Athlete's Heart & ECG

Long QT syndrome



Torsades de Pointes
associated with long
QT syndrome

(a deadly type of
Ventricular
Tachycardia)

