The J wave is a deflection immediately following the QRS complex of the surface ECG. Several lines of evidence suggest that arrhythmias associated with early repolarization (ER) pattern in the inferior or inferolateral precordial leads, Brugada syndrome (BrS) as well arrhythmias associated with hypothermia and the acute phase of ST segment elevation myocardial infarction (STEMI), are mechanistically linked to abnormalities in the manifestation of the transient outward current (Ito)-mediated J wave. Although BrS and ER syndrome (ERS) differ with respect to the magnitude and lead location of abnormal J wave manifestation, they can be considered to represent a continuous spectrum of phenotypic expression that we have termed J wave syndromes. We have proposed that ERS be divided into three subtypes: Type 1, displaying an ER pattern predominantly in the lateral precordial leads, which is prevalent among healthy male athletes and is largely benign, only rarely associated with VF; Type 2, displaying an ER pattern predominantly in the inferior or inferolateral leads, which is associated with a higher level of risk; and Type 3, displaying an ER pattern globally in the inferior, lateral and right precordial leads, which is associated with the highest level of risk for development of malignant arrhythmias and is often associated with electrical storms. BrS has been associated with mutations in 9 different genes, whereas ERS has been associated with mutations in 4 different genes, including KCNJ8, CACNA1C, CACNB2 and CACNA2D1.

**Keywords:** Brugada syndrome, early repolarization syndrome, electrophysiology