

■ ELECTRICAL ALTERNANS SYNDROMES

Electrical alternans—a beat-to-beat alternation in one or more components of the ECG signal—is a common type of nonlinear cardiovascular response to a variety of hemodynamic and electrophysiologic perturbations. Total electrical alternans (P-QRS-T) with sinus tachycardia is a relatively specific sign of pericardial effusion, usually with cardiac tamponade (Fig. 240-17). In contrast, pure repolarization (ST-T or U wave) alternans is a sign of electrical instability and may precede ventricular tachyarrhythmias.

■ CLINICAL INTERPRETATION OF THE ECG

Accurate analysis of ECGs requires thoroughness and care. The patient's age, gender, and clinical status should always be taken into account. Many mistakes in ECG interpretation are errors of omission. Therefore, a systematic approach is essential. The following 14 points should be analyzed carefully in every ECG: (1) standardization (calibration) and technical features (including lead placement and artifacts), (2) rhythm, (3) heart rate, (4) PR interval/AV conduction, (5) QRS interval, (6) QT/QT_c intervals, (7) mean QRS electrical axis, (8) P waves, (9) QRS voltages, (10) precordial R-wave progression, (11) abnormal Q waves, (12) ST segments, (13) T waves, and (14) U waves. Comparison with any previous ECGs is invaluable.

■ COMPUTERIZED ELECTROCARDIOGRAPHY

Computerized systems are widely used for immediate retrieval of thousands of ECG records. Fully automated computerized ECG analyses still have major limitations and, therefore, should not be accepted without careful clinician review of both waveforms and intervals.

■ FURTHER READING

CLERKIN KJ et al: Coronavirus disease (COVID-2019) and cardiovascular disease. *Circulation* 141:1648, 2020.

GOLDBERGER AL et al: *Goldberger's Clinical Electrocardiography: A Simplified Approach*, 9th ed. Philadelphia, Elsevier, 2017.