The electrocardiograms (ECGs) in this Atlas supplement those illustrated in Chap. 221. The interpretations emphasize findings of specific teaching value.

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The abbreviations used in this chapter are as follows:

- AF—atrial fibrillation
- HCM—hypertrophic cardiomyopathy
- LVH—left ventricular hypertrophy
- MI—myocardial infarction
- NSR—normal sinus rhythm
- RBBB—right bundle branch block
- RV—right ventricular
- RVH—right ventricular hypertrophy

**MYOCARDIAL ISCHEMIA AND INFARCTION**

**FIGURE e19-1** Anterior wall ischemia (deep T-wave inversions and ST-segment depressions in I, aVL, V3–V6) in a patient with LVH (increased voltage in V2–V3).
FIGURE e19-2 Acute anterolateral wall ischemia with ST elevations in V₄–V₆. Probable old inferior MI with Q waves in leads II, III and aVF.

FIGURE e19-3 Acute lateral ischemia with ST elevations in I and aVL with probable reciprocal ST depressions inferiorly (II, III, and aVF). Ischemic ST depressions also in V₃ and V₄. Left atrial abnormality.
**FIGURE e19-4** Sinus tachycardia. Marked ischemic ST-segment elevations in inferior limb leads (II, III, aVF) and laterally (V₆) suggestive of acute inferolateral MI, and prominent ST-segment depressions with upright T waves in V₁–V₄ consistent with acute posterior MI.

**FIGURE e19-5** Acute MI with marked ST elevations in I, aVL, V₁–V₆ and small pathologic Q waves in V₃–V₆. Marked reciprocal ST-segment depressions in III and aVF.
FIGURE e19-6 Acute anterior wall MI with ST elevations and Q waves in V₁–V₄ and aVL and reciprocal inferior ST depressions.

FIGURE e19-7 NSR with premature atrial complexes. RBBB; pathologic Q waves and ST elevation due to acute anterior/septal MI in V₁–V₃.
FIGURE e19-8  Acute anteroseptal MI (Q waves and ST elevations in V₁–V₄ with RBBB (see I, V₆).)

FIGURE e19-9  Extensive old MI involving inferior-posterior-lateral wall (Q waves in leads II, III, aVF, tall R waves in V₁, V₂, and Q waves in V₅, V₆). T-wave abnormalities in leads I and aVL, V₅, and V₆.
FIGURE e19-10  NSR with PR prolongation ("1st degree AV block"), left atrial abnormality, LVH, and RBBB. Pathologic Q waves in V₁–V₅ and aVL with ST elevations (a chronic finding in this patient). Findings compatible with old anterolateral MI and LV aneurysm.

FIGURE e19-11  Old inferior-posterior MI. Wide (0.04 s) Q waves in the inferior leads (II, III, aVF); broad R wave in V₁ (a Q wave equivalent). Absence of right-axis deviation and the presence of upright T waves in V₁–V₂ are also against RVH.
FIGURE e19-12  NSR with RBBB (broad terminal R wave in V1) and left anterior hemiblock, pathologic anterior Q waves in V1–V3 with slow R wave progression. Patient had severe multivessel coronary artery disease with echocardiogram showing septal dyskinesis and apical akinesis.
**FIGURE e19-13** Acute pericarditis with diffuse ST elevations in I, II, III, aVF, V₃₋₆ without T-wave inversions. Also PR-segment elevation in aVR and PR depression in the inferolateral leads.

**FIGURE e19-14** Sinus tachycardia; diffuse ST elevations (I, II, aVL, aVF, V₂–V₆) with associated PR deviations (elevated PR in aVR; depressed in V₄₋₆); borderline low voltage. Q-wave and T-wave inversions in II, III, and aVF. Diagnosis is acute pericarditis with inferior Q wave MI.
FIGURE e19-15 NSR, left atrial abnormality (see I, II, V1), right-axis deviation and RVH (Rr' in V1) in a patient with mitral stenosis.

FIGURE e19-16 NSR, left atrial abnormality, and LVH by voltage criteria with borderline right-axis deviation in a patient with mixed mitral stenosis (left atrial abnormality and right-axis deviation) and mitral regurgitation (LVH). Prominent precordial T-wave inversions and QT prolongation also present.
Coarse AF, tall R in V₂ with vertical QRS axis (positive R in aVF) indicating RVH. Tall R in V₄ may be due to concomitant LVH. Patient had severe mitral stenosis with moderate mitral regurgitation.

NSR; first-degree A-V block (P-R prolongation); LVH (tall R in aVL); RBBB (R') and left anterior fascicular block in a patient with HCM. Deep Q waves in I and aVL consistent with septal hypertrophy.
FIGURE e19-19 LVH with deep T-wave inversions in limb leads and precordial leads. Striking T-wave inversions in mid-precordial leads suggest **apical HCM**.
FIGURE e19-20 Sinus tachycardia with S1Q3T3 pattern (T-wave inversion in III), incomplete RBBB, and right precordial T-wave inversions consistent with acute RV overload in a patient with pulmonary emboli.

FIGURE e19-21 Sinus tachycardia, right-axis deviation, RVH with tall R in V1 and deep S in V6, and inverted T waves in II, III, aVF, and V1–V5 in a patient with atrial septal defect and severe pulmonary hypertension.
FIGURE e19-22 Signs of right atrial/RV overload in a patient with chronic obstructive lung disease: (1) peaked P waves in II; (2) QR in V1 with narrow QRS; (3) delayed precordial transition, with terminal S waves in V5/V6; (4) superior axis deviation with an S1-S2-S3 pattern.

FIGURE e19-23 (1) Low voltage; (2) incomplete RBBB (rsr’ in V1–V3); (3) borderline peaked P waves in lead II with vertical P-wave axis (probable right atrial overload); (4) slow R-wave progression in V1–V3; (5) prominent S waves in V6; and (6) atrial premature beats. This combination is seen typically in severe chronic obstructive lung disease.
FIGURE e19-24 Prominent U waves (II, III, V_4–V_6) with Q-TU prolongation in a patient with severe hypokalemia.

FIGURE e19-25 Abbreviated ST segment such that the T wave looks like it takes off directly from QRS in some leads (I, V_4, aVL, and V_5) in a patient with hypercalcemia. High take-off of ST segment in V_2/V_3.
FIGURE e19-26 NSR with LVH, left atrial abnormality, and tall peaked T waves in the precordial leads with inferolateral ST depressions (II, III, aVF, and V6); left anterior fascicular block and borderline prolonged QT interval in a patient with renal failure, hypertension, and hyperkalemia; prolonged QT is secondary to associated hypocalcemia.
FIGURE e19-27 Normal ECG in an 11-year-old male. T-wave inversions in V1–V2. Vertical QRS axis (+90°) and early precordial transition between V2 and V3 are normal findings in children.

FIGURE e19-28 Left atrial abnormality and LVH in a patient with long-standing hypertension.
FIGURE e19-29 Normal variant ST-segment elevations in a healthy 21-year-old male (commonly referred to as early repolarization pattern). ST elevations exhibit upward concavity and are most apparent in V₃ and V₄. Precordial QRS voltages are prominent, but within normal limits for a young adult. No evidence of left atrial abnormality or ST depression/T wave inversions to go along with LVH.

FIGURE e19-30 NSR with first-degree AV block (PR interval = 0.24 s), and complete left bundle branch block.
FIGURE e19-31 Dextrocardia with: (1) inverted P waves in I and aVL; (2) negative QRS complex and T wave in I; and (3) progressively decreasing voltage across the precordium.

FIGURE e19-32 Sinus tachycardia; intraventricular conduction delay with a rightward QRS axis. QT interval is prolonged for the rate. The triad of sinus tachycardia, a wide QRS complex, and a long QT suggest tricyclic antidepressant overdose. Terminal S wave (rS) in I, and terminal R wave (qR) in aVR are also seen in this condition.