

Index

- accelerated idioventricular rhythm (AIVR), 232
- ACS. *See* acute coronary syndromes
- acute aortic syndrome, 204
- acute coronary syndromes (ACS), 19, 22, 37–8
- acute phase of, 28
 - arrhythmias in, 250–7
 - chest pain in, 199
 - classic, 197
 - defining, 197
 - differential diagnosis, 201, 202
 - ECG of
 - other abnormalities in, 243–4
 - patterns, 211
 - intraventricular blocks in, 250–7
 - non-atherothrombosis, 265–73
 - NSTE, 37, 233–42
 - ECG patterns in, 211, 238
 - flattened or negative T wave in, 239–40
 - incidence of, 214
 - with normal ECG, 240–2
 - prognostic implications of, 239–40
 - STE v., 210, 216
 - typical patterns of, 210–14
 - pathophysiology of, 209–14
 - recurrent, 242–3
 - risk stratification in, 257
 - high risk groups, 260–3
 - intermediate risk groups, 265
 - low risk groups, 263–5
 - silent ischaemia in, 302
 - STE, 38, 64, 75, 214–33
 - incidence of, 214
 - inferolateral zone, 223
 - LAD occlusion and, 71, 73, 76, 77, 78, 81, 85
 - LCX occlusion and, 92, 97
 - in multivessel occlusion, 233
 - NSTE v., 213, 215
 - OM branch occlusion and, 94
 - pre-PCI, 84
 - RCA occlusion and, 82, 91, 104
 - subacute, 79
 - typical patterns of, 210–14
 - with wide QRS, 247–50
 - prognostic considerations, 248–50
 - acute mitral regurgitation, 246–7
 - AIDS, 274, 301
 - AIVR. *See* accelerated idioventricular rhythm
 - alcoholism, 42
 - negative T waves and, 53
 - Aldrich score, 224
 - amiodarone, 53
 - anaphylactic crisis, 274
 - Anderson-Wilkins score, 221
 - anemia, 274, 300
 - acute, 300
 - chronic, 300
 - angina
 - classic exertional, 207, 297–8
 - ECG in, 297–8
 - heart rate in, 299
 - ST segment changes in, 298
 - in-crescendo, 122
 - Prinzmetal, 221, 226, 271–3
 - secondary to tachyarrhythmia, 266
 - unstable, 46, 47, 197, 209, 233–42
 - anterior wall, 6–7, 15
 - anteroinferior infarction, 144
 - anteroseptal infarction, 282
 - LAD occlusion, 71
 - anteroseptal zone, 18, 24, 71, 137, 166
 - ECG limitations and, 23
 - aortic ulcer, 204
 - apical-anterior infarction, 143, 171
 - ECG pattern of, 148, 151
 - false impression of, 148
 - pacemakers and, 194
 - arrhythmias, 244, 262, 288. *See also* bradyarrhythmias
 - in ACS, 250–7
 - paroxysmal, 52, 53
 - supraventricular, 252–4
 - ventricular, 250–2
 - arrhythmogenic right ventricular dysplasia (ARVD), 109, 114
 - ARVD. *See* arrhythmogenic right ventricular dysplasia
 - atherothrombosis, 197, 206–7
 - atrial fibrillation, 253–4
 - atrial flutter, 253
 - atrial infarction, 293–5
 - atrial wave changes, 288
 - AV blocks, 254–5
 - first degree, 254
 - second degree, 254
 - AV node, 18
 - bifascicular block, 250
 - bradyarrhythmias, 254–7
 - sinus, 254
 - Brugada's syndrome, 108, 109, 113

- bull's-eye view, 307
- bundle branch blocks. *See* left bundle branch block; right bundle branch blocks
- Cabrera's sign, 180
- carbon monoxide, 274, 301
- cardiac rupture, 244, 245, 262
- cardiac surgery, 269–70
- cardiomyopathy
- dilated, 199
 - ECGs of, 304
 - hypertrophic, 172, 199
- cardiovascular magnetic resonance (CMR), 3, 4, 10, 11, 14, 275, 287
- contrast-enhanced, 4–5
 - of double infarctions, 171
 - gadolinium-enhanced, 137
 - of heart walls and segmentation, 5–15
 - in MI, 20
 - role of, 8
- CE-CMR. *See* contrast-enhanced CMR
- CHD. *See* coronary heart disease
- chest pain
- in ACS, 199
 - of doubtful origin, 204–6
 - diagnosis in, 206
 - ECG in, 203
 - of gastrointestinal origin, 200
 - of ischaemic origin, 206–7
 - non-ischaemic, 199–204
 - diagnosis of, 199
 - prognosis, 207–8
 - in precordium, 200
 - prognosis, 207–8
 - of psychological origin, 200
 - of pulmonary origin, 200
 - types of, 199
- chronic obstructive pulmonary disease (COPD), 176
- chronic renal failure, 116
- Churg-Strauss syndrome, 274
- circumflex artery (LCX), 16, 17–18, 28, 65
- occlusion of, 18, 26, 82, 104–5, 163, 280, 285
 - distal dominant, 160
 - dominant, 96–8
 - inferolateral infarction due to, 165
 - lateral infarction due to, 152
 - proximal to OM branch, 92
 - STE-ACS due to, 92, 97
 - proximal, 235
- CMDCT. *See* coronary multidetector computer tomography
- CMR. *See* cardiovascular magnetic resonance
- cocaine, 273–4
- computerised tomography (CT), 205
- congenital defects, 268–9
- contrast-enhanced CMR (CE-CMR), 4–5, 281
- COPD. *See* chronic obstructive pulmonary disease
- cor pulmonale*, 42
- chronic, 50
- coronary angiography, 3, 15–18, 236, 257, 267
- normal case, 4
 - role of, 8
- coronary arteries. *See also specific arteries*
- ECG limitations and, 25
- coronary arteritis, 274
- coronary artery disease
- multivessel, 237
- coronary circulation, 17
- coronary dissection, 266
- coronary multidetector computer tomography (CMDCT), 3, 4, 15–18
- coronary perfusion, 301
- coronary spasm, 22, 220, 271–3
- coronary tree, 15–18
- correlation exercise tests, 9
- CT. *See* computerised tomography
- DCM. *See* dilated cardiomyopathy
- depolarisation
- diastolic, 129
 - ventricular, 130
- dilated cardiomyopathy (DCM), 199
- direct patterns, 21
- dissecting aneurysm, 200, 204
- differential diagnosis, 201
 - pain due to, 205
- dyskinesia, 274
- ECG. *See* electrocardiography
- echocardiography, 3, 8, 257
- invasive v. non-invasive, 8
- electrocardiography (ECG), 3
- of ACS
 - Q wave infarction and, 106
 - risk stratification in, 257–65
 - amplified, 57
 - of anteroseptal zone, 282–5
 - of extensive anterior infarction, 148
 - patterns, 151
 - basal, 47, 52, 100, 101
 - CE-CMR v., 140
 - in chest pain, 203
 - in chronic IHD, 49
 - in chronic phase, 29
 - in classic exercise angina, 297–8
 - clinical ischaemia and, 22–3
 - in cor pulmonale, 50
 - double infarction, 171
 - electrophysiological mechanisms of, 32–8
 - fibrinolytic therapy and, 228–33
 - of inferolateral zone, 282–5
 - in-hospital mortality and, 242
 - injury patterns and, 20–2
 - ischaemia patterns and, 20–2, 31–2
 - limitations of, 23–4, 304–407
 - anteroseptal zone nad, 25
 - coexisting heart diseases and, 25
 - coronary artery variants and, 25
 - electrophysiological data, 24
 - inferior wall involvement, 26–7
 - lateral wall involvement and, 25–6
 - LV structure and, 25

- vectorial forces and, 25
 - VR lead and, 27
- location criteria from, 66–105
- measurement of parameters, 129
- in MI, 136
- MI, multiple, 169
- mid-anterior infarction, 152
- of middle fiber block, 193
- in multiple infarctions, 166–8, 287
- of multivessel chronic coronary artery disease, 237
- negative T wave, 45
- in NSTEMI-ACS, 210, 238
 - normal, 240–2
- occluded arteries and, 67–8
- with pain, 101
- patterns
 - A-1, 141, 282
 - A-2, 146, 283
 - A-3, 148, 284
 - A-4, 150, 284
 - ACS, 211
 - arising of, 142, 145, 159
 - atypical, 104–5, 211–12
 - B-1, 154, 284–5
 - B-2, 159, 285
 - B-3, 161, 285
 - classification of, 23–4
 - clinical viewpoint, 59–62
 - electrophysiologic mechanisms of, 55–9
 - of injury, 55
- Q waves in diagnosis, 166, 232
- QRS complex in, 52
- risk stratification, 257
- with SAH, 170
- of STE-ACS
 - due to LAD occlusion, 76
- ST-segment elevation, 70
- subendocardial ischaemia, 32
- subepicardial ischaemia, 32
- T wave voltage in, 52
- 24-lead, 27
- electrodes, 59
- enzymatic assessment, 257, 263, 265
- exercise stress test, 205–6, 242, 288, 309
 - criteria, 117
 - false negative, 117
 - false positive, 117
 - in IHD, 245
 - precordial pain and, 124, 299
 - subendocardial injury patterns during, 118
- extensive anterior infarction, 148
- external body-mapping surface technique, 27
- fibrinolysis, 228
- fibrinolytic therapy, 228–33
 - LBBB and, 249–50
- first diagonal branch occlusion, 102
- FP. *See* frontal plane
- free-wall rupture, 245–6
- frontal plane (FP), 12
- Gadolinium-enhanced CMR, 137
- gender, 308–9
- GUSTO trial, 223
- heart
 - bulls-eye image, 13
 - location of, 5
 - segments of, 13
- heart walls. *See also* anterior wall; inferior wall; lateral wall; posterior wall; septal wall
 - CMR of, 5–15
 - perfusion of, 16–18
- hemiblocks, 174–93. *See also* inferoposterior hemiblock; superoanterior hemiblock
 - false Q wave patterns due to, 189
 - Q wave masking, 177–8
- Holter recordings, 56, 221, 288, 303
- hypercoagulation states, 266
- hyperenhancement patterns, 10
- hyperkalemia, 42
- hypertension, 54, 256
 - pulmonary, 300
- hypertrophic cardiomyopathy, 172, 199
- hypokalemia, 42
- hypothermia, 117
- ICS. *See* intraventricular conduction systems
- IHD. *See* ischaemic heart disease
- infarction. *See also* myocardial infarction; vector of infarction
 - aborted, 214–33, 219, 283
 - acute phase of, 53, 153
 - anterior, 11, 222
 - complete RBBB and, 193
 - with IPH, 186
 - SAH associated with, 177
 - anteroinferior, 144
 - anteroseptal, 126, 282
 - apical-anterior, 143–4, 145, 146, 147, 149–50, 171
 - ECG pattern of, 148
 - false impression of, 148
 - pacemakers and, 194
 - atrial, 293–5
 - chronic, 281
 - double, 171
 - enzymatic, 198
 - extensive anterior infarction, 148
 - inferior wall, 44, 159–60, 162, 230
 - ECG pattern of, 162
 - ECG-VCG example of, 190, 191
 - IPH associated with, 177, 184
 - with lateral ischaemia, 45
 - SAH with, 183, 187
 - inferolateral, 157, 163, 164, 282
 - LCX occlusion and, 165
 - RCA occlusion and, 165
 - inferolateral apical, 160
 - in inferolateral zone, 154
 - lateral, 154
 - ECG pattern of, 160
 - with LBBB, 181

- infarction (*cont.*)
- left ventricle, 291–3
 - mid-anterior, 150, 151
 - ECG pattern of, 155
 - with SAH, 185
 - non-Q-wave, 130, 233–42, 289
 - defining, 291
 - presentation of, 289–90
 - types of, 290–1
 - patterns of, 134
 - posterior, 11
 - Q wave, 130, 133, 140, 151, 214–33, 228, 289, 305, 306
 - diagnosis of, 174
 - differential diagnosis of, 168–70
 - with disappearing Q, 295–6
 - evolving, 218
 - masking hemiblocks, 178
 - of subepicardial ischaemia, 220–1
 - Q waves
 - diagnosis of, 269
 - quantifying, 285–7
 - right-ventricular, 293
 - septal, 141, 177, 178, 282
 - with SAH, 188
 - inferior leads, 189
 - inferior wall, 6–7, 15
 - ECG limitations and, 26–7
 - infarction, 44
 - with lateral ischaemia, 45
 - MI, 138
 - rupture, 248
 - inferolateral infarction, 157, 162, 163, 164, 282
 - due to LCX occlusion, 165
 - due to RCA occlusion, 165
 - inferolateral zone, 18, 28
 - ECG patterns of, 282–5
 - IHD and, 44–6
 - infarction in, 154
 - LCX occlusion in, 82
 - RCA occlusion in, 82
 - STE-ACS involving, 223
 - inferoposterior division, 18
 - inferoposterior hemiblock (IPH), 161, 177
 - anterior infarction with, 186
 - inferior infarction and, 177, 184
 - mid-anterior infarction and, 188
 - Q waves of infarction masking, 178
 - inferoposterior wall, 138
 - injury
 - ECG patterns of, 20–2
 - patterns of, 134
 - vector, 59, 73–4, 74–5, 89, 96
 - direction, 68, 77–8, 92
 - movement of, 48
 - interlateral zone, 24
 - intramural haematoma, 204
 - intraventricular blocks, 250–7
 - intraventricular conduction systems (ICS), 172, 228
 - IPH. *See* inferoposterior hemiblock
 - ischaemia. *See also* myocardial ischaemia
 - cascade, 302
 - ECG patterns, 20–2
 - grade of, 224–7
 - patterns of, 134
 - persistent, 56–7
 - silent, 302–3
 - in ACS, 302
 - in chronic patient, 302–3
 - type I, 302
 - type II, 302
 - ischaemic heart disease (IHD)
 - acute phase of, 209
 - chronic, 20, 22, 38
 - ECG in, 49
 - diagnosis of, 22–3
 - ECG in, 308–9
 - correlations and prognostic implications, 197–8
 - ECG limitations and, 24–5
 - exercise tests in, 245
 - negative T wave in, 40–9, 203
 - diagnostic criteria for, 40–4
 - location criteria, 44–9
 - pattern of, 217
 - severe, 181
 - ST-segment depression in, 111–19
 - diagnostic criteria, 111–13
 - location criteria, 113–14
 - ST-segment elevation in, 63–6, 65
 - isotopic studies, 3
 - Kawasaki's disease, 274
 - lateral area, 137
 - lateral infarction, 154, 155
 - due to LCX occlusion, 152–3
 - ECG pattern of, 160
 - lateral leads, 25–6, 95–6
 - lateral wall, 6–7, 15
 - ECG limitations and, 25–6
 - LBBB. *See* left bundle branch block
 - LCX. *See* circumflex artery
 - lead I
 - Q wave, 128
 - ST segment in, 100
 - lead II
 - Q wave, 128
 - lead III
 - Q wave, 128
 - lead VF
 - Q wave, 128
 - left anterior descending coronary artery (LAD), 16, 17, 230
 - anomalous origin of, 271
 - occlusion of, 18, 28, 42, 64, 76, 80, 141, 144, 146, 212, 231
 - anteroseptal zone, 71
 - proximal, 46, 148
 - STE-ACS due to, 72, 73, 77, 78, 85
 - proximal, 235
 - ACS due to, 116
 - left bundle branch
 - divisions of, 182
 - middle fiber block, 193
 - perfusion of, 18

- left bundle branch block (LBBB), 42, 54, 228, 262, 288
 - acquired, 256–7
 - complete, 120, 172–4
 - infarction with, 181
 - ECG criteria in, 182
 - fibrinolytic therapy, 249–50
 - negative T wave in, 51
 - ventricular activation in case of, 179
- left main incomplete occlusion, 234
- left main trunk (LMT), 27, 213
 - occlusion, 98, 303
 - ECG limitations and, 25
- left ventricular aneurysms (LVA), 304
- left-deviated AQRS, 189
- left-ventricular apical ballooning, 267–8
- LMT. *See* left main trunk
- longitudinal vertical plane, 12
- LVA. *See* left ventricular aneurysms
- LVH
 - injury patterns and, 120–7
- magnetic resonance imaging (MRI), 257
- McGinn-White pattern, 206
- MI. *See* myocardial infarction
- mid-anterior infarction, 150, 151
 - ECG, 152, 155
 - IPH and, 188
 - with SAH, 185
- middle fibers, block of, 193
- mirror patterns, 21
- Mobitz-type blocks, 223
- monomorphic sustained ventricular tachycardia, 251
- mortality
 - estimating, 225
 - in-hospital, 242
 - long-term view, 229
 - pre-hospital, 252
 - QRS duration and, 249
- MRI. *See* magnetic resonance imaging
- myocardial bridging, 207, 299–300
- myocardial infarction (MI), 19
 - aborted, with Q wave, 296
 - ACS and, 244–7
 - acute, 69, 197, 230
 - anterior, 99, 149
 - subacute, 295
 - diagnostic criteria, 197, 281–2
 - ECG changes in, 136
 - ECG criteria in, 182
 - ECG of multiple, 166–8, 169, 287
 - enzymatic, 295
 - inferior, 103, 138, 158, 294
 - inferolateral, 161–2
 - inferoposterior, 138
 - lateral, 137, 154, 155, 156
 - posterior, 138
 - Q wave, 132–6, 275–9
 - criteria, 135
 - ECG criteria, 133–6
 - location of, 137–66
 - septal, 143
 - QRS changes due to, 129–30, 166
 - small septal, 143
- myocardial ischaemia
 - clinical settings due to, 197
 - ECG of, 19–29
- myocarditis, 42
 - acute, 173, 204
- necrosette, 198, 279, 295
- necrosis, 279, 281
 - diagnosing, 180
 - ECG patterns, 20–2
 - Q waves of, 129, 133, 136, 159, 282
 - electrophysiological mechanism of, 130–1
 - theories of, 131–2
 - in SAH, 183
- nomograms, 225
- oblique marginal (OM), 18
- occlusion. *See also* circumflex artery, occlusion; left anterior descending coronary artery, occlusion; right coronary artery, occlusion
 - acute phase of, 217
 - ECG signs and, 67–8
 - first diagonal branch, 102
 - left main incomplete, 234
 - multivessel, 233
 - proximal to D1 and S1, 72–4
 - ST-segment changes and, 222–3
- OM. *See* oblique marginal
- OM branch
 - LCX occlusion proximal to, 92
 - occlusion, 46, 93–6, 157
 - STE-ACS due to, 94
- open artery theory, 209
- P wave, 243
 - abnormal, 306
- pacemakers, 126, 194, 247–50
- pain. *See also* chest pain; precordial pain
 - ECG with, 101
 - ECG without, 123
- papillary muscle rupture, 246–7
- passivation of disrupted plaque, theory of, 209
- PCI. *See* percutaneous coronary intervention
- percutaneous coronary intervention (PCI), 211–12, 222, 270–1
 - STE-ACS before, 84
- pericarditis, 42
 - acute, 200
 - chronic constrictive, 49
 - differential diagnosis, 201, 202
 - idiopathic, 109
- pheochromocytoma, 274
- polymorphic ventricular tachycardia, 251
- posterior wall, 14, 15
 - MI, 138
- PR segment, 243

- precordial leads, 25, 38, 88
- Q wave, 128, 141
 - ST-segment depression in, 114, 236
 - ST-segment elevation in, 80, 98–100, 106, 264
- precordial pain, 48
- other clinical settings, 119
 - at exercise, 124
 - exercise test in patient with, 299
- precordium, 200
- PREDICT score, 258, 260
- pre-fibrinolytic area, 241
- premature atrial complexes, 253
- premature ventricular complexes (PVCs), 244, 250, 288
- Prinzmetal angina, 221, 226, 271–3
- pulmonary embolism, 42, 200, 204
- PVCs. *See* premature ventricular complexes
- Q wave
- evolving, 125
 - infarction, 305, 306
 - aborted, 296
 - with disappearing Q, 295–6
 - ECG in ACS with, 106
- Q waves, 20, 22, 26, 27, 166, 167–8
- abnormality criteria, 135
 - in admittance ECG, 232
 - classification of, 137
 - false, due to hemiblocks, 189
 - infarction, 130, 133, 140, 151, 214–33, 228, 289
 - diagnosis of, 170–94, 174, 269
 - differential diagnosis of, 168–70
 - evolving, 218
 - masking hemiblocks, 178
 - of subepicardial ischaemia, 220–1
 - inferolateral zone, 166
 - limits of, 128
 - lead I, 128
 - lead II, 128
 - lead VF, 128
 - precordial lead, 128
 - VL lead, 128
 - VR lead, 128
 - MI, 29, 132–6, 275–9, 287–8
 - criteria, 135
 - ECG criteria, 133–6
 - location of, 137–66
 - of necrosis, 129, 133, 136, 159, 282
 - electrophysiological mechanism of, 130–1
 - theories of, 131–2
 - pathologic, 175, 220
 - persistent, 170
 - in precordial leads, 141
 - secondary to single infarctions, 279–87
 - septal-MI, 143
 - transient, 169–70
 - in V1–V2, 23
 - in V3–V4, 23
 - in V5–V6, 23
- QR morphology, 130
- positional, 173
- Qr wave, 157
- in inferior leads, 189
- QRS complex, 11, 25, 133, 137
- changes of, 243
 - due to MI, 129–30, 166
 - composition of, 131
 - criteria, 174
 - fractioned, 129, 135, 159, 166, 278, 288, 289
 - narrow, 63–110
 - subendocardiographic patterns of, 110–20
 - scoring system, 276
 - wide, 241, 287–8
 - ACS with, 247–50
 - ECG patterns of ischaemia in, 54
 - infarction with, 296
 - as prognosis marker, 304
- QRS loop
- morphology of, 133
- QRS-T loop, 232
- QS morphology, 26, 130, 150, 305
- in V1–V2, 142
- QT interval, 243
- long, 288
- QTc interval, 268
- R waves, 21, 114, 175, 237
- RBBB. *See* right bundle branch blocks
- RCA. *See* right coronary artery
- reciprocal patterns, 62
- reperfusion patterns, 37, 220, 232, 268
- area, 249
 - arrhythmias, 232
- repolarisation
- abnormalities, 174, 226
 - alterations, 112
 - cardiac memory, 52
 - changes in, 260
 - delay of, 31–2, 33
 - early
 - differential diagnosis, 201
 - mixed changes, 48
 - typical patterns of, 50
- right bundle branch blocks (RBBB), 100, 120, 121, 204, 223
- acquired, 256–7
 - complete, 172, 176, 178, 262
 - acute anterior MI with, 193
 - ECG-VCG correlation in, 175
 - occurrence of, 256–7
- right coronary artery (RCA), 16, 17, 28, 102
- dominant, 90
 - occlusion of, 18, 82, 84, 163, 164, 293, 294
 - chronic phase, 90
 - distal to RV marginal branches, 86–7
 - dominant, 89
 - inferolateral infarction due to, 165
 - non-dominant, 160
 - STE-ACS due to, 88, 91, 104
- right precordial leads, 27
- right ventricle (RV), 12
- infarction, 293

- risk scores, 257–60
 - global, 263, 265
 - TIMI, 257
- RS morphology, 138, 157
- RV. *See* right ventricle

- SAH. *See* superoanterior hemiblock
- scintigraphy, 257
- SCS. *See* specific conduction system
- septal infarction, 141, 177, 178, 282
 - ECG pattern of, 143
 - with SAH, 188
- septal rupture, 246
- septal wall, 6–7, 15, 162
- single photon emission computed tomography (SPECT), 3, 9, 20, 292, 298, 303
- sinus node, 18
- sinus tachycardia, 252–3, 288
- specific conduction system (SCS), 16–18
 - perfusion of, 18
- SPECT. *See* single photon emission computed tomography
- sportsmen, 42
- stroke, 42
- ST-segment
 - changes in multivessel disease, 105–7
 - isoelectric, 100
 - in lead I, 100
 - normal limits of, 55
- ST-segment depression, 21, 22, 47, 100, 106–7, 213, 289
 - on admission, 234–42
 - assessing, 222
 - circumferential involvement, 114–16
 - circumferential subendocardium involvement, 61, 234–9
 - in clinical settings, 119–20
 - in IHD, 111–20
 - diagnostic criteria, 111–13
 - location criteria, 113–14
 - non-*ischaemic*, 125
 - occlusion site and, 222–3
 - in precordial leads, 106, 119, 236
 - reciprocal patterns, 62
 - regional involvement, 116–19
- ST-segment elevation, 20, 22, 24. *See also* acute coronary syndromes, STE
 - ACS
 - classifications for, 29
 - acute MI with, 69
 - on admission, 221–7, 234–42
 - assessing, 222
 - causes of, 108
 - in clinical settings, 107–10
 - dynamic changes in, 227
 - electrophysiological mechanism of, 61–2
 - in IHD, 65
 - in lateral wall leads, 102
 - in many leads, 202
 - new onset persistent, 209–10
 - occlusion site and, 222–3
 - persistent, 211
 - in precordial leads, 80, 98–100, 264
 - reciprocal patterns, 62
 - T waves with, 51, 273
 - transient, 65
- subendocardial injury pattern, 20, 32, 35, 58, 237, 275
 - electrophysiological mechanism of, 60–1
 - exercise test, 118
 - with narrow QRS, 110–20
 - vectors, 60
- subendocardial *ischaemia*, 19, 20, 35, 39, 217
 - circumferential, 234
 - T wave of, 39
 - taller-than-normal, 39
- subepicardial injury pattern, 20, 32, 35, 36, 57, 58, 59, 65, 217–19
 - ECG-VCG, 66
 - infarction Q wave in, 220–1
 - with narrow QRS, 63–110
 - vectors, 60
- subepicardial *ischaemia*
 - diagnostic criteria, 44
 - ECG pattern of, 40–54
 - T loops of, 43
- sudden death, 288, 309
- superoanterior hemiblock (SAH), 161, 177, 304
 - ACS with, 255–6
 - anterior infarction associated with, 177
 - ECG with, 170
 - inferior infarction associated with, 183
 - ECG-VCG example of, 190
 - masking, 187
 - mid-anterior infarction with, 185
 - necrosis in, 183
 - Q waves of infarction masking, 178
 - septal infarction with, 188
- T loops, 43
- T waves, 23
 - abnormalities, 30–54, 308
 - ECG-VCG correlation of, 43
 - flattened, 237, 289
 - in lead I, 308
 - in NSTEMI-ACS, 239–40
 - hyperkalemia and, 42
 - location, 30
 - morphology, 30
 - negative, 20, 35, 37, 41, 213, 220
 - in alcoholism, 53
 - causes of, 42
 - in clinical situations, 49–54
 - deep, 42
 - ECG with, 45
 - in IHD, 40–9, 203
 - in left bundle branch block, 51
 - in NSTEMI-ACS, 239–40
 - with ST-segment elevation, 51
 - in subacute phase, 38
 - symmetric, 54
 - normal limits of, 30
 - peaked, 41
 - positive, 21, 35
 - ST segment elevation and, 273

332 Index

- T waves (*cont.*)
 - in stroke patients, 42
 - of subendocardial ischaemia, 39
 - symmetric, 41
 - tall, 35, 36, 39
 - voltage, 30
 - low, 52
- tachyarrhythmia, 266
- tachycardia
 - post, 42
 - sinus, 252–3, 288
- Takayasu's disease, 274
- Tako-Tsubo syndrome, 268
- TAP. *See* transmembrane action potential
- TIMI risk index, 223, 261
 - in NSTEMI-ACS, 259–60
 - in STEMI-ACS, 257–9
- transient lengthening, 268
- transmembrane action potential (TAP), 31, 34, 55, 57
 - non-excitabile areas and, 129
 - sum of, 33, 34
 - summation, 57–8
- transmural ischaemia, 219
- transverse plane, 12
- typical exercise angina, 19

- U wave, 243
 - negative, 307

- VCG loops, 135, 136, 158
- vector of infarction, 145, 152
 - direction of, 160–1
 - movement of, 48, 131
 - theory of, 58–9
- vector of ischaemia
 - movement of, 34–5, 48
 - theory of, 33–4
- vectorcardiogram, 31
- vectorial forces, 25
- ventricular aneurysms, 247
- ventricular fibrillation (VF), 224
 - incidence of, 252
- ventricular hypertrophy, 54
- VF. *See* ventricular fibrillation
- VL leads, 128
- VR leads, 27
 - Q wave, 128

- window of Wilson, 131
- Wolff-Parkinson-White syndrome, 192, 193–4, 247–50

- X syndrome, 207, 274, 298–9
 - coronary arteries in, 300
- X-ray examination, 3
 - role of, 8