

Contents

List of contributors	xiii
Foreword	xv
<i>Eugene Braunwald</i>	
Chapter 1 Pathophysiology of acute coronary syndromes	1
<i>Alisa B. Rosen and Eli V. Gelfand</i>	
Introduction	1
Formation of atherosclerotic plaque	2
Plaque instability and the development of ACS	5
Myocardial ischemia	7
Thrombus formation	7
Platelets	7
Secondary hemostasis	9
Dynamic obstruction	10
Progressive mechanical obstruction	10
Inflammation	11
Secondary unstable angina	11
References	11
Chapter 2 Diagnosis of acute coronary syndrome	13
<i>Eli V. Gelfand and Alisa B. Rosen</i>	
Introduction	13
Definition of myocardial infarction	13
History	14
Risk factors	17
Physical examination	17
Electrocardiography	19
The pathophysiologic basis of ST segment changes during ischemia	19
Electrocardiography in ST-elevation MI and identification of the infarct-related artery	20
Electrocardiography in unstable angina and NSTEMI	26

Cardiac biomarkers	26
Noninvasive imaging	29
Echocardiography	29
Myocardial perfusion imaging	30
Coronary computed tomography	30
Cardiovascular magnetic resonance imaging	31
Stress testing for diagnosis of ACS	32
Overall diagnostic pathway for ACS	32
References	34
Chapter 3 Unstable angina and non-ST-elevation myocardial infarction	37
<i>Eli V. Gelfand and Christopher P. Cannon</i>	
Introduction	37
Causes of UA/NSTEMI	37
Presentation of UA/NSTEMI	38
General strategies in management of UA/NSTEMI	39
Risk stratification of patients with UA/NSTEMI	40
Initial management of UA/NSTEMI in the emergency department	42
Pharmacologic treatment of ischemia in UA/NSTEMI	43
Beta-blockers	44
Nitrates	44
Calcium channel blockers	45
Angiotensin-converting enzyme inhibitors	45
Morphine	46
Oxygen	46
Invasive versus conservative strategy	46
Antiplatelet therapy in UA/NSTEMI	49
Aspirin	54
Clopidogrel	55
Prasugrel	57
Glycoprotein IIb/IIIa inhibitors	58
Anticoagulant therapy in UA/NSTEMI	61
Unfractionated heparin	61
Enoxaparin	62
Direct thrombin inhibitors	65
Fondaparinux	66
Oral anticoagulation in UA/NSTEMI	67
Fibrinolysis in UA/NSTEMI	68

	Early lipid-lowering therapy in patients with UA/NSTEMI	68
	Predischarge noninvasive risk stratification after UA/NSTEMI	69
	Overall management of UA/NSTEMI	71
	References	71
Chapter 4	ST-segment-elevation myocardial infarction	79
	<i>Eli V. Gelfand and Christopher P. Cannon</i>	
	Introduction	79
	Global treatment goals in STEMI	79
	Prehospital management and triage	80
	Transport decisions	82
	Management prior to reperfusion	82
	Primary reperfusion therapy for STEMI	83
	Fibrinolysis	83
	Combination fibrinolysis	86
	Markers of fibrinolysis effectiveness	86
	Complications of fibrinolysis	88
	Primary percutaneous coronary intervention	88
	Comparison of PCI with fibrinolysis	90
	Timing of primary PCI	91
	PCI following fibrinolytic therapy	94
	Rescue PCI	94
	Facilitated PCI	94
	Routine PCI after successful fibrinolysis	96
	Overall reperfusion strategy	97
	Coronary artery bypass grafting for treatment of STEMI	98
	Adjunctive pharmacologic treatment of STEMI	98
	Antiplatelet agents	98
	Anticoagulation therapy	101
	Other adjunctive therapy	105
	Hospital care following successful reperfusion	110
	References	114
Chapter 5	Special considerations in acute coronary syndromes	123
	<i>Jason Ryan and Eli V. Gelfand</i>	
	Secondary unstable angina	123

Acute coronary syndrome in patients with diabetes mellitus	123
General considerations	123
Primary ACS therapy in diabetics	124
Glycemic control in diabetics with ACS	125
Coronary revascularization in diabetics	126
Metabolic syndrome and ACS	127
Chronic kidney disease in ACS	127
Young patients with ACS	130
ACS in the setting of cocaine use	130
ACS in patients with normal coronary arteries or mild CAD	132
Myocarditis	132
Acute transient apical ballooning syndrome	133
Postoperative ACS	134
ACS in a pregnant woman	135
Hyperthyroidism and ACS	136
ACS in patients exposed to radiation	137
Trauma and ACS	137
References	137
Chapter 6 Complications of acute coronary syndrome	141
<i>Jan M. Pattanayak and Eli V. Gelfand</i>	
Introduction	141
Pump failure	141
General principle	141
Clinical presentation	142
Prognosis	144
Treatment	144
Right ventricular infarction	148
Introduction	148
Clinical presentation	148
Diagnosis	149
Management	150
Prognosis	152
Mechanical complications of ACS	152
Introduction	152
Left ventricular free wall rupture	152

	Ventricular septal rupture	153
	Acute mitral regurgitation	154
	Left ventricular aneurysm	155
	Left ventricular pseudoaneurysm	157
	Pericardial complications	157
	Arrhythmic complications of ACS	159
	Bradyarrhythmias	159
	Atrial fibrillation	163
	Ventricular tachycardia and fibrillation	163
	Complications involving bleeding	164
	Complications of percutaneous coronary intervention	165
	References	170
Chapter 7	Post-hospitalization care of patients with acute coronary syndrome	173
	<i>Jersey Chen and Eli V. Gelfand</i>	
	Introduction	173
	Pharmacologic measures	173
	Aspirin	173
	Clopidogrel	174
	Beta adrenergic blockade	177
	Renin–angiotensin–aldosterone inhibitors	179
	Lipid-lowering therapy	185
	Warfarin	189
	Influenza vaccination	192
	Medications of limited benefit to patients following ACS	192
	Vitamins/antioxidants	192
	Estrogen replacement therapy	192
	Nonsteroidal anti-inflammatory agents and related compounds	194
	Nonpharmacologic measures	195
	Antiarrhythmic devices	195
	Therapy of comorbidities following ACS	198
	Diabetes mellitus	198
	Hypertension	199
	Depression	199

xii Contents

Lifestyle recommendations following ACS	200
General physical activity and structured cardiac rehabilitation	200
Sexual activity after ACS	201
Smoking cessation	201
Diet/nutrition and weight loss	202
References	204
Appendix	209
Index	217