

Contents

Preface.....	vii
Foreword	ix
Contributors	xvii
1 Preventive Cardiology: The SHAPE of the Future.....	1
<i>Morteza Naghavi</i>	
2 From Vulnerable Plaque to Vulnerable Patient.....	13
<i>Morteza Naghavi and Erling Falk</i>	
3 Pathology of Vulnerability Caused by High-Risk (Vulnerable) Arteries and Plaques	39
<i>Troels Thim, Mette Kallestrup Hagensen, Jacob Fog Bentzon, and Erling Falk</i>	
4 Pathophysiology of Vulnerability Caused by Thrombogenic (Vulnerable) Blood.....	53
<i>Giovanni Cimmino, Borja Ibanez, and Juan Jose Badimon</i>	
5 Vulnerability Caused by Arrhythmogenic Vulnerable Myocardium.....	67
<i>Ariel Roguin</i>	
6 Approach to Atherosclerosis as a Disease: Primary Prevention Based on the Detection and Treatment of Asymptomatic Atherosclerosis	77
<i>Morteza Naghavi, Erling Falk, Khurram Nasir, Harvey S. Hecht, Matthew J. Budoff, Zahi A. Fayad, Daniel S. Berman, and Prediman K. Shah</i>	
SECTION I RISK FACTORS AND CIRCULATING MARKERS OF ASYMPTOMATIC ATHEROSCLEROTIC CARDIOVASCULAR DISEASE	
7 History of the Evolution of Cardiovascular Risk Factors and the Predictive Value of Traditional Risk-Factor-Based Risk Assessment	89
<i>Amit Khera</i>	
8 Comprehensive Lipid Profiling Beyond LDL	107
<i>Benoit J. Arsenault, S. Matthijs Boekholdt, John J.P. Kastelein, and Jean-Pierre Després</i>	
9 New Blood Biomarkers of Inflammation and Atherosclerosis.....	119
<i>Natalie Khuseyinova and Wolfgang Koenig</i>	
10 Genomics and Proteomics: The Role of Contemporary Biomolecular Analysis in Advancing the Knowledge of Atherosclerotic Coronary Artery Disease	135
<i>Gary P. Foster and Naser Ahmadi</i>	
11 Circulating Endothelial Progenitor Cells: Mechanisms and Measurements	151
<i>Jonathan R. Murrow and Arshed A. Quyyumi</i>	

12	Family History: An Index of Genetic and Environmental Predisposition to Coronary Artery Disease	169
	<i>Shivda Pandey and Khurram Nasir</i>	
13	Endothelial Activation Markers in Sub-clinical Atherosclerosis: Insights from Mechanism-Based Paradigms.....	179
	<i>Victoria L.M. Herrera and Joseph A. Vita</i>	
SECTION II NON INVASIVE, NON IMAGING, ASSESSMENT OF ASYMPTOMATIC ATHEROSCLEROTIC CARDIOVASCULAR DISEASE		
14	Exercise Stress Testing in Asymptomatic Individuals and Its Relation to Subclinical Atherosclerotic Cardiovascular Disease	197
	<i>Kevin S. Heffernan</i>	
15	The Ankle Brachial Index.....	211
	<i>Matthew A. Allison and Mary M. McDermott</i>	
16	Arterial Elasticity/Stiffness.....	225
	<i>Daniel A. Duprez and Jay N. Cohn</i>	
17	Assessment of Endothelial Function in Clinical Practice.....	237
	<i>Jeffrey T. Kuvin</i>	
18	Digital (Fingertip) Thermal Monitoring of Vascular Function: A Novel, Noninvasive, Nonimaging Test to Improve Traditional Cardiovascular Risk Assessment and Monitoring of Response to Treatments.....	247
	<i>Matthew Budoff, Naser Ahmadi, Stanley Kleis, Wasy Akhtar, Gary McQuilkin, Khawar Gul, Timothy O'Brien, Craig Jamieson, Haider Hassan, David Panthagani, Albert Yen, Ralph Metcalfe, and Morteza Naghavi</i>	
19	Assessment of Macro- and Microvascular Function and Reactivity	265
	<i>Craig J. Hartley and Hirofumi Tanaka</i>	
SECTION III NON INVASIVE STRUCTURAL IMAGING OF ASYMPTOMATIC ATHEROSCLEROTIC CARDIOVASCULAR DISEASE		
20	Coronary Artery Calcium Imaging.....	279
	<i>Harvey S. Hecht</i>	
21	Noninvasive Ultrasound Imaging of Carotid Intima Thickness	285
	<i>Tasneem Z. Naqvi</i>	
22	Carotid Intima-Media Thickness: Clinical Implementation in Individual Cardiovascular Risk Assessment	319
	<i>Ward A. Riley</i>	
23	Computed Tomographic Angiography	323
	<i>Harvey S. Hecht</i>	
24	Role of Noninvasive Imaging using CT for Detection and Quantitation of Coronary Atherosclerosis.....	335
	<i>John A. Rumberger</i>	

25	Noninvasive Coronary Plaque Characterization: CT Versus MRI.....	351
	<i>John A. Rumberger</i>	
26	Magnetic Resonance Imaging	357
	<i>Zahi A. Fayad</i>	
27	The Role of MRI in Examining Subclinical Carotid Plaque	363
	<i>Chun Yuan, Hideki Ota, Xihai Zhao, and Tom Hatsukami</i>	
28	Comprehensive Non-contrast CT Imaging of the Vulnerable Patient	375
	<i>Damini Dey, Ioannis A. Kakadiaris, Matthew J. Budoff, Morteza Naghavi, and Daniel S. Berman</i>	
SECTION IV NON INVASIVE FUNCTIONAL IMAGING OF ASYMPTOMATIC ATHEROSCLEROTIC CARDIOVASCULAR DISEASE		
29	Ultrasound Assessment of Brachial Artery Reactivity	395
	<i>A. Rauoof Malik and Iftikhar J. Kullo</i>	
30	Cardiac Imaging for Ischemia in Asymptomatic Patients: Use of Coronary Artery Calcium Scanning to Improve Patient Selection: Lessons from the EISNER Study	411
	<i>Alan Rozanski, Heidi Gransar, Nathan D. Wong, Leslee J. Shaw, Michael J. Zellweger, and Daniel S. Berman</i>	
31	Targeted MRI of Molecular Components in Atherosclerotic Plaque	429
	<i>Zahi A. Fayad</i>	
32	Noninvasive Imaging of the Vulnerable Myocardium: Cardiac MRI and CT Based	433
	<i>Ricardo C. Cury, Anand Soni, and Ron Blankstein</i>	
SECTION V INVASIVE (INTRAVASCULAR) RISK STRATIFICATION FOR DETECTION OF VULNERABLE (HIGH-RISK) ASYMPTOMATIC ATHEROSCLEROTIC PLAQUES		
33	Angiography for Detection of Complex and Vulnerable Atherosclerotic Plaque	455
	<i>James A. Goldstein</i>	
34	Intravascular Characterization of Vulnerable Coronary Plaque	461
	<i>James A. Goldstein and James E. Muller</i>	
35	Detecting Vulnerable Plaque Using Invasive Methods.....	475
	<i>Robert S. Schwartz and Arturo G. Touchard</i>	
36	Assessment of Plaque Burden and Plaque Composition Using Intravascular Ultrasound.....	483
	<i>Paul Schoenhagen, Anuja Nair, Stephen Nicholls, and Geoffrey Vince</i>	
37	Vulnerable Anatomy; The Role of Coronary Anatomy and Endothelial Shear Stress in the Progression and Vulnerability of Coronary Artery Lesions: <i>Is Anatomy Destiny?</i>	495
	<i>Charles L. Feldman, Yiannis S. Chatzizisis, Ahmet U. Coskun, Konstantinos C. Koskinas, Morteza Naghavi, and Peter H. Stone</i>	
38	Vasa Vasorum Imaging	507
	<i>Ioannis A. Kakadiaris, Sean O'Malley, Manolis Vavuranakis, Ralph Metcalfe, Craig J. Hartley, Erling Falk, and Morteza Naghavi</i>	

SECTION VI SCREENING FOR RISK ASSESSMENT OF ASYMPTOMATIC AT-RISK POPULATION AND IDENTIFICATION OF THE VULNERABLE PATIENT – THE SHAPE PARADIGM	
39	From Vulnerable Plaque to Vulnerable Patient – Part III 517 <i>Morteza Naghavi, Erling Falk, Harvey S. Hecht, Michael J. Jamieson, Sanjay Kaul, Daniel S. Berman, Zahi Fayad, Matthew J. Budoff, John Rumberger, Tasneem Z. Naqvi, Leslee J. Shaw, Jay N. Cohn, Ole Faergeman, Raymond D. Bahr, Wolfgang Koenig, Jasenka Demirovic, Dan Arking, Victoria L.M. Herrera, Juan Jose Badimon, James A. Goldstein, Arturo G. Touchard, Yoram Rudy, K.E. Juhani Airaksinen, Robert S. Schwartz, Ward A. Riley, Robert A. Mendes, Pamela S. Douglas, and Prediman K. Shah</i>
40	Cost Effectiveness of Screening Atherosclerosis 537 <i>Leslee J. Shaw and Ron Blankenstein</i>
41	Monitoring of Subclinical Atherosclerotic Disease..... 549 <i>Daming Zhu, Allen J. Taylor, and Todd C. Villines</i>
42	Implications of SHAPE Guideline for Improving Patient Compliance..... 569 <i>Matthew J. Budoff</i>
43	The SHAPE Guideline: Why Primary Care Physicians Should Embrace It 577 <i>Robert A. Mendes</i>
44	Should We Treat According to the SHAPE Guidelines?..... 581 <i>Paolo Raggi and Stamatios Lerakis</i>
45	Duty-Bound: Rational Foundations of Clinical Strategies for Prevention of Cardiovascular Events 587 <i>George A. Diamond and Sanjay Kaul</i>
46	A Time to Live: Dynamic Changes in Risk as the Basis for Therapeutic Triage..... 597 <i>Sanjay Kaul and George A. Diamond</i>
SECTION VII TREATMENT OF ASYMPTOMATIC ATHEROSCLEROTIC CARDIOVASCULAR DISEASE AND THE VULNERABLE PATIENTS: SYSTEMIC THERAPIES	
47	LDL Targeted Therapies 605 <i>Raul D. Santos, Khurram Nasir, and Roger S. Blumenthal</i>
48	Antioxidants as Targeted Therapy: A Special Protective Role for Pomegranate and Paraoxonases (PONs)..... 621 <i>Mira Rosenblat and Michael Aviram</i>
49	The Multiconstituent Cardiovascular Pill (MCCP): Challenges and Promises of Population Based Prophylactic Drug Therapy for Heart Attack Prevention and Eradication 635 <i>Michael J. Jamieson, Harvey S. Hecht, and Morteza Naghavi</i>
50	Vaccine for Atherosclerosis: An Emerging New Paradigm..... 649 <i>Prediman K. Shah, Kuang-Yuh Chyu, Jan Nilsson, and Gunilla N. Fredrikson</i>

SECTION VIII LOCAL AND FOCAL THERAPIES FOR STABILIZATION OF VULNERABLE ARTERIES AND PLAQUES	
51 Drug-Eluting Stents: A Potential Preemptive Treatment Choice for Vulnerable Coronary Plaques.....	661
<i>Edwin Lee, George Dangas, and Roxana Mehran</i>	
52 Intrapericardial Approach for Pancoronary Stabilization of the Vulnerable Arteries and Myocardium.....	671
<i>Venkatesan Vidi and Sergio Waxman</i>	
SECTION IX EDUCATIONS, LIFE STYLE MODIFICATIONS AND NON-PHARMACOLOGIC TREATMENTS FOR PRIMARY PREVENTION AND SAVING THE VULNERABLE	
53 Dietary Management for Coronary Atherosclerosis Prevention and Treatment.....	689
<i>Michel de Lorgeril and Patricia Salen</i>	
54 Management of Preconditioning Physical Activity in a Vulnerable Patient: Getting in SHAPE.....	699
<i>Sae Young Jae</i>	
55 Last Chance for Prevention (Acute Prevention): Identification of Prodromal Symptoms and Early Heart Attack Care.....	707
<i>Raymond D. Bahr, Yasmin S. Hamirani, and Morteza Naghavi</i>	
Index.....	723