

EVIDENCE- BASED CARDIOLOGY

THIRD EDITION

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EVIDENCE-BASED CARDIOLOGY

THIRD EDITION

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P R E F A C E

Perhaps more than any other field of medicine, advances in cardiology are guided by data from large clinical trials. The number of major trials evaluating pharmacologic agents and diagnostic and therapeutic procedures continues to undergo significant growth. Since the publication of the previous edition of *Evidence-Based Cardiology*, results of hundreds of major trials have been published.

The two primary goals of *Evidence-Based Cardiology* are to (1) systematically summarize the major trials and (2) provide an overview of the field that integrates all the major trials and guidelines, thereby placing the information from the annotated studies in context. The results of major randomized trials in six major topic areas are presented in systematic fashion, including the design, study population, treatment regimen, results and when needed, additional perspective; some older trials and reviews have been eliminated and newer studies have replaced them. We have included selected meta-analyses, major review articles, and on occasion nonrandomized studies on important topics, usually with more abbreviated summaries. Importantly, the chapter overviews preceding the annotated references have been expanded with particular attention to discussing relevant ACC/AHA Practice Guidelines.

Chapter 1 focuses on preventive cardiology, particularly lipid and diet management, but also each of the multiple risk factors for coronary artery disease. There have been many advances included here. Chapter 2 focuses on major revascularization procedures, primarily coronary artery stenting and bypass surgery. New material includes data on drug-eluting stents and other novel devices. Chapters 3 and 4 cover the wealth of data on acute coronary syndromes. New material includes trial data on new antiplatelet and anticoagulant options for ACS, and a wealth of new studies on invasive strategy in STEMI patients. Chapter 5 focuses on the pharmacologic management of heart failure, with expanded information on biventricular pacing for CHF. Chapter 6 has been greatly expanded to include over 50 new trials, both in atrial fibrillation with new medications, novel strategies, and ablation procedures and in ventricular arrhythmias with expanded information on new drugs and implantable cardioverter defibrillators (ICDs).

We wish to acknowledge the coauthors of Chapters 5 and 6 (Justin M. Dunn and Jonathan Walter Dukes), who provided extensive assistance in revising, updating, and expanding these two chapters. We hope that the new edition will be helpful to you in staying up to date on the latest in evidence-based cardiology, and thereby help improve the management of patients.

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contributor to this volume.*

CONTENTS

<i>Preface</i>	xiii
<i>Contributors</i>	xv
1. Preventive Cardiology: Risk Factors for Coronary Artery Disease and Primary and Secondary Prevention Trials	1
CHRISTOPHER P. CANNON AND BENJAMIN A. STEINBERG	
CHOLESTEROL, LIPIDS, AND DIET	1
Epidemiology	1
National Cholesterol Education Program Guidelines	6
<i>Diet and Vitamins</i>	6
Special Diets	7
DRUGS	8
Bile Resins (e.g., Cholestyramine, Colestipol)	8
Fibric Acid Derivatives (e.g., Gemfibrozil, Fenofibrate)	9
Cholesterol Absorption Inhibitors	9
3-Hydroxy-3-Methylglutaryl-Coenzyme A Reductase Inhibitors (Statins)	10
<i>Primary Prevention Trials</i>	11
<i>Secondary Prevention Trials</i>	12
<i>Combined Primary and Secondary Prevention Trials</i>	13
<i>Early Statin Initiation Trials</i>	13
Raising HDL Cholesterol	14
<i>Niacin</i>	14
SMOKING	15
DIABETES	15
Metabolic Syndrome	17
HYPERTENSION	17
Epidemiology	17
Etiology	18
Diagnosis, Joint National Committee 7 Classification	18
Treatment	18
<i>Nonpharmacologic</i>	18
<i>Pharmacologic</i>	18
Target Blood Pressure	21
OBESITY	21
SEDENTARY LIFESTYLE AND EXERCISE	22
NONMODIFIABLE RISK FACTORS	23

Family History	23
Age	23
Gender	23
ALCOHOL	23
HORMONAL STATUS AND HORMONAL THERAPY	24
C-REACTIVE PROTEIN	25
OTHER POTENTIAL RISK FACTORS.....	27
Homocysteine	27
Lipoprotein-associated Phospholipase A ₂	27
Infection	28
Genetic Markers	28
ANTIPLATELET DRUGS FOR PRIMARY AND SECONDARY PREVENTION.....	29
Aspirin	29
<i>Primary Prevention Trials</i>	29
<i>Secondary Prevention Trials</i>	30
Clopidogrel	30
REFERENCES	32
General Articles	32
Lipids, Cholesterol, and Diet	33
<i>Review Articles and Meta-analyses</i>	33
<i>Epidemiology</i>	34
<i>Primary Prevention</i>	35
<i>Secondary Prevention</i>	39
<i>Combined Primary and Secondary Prevention Trials</i>	43
<i>Early Statin Initiation Trials</i>	45
<i>Trials of Raising HDL</i>	46
<i>Angiographic Analyses</i>	47
<i>Triglycerides</i>	48
<i>Lipoprotein(a)</i>	49
Antioxidants	49
<i>Studies</i>	49
Special Diets	51
Diabetes and Metabolic Syndrome	54
<i>Epidemiology</i>	54
<i>Studies</i>	55
Smoking.....	58
Hypertension.....	60
<i>Review Articles/Miscellaneous</i>	60
<i>Epidemiology and Risk Factors</i>	60
<i>Meta-analyses</i>	62
<i>Treatment</i>	62
Obesity and Weight	72
Activity and Exercise	74
Nonmodifiable Risk Factors.....	76
Alcohol	76
Hormone Status and Hormonal Replacement.....	77
C-Reactive Protein	80
Other	83
<i>Homocysteine</i>	83
<i>Lipoprotein-associated Phospholipase A₂ (Lp-PLA₂)</i>	86
<i>Infection</i>	87

<i>Genetics and Miscellaneous</i>	87
Antiplatelet Drugs for Primary and	
Secondary Prevention	89
<i>Review Articles and Meta-analyses</i>	89
<i>Studies</i>	90
Angiotensin-converting Enzyme Inhibition	
for Primary and Secondary Prevention.	92
2. Invasive Procedures and Revascularization	94
CHRISTOPHER P. CANNON AND BENJAMIN A. STEINBERG	
CORONARY ANGIOGRAPHY	94
Indications	94
Flow Grade	94
Stenosis Morphology	95
PERCUTANEOUS CORONARY INTERVENTION	95
Uses and Indications	95
Operator and Hospital Volume	96
Procedural Details	96
<i>Access</i>	96
<i>Contrast Agent</i>	97
<i>Lesion Evaluation</i>	97
<i>Balloon Angioplasty</i>	99
<i>Stenting</i>	100
Medications	100
<i>Aspirin</i>	100
<i>Heparin</i>	101
<i>Low-molecular-weight Heparin</i>	101
<i>Direct Thrombin Inhibitors</i>	101
<i>Thienopyridines/ADP Receptor Antagonists</i>	102
<i>Glycoprotein IIb/IIIa Inhibitors</i>	105
Applications of PCI	107
<i>Stable Angina</i>	107
<i>Unstable Angina/Non-ST Elevation Myocardial Infarction</i>	108
<i>Acute ST-Elevation Myocardial Infarction</i>	108
<i>After Thrombolytic Therapy</i>	108
<i>Stenting versus Percutaneous Transluminal</i>	
<i>Coronary Angioplasty: Major Trials</i>	108
<i>Direct Stenting versus Balloon Predilatation</i>	109
<i>Repeated Intervention</i>	109
Complications	110
<i>In Hospital</i>	110
<i>In Hospital and After Discharge</i>	111
Treatment and Prevention of Restenosis.	113
<i>Drug Studies</i>	113
<i>Radiation Therapy</i>	113
<i>Drug-eluting Stents</i>	114
<i>Directional Atherectomy</i>	117
<i>Rotational Atherectomy</i>	117
NEWER TECHNIQUES	118
Thrombectomy	118
Distal Protection	118
CORONARY ARTERY BYPASS SURGERY	119
Saphenous Vein Grafts	119

Internal Mammary Artery	119
Coronary Artery Bypass Surgery versus Medical Therapy	119
Coronary Artery Bypass Surgery versus Percutaneous Coronary Intervention	120
REFERENCES	122
Guidelines and Classification Articles	122
Relation of Operator and Hospital Volume to Outcomes	124
Technical Aspects	126
Contrast Agents	126
Lesion Evaluation (Fractional Flow Reserve, Intravascular Ultrasound)	128
Comparison of Revascularization with Medical Therapy	130
Stent Studies	132
<i>Stenting Compared with PTCA</i>	132
<i>Provisional Stenting</i>	134
<i>Direct Stenting</i>	136
Bare-metal Stent versus Stent Studies	136
Newer Devices/Techniques	137
<i>Cutting Balloon</i>	137
<i>Thrombectomy</i>	138
<i>Distal Protection</i>	140
Adjunctive Pharmacologic Therapy	141
<i>Aspirin</i>	141
<i>Heparin</i>	142
<i>Low-molecular-weight Heparin</i>	142
<i>Thienopyridines</i>	143
<i>Glycoprotein IIb/IIIa Inhibitors</i>	150
<i>Thrombin Inhibitors</i>	155
Directional Atherectomy Studies	156
Rotational Atherectomy Studies	158
Special Situations	159
<i>Chronic Total Occlusions</i>	159
<i>Saphenous Vein Graft Lesions</i>	160
<i>Small Vessels</i>	162
<i>Diabetes</i>	163
Complications	164
<i>Postintervention CK/CK-MB and Troponin Studies</i>	164
<i>Stent Thrombosis</i>	166
<i>Other</i>	167
Restenosis	169
<i>Review Articles and Miscellaneous</i>	169
<i>Repeated Percutaneous Coronary Intervention for Restenosis after Percutaneous Transluminal Coronary Angiography</i>	169
<i>Effect of Stent Design (Strut Thickness)</i>	171
<i>Drug Studies</i>	171
<i>Radiation</i>	176
<i>Drug-eluting Stents</i>	180
CABG Surgery	185
<i>Review Articles, Meta-analyses</i>	185
<i>Studies</i>	186

3. Unstable Angina/Non-ST Elevation MI	196
CHRISTOPHER P. CANNON AND BENJAMIN A. STEINBERG	
EPIDEMIOLOGY	196
PATHOPHYSIOLOGY	196
CLASSIFICATION	196
Unstable Angina	196
Non-ST Elevation Myocardial Infarction	198
CLINICAL AND LABORATORY FINDINGS	198
History and Symptoms	198
Electrocardiogram	198
Cardiac Enzymes	198
<i>Creatine Kinase and Creatine Kinase-MB</i>	198
<i>Troponins T and I</i>	199
<i>Myoglobin</i>	199
<i>Estimation of Early Risk at Presentation</i>	199
Treatment	200
<i>Aspirin</i>	200
<i>Thienopyridines/ADP Receptor Antagonists</i>	201
<i>Heparin</i>	201
<i>Low-molecular-weight Heparins</i>	202
<i>Direct Thrombin Inhibitors</i>	203
<i>Glycoprotein IIb/IIIa inhibitors</i>	206
<i>Thrombolytic Therapy</i>	206
<i>Anti-ischemic Medications</i>	206
<i>Invasive Strategy</i>	208
Noninvasive Evaluation	209
<i>Exercise Treadmill Test</i>	209
<i>Exercise Treadmill Testing with</i>	
<i>Nuclear Imaging</i>	210
<i>Pharmacologic Stress Testing with Imaging</i>	210
<i>Echocardiography</i>	210
<i>Coronary Computerized Tomography Angiography</i>	210
Prognosis	210
<i>Unstable Angina</i>	210
<i>Non-ST Elevation Myocardial Infarction</i>	210
<i>Prior Aspirin Use (Aspirin Failures)</i>	211
<i>Electrocardiography</i>	211
<i>Troponin Levels</i>	211
<i>C-reactive Protein</i>	211
<i>B-type Natriuretic Peptide</i>	211
REFERENCES	212
Review Articles and Pathophysiology	212
Drugs and Studies	213
<i>Aspirin</i>	213
<i>Thienopyridines</i>	214
<i>Unfractionated Heparin and Warfarin</i>	216
<i>Low-molecular-weight Heparins</i>	217
<i>β-Blockers, Calcium Antagonists, and Nitrates</i>	221
<i>Direct Thrombin Inhibitors</i>	222
<i>Glycoprotein IIb/IIIa Inhibitors</i>	224
<i>Thrombolytics</i>	229
Invasive versus Conservative Management	231

Miscellaneous	235
Prognosis and Assessment	235
<i>Clinical or General Analyses</i>	235
Biomarkers	239
<i>Review Articles and Multimarker Studies</i>	239
<i>Troponins</i>	239
<i>Inflammatory Markers</i>	241
<i>B-type Natriuretic Peptide</i>	242
<i>Specific Tests: Angiography, ECG, and Holter</i>	243
4. ST-Elevation Myocardial Infarction	244
CHRISTOPHER P. CANNON AND BENJAMIN A. STEINBERG	
EPIDEMIOLOGY	244
PATHOGENESIS	244
DIAGNOSIS	244
Pain	245
Electrocardiography	245
Echocardiography	245
Serum Markers	245
TREATMENT	246
Aspirin	246
Clopidogrel	246
β -Blockers	247
Angiotensin-converting	
Enzyme Inhibitors	248
Thrombolytic Therapy	249
<i>Indications for Thrombolysis</i>	250
<i>Contraindications</i>	251
<i>Common Agents</i>	251
<i>Prognostic Indicators</i>	253
Percutaneous Coronary Intervention	254
<i>Primary Angioplasty</i>	254
<i>Stenting</i>	258
Antithrombotic/Antiplatelet Agents	259
<i>Heparin</i>	259
<i>Enoxaparin</i>	259
<i>Fondaparinux</i>	259
<i>Direct Thrombin Inhibitors</i>	260
<i>Warfarin</i>	260
Intravenously Glycoprotein	
IIb/IIIa Inhibitors	261
Nitrates	263
Calcium-channel Blockers	263
Antiarrhythmics	263
Magnesium	264
Adenosine	264
Glucose-Insulin-Potassium	264
OTHER MODES OF TREATMENT	264
Analgesia	264
Diuretics	265
Vasopressors/Inotropes	265
Temporary Pacing	265

Insulin	265
Intra-aortic Balloon Pump	265
Emergency Coronary Artery Bypass Graft Surgery	265
SPECIAL CASE	265
Right Ventricular Infarction	265
<i>Diagnosis</i>	266
<i>Complications</i>	266
<i>Treatment</i>	266
COMPLICATIONS	266
Early	266
Intermediate	267
Late	268
PROGNOSIS AND RISK STRATIFICATION	
AFTER MYOCARDIAL INFARCTION	268
Uncomplicated Course	270
Complicated Course	271
Specific Tests	271
REFERENCES	271
General Review Articles and Guidelines	271
Diagnosis	272
<i>Chest Pain and Symptoms</i>	272
<i>Electrocardiography</i>	273
<i>Serum Markers</i>	273
<i>Emergency Department Evaluation</i>	275
Treatment	276
<i>General Meta-analysis</i>	276
Antithrombotic Agents	276
<i>Aspirin</i>	276
<i>Thienopyridines</i>	277
<i>Heparin</i>	278
<i>Low-molecular-weight Heparins</i>	278
<i>Fondaparinux</i>	281
<i>Direct Thrombin Inhibitors</i>	281
<i>Warfarin</i>	283
<i>Glycoprotein IIb/IIIa Inhibitors</i>	286
<i>Meta-analyses</i>	290
<i>β-Blockers</i>	292
<i>Thrombolytic Therapy</i>	296
<i>Percutaneous Coronary Intervention</i>	305
<i>Angiotensin-converting Enzyme Inhibitors</i>	
<i>with or without Nitrates</i>	321
<i>Nitrates</i>	325
<i>Calcium-channel Blockers</i>	326
<i>Magnesium</i>	328
<i>Antiarrhythmics</i>	328
<i>Intra-aortic Balloon Pump</i>	331
<i>Other Treatments</i>	333
Specific Cases	335
<i>Anterior Myocardial Infarction</i>	335
<i>Inferior Myocardial Infarction</i>	335
<i>Right Ventricular Infarction</i>	336
<i>Posterior Myocardial Infarction</i>	337
<i>Cocaine-associated Myocardial Infarction</i>	337

x CONTENTS

<i>Non-Q Wave/Non-ST Elevation</i>	
<i>Myocardial Infarction</i>	338
Assessment and Prognosis	338
<i>General Review Articles/Miscellaneous</i>	338
<i>Electrocardiography, Arrhythmias, and Conduction System</i>	339
<i>Exercise Testing</i>	341
<i>Echocardiography and Other Noninvasive Tests</i>	341
<i>Flow and Vessel Patency</i>	342
<i>Microvascular Perfusion</i>	344
<i>Other</i>	346
Complications of Myocardial Infarction	347
<i>Arrhythmias, Bundle Branch Block</i>	347
<i>Cardiac Rupture</i>	348
<i>Cardiogenic Shock and Congestive Heart Failure</i>	349
<i>Intracranial Hemorrhage in Thrombolysis</i>	349
<i>Reocclusion, Recurrent Ischemia, and Reinfarction</i>	350
<i>Left Ventricular Thrombi</i>	351
<i>Valvular Damage and Septal Defects</i>	352
5. Heart Failure	353
CHRISTOPHER P. CANNON, BENJAMIN A. STEINBERG, AND JUSTIN M. DUNN	
EPIDEMIOLOGY	353
HISTORY AND PHYSICAL EXAMINATION	355
ETIOLOGY	355
TESTS	356
TREATMENT	357
Acute	357
Long-term Therapies	358
<i>Angiotensin-converting Enzyme Inhibitors</i>	358
<i>Angiotensin II-Receptor Antagonists</i>	360
<i>Dual RAS Blockade (ACE/ARB)</i>	361
<i>Diuretics</i>	362
<i>Aldosterone Blockers</i>	362
<i>Digoxin</i>	363
<i>Vasodilators</i>	363
<i>Beta-blockers</i>	364
<i>Amiodarone</i>	365
<i>Some Failed Agents</i>	366
<i>Investigational Agents</i>	366
<i>Biventricular Pacing</i>	367
<i>Surgical Options</i>	367
<i>Miscellaneous</i>	369
COMPLICATIONS	370
<i>Sudden Cardiac Death</i>	370
<i>Atrial Fibrillation</i>	371
<i>Embolism</i>	371
REFERENCES	371
Guidelines, Miscellaneous	371
Epidemiology	373
Assessment and Prognosis	374
<i>Physical Examination</i>	374
<i>Etiology</i>	375

<i>Laboratory, Other</i>	375
<i>Noninvasive Testing</i>	378
Treatment	378
<i>Angiotensin-converting Enzyme Inhibitors</i> <i>and Angiotensin II Inhibitors</i>	378
<i>Diuretics</i>	383
<i>Digoxin</i>	384
<i>Vasodilator Studies</i>	385
<i>Beta-blockers</i>	388
<i>Amiodarone</i>	394
<i>Inotropic and Other Agents</i>	395
<i>Mechanical Assist Devices and Surgical Options</i>	397
<i>Invasive Therapy</i>	399
<i>Exercise/Training</i>	399
Complications	400

6. Arrhythmias 401

CHRISTOPHER P. CANNON, BENJAMIN A. STEINBERG, AND JONATHAN WALTER DUKES

ATRIAL ARRHYTHMIAS	401
Epidemiology	401
Natural History	401
Etiologies and Risk Factors	402
Stroke Risk Factors	402
Treatment	403
<i>Rate versus Rhythm Control</i>	403
<i>Pharmacologic Agents for Control of the Ventricular Rate</i>	404
<i>Pharmacologic Agents for the Acute Conversion</i> <i>of Atrial Fibrillation</i>	405
<i>Pharmacologic Agents for Long-term</i> <i>Maintenance of Sinus Rhythm</i>	409
<i>Catheter and Surgical Ablation</i>	411
<i>Electrical Cardioversion</i>	412
<i>Long-term Anticoagulation</i>	413
<i>Investigational Anticoagulants</i>	415
<i>Other Treatment Measures</i>	415
<i>Atrial Fibrillation Prevention After Cardiac Surgery</i>	416
VENTRICULAR ARRHYTHMIAS	416
Immediate Therapy: Automated External Defibrillators	416
Immediate Therapy: Intravenous Amiodarone	417
Secondary-prevention Trials: Drugs versus Implantable Cardioverter Defibrillators	417
Primary-prevention Trials: Antiarrhythmic Drugs	420
Primary-prevention Trials: Drugs versus Implantable Cardioverter Defibrillators	420
Primary-prevention Trials: Nonischemic Cardiomyopathy Patients	421
CARDIAC PACING STUDIES	422
Pacemaker Mode Selection Trials	422
Pacing for Vasovagal Syncope	422
Pacing for Prevention of Atrial Fibrillation	423
Resynchronization Therapy for Congestive Heart Failure	423

REFERENCES 424

 Atrial Fibrillation 424

 Epidemiology 425

 Rate versus Rhythm Control 426

 Antiarrhythmic Drug Trials for Atrial Fibrillation 427

 Catheter and Surgical Ablation 436

 Catheter Ablation 436

 Surgical Ablation 437

 Electrical Cardioversion and Percutaneous Cardioversion

 Anticoagulation 438

 Long-term Anticoagulation Studies 440

 Investigational Anticoagulants 444

 Atrial Fibrillation Prevention After Surgery 445

 Ventricular Arrhythmias 445

 Immediate Therapy: Automated External Defibrillators 445

 Immediate Therapy: Intravenous Amiodarone 446

 Secondary-prevention Trials: Drugs versus Implantable

 Cardioverter Defibrillators 447

 Primary-prevention Trials: Antiarrhythmic Drugs 448

 Primary-prevention Trials: Drugs versus Implantable

 Cardioverter Defibrillators 449

 Primary-prevention Trials: Nonischemic Cardiomyopathy Patients 452

 Cardiac Pacing Studies 453

 Guidelines 453

 Mode Selection Trials 453

 Pacing for Vasovagal Syncope 455

 Pacing for Prevention of Atrial Fibrillation 456

 Resynchronization Therapy for Congestive Heart Failure 457

Index 461

Preventive Cardiology: Risk Factors for Coronary Artery Disease and Primary and Secondary Prevention Trials

Christopher P. Cannon and Benjamin A. Steinberg

CHOLESTEROL, LIPIDS, AND DIET

Epidemiology

An estimated 107 million Americans have elevated total cholesterol (TC) levels, and based on the new National Cholesterol Education Program (NCEP) III guidelines, 37 million (one in five adults) are eligible for cholesterol-lowering therapy. A 10% decrease in TC is associated with an approximately 10% to 15% lower coronary heart disease (CHD) mortality rate and an approximately 20% decrease in the risk of myocardial infarction (MI). When TC levels are reduced by lifestyle modification (e.g., diet, exercise) and/or pharmacologic intervention, more benefit is derived in younger individuals, and the full benefits of a sustained decrease are not achieved for at least 5 years. Very low TC levels have been associated with higher mortality rates than those found with normal TC levels; however, this is likely owing to the higher prevalence of cancer in such individuals. Cardiac risk tables have been created to estimate the risk of CHD death at various cholesterol levels and in combination with other major CRFs. The NCEP III guidelines use modified Framingham risk score tables to estimate the 10-year CHD risk (see **Table 1.1**).

Low-density lipoprotein (LDL) has been shown in several studies, including the Framingham Heart Study, Multiple Risk Factor Intervention Trial (MRFIT), and Lipid Research Clinics (LRC) trial, to be a stronger predictor of CHD than TC. In fact, for every 30 mg/dL rise in LDL-C above 40 mg/dL, relative risk for coronary artery disease (CAD) increases by 30% (*Circulation* 2004;110:227). As a result, LDL levels are the primary focus of the NCEP III guidelines and their subsequent update. Of note, recent evidence suggests that C-reactive protein (CRP), a marker of inflammation, can provide additional prognostic information beyond that of LDL (see page 25).

High levels of high-density lipoproteins (HDLs) are associated with a decreased risk of CHD mortality; a 1% lower HDL-C is associated with a 2% to 3% higher CHD risk (17). The NCEP III guidelines now consider a low HDL level as less than 40 mg/dL (vs. less than 35 mg/dL in NCEP II) an indicator of

TABLE 1.1 Estimate of 10-Year Coronary Heart Disease Risk for Men and Women (Framingham Point Scores)

1. Age (yr)					
20–34: –9/–7					
35–39: –4/–3					
40–44: 0/0					
45–49: 3/3					
50–54: 6/6					
55–59: 8/8					
60–64: 10/10					
65–69: 11/12					
70–74: 12/14					
75–79: 13/16					
2. Total Cholesterol mg/dL	Age 20–39 yr	Age 40–49 yr	Age 50–59 yr	Age 60–69 yr	Age 70–79 yr
<160	0/0	0/0	0/0	0/0	0/0
160–199	4/4	3/3	2/2	1/1	0/1
200–239	7/8	5/6	3/4	1/2	0/1
240–279	9/11	6/8	4/5	2/3	1/2
≥280	11/13	8/10	5/7	3/4	1/2
3. Smoking Status	Age 20–39 yr	Age 40–49 yr	Age 50–59 yr	Age 60–69 yr	Age 70–79 yr
Nonsmoker	0/0	0/0	0/0	0/0	0/0
Smoker	8/9	5/7	3/4	1/2	1/1
4. HDL (mg/dL)					
>60: –1/–1					
50–59: 0/0					
40–49: 1/1					
<40: 2					
5. Systolic BP mm Hg	If Untreated	If Treated			
<120	0/0	0/0			
120–129	0/1	1/3			