

CHAPTER ONE: INTRODUCTION.....	1
STUDY GOALS AND OBJECTIVES.....	1
REASONS FOR STUDY.....	1
SCOPE OF STUDY.....	1
METHODOLOGY AND INFORMATION SOURCES.....	2
ANALYST CREDENTIALS.....	2
RELATED BCC REPORTS.....	3
BCC ON-LINE SERVICES.....	3
DISCLAIMER.....	3
 CHAPTER TWO: SUMMARY.....	 4
<i>SUMMARY TABLE TOTAL GLOBAL MARKET SIZE AND GROWTH FOR CORONARY STENT DEVICES BY REGION, THROUGH 2016 (\$ MILLIONS)</i>	 4
<i>SUMMARY FIGURE TOTAL GLOBAL MARKET SIZE AND GROWTH FOR CORONARY STENT DEVICES BY REGION, 2010–2016 (\$ MILLIONS)</i>	 5
SUMMARY (CONTINUED).....	6
 CHAPTER THREE: OVERVIEW.....	 7
CARDIOVASCULAR ANATOMY.....	7
HEART.....	7
CIRCULATORY SYSTEM.....	8
Cardiac Cycle.....	9
Ventricular Ejection.....	9
Isovolumic Relaxation.....	10
Atrial Events.....	10
Aortic and Pulmonary Events.....	10
Coronary Circulation.....	11
Anatomy of the Coronary Vessels.....	11
Regulation of Coronary Blood Flow.....	11
Cardiac Myocytes.....	12
Myocyte Structure.....	12
Molecular Basis of Contraction.....	12
Overview of Contraction.....	12
Role of Calcium in Muscle Contraction.....	13
Cardiac Energy Metabolism.....	13
Oxygen Utilization.....	13
Substrate Utilization.....	13
Cardiac Electrophysiology.....	14
Cardiac Resting Potential.....	14
Cardiac Action Potentials.....	14
Rhythmicity of Myocardial Cells.....	15
Specialized Conduction System of the Heart.....	15

Autonomic Regulation of Rhythmicity.....	16
Cardiac Output	16
Determinants of Heart Rate.....	16
Determinant of Stroke Volume.....	17
Cardiac Workload	17
CARDIAC DISEASES.....	17
Ischemic Heart Disease.....	17
Etiology.....	17
Mechanisms of Coronary Atherosclerosis	18
Pathophysiology of Ischemia	19
Clinical Features of Ischemia.....	20
Angina Pectoris	20
Acute Ischemia and Myocardial Infarction	21
Chronic Ischemic Cardiomyopathy	21
Sudden Cardiac Death.....	22
Endocardial and Valvular Disease	22
Disorders of the Mitral Valve.....	23
Disorders of the Aortic Valve	24
Rheumatic Heart Disease.....	24
Infective Endocarditis.....	24
Myocardial Diseases	25
Myocarditis.....	25
Cardiomyopathy.....	26
Pericardial Diseases	26
Pericardial Effusion	26
Pericarditis.....	26
Congestive Heart Failure	26
Congestive Heart Failure (Continued).....	27
Systolic Failure	28
Diastolic Failure.....	28
Cardiac Dysrhythmias.....	29
Sinus Tachycardia	29
Sinus Bradycardia	30
Sinus Arrhythmia	30
Asystole	30
Hypertension.....	30
Risk Factors	30
Age	30
Race.....	31
Obesity.....	31
Excess Sodium Intake.....	31
Signs and Symptoms.....	32
SURGICAL TREATMENT	32
DEMOGRAPHICS.....	33

<i>TABLE 1 TOTAL GLOBAL POPULATION BY SELECTED GEOGRAPHICAL REGION, 2000–2050 (MILLIONS/%)</i>	34
<i>FIGURE 1 TOTAL GLOBAL POPULATION BY SELECTED GEOGRAPHICAL REGION, 2000–2050 (MILLIONS)</i>	35
Cardiovascular Demographics	35
<i>TABLE 2 HEART DISEASE DEATHS BY COUNTRY</i>	36
<i>TABLE 2 (CONTINUED)</i>	37
COST CONCERNS	37
STENT DEVICES	38
STENT MATERIAL DESIGN	39
STENT FABRICATION	39
BARE-METAL STENTS	39
Bare-metal Stents (Continued)	40
<i>TABLE 3 BARE-METAL STENTS</i>	41
<i>TABLE 3 (CONTINUED)</i>	42
Increased Use of Bare-Metal Stents	42
DRUG-ELUTING STENTS	43
<i>TABLE 4 DRUG-ELUTING STENTS</i>	44
<i>TABLE 4 (CONTINUED)</i>	45
CORONARY STENT TECHNOLOGIES	46
Antibody-Coated	46
Diamond-Like Carbon	46
Platinum Enriched Stainless Steel.....	46
STENT RESEARCH AND DEVELOPMENT.....	46
STENT RESEARCH AND DEVELOPMENT (CONTINUED)	47
<i>TABLE 5 PIPELINE CORONARY STENT DEVICES AND TECHNOLOGY</i>	48
<i>TABLE 5 (CONTINUED)</i>	49
CHAPTER FOUR: GLOBAL MARKET SIZE AND GROWTH	50
<i>TABLE 6 TOTAL GLOBAL MARKET SIZE AND GROWTH BY REGION FOR CORONARY STENT DEVICES, THROUGH 2016 (\$ MILLIONS)</i>	51
<i>FIGURE 2 TOTAL GLOBAL MARKET SIZE AND GROWTH BY REGION FOR CORONARY STENT DEVICES, 2010–2016 (\$ MILLIONS)</i>	51
GROWTH BY GEOGRAPHIC REGION	52
<i>TABLE 7 TOTAL GLOBAL MARKET PERCENT FOR CORONARY STENT DEVICE REVENUES, BY REGION, 2011 (%)</i>	52
<i>FIGURE 3 TOTAL GLOBAL MARKET PERCENT FOR CHF REVENUES, BY REGION, 2011 (%)</i>	53
GROWTH BY DEVICE TYPE	53
<i>TABLE 8 GLOBAL MARKET SIZE OF CORONARY STENT MARKET REVENUE BY DEVICE TYPE AT MANUFACTURERS’ SALES LEVELS, THROUGH 2016 (\$ MILLIONS)</i>	54

<i>FIGURE 4 GLOBAL MARKET SIZE OF CORONARY STENT MARKET REVENUE BY DEVICE TYPE AT MANUFACTURERS' SALES LEVELS, 2010–2016 (\$ MILLIONS)</i>	54
<i>TABLE 9 PERCENT OF GLOBAL CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%)</i>	55
<i>FIGURE 5 GLOBAL CORONARY STENTS MARKET PERCENT BY DEVICE TYPE, 2011 (%)</i>	55
<i>TABLE 10 GLOBAL CORONARY STENT PERCENT, BY DEVICE TYPE, 2016 (%)</i>	56
<i>FIGURE 6 GLOBAL CORONARY STENT MARKET PERCENT BY DEVICE TYPE, 2016 (%)</i>	56
COMPETITIVE ANALYSIS.....	56
<i>TABLE 11 TOTAL GLOBAL CORONARY STENT DEVICE MARKET COMPETITIVE ANALYSIS, 2011 (\$ MILLIONS/%)</i>	57
<i>FIGURE 7 TOTAL GLOBAL CORONARY STENT DEVICE MARKET COMPETITIVE ANALYSIS, BY PERCENT, 2011 (%)</i>	57
<i>TABLE 12 TOTAL GLOBAL CORONARY STENT MANUFACTURER PRODUCT PARTICIPATION, BY DEVICE TYPE</i>	58
CHAPTER FIVE: THE AMERICAS MARKET.....	59
UNITED STATES.....	59
CANADA.....	59
CANADA (CONTINUED).....	60
CANADA (CONTINUED).....	61
CANADA (CONTINUED).....	62
LATIN AND SOUTH AMERICA.....	63
BRAZIL.....	64
MEXICO.....	65
VENEZUELA.....	66
ARGENTINA.....	66
PERU.....	67
CHILE.....	67
COLOMBIA.....	68
CUBA.....	68
THE AMERICAS ELDERLY POPULATION DEMOGRAPHICS.....	69
UNITED STATES.....	69
<i>TABLE 13 UNITED STATES' ELDERLY POPULATION BY AGE GROUP 2000–2050</i>	69
CANADA.....	70
<i>TABLE 14 CANADA'S ELDERLY POPULATION BY AGE GROUP, 2000–2050</i>	70
LATIN AND SOUTH AMERICA.....	70
Brazil.....	70
<i>TABLE 15 BRAZIL'S ELDERLY POPULATION BY AGE GROUP 2000–2050</i>	71

Mexico	71
<i>TABLE 16 MEXICO'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	72
Venezuela	72
<i>TABLE 17 VENEZUELA'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	72
Argentina	73
<i>TABLE 18 ARGENTINA'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	73
Peru	73
<i>TABLE 19 PERU'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	74
Chile	74
<i>TABLE 20 CHILE'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	74
Colombia	75
<i>TABLE 21 COLOMBIA'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	75
Cuba	75
<i>TABLE 22 CUBA'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	76
THE AMERICAS MARKET SIZE AND GROWTH OF THE CORONARY STENT MARKET	76
<i>TABLE 23 TOTAL AMERICAS REGION MARKET SIZE OF CORONARY STENT DEVICES BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS).....</i>	<i>77</i>
<i>FIGURE 8 TOTAL AMERICAS MARKET FOR CORONARY STENT DEVICES BY GEOGRAPHIC REGION, 2011 AND 2016 (\$ MILLIONS).....</i>	<i>77</i>
<i>TABLE 24 TOTAL AMERICAS MARKET SIZE OF CORONARY STENT MARKET BY DEVICE TYPE, 2010–2016 (\$ MILLIONS)</i>	<i>78</i>
<i>TABLE 25 TOTAL AMERICAS CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%).....</i>	<i>78</i>
<i>FIGURE 9 TOTAL AMERICAS CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%).....</i>	<i>79</i>
<i>TABLE 26 TOTAL AMERICAS CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%).....</i>	<i>79</i>
<i>FIGURE 10 TOTAL AMERICAS CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%).....</i>	<i>80</i>
<i>TABLE 27 U.S. CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....</i>	<i>81</i>
<i>TABLE 28 CANADA'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....</i>	<i>81</i>

<i>TABLE 29 LATIN AND SOUTH AMERICA'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	82
CHAPTER SIX: THE EUROPEAN MARKET	83
THE EUROPEAN MARKET	83
FRANCE	84
FRANCE (CONTINUED)	85
GERMANY	86
GERMANY (CONTINUED).....	87
ITALY	88
ITALY (CONTINUED).....	89
SPAIN.....	90
UNITED KINGDOM.....	91
UNITED KINGDOM (CONTINUED)	92
EUROPEAN ELDERLY POPULATION DEMOGRAPHICS	93
FRANCE	93
<i>TABLE 30 FRANCE'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	94
GERMANY	94
<i>TABLE 31 GERMANY'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	94
ITALY	95
<i>TABLE 32 ITALY'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	95
SPAIN	95
<i>TABLE 33 SPAIN'S ELDERLY POPULATION BY AGE GROUP</i>	
2000–2050	96
UNITED KINGDOM.....	96
<i>TABLE 34 UNITED KINGDOM BY OLDER POPULATION BY AGE GROUP, 2000–2050</i>	96
EUROPE MARKET SIZE AND GROWTH FOR THE CORONARY STENT DEVICE MARKET.....	97
<i>TABLE 35 TOTAL EUROPEAN MARKET FOR CORONARY STENT DEVICES BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS)</i>	98
<i>FIGURE 11 TOTAL EUROPEAN MARKET FOR CORONARY STENT DEVICES BY GEOGRAPHIC REGION, 2011 AND 2016 (\$ MILLIONS)</i>	98
<i>TABLE 36 TOTAL EUROPEAN MARKET FOR CORONARY STENTS BY DEVICE, 2010–2016 (\$ MILLIONS)</i>	99
<i>TABLE 37 TOTAL EUROPEAN CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%)</i>	99
<i>FIGURE 12 TOTAL EUROPEAN CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%)</i>	100

TABLE 38 TOTAL EUROPEAN CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%).....	100
FIGURE 13 TOTAL EUROPEAN CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%).....	101
TABLE 39 FRANCE'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	101
TABLE 40 GERMANY'S CORONARY STENT MARKET, BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	102
TABLE 41 ITALY'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	102
TABLE 42 SPAIN'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	103
TABLE 43 UNITED KINGDOM'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	103
CHAPTER SEVEN: THE ASIAN MARKET	104
THE ASIAN MARKET	104
ASIAN ELDERLY POPULATION DEMOGRAPHICS	105
JAPAN	105
TABLE 44 JAPAN'S ELDERLY POPULATION BY AGE GROUP 2000-2050	106
CHINA	106
TABLE 45 CHINA'S ELDERLY POPULATION BY AGE GROUP 2000-2050	106
THE ASIAN MARKET	107
JAPAN	107
Japan (Continued).....	108
CHINA	109
ASIAN MARKET SIZE AND GROWTH FOR THE CORONARY STENT DEVICE MARKET.....	110
TABLE 46 TOTAL ASIAN CORONARY STENT MARKET BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS).....	111
FIGURE 14 TOTAL ASIAN CORONARY STENT MARKET, BY GEOGRAPHIC REGION, 2011 AND 2016 (\$ MILLIONS).....	111
TABLE 47 TOTAL ASIAN MARKET CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	112
TABLE 48 TOTAL ASIAN CORONARY STENT MARKET BY DEVICE TYPE, 2011 AND 2016 (%).....	112
FIGURE 15 TOTAL ASIAN CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%).....	113
FIGURE 16 TOTAL ASIAN CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%).....	113
TABLE 49 JAPAN'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS).....	114

<i>TABLE 50 CHINA'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	114
CHAPTER EIGHT: EMERGING MARKETS/REST OF WORLD MARKETS.....	115
REST OF WORLD ELDERLY POPULATION DEMOGRAPHICS.....	115
AUSTRALIA.....	115
<i>TABLE 51 AUSTRALIA'S ELDERLY POPULATION BY AGE GROUP 2000-2050</i>	115
INDIA	116
<i>TABLE 52 INDIA'S ELDERLY POPULATION BY AGE GROUP 2000-2050</i>	116
ISRAEL.....	116
<i>TABLE 53 ISRAEL'S ELDERLY POPULATION BY AGE GROUP 2000-2050</i>	117
RUSSIA AND OTHERS.....	117
<i>TABLE 54 RUSSIA'S ELDERLY POPULATION BY AGE GROUP 2000-2050</i>	117
REST OF WORLD MARKET	118
AUSTRALIA.....	118
INDIA	119
India (Continued).....	120
ISRAEL/MIDDLE EAST.....	121
RUSSIA.....	122
REST-OF-WORLD MARKET SIZE AND GROWTH FOR THE CORONARY STENT DEVICES MARKET	122
<i>TABLE 55 TOTAL REST-OF-WORLD MARKET FOR CORONARY STENT DEVICES BY GEOGRAPHIC REGION, THROUGH 2016 (\$ MILLIONS)</i>	123
<i>FIGURE 17 TOTAL REST-OF-WORLD MARKET FOR CORONARY STENT DEVICES BY GEOGRAPHIC REGION, 2010-2016 (\$ MILLIONS)</i>	124
<i>TABLE 56 TOTAL REST OF WORLD MARKET FOR CORONARY STENT DEVICES BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	124
<i>TABLE 57 TOTAL REST OF WORLD CORONARY STENT MARKET BY DEVICE TYPE, 2011 AND 2016 (%)</i>	125
<i>FIGURE 18 TOTAL REST OF WORLD CORONARY STENT MARKET BY DEVICE TYPE, 2011 (%)</i>	125
<i>FIGURE 19 TOTAL REST OF WORLD CORONARY STENT MARKET BY DEVICE TYPE, 2016 (%)</i>	126
<i>TABLE 58 AUSTRALIA'S CORONARY STENT MARKET, BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	126
<i>TABLE 59 INDIA'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	127
<i>TABLE 60 ISRAEL/MIDDLE EAST'S CORONARY STENT MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)</i>	127

*TABLE 61 RUSSIA AND OTHER REGIONAL CORONARY STENT
MARKET BY DEVICE TYPE, THROUGH 2016 (\$ MILLIONS)..... 127*

CHAPTER NINE: COMPANY PROFILES	128
AACHEN RESONANCE GMBH.....	128
ABBOTT VASCULAR DEVICES	129
AMG INTERNATIONAL GMBH	130
ARTERIUS.....	131
BALTON LTD	131
B. BRAUN MELSUNGEN AG	132
BIOSENSORS INTERVENTIONAL TECHNOLOGIES PTE. LTD.	133
BIOTRONIK.....	134
BLUE MEDICAL	135
BOSTON SCIENTIFIC.....	136
CAPPELLA MEDICAL DEVICES LTD.	137
CELONOVA BIOSCIENCES	138
COOK MEDICAL, INC.....	139
CORDIS CORPORATION	139
CORDIS CORPORATION (CONTINUED).....	140
DISA VASCULAR.....	141
ELIXIR MEDICAL.....	141
INVATEC S.P.A.	142
KYOTO MEDICAL DESIGNS COMPANY	142
LEPU MEDICAL TECHNOLOGY CO, LTD	143
MEDTRONIC INC	144
OPTO CIRCUITS LTD	145
ORBUSNEICH.....	145
SAHAJANAND MEDICAL TECHNOLOGIES	146
STENTYS SA	147
APPENDIX.....	148
AACHEN RESONANCE GMBH.....	148
ABBOTT VASCULAR.....	148
AMG INTERNATIONAL GMBH	148
ARTERIUS.....	148
AVANTEC VASCULAR.....	148
B. BRAUN MELSUNGEN AG	149
BALTON.....	149
BIOSENSORS INTERVENTIONAL TECHNOLOGIES PTE. LTD.	149
BIOTRONIK SE & CO. KG	149
BLUE MEDICAL	149
BOSTON SCIENTIFIC.....	150
CAPELLA MEDICAL DEVICES LTD.	150
CELONOVA BIOSCIENCE	150
CID VASCULAR.....	150

COOK MEDICAL.....	150
CORDIS CORP.....	150
DISA VASCULAR.....	151
ELIXIR MEDICAL.....	151
EUCATECH AG.....	151
EUROCOR GMBH.....	151
GOODMAN CO. LTD.....	151
HEXACATH.....	152
ICON INTERNATIONAL INC.....	152
INSPIRE MD.....	152
INVATEC S.P.A.....	152
ITGI MEDICAL.....	152
KYOTO MEDICAL DESIGN CO.....	153
LANCER MEDICAL TECHNOLOGIES PVT.....	153
LEPU MEDICAL.....	153
MEDINOL.....	153
MEDTRONIC.....	153
MICELL TECHNOLOGIES.....	154
MICROPORT MEDICAL CO. LTD.....	154
MINVASYS.....	154
NEXEON MEDICAL SYSTEMS INC.....	154
ORBUSNEICH.....	154
OPTOCIRCUITS LTD.....	155
PALMAZ SCIENTIFIC.....	155
RELISYS MEDICAL DEVICES LTD.....	155
REVA MEDICAL INC.....	155
SAHANJANAND MEDICAL TECHNOLOGIES.....	155
STENTYS SA.....	156
TERUMO MEDICAL CORP.....	156
TRANSLUMINA GMBH.....	156
TRIEMI MEDICAL.....	156
TRYTON MEDICAL.....	156
VASCULAR CONCEPTS.....	156
XTENT INC.....	157