Clinical Manual of Total Cardiovascular Risk

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Preface

Over the last 10–20 years, there has been an increasing appreciation of the need to manage individual risk factors for cardiovascular disease (CVD) in the context of overall cv risk rather than on the basis of the absolute level of any given risk factor.

This approach has given rise to the misnomer "global risk" and generated extensive "lip-service" around this more broad-minded approach to managing risk factors and the prevention of CVD.

This short book was devised with the idea of providing a practical summary of the rationale for management based on estimated total CV risk and the various methods associated with so-doing.

Practical issues are addressed including treatment thresholds and targets for the major risk factors on which we routinely intervene, and a brief description of the major means of these interventions is provided.

Whilst a multifactorial approach to CV prevention is logical and reflects the pathophysiological processes which underpin the formation of atherosclerosis, the evidence base to guide practice using estimated CV risk ("global risk") as a threshold for intervention is essentially non-existent.

Meanwhile, pending supportive evidence from randomized trials, practical, pragmatic, and cost-effective approaches to preventing CVD, which is the current biggest contributor to global mortality and burden of disease, is urgently required.

The hope is that this book may make a small contribution toward reducing the horrendous burden which CVD currently imposes on the world.

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Author Biography

Neil R. Poulter, MBBS, MSc, FRCP, is Professor of Preventive Cardiovascular Medicine and Co-Director of the International Centre for Circulatory Health, Imperial College, London, UK. He was President of the British Hypertension Society (BHS) from 2003 to 2005, and was co-author of the 1998 and 2005 Joint British Recommendations on the Prevention of CHD and CVD; the 2003 World Health Organisation/International Society of Hypertension Statement on Management of Hypertension; the 2003 European Society of Hypertension–European Society of Cardiology guidelines for the management of arterial hypertension; and the 2004 BHS guidelines for management of hypertension. He was Director of Operations of the UK half of the ASCOT Trial, and regional Principal Investigator of the North European region of the ADVANCE study. Other Current research interests include the optimal investigation and management of essential hypertension and dyslipidemia, the association between birth weight and hypertension, the cardiovascular effects of exogenous estrogen and progesterone, and ethnic differences in cardiovascular disease and the prevention of type 2 diabetes.

Abbreviations

ABCD-HT	Appropriate Blood Pressure Control in Diabetes hypertensive cohort
ABCD-NT	Appropriate Blood Pressure Control in Diabetes normotensive cohort
ACCOMPLISH	
ACCORD	Action to Control Cardiovascular Risk in Diabetes
ACE	angiotensin-converting enzyme
ADVANCE	Action in Diabetes and Vascular disease: preterAx and diamicroN modified release Controlled Evaluation
ALLHAT	Antihypertensive and Lipid-Lowering treatment to prevent Heart Attack Trial
AMI	acute myocardial infarction
ApoA	apolipoprotein A
ApoB	apolipoprotein B
ARB	angiotensin receptor blocker
ASCOT	Anglo-Scandinavian Cardiac Outcomes Trial
ASCOT-BPLA	Anglo-Scandinavian Cardiac Outcomes Trial–Blood Pressure-Lowering Arm
ASCOT-LLA	Anglo-Scandinavian Cardiac Outcomes Trial–Lipid-Lowering Arm
ATP	Adult Treatment Panel
BHS	British Hypertension Society
BMI	body mass index
BP	blood pressure
BPLTT	Blood Pressure Lowering Treatment Trialists
CARDS	Collaborative AtoRvastatin Diabetes Study
CARE	Cholesterol And Recurrent Events
CCB	calcium-channel blocker
CHD	coronary heart disease
CTT	Cholesterol Treatment Trialists
CV	cardiovascular
CVD	cardiovascular disease
DASH	Dietary Approaches to Stop Hypertension
DBP	diastolic blood pressure
DCCT	Diabetes Control and Complications Trial
DHA	docosahexenoic acid
DIGAMI	Diabetes and Insulin-Glucose infusion in Acute Myocardial Infarction
ECG	electrocardiogram
EPA	eicosapentenoic acid

ESH–ESC	European Society of Hypertension–European Society of Cardiology
EUROPA	EURopean trial On reduction of cardiac events with Perindopril in stable coronary Artery disease
FCH	familial combined hyperlipidemia
FH	familial hypercholesterolemia
GREACE	GREek Atorvastatin and Coronary-heart-disease Evaluation
HbA1c	hemoglobin A1c
HDL	high-density lipoprotein
HMG-CoA	3-Hydroxy-3-methylglutaryl coenzyme A
HOPE	Heart Outcomes Prevention Evaluation
HOT	Hypertension Optimal Treatment
HPS	Heart Protection Study
IDEAL	Incremental Decrease in End points through Aggressive Lipid Lowering
IHD	Ischoemic heart disease
ITT	intention-to-treat
JBS	Joint British Societies
JNC	Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure
LDL	low-density lipoprotein
LIPID	Long-term Intervention with Pravastatin in Ischemic Disease
LVH	left ventricular hypertrophy
MI	myocardial infarction
MIRACL	Myocardial Ischemia Reduction with Aggressive Cholesterol Lowering
MRFIT	Multiple Risk Factor Intervention Trial
NCEP	National Cholesterol Education Program
NICE	National Institute for Health and Clinical Excellence
NNT	numbers-needed-to-treat
PAR	population attributable risk
PROGRESS	Perindopril pROtection aGainst REcurrent Stroke Study
PROVE-IT	PRavastatin Or atorVastatin Evaluation and Infection Trial
REVERSAL	Reversing Atherosclerosis with Aggressive Lipid Lowering
RCT	randomized controlled trial
SBP	systolic blood pressure
SCORE	Systematic COronary Risk Evaluation
SEARCH	Study of the Effectiveness of Additional Reductions in Cholesterol and Homocysteine
SFA	saturated fatty acid
SHEP	Systolic Hypertension in the Elderly Program
TC	Total Cholestrol
TNT	Treating to New Targets
UKPDS	UK Prospective Diabetes Study
WHO–ISH	World Health Organisation–International Society of Hypertension

Chapter 1

Principles of Total Risk Management

Why Assess Total Risk?

Cardiovascular disease (CVD) is a major cause of morbidity and mortality in Western industrialized countries. In the UK, for example, CVD accounted for about 37% of all deaths in 2004. The management of non-fatal stroke and heart attack consumes a major proportion of current healthcare budgets and has a huge detrimental impact on quality of life for both patients and their relatives.

Epidemiological studies indicate that many factors impact on the likelihood of an individual suffering a cardiovascular (CV) event including age, smoking, elevated blood pressure (BP), and cholesterol. The multifactorial nature of CVD and the interactions between risk factors mean that it is difficult for clinicians to make an intuitive assessment of an individual's future risk of disease. This has led to the production of a number of guidelines on the prevention of CVD, all of which recommend risk assessment tools to guide primary prevention strategies.

Individual Risk Factors

The etiology of coronary heart disease (CHD) and stroke has been known for decades to be multifactorial. An increasing risk of both CHD and stroke has been shown to have a graded continuous relationship with rising BP and total cholesterol across the whole BP and cholesterol ranges. Furthermore, among the hypertensive population, for example, the coexistence of other risk factors such as age, smoking, and cholesterol has been shown to result in a dramatic increase in risk associated with any BP stratum. Similarly, among dyslipidemic or diabetic populations, other risk factors have a critical impact on the absolute levels of CV risk for any level of cholesterol or blood glucose.

Significantly, these risk factors tend to cluster in individuals such that, for example, the majority of people with hypertension have at least two other risk factors, and these risk factors are often more common in those with hypertension than in people with a normal BP (see Table 1.1). This clustering

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