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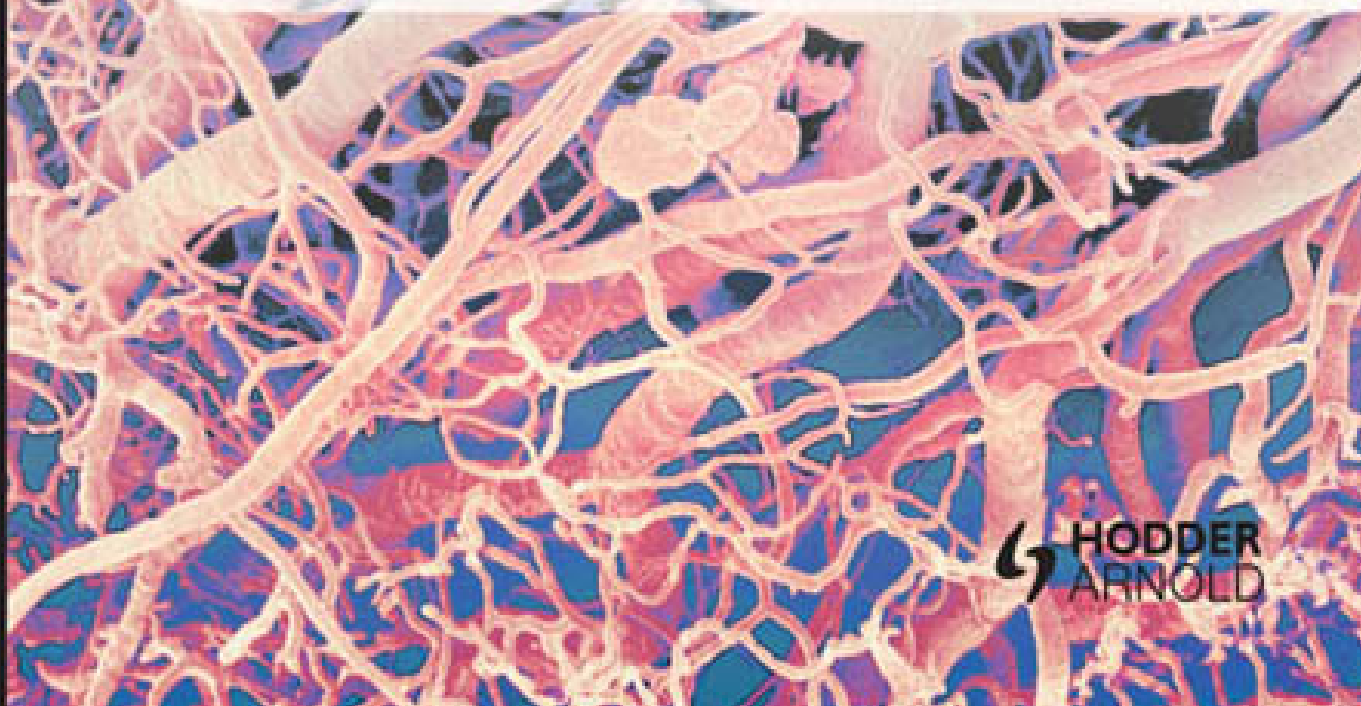
McDonald's Blood Flow in Arteries

THEORETICAL, EXPERIMENTAL AND CLINICAL PRINCIPLES

SIXTH EDITION

Wilmer W Nichols
Michael F O'Rourke
Charalambos Vlachopoulos



HODDER ARNOLD

McDonald's Blood Flow in Arteries

McDonald's Blood Flow in Arteries Theoretical, Experimental and Clinical Principles

Sixth edition

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To the memory of friends and colleagues

Donald A McDonald
(Born June 3, 1917; died in Birmingham, AL May 24, 1973)

John R Womersley
(Born June 20, 1907; died in Columbus, OH March 7, 1958)

Michael G Taylor
(Born December 30; 1926; died in Sydney, AU January 10, 2006)

William R Milnor
(Born May 4, 1920; died in Baltimore, MD January 3, 2008)

Raymond P Kelly
(Born December 5, 1956; died in Sydney, AU October 5, 2000)

As an animal Body consists not only of a wonderful texture of solid Parts, but also of large proportion of Fluids, which are continually circulating and flowing, thro' an inimitable Embroidery of Blood-Vessels, and other inconceivably minute Canals: and as the healthy State of an Animal principally consists, in the maintaining of a due *Equilibrium* between those Solids and Fluids; it has ever since the important Discovery of the Circulation of the Blood, been looked upon as a Matter well worth enquiring into, to find the Force and Velocity with which these Fluids are impelled; as a likely means to give a considerable Insight into Animal Oeconomy.

S. Hales

…when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of Science whatever the matter may be.

Kelvin

Science like life feeds on its own decay. New facts burn old rules; then newly developed concepts bind old and new together into a reconciling law.

William James

Die Methode ist Alles

Carl Ludwig

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Foreword by Michael Taylor

It is very pleasant to be invited to provide a few words of introduction to the fifth edition of McDonald's "Blood Flow in Arteries", for it takes me back fifty years, to the first time I met Donald McDonald and John Womersley in January 1955 at St. Bartholomew's hospital in London. Womersley was an applied mathematician at the National Physical Laboratory, and his daughter was a medical student at Barts. She had told him about McDonald's studies on pulsatile arterial blood flow and he became intrigued. By 1955 he and McDonald had been working together very fruitfully for some time, but no one then would have predicted how far their work would lead. This book first appeared in 1960, and now is going into its fifth edition. Over time its character has evolved, with gradually increasing clinical emphasis, but essentially it remains a tribute to the imagination and foresight of Donald McDonald.

Michael Taylor
Sydney 2004

Foreword by David A. Kass and Myron L. Weisfeldt

With each heart beat, both ventricles eject blood into their respective vascular systems – but do so for only a fraction of the time. The rest of the cycle is allocated to muscle relaxation and refilling of the chambers so the process can start all over again. This fact belies a profound yet often ignored feature of the circulation, namely that, that it is pulsatile. The cyclical nature of flow exiting each ventricle results in pulse pressures that both define the mechanical forces experienced by vascular tissues, and the loads imposed on each ventricle. This hemodynamic behavior is conserved across mammalian species – indeed, the pulse and mean pressure at the base of the brain is remarkably similar between mouse, dog, human, or even giraffe, whose heart has to work a bit extra to provide it. Perhaps not surprisingly, organ physiology has developed to take full advantage of the pulsatile nature of flow and pressure, with vascular signaling that is particularly responsive to vessel stretch and phasic shear stress, and distributed compliances that buffer the pulse as required. As is now well recognized, loss of such buffering capacity and attendant augmentation of the pulse pressure is common in older individuals. Rather than being a 'normal' feature of aging, this change is associated with substantial morbidity and mortality. For all the sophisticated molecular biology being applied to identify risks for cardiovascular disease, the simple difference between systolic and diastolic blood pressure is an amazingly potent predictor. Yet for most physicians in medical practice, including those who specialize in cardiovascular disease, we primarily measure and treat means – pressure, flow, resistance – rather than the properties that result in greater pulsatility. While any first-year medical student can define pulse pressure, the properties that give rise to it are traditionally more difficult to measure and can require sophisticated mathematics. As our ability to selectively target arterial properties that lead to excessive pulsatility remain limited, one might reasonably ask, why bother trying?

The answer to this last question and to the many others regarding large artery properties and the pulsatile nature of blood flow are to be found in the newly revised sixth edition of the unparalleled volume, *McDonald's Blood Flow in Arteries*. The authors, all seminal leaders in this field, have updated prior chapters and added several new ones to enhance the discussion in several critical areas. As before, the book provides a lucid and comprehensive presentation of the history of blood flow and pressure measurements, and the physics and mathematics required to assess pulsatile loading – a.k.a. impedance. They describe newer methodologies that have translated what was once a complex and rather arcane research tool into something more accessible and easily measured in outpatient clinics. In a new chapter on central arterial pressure, methods for its estimation from non-invasively recorded data are explained, and importantly, evidence that such estimation provides better assessment of cardiovascular risk and the benefits of pharmacologic therapy are discussed. Other chapters deal with the impact of pulsatile loading on the heart, blood vessel signaling and biology, and how the normally distensible arterial system in both systemic and pulmonary circulations modulates this pulsatility. There are a number of chapters exploring how vascular pulsatility becomes modified by aging and by disease. A new chapter highlights the impact of common environmental and lifestyle factors as well. Other updated chapters highlight the physiology and pathophysiology of pulmonary and coronary vascular circuits, and in a chapter, this analysis is now extended to cerebral and renal circulations.

The new edition provides an excellent reference for those already engaged in the field, and for those embarking anew as researchers, students, and clinicians. The measurement and understanding of pulsatile circulatory dynamics and its implications to the body are important for clarifying the pathophysiology of many organ diseases, and central for charting the course for better and more appropriate therapies to treat them. This continues to be particularly true in the elderly, a population in which pulsatile features of the circulation are often prominent. The volume is readable, comprehensive, authoritative and remarkably revealing to the casual and expert reader. The subject has always been important, and volumes like this bring to light just why, and will hopefully stimulate new research and disease therapies based upon these insights.

David A. Kass and Myron L. Weisfeldt
Johns Hopkins Medical Institutions
Baltimore, MD, April 25, 2011

Preface

The first edition of *Blood Flow in Arteries* appeared in 1960 as a monograph for the British Physiological Society and introduced a new approach to the study of arterial hemodynamics. It was the product of six years' collaboration between an inventive physiologist, Donald McDonald, a talented applied mathematician, John Womersley, and a young medical graduate, Michael Taylor, at St Bartholomew's Hospital in London – the site of William Harvey's revolutionary work just over 300 years before.

As befits arterial pressure and flow, the first edition concentrated on pulsatile phenomena, and brought to its analysis techniques that were established in engineering science, but had hitherto not been applied comprehensively to a biological system. The major advance was to consider the arterial system as in a 'steady state' of oscillation so that waveforms could be analyzed in the frequency domain – as a series of integral harmonics – and whose relationship with other pulsations could also be considered in the frequency domain. The approach broke completely with the traditional approach of analyzing arterial pulses in the time domain – as a fluctuation over a cardiac cycle between systolic and diastolic values, with peak and nadir of the pressure pulse (systolic and diastolic pressure) considered to have particular physiological and clinical significance.

The new approach considered any pulse waveform as having a mean value, and a fluctuation around this mean, and with the fluctuations capable of being expressed as a series of harmonic components. This new approach stepped further by considering pressure/flow relationships to be near linear, so that the relationships between individual harmonic components of other pulses (of flow at the same site as pressure, or of pressure at another site) could be expressed as a function of frequency. This approach had the advantage of separating pulsatile from steady flow phenomenon and was entirely consistent with the method used then (and now) of relating mean pressure to mean flow for calculation of peripheral resistance. But the new approach, championed by McDonald in his 1960 monograph, was that the arterial system could be considered as a linear system – that any harmonic component of a pressure wave could be related to the same harmonic of another pressure or flow wave recorded at the same time, and to no other harmonic. This was revolutionary (even though linearity was assumed in calculation of resistance from mean pressure and flow). It was, however, soundly based on Womersley's classic mathematical studies on the equations of motion as these applied to blood flow in arteries. Womersley had shown that the non-linear terms were indeed sufficiently small (in relation to measuring errors) that they could be neglected to a first approximation.

The 1960 monograph ran entirely counter to the prevailing approaches to arterial physiology, particularly as practiced in the United States, but was sufficiently appealing for both Womersley and McDonald to be later attracted to institutions in the USA, and Taylor back to Australia. John Womersley died in Columbus, Ohio as the original monograph was being completed.

Donald McDonald wrote the second edition of *Blood Flow in Arteries* while Professor of Physiology at the University of Alabama in Birmingham. He died when the book was in galley proof stage. The book was completed by his US colleagues Bill Milnor (of Johns Hopkins) and Wilmer Nichols (of the University of Florida). This edition extended the earlier work and introduced some clinical applications.

The third to fifth editions of *Blood Flow in Arteries* were written together by Wilmer Nichols (a pupil of Donald McDonald) and Michael O'Rourke (a pupil of Michael Taylor). At a time when arterial disease was exploding as a clinical problem in developed and developing countries, the book came more and more to consider clinical implications of the original hemodynamic discoveries and to show that the same principles could be expanded and applied to clinical practice – both with regard to the arteries that are affected by disease, and the organs, especially the heart, that are secondarily affected by changes in pressure and flow fluctuations. The authors, both protégés of McDonald, were anxious to retain the attractive features of the original 1960 monograph – emphasis on mechanisms with strong scientific base, embrace of new technology, a focus on practical applications, a comprehensive coordinated style, a disrespect of cant, and a challenge to established authority.

In this sixth edition, we attempt to endorse the same approach to problems of blood flow in arteries as we see them today. The main problems are in the clinical arena and relate to pressure as much as to flow, and to the heart, which generates pulsatile pressure and flow, as well as all organs which require flow so as to live and function normally. Our emphasis remains on arterial pulsations resulting from ventricular ejection, not on the steady component of flow and pressure, and on mechanisms, i.e. on theoretical principles, physiological principles, and clinical principles. This book cannot be a text on arterial disease. It is intended to help those dealing with arterial function, aging, and disease, when they wish to understand underlying principles.

'Principles' and 'reasons' underlie all good practice. 'Evidence' follows. Emphasis on principles may explain why earlier editions of this book have been so popular and so successful in anticipating future developments in clinical practice. As with the first edition, this sixth edition will prove contentious, since it provides a challenge to clinicians and epidemiologists who have seen just one way to measure arterial pressure and cardiac load with the cuff sphygmomanometer. If it succeeds, it will have continued the same approach and traditions, not only of the first edition of 'McDonald', but of Harvey's treatise as well.

This sixth edition appears 50 years after the first. As befits a mature publication which has introduced a new approach to clinical issues related to aging and disease, it is appropriate that the new steps be summarized in the Introduction, then expanded in the text that follows. Scientific advances carry little benefit unless they can be applied. Application requires simplification and approximation. This was done by Einthoven with the electrocardiogram (ECG), by analysis on the basis of an equilateral triangle in the frontal plane of the body. In this sixth edition, which may complete the stewardship of *Blood Flow in Arteries* by the first two authors, we expand McDonald's concept of linearity into 'Fifteen Commandments' (or general principles) which may guide further advance in the clinical arena. These are summarized in Chapter 1.

We cannot adequately thank those we should in extending the work of illustrious pioneers. We have encountered the same frustrations and setbacks as have they, yet have received generous support from colleagues around the world. We are especially grateful to Arnold Hoeks and Robert Reneman from the Cardiovascular Research Institute, Maastricht, The Netherlands for their assistance with Chapter 5 (Endothelial function) and their contribution of Chapter 8 (Ultrasound). Our younger colleagues are extending this work and have our admiration and respect, particularly Ray Kelly, whose premature death robbed this field and this book of a worthy heir. Above all we thank our dear wives, Arlene, Margaret, and Antonia, who have contributed more than anyone could know.

Wilmer W Nichols
Michael F O'Rourke
Charalambos Vlachopoulos

List of Abbreviations

AASI	arterial stiffness index
ABI	ankle–brachial index
AC	alternating current
ACCT	Anglo-Cardiff Collaborative Trial
ACE	angiotensin-converting enzyme
ACEI	angiotensin-converting enzyme inhibitor
ACEI	angiotensin-converting enzyme inhibitors
ACEI	angiotensin-converting enzymes inhibitors
ACh	acetylcholine
AGE	advanced glycation end product
AGE	advanced glycosylation end-products
AHA	American Heart Association
AIx	augmentation index
ARB	angiotensin receptor blocker
ARB	angiotensin receptor blockers
ARB	angiotensin receptor type 1 blocker
ARIC	Atherosclerosis Risk in Communities
ASCOT	Anglo-Scandinavian Cardiac Outcomes Trial
BA	brachial artery
BHS	Bogalusa Heart Study
BLSA	Baltimore Longitudinal Study of Aging
BP	blood pressure
CAC	coronary artery calcium
CAD	coronary artery disease
CAFE	Conduit Artery Function Evaluation
CC	compliance coefficient
CCA	common carotid artery
CCB	calcium channel blocker
CCB	calcium channel blockers
CCTA	coronary CT angiography
CDC	Center for Disease Control
CFA	common femoral artery
CFR	coronary flow reserve
cGMP	cyclic guanosine monophosphate
CHD	coronary heart disease
CO	cardiac output
CPTE	chronic pulmonary thromboembolism
CRP	C-reactive protein
CT	computed tomography
CUPS	Chennai Urban Population Study
CV	cardiovascular
CVD	cardiovascular disease
CW	continuous wave
DC	direct current
DC	distensibility coefficient
DHEA	dehydroepiandrosterone
DPTI	diastolic pressure–time index
ECG	echocardiogram
ECG	electrocardiogram
EDRF	endothelial-derived relaxing factor
EDRF	endothelium-derived relaxing factor
EECP	enhanced external counterpulsation
EMF	electromagnetic flowmeter
eNOS	enzyme nitric oxide synthase
EPC	endothelial progenitor cells
ESPVR	end-systolic pressure–volume relationship
ESRD	end-stage renal disease
FAI	flow augmentation index
FF	form factor
FFR	fractional flow reserve
FMD	Flow-mediated vasodilation
FMD	flow-mediated dilation
HRT	hormone replacement therapy
iCFR	Invasive CFR
ICG	impedance cardiography
IMT	intima-media thickness
IMT	intima-medial thickness
ISH	International Society of Hypertension
ISH	isolated systolic hypertension
IVUS	intravascular ultrasonic
IVUS	intravascular ultrasound
IVUS	invasive intravascular ultrasound
L-NMMA	L-monomethyl arginine
LBBB	left ventricular bundle branch block
LDA	laser Doppler anemometry
LDF	laser Doppler flowmetry
LDL	low-density lipoprotein
LV	left ventricular
MAP	mean aortic pressure
MCP	monocyte chemoattractant protein
MESA	Multi-Ethnic Study of Atherosclerosis
MI	myocardial infarction
MMP	matrix metalloproteinase
MP	microparticles
MRI	magnetic resonance imaging
NO	nitric oxide
NTG	nitroglycerin
NYHA	New York Heart Association
OCT	optical coherence tomography
P–V	pressure–volume
PA	pulmonary arterial
PAD	peripheral arterial disease
PAT	pulse amplitude tonometry
PDA	patent ductus arteriosus
PDE5	phosphodiesterase 5
PDE5	phosphodiesterase type 5
PDE5	phosphodiesterase-5
PET	positron emission tomography
PI	pulsatility index
PP	pulse pressure

PPH	primary pulmonary hypertension
PRAM	pressure recording analytical method
PRF	pulse repetition frequency
PRU	peripheral resistance unit
PWA	pulse waveform analysis
PWV	pulse wave velocity
QCA	quantitative coronary angiography
RBC	red blood cell
REASON	pREterax in regression of Arterial Stiffness in a contrOlled double-bliNd
RF	radiofrequency
RR	relative risk
rtPA	recombinant tissue plasminogen activator
SAC	systemic arterial bed
SFA	superficial femoral artery
SHEP	Systolic Hypertension in the Elderly Project
SHM	simple harmonic motion
SIH	secondary intracranical hypertension
SMC	smooth muscle cells
SNR	signal-to-noise ratio
SPTI	systolic pressure–time index
SRES	shear rate estimating system
SV	stroke volume
TEE	transesophageal echocardiography
TGF-β	transforming growth factor-β
TTI	tension–time index
US	ultrasound
VSD	ventricular septal defect
WBV	whole blood viscosity
WSR	wall shear rate
WSS	wall shear stress

1

Introduction

The most obvious feature of 'blood flow in arteries' is that it is pulsatile. Therefore, the field of survey is the character of pulsatile flow and the physical laws governing it. This means that the survey must also comprehend the form of the pressure wave of the pulse, in relation both to the flow wave and to the means by which the pulse wave (of flow, as well as pressure) is propagated over the arterial system.

The ability to measure and interpret variations of pressure and flow in humans depends on an understanding of physiologic principles and is based on a heritage well over 100 years old. Studies of pressure preceded those of flow, since reliable tools were available for pressure measurement 100 years ago, but for flow some 40 years less. Relevant studies of the circulation and of underlying physical principles, however, stretch back over 400 years through Harvey and Newton to Galileo.

Pulsatile pressure is recorded routinely in human cardiovascular diagnostic laboratories, operating rooms, and critical care units in the present generation, and pulsatile flow patterns are now used invasively and non-invasively for the quantification of cardiac and vascular shunts and of valvular and vascular stenoses. These techniques have assumed practical importance in routine cardiologic and vascular diagnostic, investigative, and monitoring procedures.

Earlier editions of this book did not anticipate the full clinical implications and potential application of non-invasive pressure and flow measurements in human studies. In particular, the development of diagnostic ultrasound, applanation tonometry, magnetic resonance imaging (MRI), and computed tomography (CT) were not foreseen. These issues are covered in separate chapters. New to the sixth edition are chapters on central blood pressure, change in pulsatile cerebral and renal blood flow with aging and relevance to syndromes of dementia and kidney function, on physical biomarkers which may anticipate and help interpret results of forthcoming trials and studies, including Framingham and on lifestyle and the environment.

Earlier editions of this book referred to particular conferences, books and articles that had advanced the field. Such reference is no longer appropriate, since arterial hemodynamics is now a mainstream topic in the literature, including the most august experimental and clinical journals, which deal in cardiovascular function and disease. Implications of central aortic pressure measurement rated discussion in Highlights of the Year in *Journal of the American College of Cardiology* 2009 (DeMaria *et al*., 2010). An award for the best clinical research paper for 2007 was presented to Peter Lacy for the CAFE study (Williams *et al*., 2006) by the American Heart Association, while Eugene Braunwald in his keynote address to the American Society of Hypertension's annual meeting in 2010 stressed the historical studies of Frederick Mahomed on the arterial pressure waveform (Braunwald, 2010). The most eminent general medical journals, such as the *New England Journal of Medicine* and the *Lancet*, however, continue to prefer the older, established approaches to arterial pressure and flow measurement and analysis, with scant reference (except in correspondence) to phenomena such as wave reflection and pressure wave amplification in the arterial tree.

This sixth edition of *Blood Flow in Arteries* seeks to justify its place as a reference in the field of pulsatile flow for those who might wish direction to greater detail elsewhere, but who still want to retain orientation, perspective, and balance in what was, is, and always will be a particularly complex and challenging multidisciplinary area. Our challenge, originally met by McDonald alone in 1960, is to achieve this in a sound but interesting and provocative way.

While our principal interest is in pulsatile flow, we must also deal with pulsatile pressure and diameter as they are related to flow. We will be attempting to redress the

problem pointed out by Jarisch in 1928, and quoted again by Neil in 1983, that:

> The development of our knowledge of the circulation has been bedevilled by the fact that the measurement of blood flow is so complicated whereas that of blood pressure is so easy: hence the blood pressure manometer has exerted an almost hypnotic influence, though bodily organs don't need pressure but flow.

Sir James Mackenzie (1917), the father of modern cardiology, was even more scathing in his criticism of those who accepted uncritically the numbers provided by the cuff sphygmomanometer: 'we get now a definite and precise figure which most people imagine to be more scientific'.

There is still preoccupation with the sphygmomanometer in the diagnosis and management of hypertension. At the turn of the century, attention was deflected from diastolic to systolic pressure as the major index of risk in hypertension (Black, 1999; He and Whelton, 1999; Staessen *et al*., 2000b) and to the importance of large arteries both in determining systolic and pulse pressure and as the target of damage when pressure is high (Laurent *et al*., 2001b; Boutouyrie *et al*., 2002). This has led to a new approach to hypertension (O'Rourke, 1976; O'Rourke, 1983a; Nichols *et al*., 1986b; Ting *et al*., 1986; Safar, 1987; O'Brien and Staessen, 1999; Safar, 2001; Beevers *et al*., 2001a, Beevers *et al*., 2001b, Beevers *et al*., 2001c), which has been aided by new methods for determining arterial pressure, flow, and diameter non-invasively (Avolio *et al*., 1988; Kelly *et al*., 1988a; Kelly *et al*., 1988b; Kelly *et al*., 1989a; Kelly *et al*., 1989b; Kelly *et al*., 1989c; Kelly *et al*., 1989d; Kelly *et al*., 1989e; Kelly *et al*., 1989f; Pedersen *et al*., 1993; Pauca *et al*., 2001; Schofield *et al*., 2002a; das Chagas de Azevedo *et al*., 2005; Fesler *et al*., 2007; Chugh and Bakris, 2007; Giannattasio *et al*., 2008; Wolak *et al*., 2008).

The 1990s saw confirmation of the view that systolic blood pressure is of greater importance than diastolic (at least in people over age 60) as a risk factor for cardiovascular disease (Rutan *et al*., 1989; Folkow and Svanborg, 1993; Franklin and Weber, 1994; Franklin *et al*., 1997) and saw further development of tonometric and ultrasonic methods for more precise assessment of arterial pressure, flow, and diameter changes (Kelly *et al*., 1990a; Kelly *et al*., 1990b; Kelly and Fitchett, 1992; Länne *et al*., 1992a; Länne *et al*., 1992b). The landmark SHEP publication (1991) showed that treatment of elevated systolic pressure reduced cardiovascular mortality and morbidity, even in people whose diastolic pressure was normal or low. Tonometric and other methods for recording pressure have been used to identify the boost to pressure in central arteries caused by the early return of wave reflection and have linked such boost to measures of left ventricular hypertrophy and performance. There has been new interest in pulse pressure (systolic minus diastolic) as a marker of arterial stiffness, and a prognostic indicator in older people (O'Rourke and Frohlich, 1999; Dart and Kingwell, 2001; Safar, 2001; Van Bortel *et al*., 2001a; Domanski *et al*., 2002; Franklin *et al*., 2009; Roman *et al*., 2009). This issue remains contentious, since older, larger studies have not shown the same superiority of pulse pressure over systolic or diastolic pressure (MacMahon *et al*., 1990; Prospective Studies Collaboration, 2002; Mosley *et al*., 2007). An explanation arises when one considers the relative youth of subjects in the trials of entry (when amplification of the pulse is considerable), and the different criteria used for measuring systolic and (particularly) diastolic pressure. As discussed in Chapter 28, this issue can be clarified in the future through measurement of central rather than brachial pressure, and with due consideration of aortic aging change (Benetos *et al*., 2010; Mitchell *et al*., 2010; Vlachopoulos *et al*., 2010a; Vlachopoulos *et al*., 2010b; Wang *et al*., 2010; Weber *et al*., 2010). Interest in pulse pressure is moving on to amplitude and contour of the pressure pulse, and in the central arteries. Ultrasonic methods have been further refined for measurement of arterial caliber (Pedersen *et al*., 1993; Astrand *et al*., 2005), arterial caliber change (Sonesson *et al*., 1994; Reneman *et al*., 2005), wall thickness (Pearson *et al*., 1994; Astrand *et al*., 2005), and flow velocity profiles (Yamamoto *et al*., 1994; Tortoli *et al*., 2003), using both invasive and non-invasive approaches (see Chapters 6 and 8) (Dewey, 2009; Hermeling *et al*., 2009; Joly *et al*., 2009; Muiesan and Paini, 2009).

Over the past 25 years, there has been a surge of interest in the vascular endothelium, on substances produced by the endothelium that influence components of the blood within the lumen, and on the tone of smooth muscle in the vessel wall. This subject has commanded the attention of some of the best minds in molecular biology, has been widely covered in the literature, and was the subject of the Nobel Prize Award in 1998 (Moncada *et al*., 1991; Griffith *et al*., 1994; Rubanyi, 1996; Cardillo and Panza, 1998). Findings give new insight into such subjects as hemostasis and clot formation (Verhamme and Hoylaerts, 2006), arterial spasm (Kawano and Ogawa, 2005; Yasue *et al*., 2008; Miwa *et al*., 2009) and variations of arterial tone (Fields and Makhoul, 1998), and atherogenesis (Dobarro *et al*., 2009; Herrera *et al*., 2010; Napoli and Ignarro, 2009) and cellular proliferation after angioplasty (Torella *et al*., 2004; Finn *et al*., 2010; Libby *et al*., 2010).

Over the past 20 years also, there has been acceptance of plaque disruption as the initial event causing coronary thrombosis and myocardial infarction, and on the value of urgent stenting, and of thrombolysis, used early, for dissolution of the clot and limitation of infarction size, not only in the heart, but in the brain as well (Wang *et al*., 2006; Ay *et al*., 2008; Braunwald, 2009; Libby *et al*., 2009; Sanz *et al*., 2009a). All this leads on to more precision in the approach to understanding how plaques develop in the first place, the influence of inflammation, and why they disrupt. Attention is directed at disrupting forces

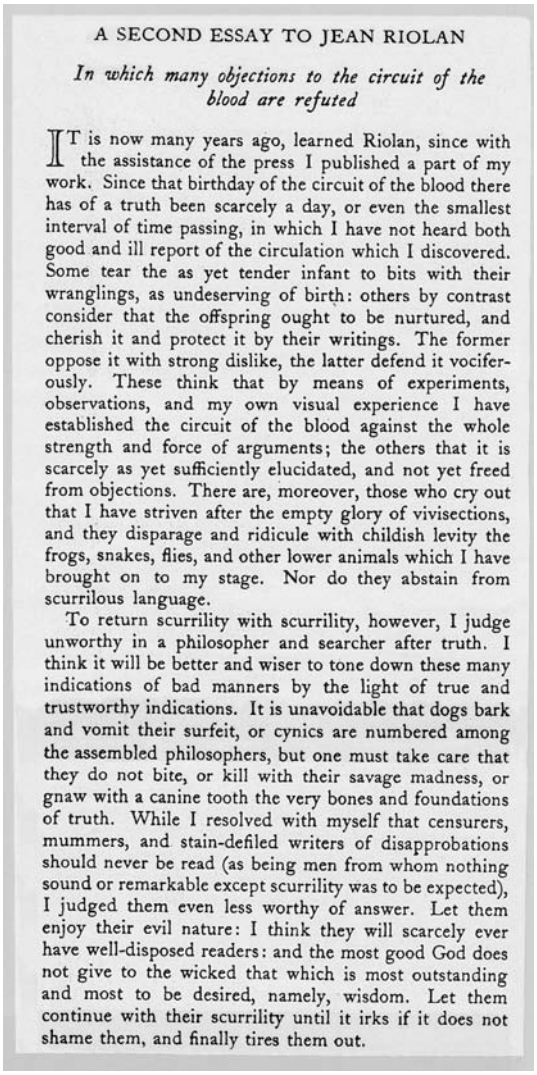
within the arterial wall and shearing stresses on the blood–vascular interface. Attention is also directed at the factors which can limit the benefits of angioplasty and stenting – particularly intimal proliferation with bare metal stents and late thrombosis with drug eluting stents (Htay and Liu, 2005; Mehdizadeh *et al*., 2009; Nakazawa *et al*., 2009; Nakazawa *et al*., 2010).

IN THE BEGINNING ……

The sudden swing from 'natural philosophy' into modern science is most vividly characterized in the person of Galileo Galilei (1564–1642). From 1598 to 1610, he was Professor of Mathematics at the University of Padua, Padova, Italy. During this period, William Harvey (1578–1657) was studying medicine there, and although Harvey (1628) never mentioned Galileo in his book *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus* (Anatomical Essay on the Motion of the Heart and Blood in Animals), it is difficult to believe that he was not influenced by the new quantitative teaching and reasoning in his approach to the problem of the circulation of blood. Others were prepared to accept passage of blood through the lungs into the left atrium and through small systemic blood vessels into the right atrium; it was Harvey who stressed the magnitude of such flow. His challenge to the existing order attracted many detractors, especially in France, and he defended his views with colourful language (Fig. 1.1). Modern cardiovascular physiology and biophysics began with Harvey and *Exercitatio Anatomica de Motu Cordis*. However, Harvey typified another characteristic of many of the later pioneers in this field, i.e. interest, competence, and often prominence in more than one field of endeavor. Perhaps a commitment to science and a catholicity of interest accounted for the unusual multidisciplinary achievements of these men. Galileo achieved prominence as a mathematician and as an astronomer, Harvey as anatomist, physiologist and physician (indeed as personal physician to King Charles I).

Perhaps the greatest mathematician and physicist of all time was Sir Isaac Newton (1642–1727). Newton's monumental work *Principia Mathematica* contained as an addended proposition the concept of fluid viscosity; this has now become central to the consideration of arterial blood flow, pressure–flow relationships, and vascular resistance. Newton left Cambridge in 1696 to take on and excel at an administrative task as Warden of the Royal Mint in London and to gain office, ultimately as president, of the Royal Society (Manuel, 1968). It was in this capacity that he authorized publication of a book by another Cambridge graduate, the Reverend Stephen Hales (1677–1761), entitled *Haemastaticks* (1733).

Although Galen (130–200 AD) palpated the arterial pulse and classified it in terms of strength, rate, and rhythm, Hales was the first to measure arterial pressure in an animal, to document the response of arterial pressure to blood loss, to formulate the concept of peripheral resistance, and to show in an elegantly simple experiment that the greatest resistance to blood flow resides in the tiny blood vessels that are invisible to the naked eye. Hales also likened the arterial system to the inverted, air-filled dome of the contemporary fire engine that smoothed the oscillations due to intermittent pumping so that flow of water through the fire hose nozzle was almost perfectly continuous (Fig. 1.2). Hales saw the arterial system acting as a cushion (or buffer) and the arterioles as resistance to the intermittent pumping of the heart, so that flow through the tissues was virtually devoid of cardiac pulsations. In the German translation of *Haemastaticks*, the fire engine compression chamber was referred to as *Windkessel* – a term which has stuck to the description of the functional cushioning role of the arterial system.



A SECOND ESSAY TO JEAN RIOLAN

In which many objections to the circuit of the blood are refuted

IT is now many years ago, learned Riolan, since with the assistance of the press I published a part of my work. Since that birthday of the circuit of the blood there has of a truth been scarcely a day, or even the smallest interval of time passing, in which I have not heard both good and ill report of the circulation which I discovered. Some tear the as yet tender infant to bits with their wranglings, as undeserving of birth: others by contrast consider that the offspring ought to be nurtured, and cherish it and protect it by their writings. The former oppose it with strong dislike, the latter defend it vociferously. These think that by means of experiments, observations, and my own visual experience I have established the circuit of the blood against the whole strength and force of arguments; the others that it is scarcely as yet sufficiently elucidated, and not yet freed from objections. There are, moreover, those who cry out that I have striven after the empty glory of vivisections, and they disparage and ridicule with childish levity the frogs, snakes, flies, and other lower animals which I have brought on to my stage. Nor do they abstain from scurrilous language.

To return scurrility with scurrility, however, I judge unworthy in a philosopher and searcher after truth. I think it will be better and wiser to tone down these many indications of bad manners by the light of true and trustworthy indications. It is unavoidable that dogs bark and vomit their surfeit, or cynics are numbered among the assembled philosophers, but one must take care that they do not bite, or kill with their savage madness, or gnaw with a canine tooth the very bones and foundations of truth. While I resolved with myself that censurers, mummers, and stain-defiled writers of disapprobations should never be read (as being men from whom nothing sound or remarkable except scurrility was to be expected), I judged them even less worthy of answer. Let them enjoy their evil nature: I think they will scarcely ever have well-disposed readers: and the most good God does not give to the wicked that which is most outstanding and most to be desired, namely, wisdom. Let them continue with their scurrility until it irks if it does not shame them, and finally tires them out.

Figure 1.1 Introductory paragraphs of William Harvey's second letter to the anatomist Jean Riolan of Paris. Translated from the original Latin by KJ Franklin of St Bartholomew's Hospital, London

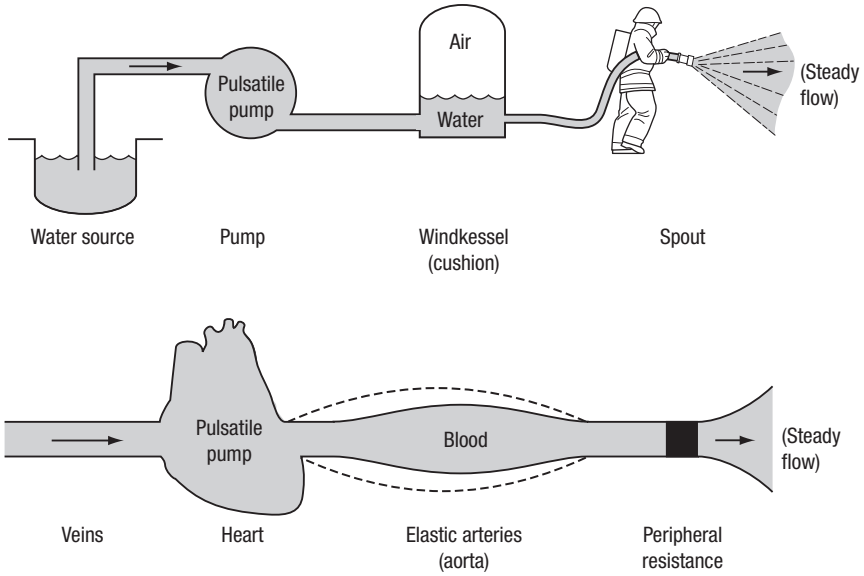


Figure 1.2 The *Windkessel* model of the arterial system. The arterial tree is likened to a medieval fire cart, with distensibility represented by the inverted air-filled chamber, which changes pulsatile flow from the intermittently acting pump, and with peripheral resistance represented by the fire hose nozzle. Reproduced from Westerhof *et al.* (2009)

The eighteenth century was further notable for the great development of the theoretic mathematical treatment of fluid dynamics. While this was based on the work of Newton, it usually dealt with an 'ideal' fluid in which Newton's *defectus lubricatis* or viscosity was ignored. The leader in this field was Leonhart Euler (1707–83), who is described as the most prolific mathematician that ever lived; he established the general equations of fluid motion virtually as they are used today. Euler was a close friend of Daniel Bernoulli (1700–82), who is remembered for his equation describing pressure change with interconversion of potential to kinetic energy.

Daniel Bernoulli was a member of the illustrious Bernoulli family, which included at least three generations of famous and productive mathematicians and physicists (Hopkins, 1991). Daniel, the second son of Jacob's brother Johann (Fye, 2001), who was a trained physician, learned mathematics from his older brother Nicolaus III. He became Professor of Mathematics in 1725 at St Petersburg, Russia where he did most of the work on his principal opus, *Hydrodynamica.* Life there irked him so greatly that he returned at the first opportunity to Basel, where he became Professor of Anatomy and Botany, and finally of Physics. His mathematical work included calculus, differential equations, probability, the theory of vibrating strings and many other problems in applied mathematics. Daniel Bernoulli has been called the founder of mathematical physics.

The nineteenth century saw further advances in the theory and application of arterial hemodynamics, principally in Germany, England, and France, and again often by young achievers in many disciplines. One of the most prominent was Poiseuille (1799–1869), whose research in cardiovascular physiology began when he was still a medical student (Hopkins, 1991). Poiseuille was fundamentally a physician with training in physics. His major contribution was to establish the relationship between flow, pressure gradient, and dimensions of a capillary tube; Poiseuille showed experimentally that flow was related to the fourth power of the tube's internal diameter (1846). Poiseuille's equation is now expressed as:

$$P_1 - P_2 = \frac{Flow \times viscosity \times length \times 8}{\pi \times (radius)^4}$$

but the precise derivation of this from theoretic principles was attributed to Hagenbach (1860). Poiseuille expressed (viscosity/π) as a constant. His measurements of relatively low venous pressure in animals (Poiseuille, 1830) suggested to him that a marked drop in pressure must occur somewhere beyond the high pressure that he had measured in arteries down to approximately 2 mm in diameter (Poiseuille, 1828), thus confirming Hales' contention that the greatest component of peripheral resistance resides in the smallest blood vessels (Fig. 1.3) (Poiseuille, 1828). This (earlier) work explains Poiseuille's interest in tiny capillary tubes for determining mean pressure–flow relationships.

A man of similar background to Poiseuille as physicist and physician, but who covered an even greater range, was Thomas Young (1773–1829). Young's scientific exploits are legendary (Hopkins, 1991). His most famous researches in biophysics were concerned with human vision, particularly with the perception of color. The theory that human vision is based on three primary colors – red, green, and violet – is commemorated today as the Young–Helmholtz theory. In fact, his work on light went

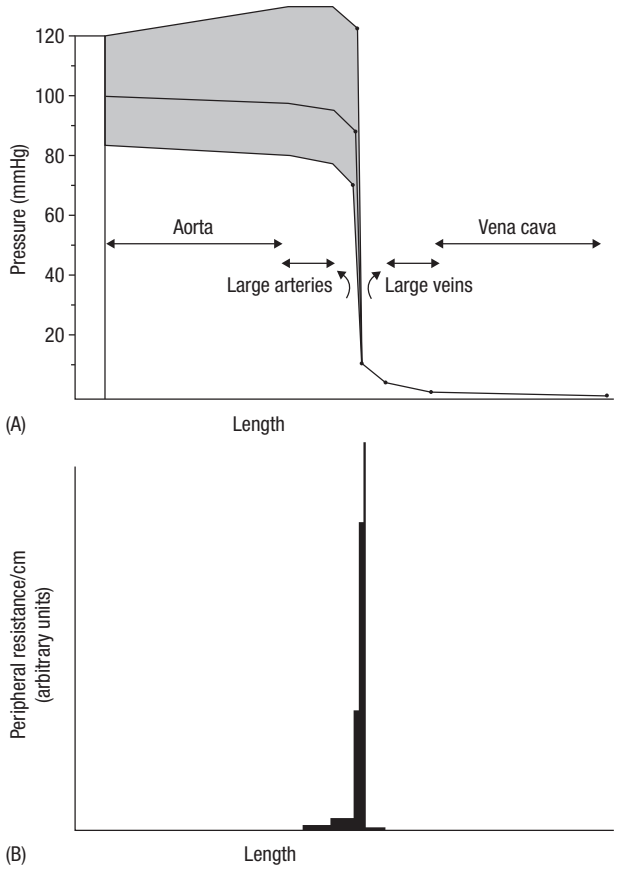


Figure 1.3 (A) Change in pressure between left ventricle and right atrium along the whole vascular pathway. Mean pressure falls precipitously in the arterioles. Pressure wave amplitude is greater in peripheral than in central arteries as a consequence of wave reflection, but falls precipitously in prearteriolar vessels. (B) Change in resistance per unit length along the vascular pathway. Reproduced from O'Rourke (1982b)

much deeper, and that on interference gratings led to the acceptance of the wave nature of light (Williams, 1969). However, the other great body of biophysical work done by Young was into the nature of elasticity, in particular the relationship between the elastic properties of arteries and the velocity of propagation of the arterial pulse (Young, 1808; Young, 1809; Laird, 1980). His work on the nature of elasticity led to the concept of the elastic modulus to which his name is still attached. In determining wave velocity, he derived the formula (given as eqn 3.49) that Bramwell and Hill (1922a) attributed to AV Hill and which other writers (e.g. Bergel and Schultz, 1971) attributed to Otto Frank (1865–1944). This preceded the work of Moens (1878) and of Korteweg (1878) (eqn 3.51) into the relationship between the arterial pulse wave velocity and Young's elastic modulus of the arterial wall. It is finally of interest to add that Thomas Young created an independent reputation in successfully deciphering Egyptian hieroglyphics after the discovery of the Rosetta Stone.

The reference to Egypt creates a link with Fourier (1768–1830), who was one of the band of savants that Napoleon took with him to Egypt and who were stranded there for several years. Fourier's work on the analysis of periodic functions was apparently carried out here and is published in his monograph on heat. Fourier never contributed directly to hemodynamics, but his name occurs so frequently as originator of the Fourier (or harmonic) series that it can hardly be omitted from a historical survey.

The next work of interest in the field of arterial distensibility and wave velocity was the result of collaboration in Germany between the brothers WE and EH Weber (physicist and physician, respectively) and published in a monograph entitled *Wellenlehre* in 1825. This established many of the properties of propagated and reflected waves. This work by the Webers on wave propagation was soon followed by the experimental work of Moens in Leiden, published in his short monograph of 1878. The mathematical analyses of Korteweg and Resal on his data give the equation (written as eqn 3.51) which remains the most useful relationship between pulse wave velocity and arterial properties.

The work of Young, Weber, and other physicians had important clinical implications that were well appreciated at the time. These became more important with the description by Bright (1827) of a relationship between hardening of the arteries, albuminuria, cardiac hypertrophy, and risk of death from stroke and cardiac failure. This work was extended by many, including Marey (1863) and Mahomed (1872) who first described changes in contour of the arterial pressure pulse with age and in hypertension, changes that were forgotten with the introduction of the cuff sphygmomanometer, then rediscovered 100 years later (see Chapter 18) (Braunwald, 2010). Like Poiseuille, Mahomed's research contributions began as a medical student when he developed and described the first quantitative sphygmograph (Mahomed, 1872). Using this, he was the first to detail the natural history of 'essential' hypertension (Mahomed, 1874) and to separate 'essential' from renal hypertension (see Chapter 19 and O'Rourke's (1992), Swales' (1996a), Lewis' (1997), and Cameron and Hicks' (1996) historical tributes to this great pioneer).

The implications of arterial stiffening with respect to cardiac load were, it seems, appreciated at this time, together with the relentless stiffening that occurs in humans with age. Roy (1880) pointed out that 'only in the case of young children do we find that the elasticity of arteries is so perfectly adapted to the requirements of the organism as it is in the case of the lower animals'. The clinical achievements of the later nineteenth century were all the more remarkable when one appreciates that there were no accurate means of measuring arterial blood pressure. The cuff of Riva-Rocci was not introduced until 1896 and the use of Korotkov's sounds not until 1905. Prior to this, high arterial blood pressure was assessed

on the basis of the force required to compress the radial artery and on the amplitude and contour of the arterial pressure pulse. A variety of sphygmographs had been introduced by Marey (1860), Mahomed (1872), Mackenzie (1902), and others, but these could not be calibrated in absolute terms and their dynamic frequency response was poor. Although Torricelli (1608–1647), Galileo's successor as Professor of Mathematics at the Academia in Florence, was the first to use mercury in a glass tube to measure (atmospheric) pressure, Poiseuille (1828) introduced the mercury manometer (U-tube) to measure absolute values of intra-arterial blood pressure. Ludwig (1847) added a float and pointer, enabling pressure to be recorded on a smoked drum. The inertia of such systems was, of course, considerable, so that only mean pressure with slight fluctuations could be obtained. It was known that these small fluctuations occurred simultaneously with cardiac contraction, but their magnitude was too low to represent systolic and diastolic blood pressures. One of Ludwig's pupils, Adolph Fick (Acierno, 2000), was the first to devise a manometer that responded rapidly enough to record systolic and diastolic pressures relatively accurately (1864).

The outstanding difference between the records obtained with Ludwig's mercury manometer and Fick's C-spring recorder was the magnitude of the fluctuations (or pulsations). How large they should be was unknown, and renewed efforts were made to increase the frequency response of the recording system. In 1883, Fick introduced his straight-spring manometer and recorded the first arterial pressure wave that showed a slight hint of a dicrotic notch, although Landois had already demonstrated the presence of a true dicrotic notch in 1874 (Luciani, 1911). He placed a small needle into a dog artery and directed the jet of blood onto the rotating drum of a kymograph. There, clearly displayed, was the dicrotic notch, along with systolic and diastolic pressures. Landois called his record a 'hemautograph'. The development of reliable manometers that could accurately measure pulsatile blood pressure had to await Otto Frank's great work of 1903.

The French physiologist/physician EJ Marey made important contributions not only to non-invasive recordings of arterial pressure waves (Marey, 1863), but also to direct measurements of arterial blood flow. Marey's textbook of 1881 (see Snellen, 1980) includes a complete chapter on the velocity of blood flow in arteries. The technique used was that of a double Pitot tube, which is based on the Bernoulli principle and is used in modern aircraft to measure air speed. (A defective pitot tube is thought to have contributed to the fatal crash of an Air France A330 into the South Atlantic Ocean in 2008.) The Marey tracings look surprisingly like those that we accept as normal today, clearly showing the back flow phase of flow in the carotid and femoral arteries. As with Mahomed's observations, these findings took another 100 years to be rediscovered and accepted (see Chapter 9). Marey's special interest was in biological motion – of birds in flight and of running horses. His rapid-sequence photographs were the forerunner of modern cinematography (and coronary angiography). As with others previously mentioned, he was a master of many fields. Carl Ludwig appears to have been the first to introduce a continuously recording blood flowmeter. This was an ingenious though awkward device in which blood, flowing through an exteriorized tube, pushed before it a column of oil. As with his pressure recordings, this provided better registration of mean than of pulsatile flow. Adolph Fick is known for the principle enunciated by him that related blood flow through an organ to the arteriovenous concentration gradient of a substance and the amount of the substance taken up or given off by that organ (Fick, 1870). This principle became the standard for measurement of cardiac output in humans following the first human cardiac catheterization by Forssmann (on himself) in 1929 and its popularization by Cournand, Richards, and others in the early 1940s, and the developments which have followed (Mueller and Sanborn, 1995; Ryan, 2002; Braunwald, 2009).

The early twentieth century was completely dominated by Otto Frank and his pupils in Munich. Frank had been highly trained in physics and mathematics and apparently did not turn to physiology until in his late twenties. Frank's first major contribution was to cardiac contraction (in 1895), and it is for this that he is best remembered today. Frank was the first to describe the influence of ventricular dimension on ventricular contraction; this phenomenon, clarified by Starling (Patterson *et al*., 1914; Starling, 1918), is usually referred to as the Frank–Starling mechanism (Konhilas *et al*., 2002) or the 'law of the heart' (Katz, 2002). From this early work of Frank sprang the need to produce a manometer that could measure pulsatile blood pressure accurately (Frank, 1903). The manometer that emerged, as with Einthoven's electrocardiogram introduced at the same time (Einthoven, 1903; Fisch, 2000), was based on a very sound physical analysis of the requirements of such an instrument; the analysis remains valid to this day.

Frank passed from cardiac dynamics to manometry, to the measurement of arterial pressure waves, and on to analysis of arterial behavior (Frank, 1905). Frank's penultimate goal was the understanding of arterial properties and arterial function, so that (ultimately) flow could be predicted from pressure change. Beginning with accurate arterial pressure waves, he sought a theoretic basis for arterial function. The framework of his approach was that of manometer theory – that the arterial system behaved like a manometer with a 'lumped' distensible section or *Windkessel* and 'lumped' peripheral resistance. Such analysis ignored wave propagation and wave reflection (McDonald and Taylor, 1959). Frank had the uneasy task of reconciling this theory with the obvious secondary pressure oscillations or diastolic waves that were apparent on his pressure tracings from peripheral arteries. He did

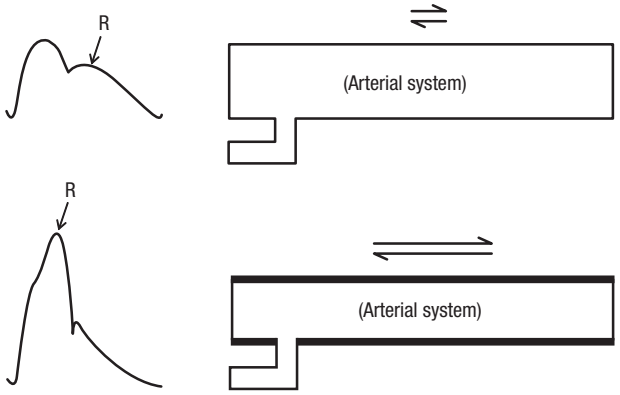


Figure 1.4 Tubular models of the arterial system with the heart (at left) and conduit arteries and lumped peripheral resistance (at right). Coronary arteries are represented by the 'hook'. Pressure waves in the ascending aorta are represented at left. The top model represents the normal youthful arterial tree. The bottom model represents the stiffened arterial tree of an older person with increased aortic pulse wave velocity. Reflection (R) is represented by the diastolic wave in the top case and by the late systolic wave in the bottom case. Reproduced from O'Rourke *et al.* (1987)

so with the awkward compromise of accepting at the same time the infinite wave travel of a *Windkessel* and the finite wave travel of an elastic liquid-filled tube (Fig. 1.4). The solution was more Chinese (related to paradoxical logic) than Germanic (related to Aristotelian logic), more feminine than masculine, utterly uncharacteristic of the man as history portrays him personally. Frank (1899) viewed the arterial pressure pulse as having a *Grundform* or basic pattern upon which was superimposed a *Grundschwingung* or damped oscillation created by wave travel and reflection generating a type of resonance. A similar approach was later introduced by Cohn and colleagues (Cohn and Finkelstein, 1992; Cohn *et al.*, 1995) and by Davies *et al.* (2007) for calculating the components of arterial compliance. Assuming wave reflection as being from a closed-end reflecting site (as is usually accepted today), Frank proceeded to calculate the length of the *Windkessel* and then went on to estimate flow. The compromise was brilliant. Frank's contributions have been criticized by many (including ourselves) as contradictory and illogical. Viewed from a farther distance in time, and allowing for the primitive state of knowledge at that time and the need to attempt some reconciliation of apparently conflicting observations so that the field might advance, it is clear that one should be far more generous. One's criticisms are more appropriately directed at the unwieldy mathematical edifices that have been created about the initial simple analog model by those followers of Frank who have overlooked the conflicting basic assumptions that were so apparent to him. Such contributions are still seen appearing anew in the literature today (Davies *et al.*, 2007; Cameron, 2009; Manisty *et al.*, 2009). This subject was well reviewed by Apéria (1940) and by McDonald and Taylor (1959). It was alluded to also by Birkhoff (1960), who, quoting Sir Cyril Hinshelwood, said 'fluid dynamists in the nineteenth century were divided into hydraulic engineers who observed what could not be explained and mathematicians who explained what could not be observed', and added, 'it is my impression that many survivors of both species are still with us'. Some prosper in clinical departments where physical and physiological scrutiny is lacking or dismissed. Good clinical researchers can be 'hoodwinked' (Sharman *et al.*, 2009b).

The First World War destroyed cardiovascular research in Europe. The classic article by Patterson *et al.* (1914) on 'The Law of the Heart' only just made publication, as the sole item in the last issue of the *Journal of Physiology* to be published in five years. Piper was killed in the war. Starling was directed to practical matters of military importance. Frank's work was terminated by the war and never recommenced. His laboratory was destroyed by a bomb shortly after his death at the end of the Second World War. In cardiovascular physiology, the period since the First World War saw the emergence of and ultimate domination by research scientists in the United States. Early pioneers include Katz, Wiggers (a student of Frank), and Hamilton, all of whom wrote influential textbooks and reviews before and after the Second World War. In England, Bramwell and Hill (1922b) described cardiac function in relation to hydraulic load and showed how arterial stiffness (measured as pulse wave velocity (PWV)) was an important component of this load, and how PWV increased in humans with age (Fig. 1.4).

The electromagnetic flowmeter was introduced independently by Wetterer (1937) in Germany (1937) and by Kolin (1936) in the United States. Interference due to the electric potentials created by the heart were overcome, and Deppe and Wetterer (1940) used it successfully on the ascending aorta; its use there and in other arteries in animals became commonplace. Gregg and colleagues (Gregg and Green, 1940; Gregg *et al.*, 1948; Gregg and Fisher, 1963) recorded accurate flow waves in the coronary and other arteries of dogs using this instrument. The period between the world wars had seen little advancement in cardiovascular medicine apart from acceptance qof the cuff sphygmomanometer and the electrocardiograph into clinical practice. This period contrasts with that which followed 1944. One can still argue, as did Mackenzie in 1917, that the sphygmomanometer proved a disservice to cardiovascular medicine. While it enabled pressure to be recorded reasonably accurately, quickly, and non-invasively in individual subjects, it concentrated attention on 'the systolic' and 'the diastolic' pressure, inducing an aura of complacency of mind. Clinicians, and indeed researchers, came to consider that systolic and diastolic pressure had some particular biological significance instead of estimating just the highest and the lowest point of a pressure wave in the brachial artery at the time of measurement. Such a view takes no account

of pressure wave amplification between central and peripheral arteries; this renders both systolic and pulse pressure different in different arteries and susceptible to the various influences that alter amplification. The view also encourages the simplistic notion referred to previously, first voiced posthumously in Mackenzie's text but attributable to James Orr, his literary executor, that systolic pressure is a manifestation of cardiac strength and diastolic pressure a manifestation of arteriolar tone (and resistance). This is the basis of the myth that still persists in many quarters that diastolic pressure is the appropriate gauge of elevated arteriolar tone in systemic hypertension (O'Rourke, 1983a; Fisher, 1985; Nichols and Edwards, 2001; Arguedas *et al*., 2009).

The clinical scene since 1944 has not yet been able to overcome the shackles of restrictive thought that surround concepts of systolic and diastolic pressure, but has exploded in other directions. The introduction of cardiac catheterization by Cournand and Ranges (1941) led to surgical correction of cardiac defects and to the introduction of other invasive and non-invasive techniques into the clinical arena. Intravascular pressure is now recorded routinely not only in the diagnostic laboratory, but in the operating room and critical care area as well. Cardiac output can be recorded by a conventional Fick technique (Acierno, 2000), or by indicator dilution or thermodilution at the same time. Micromanometers have been introduced, permitting the measurement not only of arterial pressure waves and their differentials but also of cardiovascular sound (Murgo and Millar, 1972). Electromagnetic velocity sensors have been miniaturized and mounted on cardiac catheters for the measurement of phasic blood flow velocity (Mills and Shillingford, 1967; Nichols *et al*., 1980a). Catheter-mounted ultrasonic devices were developed and used for the measurement of flow velocity waveforms (Hartley and Cole, 1974a; Hartley and Cole, 1974b; Bertolet *et al*., 1996; von Mering *et al*., 2004; Pepine *et al*., 2007) and for the visualization of arterial wall structure (Nishimura *et al*., 1991; Reneman *et al*., 2006; Nicholls *et al*., 2008; Bayturan *et al*., 2009). Ultrasonic techniques have become office procedures for visualizing the chambers of the heart and the blood vessels, and for Doppler non-invasive flow velocity recording. Possibilities for other imaging techniques, such as magnetic resonance imaging and computed tomography, abound and are presently giving new insight into the development of cerebral microvascular disease (Bateman, 2002b; Henry-Feugeas *et al*., 2005; O'Rourke and Hashimoto, 2007; Lin *et al*., 2007; Kang *et al*., 2009). The disease on which they can be used has become not only the most common in the Western world, but correctable to boot (Gibbons *et al*., 2009; Lauer, 2009; Matter *et al*., 2009; Wu *et al*., 2009; Achenbach and Raggi, 2010; Mark *et al*., 2010).

With the introduction of new methods for measuring phasic blood flow, and with the availability of existing techniques for measuring phasic pressure, a need arose for more sophisticated analysis of the recorded data. Until 1955, there had been little attempt to do anything other than analyze the waves as they were displayed (i.e. in the time domain). This approach had been explored almost *ad nauseam* for pressure and showed little prospect of giving new information on flow or on the relationship between pressure and flow waves. Physiologists (as well as clinicians) of the time had been content to describe waves in terms of their obvious features, using such descriptive terms as 'foot', 'peak', 'anacrotic wave', and 'dicrotic notch'. This is clearly unsatisfactory from the analytic point of view, however familiar it may be in conveying information of a sort from one person to another. However, the terms used were confusing and descriptions often conflicting (O'Rourke, 1971; O'Rourke, 1982c). Neither the American Heart Association, the American College of Cardiology, nor the European Society of Cardiology have yet been able to provide a consensus document on description and terminology of that most fundamental of all signs, the arterial pulse! Yet methods of description and of analysis have been available and routinely used in the physical sciences. These, of course, utilize the fundamental language of science – mathematics. This subject was addressed by DA McDonald with the mathematician John Womersley in a series of papers published in 1955 and afterwards (McDonald, 1955; leading up to the review by McDonald and Taylor (1959) and the first edition of this book in 1960. The most fundamental and important advance was the demonstration that the arterial system could be viewed as being in a steady state of oscillation, so could validly be analyzed in the frequency domain (Fig. 1.5).

THE ARTERIAL SYSTEM IN STEADY-STATE OSCILLATION

In an attempt to apply mathematical techniques to the circulation, it is obvious that one must be able to describe the phenomena studied in such a way that numerical values can be attached to them. In terms of physical and mathematical practice, a wave is regarded either as an isolated phenomenon or as a repetitive one. That is, it is a transient or it is a periodic oscillation. As the mathematical description of a periodic oscillation is simpler than that of a transient one, it was considered reasonable to suppose that it was the preferred approach, provided that it was valid. Regularity of the heart beat is one of its most characteristic features, and in terms of the length of an individual pulse this regularity is normally maintained for a very long period of time. This is indeed a condition of steady-state oscillation. In these circumstances, any wave that is repeated regularly can be represented by a Fourier series; that is, the wave shape can be described as the sum of a set of sinusoidal waves whose frequencies are

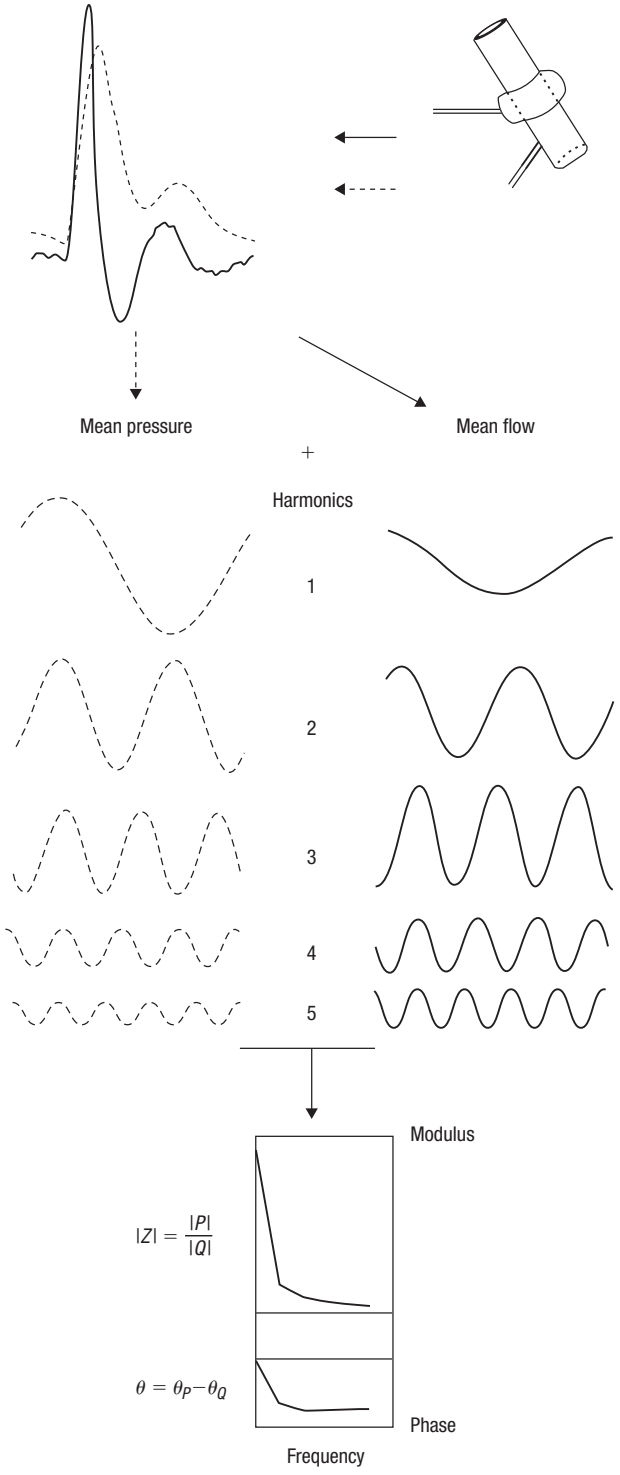


Figure 1.5 Use of Fourier analysis to determine arterial input impedance. Pressure (dotted line) and flow (solid line) measured in a peripheral artery are decomposed into mean values and a series of harmonic (sine) waves at multiples of heart rate frequency. Only the first to fifth are shown. Impedance modulus (top line of lower panel) is the modulus of pressure (P) divided by modulus of flow (Q) at the different frequencies, and phase (bottom line of lower panel) is the delay between pressure and flow harmonics. Reproduced from O'Rourke and Taylor (1966)

all integral multiples of the frequency of repetition of the wave.

The Fourier series and the method of performing Fourier analysis are described in Chapter 11. It is familiar to most people in terms of the harmonic analysis of musical sounds, a connection that is emphasized by the use of phrases such as 'harmonic components' or 'overtones'. It is widely used in the physical sciences of acoustic, electrical, and aeronautical engineering. In physiology, it is generally accepted as a basis for determining the frequency response of manometers and for recording arterial pressure pulses (see Chapter 6). It is, therefore, logical to extend its use to the flow pulse and the physical relation between pulsatile pressure and flow. It has the advantage of dealing with simple harmonic motion, which, mathematically, is the most tractable form of oscillatory motion, the compound synthesized curve or wave being the simple sum of the component harmonic terms. This property of summation of its component terms is one reason for its outstanding usefulness in describing curves. From this is derived the important practical property of the series that the curve described by a certain number of terms is the best approximation possible for that number of terms. Computing further terms will only improve the fit where it is faulty and does not require any alteration in the lower harmonics.

In applying Fourier analysis to the circulation, certain approximations have to be made. In the first place, there are irregularities in the pulse frequency. As it is a requirement for the Fourier series that the system should be in a 'steady state', any alteration in frequency must be allowed to settle down, just as the conditions due to the starting up in a system must have disappeared before a steady state is attained. The rapidity with which a steady state is attained depends largely on the damping in the system which is being driven; in the arterial system of a dog, early evidence suggested that this is attained within 1.0 s and probably within 0.5 s (i.e. once the pulse has been regular for at most two or three beats). Later evidence (O'Rourke and Taylor, 1966) indicated that a steady state could be achieved well within 0.5 s, so that individual waves could be regarded as part of a steady-state oscillation, even though the heart was beating irregularly.

A more complex difficulty with respect to application of Fourier analysis arises over the question of non-linearity. The circulation is not a linear system, so that, even though a Fourier series may represent a pressure pulse or a flow pulse, one cannot, strictly speaking, say that one harmonic term of pressure is related exclusively to the corresponding harmonic term of flow. The harmonic components must interact with each other. This non-linear effect was calculated by Womersley (1957b) with respect to the motion of blood and found to be small enough to be regarded as negligible to a first-order approximation. Later experimental work has confirmed Womersley's predictions again and again (Dick *et al.*, 1968; Nichols *et al.*, 1977a; Noble, 1979b; O'Rourke,

1982a; O'Rourke, 1982b; Milnor, 1989). This issue is no longer a subject of contention, though it could re-emerge as more accurate measuring and analytical techniques are introduced.

The physical reality of the Fourier representation of impulses having complex shape has often been debated. The apparent artificiality of the statement that the only frequencies represented are integral multiples of the fundamental frequency suggests to the skeptic that this is merely a mathematic device. Yet it can easily be seen that if frequencies other than integral multiples were present, they would not repeat at the fundamental interval, so successive waves would not be of the same form, which denies the condition for applying the analysis. Put another way, this means that the cyclical period to be analyzed must be one in which the whole pattern is exactly repeated.

Further discussion on Fourier analysis, frequency spectrum analysis (Taylor, 1966a; Taylor, 1966b; Taylor, 1966c; Taylor, 1966d), and other analyses of wave contour is presented in Chapter 11. Womersley, McDonald, and Taylor established the validity and suitability of applying Fourier analysis to circulatory phenomena even if they were not the first to propose its use (Apéria, 1940; Porjé, 1946; Randall, 1958; McDonald and Taylor, 1959). This approach has been utilized by many over the last 50 years and forms the basis for the work presented in this sixth edition of *Blood Flow in Arteries*, as it did in the first edition.

ANALYSIS IN THE FREQUENCY AND TIME DOMAINS

The concept of the arterial system as being in steady-state oscillation is stressed here because it is foreign to most physiologists and physicians, and because it has been so helpful to us in studies of the arterial system. It has, however, led to the more general concept of frequency spectrum analysis (Taylor, 1965), which, while it does in theory describe the pulse (or better still a series of pulses) as a transient, expresses results in the frequency domain just as does Fourier analysis, while having the additional advantage of covering the whole frequency range between the individual harmonic frequencies of a single pulse. The full potential is realized when applied to data obtained with the heart beating irregularly, as with random electrical stimuli applied to the heart or when the heart rhythm has converted to atrial fibrillation (Taylor, 1966d). Frequency spectrum analysis and other analytical techniques, including the method of characteristics and controversial use of wave intensity analysis, are described more fully in Chapter 11.

It goes without saying that the results of one method of analysis must be reconcilable with the results of another method when applied to the same data. It should be possible to reach the same conclusions with any analytic method. This was a problem at the time that the first edition of this book was published in 1960, when the field of arterial hemodynamics was polarized into those who could only see the pulse as a transient (see Hamilton, 1962; Spencer and Denison, 1963), and those like McDonald who could only see the pulse as a series of harmonics. It is possible to draw these two approaches together and link them with others (see Avolio *et al*., 2009a; O'Rourke, 2009a; and other papers in a special issue of *Medical, Biological, Engineering and Computing*).

In a book such as this, emphasis must be given to details, theoretic and experimental, of blood flow and pressure–flow relationships in different segments of the arterial tree, but the overall perspective of the circulation and its purpose must be retained. Described in its simplest form, the circulation consists of a pump, the heart, which forces blood periodically and rhythmically into a branching system of elastic tubes. The pulsations so generated travel centrifugally and are partially reflected at points of discontinuity (or change in impedance) to travel backwards again (see Chapter 10), while pulsations themselves are normally damped by the time they reach the smallest branches, the capillaries, which are in intimate contact with the cells of the tissues. The blood then returns in a more or less steady stream to the right side of the heart with secondary pulsations imposed in veins by skeletal muscular activity and by the heart itself. The circulation is, of course, far more complicated than this, and the arterial system markedly so, with varied geometric patterns of branching, non-uniform elasticity of arteries, non-linear elastic wall properties, and anomalous viscosity of blood in smaller vessels. Solutions to these problems are sought by detailed descriptions of individual parts of the arterial system, using analytic techniques that are foreign to many and often difficult to comprehend. However, once arterial hemodynamics has been dissected into its component parts, one can synthesize the whole from analysis of arterial pressure and flow waves in single arteries; one then finds that the analysis of the whole complex system of the vascular tree proves to be a great deal simpler than a first look suggests. This book has been written in the hope that such a view – of cohesion, of harmony, and of simplicity arising from complexity – can be transmitted to men and women entering the field, with the expectation that young and flexible minds will enlarge and extend the field and provide further clarification. In this spirit, we provide a summary list of what we see has evolved over the 50 years of this book's publication.

APPLICATION TO CLINICAL PROBLEMS

Application requires simplification. On the basis of what is presented throughout this book, and on the presumption that recordings are accurate, we offer the following as present art, and a tentative foundation for future work.

- To a first approximation, a linear relationship may be assumed between harmonic components of pressure and of flow waves, such that the relationship between pressure and flow at the same point may be described as vascular impedance, and the relationship between pressure waves at different points can be described as a transfer function, i.e. in terms of modulus and phase plotted against frequency.
- Fatigue and fracture of non-living components of the arterial wall can be explained and predicted from conventional engineering theory on strain × frequency curves – i.e. from the relationship between degree of stretch at each cycle and the cumulative number of cycles. This explains degeneration of the aorta and proximal elastic arteries with age, the progressive increase in aortic systolic and pulse pressure, or aortic diameter and increased left ventricular (LV) load and predisposition to hypertrophy and ischemia with age.
- Other things being equal, wave reflection in the arterial tree can be estimated from the secondary boost to arterial pressure after the peak of flow velocity in the ascending aorta.
- The relationship between velocity of LV contraction and afterload is such that increased load or impairment of contractility reduces aortic flow velocity after the early peak of flow velocity in the ascending aorta.
- The secondary boost or augmentation of pressure in late systole can only be interpreted in terms of wave reflection when the aortic flow wave is of almost normal contour – i.e. when the heart contracts normally and functions as a flow source – with output essentially independent of afterload.
- The major component of LV afterload is wave reflection from peripheral sites, mainly in the lower body. Wave reflection can increase pressure or decrease flow or cause a mixture of both. Pressure increase dominates when the heart acts as a flow source. Flow decrease dominates when contraction is weak and the heart acts as a pressure source.
- Drugs which reduce wave reflection have a favorable effect on the heart when reflection returns during systole – i.e. in adults from the third decade on. When the heart is beating strongly and normally, wave reflection decrease is manifest as fall in aortic and LV late systolic pressure (an antihypertensive effect). When the heart contracts weakly, wave reflection decrease is manifest as increase in aortic flow in late systole, with increased LV emptying (an antiheart failure effect). Hence, such drugs are effective in treating both hypertension and heart failure.
- Drugs which decrease muscular tone have a far greater effect on peripheral muscular arteries than on central elastic arteries, and so a far greater effect on wave reflection than on stiffness of the aorta and other elastic central arteries.
- Stiffening of the aorta with age is due to the fracture of elastin fibers with transfer of stress to more rigid components of the wall. The aorta becomes less able to cushion flow pulsations; these extend peripherally into the smallest arteries of vasodilated organs, principally the brain and kidney. Consequent high pulsatile shear stress and radial stress in the small vessels causes damage with obstruction of lumen and disruption of the wall. Consequences include dementia and renal failure.
- The century-old method for assessment of blood pressure (the brachial cuff) is an inadequate method for prognosis and gauge of therapy, and needs to be supplemented by other methods for precise description of arterial stresses and LV load.
- Measurement of aortic pulse wave velocity as an index of stiffness is a robust predictor of cardiovascular events.
- Measurement of aortic central pressure by validated methods adds substantially to use of cuff brachial pressure for predicting cardiovascular events.
- Central aortic pressure cannot reliably be estimated by applanation tonometry applied to the brachial artery at the elbow.
- Subtle effects of gender and race cannot reliably be estimated from cuff sphygmomanometry, but can be uncovered non-invasively from the pressure waveform measured at the wrist or in the neck.
- Entrainment between heart rate and step rate can explain some benefits and hazards of long distance running – the rhythm of running to which athletes aspire, and cardiac arrest from extreme ischemia.

Bibliography

Aars, H. 1971a: Diameter and elasticity of the ascending aorta during infusion of noradrenaline. Acta Physiologica Scandinavica 83, 133–8.

Aars, H. 1971b: Effects of altered smooth muscle tone on aortic diameter and aortic baroreceptor activity in anesthetized rabbits. Circulation Research 28(2), 254–62.

Aatola, H., Koivistoinen, T., Hutri-Kähönen, N. et al. 2010: Lifetime fruit and vegetable consumption and arterial pulse wave velocity in adulthood: The Cardiovascular Risk in Young Finns Study. Circulation 122, 2521–8.

Abbatecola, A.M., Barbieri, M., Rizzo, M.R. et al. 2008: Arterial stiffness and cognition in elderly persons with impaired glucose tolerance and microalbuminuria. Journals of Gerontology. Series A, Biological Sciences and Medical Sciences 63A, 991–6.

Abbott, B.C. and Gordon, D.C. 1975: A commentary on muscle mechanics. Circulation Research 36, 1–7.

Abbott, B.C. and Mommaerts, W.F. 1959: A study of inotropic mechanisms in the papillary muscle preparation. Journal of General Physiology 42, 533.

Abel, F.L. 1971: Fourier analysis of left ventricular performance. Circulation Research 28, 119–35.

Abhayaratna, W.P., Barnes, M.E., O'Rourke, M.F. et al. 2006a: Relation of arterial stiffness to left ventricular diastolic function and cardiovascular risk prediction in patients $\geq$65 years of age. American Journal of Cardiology 98, 1387–92.

Abhayaratna, W.P., Smith, W.T., Becker, N.G. et al. 2006b: Prevalence of heart failure and systolic ventricular dysfunction in older Australians: the Canberra Heart Study. Medical Journal of Australia 184, 151–4.

Abhayaratna, W.P., Srikusalanukul, W. and Budge, M.M. 2008: Aortic stiffness for the detection of preclinical left ventricular diastolic dysfunction: pulse wave velocity versus pulse pressure. Journal of Hypertension 26, 758–64.

Achenbach, S. and Raggi, P. 2010: Imaging of coronary atherosclerosis by computed tomography. European Heart Journal 31, 1442–8.

Acierno, L.J. 2000: Adolph Fick, mathematician, physicist, physiologist. Clinical Cardiology 23(5), 390–1.

Adamopoulos, D., Vyssoulis, G., Karpanou, E. et al. 2010: Environmental determinants of blood pressure, arterial stiffness, and central hemodynamics. Journal of Hypertension 28, 903–9.

Adam, D., Beilin-Nissan, S., Friedman, Z. and Behar, V. 2006: The combined effect of spatial compounding and nonlinear filtering on the speckle reduction in ultrasound images. Ultrasonics 44, 166–81.

Adams, H.P., del Zoppo, G., Alberts, M.J. et al. 2007: Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Group. Stroke 38, 1655–711.

Adams, J.N., Brooks, M., Redpath, T.W. et al. 1995: Aortic distensibility and stiffness index measured by magnetic resonance imaging in patients with Marfan's syndrome. British Heart Journal 73, 265–9.

Adams, M.R. 2006: Clinical assessment of endothelial function. Endothelium 13(6), 367–74.

Adamson, P.B., Magalski, A., Braunschweig, F. et al. 2003: Ongoing right ventricular hemodynamics in heart failure: clinical value of measurements derived from an implantable monitoring system. Journal of the American College of Cardiology 41(4), 565–71.

Adji, A. and O'Rourke, M.F. 2004a: Disparate effects of aging on indices of arterial stiffness and wave reflection. Journal of the American College of Cardiology 43(suppl. A), 528A.

Adji, A. and O'Rourke, M.F. 2004b: Determination of central aortic systolic and pulse pressure from the radial artery pressure waveform. Blood Pressure Monitoring 9, 115–21.

Adji, A., Hirata, K., Hoegler, S. et al. 2007: Noninvasive pulse waveform analysis in clinical trials: similarity of two methods for calculating aortic systolic pressure. American Journal of Hypertension 20(8), 917–22.

Adji, A., O'Rourke, M.F. and Avolio, A. 2009: Disparate effect of ageing in pressure and flow waveform: a modelling study. Hypertension 53, 1099.

Adji, A., O'Rourke, M.F. and Namasivayam, M. 2011: Arterial stiffness, its assessment, prognostic value, and implications for treatment. American Journal of Hypertension 24, 5–17.

Adkisson, E.J., Casey, D.P., Beck, D.T. et al. 2010: Central, peripheral and resistance arterial reactivity: fluctuates during the phases of the menstrual cycle. Experimental Biology and Medicine 235(1), 111–18.

Adler, A.I., Stratton, I.M., Neil, H.A.W. et al. on behalf of the UK Prospective Diabetes Study Group. 2000: Association of systolic blood pressure with macrovascular and microvascular complications of type 2 diabetes (UKPDS 36), Prospective observational study. British Medical Journal 321, 412–19.

Agabiti-Rosei, E., Mancia, G., O'Rourke, M.F. et al. 2007: Central blood pressure measurements and antihypertensive therapy. A consensus document. Hypertension 50, 154–60.

Agapitov, A.V. and Haynes, W.G. 2002: Role of endothelin in cardiovascular disease. Journal of the Renin-Angiotensin-Aldosterone System 3(1), 1–15.

Agarwal, S., Morgan, T., Herrington, D.M. et al. 2011: Coronary calcium score and prediction of all-cause mortality in diabetes: the diabetes heart study. Diabetes Care 34(5), 1219–24.

Aggoun, Y., Bonnet, D., Sidi, D. et al. 2000: Arterial mechanical changes in children with familial hypercholesterolemia. Arteriosclerosis, Thrombosis and Vascular Biology 20(9), 2070–5.

Aggoun, Y., Farpour-Lambert, N.J., Marchand, L.M. et al. 2008: Impaired endothelial and smooth muscle functions and arterial stiffness appear before puberty in obese children and are associated with elevated ambulatory blood pressure. European Heart Journal 29(6), 792–9.

Agmon, Y., Khanderia, B.K., Meissner, I. et al. 2003: Is aortic dilatation an atherosclerosis-related process? Journal of the American College of Cardiology 42, 1076–83.

Ahimastos, A.A., Aggarwal, A., D'Orsa, K. et al. 2007: Effect of perindopril on large artery stiffness and aortic root diameter in patients with Marfan syndrome: a randomized controlled trial. Journal of the American Medical Association 298, 1539–47.

Ahimastos, A.A., Formosa, M., Dart, A.M. and Kingwell, B.A. 2003: Gender differences in large artery stiffness pre- and post puberty. Journal of Clinical Endocrinology and Metabolism 88, 5375–80.

Ahlgren, A.R., Hansen, F., Sonesson, B. et al. 1997: Stiffness and diameter of the common carotid artery and abdominal aorta in women. Ultrasound in Medicine and Biology 23(7), 983–8.

Ahmed, M.M. 1967: Age and sex differences in the structure of the tunica media of the human aorta. Acta Anatomy (Basel) 66(1), 45–58.

Ahuja, K., Robertson, I. and Ball, M. 2009: Acute effects of food on postprandial blood pressure and measures of arterial stiffness in healthy humans. American Journal of Clinical Nutrition 90, 298–303.

Ainstie, F.E. 1866: The Sphygmograph in English Medical Practice (letter to the editor). Lancet I, 671.

Aizer, J., Karlson, E.W., Chibnik, L.B. et al. 2009: A controlled comparison of brachial artery flow mediated dilation (FMD) and digital pulse amplitude tonometry (PAT) in the assessment of endothelial function in systemic lupus erythematosus. Lupus 18(3), 235–42.

Akasaka, T., Yamamuro, A., Kamiyama, N. et al. 2003: Assessment of coronary flow reserve by coronary pressure measurement: comparison with flow- or velocity-derived coronary flow reserve. Journal of the American College of Cardiology 41(9), 1554–60.

Akhtar, M., Wu, G.F., Du, Z.M. et al. 2006: Effect of external counterpulsation on plasma nitric oxide and endothelin-1 levels. American Journal of Cardiology 98(1), 28–30.

Alam, T.A., Seifalian, A.M. and Baker, D. 2005: A review of methods currently used for assessment of in vivo endothelial function. European Journal of Vascular and Endovascular Surgery 29, 269–76.

Albaladejo, P., Laurent, P., Pannier, B. et al. 2003: Influence of sex on the relation between heart rate and aortic stiffness. Journal of Hypertension 21(3), 555–62.

Albrecht, K.H., Gaehtgens, P., Pries, A. et al. 1979: The Fahraeus effect in narrow capillaries (i.d. 3.3 to 11.0 mm). Microvascular Research 18, 33–47.

Alderman, M.H., Cohen, H. and Madhavan, S. 1998: Dietary sodium intake and mortality: the National Health and Nutrition Examination Survey (NHANES I). Lancet 351(9105), 781–5.

Alecu, C., Gueguen, R., Aubry, C. et al. 2006: Determinants of arterial stiffness in an apparently healthy population over 60 years. Journal of Human Hypertension 20(10), 749–56.

Alecu, C., Labat, C., Kearney-Schwartz, A. et al. 2008: Reference values of aortic pulse wave velocity in the elderly. Journal of Hypertension 26, 2207–12.

Alessandri, N., Franzin, S., Sulpizii, L. et al. 1995: [Wall elasticity of the ascending aorta in ischemic heart disease]. Cardiologia 40(3), 173–81.

Alexander, J., Burkhoff, D., Schipke, J. et al. 1989: Influence of mean pressure on aortic impedance and reflections in the systemic arterial system. American Journal of Physiology 257, H969–H978.

Alexander, R.S. 1953: The genesis of the aortic standing wave. Circulation Research 1, 145–51.

Alexander, R.S. 1954: The influence of constrictor drugs on the distensibility of the splanchnic venous system, analyzed on the basis of an aortic model. Circulation Research 2, 140–7.

Alexopoulos, N., Vlachopoulos, C., Aznaouridis, K. et al. 2008: The acute effect of green tea consumption on endothelial function in healthy individuals. European Journal of Cardiovascular Prevention and Rehabilitation 15, 300–5.

Alfie, J., Galarza, C. and Waisman, G. 2005: Noninvasive hemodynamic assessment of the effect of mean arterial pressure on the amplitude of pulse pressure. American Journal of Hypertension 18(2 Pt 2), 60S–64S.

Ali, K., Rajkumar, C., Fantin, F. et al. 2009: Irbesartan improves arterial compliance more than lisinopril. Vascular Health and Risk Management 5(4), 587–92.

ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group 2002: Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blocker vs diuretic. Journal of the American Medical Association 288, 2981–97.

Almoznino-Sarafian, D., Sarafian, G., Zyssman, I. et al. 2009: Application of HRV-CD for estimation of life expectancy in various clinical disorders. European Journal of Internal Medicine 20(8), 779–83.

Al-Solaiman, Y., Jesri, A., Zhao, Y. et al. 2009: Low-sodium DASH reduces oxidative stress and improves vascular function in salt-sensitive humans. Journal of Human Hypertension 23, 826–35.

Altobelli, S.A. and Nerm, R.M. 1885: An experimental study of coronary artery fluidmechanics. Journal of Biomechical Engineering 107(1), 16–23.

Amar, J., Ruidavets, J.B., Chamontin, B. et al. 2001: Arterial stiffness and cardiovascular risk factors in a population-based study. Journal of Hypertension 19, 381–87.

Amarenco, P., Cohen, A., Tzourio, C. et al. 1994: Atherosclerotic disease of the aortic arch and the risk of ischemic stroke. New England Journal of Medicine 331(22), 1474–9.

Ambrose, J.A. and Barua, R.S. 2004: The pathophysiology of cigarette smoking and cardiovascular disease: an update. Journal of the American College of Cardiology 43, 1731–7.

American Diabetes Association Position Statement 2002: Diabetic nephropathy. Diabetes Care 25(suppl. 1), S85–9.

Amery, A., Birkenhager, W., Brixko, R. et al. 1986: Efficacy of antihypertensive drug treatment according to age, sex, blood pressure, and previous cardiovascular disease in patients over the age of 60. Lancet 2, 589–92.

Amery, A., Brixko, P., Clement, D. et al. 1985: Mortality and morbidity results from the European working party on high blood pressure in the elderly trial. Lancet, 1349–54.

Amin, T.M. and Sivs, J.A. 1985: The blood rheology of man and various animal species. Quarterly Journal Experimental Physiology 70, 37–49.

Anastas, Z.M., Jimerson, E. and Garolis, S. 2008: Comparison of noninvasive blood pressure measurements in patients with atrial fibrillation. Journal of Cardiovascular Nursing 23(6), 519–24.

Anderson, C.S., Huang, Y., Wang, J.G. et al. for the INTERACT Investigators 2008: Intensive blood pressure reduction in acute cerebral haemorrhage trial (INTERACT): a randomised pilot trial. Lancet Neurology 7, 391–9.

Anderson, E.A. and Mark, A.L. 1989: Flow-mediated and reflex changes in large peripheral artery tone in humans. Circulation 79(1), 93–100.

Anderson, R.D., Sizemore, B.C., Barrow, G.M. et al. 2008: Pulse pressure and adverse outcomes in women: a report from the Women's Ischemia Syndrome Evaluation (WISE). American Journal of Hypertension 21(11), 1224–30.

Anderson, S.G., Sanders, T.A. and Cruickshank, J.K. 2009: Plasma fatty acid composition as a predictor of arterial stiffness and mortality. Hypertension 53, 839–45.

Anderson, T.J. 1999: Assessment and treatment of endothelial dysfunction in humans. Journal American College Cardiology 34, 631–8.

Anderson, T.J. 2007: Prognostic significance of brachial flow-mediated vasodilation. Circulation 115(18), 2373–5.

Anderson, T.J., Elstein, E., Haber, H. et al. 2000: Comparative study of ACE-inhibition, angiotensin II antagonism, and calcium channel blockade on flow-mediated vasodilation in patients with coronary disease (BANFF study). Journal of the American College of Cardiology 35(1), 60–6.

Anderson, T.J., Uehata, A., Gerhard, M.D. et al. 1995: Close relation of endothelial function in the human coronary and peripheral circulations. Journal of the American College of Cardiology 26(5), 1235–41.

Anderson, T.J., Meredith, I.T., Yeung, A.C. et al. 1995a: The effect of cholesterol-lowering and antioxidant therapy on endothelium-dependent coronary vasomotion. New England Journal of Medicine 332(8), 488–93.

Anderson, T.J., Uehata, A., Gerhard, M.D. et al. 1995b: Close relation of endothelial function in the human coronary and peripheral circulations. Journal of the American College of Cardiology 26(5), 1235–41.

Ando, J., Tsuboi, H., Korenaga, R. et al. 1994: Shear stress inhibits adhesion of cultured mouse endothelial cells to lymphocytes by downregulating VCAM-1 expression. American Journal of Physiology 267, C679–87.

Andreadis, E.A., Sfakianakis, M.E., Tsourous, G.I. et al. 2010: Differential impact of angiotensin receptor blockers and calcium channel blockers on arterial stiffness. International Journal of Angiology 29(3), 266–72.

Angelakos, E.T. 1964: Semiconductor pressure microtransducers for measuring velocity and acceleration of intraventricular pressures. American Journal of Medical Electronics 3, 266–70.

Angelsen, B.A. 1980: A theoretical study of the scattering of ultrasound from blood. IEEE Transactions on Biomedical Engineering 27(2), 61–7.

Angouras, D., Sokolis, D.P., Dosios, T. et al. 2000: Effect of impaired vasa vasorum flow on the structure and mechanics of the thoracic aorta, implications for the pathogenesis of aortic dissection. European Journal of Cardiothoracic Surgery 17(4), 468–73.

Ankle Brachial Index Collaboration, Fowkes, F.G., Murray, G.D., Butcher, I. et al. 2008: Ankle brachial index combined with Framingham Risk Score to predict cardiovascular events and mortality: a meta-analysis. Journal of the American Medical Association 300, 197–208.

Anliker, M., Moritz, W.E. and Ogden, E. 1968a: Transmission characteristics of axial waves in blood vessels. Journal of Biomechanics 1, 235–46.

Anliker, M., Histand, M.B. and Ogden, E. 1968b: Dispersion and attenuation of small artificial pressure waves in the canine aorta. Circulation Research 23, 539–51.

Antman, E.M., Bennett, J.S., Daugherty, A. et al. 2007: Use of nonsteroidal antiinflammatory drugs: an update for clinicians. A scientific statement from the American Heart Association. Circulation 115, 1634–42.

Antonini-Canterin, F., Roşca, M., Beladan, C.C. et al. 2009: Echo-tracking assessment of carotid artery stiffness in patients with aortic valve stenosis. Echocardiography 26(7), 823–31.

Anversa, P., Olivetti, G., Leri, A. et al. 1997: Myocyte cell death and ventricular remodeling. Current Opinion in Nephrology and Hypertension 6, 169–76.

Apéria, A. 1940: Haemodyanamical studies. Scandinavian Archives of Physiology 83(suppl. 1), 1–230.

Applegate, R.J. 2010: Fractional flow reserve-guided stent therapy for multivessel disease: taking a closer look. Journal of the American College of Cardiology 55, 2822–4.

Apter, J.T. 1966: Correlation of visco-elastic properties of large arteries with microscopic structure: I. Methods used and their justification. III. Circumferential viscous and elastic constants measured in vitro. Circulation Research 19, 104–21.

Apter, J.T. 1967: Correlation of visco-elastic properties of large arteries with microscopic structure: IV. Thermal responses of collagen, elastin, smooth muscle, and intact arteries. Circulation Research 21, 901–18.

Apter, J.T., Rabinowitz, M. and Cummings, D.H. 1966: Correlation of visco-elastic properties of large arteries with microscopic structure: II. Collagen, elastin, and muscle determined chemically, histologically, and physiologically. Circulation Research 19, 104–21.

Apter, J.T., Marquez, E. and Janas, M. 1970: Dynamic visco-elastic anisotropy of canine aorta correlated with wall composition: III. Association for the Advancement of Medical Instrumentation 4, 15–21.

Arcaro, G., Laurent, S., Benetos, A. et al. 1991a: Heterogeneous effect of nitrates on large arteries of hypertensives. Journal of Hypertension 9(suppl. 6), S142–S143.

Arcaro, G., Laurent, S., Jondeau, G. et al. 1991b: Stiffness of the common carotid artery in treated hypertensive patients. Journal of Hypertension 9(10), 947–54.

Ardehali, A., Segal, J. and Cheitlin, M.D. 1995: Coronary blood flow reserve in acute aortic regurgitation. Journal of the American College of Cardiology 25(6), 1387–92.

Arena, R., Myers, J., Williams, M.A. et al. 2007: Assessment of functional capacity in clinical and research settings: a scientific statement from the American Heart Association Committee on Exercise, Rehabilitation, and Prevention of the Council on Clinical Cardiology and the Council on Cardiovascular Nursing. Circulation 116, 329–43.

Aretz, H.T., Martinelli, M.A. and LeDet, E.G. 1989: Intraluminal ultrasound guidance of transverse laser coronary atherectomy. International Journal of Cardiac Imaging 4, 153–7.

Argacha, J.F., Adamopoulos, D., Gujic, M. et al. 2008: Acute effects of passive smoking on peripheral vascular function. Hypertension 51, 1506–11.

Arguedas, J.A., Perez, M.I. and Wright, J.M. 2009: Treatment blood pressure targets for hypertension. Cochrane Database of Systemic Reviews (3), CD004349.

Arheden, H., Saeed, M., Higgins, C.B. et al. 1999: Measurement of the distribution volume of gadopentetate dimeglumine at echo-planar MR imaging to quantify myocardial infarction: comparison with 99mTc-DTPA autoradiography in rats. Radiology 211(3), 698–708.

Aristizabal, D., Messerli, F.H. and Frohlich, E.D. 1994: Disparate structural effects on left and right ventricles by angiotensin-converting enzyme inhibitors and calcium antagonists in essential hypertension. American Journal of Cardiology 73(7), 483–7.

Armentano, R.L., Levenson, J., Barra, J.G. et al. 1991: Assessment of elastin and collagen contribution to aortic elasticity in conscious dogs. American Journal of Physiology 260, H1870–H1877.

Armentano, R., Megnien, J.L., Simon, A. et al. 1995: Effects of hypertension on viscoelasticity of carotid and femoral arteries in humans. Hypertension 26(1), 48–54.

Armentano, R.L., Santana, D.B., Cabrera Fischer, E.I. et al. 2006: An *in vitro* study of cryopreserved and fresh human arteries: a comparison with ePTFE prostheses and human arteries studied non-invasively *in vivo*. Cryobiology 52(1), 17–26.

Arndt, J.O., Klauske, J. and Mersch, F. 1968: The diameter of the intact carotid artery in man and its change with pulse pressure. Pflüger's Archivs gesamte Physiologie Menschen Tiere Physiol 301, 230–40.

Arndt, J.O., Stegall, H.F. and Wicke, H.J. 1971: Mechanics of the aorta in vivo. Circulation Research 28, 693–704.

Arnett, D.K., Chambless, L.E., Kim, H. et al. 1999: Variability in ultrasonic measurements of arterial stiffness in the Atherosclerosis Risk in Communities study. Ultrasound in Medicine and Biology 25(2), 175–80.

Arnold, J.M.O., Marchiori, G.E., Imrie, J.R. et al. 1991: Large artery function in patients with chronic heart failure: studies of brachial artery diameter and hemodynamics. Circulation 84, 2418–25.

Arroyo, L.H. and Lee, R.T. 1999: Mechanisms of plaque rupture: mechanical and biologic interactions. Cardiovascular Research 41(2), 369–75.

Arts, T., Kruger, R.T.I., Van Gerven, W. et al. 1979: Propagation velocity and reflection of pressure waves in the canine coronary artery. American Journal of Physiology 237, H469–H474.

Asahara, T., Murohara, T., Sullivan, A. et al. 1997: Isolation of putative progenitor endothelial cells for angiogenesis. Science 275, 964–7.

Asberg, A., Hartmann, A., Fjeldsa, E. and Holdaas, H. 2001: Atorvastatin improves endothelial function in renal-transplant recipients. Nephrology, Dialysis and Transplantation 16(9), 1920–4.

Ashton, H.A., Buxton, M.J., Day, N.E. et al. Multicentre Aneurysm Screening Study Group. 2002: The Multicentre Aneurysm Screening Study (MASS) into the effect of abdominal aortic aneurysm screening on mortality in men: a randomised controlled trial. Lancet 360(9345), 1531–9.

Asmar, R. 1999: Arterial stiffness and pulse wave velocity, clinical applications. Paris: Elsevier.

Asmar, R.G., Journo, H.J., Lacolley, P.J. et al. 1988a: Treatment for one year with perindopril: effect on cardiac mass and arterial compliance in essential hypertension. Journal of Hypertension 6(suppl. 3), S33–S39.

Asmar, R.G., Pannier, B., Santoni, J.P. et al. 1988b: Reversion of cardiac hypertrophy and reduced arterial compliance after converting enzyme inhibition in essential hypertension. Circulation 78, 941–50.

Asmar, R.G., Benetos, A., Chaouche-Teyara, K. et al. 1993: Comparison of effects of felodipine versus hydrochlorothiazide on arterial diameter and pulse-wave velocity in essential hypertension. American Journal of Cardiology 72, 794–8.

Asmar, R., Benetos, A., Topouchian, J. et al. 1995a: Assessment of arterial distensibility by automatic pulse wave velocity measurement – validation and clinical application studies. Hypertension 26, 485–90.

Asmar, R., Benetos, A., London, G. et al. 1995b: Aortic distensibility in normotensive, untreated and treated hypertensive patients. Blood Pressure 4(1), 48–54.

Asmar, R., Vol, S., Brisac, A.M. et al. 2001a: Reference values for clinical pulse pressure in a non-selected population. American Journal of Hypertension 14, 415–18.

Asmar, R.G., London, G.M., O'Rourke, M.F. and Safar, M.E. for the REASON Project Coordinators and Investigators. 2001b: Improvement in blood pressure, arterial stiffness and wave reflections with a very-low-dose perindopril/indapamide combination in hypertensive patients, a comparison with atenolol. Hypertension 38, 922–6.

Asmar, R.G., London, G.M., O'Rourke, M.F. et al. 2001d: Amelioration of arterial properties with a perindopril-indapamide very-low dose combination. Journal of Hypertension Supplement 19, S15–S20.

Assmann, G., Carmena, R., Cullen, P. et al. 1999: Coronary heart disease: reducing the risk: a worldwide view. International Task Force for the Prevention of Coronary Heart Disease. Circulation 100(18), 1930–38.

Assmus, B., Schachinger, V., Teupe, C. et al. 2002: Transplantation of progenitor cells and regeneration enhancement in acute myocardial infarction (TOPCARE-AMI). Circulation 106, 3009–17.

Astrand, H., Rydén-Ahlgren, A., Sandgren, T. et al. 2005: Age-related increase in wall stress of the human abdominal aorta: an in vivo study. Journal of Vascular Surgery 42(5), 926–31.

Atabek, H.B., Chang, C.C. and Fingerson, L.M. 1964: Measurement of laminar oscillatory flow in the inlet length of a circular tube. Physics in Medicine and Biology 9, 219–27.

Atabek, H.B., Ling, S.C. and Patel, D.J. 1975: Analysis of coronary flow fields in thoracotomized dogs. Circulation Research 37(6), 752–61.

Atkinson, J. 2008: Age-related medial elastocalcinosis in arteries: mechanisms, animal models, and physiological consequences. Journal of Applied Physiology 105(5), 1643–51.

Attinger, E.O. 1963: Pressure transmission in pulmonary arteries related to frequency and geometry. Circulation Research 12, 623–41.

Attinger, E.O., Anne, A. and McDonald, D.A. 1966a: Use of Fourier series for the analysis of biological systems. Biophysical Journal 6, 291–304.

Attinger, E.O., Sugawara, H., Navarro, A. et al. 1966b: Pulsatile flow patterns in distensible tubes. Circulation Research 18, 447–56.

Attinger, E.O., Sugawara, H., Navarro, A. et al. 1966c: Pressure–flow relationships in dog arteries. Circulation Research 19, 230–46.

Attinger, E.O., Sugawara, H., Navarro, A. et al. 1967: Flow patterns in the peripheral circulation of the anesthetized dog. Angiologica 4, 1–27.

Attinger, F.M.L. 1968: Two-dimensional in vitro studies of femoral arterial walls of the dog. Circulation Research 22, 829–40.

Aurigemma, G.P., Gaasch, W.H., McLaughlin, M. et al. 1995: Reduced left ventricular systolic pump performance and depressed myocardial contractile function in patients > 65 years of age with normal ejection fraction and a high relative wall thickness. American Journal of Cardiology 76(10), 702–5.

Avanzini, F., Bettelli, G., Alli, C. et al. 1995: The prognostic significance of systolic and diastolic blood pressure in the elderly. Suggestions of a 10 year follow-up study. Journal of the American College of Cardiology 25, 178A.

Averbook, A.W. and Wilson, S.E. 1994: Epidemiology of atherosclerosis and its modification. In: Veith, F.J., Hobson, R.W., Williams, R.A. and Wilson, S.E. (eds), Vascular surgery – principles and practice, 2nd edn. New York: McGraw-Hill, pp. 40–54.

Averkiou, M.A. and Hamilton, M.F. 1995: Measurements of harmonic generation in a focussed finite-amplitude sound beam. Journal of the Acoustical Society of America 98, 3439–42.

Averkiou, M.A. and Powers, J.E. 2001: Ultrasonic pulse inversion harmonic separation with reduced motional effects.

Aversa, A., Caprio, M., Rosano, G.M. et al. 2008: Endothelial effects of drugs designed to treat erectile dysfunction. Current Pharmaceutical Design 14(35), 3768–78.

Avolio, A.P. 1976: Hemodynamic studies and modeling of the mammalian arterial system. PhD thesis, University of NSW, Sydney.

Avolio, A.P. 1980: A multibranched model of the human arterial system. Medical and Biological Engineering and Computing 18, 709–18.

Avolio, A. 1994: Increased aortic impedance. Circulation 89(6), 2945–6.

Avolio, A. 2002: The finger volume pulse and assessment of arterial properties. Journal of Hypertension 20, 2341–3.

Avolio, A. 2003: Salt sensitivity and arterial structure and function. Journal of Hypertension 21, 251–3.

Avolio, A. 2004: Pulse pressure and inflammatory markers. Journal of Hypertension 22, 247–9.

Avolio, A. 2009: Input impedance of distributed arterial structures as used in investigations of underlying concepts in arterial haemodynamics. Medical and Biological Engineering and Computing 47(2), 143–51.

Avolio, A.P., O'Rourke, M.F., Mang, K. et al. 1976: A comparative study of pulsatile arterial hemodynamics in rabbits and guinea pigs. American Journal of Physiology 230, 868–75.

Avolio, A.P., O'Rourke, M.F., Bulliman, B.T. et al. 1982: Systemic arterial hemodynamics in the diamond python (*Morelia spilotes*). American Journal of Physiology 243, R205–R212.

Avolio, A.P., Chen, S., Wang, R. et al. 1983: Effects of aging on changing arterial compliance and left ventricular load in a northern Chinese urban community. Circulation 68, 50–8.

Avolio, A.P., Nichols, W.W. and O'Rourke, M.F. 1984: Exaggerated wave reflection in the kangaroo simulates arterial counterpulsation. American Journal of Physiology 246, R267–R270.

Avolio, A.P., Deng, F.Q., Li, W.Q. et al. 1985a: Effects of aging on arterial distensibility in populations with high and low prevalence of hypertension: comparison between urban and rural communities in China. Circulation 71(2), 202–10.

Avolio, A.P., Nichols, W.W. and O'Rourke, M.F. 1985b: Propagation of pressure pulse in kangaroo arterial system. American Journal of Physiology 249, R335–R340.

Avolio, A.P., Clyde, K.M., Beard, T.C. et al. 1986: Improved arterial distensibility in normotensive subjects on a low salt diet. Arteriosclerosis 6, 166–9.

Avolio, A.P., Kelly, R.P., Hayward, C.S. et al. 1988: Noninvasive registration of the arterial pulse waveform using high fidelity applanation tonometry. FASEB Journal 2, A316.

Avolio, A., Jones, D. and Tafazzoli-Shadpour, M. 1998: Quantification of alterations in structure and function of elastin in the arterial media. Hypertension 32(1), 170–5.

Avolio, A., Qasem, A. and Park, Y.J. 2001: Noninvasive estimation of baroreflex sensitivity using pressure pulse amplification. IEEE Engineering in Medicine and Biology 20, 53–8.

Avolio, A., Iliopoulos, J., Walsh, W. and O'Rourke, M. 2002: Mechanical preconditioning of the thoracic aorta. Symposium on Mechanical Factors in Cardiovascular Disease. 4th International Congress of Pathophysiology. Budapest, June 29–July 25.

Avolio, A.P., Cockcroft, J.R. and O'Rourke, M.F. 2004: Use of arterial transfer functions for the derivation of central aortic waveform characteristics in subjects with type 2 diabetes and cardiovascular disease. Diabetes Care 27, 2564–5.

Avolio, A., Westerhof, B.E., Siebes, M. et al. 2009a: Arterial hemodynamics and wave analysis in the frequency and time domains: an evaluation of the paradigms. Medical, Biological, Engineering and Computing 47, 107–10.

Avolio, A.P., van Bortel, L.M., Boutouyrie, P. et al. 2009b: Role of pulse pressure amplification in arterial hypertension. Experts' opinion and review of the data. Hypertension 54, 375–83.

Axelsson, J., Reinprecht, F., Siennicki-Lantz, A. et al. 2008: Low ambulatory blood pressure is associated with lower cognitive function in healthy elderly men. Blood Pressure Monitoring 13, 269–76.

Ay, H., Arsava, E.M., Gungor, L. et al. 2008: Admission international normalized ratio and acute infarct volume in ischemic stroke. Annals of Neurology 64(5), 499–506.

Ayer, J.G., Harmer, J.A., Marks, G.B. et al. 2010: Central arterial pulse wave augmentation is greater in girls than boys, independent of height. Journal of Hypertension 28, 306–13.

Azeka, E., Franchini Ramires, J.A., Valler, C. et al. 2002: Delisting of infants and children from the heart transplantation waiting list after carvedilol. Journal of the American College of Cardiology 40(11), 2034–8.

Azer, K. and Peskin, C.S. 2007: A one-dimensional model of blood flow in arteries with friction and convection based on the Womersley velocity profile. Cardiovascular Engineering 7(2), 51–73.

Bache, R.J. 1998: Vasodilator reserve: a functional assessment of coronary health. Circulation 98(13), 1257–60.

Badeer, H.S. 2001: Hemodynamics for medical students. Advances in Physiological Education 25(1–4), 44–52.

Bae, J.H., Kim, W.S., Rihal, C.S. and Lerman, A. 2006: Individual measurement and significance of carotid intima, media, and intima-media thickness by B-mode ultrasonographic image processing. Arteriosclerosis, Thrombosis and Vascular Biology 26, 2380–5.

Baez, S. 1968: Bayliss response in the microcirculation. Federation Proceedings 27, 1410–15.

Baez, S., Lamport, H. and Baez, A. 1960: Pressure effects in living microscopic vessels. In: Copley, A.L. and Stainsby, G. (eds), Flow properties of blood. London: Pergamon Press.

Bagshaw, R.J. and Attinger, F.M.L. 1972: Two-directional delayed compliance in the canine abdominal aorta. Experientia 28, 803–4.

Baguet, J.P., Kingwell, B.A., Dart, A.L. et al. 2003: Analysis of the regional pulse wave velocity by Doppler: methodology and reproducibility. Journal of Human Hypertension 17(6), 407–12.

Baim, D.S. 2005: Grossman's cardiac catheterization, angiography and intervention, 7th edn. Baltimore: Lippincot/Williams and Wilkins.

Baim, D.S. and Grossman, W. (eds). 2000: Grossman's cardiac catheterization, angiography, and intervention, 6th edn. Philadelphia: Lippincott Williams, Wilkins.

Bairey Merz, C.N., Johnson, B.D., Sharaf, B.L. et al. 2003: WISE Study Group. Hypoestrogenemia of hypothalamic origin and coronary artery disease in premenopausal women: a report from the NHLBI-sponsored WISE study. Journal of the American College of Cardiology 41, 413–19.

Baker, D.W. 1966: Pulsed ultrasonic flowmeter. Methods of Medical Research 11, 107–17.

Baker, D.W., Forster, F.K. and Daigle, R.E. 1978: Doppler principles and techniques. In: Fry, F.J. (ed.), Ultrasound: its application in medicine and biology, Part I. New York: Elsevier, pp. 219–54.

Bakris, G. 2005: Proteinuria: a link to understanding changes in vascular compliance? Hypertension 46, 473–4.

Baksi, A.J., Treibel, T.A., Davies, J.E. et al. 2009: A meta-analysis of the mechanism of blood pressure change with aging. Journal of the American College of Cardiology 54, 2087–92.

Baldassarre, D., Amato, M., Bondioli, A. et al. 2000: Carotid artery intima-media thickness measured by ultrasonography in normal clinical practice correlates well with atherosclerosis risk factors. Stroke 31(10), 2426–30.

Baldassarre, D., Amato, M., Bondioli, A. et al. 2000a: Carotid artery intima-media thickness measured by ultrasonography in normal clinical practice correlates well with atherosclerosis risk factors. Stroke 31, 2426–30.

Baldassarre, D., Tremoli, E., Amato, M. et al. 2000b: Reproducibility validation study comparing analog and digital imaging technologies for the measurement of intima-media thickness. Stroke 31, 1104–10.

Ball, R.M. and Bache, R.J. 1976: Distribution of myocardial blood flow in the exercising dog with restricted coronary artery inflow. Circulation Research 38, 60–6.

Banerjee, P., Banerjee, T., Khand, A. et al. 2002: Diastolic heart failure: neglected or misdiagnosed? Journal of the American College of Cardiology 39, 138–41.

Bangalore, S., Messerli, F.H., Franklin, S.S. et al. 2009: Pulse pressure and risk of cardiovascular outcomes in patients with hypertension and coronary artery disease: an INternational VErapamil SR-trandolapril Study (INVEST) analysis. European Heart Journal 30(11), 1395–401.

Bank, A.J. and Kaiser, D.R. 1998: Smooth muscle relaxation – effect on arterial compliance, distensibility, elastic modulus, and pulse wave velocity. Hypertension 32, 356–9.

Bank, A.J., Wilson, R.F., Kubo, S.H. et al. 1995: Direct effects of smooth muscle relaxation and contraction on in vivo human brachial artery elastic properties. Circulation Research 77, 1008–16.

Bank, A.J., Wang, H., Holte, J.E. et al. 1996: Contribution of collagen, elastin, and smooth muscle to in vivo human brachial artery wall stress and elastic modulus. Circulation 94, 3263–70.

Bank, A.J., Kaiser, D.R., Rajala, S. and Cheng, A. 1999: In vivo human brachial artery elastic mechanics: effects of smooth muscle relaxation. Circulation 100(1), 41–7.

Banyai, S., Banyai, M., Falger, J. et al. 2001: Atorvastatin improves blood rheology in patients with familial hypercholesterolemia (FH) on long-term LDL apheresis treatment. Atherosclerosis 159(2), 513–19.

Barasch, E., Benderly, M., Graff, E. et al. 1995: Plasma fibrinogen levels and their correlates in 6457 coronary heart disease patients. The Bezafibrate Infarction Prevention (BIP) Study. Journal of Clinical Epidemiology 48(6), 757–65.

Barbee, J.H. and Cokelet, G.R. 1971: Prediction of blood flow in tubes with diameters as small as 29 m. Microvascular Research 3, 17–21.

Barbee, K.A., Davies, P.F. and Lal, R. 1994: Shear stress-induced reorganization of the surface topography of living endothelial cells imaged by atomic force microscopy. Circulation Research 74, 163–71.

Barbee, K.A., Mundel, T., Lal, R. et al. 1995: Subcellular distribution of shear stress at the surface of flow-aligned and nonaligned endothelial monolayers. American Journal of Physiology 268, H1765–72.

Barbee, KA. 2002: Role of subcellular shear-stress distributions in endothelial cell mechanotransduction. Annals of Biomedical Engineering 30, 472–82.

Barbey, F., Brakch, N., Linhart, A. et al. 2006: Increased carotid intima-media thickness in the absence of atherosclerotic plaques in an adult population with Fabry disease. Acta Paediatrica. Supplement 95(451), 63–8.

Barbosa, A.S., Pereira, A.K., Reis, Z.S.N. et al. 2010: Ophthalmic artery-resistive index and evidence of overperfusion-related encephalopathy in severe preeclampsia. Hypertension 55, 189–93.

Bard, P. 1961: Medical physiology, 11th edn. New York: Mosby.

Barenbrock, M., Hausberg, M., Kosch, M. et al. 1999: Flow-mediated vasodilation and distensibility in relation to intima-media thickness of large arteries in mild essential hypertension. American Journal Hypertension 12, 973–9.

Bargainer, J.D. 1967: Pulse wave velocity in the pulmonary artery of the dog. Circulation Research 20, 630–7.

Barker, P.C., Ensing, G., Ludomirsky, A. et al. 2002: Comparison of simultaneous invasive and noninvasive measurements of pressure gradients in congenital aortic valve stenosis. Journal of the American Society of Echocardiography 15(12), 1496–502.

Barnes, R.J., Comline, R.S., Dobson, A. et al. 1983: An implantable transit-time ultrasonic blood flowmeter. Journal of Physiology 35, 2.

Barnhart, H.X., Haber, M.J. and Lin, L.I. 2007: An overview on assessing agreement with continuous measurements. Journal of Biopharmaceutical Statistics 17(4), 529–69.

Barr, G. 1931: A monograph of viscometry. London: Oxford University Press.

Barra, J.G., Armentano, R.L., Levenson, J. et al. 1993: Assessment of smooth muscle contribution to descending thoracic aortic elastic mechanics in conscious dogs. Circulation Research 73(6), 1040–50.

Barry, W.H. and Gilbert, E.M. 2003: How do beta-blockers improve ventricular function in patients with congestive heart failure? Circulation 107, 2395–7.

Barst, R.J., Langleben, D., Badesch, D. et al. 2006: Treatment of pulmonary arterial hypertension with the selective endothelin-A receptor antagonist Sitaxsentan. Journal of the American College of Cardiology 47, 2049–56.

Barst, R.J., Rubin, L.J., Long, W.A. et al. 1996: A comparison of continuous intravenous epoprostenol (prostacyclin) with conventional therapy for primary pulmonary hypertension: the Primary Pulmonary Hypertension Study Group. New England Journal of Medicine 334, 296–302.

Barzilay, J.I., Davis, B.R., Cutler, J.A. et al. 2006: Fasting glucose levels and incident diabetes mellitus in older nondiabetic adults randomized to receive 3 different classes of antihypertensive treatment. Archives of Internal Medicine 166, 2191–201.

Barzilay, J.I., Spiekerman, C.F., Wahl, P.W. et al. 1999: Cardiovascular disease in older adults with glucose disorders, comparison of American Diabetes Association criteria for diabetes mellitus with WHO criteria. Lancet 354, 622–25.

Basaria, S. and Dobs, A.S. 2007: Testosterone making an entry into the cardiometabolic world. Circulation 116, 2658–61.

Basaria, S., Coviello, A.D., Travison, T.G. et al. 2010: Adverse events associated with testosterone administration. New England Journal of Medicine 363, 109–22.

Baskett, J.J., Beasley, M.G., Murphy, G.J. et al. 1977: Screening for carotid junction disease by spectral analysis of Doppler signals. Cardiovascular Research 11, 147–55.

Baskett, J.J., Lewis, R.R., Beasley, M.G. et al. 1990: Changes in carotid artery compliance with age. Age and Ageing 19, 241–6.

Baskurt, O.K. and Meiselman, H.J. 2007: Hemodynamic effects of red blood cell aggregation. Indian Journal of Experimental Biology 45(1), 25–31.

Bassiouny, H.S., Zarins, C.K., Kadowaki, M.H. et al. 1994: Hemodynamic stress and experimental aortoiliac atherosclerosis. Journal of Vascular Surgery 19, 426–34.

Bateman, D.N. 2000: Triptans and migraine. Lancet 355, 860–61.

Bateman, G.A. 2002a: Pulse-wave encephalopathy: a comparative study of the hydrodynamics of leukoaraiosis and normal-pressure hydrocephalus. Neuroradiology 44, 740–8.

Bateman, G.A. 2002b: Vascular hydraulics association with idiopathic and secondary intracranial hypertension. American Journal of Neuroradiology 23, 1180–6.

Bateman, G.A. 2003: The reversibility of reduced cortical vein compliance in normal-pressure hydrocephalus following shunt insertion. Neuroradiology 45, 65–70.

Bateman, G.A. 2004: Pulse wave encephalopathy: a spectrum hypothesis incorporating Alzheimer's disease, vascular dementia and normal pressure hydrocephalus. Medical Hypotheses 62, 182–7.

Bateman, G.A. 2008: The pathophysiology of idiopathic normal pressure hydrocephalus: cerebral ischemia or altered venous hemodynamics? American Journal of Neuroradiology 29, 198–203.

Bateman, G.A., Levi, C., Schofield, P. et al. 2008: The venous manifestations of pulse wave encephalopathy: windkessel dysfunction in normal aging and senile dementia. Neuroradiology 50, 491–7.

Baughman, K.L. 2002: B-type natriuretic peptide – a window to the heart (Editorial). New England Journal of Medicine 347, 158–9.

Baumbach, G.L. and Heistad, D.D. 1985: Heterogeneity of brain flow and permeability during acute hypertension. American Journal of Physiology Heart and Circulatory Physiology 249, 629–37.

Baumbach, G.L., Dobrin, P.B., Hart, M.N. et al. 1988: Mechanics of cerebral arterioles in hypertensive rats. Circulation Research 62(1), 56–64.

Baumgartner, D., Baumgartner, C., Schermer, E. et al. 2006: Different patterns of aortic wall elasticity in patients with Marfan syndrome: a noninvasive follow-up study. Journal of Thoracic and Cardiovascular Surgery 132(4), 811–19.

Baumgartner, R.W., Gonner, F., Arnold, M. et al. 1997: Transtemporal power- and frequency-based color-coded duplex sonography of cerebral veins and sinuses. American Journal of Neuroradiology 18, 1771–81.

Bayraktutan, U. 2002: Free radicals, diabetes and endothelial dysfunction. Diabetes, Obesity and Metabolism 4, 224–38.

Bayturan, O., Tuzcu, E.M., Nicholls, S.J. et al. 2009: Attenuated plaque at nonculprit lesions in patients enrolled in intravascular ultrasound atherosclerosis progression trials. JACC. Cardiovascular Interventions 2(7), 672–8.

Bazett, H.C. 1941: In: Macleod's Physiology in modern medicine. London: Kimpton.

Beaussier, H., Masson, I., Collin, C. et al. 2008: Carotid plaque, arterial stiffness gradient, and remodelling in hypertension. Hypertension 52, 729–36.

Becker, A.E. 1995: Congenital coronary arterial anomalies of clinical relevance. Coronary Artery Disease 6(3), 187–94.

Becker, L.C. 1976: Effect of nitroglycerin and dipyridamole on regional left ventricular flow during coronary artery occlusion. Journal of Clinical Investigation 58(6), 1287–96.

Becker, L.C. 1978: Conditions for vasodilator induced coronary steal in experimental myocardial ischemia. Circulation 57, 1103–10.

Beckett, N.S., Peters, R., Fletcher, A.E. et al. 2008: Treatment of hypertension in patients 80 years of age or older. New England Journal of Medicine 358, 1887–98.

Bedford, D.E. 1951: The ancient art of feeling the pulse. British Heart Journal 13, 423–37.

Beevers, G., Lip, G.Y. and O'Brien, E. 2001a: ABC of hypertension: blood pressure measurement. Part I – Sphygmomanometry: factors common to all techniques. British Medical Journal 322(7292), 981–5.

Beevers, G., Lip, G.Y. and O'Brien, E. 2001b: ABC of hypertension: blood pressure measurement. Part II – Conventional sphygmomanometry: technique of auscultatory blood pressure measurement. British Medical Journal 322(7293), 1043–7.

Bein, B., Worthmann, F., Tonner, P.H. et al. 2004: Comparison of esophageal Doppler, pulse contour analysis, and real-time pulmonary artery thermodilution for the continuous measurement of cardiac output. Journal of Cardiothoracic and Vascular Anesthesia 18(2), 185–9.

Belani, K., Ozaki, M., Hynson, J. et al. 1999a: A new noninvasive method to measure blood pressure: results of a multicenter trial. Anesthesiology 91(3), 686–92.

Belani, K.G., Buckley, J.J. and Poliac, M.O. 1999b: Accuracy of radial artery blood pressure determination with the Vasotrac. Canadian Anaesthetists Society Journal 46(5 Pt 1), 488–96.

Belardinelli, R., Grorgiou, D., Cianci, G. et al. 1995: Exercise training improves left ventricular diastolic filling in patients with dilated cardiomyopathy: clinical and prognostic implications. Circulation 91, 2775–84.

Bella, J.N., Wachtell, K., Boman, K. et al. 2002: Relation of left ventricular geometry and function to aortic root dilatation in patients with systemic hypertension and left ventricular hypertrophy (the LIFE study). American Journal of Cardiology 89(3), 337–41.

Beller, C.J., Labrosse, M.R., Thubrikar, M.J. and Robicsek, F. 2004: Role of aortic root motion in the pathogenesis of aortic dissection. Circulation 109, 763–9.

Benchimol, A. and Desser, K.B. 1971: Phasic renal artery blood flow velocity in man during cardiac arrhythmias. American Journal of Medical Science 261, 161–6.

Benchimol, A., Barreto, E.C., Goldstein, M.R. et al. 1970: Measurement of phasic carotid artery flow velocity in man. American Journal of Medicine 49, 170.

Benchimol, A., Stegall, H.F. and Gartlan, J.L. 1971: New method to measure phasic coronary blood velocity in man. American Heart Journal 81, 93–101.

Benchimol, A., Stegall, H.F., Maroko, P.R. et al. 1969: Aortic flow velocity in man during cardiac arrhythmias measured with the Doppler catheter-flowmeter system. American Heart Journal 78(5), 649–59.

Benchimol, A., Matsuo, S., Wang, T.F. et al. 1972: Phasic coronary arterial flow velocity during arrhythmias in man. American Journal of Cardiology 29, 604–10.

Benchimol, A., Desser, K.B. and Gartlan, J.L. 1973: Left ventricle blood flow velocity in man studied with the Doppler ultrasonic flowmeter. American Heart Journal 85, 294–301.

Benchimol, A., Desser, K.B., Wang, T.F. et al. 1974: Left ventricular blood flow velocity during atrial arrhythmias in man. American Journal of Cardiology 34, 271.

Benetos, A., Adamopoulos, C., Bureau, J.P. et al. 2002: Determinants of accelerated progression of arterial stiffness in normotensive subjects and in treated hypertensive subjects over a 6-year period. Circulation 105, 1202–7.

Benetos, A., Buatois, S., Salvi, P. et al. 2010: Blood pressure and pulse wave velocity values in the institutionalized elderly aged 80 and over: baseline of the PARTAGE study. Journal of Hypertension 28(1), 41–50.

Benetos, A., Laurent, S., Boutouyrie, P. et al. 1991a: Alteration in the carotid artery wall properties with ageing and high blood pressure level. Journal of Hypertension 9(suppl. 6), S112–S113.

Benetos, A., Huguet, F., Albaladejo, P. et al. 1993a: Role of adrenergic tone in mechanical and functional properties of carotid artery during aging. American Journal of Physiology 265, H1132–H1138.

Benetos, A., Laurent, S., Hoeks, A.P. et al. 1993b: Arterial alterations with aging and high blood pressure: a noninvasive study of carotid and femoral arteries. Arteriosclerosis and Thrombosis 13, 90–7.

Benetos, A., Safar, M., Rudnichi, A. et al. 1997: Pulse pressure: a predictor of long-term cardiovascular mortality in a French male population. Hypertension 30, 1410–15.

Benetos, A., Thomas, F., Joly, L. et al. 2010: Pulse pressure amplification: a mechanical biomarker of cardiovascular risk. Journal of the American College of Cardiology 55, 1032–7.

Bengtsson, H., Bergqvist, D. and Sternby, N. 1992: Increasing prevalence of abdominal aortic aneurysms: a necropsy study. European Journal Surgery 158, 19–23.

Benjamin, E.J., Larson, M.G., Keyes, M.J. et al. 2004: Clinical correlates and heritability of flow-mediated dilation in the community: the Framingham Heart Study. Circulation 109(5), 613–9.

Benjo, A., Thompson, R.E., Fine, D. et al. 2007: Pulse pressure is an age-independent predictor of stroke development after cardiac surgery. Hypertension 50(4), 630–5.

Benndorf, R.A., Appel, D., Maas, R. et al. 2007: Telmisartan improves endothelial function in patients with essential hypertension. Journal of Cardiovascular Pharmacology 50(4), 367–71.

Benson, W.R. and Sealy, W.C. 1956: Arterial necrosis following resection of coarctation of the aorta. Laboratory Investigation 5, 359–76.

Benthin, M., Dahl, P., Ruzicka, R. et al. 1991: Calculation of pulse-wave velocity using cross correlation – effects of reflexes in the arterial tree. Ultrasound in Medicine and Biology 17, 461–9.

Benumof, J.L., Saidman, L.J., Arkin, D.B. et al. 1977: Where pulmonary arterial catheters go: intrathoracic distribution. Anesthesiology 46(5), 336–8.

Benza, R.L., Mehta, S., Keogh, A. et al. 2007: Sitaxsentan treatment for patients with pulmonary arterial hypertension discontinuing Bosentan. Journal of Heart and Lung Transplantation 26, 63–9.

Berge, E. 2007: Decompressive surgery for cerebral oedema after stroke: evidence at last. Lancet Neurology 6, 200–1.

Bergel, D., Galazier, J., Hughes, M. et al. 1967: The transmission of pressure and flow waves through the pulmonary circulation. 7th International Conference on Medical and Biological Engineering, Stockholm.

Bergel, D.H. 1960: The visco-elastic properties of the arterial wall. PhD Thesis, University of London.

Bergel, D.H. 1961a: The static elastic properties of the arterial wall. Journal of Physiology 156, 445–57.

Bergel, D.H. 1961b: The dynamic elastic properties of the arterial wall. Journal of Physiology 156, 458–69.

Bergel, D.H. (ed.). 1972: Cardiovascular fluid dynamics. London: Academic Press.

Bergel, D.H. and Milnor, W.R. 1965: Pulmonary vascular impedance in the dog. Circulation Research 16(5), 401–15.

Bergel, D.H. and Gessner, U. 1966: The electromagnetic flowmeter. Methods in Medical Research 11, 70–82.

Bergel, D.H. and Schultz, D.L. 1971: Arterial elasticity and fluid dynamics. Progress in Biophysics and Molecular Biology 22, 1–36.

Bergel, D.H., McDonald, D.A. and Taylor, M.G. 1958: A method for measuring arterial impedance using a differential manometer. Journal of Physiology 141S, 17P–18P.

Berger, D.S. and Li, J.K. 1990: Concurrent compliance reduction and increased peripheral resistance in the manifestation of isolated systolic hypertension. American Journal of Cardiology 65, 67–71.

Berger, D.S., Li, J.K., Laskey, W.K. et al. 1993: Repeated reflection of waves in the systemic arterial system. American Journal of Physiology 264, H269–H281.

Berger, D.S., Li, J.K. and Noordergraaf, A. 1994: Differential effects of wave reflections and peripheral resistance on aortic blood pressure: a model-based study. American Journal of Physiology 266, H1626–H1642.

Bergstrom, J., Alvestrand, A. and Gutlerrez, A. 1986: Progression of chronic renal failure in man is retarded with more frequent clinical follow-ups and better blood pressure control. Clinical Nephrology 25, 1–6.

Berliner, J.A., Navab, M., Fogelman, A.M. et al. 1995: Atherosclerosis: basic mechanisms. Oxidation, inflammation, and genetics. Circulation 91(9), 2488–96.

Berlowitz, D.R., Ash, A.S., Hickey, E.C. et al. 2003: Hypertension management in patients with diabetes, the need for more aggressive therapy. Diabetes Care 26(2), 355–9.

Berne, R.M. and Levy, M.N. 1977: Cardiovascular physiology, 3rd edn. St. Louis: C.V. Mosby.

Berne, R.M. and Rubio, R. 1979: Coronary circulation. In: Berne, R.M. (ed.), Handbook of physiology. Section 2: The cardiovascular system, vol. I, The heart. Washington, DC: American Physiological Society, pp. 873–952.

Berne, R.M. and Levy, M.N. 1983: Physiology. St Louis: Mosby.

Bertolet, B.D., Belardinelli, L., Franco, E.A. et al. 1996: Selective attenuation by N-0861 (N6-endonorboran-2-yl-9-methyladenine) of cardiac A1 receptor-mediated effects in humans. Circulation 93, 1871–6.

Bertovic, D.A., Waddell, T.K., Gatzka, C.D. et al. 1999: Muscular strength training is associated with low arterial compliance and high pulse pressure. Hypertension 33, 1385–91.

Bertram, C.D. and She, J. 1995: Analysis of the effects of measurement errors on the evaluation of propagation coefficients, in rubber tubes and canine aorta in vivo. Technology and Health Care 3(3), 161–84.

Bertram, C.D., Gow, B.S. and Greenwald, S.E. 1997: Comparison of different methods for the determination of the true wave propagation coefficient, in rubber tubes and the canine thoracic aorta. Medical Engineering and Physics 19(3), 212–22.

Bertram, C.D., Pythoud, F., Stergiopulos, N. et al. 1999: Pulse wave attenuation measurement by linear and nonlinear methods in nonlinearly elastic tubes. Medical Engineering and Physics 21(3), 155–66.

Bertram, D., Oréa, V., Chapuis, B. et al. 2005: Differential responses of frequency components of renal sympathetic nerve activity to arterial pressure changes in conscious rats. American Journal of Physiology. Regulatory, Integrative and Comparative Physiology 289(4), R1074–82.

Bertuglia, S. 2001: Increased viscosity is protective for arteriolar endothelium and microvascular perfusion during severe hemodilution in hamster cheek pouch. Microvascular Research 61(1), 56–63.

Berson, M., Roncin, A. and Pourcelot, L. 1981: Compound scanning with an electrically steered beam. Ultrasonic Imaging 3, 303–8.

Bessems, D., Giannopapa, C.G., Rutten, M.C. et al. 2008: Experimental validation of a time-domain-based wave propagation model of blood flow in viscoelastic vessels. Journal of Biomechanics 41(2), 284–91.

Bessems, D.B., Rutten, M. and Van De Vosse, F. 2007: A wave propagation model of blood flow in large vessels using an approximate velocity profile function. Journal of Fluid Mechanics 580, 145–68.

Betik, A.C., Luckham, V.B. and Hughson, R.L. 2004: Flow-mediated dilation in human brachial artery after different circulatory occlusion conditions. American Journal of Physiology – Heart and Circulatory Physiology 286(1), H442–H448.

Bevan, J.A. and Laher, I. 1991: Pressure and flow-dependent vascular tone. FASEB Journal 5(9), 2267–73.

Bezie, Y., Lacolley, P., Laurent, S. et al. 1998: Connection of smooth muscle cells to elastic lamellae in aorta of spontaneously hypertensive rats. Hypertension 32(1), 166–9.

Bharadvaj, B.K., Mabon, R.F. and Giddens, D.P. 1982a: Steady flow in a model of the human carotid bifurcation. Part I – flow visualization. Journal of Biomechanics 15, 349–62.

Bharadvaj, B.K., Mabon, R.F. and Giddens, D.P. 1982b: Steady flow in a model of the human carotid bifurcation. Part II - laser-Doppler anemometer measurements. Journal of Biomechanics 15, 363–78.

Bhuiyan, A.R., Srinivasan, S.R., Chen, W. et al. 2006: Correlates of vascular structure and function measures in asymptomatic young adults: the Bogalusa Heart Study. Atherosclerosis 189, 1–7.

Biancofiore, G., Critchley, L.A., Lee, A. et al. 2009: Evaluation of an uncalibrated arterial pulse contour cardiac output monitoring system in cirrhotic patients undergoing liver surgery. British Journal of Anaesthesia 102(1), 47–54.

Bibbins-Domingo, K., Pletcher, M.J., Liu, F. et al. 2009: Racial differences in incident heart failure among young adults. New England Journal of Medicine 360, 1179–90.

Bigi, M.A., Aslani, A. and Mehrpour, M. 2008: Effect of chronic cocaine abuse on the elastic properties of aorta. Echocardiography 25, 308–11.

Bikkina, M., Levy, D., Evans, J.C. et al. 1994: Left ventricular mass and risk of stroke in an elderly cohort. Journal of the American Medical Association 272, 33–6.

Binder, J., Bailey, K.R., Seward, J.B. et al. 2006: Aortic augmentation index is inversely associated with cardiorespiratory fitness in men without known coronary heart disease. American Journal of Hypertension 19, 1019–24.

Biner, S., Rafique, A.M., Ray, I. et al. 2009: Aortopathy is prevalent in relatives of bicuspid aortic valve patients. Journal of the American College of Cardiology 53, 2288–95.

Bing, R.J., Handelsman, J.C., Campbell, J.A. et al. 1948: The surgical treatment and the physiopathology of coarctation of the aorta. Annals of Surgery 128, 803–20.

Binkley, P.F., van Fossen, D.B., Haas, G.J. et al. 1996: Increased ventricular contractility is not sufficient for effective positive inotropic intervention. American Journal of Physiology 271, H1635–42.

Binkley, P.F., Van Fossen, D.B., Nunziata, E. et al. 1990: Influence of positive inotropic therapy on pulsatile hydraulic load and ventricular–vascular coupling in congestive heart failure. Journal of the American College of Cardiology 15(5), 1127–35.

Birkhoff, G. 1960: Hydrodynamics. Princeton: University Press. (reprinted 1978. Greenwood Press, Westport, CT).

Bishop, J.E. 1994: Some doctors denounce U.S. guidelines on drugs to treat high blood pressure. Wall Street Journal, 17 November.

Bishop, J.E., Kiernan, L.A., Montgomery, H.E. et al. 2000: Raised blood pressure, not renin–angiotensin systems, causes cardiac fibrosis in TGR m(Ren2)27 rats. Cardiovascular Research 47, 57–67.

Bjaerum, S., Torp, H. and Kristoffersen, K. 2002: Clutter filters adapted to tissue motion in ultrasound color flow imaging. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 49, 693–704.

Bjarnegard, N., Bengtsson, C., Brodszki, J. et al. 2006: Increased aortic pulse wave velocity in middle aged women with systemic lupus erythematosus. Lupus 15, 644–50.

Blacher, J., Asmar, R., Djane, S. et al. 1999a: Aortic pulse wave velocity as a marker of cardiovascular risk in hypertensive patients. Hypertension 33, 1111–17.

Blacher, J., Guerin, A.P., Pannier, B. et al. 1999b: Impact of aortic stiffness on survival in end-stage renal disease. Circulation 99(18), 2434–9.

Blacher, J., Safar, M.E., Guerin, A.P. et al. 2003: Aortic pulse wave velocity index and mortality in end-stage renal disease. Kidney International 63(5), 1852–60.

Blacher, J., Staessen, J.A., Girerd, X. et al. 2000: Pulse pressure not mean pressure determines cardiovascular risk in older hypertensive patients. Archives of Internal Medicine 160, 1085–9.

Black, H.R. 1999: The paradigm has shifted, to systolic blood pressure. Hypertension 34, 386–7.

Black, M.A., Cable, N.T., Thijssen, D.H. et al. 2007: Importance of measuring the time course of flow-mediated dilatation in humans. Hypertension 51(2), 203–10.

Black, M.A., Cable, N.T., Thijssen, D.H. and Green, D.J. 2008: Importance of measuring the time course of flow-mediated dilatation in humans. Hypertension 51, 203–10.

Black, M.A., Cable, N.T., Thijssen, D.H. et al. 2009: Impact of age, sex, and exercise on brachial artery flow-mediated dilatation. American Journal of Physiology. Heart and Circulatory Physiology 297(3), H1109–16.

Blackman, R.B. and Tukey, J.W. 1959: The measurement of power spectra from the point of view of communications engineering. New York: Dover.

Blake, R.W. 1991: Efficiency and economy in animal physiology. Cambridge: Cambridge University Press.

Bland, J.M. and Altman, D.G. 1986: Statistical methods for assessing agreement between two methods of clinical measurement. Lancet 1(8476), 307–10.

Bland, J.M. and Altman, D.G. 1999: Measuring agreement in method comparison studies. Statistical Methods in Medical Research 8(2), 135–60.

Bland, J.M. and Altman, D.G. 2003: Applying the right statistics: analyses of measurement studies. Ultrasound in Obstetrics and Gynecology 22(1), 85–93.

Blank, S.G., West, J.E., Muller, F.B. et al. 1988: Wideband external pulse recording during cuff deflation: a new technique for evaluation of the arterial pressure pulse and measurement of blood pressure. Circulation 77(6), 1297–305.

Blank, S.G., West, J.E., Muller, F.B. et al. 1991: Characterization of auscultatory gaps with wideband external pulse recording. Hypertension 17(2), 225–33.

Blank, S.G., Mann, S.J., James, G.D. et al. 1995: Isolated elevation of diastolic blood pressure. Real or artifactual? Hypertension 26(3), 383–9.

Blood Pressure Lowering Treatment Trialists' Collaboration 2000: Effects of ACE inhibitors, calcium antagonists, and other blood-pressure-lowering drugs, results of prospectively designed overviews of randomised trials. Lancet 355, 1955–64.

Blount, K.J. and Hagspiel, K.D. 2009: Aortic diameter, true lumen, and false lumen growth rates in chronic type B aortic dissection. AJR: American Journal of Roentgenology 192(5), W222–9.

Bluemke, D.A., Achenbach, S., Budoff, M. et al. 2008: Noninvasive coronary artery imaging: magnetic resonance angiography and multidetector computed tomography angiography. A scientific statement from the American Heart Association Committee on Cardiovascular Imaging and Intervention of the Council on Cardiovascular Radiology and Intervention, and the Councils on Clinical Cardiology and Cardiovascular Disease in the Young. Circulation 118, 586–606.

Blumenthal, J.A., Babyak, M.A., Hinderliter, A. et al. 2010: Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: the ENCORE study. Archives of Internal Medicine 170, 126–35.

Blumenthal, H.T., Handler, F.P. and Blache, J.O. 1954: The histogenesis of arteriosclerosis of the larger cerebral arteries, with an analysis of the importance of mechanical factors. American Journal of Medicine 17, 337–47.

Bocksch, W., Fateh-Moghadam, S., Huehns, S. et al. 2005: Influence of different lipid-lowering strategies on plaque volume and plaque composition in patients with coronary artery disease: role of intravascular ultrasound imaging. Kidney and Blood Pressure Research 28(5–6), 290–4.

Boden, W.E. 2004: Surgery, angioplasty, or medical therapy for symptomatic multivessel coronary artery disease: is there an indisputable 'winning strategy' from evidence-based clinical trials? Journal of the American College of Cardiology 43, 1752–4.

Boden, W.E., O'Rourke, R.A., Teo, K.K. et al. 2007: Optimal medical therapy with or without PCI for stable coronary disease. New England Journal of Medicine 356, 1503–16.

Boden, W.E., O'Rourke, R.A., Teo, K.K. et al. 2009: Impact of optimal medical therapy with or without percutaneous coronary intervention on long-term cardiovascular end points in patients with stable coronary artery disease (from the COURAGE Trial). American Journal of Cardiology 104, 1–4.

Bogaty, P., Hackett, D., Davies, G. et al. 1994: Vasoreactivity of the culprit lesion in unstable angina. Circulation 90, 5–11.

Bogert, L.W. and van Lieshout, J.J. 2005: Non-invasive pulsatile arterial pressure and stroke volume changes from the human finger. Experimental Physiology 90(4), 437–46.

Bogren, H.G., Mohiaddin, R.H., Klipstein, R.K. et al. 1989: The function of the aorta in ischemic heart disease: a magnetic resonance and angiographic study of aortic compliance and blood flow patterns. American Heart Journal 118, 234–47.

Bohr, D.F., Somlyo, A.D. and Sparks, H.V. 1980: Vascular smooth muscle. In: American Physiological Society handbook of physiology. Section 2: The cardiovascular system, vol. 2. Bethesda, MD: American Physiological Society.

Bom, N., Lancee, C.T., Honkoop, J. and Hugenholtz, P.G. 1971: Ultrasonic viewer for cross-sectional analyses of moving cardiac structures. Biomedical Engineering 6, 500–3, 505.

Bonapace, S., Rossi, A., Cicoira, M. et al. 2003: Aortic distensibility independently affects exercise tolerance in patients with dilated cardiomyopathy. Circulation 107(12), 1603–8.

Bond, R.F. and Barefoot, C.A. 1967: Evaluation of an electromagnetic catheter tip velocity sensitive blood flow probe. Journal of Applied Physiology 23, 403–9.

Bonello, L., De Labriolle, A., Lemesle, G. et al. 2009: Intravascular ultrasound-guided percutaneous coronary interventions in contemporary practice. Archives of Cardiovascular Diseases 102(2), 143–51.

Bonetti, P.O., Lerman, L.O. and Lerman, A. 2003a: Endothelial dysfunction, a marker of atherosclerotic risk. Arteriosclerosis, Thrombosis, and Vascular Biology 23(2), 168–75.

Bonetti, P.O., Barsness, G.W., Keelan, P.C. et al. 2003b: Enhanced external counterpulsation improves endothelial function in patients with symptomatic coronary artery disease. Journal of the American College of Cardiology 41(10), 1761–8.

Bonetti, P.O., Holmes, D.R., Lerman, A. and Barness, G.W. 2003c: Enhanced external counterpulsation for ischemic heart disease. Journal of the American College of Cardiology 1918–25.

Bonetti, P.O., Pumper, G.M., Higano, S.T. et al. 2004: Noninvasive identification of patients with early coronary atherosclerosis by assessment of digital reactive hyperemia. Journal of the American College of Cardiology 44, 2137–41.

Bonow, R.O. 1994: Management of chronic aortic regurgitation. New England Journal of Medicine 331(11), 736–7.
Bonow, R.O. and Udelson, J.E. 1992: Left ventricular diastolic dysfunction as a cause of congestive heart failure: mechanisms and management. Annals of Internal Medicine 117, 502–10.
Bonow, R.O., Mann, D.L., Zipes, D.P. and Libby, P. (eds). 2012: Braunwald's heart disease, 9th edn. Philadelphia, Saunders.
Bonnefous, O. and Pesque, P. 1986: Time domain formulation of pulse-Doppler ultrasound and blood velocity estimation by cross correlation. Ultrasonic Imaging 8, 73–85.
Bonyhay, I., Jokkel, G., Karlocai, K. et al. 1997: Effect of vasoactive drugs on carotid diameter in humans. American Journal of Physiology 273(4 Pt 2), H1629–36.
Booth, A.D., Jayne, D.R., Kharbanda, R.K. et al. 2004a: Infliximab improves endothelial dysfunction in systemic vasculitis: a model of vascular inflammation. Circulation 109(14), 1718–23.
Booth, A.D., Wallace, S., McEniery, C.M. et al. 2004b: Inflammation and arterial stiffness in systemic vasculitis. A model of vascular inflammation. Arthritis and Rheumatism 50, 581–8.
Booth, G.L., Kapral, M.K., Fung, K. et al. 2006: Relation between age and cardiovascular disease in men and women with diabetes compared with non-diabetic people: a population based retrospective cohort study. Lancet 368, 29–36.
Borders, J.L. and Granger, H.J. 1984: An optical Doppler intravital velocimeter. Microvascular Research 27, 117–27.
Boreham, C.A., Ferreira, I., Twisk, J.W. et al. 2004: Cardiorespiratory fitness, physical activity, and arterial stiffness: the Northern Ireland Young Hearts Project. Hypertension 44, 721–6.
Borlaug, B.A., Lam, C.S.P., Roger, V.L. et al. 2009: Contractility and ventricular systolic stiffening in hypertensive heart disease: insights into the pathogenesis of heart failure with preserved ejection fraction. Journal of the American College of Cardiology 54, 410–18.
Borlaug, B.A., Olson, T.P., Lam, C.S.P. et al. 2010: Global cardiovascular reserve dysfunction in heart failure with preserved ejection fraction. Journal of the American College of Cardiology 56, 845–54.
Boron, W. and Boulpaep, E.L. 2005: Medical physiology: a cellular and molecular approach. Philadelphia, PA: Elsevier/Saunders.
Borow, K.M. and Newburger, J.W. 1982: Noninvasive estimation of central aortic pressure using the oscillometric method for analyzing systemic artery pulsatile blood flow: comparative study of indirect systolic, diastolic and mean brachial artery pressure with simultaneous direct ascending aortic pressure measurements. American Heart Journal 103, 879–86.
Bortolotto, L.A., Hanon, O., Franconi, G. et al. 1999: The aging process modifies the distensibility of elastic but not muscular arteries. Hypertension 34(4 Pt 2), 889–92.
Bos, W.J., Imholz, B.P., Van Goudoever, J. et al. 1992: The reliability of noninvasive continuous finger blood pressure measurement in patients with both hypertension and vascular disease. American Journal of Hypertension 5(8), 529–35.
Bos, W.J., van den Meiracker, A.H., Wesseling, K.H. et al. 1995: Effect of regional and systemic changes in vasomotor tone on finger pressure amplification. Hypertension 26(2), 315–20.
Bos, W.J., van Goudoever, J., van Montfrans, G.A. et al. 1996: Reconstruction of brachial artery pressure from noninvasive finger pressure measurements. Circulation 94(8), 1870–5.
Bos, W.J., Verrij, E., Vincent, H.H. et al. 2007a: How to assess mean blood pressure properly at the brachial artery level. Journal of Hypertension 25(4), 751–5.
Bos, W.J.W., Verrij, E., Vincent, H.H. et al. 2007b: Thumb-rule for the proper assessment of mean blood pressure at the brachial artery level: what should be changed? Journal of Hypertension 25, 1741–2.
Botnar, R., Rappitsch, G., Scheidegger, M.B. et al. 2000a: Hemodynamics in the carotid artery bifurcation, a comparison between numerical simulations and in vitro MRI measurements. Journal of Biomechanics 33(2), 137–44.
Botnar, R.M., Stuber, M., Kissinger, K.V. et al. 2000b: Noninvasive coronary vessel wall and plaque imaging with magnetic resonance imaging. Circulation 102(21), 2582–7.
Bots, M.L., Baldassarre, D., Simon, A. et al. 2007: Carotid intima-media thickness and coronary atherosclerosis: weak or strong relations? European Heart Journal 28, 398–406.
Bots, M.L., Hofman, A. and Grobbee, D.E. 1997: Increased common carotid intima-media thickness. Adaptive response or a reflection of atherosclerosis? Findings from the Rotterdam study. Stroke 28, 2442–7.
Bots, M.L., Hoes, A.W., Hofman, A. et al. 1999: Cross-sectionally assessed carotid intima-media thickness relates to long-term risk of stroke, coronary heart disease and death as estimated by available risk functions. Journal of Internal Medicine 245(3), 269–76.
Bots, M.L., Dijk, J.M., Oren, A. et al. 2002: Carotid intima–media thickness, arterial stiffness and risk of cardiovascular disease, current evidence. Journal of Hypertension 20, 2317–25.
Bots, M.L., Grobbee, D.E., Hofman, A. and Witteman, J.C. 2005: Common carotid intima-media thickness and risk of acute myocardial infarction: the role of lumen diameter. Stroke 36, 762–7.
Bots, M.L., Westerink, J., Rabelink, T.J. et al. 2005: Assessment of flow-mediated vasodilatation (FMD) of the brachial artery: effects of technical aspects of the FMD measurement on the FMD response. European Heart Journal 26, 363–8.
Bouchard, A., Blumlein, S., Schiller, N.B. et al. 1987: Measurement of left ventricular stroke volume using continuous wave Doppler echocardiography of the ascending aorta and m-mode echocardiography of the aortic valve. Journal of the American College of Cardiology 9, 75–83.
Boudoulas, H. 1990: Systolic time intervals. European Heart Journal 11(suppl. I), 93–104.
Boudoulas, H. 1991: Diastolic time: the forgotten dynamic factor. Implications for myocardial perfusion. Acta Cardiologia 46(1), 61–71.
Boudoulas, H. and Leier, C.V. 2000: Clinical perspective: myocardial perfusion pressure in the age of afterload reduction. ACC Current Journal Review (September/October), 27–31.
Boudoulas, H. and Stefanadis, C. (eds) 2008: Aorta: structure, function, dysfunction, and diseases. New York: Informa Healthcare.
Boudoulas, H., Lewis, R.P., Rittgers, S.E. et al. 1979: Increased diastolic time: a possible important factor in the beneficial effect of propranolol in patients with coronary artery disease. Journal of Cardiovascular Pharmacology 1, 503–13.
Boudoulas, H., Dervenagas, S., Fulkerson, P.K. et al. 1981: Effect of heart rate on diastolic time and left ventricular performance in patients with atrial fibrillation. In: Diethrich, E.G. (ed.), Noninvasive cardiovascular diagnosis, 2nd edn. Massachusetts: PSG Publishing Company, pp. 433–45.
Boudoulas, H., Karayannacos, P.E., Kien, N. et al. 1982: Noninvasive method of estimating relative subendocardial flow employing diastolic time. In: Noninvasive assessment of the cardiovascular system. Littleton: John Wright-PSG, pp. 211–17.
Boudoulas, H., Toutouzas, P.K. and Wooley, C.F. 1995b: Functional abnormalities of the aorta. Armonk, NY: Futura Publishing Company, Inc.
Boulanger, C.M., Amabile, N. and Tedgui, A. 2006: Circulating microparticles: a potential prognostic marker for atherosclerotic vascular disease. Hypertension 48, 180–6.
Bourdarias, J.P. 1995: Coronary reserve: concept and physiological variations. European Heart Journal 16(suppl. I), 2–6.
Bourge, R.C., Abraham, W.T., Adamson, P.B. et al. 2008: Randomized controlled trial of an implantable continuous hemodynamic monitor in patients with advanced heart failure: the COMPASS-HF study. Journal of the American College of Cardiology 51(11), 1073–9.
Bousell, L., Rayz, V., McCulloch, C. et al. 2008: Aneurysm growth occurs at region of low wall shear stress: patient-specific correlation of hemodynamics and growth in a longitudinal study. Stroke 39, 2997–3002.
Bouthier, J.D., De Luca, N., Safar, M.E. et al. 1985: Cardiac hypertrophy and arterial distensibility in essential hypertension. American Heart Journal 109, 1345–52.

Boutitie, F., Gueyffier, F., Pocock, S. et al. 2002: J-shaped relationship between blood pressure and mortality in hypertensive patients: new insights from a meta-analysis of individual-patient data. Annals of Internal Medicine 136(6), 438–48.

Boutouyrie, P., Laurent, S., Benetos, A. et al. 1992: Opposing effects of ageing on distal and proximal large arteries in hypertensives. Journal of Hypertension 10(suppl. 6), S87–91.

Boutouyrie, P., Lacolley, P., Laurent, S. et al. 1994: Intrinsic modifications of the brachial and radial arteries in hypertensive humans. Clinical and Investigative Medicine 17(2), 97–106.

Boutouyrie, P., Laurent, S., Girerd, X. et al. 1995: Common carotid artery stiffness and patterns of left ventricular hypertrophy in hypertensive patients. Hypertension 25, 651–9.

Boutouyrie, P., Bussy, C., Lacolley, P. et al. 1999: Association between local pulse pressure, mean blood pressure, and large-artery remodeling. Circulation 100, 1387–93.

Boutouyrie, P., Bussy, C., Hayoz, D. et al. 2000: Local pulse pressure and regression of arterial wall hypertrophy during long-term antihypertensive treatment. Circulation 101, 2601–6.

Boutouyrie, P., Tropeano, A.I., Asmar, R. et al. 2002: Aortic stiffness is an independent predictor of primary coronary events in hypertensive patients. A longitudinal study. Hypertension 39, 10–15.

Boutouyrie, P., Agharazii, M., Verbeke, F. et al. 2004a: Wall shear stress does not acutely regulate arterial stiffness. Journal of Hypertension 22(suppl. 2), S13.

Boutouyrie, P. 2008: New techniques for assessing arterial stiffness. Diabetes and Metabolism 34(suppl. 1), S21–6.

Boutouyrie, P., Achouba, A., Trunet, P. et al. 2010: Amlodipine–valsartan combination decreases central systolic blood pressure more effectively than the amlodipine–atenolol combination: The EXPLOR Study. Hypertension 55, 1314–22.

Boutsianis, E., Gupta, S., Boomsma, K. et al. 2008: Boundary conditions by Schwarz-Christoffel mapping in anatomically accurate hemodynamics. Annals of Biomedical Engineering 36(12), 2068–84.

Bowman, A.W., Kantor, B. and Gerber, T.C. 2009: Coronary computed tomographic angiography: current role in the diagnosis and management of coronary artery disease. Polskie Archiwum Medycyny Wewnętrznej 119(6), 381–90. (Erratum in: Polskie Archiwum Medycyny Wewnętrznej 119(7–8), 518.)

Bowman, T.S., Gaziano, J.M., Buring, J.E. et al. 2007: A prospective study of cigarette smoking and risk of incident hypertension in women. Journal of the American College of Cardiology 50, 2085–92.

Bradley, T.J., Potts, J.E., Lee, S.K. et al. 2010: Early changes in the biophysical properties of the aorta in pre-adolescent children born small for gestational age. Journal of Pediatrics 156(3), 388–92.

Bradlow, W.M., Gatehouse, P.D., Hughes, R.L. et al. 2007: Assessing normal pulse wave velocity in the proximal pulmonary arteries using transit time: a feasibility, repeatability, and observer reproducibility study by cardiovascular magnetic resonance. Journal of Magnetic Resonance Imaging 25(5), 974–81.

Bradt, J. and Dileo, C. 2009: Music for stress and anxiety reduction in coronary heart disease patients. Cochrane Database of Systematic Reviews (2), CD006577.

Brady, A.R., Thomson, S.G., Fowkes, G.R. et al. 2004: Abdominal aortic aneurysm expansion: risk factors and time intervals for surveillance. Circulation 110, 16–21.

Bragulat, E., de la Sierra, A., Antonio, M.T. et al. 2001: Endothelial dysfunction in salt–sensitive essential hypertension. Hypertension 37(2 Pt 2), 444–8.

Braith, R., Conti, C.R., Nichols, W.W. et al. 2010: Enhanced external counterpulsation improves peripheral artery flow-mediated dilation in patients with chronic angina: a randomized sham-controlled study. Circulation 122, 1612–20.

Bramble, D. and Lieberman, D. 2004: Endurance running and the evolution of Homo. Nature 432, 345–52.

Bramwell, B. 1880: The examination of the pulse. Edinburgh Medical Journal 26, 520–36.

Bramwell, J.C. and Hill, A.V. 1922a: The velocity of the pulse wave in man. Proceedings of the Society for Experimental Biology and Medicine 93, 298–306.

Bramwell, J.C. and Hill, A.V. 1922b: Velocity of transmission of the pulse wave and elasticity of arteries. Lancet 1, 891–2.

Bramwell, J.C. and Hill, A.V. 1923: The formation of 'breakers' in the transmission of the pulsewave. Journal of Physiology 57, lxxiii–iv.

Brands, P.J., Hoeks, A.P., Ledoux, L.A. and Reneman, R.S. 1997: A radio frequency domain complex cross-correlation model to estimate blood flow velocity and tissue motion by means of ultrasound. Ultrasound in Medicine and Biology 23, 911–20.

Brands, P.J., Hoeks, A.P.G., Willigers, J. et al. 1999: An integrated system for the non-invasive assessment of vessel wall and hemodynamic properties of large arteries by means of ultrasound. European Journal of Ultrasound 9, 257–66.

Brandes, R.P., Fleming, I. and Busse, R. 2005: Endothelial aging. Cardiovascular Research 66(2), 286–94.

Brandestini, M. 1978: Topoflow – a digital full range Doppler velocity meter. IEEE Transactions on Sonics and Ultrasonics SU-25, 287–93.

Brandfonbrener, M., Landowne, M. and Shock, N.W. 1955: Changes in cardiac output with age. Circulation 12, 557–66.

Braunschweig, F., Linde, C., Adamson, P.B. et al. 2009: Continuous central haemodynamic measurements during the six-minute walk test and daily life in patients with chronic heart failure. European Journal of Heart Failure 11(6), 594–601.

Braunwald, E. (ed.). 2010: Hypertension management evolving through the ages. American Society of Hypertension Annual Scientific Meeting. New York: ASH Times.

Braunwald, E. 1969: The determinants of myocardial oxygen consumption. Physiologist 12, 65–93.

Braunwald, E. 1976: Mechanisms of contraction of the normal and failing heart, 2nd edn. Boston: Little, Brown.

Braunwald, E. 1992: Heart disease – a textbook of cardiovascular medicine. Philadelphia: W.B. Saunders.

Braunwald, E. 1997a: Heart disease: a textbook of cardiovascular medicine, 5th edn. Philadelphia: W.B. Saunders.

Braunwald, E. 1997b: Shattuck lecture – cardiovascular medicine at the turn of the millennium, triumphs, concerns, and opportunities. New England Journal of Medicine 337(19), 1360–9.

Braunwald, E. 2001a: Congestive heart failure: a half century perspective. European Heart Journal 22, 825–36.

Braunwald, E. 2001b: Expanding indications for beta-blockers in heart failure. New England Journal of Medicine 344, 1711–12.

Braunwald, E. 2009: Adventures in cardiovascular research. Circulation 120, 170–80.

Braunwald, E. and Ross, J. Jr. 1979: Control of cardiac performance. In: Berne, R.M. (ed.), Handbook of Physiology. Section 2: The cardiovascular system, vol. 1, The heart. Bethesda, MD: American Physiological Society, pp. 533–80.

Braunwald, E., Sonnenblick, E.H. and Ross, J. Jr. 1992: Mechanism of cardiac contraction and relaxation. In: Braunwald, E. (ed.), Heart disease – a textbook of cardiovascular medicine, 4th edn. Philadelphia: W.B. Saunders, pp. 351–92.

Braunwald, E., Zipes, D. and Libby, P. (eds). 2001: Heart disease, 6th edn. Philadelphia: Saunders, pp. 2199–203.

Braunwald, E., Zipes, D., Libby, P. and Bonow, R. (eds). 2004: Heart Disease, 7th edn. Philadelphia: Saunders.

Brazdzionyte, J. and Macas, A. 2007: Bland–Altman analysis as an alternative approach for statistical evaluation of agreement between two methods for measuring hemodynamics during acute myocardial infarction. Medicina (Kaunas) 43(3), 208–14.

Breit, S.N. and O'Rourke, M.F. 1974: Comparison of direct and indirect arterial pressure measurements in hospitalised patients. Australian and New Zealand Journal of Medicine 4, 485–91.

Breithaupt-Grögler, K., Ling, M., Boudoulas, H. et al. 1997: Protective effect of chronic garlic intake on elastic properties of aorta in the elderly. Circulation 96, 2649–55.

Brenner, B.M., Cooper, M.E., de Zeeuw, D. et al. 2001: Effects of losartan on renal and cardiovascular outcomes in patients with type 2 diabetes and nephropathy. New England Journal of Medicine 345(12), 861–9.

Brewer, L.C., Chai, H.S., Bailey, K.R. et al. 2007: Measures of arterial stiffness and wave reflection are associated with walking distance in patients with peripheral arterial disease. Atherosclerosis 191(2), 384–90.

Bright, R. 1827: Reports of medical cases selected with a view of illustrating the symptoms and cure of diseases by a reference to morbid anatomy. London: Longmans.

Brin, K.P. and Yin, F.C.P. 1984: Effect of nitroprusside on wave reflections in patients with heart failure. Annals of Biomedical Engineering 12, 135–50.

Brinton, T.J., Kailasam, M.T., Wu, R.A. et al. 1996: Arterial compliance by cuff sphygmomanometer. Application to hypertension and early changes in subjects at genetic risk. Hypertension 28(4), 599–603.

Brinton, T.J., Cotter, B., Kailasam, M.T. et al. 1997: Development and validation of a noninvasive method to determine arterial pressure and vascular compliance. American Journal of Cardiology 80(3), 323–30.

Brinton, T.J., Walls, E.D. and Chio, S.S. 1998: Validation of pulse dynamic blood pressure measurement by auscultation. Blood Pressure Monitoring 3(2), 121–4.

Brisman, J.L., Song, J.K. and Newell, D.W. 2006: Cerebral aneurysms. New England Journal of Medicine 355, 928–39.

Bristow, M.R. 2001: Management of heart failure. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease. W.B. Saunders, pp. P635–58.

Broadbent, W.H. 1875: The pulse: its diagnostic, prognostic, and therapeutic indications. Lancet II, 441–3, 549–50, 583–5, 901–07.

Broadbent, W.H. 1890: The pulse. London: Cassell.

Broderick, J., Connolly, S., Feldmann, E. et al. 2007: Guidelines for the management of spontaneous intracerebral hemorrhage in adults: 2007 update. A guideline from the American Heart Association/American Stroke Association Stroke Council, High Blood Pressure Research Council, and the Quality of Care and Outcomes in Research Interdisciplinary Working Group. Circulation 116, e391–413.

Brodszki, J., Gardiner, H.M., Eriksson, A. et al. 1998: Reproducibility of ultrasonic fetal volume blood flow measurements. Clinical Physiology 18(5), 479–85.

Brook, R.D., Rajagopalan, S., Pope, C.A. 3rd et al. on behalf of the American Heart Association Council on Epidemiology and Prevention, Council on the Kidney in Cardiovascular Disease, and Council on Nutrition, Physical Activity and Metabolism 2010: Particulate Matter Air Pollution and Cardiovascular Disease. An update to the Scientific Statement from the American Heart Association. Particulate matter air pollution and cardiovascular disease. Circulation 121, 2331–78.

Brooke, B.S., Habashi, J.P., Judge, D.P. et al. 2008: Angiotensin II blockade and aortic-root dilation in Marfan's syndrome. New England Journal of Medicine 358(26), 2787–95.

Brooks, A.R., Lelkes, P.I. and Rubanyi, G.M. 2002: Gene expression profiling of human aortic endothelial cells exposed to disturbed flow and steady laminar flow. Physiological Genomics 9, 27–41.

Brooks, B., Molyneaux, L. and Yue, D. 1999: Augmentation of central arterial pressure in type 1 diabetes. Diabetes Care 22(10), 1722–7.

Brooks, B., Molyneaux, L. and Yue, D. 2001: Augmentation of central arterial pressure in type 2 diabetes. Diabetic Medicine 18, 374–80.

Brooks, B., Molyneaux, L. and Yue, D.K. 2000: Where is the evidence that radial artery tonometry can be used to accurately and noninvasively predict central aortic blood pressure in patients with diabetes? (Response to Lehmann). Diabetes Care 23, 870.

Brooks, D.E., Goodwin, T.W. and Seaman, G.V.F. 1970: Interactions among erythrocytes under shear. Journal of Applied Physiology 28, 172–7.

Broom, N.D. 1978a: Fatigue-induced damage in glutaraldehyde-preserved heart valve tissue. Journal of Thoracic and Cardiovascular Surgery 76, 202–11.

Broom, N.D. 1978b: Simultaneous morphological and stress–strain studies of the fibrous components in wet heart valve leaflet tissue. Connective Tissue Research 6, 37–50.

Broom, N.D. 1980: An 'in vitro' study of mechanical fatigue in glutaraldehyde-treated porcine aortic valve tissue. Biomaterials 1, 3–8.

Brotmacher, L. 1957: Evaluation of derivation of cardiac output from blood pressure measurements. Circulation Research 5, 589–93.

Brown, B.G. 1985: Response of normal and diseased epicardial coronary arteries to vasoactive drugs: quantitative arteriographic studies. American Journal of Cardiology 56, 23E–9E.

Brown, B.G. 2007: A direct comparison of intravascular ultrasound and quantitative coronary arteriography: implications for measures of atherosclerosis as clinical surrogates. Circulation 115(14), 1824–6.

Brown, B.G. and Taylor, A.J. 2008: Does ENHANCE diminish confidence in lowering LDL in ezetimibe? New England Journal of Medicine 358, 1504–7.

Brown, B.G., Albers, J.J., Fisher, L.D. et al. 1990: Niacin or lovastatin, combined with colestipol regresses coronary atherosclerosis and prevents clinical events in men with elevated apolipoprotein B. New England Journal of Medicine 323, 1289–98.

Brown, B.G., Bolson, E., Frimer, M. et al. 1977: Quantitative coronary arteriography: estimation of dimensions, hemodynamic resistance, and atheroma mass of coronary artery lesions using the arteriogram and digital computation. Circulation 55(2), 329–37.

Brown, B.G., Bolson, E.L. and Dodge, H.T. 1984: Dynamic mechanisms in human coronary stenosis. Circulation 70(6), 917–22.

Brown, B.G., Bolson, E.L. and Dodge, H.T. 1986: Quantitative computer techniques for analyzing coronary arteriograms. Progress in Cardiovascular Disease 28, 403–18.

Brown, B.G., Endersby, C.A., Smith, R.N. et al. 1991: The safety and tolerability of sumatriptan: an overview. European Neurology 31, 339–44.

Brown, B.G., Petersen, R.B., Pierce, C.D. et al. 1982: Dynamics of human coronary stenosis: interactions among stenosis flow, distending pressure and vasomotor tone. In: Stantamore, W.P. and Bove, A.A. (eds), Coronary artery disease. Baltimore: Urban and Schwarzenberg, pp. 199–214.

Brown, B.G., Zhao, X.Q., Sacco, D.E. et al. 1993: Lipid-lowering and plaque regression: new insights into prevention of plaque disruption and clinical events in coronary disease. Circulation 87, 1781–91.

Brown, B.G., Stukovsky, K.H. and Zhao, X.Q. 2006: Simultaneous low-density lipoprotein-C lowering and high-density lipoprotein-C elevation for optimum cardiovascular disease prevention with various drug classes, and their combinations: a meta-analysis of 23 randomized lipid trials. Current Opinion in Lipidology 17, 631–6.

Brown, D.W., Giles, W.H. and Croft, J.B. 2001: Hematocrit and the risk of coronary heart disease mortality. American Heart Journal 142(4), 657–63.

Brown, J.R. and O'Connor, G.T. 2010: Coronary heart disease and prevention in the United States. New England Journal of Medicine 362, 2150–3.

Brown, M.A., Norris, R.M., Takayama, M. and White, H.D. 1987: Post-systolic shortening: a marker of potential for early recovery of acutely ischaemic myocardium in the dog. Cardiovascular Research 21, 703–16.

Brunner, H. and Gavras, H. 2002: Angiotensin blockade for hypertension, a promise fulfilled (Commentary). Lancet 359, 990–1.

Brunner, H., Cockcroft, J.R., Deanfield, J. et al. 2005: Endothelial function and dysfunction. Part II: Association with cardiovascular risk factors and diseases. A statement by the Working Group on Endothelins and Endothelial Factors of the European Society of Hypertension. Journal of Hypertension 23(2), 233–46.

Brutsaert, D.L. and Sonnenblick, E.H. 1973: Cardiac muscle mechanics in the evaluation of myocardial contractility and pump function: problems, concepts and directions. Progress in Cardiovascular Diseases 16, 337–61.

Brutsaert, D.L. and Paulus, W.J. 1977: Loading and performance of the heart as muscle and pump. Cardiovascular Research 11, 1–16.

Brutsaert, D.L., Rademakers, F.E. and Sys, S.U. 1984: Triple control of relaxation: implications in cardiac disease. Circulation 69, 190–6.

Brutsaert, D.L., Sys, S.U. and Gillebert, T.C. 1993: Diastolic failure: pathophysiology and therapeutic implications. Journal of the American College of Cardiology 22(1), 318–25.

Brzosko, S., Hryszko, T., Lebkowska, U. et al. 2003: Plasma tissue-type plasminogen activator, fibrinogen, and time on dialysis prior to transplantation are related to carotid intima media thickness in renal transplant recipients. Transplantation Proceedings 35(8), 2931–4.

Buccelletti, E., Gilardi, E., Scaini, E. et al. 2009: Heart rate variability and myocardial infarction: systematic literature review and metanalysis. European Review for Medical and Pharmacological Sciences 13(4), 299–307.

Buckberg, G., Hoffman, J.I., Mahajan, A. et al. 2008: Cardiac mechanics revisited: the relationship of cardiac architecture to ventricular function. Circulation 118, 2571–87.

Buckberg, G.D., Fixler, D.E., Archie, J.P. et al. 1972a: Experimental subendocardial ischemia in dogs with normal coronary arteries. Circulation Research 30, 67–81.

Buckberg, G.D., Towers, B., Paglia, D.E. et al. 1972b: Subendocardial ischemia after cardiopulmonary bypass. Journal of Thoracic and Cardiovascular Surgery 64, 669–84.

Buee, L., Hof, P.R. and Delacourte, A. 1997: Brain microvascular changes in Alzheimer's disease and other dementias. Annals of the New York Academy of Sciences 826, 7–24.

Buga, G.M., Gold, M.E., Fukuto, J.M. et al. 1991: Shear stress-induced release of nitric oxide from endothelial cells grown on beads. Hypertension 17(2), 187–93.

Bugiardini, R. and Merz, C.N.B. 2005: Angina with 'normal' coronary arteries: a changing philosophy. Journal of the American Medical Association 293(4), 477–84.

Buijs Ballot, C.H.D. 1845a: Akustische Versuche auf der Niederländische Eisenbahn, nebst gelegentlichen bemerkingen zur Theorie des Hrn Prof. Doppler. Annalen der Physik und Chemie 66, 321–51.

Buijs Ballot, C.H.D. 1845b: Bedrog van het gehoororgaan in het bepalen van de hoogte van eenen waargenomen toon. Caecilia, Algemeen Muzikaal Tijdschrift van Nederland 2, 79–81.

Bulliman, B. 1980: Influence of aging and drug therapy on arterial input impedance and arterial wall elasticity Masters Biomedical Engineering thesis, University of New South Wales.

Bulliman, B.T., Avolio, A.P. and O'Rourke, M.F. 1981: Effects of age on pulsatile arterial function in the beagle dog. Proceedings of the Australian Physiology and Pharmacology Society 12, 207P–8P.

Burattini, R. and Carlos, S. 1988: Effective length of the arterial circulation determined in the dog by aid of a model of the systemic input impedance. IEEE Transactions on Biomedical Engineering 35, 53–67.

Burattini, R. and Campbell, K.B. 1989: Modified asymmetric T-tube model to infer arterial wave reflection at the aortic root. IEEE Transactions on Biomedical Engineering 36, 805–14.

Burattini, R. and Campbell, K.B. 1993: Effective distributed compliance of the canine descending aorta estimated by modified T-tube model. American Journal of Physiology 264, H1977–87.

Burattini, R. and Campbell, K.B. 2002: Comparative analysis of aortic impedance and wave reflection in ferrets and dogs. American Journal of Physiology. Heart and Circulatory Physiology 282(1), H244–55.

Burattini, R. and Di Salvia, P.O. 2007: Development of systemic arterial mechanical properties from infancy to adulthood interpreted by four-element Windkessel models. Journal of Applied Physiology 103(1), 66–79.

Burattini, R. and Natalucci, S. 1998: Complex and frequency-dependent compliance of viscoelastic windkessel resolves contradictions in elastic windkessels. Medical Engineering and Physics 20, 502–14.

Burattini, R., Knowlen, G.G. and Campbell, K.B. 1991: Two arterial effective reflecting sites may appear as one to the heart. Circulation Research 68, 85–99.

Burckhardt, C.B. 1978: Speckle in ultrasound B-mode scans. IEEE Transactions on Sonics and Ultrasonics SU-25, 1–6.

Burkhoff, D. and Sagawa, K. 1986: Ventricular efficiency predicted by an analytical model. American Journal of Physiology 250, R1021–7.

Burkhoff, D., Alexander, J. Jr. and Schipke, J. 1988: Assessment of Windkessel as a model of aortic input impedance. American Journal of Physiology 255, H742–53.

Burkhoff, D., de Tombe, P. and Hunter, W.C. 1993: Impact of ejection on magnitude and time course of ventricular pressure-generating capacity. American Journal of Physiology 265, H899–909.

Burkhoff, D., Maurer, M.S. and Packer, M. 2003: Heart failure with a normal ejection fraction: is it really a disorder of diastolic function? Circulation 107, 656–8.

Burrows, M.E. and Johnson, P.C. 1978: The response of cat mesenteric arteries to arterial pressure reduction. Archives Internationales de Pharmacodynamie et de Therapie 236, 290–1.

Burt, V.L., Whelton, P., Roccella, E.J. et al. 1995: Prevalence of hypertension in the US adult population. Results from the Third National Health and Nutrition Examination Survey, 1988–1991. Hypertension 25(3), 305–13.

Burton, A. 1965. Physiology and biophysics of the circulation. Chicago: Year Book Medical Publishers, 102–5.

Burton, A.C. 1954: Relation of structure to function of the tissues of the walls of blood vessels. Physiological Reviews 34, 619–42.

Buss, D., Wusten, B. and Schaper, W. 1978: Effects of coronary stenoses and ventricular loading conditions on coronary flow. Basic Research in Cardiology 73, 571–83.

Busse, R., Bauer, R.D., Schubert, A. et al. 1979a: An improved method for the determination of the pulse transmission characteristics of arteries in vivo. Circulation Research 44, 630–6.

Busse, R., Bauer, R.D., Schubert, A. et al. 1979b: The mechanical properties of exposed human common carotid arteries, in vivo. Basic Research in Cardiology 74, 545–54.

Busse, R., Wetterer, E., Bauer, R.D. et al. 1975: The genesis of the pulse contours of the distal leg arteries in man. Pfluegers Archivs 360, 63–79.

Butcher, H.R. and Newton, W.T. 1958: The influence of age, arteriosclerosis and homotransplantation upon the elastic properties of major human arteries. Annals of Surgery 148, 1–20.

Buyck, J.-F., Dufouil, C., Mazoyer, B. et al. 2009: Cerebral white matter lesions are associated with the risk of stroke but not with other vascular events: the 3-city Dijon study. Stroke 40, 2327–31.

Byrom, F.B. 1954: The pathogenesis of hypertensive encephalopathy and its relation to the malignant phase of hypertension: experimental evidence from the hypertensive rat. Lancet, ii, 201–11.

Byrom, F.B. 1969. The hypertensive vascular crisis: an experimental study. London: Heinemann.

Byrom, F.B. and Dodson, L.F. 1948: The causation of acute arterial necrosis in hypertensive disease. Journal of Pathology and Bacteriology 60, 357–68.

Byrom, F.B. and Dodson, L.F. 1949: The mechanism of the vicious circle in chronic hypertension. Clinical Sciences 8, 1–10.

Byrom, M.J., Bannon, P.G., White, G.H. et al. 2010: Animal models for the assessment of novel vascular conduits. Journal of Vascular Surgery 52, 176–95.

Cai, H., Li, Z., Goette, A. et al. 2002: Downregulation of endocardial nitric oxide synthase expression and nitric oxide production in atrial fibrillation: potential mechanisms for atrial thrombosis and stroke. Circulation 106(22), 2854–8.

Calabrò, P., Golia, E. and Yeh, E.T. 2009: CRP and the risk of atherosclerotic events. Seminars in Immunopathology 31(1), 79–94.

Caldwell, S.M., Merrill, R.A., Sloman, C.M. et al. 1940: Dynamic fatigue life of rubber. Industrial and Engineering Chemistry 12, 19–23.

Calhoun, D.A. and Oparil, S. 1995: Hypertensive crisis since FDR – a partial victory. New England Journal Medicine 332(15), 1029–30.

Callaghan, F.J., Babbs, C.F., Bourland, J.D. et al. 1984: The relationship between arterial pulse-wave velocity and pulse frequency at different pressures. Journal of Medical Engineering and Technology 8, 15–18.

Calvet, D., Boutouyrie, P., Touze, E. et al. 2004: Increased stiffness of the carotid wall material in patients with spontaneous cervical artery dissection. Stroke 35, 2078–82.

Calvin, J.E., Baer, R.W. and Glantz, S.A. 1985: Pulmonary artery constriction produces a greater right ventricular dynamic afterload than lung microvascular injury in the open chest dog. Circulation Research 56, 40–56.

Cameron, J.D. 2009: Wave intensity analysis and central blood pressure. Hypertension 54, 958–9.

Cameron, J.D. and Dart, A.M. 1994: Exercise training increases total systemic arterial compliance in humans. American Journal of Physiology 266, H693–701.

Cameron, J.D., Jennings, G.L. and Dart, A.M. 1996: Systemic arterial compliance is decreased in newly-diagnosed patients with coronary heart disease, implications for prediction of risk. Journal of Cardiovascular Risk 3(6), 495–500.

Cameron, J.S. and Hicks, J. 1996: Frederick Akbar Mahomed and his role in the description of hypertension at Guy's Hospital. Kidney International 49(5), 1488–506.

Camici, P.G. and Crea, F. 2007: Coronary microvascular dysfunction. New England Journal of Medicine 356, 830–40.

Campbell, K.B., Lee, L.C., Frasch, H.F. et al. 1989: Pulse reflection sites and effective length of the arterial system. American Journal of Physiology 256(6 Pt 2), H1684–9.

Campbell, M. 1970: Natural history of coarctation of the aorta. British Heart Journal 32, 633–40.

Campbell, W.B., Skidmore, R., Woodcock, J.P. et al. 1985: Detection of early arterial disease: a study using Doppler waveform analysis. Cardiovascular Research 19, 206–11.

Cannon, R.O. III 2009: Microvascular angina and the continuing dilemma of chest pain with normal coronary angiograms. Journal of the American College of Cardiology 54(10), 877–85.

Cannon, R.O. III and Epstein, S.E. 1988: 'Microvascular angina' as a cause of chest pain with angiographically normal coronary arteries. American Journal of Cardiology 61, 1338–43.

Cannon, R.O., Camici, P.G. and Epstein, S.E. 1992: Pathophysiologic dilemma of syndrome X. Circulation 85(3), 883–92.

Cannon, S.R., Richards, K.L. and Crawford, M. 1985: Hydraulic estimates of stenotic orifice area: a correlation of the Gorlin formula. Circulation 71, 1170–8.

Cantini, C., Kieffer, P., Corman, B. et al. 2001: Aminoguanidine and aortic wall mechanics, structure, and composition in aged rats. Hypertension 38(4), 943–8.

Cao, J.J., Arnold, A.M., Manolio, T.A. et al. 2007: Association of carotid artery intima-media thickness, plaques, and C-reactive protein with future cardiovascular disease and all-cause mortality: the Cardiovascular Health Study. Circulation 116, 32–8.

Caplan, L.R. 1998: Should intracranial aneurysms be treated before they rupture? New England Journal of Medicine 339, 1774–5.

Carallo, C., Lucca, L.F., Ciamei, M. et al. 2006: Wall shear stress is lower in the carotid artery responsible for a unilateral ischemic stroke. Atherolerosis 185(1), 108–13.

Cardillo, C. and Panza, J.A. 1998: Impaired endothelial regulation of vascular tone in patients with systemic arterial hypertension. Vascular Medicine 3, 138–44.

Cardillo, C., Campia, U., Bryant, M.B. et al. 2002a: Increased activity of endogenous endothelin in patients with type II diabetes mellitus. Circulation 106, 1783–7.

Cardillo, C., Campia, U., Kilcoyne, C.M. et al. 2002b: Improved endothelium-dependent vasodilation after blockade of endothelin receptors in patients with essential hypertension. Circulation 105(4), 452–6.

Carew, T.E., Vaishnav, R.N. and Patel, D.J. 1968: Compressibility of the arterial wall. Circulation Research 23, 61–8.

Carey, B.J., Eames, P.J., Blake, M.J. et al. 2000: Dynamic cerebral autoregulation is unaffected by aging. Stroke 31, 2895–900.

Carlson, R.G., Lillehei, C.W. and Edwards, J.E. 1970: Cystic medial necrosis of the ascending aorta in relation to age and hypertension. American Journal of Cardiology 25(4), 411–15.

Carnoya, J. and Glantz, S.A. 2005: Cardiovascular effects of secondhand smoke: nearly as large as smoking. Circulation 111, 2684–98.

Caro, C.G. 1977: Mechanical factors in atherogenesis. In: Hwang, N.H. and Normann, N.A. (eds), Cardiovascular flow dynamics and measurements. Baltimore: University Park Press, pp. 473–87.

Caro, C.G. 1994: Alterations of arterial hemodynamics associated with risk factors for atherosclerosis and induced by pharmacological or physiologic means: implications for the development/management of atherosclerosis. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Switzerland: Harwood Academic Publishers, pp. 197–213.

Caro, C.G. and Harrison, G.K. 1962: Observations of pulse wave velocity and pulsatile blood pressure in the human pulmonary circulation. Clinical Science 23, 317–29.

Caro, C.G. and McDonald, D.A. 1961: The relation of pulsatile pressure and flow in the pulmonary vascular bed. Journal of Physiology 157, 426–53.

Caro, C.G. and Lever, M.J. 1983: The mass transport of the arterial wall: effect of mechanical stresses and vasoactive agents, including nitrates. Zeitung fur Kardiologie 72, 178–81.

Caro, C.G., Bergel, D.H. and Seed, W.A. 1967b: Forward and backward transmission of pressure waves in the pulmonary vascular bed of the dog. Circulation Research 20, 185–93.

Caro, C.G., Harrison, G.K. and Mognoni, P. 1967a: Pressure wave transmission in the human pulmonary circulation. Cardiovascular Research 1, 91–100.

Caro, C.G., Pedley, T.J., Schroter, R.C. et al. 1978. The mechanics of the circulation. Oxford: Oxford University Press.

Carretero, O.A. and Oparil, S. 2000a: Essential hypertension; Part I: Definition and etiology. Circulation 101, 329–35.

Carretero, O.A. and Oparil, S. 2000b: Essential hypertension; Part II: Treatment. Circulation 101, 446–53.

Carroll, J.D., Shroff, S., Wirth, P. et al. 1991: Arterial mechanical properties in dilated cardiomyopathy: aging and the response to nitroprusside. Journal of Clinical Investigation 87, 1002–09.

Carson, P., Ziesche, S., Johnson, G. et al. 1999: Racial differences in response to therapy for heart failure: analysis of the Vasodilator-Heart Failure Trials. Journal of Cardiac Failure 5, 178–87.

Caruana, L., Petrie, M.C., Davie, A.P. and McMurray, J.J.V. 2000: Do patients with suspected heart failure and preserved left ventricular systolic function suffer from 'diastolic heart failure' or from misdiagnosis? A prospective descriptive study. British Medical Journal 321, 215–9.

Casale, P.N., Devereux, R.B., Milner, M. et al. 1986: Value of echocardiographic measurement of left ventricular mass in predicting cardiovascular morbid events in hypertensive men. Annals of Internal Medicine 105(2), 173–8.

Casey, D.P. 2008: Assessment of central arterial blood pressure during exercise: is it reproducible? American Journal of Hypertension 21, 1073.

Casey, D.P., Beck, D.T., Nichols, W.W. et al. 2011: Effects of enhanced external counterpulsation on arterial stiffness and myocardial oxygen demand in patients with chronic angina pectoris. American Journal of Cardiology 107(10), 1466–72.

Casey, D.P., Pierce, G.L., Howe, K.S. et al. 2007: Effect of resistance training on arterial wave reflection and brachial artery reactivity in normotensive postmenopausal women. European Journal of Applied Physiology 100(4), 403–8.

Casey, D.P., Conti, C.R., Nichols, W.W. et al. 2008a: Effect of enhanced external counterpulsation on inflammatory cytokines and adhesion molecules in patients with angina pectoris and angiographic coronary artery disease. American Journal of Cardiology 101(3), 300–2.

Casey, D.P., Nichols, W.W. and Braith, R.W. 2008b: Impact of aging on central pressure wave reflection characteristics during exercise. American Journal of Hypertension 21, 419–24.

Casey, D.P., Nichols, W.W., Conti, C.R. et al. 2010: Relationship between endogenous concentrations of vasoactive substances and measures of peripheral vasodilator function in patients with coronary artery disease. Clinical and Experimental Pharmacology and Physiology 37, 24–8.

Cassar, A., Chareonthaitawee, P., Rihal, C.S. et al. 2009: Lack of correlation between noninvasive stress tests and invasive coronary vasomotor dysfunction in patients with nonobstructive coronary artery disease. Circulation: Cardiovascular Interventions 2, 237–44.

Cassottana, P., Badano, L., Piazza, R. et al. 1997: [Dimensions of the proximal thoracic aorta from childhood to adult age: reference values for two-dimensional echocardiography. Ligurian Group of SIEC (Italian Society of Echocardiography)]. Giornale Italiano di Cardiologia 27(7), 686–96.

Castlelain, V., Herve, P., Lecarpentier, Y. et al. 2001: Pulmonary artery pulse pressure and wave reflection in chronic pulmonary thromboembolism

and primary pulmonary hypertension. Journal of the American College of Cardiology 37, 1085–92.
Casty, M. and Giddens, D.P. 1984: 25+1 channel pulsed ultrasound Doppler velocity meter for quantitative flow measurements and turbulence analysis. Ultrasound in Medicine and Biology 10(2), 161–72.
Cattell, M.A., Anderson, J.C. and Hasleton, P.S. 1996: Age-related changes in amounts and concentrations of collagen and elastin in normotensive human thoracic aorta. Clinica Chimica Acta 245(1), 73–84.
Cavallini, M.C., Roman, M.J., Pini, R. et al. 1995: Relation of pulse pressure to target organ damage in hypertensive patients. Journal of the American College of Cardiology February, 299A.
Cawley, P.J. and Otto, C.M. 2009: Valvular regurgitation: does cardiovascular magnetic resonance provide additional information compared to echocardiography? Minerva Cardioangiologica 57(4), 521–35.
Cecconi, M., Fawcett, J., Grounds, R.M. et al. 2008: A prospective study to evaluate the accuracy of pulse power analysis to monitor cardiac output in critically ill patients. BMC Anesthesiology 8, 3.
Cecelja, M. and Chowienczyk, P. 2009: Dissociation of pulse wave velocity with risk factors for cardiovascular disease other than hypertension: a systematic review. Hypertension 54, 1328–36.
Cecelja, M., Jiang, B., Bevan, L. et al. 2011: Arterial stiffening relates to arterial calcification but not to non-calcified atheroma in women: a twin study. Journal of the American College of Cardiology 57, 1480–6.
Cecelja, M., Jiang, B., McNeill, K. et al. 2009: Increased wave reflection rather than central arterial stiffness is the main determinant of raised pulse pressure in women and relates to mismatch in arterial dimensions: a twin study. Journal of the American College of Cardiology 54, 695–703.
Celentano, A., Crivaro, M., Roman, M.J. et al. 2001: Left ventricular geometry and arterial function in hypercholesterolemia. Nutrition and Metabolism in Cardiovascular Disease 11(5), 312–9.
Celermajer, D.S. 1997: Endothelial dysfunction: does it matter? Is it reversible? Journal of the American College of Cardiology 30, 325–33.
Celermajer, D.S. 1998: Noninvasive detection of atherosclerosis. New England Journal of Medicine 339, 2014–5.
Celermajer, D.S. 2003: Clinical trials: evidence and unanswered questions – hypertension. Cerebrovascular Diseases 16(suppl. 3), 18–24.
Celermajer, D.S. 2008: Reliable endothelial function testing: at our fingertips? Circulation 117(19), 2428–30.
Celermajer, D.S. and Greaves, K. 2002: Survivors of coarctation repair, fixed but not cured (Editorial). Heart 88, 113–14.
Celermajer, D.S., Sorensen, K.E., Gooch, V.M. et al. 1992: Non-invasive detection of endothelial dysfunction in children and adults at risk of atherosclerosis. Lancet 340, 1111–15.
Celermajer, D.S., Sorensen, K.E., Georgakopoulos, D. et al. 1993a: Cigarette smoking is associated with dose-related and potentially reversible impairment of endothelium-dependent dilation in healthy young adults. Circulation 88, 2149–55.
Celermajer, D.S., Cullen, S. and Deanfield, J.E. 1993b: Impairment of endothelium-dependent pulmonary artery relaxation in children with congenital heart disease and abnormal pulmonary hemodynamics. Circulation 87, 440–6.
Celermajer, D.S., Sorensen, K.E. and Spiegelhalter, D.J. 1994a: Aging is associated with endothelial dysfunction in healthy men years before the age-related decline in women. Journal of the American College of Cardiology 24(2), 471–6.
Celermajer, D.S., Sorensen, K.E., Bull, C. et al. 1994b: Endothelium-dependent dilation in the systemic arteries of asymptomatic subjects relates to coronary risk factors and their interaction. Journal of the American College of Cardiology 24(6), 1468–74.
Celermajer, D.S., Adams, M.R., Clarkson, P. et al. 1996: Passive smoking and impaired endothelium-dependent arterial dilatation in healthy young adults. New England Journal of Medicine 334, 150–4.
Cemin, R., Erlicher, A., Fattor, B. et al. 2008: Reduced coronary flow reserve and parasympathetic dysfunction in patients with cardiovascular syndrome X. Coronary Artery Disease 19(1), 1–7.
Cernes, R., Zimlichman, R. and Shargorodsky, M. 2008: Arterial elasticity in cardiovascular disease: focus on hypertension, metabolic syndrome and diabetes. Advances in Cardiology 45, 65–81.
Cernes, R., Peer, M., Boaz, M. et al. 2010: Relation of arterial properties to left ventricular hypertrophy in hypertensive adults: focus on gender-related differences. Angiology 61(5), 510–15.
Chaer, R.A., Trocciola, S., DeRubertis, B. et al. 2006: Evaluation of the accuracy of a wireless pressure sensor in a canine model of retrograde-collateral (type II) endoleak and correlation with histologic analysis. Journal of Vascular Surgery 44(6), 1306–13.
Chahed, N., Peronneau, P., Delouche, A. and Diebold, B. 1991: Velocity profiles and streamlines of a revolution post-stenotic flow. Biorheology 28(5), 383–400.
Chaignon, M.M., Mourad, J.-J. and Guédon, J. 1993: Comparative effects of antihypertensive drugs on systolic blood pressure. Journal of Hypertension 11(suppl. 1), S27–S31.
Chandraratna, P.A., Nanna, M., McKay, C. et al. 1984: Determination of cardiac output by transcutaneous continuous-wave ultrasonic Doppler computer. American Journal of Cardiology 53, 234–7.
Chang, C.C. and Atabek, H.B. 1961: The inlet length for oscillatory flow and its effects on the determination of the rate of flow in arteries. Physics in Medicine and Biology 6, 303–17.
Chang, K.C., Hsieh, K.S., Kuo, T.S. et al. 1990: Effects of nifedipine on systemic hydraulic vascular load in patients with hypertension. Cardiovascular Research 24, 719–726.
Chappell, D.C., Varner, S.E., Nerem, R.M. et al. 1998: Oscillatory shear stress stimulates adhesion molecule expression in cultured human endothelium. Circulation Research 82, 532–9.
Chapuis, B., Vidal-Petiot, E., Oréa, V. et al. 2004: Linear modeling analysis of baroreflex control of arterial pressure variability in rats. Journal of Physiology 559(Pt 2), 639–49.
Charcot, J.M. and Bouchard, C. 1868: Nouvelles recherches sur la pathogénic de l'hémorrhagie cérébrale. Archives de Physiologie 1, 110, 643, 725.
Chatterjee, A., Black, S.M. and Catravas, J.D. 2008: Endothelial nitric oxide (NO) and its pathophysiologic regulation. Vascular Pharmacology 49(4–6), 134–40.
Chaturvedi, N., Bulpitt, C.J., Leggetter, S. et al. 2004: Ethnic differences in vascular stiffness and relations to hypertensive target organ damage. Journal of Hypertension 22, 1731–7.
Chatzizisis, Y.S., Coskun, A.U., Jonas, M. et al. 2007: Role of endothelial shear stress in the natural history of coronary atherosclerosis and vascular remodeling: molecular, cellular, and vascular behavior. Journal of the American College of Cardiology 49(25), 2379–93.
Chatzizisis, Y.S., Jonas, M., Coskun, A.U. et al. 2008: Prediction of the localization of high-risk coronary atherosclerotic plaques on the basis of low endothelial shear stress: an intravascular ultrasound and histopathology natural history study. Circulation 117(8), 993–1002.
Chaudhry, S.I., Wang, Y., Gill, T.M. et al. 2010: Geriatric conditions and subsequent mortality in older patients with heart failure. Journal of the American College of Cardiology 55, 309–16.
Chauhan, A., More, R.S., Mullins, P.A. et al. 1996: Aging-associated endothelial dysfunction in humans is reversed by L-arginine. Journal of the American College Cardiology 28(7), 1796–804.
Cheitlin, M.D. 2001: Obesity is bad: but what should the definition be, and when is it bad? Cardiology Review 9, 208–9.
Cheitlin, M.D., Hutter, A.M., Brindis, R.G. et al. 1999: Use of sildenafil (Viagra) in patients with cardiovascular disease. The ACC/AHA Expert Consensus Document. Circulation 99, 168–77.
Chemla, D., Antony, I., Hebert, J.L. et al. 2002a: Increased aortic pulse pressure associated with concentric left ventricular hypertrophy in arterial hypertension. American Journal of Hypertension 15(4 Pt 2), 164A.
Chemla, D., Antony, I., Zamani, K. et al. 2005: Mean aortic pressure is the geometric mean of systolic and diastolic aortic pressure in resting humans. Journal of Applied Physiology 99(6), 2278–84.

Chemla, D., Castelain, V., Provencher, S. et al. 2009: Evaluation of various empirical formulas for estimating mean pulmonary artery pressure by using systolic pulmonary artery pressure in adults. Chest 135, 760–8.

Chemla, D., Coirault, C., Hébert, J.-L. and Lecarpentier, Y. 2000: Mechanics of relaxation of the human heart. News in Physiological Sciences 15, 78–83.

Chemla, D., Hebert, J.L. and Coirault, C. 1998: Total arterial compliance estimated by stroke volume-to-aortic pulse pressure ratio in humans. American Journal of Physiology 274(2 Pt 2), H500–H505.

Chemla, D., Hebert, J.L., Aptecar, E. et al. 2002b: Empirical estimates of mean aortic pressure: advantages, drawbacks and implications for pressure redundancy. Clinical Science 103, 7–13.

Chemla, D., Plamann, K. and Nitenberg, A. 2008: Towards new indices of arterial stiffness using systolic pulse contour analysis: a theoretical point of view. Journal of Cardiovascular Pharmacology 51(2), 111–7.

Chen, C.-H., Nakayama, M., Nevo, E. et al. 1998: Coupled systolic–ventricular and vascular stiffening with age: implications for pressure regulation and cardiac reserve in the elderly. Journal of the American College of Cardiology 32, 1221–7.

Chen, C.-H., Nakayama, M., Talbot, M. et al. 1999: Verapamil acutely reduces ventricular–vascular stiffening and improves aerobic exercise performance in elderly individuals. Journal of the American College of Cardiology 33, 1602–9.

Chen, C.H., Nevo, E., Fetics, B. et al. 1997: Estimation of central aortic pressure waveform by mathematical transformation of radial tonometry pressure: validation of generalized transfer function. Circulation 95, 1827–36.

Chen, C.H., Ting, C.T., Lin, S.J. et al. 1995: Different effects of fosinopril and atenolol on wave reflections in hypertensive patients. Hypertension 25(5), 1034–41.

Chen, C.H., Ting, C.T., Nussbacher, A. et al. 1996: Validation of carotid artery tonometry as a means of estimating augmentation index of ascending aortic pressure. Hypertension 27(2), 168–75.

Chen, C.-H., Fetics, B., Nevo, E. et al. 2001: Noninvasive single-beat determination of left ventricular end-systolic elastance in human. Journal of the American College of Cardiology 38, 2028–34.

Chen, H.I., Hsieh, N.K., Chang, H.R. et al. 2008: Arterial haemodynamics on ventricular hypertrophy in rats with simulated aortic stiffness. Pflugers Archiv 455(4), 595–606.

Chen, L., Nichols, W.W., Mattsson, C. et al. 1996: Inogatran, a novel direct low molecular weight thrombin inhibitor, given with, but not after, tissue-plasminogen activator, improves thrombolysis. Journal of Pharmacology: Experimental and Theory 277(3), 1276–83.

Chen, Y.T., Chen, K.S., Chen, J.S. et al. 1990: Aortic and pulmonary input impedance in patients with cor pulmonale. Japanese Heart Journal 31(5), 619–29.

Cheng, C., Helderman, F., Tempel, D. et al. 2007: Large variations in absolute wall shear stress levels within one species and between species. Atherosclerosis 195, 225–35.

Cheng, G.C., Loree, J.M., Kamm, R.D. et al. 1993: Distribution of circumferential stress in ruptured and stable atherosclerotic lesions: a structural analysis with histopathological correlation. Circulation 87, 1179–87.

Cheng, K.S., Baker, C.R., Hamilton, G. et al. 2002: Arterial elastic properties and cardiovascular risk/event. European Journal of Vascular and Endovascular Surgery 24(5), 383–97.

Cheng, K.S., Tiwari, A., Boutin, A. et al. 2003a: Differentiation of primary and secondary Raynaud's disease by carotid arterial stiffness. European Journal of Vascular Endovascular Surgery 25(4), 336–41.

Cheng, K.S., Tiwari, A., Morris, R. et al. 2003b: The influence of peripheral vascular disease on the carotid and femoral wall mechanics in subjects with abdominal aortic aneurysm. Journal of Vascular Surgery 37(2), 403–9.

Cheng, S., Xanthakis, V., Sullivan, L.M. et al. 2010: Correlates of echocardiographic indices of cardiac remodeling over the adult life course: longitudinal observations from the Framingham Heart Study. Circulation 122(6), 570–8.

Cherin, E.W., Poulsen, J.K., van der Steen, A.F et al. 2002: Experimental characterization of fundamental and second harmonic beams for a high-frequency ultrasound transducer. Ultrasound in Medicine and Biology 28, 635–46.

Cheruvu, P.K., Finn, A.V., Gardner, C. et al. 2007: Frequency and distribution of thin-cap fibroatheroma and ruptured plaques in human coronary arteries: a pathologic study. Journal of the American College of Cardiology 50, 940–9.

Chesler, N.C., Roldan, A., Vanderpool, R.R. et al. 2009: How to measure pulmonary vascular and right ventricular function. Conference proceedings: Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 177–80.

Cheung, Y., Brogan, P.A., Dillon, M.J. et al. 2000: Distensibility of the medium-sized muscular arteries in polyarteritis nodosa. Journal of the American College of Cardiology 35, 298A.

Cheung, Y.F., Chan, G.C. and Ha, S.Y. 2002: Arterial stiffness and endothelial function in patients with beta-thalassemia major. Circulation 106(20), 2561–6.

Chida, Y. and Steptoe, A. 2010: Greater cardiovascular responses to laboratory mental stress are associated with poor subsequent cardiovascular risk status: a meta-analysis of prospective evidence. Hypertension 55, 1026–32.

Chien, S. 2003: Molecular and mechanical bases of focal lipid accumulation in arterial wall. Progress in Biophysics and Molecular Biology 83, 131–51.

Chien, S., Usami, S., Taylor, M. et al. 1966: Effects of hematocrit and plasma proteins on human blood rheology at low shear rates. Journal of Applied Physiology 21, 81–7.

Chien, S., Luse, S.A. and Bryant, C.A. 1971: Hemolysis during filtration through micropores: a scanning electron microscope and hemorheology correlation. Microvascular Research 3, 183–203.

Chikada, M., Shiota, T. and Jones, M. 2005: Gorlin formulas for aortic regurgitant and mitral regurgitant orifice areas: experimental studies. Journal of Cardiology 46(4), 149–54.

Chilian, W.M. 1997: Coronary microcirculation in health and disease. Summary of an NHLBI workshop. Circulation 95(2), 522–8.

Chirinos, J.A. and Segers, P. 2010a: Noninvasive evaluation of left ventricular afterload. Part 1: Pressure and flow measurements and basic principles of wave conduction and reflection. Hypertension 56, 555–62.

Chirinos, J.A., Zambrano, J.P., Chakko, S. et al. 2005: Aortic pressure augmentation predicts adverse cardiovascular events in patients with established coronary artery disease. Hypertension 45, 980–5.

Chirinos, J.A., Rietzschel, E.R., De Buyzere, M.L. et al. 2009a: Arterial load and ventricular–arterial coupling: physiologic relations with body size and effect of obesity. Hypertension 54(3), 558–66.

Chirinos, J.A., Segers, P., Gupta, A.K. et al. 2009b: Time-varying myocardial stress and systolic pressure-stress relationship: role in myocardial-arterial coupling in hypertension. Circulation 119, 2798–807.

Chirinos, J.A., Segers, P., Raina, A. et al. 2009c: Arterial pulsatile hemodynamic load induced by isometric exercise strongly predicts left ventricular mass in hypertension. American Journal of Physiology. Heart and Circulatory Physiology 298(2), H320–30.

Chirinos, J.A. and Segers, P. 2010b: Noninvasive evaluation of left ventricular afterload. Part 2: Arterial pressure–flow and pressure–volume relation in humans. Hypertension 56, 563–70.

Chiu, Y.C., Arand, P.W. and Carroll, J.D. 1992: Power-afterload relation in the failing human ventricle. Circulation Research 70, 530–5.

Cho, G.-Y., Marwick, T.H., Kim, H.-S. et al. 2009: Global 2-dimensional strain as a new prognosticator in patients with heart failure. Journal of the American College of Cardiology 54, 618–24.

Chobanian, A.V. 2001: Control of hypertension – an important national priority (Editorials). New England Journal of Medicine 345, 534–5.

Chobanian, A.V., Bakris, G.L., Black, H.R. et al. 2003: The seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. Journal of the American Medical Asssociation 289(19), 2560–72.

Choi, C.U., Park, E.B., Suh, S.Y. et al. 2007: Impact of aortic stiffness on cardiovascular disease in patients with chest pain. Assessment with

direct intra-arterial measurement. American Journal of Hypertension 20, 1163–9.
Choi, E.-K., Choi, S.I., Rivera, J.J. et al. 2008: Coronary computed tomography angiography as a screening tool for the detection of occult coronary artery disease in asymptomatic individuals. Journal of the American College of Cardiology 52, 357–65.
Cholley, B.P. and Singer, M. 2003: Esophageal Doppler: noninvasive cardiac output monitor. Echocardiography 20(8), 763–9.
Cholley, B.P. and Payen, D. 2005: Noninvasive techniques for measurements of cardiac output. Current Opinion in Critical Care 11(5), 424–9.
Cholley, B.P., Lang, R.M., Berger, D.S. et al. 1995a: Alterations in systemic arterial mechanical properties during septic shock: role of fluid resuscitation. American Journal of Physiology 269, H375–4.
Cholley, B.P., Shroff, S.G., Sandelski, J. et al. 1995b: Differential effects of chronic oral antihypertensive therapies on systemic arterial circulation and ventricular energetics in African-American patients. Circulation 91(4), 1052–62.
Cholley, B.P., Lang, R.M., Korcarz, C.E. et al. 2001: Smooth muscle relaxation and local hydraulic impedance properties of the aorta. Journal of Applied Physiology 90, 2427–38.
Choshniak, I., Ben-Kohav, N., Taylor, C.R. et al. 1995: Metabolic adaptations for desert survival in the Bedouin goat. American Journal of Physiology 268(5), R1101–10.
Chow, C.K., Lock, K., Teo, K. et al. 2009: Environmental and societal influences acting on cardiovascular risk factors and disease at a population level: a review. International Journal of Epidemiology 38, 1580–94.
Chowienczyk, P.J., Kelly, R.P., MacCallum, H. et al. 1999: Photoplethysmographic assessment of pulse wave reflection: blunted response to endothelium-dependent beta2-adrenergic vasodilation in type II diabetes mellitus. Journal of the American College of Cardiology 34, 2007–14.
Christie, L.G., Nichols, W.W., Pepine, C.J. et al. 1978: Pulsatile flow characteristics of aortic valve porcine heterografts in man. Circulation 58(suppl. 1), 1162–5.
Christy, R.M., Baskurt, O.K., Gass, G.C. et al. 2010: Erythrocyte aggregation and neutrophil function in an aging population. Gerontology 56, 175–80.
Chue, C.D., Townend, J.N., Steeds, R.P. and Ferro, C.J. 2010: Arterial stiffness in chronic kidney disease: causes and consequences. Heart 96, 817–23.
Chugh, A. and Bakris, G.L. 2007: Pulse pressure and arterial stiffness: an emerging renal risk predictor? Journal of Hypertension 25, 1796–7.
Chuter, T.A. 2009: Durability of endovascular infrarenal aneurysm repair: when does late failure occur and why? Seminars in Vascular Surgery 22, 102–10.
CIBIS-II Investigators and Committees. 1999: The cardiac insufficiency bisoprolol study II (CIBIS-II): a randomised trial. Lancet 353, 9–13.
Çinar, Y., Demir, G., Pac, M. et al. 1999: Effect of hematocrit on blood pressure via hyperviscosity. American Journal of Hypertension 12(7), 739–43.
Çinar, Y., Senyol, A.M. and Duman, K. 2001: Blood viscosity and blood pressure, role of temperature and hyperglycemia. American Journal of Hypertension 14(5 Pt 1), 433–8.
Cinthio, M., Ahlgren, A.R., Bergkvist, J. et al. 2006: Longitudinal movements and resulting shear-strain of the arterial wall. American Journal of Physiology. Heart and Circulatory Physiology 291, H394–402.
Cipolla, M.J. 2007: Cerebrovascular function in pregnancy and eclampsia. Hypertension 50, 14–24.
Clark, C. 1974: Thin film gauges for fluctuating velocity measurements in blood. Journal Science Instrumentation 7, 548–56.
Clark, J.M. and Glagov, S. 1985: Transmural organization of the arterial media – the lamellar unit revisited. Arteriosclerosis 5, 19–34.
Clarkson, P., Celermajer, D.S., Donald, A.E. et al. 1996: Impaired vascular reactivity in insulin-dependent diabetes mellitus is related to disease duration and low density lipoprotein cholesterol levels. Journal of the American College of Cardiology 28, 573–9.
Clarkson, P.M., Nicholson, M.R., Barratt-Boyes, B.G. et al. 1983: Results after repair of coarctation of the aorta beyond infancy: a 10 to 28 year follow-up with particular reference to late systemic hypertension. American Journal of Cardiology 51(9), 1481–8.
Clausen, J.P. 1977: Effect of physical training on cardiovascular adjustments to exercise in man. Physiological Reviews 57, 779–815.
Cleary, E.G. 1963: A correlative and comparative study of non-uniform arterial wall. MD thesis, University of Sydney.
Cleland, J.G., Tendera, M., Adamus, J. et al. 1999: Perindopril for elderly people with chronic heart failure: the PEP-CHF study: the PEP Investigators. European Journal of Heart Failure 1, 211–7.
Cleland, J.G.F., Tendera, M., Adamus, J. et al. 2006: The periondopril in elderly people with chronic heart failure (PEP-CHF) study. European Heart Journal 27, 2338–45.
Cliff, W.F. 1981: Aging and arterial structure. In: Schwartz, C.J., Werthessen, N.T. and Wolf, S. (eds), Structure and function of the circulation. New York: Plenum Press, pp. 635–65.
Cloutier, G., Chen, D. and Durand, L.G. 2001: Performance of time-frequency representation techniques to measure blood flow turbulence with pulsed-wave Doppler ultrasound. Ultrasound in Medicine and Biology 27(4), 535–50.
Clowes, A.W. and Berceli, S.A. 2000: Mechanisms of vascular atrophy and fibrous cap disruption. Annals of the New York Academy of Sciences 902, 153–61.
Cobbold, R.S.C. 1974: Transducers for Biomedical Measurements: principles and applications. New York: John Wiley & Sons.
Cobbold, R.S.C. 2007: Foundations of Biomedical Ultrasound. Oxford: Oxford University Press.
Cockcroft, J. 2009: Atenolol is dead: long live beta-blockade. Journal of the American College of Cardiology 53, 2102.
Cockcroft, J.R., Chowienczyk, P.J., Benjamin, N. et al. 1994: Preserved endothelium-dependent vasodilatation in patients with essential hypertension. New England Journal of Medicine 330, 1036–40.
Cockcroft, J.R. and Wilkinson, I.B. 2002: Arterial stiffness and pulse contour analysis, an age-old concept revisited. Clinical Science 103, 379–80.
Cockcroft, J., Webb, D. and Wilkinson, I. 2000: Arterial stiffness, hypertension and diabetes mellitus (Review). Journal of Human Hypertension 14, 377–80.
Cockcroft, J.R., Wilkinson, I.B. and Webb, D.J. 1997: The Trevor Howell Lecture. Age, arterial stiffness and the endothelium. Age and Ageing 26(suppl. 4), 53–60.
Coggan, A.R., Spina, R.J., Rogers, M.A. et al. 1990: Histochemical and enzymatic characteristics of skeletal muscle in master athletes. Journal Applied Physiology 68(5), 1896–901.
Cohen, M.A. and Taylor, J.A. 2002: Short-term cardiovascular oscillations in man: measuring and modelling the physiologies. Journal of Physiology 542(Pt 3), 669–83.
Cohen, M., Fuster, V., Steele, P.M. et al. 1989: Coarctation of the aorta. Long-term follow-up and prediction of outcome after surgical correction. Circulation 80(4), 840–5.
Cohen, M.V. and Gorlin, R. 1972: Modified orifice equation for calculation of mitral value area. American Heart Journal 84, 839–40.
Cohen, M.V., Sonnenblick, E.H. and Kirk, E.S. 1976: Coronary steal: its role in detrimental effect of isoproterenol after acute coronary occlusion in dogs. American Journal of Cardiology 38, 880–8.
Cohn, J.N. 1994: Vasodilators in heart failure. Drugs 47, 47–58.
Cohn, J.N. and Finkelstein, S.M. 1992: Abnormalities of vascular compliance in hypertension, aging and heart failure. Journal of Hypertension 10(6), (suppl.) S61–4.
Cohn, J.N., Archibald, D.G., Ziesche, S. et al. 1986: Effect of vasodilator therapy on mortality in chronic congestive heart failure: results of a Veterans Administration Cooperative Study. New England Journal of Medicine 314, 1547–52.
Cohn, J.N., Johnson, G., Ziesche, S. et al. 1991: A comparison of enalapril with hydralazine-isosorbide dinitrate in the treatment of chronic congestive heart failure. New England Journal of Medicine 325, 303–10.
Cohn, J.N., Finkelstein, S., McVeigh, G. et al. 1995: Noninvasive pulse wave analysis for the early detection of vascular disease. Hypertension 26(3), 503–8.

Cohn, J.N., Bristow, M.R., Chien, K.R. et al. 1997: Report of the National Heart, Lung, and Blood Institute Special Emphasis Panel on Heart Failure Research. Circulation 95(4), 766–70.

Cohn, J.N., Quyyumi, A.A., Hollenberg, N.K. and Jamerson, K.A. 2004: Surrogate markers for cardiovascular disease: functional markers. Circulation 109(suppl. IV), IV31–46.

Cokelet, G.R., Merrill, E.W., Gilliland, E.R. et al. 1963: The rheology of human blood measurement near and at zero shear rate. Transactions of the Society of Rheology 7, 303–17.

Cole, J.S. and Hartley, C.J. 1977: The pulsed Doppler coronary artery catheter: preliminary report of a new technique for measuring rapid changes in coronary artery flow velocity in man. Circulation 56, 18–25.

Collen, D. 1992: Designing thrombolytic agents; focus on safety and efficacy. American Journal of Cardiology 69(2), 71A–81A.

Collen, D. and Van de Werf, F. 1993: Coronary thrombolysis with recombinant staphylokinase in patients with evolving myocardial infarction. Circulation 87(6), 1850–3.

Colleran, P.N., Behnke, B.J., Wilkerson, M.K. et al. 2008: Simulated microgravity alters rat mesenteric artery vasoconstrictor dynamics through an intracellular Ca(2+) release mechanism. American Journal of Physiology. Regulatory, Integrative and Comparative Physiology 294(5), R1577–85.

Collier, S.R., Kanaley, J.A. and Carhart, R. Jr. 2008: Effect of 4 weeks of aerobic or resistance exercise training on arterial stiffness, blood flow and blood pressure in pre- and stage-1 hypertensives. Journal of Human Hypertension 22, 678–86.

Collins, P. and Fox, K. 1992: The pathogenesis of atheroma and the rationale for its treatment. European Heart Journal 13, 560–5.

Come, P.C., Bulkley, B.H., Goodman, Z.D. et al. 1977: Hypercontractile cardiac states simulating hypertrophic cardiomyopathy. Circulation 55, 901–08.

Comeau, S.G. and Hicks, J.W. 1994: Regulation of central vascular blood flow in the turtle. American Journal of Physiology 267(2), R569–78.

Compton, F., Wittrock, M., Schaefer, J.H. et al. 2008a: Noninvasive cardiac output determination using applanation tonometry-derived radial artery pulse contour analysis in critically ill patients. Anesthesia and Analgesia 106(1), 171–4.

Compton, F.D., Zukunft, B., Hoffmann, C. et al. 2008b: Performance of a minimally invasive uncalibrated cardiac output monitoring system (Flotrac/Vigileo) in haemodynamically unstable patients. British Journal of Anaesthesia 100(4), 451–6.

Condos, W.R., Latham, R.D., Hoadley, S.D. et al. 1987: Hemodynamics of the Mueller maneuver in man: right and left heart micromanometry and Doppler echocardiography. Circulation 76, 1020–8.

Conen, D., Ridker, P.M., Mora, S. et al. 2007: Blood pressure and risk of developing type 2 diabetes mellitus: the Women's Health Study. European Heart Journal 28, 2937–43.

Cong, P., Young, D.J., Hoit, B. et al. 2006: Novel long-term implantable blood pressure monitoring system with reduced baseline drift. Conference Proceedings Annual International Conference of the IEEE Engineering in Medicine and Biology Society 1, 1854–7.

Connor, H.E., Feniuk, W. and Humphrey, P.P.A. 1989: 5-Hydroxytryptamine contracts human coronary arteries predominantly via 5-HT2 receptor activation. European Journal of Pharmacology 161, 91–4.

Consensus Trial Study Group. 1987: Effects of enalapril on mortality in severe congestive heart failure. New England Journal of Medicine 316, 1429–35.

Constans, J., Germain, C., Gosse, P. et al. 2007: Arterial stiffness predicts severe progression in systemic sclerosis: the ERAMS study. Journal of Hypertension 25, 1900–6.

Conti, C.R. 1993: What is Syndrome X? Clinical Cardiology 16(1), 1–4.

Cook, J.N., DeVan, A.E., Schleifer, J.L. et al. 2006: Arterial compliance of rowers: implications for combined aerobic and strength training on arterial elasticity. American Journal of Physiology. Heart and Circulatory Physiology 290, H1596–600.

Cooke, J.P. 1999: The 1998 Nobel Prize in medicine: clinical implications for 1999 and beyond (Editorial). Vascular Medicine 4, 57–60.

Cooper, D.J., Rosenfeld, J.V., Murray, L. et al. the DECRA Trial Investigators and the Australian and New Zealand Intensive Care Society Clinical Trials Group. 2011: Decompressive craniectomy in diffuse traumatic brain injury. New England Journal of Medicine 364(16), 1493–502.

Cooper, R., Ghali, J., Simmons, B.E. et al. 1991: Elevated pulmonary artery pressure. An independent predictor of mortality. Chest 99(1), 112–20.

Corretti, M.C., Plotnick, G.D. and Vogel, R.A. 1995: Technical aspects of evaluating brachial artery vasodilatation using high-frequency ultrasound. American Journal of Physiology 268, H1397–404.

Corretti, M.C., Anderson, T.J., Benjamin, E.J. et al. 2002: Guidelines for the ultrasound assessment of endothelial-dependent flow-mediated vasodilation of the brachial artery: a report of the International Brachial Artery Reactivity Task Force. Journal of the American College of Cardiology 39, 257–65.

Corte, M.D., Locchi, F., Spinelli, E. et al. 1979: Effect of the anatomical structure of the arterial tree on the measurement of pulse wave velocity in man. Physics Medicine and Biology 24, 593–9.

Corti, R., Flammer, A.J., Hollenberg, N.K. et al. 2009: Cocoa and cardiovascular health. Circulation 119, 1433–41.

Coulter, N.A. and Pappenheimer, J.R. 1949: Development of turbulence in flowing blood. American Journal of Physiology 159, 401–8.

Councilman, W.T. 1891: On the relations between arterial disease and tissue changes. Transactions of the Association of American Physicians 6, 179–99.

Cournand, A. and Ranges, H.A. 1941: Catheterisation of the right atrium in man. Proceedings of the Society for Experimental Biology and Medicine 46, 462–6.

Cournand, A., Riley, R.L., Breed, E.S. et al. 1945: Measurements of cardiac output in man using the technique of catherization of the right auricle or ventricle. Journal of Clinical Investigation 24, 106–16.

Covic, A., Goldsmith, D.J.A., Panaghiu, L. et al. 2000: Analysis of the effect of hemodialysis on peripheral and central arterial pressure waveforms. Kidney International 57, 2634–43.

Covic, A., Goldsmith, D.J., Gusbeth-Tatomir, P. et al. 2003: Successful renal transplantation decreases aortic stiffness and increases vascular reactivity in dialysis patients. Transplantation 76, 1573–7.

Covic, A., Goldsmith, D.J., Gusbeth-Tatomir, P. and Covic, M. 2004: Haemodialysis acutely improves endothelium-independent vasomotor function without significantly influencing the endothelium-mediated abnormal response to a beta 2-agonist. Nephrology Dialysis Transplantation 19(3), 637–43.

Covic, A., Mardare, N., Gusbeth-Tatomir, P. et al. 2006: Arterial wave reflections and mortality in haemodialysis patients – only relevant in elderly, cardiovascularly compromised? Nephrology Dialysis Transplantation 21, 2859–66.

Cox, R.H. 1968: Wave propagation through a Newtonian fluid contained within a thick walled, viscoelastic tube. Biophysics Journal 8, 691–709.

Cox, R.H. 1970: Blood flow and pressure propagation in the canine femoral artery. Journal of Biomechanics 3, 131–49.

Cox, R.H. 1971: Determination of the true phase velocity of arterial pressure waves in vivo. Circulation Research 29, 407–17.

Cox, R.H. 1974: Three-dimensional mechanism of arterial segments in vitro: methods. Journal of Applied Physiology 36, 381–4.

Cox, R.H. 1975a: Pressure dependence of the mechanical properties of arteries in vivo. American Journal of Physiology 229(5), 1371–5.

Cox, R.H. 1975b: Anisotropic properties of canine carotid artery in vitro. Journal Biomechanics 8, 293–300.

Cox, R.H. 1976: Mechanics of canine iliac artery smooth muscle in vitro. American Journal of Physiology 230, 462–70.

Cox, R.H. 1978: Passive mechanics and connective tissue of canine arteries. American Journal of Physiology 234, H533–41.

Cox, R.H. 1982: Comparison of mechanical and chemical properties of extra- and intralobar canine pulmonary arteries. American Journal of Physiology 242, H245–53.

Cox, R.H. 1983a: Comparison of arterial wall mechanics using ring and cylindrical segments. American Journal of Physiology 244, H298–303.

Cox, R.H. 1983b: Age-related changes in arterial wall mechanics and composition of NIA Fischer rats. Mechanisms of Ageing and Development 23, 21–36.

Cox, R.H. 1984: Viscoelastic properties of canine pulmonary arteries. American Journal of Physiology 246, H90–106.

Cox, R.H. and Pace, J.B. 1975: Pressure-flow relations in the vessels of the canine aortic arch. American Journal of Physiology 228, 1–10.

Cox, D.A., Vita, J.A., Treasure, C.B. et al. 1989: Atherosclerosis impairs flow-mediated dilation of coronary arteries in humans. Circulation 80, 458–65.

Craiem, D. and Armentano, R.L. 2007: A fractional derivative model to describe arterial viscoelasticity. Biorheology 44(4), 251–63.

Craiem, D., Rojo, F.J., Atienza, J.M. et al. 2008: Fractional-order viscoelasticity applied to describe uniaxial stress relaxation of human arteries. Physics in Medicine and Biology 53(17), 4543–54.

Crea, F., Davies, G., Crake, T. et al. 1993: Variability of coronary blood flow reserve assessed by Doppler catheter after successful thrombolysis in patients with acute myocardial infarction. American Heart Journal 125, 1547–52.

Creager, M.A., Cooke, J.P., Mendelsohn, M.E. et al. 1990: Impaired vasodilation of forearm resistance vessels in hypercholesterolemic humans. Journal of Clinical Investigation 86, 228–34.

Crilly, M.A., Kumar, V., Clark, H.J. et al. 2009: Arterial stiffness and cumulative inflammatory burden in rheumatoid arthritis: a dose-response relationship independent of established cardiovascular risk factors. Rheumatology (Oxford) 48, 1606–12.

Crouse, J.R. 3rd, Raichlen, J.S., Riley, W.A. et al. METEOR Study Group. 2007: Effect of rosuvastatin on progression of carotid intima-media thickness in low-risk individuals with subclinical atherosclerosis: the METEOR Trial. Journal of the American Medical Association 297, 1344–53.

Crowley, J.P., Valeri, C.R., Metzger, J. et al. 1991: The estimation of whole blood viscosity by a porous bed method. American Journal of Clinical Pathology 96(6), 729–37.

Crowley, J.P., Metzger, J., Assaf, A. et al. 1994: Low density lipoprotein cholesterol and whole blood viscosity. Annals of Clinical and Laboratory Science 24(6), 533–41.

Cruickshank, K., Gosling, R.G., Anderson, S.G. et al. 2002: Aortic pulse wave velocity and its relationship to mortality in diabetes and glucose intolerance, an integrated index of vascular function? Circulation 106, 2085–90.

Cruickshank, J.K., Rezailashkajani, M. and Goudot, G. 2009: Arterial stiffness, fatness, and physical fitness: ready for intervention in childhood and across the life course? Hypertension 53, 602–4.

Cullen, K.M., Kocsi, Z. and Stone, J. 2005: Pericapillary haem-rich deposits: evidence for microhaemorrhages in aging human cerebral cortex. Journal of Cerebral Blood Flow and Metabolism 25, 1656–67.

Cullen, K.M., Kocsi, Z. and Stone, J. 2006: Microvascular pathology in the aging human brain: evidence that senile plaques are sites of microhaemorrhages. Neurobiology of Aging 27, 1786–96.

Curci, J.A. 2009: Digging in the 'soil' of the aorta to understand the growth of abdominal aortic aneurysms. Vascular 17(suppl. 1), S21–9.

Curfman, G.D. 1993: Is exercise beneficial – or hazardous – to your heart? New England Journal of Medicine 329(23), 1730–1.

Curi, M.A., Skelly, C.L., Quint, C. et al. 2002: Longitudinal impedance is independent of outflow resistance. Journal of Surgical Research 108, 191–7.

Currie, K., Thomas, S. and Goodman, J. 2009: Effects of short-term endurance exercise training on vascular function in young males. European Journal of Applied Physiology 107, 211–18.

Cushing, H. 1901: Concerning a definite regulatory mechanism of the vaso-motor centre which controls blood pressure during cerebral compression. Bulletin of the Johns Hopkins Hospital 2, 290–2.

Cuther, T.A. 2009: Durability of endovascular infrarenal aneurysm repair: when does late failure occur and why? Seminars in Vascular Surgery 22, 102–10.

Czernin, J., Müller, P., Chan, S. et al. 1993: Influence of age and hemodynamics on myocardial blood flow and flow reserve. Circulation 88, 62–9.

D'Alessio, T. 1985: Objective algorithm for maximum frequency estimation in Doppler spectral analysers. Medical & Biological Engineering & Computing 23, 63–8.

da Costa, L.S., de Oliveira, M.A., Rubim, V.S. et al. 2004: Effects of hormone replacement therapy or raloxifene on ambulatory blood pressure and arterial stiffness in treated hypertensive postmenopausal women. American Journal of Cardiology 94, 1453–6.

Daemen, M.J. and De Mey, J.G. 1995: Regional heterogeneity of arterial structural changes. Hypertension 25, 464–73.

Dahlöf, B. and Hansson, L. 1992: Regression of left ventricular hypertrophy in previously untreated essential hypertension: different effects of enalapril and hydrochlorothiazide. Journal of Hypertension 10, 1513–24.

Dahlöf, B. and Lindholm, L.H. 2002: Losartan for cardiovascular disease in patients with and without diabetes in the LIFE study (Correspondence). Lancet 359, 2199–204.

Dahlöf, B., Lindholm, L.H., Hansson, L. et al. 1991: Morbidity and mortality in the Swedish trial in old patients with hypertension (STOP-Hypertension). Lancet 338, 1281–5.

Dahlöf, B., Devereux, R., Kjeldsen, S. et al. 2002: Cardiovascular morbidity and mortality in the Losartan Intervention For Endpoint reduction in hypertension study (LIFE), a randomised trial against atenolol. Lancet 359, 995–1002.

Dahlof, B., Sever, P.S., Poulter, N.R. et al. 2005: Prevention of cardiovascular events with an antihypertensive regimen of amlodipine adding perindopril as required vs atenolol adding bendroflumethiazide as required, in the Anglo-Scandinavian Cardiac Outomes Trial – Blood Pressure Lowering Arm (ASCOT-BPLA): a multicentre randomized controlled trial. Lancet 366, 895–906.

Dai, G., Kaazempur-Mofrad, M.R., Natarajan, S. et al. 2004: Distinct endothelial phenotypes evoked by arterial waveforms derived from atherosclerosis-susceptible and -resistant regions of human vasculature. Proceedings of the National Academy of Sciences of the United States of America 101, 14871–6.

Dake, M.D., Kato, N., Mitchell, R.S. et al. 1999: Endovascular stent-graft placement for the treatment of acute aortic dissection. New England Journal of Medicine 340, 1546–52.

Dal, K., Xue, H., Dou, R. et al. 1985: On the detection of messages carried in arterial pulse waves. Journal of Biomechanical Engineering 107, 268–73.

Dammers, R., Stifft, F., Tordoir, J.H. et al. 2003: Shear stress depends on vascular territory: comparison between common carotid and brachial artery. Journal of Applied Physiology 94(2), 485–9.

Danchin, N., Benetos, A., Lopez-Sublet, M. et al. 2004: Aortic pulse pressure is related to the presence and extent of coronary artery disease in men undergoing diagnostic coronary angiography: a multicenter study. American Journal of Hypertension 17, 129–33.

Danesh, J., Wheeler, J.G., Hirschfield, G.M. et al. 2004: C-reactive protein and other circulating markers of inflammation in the prediction of coronary heart disease. New England Journal of Medicine 350(14), 1387–97.

Danias, P.G., Tritos, N.A., Stuber, M. et al. 2003: Comparison of aortic elasticity determined by cardiovascular magnetic resonance imaging in obese versus lean adults. American Journal of Cardiology 91(2), 195–9.

Danpinid, A., Luo, J., Vappou, J. et al. 2010: *In vivo* characterization of the aortic wall stress-strain relationship. Ultrasonics 50, 654–65.

Dao, H.H., Essalihi, R., Bouvet, C. et al. 2005: Evolution and modulation of age-related medial elastocalcinosis: impact on large artery stiffness and isolated systolic hypertension. Cardiovascular Research 66(2), 307–17.

Dark, P.M. and Singer, M. 2004: The validity of trans-esophageal Doppler ultrasonography as a measure of cardiac output in critically ill adults. Intensive Care Medicine 30, 2060–6.

Darne, B., Girerd, X., Safar, M. et al. 1989: Pulsatile versus steady component of blood pressure: a cross-sectional analysis and a prospective analysis on cardiovascular mortality. Hypertension 13, 392–400.

Dart, A.M. and Kingwell, B.A. 2001: Pulse pressure – a review of mechanisms and clinical relevance. Journal of the American College of Cardiology 37(4), 975–84.

Dart, A.M., Lacombe, F., Yeoh, J.K. et al. 1991: Aortic distensibility in patients with isolated hypercholesterolaemia, coronary artery disease, or cardiac transplant. Lancet 338, 270–3.

Dart, A.M., Reid, C.M. and McGrath, B. Tonometry Study Group. 2001: Effects of ACE inhibitor therapy on derived central arterial waveforms in hypertension. American Journal of Hypertension 14(8 Pt 1), 804–10.

Dart, A.M., Gatzka, C.D., Kingwell, B.A. et al. 2006: Brachial blood pressure but not carotid arterial waveforms predict cardiovascular events in elderly female hypertensives. Hypertension 47, 785–90.

Dart, A.M., Cameron, J.D., Gatzka, C.D. et al. 2007: Similar effects of treatment on central and brachial blood pressures in older hypertensive subjects in the Second Australian National Blood Pressure Trial. Hypertension 49, 1242–7.

das Chagas de Azevedo, F., Zerati, A.E., Blasbalg, R. et al. 2005: Comparison of ultrasonography, computed tomography, and magnetic resonance imaging with intraoperative measurements in the evaluation of abdominal aortic aneurysms. Clinics (Sao Paulo) 60, 21–8.

Davidson, W.R. Jr. and Fee, E.C. 1990: Influence of aging on pulmonary hemodynamics in a population free of coronary artery disease. American Journal of Cardiology 65(22), 1454–8.

Davies, J.E., Hadjiloizou, N., Leibovich, D. et al. 2007: Importance of the aortic reservoir in determining the shape of the arterial pressure waveform – the forgotten lessons of Frank. Artery Research 1, 40–5.

Davies, J.I. and Struthers, A.D. 2003: Pulse wave analysis and pulse wave velocity: a critical review of their strengths and weaknesses. Journal of Hypertension 21(3), 463–72.

Davies, J.N. and Fisher, J.A. 1943: Coarctation of the aorta, double mitral a-V orifice, and leaking cerebral aneurysm. British Heart Journal 5, 197–204.

Davies, J.N.P. 1993: Abdominal aortic aneurysm. Lancet 341, 215–16.

Davies, M. 1999: New diagnostic criteria for diabetes – are they doing what they should? Lancet 354, 610–11.

Davies, M.J. 1997: The composition of coronary artery plaques. New England Journal of Medicine 336, 1312–14.

Davies, M.J. 1998: Aortic aneurysm formation, lessons from human studies and experimental models (Editorial). Circulation 98, 193–5.

Davies, P.F. 1995: Flow-mediated endothelial mechanotransduction. Physiological Reviews 75, 519–60.

Davies, M.J. and Thomas, A. 1984: Thrombosis and acute coronary-artery lesions in sudden cardiac ischemic death. New England Journal of Medicine 310(18), 1137–40.

Davies, M.J., Pomerance, A. and Lamb, D. 1975: Techniques in examination and anatomy of the heart. In: Pomerance, A. and Davies, M.J. (eds), The pathology of the heart. Oxford: Blackwell Scientific.

Davies, M.J., Richardson, P.D., Woolf, N. et al. 1993: Risk of thrombosis in human atherosclerotic plaques: role of extracellular lipid, macrophage, and smooth muscle cell content. British Heart Journal 69, 377–81.

Davies, P.F. and Tripathi, S.C. 1993: Mechanical stress mechanisms and the cell. An endothelial paradigm. Circulation Research 72, 239–45.

Davies, P.F., Remuzzi, A., Gordon, E.J. et al. 1986: Turbulent fluid shear stress induces vascular endothelial cell turnover in vitro. Proceedings of the National Academy of Science 83, 2114–7.

Davies, P.F., Shi, C., Depaola, N. et al. 2001: Hemodynamics and the focal origin of atherosclerosis: a spatial approach to endothelial structure, gene expression, and function. Annals of the New York Academy of Sciences 947, 7–16.

Davis, J.J. 1988: Control of bat wing capillary pressure and blood flow during reduced perfusion pressure. American Journal of Physiology 255, H1114–29.

Davis, J.J., Hill, H.A. and Powell, T. 2001a: High resolution scanning force microscopy of cardiac myocytes. Cell Biology International 25(12), 1271–7.

Davis, P.H., Dawson, J.D., Riley, W.A. and Lauer, R.M. 2001b: Carotid intimal-medial thickness is related to cardiovascular risk factors measured from childhood through middle age: the muscatine study. Circulation 104(23), 2815–19.

Davris, M. 1999: New diagnostic criteria for diabetes – are they doing what they should? Lancet 354, 610–11.

Dawber, T.R., Thomas, H.E. Jr. and McNamara, P.M. 1973: Characteristics of the dicrotic notch of the arterial pulse wave in coronary heart disease. Angiology 24(4), 244–55.

Dawson, E.A., Black, M.A., Pybis, J. et al. 2009: The impact of exercise on derived measures of central pressure and augmentation index obtained from the SphygmoCor device. Journal of Applied Physiology 106(6), 1896–901.

De Angelis, L., Millasseau, S.C., Smith, A. et al. 2004: Sex differences in age-related stiffening of the aorta in subjects with type 2 diabetes. Hypertension 44, 67–71.

De Backer, T.L., De Buyzere, M., Segers, P. et al. 2002: The role of whole blood viscosity in premature coronary artery disease in women. Atherosclerosis 165(2), 367–73.

de Boode, W.P., Hopman, J.C., Wijnen, M.H. et al. 2009: Cardiac output measurement in ventilated lambs with a significant left-to-right shunt using the modified carbon dioxide fick method. Neonatology 97(2), 124–31.

De Bruyne, B., Bartunek, J., Sys, S.U. et al. 1995: Relation between myocardial fractional flow reserve calculated from coronary pressure measurements and exercise-induced myocardial ischemia. Circulation 92, 39–46.

De Bruyne, B., Bartunek, J., Sys, S.U. et al. 1996: Simultaneous coronary pressure and flow velocity measurements in humans. Feasibility, reproducibility, and hemodynamic dependence of coronary flow velocity reserve, hyperemic flow versus pressure slope index, and fractional flow reserve. Circulation 94(8), 1842–9.

De Bruyne, B., Hersbach, F., Pijls, N.H. et al. 2001a: Abnormal epicardial coronary resistance in patients with diffuse atherosclerosis but 'Normal' coronary angiography. Circulation 104(20), 2401–6.

De Franco, A.C. and Nissen, S.E. 2001: Coronary intravascular ultrasound, implications for understanding the development and potential regression of atherosclerosis. American Journal of Cardiology 88(10A), 7M–20M.

De Groot, E., Hovingh, G.K., Wiegman, A. et al. 2004: Measurement of arterial wall thickness as a surrogate marker for atherosclerosis. Circulation 109(23 Suppl 1)III, 33–8.

De Groot, P.C., Bleeker, M.W., Van, K., uppevelt, D.H. et al. 2006: Rapid and extensive arterial adaptations after spinal cord injury. Archives of Physical Medicine and Rehabilitation 87, 688–96.

de Groot, E., van Leuven, S.I., Duivenvoorden, R. et al. 2009: Measurement of carotid intima-media thickness to assess progression and regression of atherosclerosis. Nature Clinical Practice. Cardiovascular Medicine 5(5), 280–8.

De Jong, P.G.M., Arts, T., Hoeks, A.P.G. and Reneman, R.S. 1990: Determination of tissue motion velocity by correlation interpolation of pulsed ultrasonic echo signals. Ultrasonic Imaging 12, 84–98.

de Jongh, S., Lilien, M.R., op't Roodt, J. et al. 2002: Early statin therapy restores endothelial function in children with familial hypercholesterolemia. Journal of the American College of Cardiology 40(12), 2117–21.

De Keulenaer, G.W. and Brutsaert., D.L. 2009: The heart failure spectrum: time for a phenotype-oriented approach. Circulation 119, 3044–6.

De Keulenaer, G.W., Chappell, D.C., Ishizaka, N. et al. 1998: Oscillatory and steady laminar shear stress differentially affect human endothelial redox state: role of a superoxide-producing NADH oxidase. Circulation Research 82, 1094–101.

de Luca, N., Asmar, R.G., London, G.M. et al. 2004: REASON Project Investigators. Selective reduction of cardiac mass and central blood pressure on low-dose combination perindopril/indapamide in hypertensive subjects. Journal of Hypertension 22, 1623–30.

De Marco, M., de Simone, G., Roman, M.J. et al. 2009: Cardiovascular and metabolic predictors of progression of prehypertension into hypertension. The Strong Heart Study. Hypertension 54, 974–80.

de Nigris, F., Lerman, A., Ignarro, L.J. et al. 2003: Oxidation-sensitive mechanisms, vascular apoptosis and atherosclerosis. Trends in Molecular Medicine 9(8), 351–9.

De Paepe, A., Devereux, R.B., Dietz, H.C. et al. 1996: Revised diagnostic criteria for the Marfan syndrome. American Journal of Medical Genetics 62(4), 417–26.

de Simone, G. and Devereux, R.B. 2008: Assessing left ventricular performance: a rashomon effect. Hypertension 51, 179–81.

de Simone, G., Roman, M.J., Koren, M.J. et al. 1999: Stroke volume/pulse pressure ratio and cardiovascular risk in arterial hypertension. Hypertension 33(3), 800–5.

de Simone, G., Greco, R., Mureddu, G. et al. 2000: Relation of left ventricular diastolic properties to systolic function in arterial hypertension. Circulation 101, 152–7.

de Simone, G., Palmieri, V., Bella, J.N. et al. 2002: Association of left ventricular hypertrophy with metabolic risk factors, the HyperGEN study. Journal of Hypertension 20(2), 323–31.

de Vaal, J.B., de Wilde, R.B., van den Berg, P.C. et al. 2005: Less invasive determination of cardiac output from the arterial pressure by aortic diameter-calibrated pulse contour. British Journal of Anaesthesia 95(3), 326–31.

de Wit, C., Schafer, C., von Bismarck, P. et al. 1997: Elevation of plasma viscosity induces sustained NO-mediated dilation in the hamster cremaster microcirculation in vivo. Pflugers Archives 434(4), 354–61.

Dean, J.C. 2007: Marfan syndrome: clinical diagnosis and management. European Journal of Human Genetics 15(7), 724–33.

Dean, W.R. 1928: The streamline motion of fluid in a curved pipe. Philosophical Magazine 5, 673–95.

Deanfield, J., Donald, A., Ferri, C. et al. 2005: Endothelial function and dysfunction. Part I: Methodological issues for assessment in the different vascular beds: a statement by the Working Group on Endothelin and Endothelial Factors of the European Society of Hypertension. Journal of Hypertension 23(1), 7–17.

Deanfield, J.E., Halcox, J.P. and Rabelink, T.J. 2007: Endothelial function and dysfunction: testing and clinical relevance. Circulation 115(10), 1285–95.

Debette, S. and Markus, H.S. 2010: The clinical importance of white matter hyperintensities on brain magnetic resonance imaging: systematic review and meta-analysis. British Medical Journal 341, c3666.

Dechant, K.L. and Clissold, S.P. 1992: Sumatriptan: a review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy in the acute treatment of migraine and cluster headache. Drugs 43(5), 776–98.

Dekker, R.J., Boon, R.A., Rondaij, M.G. et al. 2006: KLF2 provokes a gene expression pattern that establishes functional quiescent differentiation of the endothelium. Blood 107(11), 4354–63.

Delacrétaz, E., Zanchi, A., Nussberger, J. et al. 1995: Chronic nitric oxide synthase inhibition and carotid artery distensibility in renal hypertensive rats. Hypertension 26(2), 332–6.

Delnoy, P.P., Ottervanger, J.P., Luttikhuis, H.O. et al. 2009: Pressure-volume loop analysis during implantation of biventricular pacemaker/cardiac resynchronization therapy device to optimize right and left ventricular pacing sites. European Heart Journal 30(7), 797–804.

DeLoach, S.S. and Townsend, R.R. 2008: Vascular stiffness: its measurement and significance for epidemiologic and outcome studies. Clinical Journal of the American Society of Nephrology 3(1), 184–92.

Deloskey, A.F., Nichols, W.W., Conti, C.R. et al. 1978: Estimation of beat-to-beat stroke volume from the pulmonary arterial pressure contour in man. Medical and Biological Engineering and Computing 16, 707–14.

DeMaria, A.N., Bax, J.J., Ben-Yehuda, O. et al. 2010: Highlights of the year in JACC 2009. Journal of the American College of Cardiology 55, 380–407.

DeMaria, A.N., Ben-Yehuda, O., Bax, J.J. et al. 2009: Highlights of the year in JACC 2008. Journal of the American College of Cardiology 53, 373–98.

Denardo, S.J., Nandyala, R., Freeman, G.L. et al. 2010: Pulse wave analysis of the aortic pressure waveform in severe left ventricular systolic dysfunction. Circulation. Heart Failure 3(1), 149–56.

Deng, M.C. 2004: Heart transplantation: the increasing challenges of evidence based decision making. Journal of the American College of Cardiology 43, 803–5.

Dengel, D.R., Kelly, A.S., Olson, T.P. et al. 2006: Effects of weight loss on insulin sensitivity and arterial stiffness in overweight adults. Metabolism 55, 907–11.

Dengo, A.L., Dennis, E.A., Orr, J.S. et al. 2010: Arterial destiffening with weight loss in overweight and obese middle-aged and older adults. Hypertension 55, 855–61.

Denison, A.B., Spencer, M.P. and Green, H.D. 1955: A square-wave electromagnetic flowmeter for application to intact blood vessels. Circulation Research 3, 39–46.

Dennis, J. and Wyatt, D.G. 1969: Effect of haematocrit value upon flowmeter sensitivity. Circulation Research 24, 875–85.

Deppe, B. and Wetterer, E. 1940: Vergleichende tierexperimentelle untersuchungen zur physikalische Schlagvolumenbestimmung. Mitteilunger Zeitschrift Biologie 100, 105–18.

Dernellis, J. and Panaretou, M. 2005: Aortic stiffness is an independent predictor of progression to hypertension in nonhypertensive subjects. Hypertension 45(3), 426–31.

Derval, N. and Jaïs, P. 2010: Optimizing hemodynamics in cardiac resynchronization therapy by left ventricular pacing site: you find only what you are looking for. Journal of the American College of Cardiology 56, 782–3.

Desai, A.S., Mitchell, G.F., Fang, J.C. et al. 2009: Central aortic stiffness is increased in patients with heart failure and preserved ejection fraction. Journal of Cardiac Failure 15(8), 658–64.

Desai, N.R. and Bhatt, D.L. 2009: Evaluating percutaneous support for cardiogenic shock: data shock and sticker shock. European Heart Journal 30, 2073–5.

Desjardins, F. and Balligand, J.L. 2006: Nitric oxide-dependent endothelial function and cardiovascular disease. Acta Clinica Belgica 61(6), 326–34.

DeSouza, C.A., Shapiro, L.F., Clevenger, C.M. et al. 2000: Regular aerobic exercise prevents and restores age-related declines in endothelium-dependent vasodilation in healthy men. Circulation 102, 1351–7.

Detrano, R., Guerci, A.D., Carr, J.J. et al. 2008: Coronary calcium as a predictor of coronary events in four racial or ethnic groups. New England Journal of Medicine 358(13), 1336–45.

DeVan, A.E., Anton, M.M., Cook, J.N. et al. 2005: Acute effects of resistance exercise on arterial compliance. Journal of Applied Physiology 98, 2287–91.

Devereux, R.B. 1991: Toward a more complete understanding of left ventricular afterload. Journal of the American College of Cardiology 17(1), 122–4.

Devereux, R. 1997: Do antihypertensive drugs differ in their ability to regress left ventricular hypertrophy? Circulation 95, 1983–5.

Devereux, R.B. and Laragh, J.H. 1992: Angiotensin converting enzyme inhibition of renin system activity induces reversal of hypertensive target organ changes: do these effects predict a reduction in long-term morbidity? American Journal of Hypertension 5, 923–6.

Devereux, R.B. and Roman, M.J. 1999: Aortic disease in Marfan's syndrome (Editorial). New England Journal of Medicine 340, 1358–9.

Devereux, R.B., Roman, M.J., Paranicas, M. et al. 1995: The weak relation between blood pressure and left ventricular mass is partially explained by additional effects of hemodynamic volume load and myocardial contractility: the STRONG heart study. Journal of the American College of Cardiology (February special issue), 299A.

Devereux, R.B., Roman, M.J., Paranicas, M. et al. 2000a: Impact of diabetes on cardiac structure and function: The Strong Heart Study. Circulation 101(19), 2271–6.

Devereux, R.B., Palmieri, V., Sharpe, N. et al. 2001: Effects of once-daily angiotensin-converting enzyme inhibition and calcium channel blockade-based antihypertensive treatment regimens on left ventricular hypertrophy and diastolic filling in hypertension: the Prospective Randomized Enalapril Study Evaluating Regression of Ventricular Enlargement (PRESERVE) Trial. Circulation 104, 1248–54.

Devereux, R.B., Dahlof, B., Gerdts, E. et al. 2004: Regression of hypertensive left ventricular hypertrophy by losartan compared with atenolol: the Losartan Intervention for Endpoint Reduction in Hypertension. Circulation 110, 1456–62.

Devlin, M., Jacobs, L.E., Oliner, C.M. et al. 2001: A novel approach to calculation of mean mitral valve gradient by Doppler echocardiography. Journal of the American Society of Echocardiography 14(11), 1107–11.

Dewey, M. 2009: Comprehensive assessment of peripheral artery disease using magnetic resonance imaging, angiography, and spectroscopy. Journal of the American College of Cardiology 54, 636–7.

Dewitte, K., Fierens, C., Stöckl, D. et al. 2002: Application of the Bland–Altman plot for interpretation of method-comparison studies: a critical investigation of its practice. Clinical Chemistry 48(5), 799–801.

DeWood, M.A., Spores, J., Notske, R. et al. 1980: Prevalence of total coronary occlusion during the early hours of transmural myocardial infarction. New England Journal of Medicine 303(16), 897–902.

Deyl, Z., Juricova, M., Rosmus, J. et al. 1971: Aging of the connective tissue: collagen cross-linking in animals of different species and equal age. Experimental Gerontology 6(3), 227–33.

Dhaun, N., Goddard, J. and Webb, D.J. 2006: The endothelin system and its antagonism in chronic kidney disease. Journal of the American Society of Nephrology 17(4), 943–55.

Dhaun, N., Goddard, J., Kohan, D.E. et al. 2008: Role of endothelin-1 in clinical hypertension: 20 years on. Hypertension 52(3), 452–9.

Di Castelnuovo, A., Costanzo, S., Bagnardi, V. et al. 2006: Alcohol dosing and total mortality in men and women: an updated meta-analysis of 34 prospective studies. Archives of Internal Medicine 166, 2437–45.

Dias, N.V., Ivancev, K., Malina, M. et al. 2004: Direct intra-aneurysm sac pressure measurement using tip-pressure sensors: *in vivo* and *in vitro* evaluation. Journal of Vascular Surgery 40(4), 711–16.

Dick, D.E., Kendrick, J.E., Matson, G.L. et al. 1968: Measurement of nonlinearity in the arterial system of the dog by a new method. Circulation Research 22, 101–11.

Dickinson, K.M., Keogh, J.B. and Clifton, P.M. 2009: Effects of a low-salt diet on flow-mediated dilatation in humans. American Journal of Clinical Nutrition 89, 485–90.

Diehm, N. and Baumgartner, I. 2009: Determinants of aneurysmal aortic disease. Circulation 119, 2134.

Dietz, U. and Belz, G.G. 1991: Low frequency arterial wall movements for indirect blood pressure measurement in man. Arzneimittel-Forschung Drug Research 41(1), 557–62.

Digitalis Investigation Group. 1997: The effect of digoxin on mortality and morbidity in patients with heart failure. New England Journal of Medicine 336, 525–33.

Din-Dzietham, R., Couper, D., Evans, G. et al. 2004: Arterial stiffness is greater in African Americans than in Whites. American Journal of Hypertension 17, 304–13.

Dinenno, F.A., Tanaka, H., Monahan, K.D. et al. 2001: Regular endurance exercise induces expansive arterial remodelling in the trained limbs of healthy men. Journal of Physiology 534(Pt 1), 287–95.

Dintenfass, L. 1976. Rheology of blood in diagnostic and preventive medicine. London: Butterworth.

Dintenfass, L. 1985: Blood viscosity, hyperviscosity and hyperviscosaemia. Boston: MTP Press.

Dintenfass, L. and Seaman, G.V.F. 1981. Blood viscosity in heart disease and cancer. Oxford: Pergamon Press.

Dipla, K., Mattiello, J.A., Jeevanandam, V. et al. 1998: Myocyte recovery after mechanical circulatory support in humans with end-stage heart failure. Circulation 97, 2316–22.

Djuric, D., Popovic, Z., Petrovic, J. and Bojic, M. 1999: Age-related progressive brachial artery endothelial dysfunction precedes the changed carotid and left ventricular geometry in healthy humans. Angiology 50(7), 555–61.

Dluhy, R.G. and McMahon, G.T. 2008: Intensive glycemic control in the ACCORD and ADVANCE trial. New England Journal of Medicine 358, 2630–3.

Dobarro, D., Gómez-Rubín, M.C., Sanchez-Recalde, A. et al. 2009: Current pharmacological approach to restore endothelial dysfunction. Cardiovascular and Hematological Agents in Medicinal Chemistry 7(3), 212–22.

Dobrin, P.B. 1978: Mechanical properties of arteries. Physiological Reviews 58, 397–460.

Dobrin, P.B. 1983: Vascular mechanics. In: Shepherd, J.T. and Abboud, F.M. (eds), Handbook of physiology. Section 2: The cardiovascular system, vol. III, Peripheral circulation and organ blood flow. Bethesda, MD: American Physiological Society, pp. 65–102.

Dobrin, P.B. 1986: Biaxial anisotropy of dog carotid artery: estimation of circumferential elastic modulus. Journal of Biomechanics 19, 351–8.

Dobrin, P.B. 1999: Distribution of lamellar deformations, implications for properties of the arterial media. Hypertension 33(3), 806–10.

Dobrin, P.B. 2000: Elastin, collagen, and the pathophysiology of arterial aneurysms. In: Keen, R.R. and Dobrin, P.B. (eds), Development of aneurysms. Georgetown, TX: Landes Bioscience, pp. 42–73.

Dobrin, P.B. and Doyle, J.M. 1970: Vascular smooth muscle and the anisotropy of dog carotid artery. Circulation Research 27, 105–19.

Dobrin, P.B. and Rovick, A.A. 1969: Influence of vascular smooth muscle on contractile mechanics and elasticity of arteries. American Journal of Physiology 217, 1644–51.

Dobrin, P.B. and Canfield, T.R. 1984: Elastase, collagenase, and the biaxial elastic properties of dog carotid artery. American Journal of Physiology 247, H124–31.

Dobson, G., Flewitt, J., Tyberg, J.V. et al. 2006: Endografting of the descending thoracic aorta increases ascending aortic input impedance and attenuates pressure transmission in dogs. European Journal of Vascular and Endovascular Surgery 32(2), 129–35.

Dockery, F., Bulpitt, C.J., Donaldson, M. et al. 2003: The relationship between androgens and arterial stiffness in older men. Journal of the American Geriatrics Society 51, 1627–32.

Dohi, Y., Criscione, L., Pfeiffer, K. et al. 1994: Angiotensin blockade or calcium antagonists improve endothelial dysfunction in hypertension, studies in perfused mesenteric resistance arteries. Journal of Cardiovascular Pharmacology 24(3), 372–9.

Doi, H., Maehara, A., Mintz, G.S. et al. 2010: Intravascular ultrasound findings of stent fractures in patients with Sirolimus- and Paclitaxel-eluting stents. American Journal of Cardiology 106(7), 952–7.

Doi, Y.L., Deanfield, J.E., McKenna, W.J. et al. 1980: Echocardiographic differentiation of hypertensive heart disease and hypertrophic cardiomyopathy. British Heart Journal 44, 395–400.

Dolan, E., Thijs, L., Li, Y. et al. 2006: Ambulatory arterial stiffness index as a predictor of cardiovascular mortality in the Dublin Outcome Study. Hypertension 47(3), 365–70.

Dole, W.P., Richards, K.L., Hartley, C.J. et al. 1984b: Diastolic coronary artery pressure–flow velocity relationships in conscious man. Cardiovascular Research 18(9), 548–54.

Domanski, M., Mitchell, G., Pfeffer, M. et al. 2002: Pulse pressure and cardiovascular disease – related mortality. Journal of the American Medical Association 287, 2677–83.

Donald, A.E., Halcox, J.P., Charakida, M. et al. 2008: Methodological approaches to optimize reproducibility and power in clinical studies of flow-mediated dilation. Journal of the American College of Cardiology 51(20), 1959–64.

Doonan, R.J., Hausvater, A., Scallan, C. et al. 2010: The effect of smoking on arterial stiffness. Hypertension Research 33, 398–410.

Doppler, C. 1842: Über das farbige Licht der Doppelsterne und einiger anderer Gestirne des Himmels [On the coloured light of the binary stars and some other stars of the heavens]. Prague: Borrosch und André.

Doriot, P.A., Dorsaz, P.A., Dorsaz, L. et al. 2000: In-vivo measurements of wall shear stress in human coronary arteries. Coronary Artery Disease 11, 495–502.

Doucette, J.W., Corl, P.D., Payne, H.M. et al. 1992: Validation of a Doppler guide wire for intravascular measurement of coronary artery flow velocity. Circulation 85, 1899–1911.

Douglas, J.E. and Greenfield, J.C. 1970: Epicardial coronary artery compliance in the dog. Circulation Research 27, 921–9.

Dow, P. 1941: The development of the anacrotic and tardus pulse of aortic stenosis. American Journal of Physiology 131, 432–6.

Dow, P. and Hamilton, W.F. 1939: An experimental study of the velocity of the pulse wave propagated through the aorta. American Journal of Physiology 125, 60–5.

Downing, G.J., Yarlagadda, A.P. and Maulik, D. 1991: Comparison of the pulsatility index and input impedance parameters in a model of altered hemodynamics. Journal of Ultrasound in Medicine 10, 317–21.

Downing, G.J., Maulik, D., Phillips, C. et al. 1993: In vivo correlation of Doppler waveform analysis with arterial input impedance parameters. Ultrasound in Medicine and Biology 19(7), 549–59.

Draaijer, P., Kool, M.J., Maessen, J.M. et al. 1993: Vascular distensibility and compliance in salt-sensitive and salt-resistant borderline hypertension. Journal of Hypertension 11, 1199–207.

Drazen, J.M., Morrissey, S. and Curfman, G.D. 2007: Rosiglitazone – continued uncertainty about safety. New England Journal of Medicine 357, 63–4.

Drazner, M.H., Rame, J.F., Marino, E.K. et al. 2004: Increased left ventricular mass is a risk factor for the development of a depressed left ventricular ejection fraction within five years: the Cardiovascular Health Study. Journal of the American College of Cardiology 43, 2207–15.

Dressler, F., Malekzadeh, S. and Roberts, W. 1990: Quantitative analysis of amounts of coronary arterial narrowing in cocaine addicts. American Journal of Cardiology 65, 303–8.

Drexler, H., Hayoz, D., Munzel, T. et al. 1992: Endothelial function in chronic congestive heart failure. American Journal of Cardiology 69(19), 1596–601.

Drost, C.J. 1978: Vessel diameter-independent volume flow measurements using ultrasound. Proceedings of the San Diego Biomedical Symposium 17, 299–302.

Drzewiecki, G.M., Melbin, J. and Noordergraaf, A. 1983: Arterial tonometry: review and analysis. Journal of Biomechanics 6, 141–53.

Dubin, J., Wallerson, D.C., Cody, R.J. et al. 1990: Comparative accuracy of Doppler echocardiographic methods for clinical stroke volume determination. American Heart Journal 120(1), 116–23.

Ducharme, A., Dupuis, J., McNicoll, S. et al. 1999: Comparison of nitroglycerin lingual spray and sublingual tablet on time of onset and duration of brachial artery vasodilation in normal subjects. American Journal of Cardiology 84(8), 952–4, A8.

Duchier, J., Iannascoli, F. and Safar, M. 1987: Antihypertensive effect of sustained-release isosorbide dinitrate for isolated systolic systemic hypertension in the elderly. American Journal of Cardiology 60, 99–102.

Duckworth, W., Abraira, C., Moritz, T. et al. 2009: Glucose control and vascular complications in veterans with type 2 diabetes. New England Journal of Medicine 360(2), 129–39.

Duda, D.G., Cohen, K.S., Scadden, D.T. et al. 2007: A protocol for phenotypic detection and enumeration of circulating endothelial cells and circulating progenitor cells in human blood. Nature Protocols 2, 805–10.

Dufouil, C., Chalmers, J., Coskun, O. et al. 2005: Effects of blood pressure lowering on cerebral white matter hyperintensities in patients with stroke. Circulation 112, 1644–50.

Duguid, J.B. and Robertson, W.B. 1957: Mechanical factors in atherosclerosis. Lancet i, 1205–9.

Dujardin, J.P. and Stone, D.N. 1981: Characteristic impedance of the proximal aorta determined in the time and frequency domain: a comparison. Medical and Biological Engineering and Computing 19, 565–8.

Dujardin, J.P., Stone, D.N., Forcino, C.D. et al. 1982: Effects of blood volume changes on characteristic impedance of the pulmonary artery. American Journal of Physiology 242, H197–H202.

Duncker, D.J. and Bache, R.J. 2008: Regulation of coronary blood flow during exercise. Physiological Reviews 88(3), 1009–86.

duPre Denning, A. and Watson, J. 1900: From 'The emergence of rheology' by Hershel Markovitz. Physics Today 21, 23–30.

Duprez, D.A., De Buyzere, M.L., Rietzschel, E.R. et al. 1998: Inverse relationship between aldosterone and large artery compliance in chronically treated heart failure patients. European Heart Journal 19(9), 1371–6.

Dupuis, J., Tardif, J.C., Cernacek, P. et al. 1999: Cholesterol reduction rapidly improves endothelial function after acute coronary syndromes. The RECIFE (reduction of cholesterol in ischemia and function of the endothelium) trial. Circulation 99(25), 3227–33.

Duren, C.M., Cress, M.E. and McCully, K.K. 2008: The influence of physical activity and yoga on central arterial stiffness. Dynamic Medicine 7, 1–8.

Dustan, H.P. 1989: Isolated systolic hypertension: a long-neglected cause of cardiovascular complications. American Journal of Medicine 86, 368–9.

Dwight, H.B. 1961: Mathematical tables, 3rd edn. New York: Dover.

Dzau, V.J., Antman, E.M., Black, H.R. et al. 2006a: The cardiovascular disease continuum validated: clinical evidence of improved patient outcomes. Part I: pathophysiology and clinical trial evidence (risk factors through stable coronary artery disease). Circulation 114, 2850–70.

Dzau, V.J., Antman, E.M., Black, H.R. et al. 2006b: The cardiovascular disease continuum validated: clinical evidence of improved patient outcomes. Part II: clinical trial evidence (acute coronary syndromes through renal disease) and future directions. Circulation 114, 2871–91.

Eaton, G.M., Cody, R.J. and Binkley, P.F. 1993: Increased aortic impedance precedes peripheral vasoconstriction at the early stage of ventricular failure in the paced canine model. Circulation 88, 2714–21.

Eaton, G.M., Cody, R.J. and Binkley, P.E. 1994: Increased aortic impedance; reply to Avolio's comment. Circulation 89, 2946.

Eckert, S. and Horstkotte, D. 2002: Comparison of Portapres non-invasive blood pressure measurement in the finger with intra-aortic pressure measurement during incremental bicycle exercise. Blood Pressure Monitoring 7(3), 179–83.

Eckmann, D.M., Bowers, S., Stecker, M. et al. 2000: Hematocrit, volume expander, temperature, and shear rate effects on blood viscosity. Anesthesia and Analgesia 91(3), 539–45.

Edouard, D.A., Pannier, B.M., London, G.M. et al. 1998: Venous and arterial behavior during normal pregnancy. American Journal of Physiology 274, H1605–12.

Edwards, D.G. and Lang, J.T. 2005: Augmentation index and systolic load are lower in competitive endurance athletes. American Journal of Hypertension 18, 679–83.

Edwards, D.G., Roy, M.S. and Prasad, R.Y. 2008: Wave reflection augments central systolic and pulse pressures during facial cooling. American Journal of Physiology. Heart and Circulatory Physiology 294(6), H2535–9.

Edwards, D.G., Schofield, R.S., Lennon, S.L. et al. 2004a: Effect of exercise training on endothelial function in men with coronary artery disease. American Journal of Cardiology 93(5), 617–20.

Edwards, D.G., Schofield, R.S., Magyari, P.M. et al. 2004b: Effect of exercise training on central aortic pressure wave reflection in coronary artery disease. American Journal of Hypertension 17, 540–3.

Edwards, J.E. 1957: Functional pathology of the pulmonary vascular tree in congenital cardiac disease. Circulation 15, 164–96.

Eeftinck Schattenkerk, D.W., van Lieshout, J.J., van den Meiracker, A.H. et al. 2009: Nexfin noninvasive continuous blood pressure validated against Riva-Rocci/Korotkoff. American Journal of Hypertension 22(4), 378–83.

Efstathopoulos, E.P., Patatoukas, G., Pantos, I. et al. 2008a: Measurement of systolic and diastolic arterial wall shear stress in the ascending aorta. Physica Medica 24(4), 196–203.

Efstathopoulos, E.P., Patatoukas, G., Pantos, I. et al. 2008b: Wall shear stress calculation in ascending aorta using phase contrast magnetic resonance imaging. Investigating effective ways to calculate it in clinical practice. Physica Medica 24(4), 175–81.

Egashira, K., Inou, T., Hirooka, Y. et al. 1993a: Effects of age on endothelium-dependent vasodilation of resistance coronary artery by acetylcholine in humans. Circulation 88(1), 77–81.

Egashira, K., Inou, T., Hirooka, Y. et al. 1993b: Impaired coronary blood flow response to acetylcholine in patients with coronary risk factors and proximal atherosclerotic lesions. Journal of Clinical Investigation 91, 29–37.

Egashira, K., Inou, T., Hirooka, Y. et al. 1993c: Evidence of impaired endothelium-dependent coronary vasodilatation in patients with angina pectoris and normal coronary angiograms. New England Journal of Medicine 328(23), 1659–64.

Eguchi, K., Kario, K. and Shimada, K. 2003: Greater impact of coexistence of hypertension and diabetes on silent cerebral infarcts. Stroke 34, 2471–2.

Einthoven, W. 1903: Die galvanometrische Registrierung des menschlichen Elektrokardiogramms, zugleich eine Beurteilung der Anwendung des

Capillar-elektrometers in der Physiologie. Pfluger Archives Gesante Physiologie Menschen Tiere 99, 472–80.
El Assaad, M.A., Topouchian, J.A., Darne, B.M. and Asmar, R.G. 2002: Validation of the Omron HEM-907 device for blood pressure measurement. Blood Pressure Monitoring 7(4), 237–41.
El-Barhoun, E.N., Gledhill, S.R. and Pitman, A.G. 2009: Circle of Willis artery diameters on MR angiography: an Australian reference database. Journal of Medical Imaging and Radiation Oncology 53(3), 248–60.
El Feghali, R.N., Topouchian, J.A., Pannier, B.M. et al. 2007: Validation of the OMRON M7 (HEM-780-E) blood pressure measuring device in a population requiring large cuff use according to the International Protocol of the European Society of Hypertension. Blood Pressure Monitoring 12, 173–8.
Elefteriades, J.A. 2008: Thoracic aortic aneurysm: reading the enemy's playbook. Yale Journal of Biology and Medicine 81(4), 175–86.
Elefteriades, J.A. and Farkas, E.A. 2010: Thoracic aortic aneurysm: clinically pertinent controversies and uncertainties. Journal of the American College of Cardiology 55, 841–57.
Eliakim, M., Sapoznikov, D. and Weinman, J. 1971: Pulse wave velocity in healthy subjects and in patients with various disease states. American Heart Journal 82(4), 448–57.
Elias, M.F., Elias, P.K., Dore, G.A. et al. 2008: High-normal blood pressure and cognition: supplying the missing data. Hypertension 52, e1–e2.
Elias, M.F., Robbins, M.A., Budge, M.M. et al. 2009: Arterial pulse wave velocity and cognition with advancing age. Hypertension 53, 668–73.
Elkins, R.C. and Milnor, W.R. 1971: Pulmonary vascular response to exercise in the dog. Circulation Research 29, 591–9.
Elkins, R.C., Peyton, M.D. and Greenfield, L.J. 1974: Pulmonary vascular impedance in chronic pulmonary hypertension. Surgery 76, 57–64.
Ellins, E., Halcox, J., Donald, A. et al. 2008: Arterial stiffness and inflammatory response to psychophysiological stress. Brain, Behavior, and Immunity 22, 941–8.
Elliott, W.J. and Meyer, P.M. 2007: Incident diabetes in clinical trials of antihypertensive drugs: a network meta-analysis. Lancet 369, 201–7.
Elzinga, G. 1992: Starling's 'law of the heart': rise and fall of the descending limb. Physiology 7, 134–7.
Elzinga, G. and Westerhof, N. 1973: Pressure and flow generated by the left ventricle against different impedances. Circulation Research 32, 178–86.
Elzinga, G. and Westerhof, N. 1974: End-diastolic volume and source impedance of the heart. In: Ciba Foundation Symposium: The physiologic basis of Starling's law of the heart. Amsterdam: 24 Excerpta Medica, pp. 242–55.
Elzinga, G. and Westerhof, N. 1976: The pumping ability of the left heart and the effect of coronary occlusion. Circulation Research 38, 297–302.
Elzinga, G. and Westerhof, N. 1978: The effect of an increase in inotropic state and end diastolic volume on the pumping ability of the feline left heart. Circulation Research 42, 620–8.
Elzinga, G. and Westerhof, N. 1979: How to quantify pump function of the heart: the value of variables derived from measurements on isolated muscle. Circulation Research 44(3), 303–8.
Elzinga, G. and Westerhof, N. 1980: Pump function of the feline left heart: changes with heart rate and its bearing on the energy balance. Cardiovascular Research 14, 81–92.
Elzinga, G. and Westerhof, N. 1991: Matching between ventricle and arterial load. An evolutionary process. Circulation Research 68(6), 1495–500.
Elzinga, G., Piene, H. and de Jong, J.P. 1980: Left and right ventricular pump function and consequences of having two pumps in one heart. A study on the isolated cat heart. Circulation Research 46, 564–74.
Endo, H., Shiraishi, H. and Yanagisawa, M. 1994: Afterload reduction by hydralazine in children with a ventricular septal defect as determined by aortic input impedance. Cardiovascular Drugs and Therapy 8(1), 161–6.
Engel, H.J. and Lichtlen, P.R. 1981: Beneficial enhancement of coronary blood flow by nifedipine: comparison with nitroglycerin and beta-blocking agents. American Journal of Medicine 71, 658–66.
Engler, R.L., Schmid-Schonbein, G.W. and Pavelec, R.S. 1983: Leukocyte capillary plugging in myocardial ischemia and reperfusion in the dog. American Journal of Pathology 111(1), 98–111.
Epstein, S.E., Zhu, J., Najafi, A.H. et al. 2009: Insight into the role of infection in atherogenesis and in plaque rupture. Circulation 119, 3133–41.
Ercan, M., Konukoglu, D., Erdem, T. et al. 2002: The effects of cholesterol levels on hemorheological parameters in diabetic patients. Clinical Hemorheology and Microcirculation 26(4), 257–63.
Eriksen, M. 1987: Noninvasive measurement of arterial diameters in humans using ultrasound echoes with prefiltered waveforms. Medical and Biological Engineering and Computing 25, 189–94.
Eriksson, A., Greiff, E., Loupas, T. et al. 2002: Arterial pulse wave velocity with tissue Doppler imaging. Ultrasound in Medicine and Biology 28(5), 571–80.
Erlanger, J. 1921: Studies in blood pressure estimation by indirect methods. American Journal of Physiology 55, 84–158.
Erlanger, J. and Hooker, D.R. 1904: An experimental study of blood pressure and of pulse pressure in man. Johns Hopkins Hospital Reports 12, 145–378.
Ernst, C.B. 1993: Abdominal aortic aneurysm (current concepts). New England Journal of Medicine 328(16), 1167–72.
ESH/ESC Guidelines Committee. 2003: Guidelines for the management of arterial hypertension. Journal of Hypertension 21, 1011–53.
Eskurza, I., Monahan, K.D., Robinson, J.A. et al. 2004: Ascorbic acid does not affect large elastic artery compliance or central blood pressure in young and older men. American Journal of Physiology. Heart and Circulatory Physiology 286, H1528–34.
Eskurza, I., Seals, D.R., DeSouza, C.A. et al. 2001: Pharmacologic versus flow-mediated assessments of peripheral vascular endothelial vasodilatory function in humans. American Journal of Cardiology 88(9), 1067–9.
Esper, R.J., Nordaby, R.A., Vilariño, J.O. et al. 2006: Endothelial dysfunction: a comprehensive appraisal. Cardiovascular Diabetology 5, 4.
Evans, C.L. 1918: The velocity factor in cardiac work. Journal of Physiology 52, 6–14.
Evans, R.G., Hayes, I.P., Ludbrook, J. et al. 1993: Factors confounding blockade of cardiac afferents by intrapericardial procaine in conscious rabbits. American Journal of Physiology 264(6), H1861–70.
Evans, D.H., McDicken, W.N., Skidmore, R. and Woodcock, J.P. 2000: Doppler Ultrasound: physics, instrumentation and clinical applications. Chichester, UK: John Wiley & Sons.
Ewald, C. 1877: Uber die Transpiration des Blutes. Archives Anatomie et Physiologie 208, 32.
Ewy, G.A., Rios, J.C. and Marcus, F.I. 1969: The dicrotic arterial pulse. Circulation 39, 655–61.
Eze-Nliam, C.M., Thombs, B.D., Lima, B.B. et al. 2010: The association of depression with adherence to antihypertensive medications: a systematic review. Journal of Hypertension 28, 1785–95.
Faber, M. and Moller-Hou, G. 1952: The human aorta. Part. V: Collagen and elastin in the normal and hypertensive aorta. Acta Pathologica et Microbiologica Scandinavica 31, 377–82.
Fabre, P. 1932: Utilisation des forces electromotrices d'induction pour l'enregistrement des variations de vitesse des liquids conducteurs: un nouvel hemodromographe sans palette dans les sang. Compte Rendue Academie Science de Paris 194, 1097.
Fagard, R.H., Celis, H., Thijs, L. et al. 2009: Regression of left ventricular mass by antihypertensive treatment: a meta-analysis of randomized comparative studies. Hypertension 54, 1084–91.
Fahraeus, R. 1928: Die Strömungsverhältnisse und die Verteilung der Blutzellen im Gefäsystem. Klinische Wochenschrift 7, 100–6.
Fahraeus, R. and Lindqvist, R.T. 1931: Viscosity of blood in narrow capillary tubes. American Journal of Physiology 96, 562–8.
Failla, M., Grappiolo, A., Carugo, S. et al. 1997: Effects of cigarette smoking on carotid and radial artery distensibility. Journal of Hypertension 15, 1659–64.
Faita, F., Masi, S., Loukogeorgakis, S. et al. 2011: Comparison of two automatic methods for the assessment of brachial artery flow-mediated dilation. Journal of Hypertension 29, 85–90.

Falk, E. 1985: Unstable angina with fatal outcome: dynamic coronary thrombosis leading to infarction and/or sudden death. Autopsy evidence of recurrent mural thrombosis with peripheral embolization culminating in total vascular occlusion. Circulation 71(4), 699–708.

Falk, E. 1992: Why do plaques rupture? Circulation 86(suppl. III), 30–42.

Falk, E., Shah, P.K. and Fuster, V. 1995: Coronary plaque disruption. Circulation 92(3), 657–71.

Fallen, E.L., Nahmias, C., Scheffel, A. et al. 1995: Redistribution of myocardial blood flow with topical nitroglycerin in patients with coronary artery disease. Circulation 91(5), 1381–8.

Falsetti, H.W., Kiser, K.M., Francis, G.P. et al. 1972: Sequential velocity development in the ascending and descending aorta of the dog. Circulation Research 29, 328–38.

Fam, W.M. and McGregor, M. 1964: Effect of coronary vasodilator drugs on retrograde flow in areas of chronic myocardial ischemia. Circulation Research 15, 355–65.

Fang, J., Mensah, G.A., Croft, J.B. et al. 2008: Heart failure-related hospitalization in the US, 1979 to 2004. Journal of the American College of Cardiology 52, 428–34.

Fang, S.C., Cavallari, J.M., Eisen, E.A. et al. 2009: Vascular function, inflammation, and variations in cardiac autonomic responses to particulate matter among welders. American Journal of Epidemiology 169, 848–56.

Fang, Z.Y. and Marwick, T.H. 2003: Patients with early diabetic heart disease demonstrate a normal myocardial response to dobutamine. Journal of the American College of Cardiology 42, 446–53.

Faraci, F.M. and Heistad, D.D. 1990: Regulation of large cerebral arteries and cerebral microvascular pressure. Circulation Research 66, 8–17.

Faraday, M. 1832: Experimental researches in electricity. Philosophical Transactions 15, 175.

Farnett, L., Mulrow, C.D., Linn, W.D. et al. 1991: The J-curve phenomenon and the treatment of hypertension. Is there a point beyond which pressure reduction is dangerous? JAMA 265, 489–95.

Farpour-Lambert, N.J., Aggoun, Y., Marchand, L.M. et al. 2009: Physical activity reduces systemic blood pressure and improves early markers of atherosclerosis in pre-pubertal obese children. Journal of the American College of Cardiology 54, 2396–406.

Farrar, D.J., Green, H.D., Bond, M.G. et al. 1978: Aortic pulse wave velocity, elasticity, and composition in a non human primate model of atherosclerosis. Circulation Research 43, 52–62.

Farrar, D.J., Green, H.D. and Peterson, D.W. 1979: Noninvasively and invasively measured pulsatile haemodynamics with graded arterial stenosis. Cardiovascular Research 13(1), 45–57.

Farthing, S. and Peronneau, P. 1979: Flow in the thoracic aorta. Cardiovascular Research 13, 607–20.

Fathi, R., Haluska, B., Isbel, N. et al. 2004: The relative importance of vascular structure and function in predicting cardiovascular events. Journal of the American College of Cardiology 43(4), 616–23.

Faury, G., Pezet, M., Knutsen, R.H. et al. 2003: Developmental adaptation of the mouse cardiovascular system to elastin haploinsufficiency. Journal of Clinical Investigation 112(9), 1419–28.

Feder, W. and Bay, E.B. 1959: The d.c. electromagnetic flowmeter and its application to blood flow measurement in unopened vessels. IRE Transactions in Medical Electronics 6, 2140–5.

Federmann, M. and Hess, O.M. 1994: Differentiation between systolic and diastolic dysfunction. European Heart Journal 15 (suppl. D), 2–6.

Feig, P.U., Roy, S. and Cody, R.J. 2010: Antihypertensive drug development: current challenges and future opportunities. Journal of the American Society of Hypertension 4, 163–73.

Feigl, E.O. 1983: Coronary physiology. Physiological Review 63, 1–205.

Feldman, R.L., Nichols, W.W., Pepine, C.J. et al. 1978a: Hemodynamic significance of the length of a coronary arterial narrowing. American Journal of Cardiology 41(5), 865–71.

Feldman, R.L., Nichols, W.W., Pepine, C.J. et al. 1978b: Hemodynamic effects of long and multiple coronary arterial narrowings. Chest 74, 280–5.

Feldman, R.L., Nichols, W.W., Pepine, C.J. et al. 1979a: The coronary hemodynamics of left main and branch coronary stenoses: the effects of reduction in stenosis diameter, stenosis length, and number of stenoses. Journal of Thoracic and Cardiovascular Surgery 77, 377–88.

Feldman, R.L., Nichols, W.W., Pepine, C.J. et al. 1979b: Influence of aortic insufficiency on the hemodynamic significance of a coronary artery narrowing. Circulation 60, 259–68.

Feldman, R.L., Conetta, D.A., Nichols, W.W. et al. 1980: Effect of graded narrowing of left main coronary artery on left ventricular function. Journal of Thoracic and Cardiovascular Surgery 79, 904–10.

Feldman, R.L., Pepine, C.J. and Conti, C.R. 1981: Magnitude of dilation of large and small coronary arteries by nitroglycerin. Circulation 64, 324–33.

Feldman, R.L., Nichols, W.W., Edgerton, J.R. et al. 1983: Influence of aortic stenosis on the hemodynamic importance of coronary artery narrowing in dogs without left ventricular hypertrophy. American Journal of Cardiology 51, 865–71.

Fenn, W.O. 1923: A quantitative comparison between the energy liberated and the work performed by the isolated sartorius muscle of the frog. Journal of Physiology 58, 175–203.

Fenn, W.O. 1957: Changes in length of blood vessels on inflation. In: Remington, J. (ed.), Tissue elasticity. Washington: American Physiological Society, pp. 154–67.

Ferguson, D.J. and Wells, H.S. 1959: Harmonic analysis of frequencies in pulsatile blood flow. IRE Transactions in Medical Electronics 6, 291–4.

Ferguson, J.J., Julius, S. and Randall, O.S. 1984: Stroke volume–pulse pressure relationships in borderline hypertension, a possible indicator of decreased arterial compliance. Journal of Hypertension (suppl.) 2(3), S397–S399.

Fernhall, B. and Agiovlasitis, S. 2008: Arterial function in youth: window into cardiovascular risk. Journal of Applied Physiology 105(1), 325–33.

Ferrara, K. and DeAngelis, G. 1997: Color flow mapping. Ultrasound in Medicine and Biology 23, 321–45.

Ferrari, A.U., Radaelli, A. and Centola, M. 2003: Invited review: aging and the cardiovascular system. Journal of Applied Physiology 95, 2591–7.

Ferreira, A.V., Viana, M.C. and Mill, J.G. et al. 1999: Racial differences in aortic stiffness in normotensive and hypertensive adults. Journal of Hypertension 17, 631–7.

Ferreira, I., Twisk, J.W.R., van Mechelen, W.V. et al. 2002: Current and adolescent levels of cardiopulmonary fitness are related to large artery properties at age 36: the Amsterdam Growth and Health Longitudinal Study. European Journal of Clinical Investigation 32, 723–31.

Ferreira, I., Twisk, J.W., van Mechelen, W.V. et al. 2004: Current and adolescent body fatness and fat distribution: relationships with carotid intima-media thickness and large artery stiffness at the age of 36 years. Journal of Hypertension 22, 145–55.

Ferrier, K.E., Waddell, T.K., Gatzka, C.D. et al. 2001: Aerobic exercise training does not modify large-artery compliance in isolated systolic hypertension. Hypertension 38, 222–6.

Ferrier, K.E., Muhlmann, M.H., Baguet, J.P. et al. 2002: Intensive cholesterol reduction lowers blood pressure and large artery stiffness in isolated systolic hypertension. Journal of the American College of Cardiology 39, 1020–5.

Ferro, G., Duilio, C., Spinelli, L. et al. 1995: Relation between diastolic perfusion time and coronary artery stenosis during stress-induced myocardial ischemia. Circulation 92, 342–7.

Ferro, C.J., Savage, T., Pinder, S.J. et al. 2002: Central aortic pressure augmentation in stable renal transplant recipients. Kidney International 62, 166–71.

Fesler, P., Safar, M.E., du Cailar, G. et al. 2007: Pulse pressure is an independent determination of renal function decline during treatment of essential hypertension. Journal of Hypertension 25, 1915–20.

Fetics, B., Nevo, E., Chen, C.-H. et al. 1999: Parametric model derivation of transfer function for noninvasive estimation of aortic pressure by radial tonometry. Transactions of IEEE 46, 698–706.

Fich, S., Welkowitz, W. and Hilton, R. 1966: Pulsatile blood flow in the aorta. Biomedical Fluid Mechanics Symposium. New York: ASME.

Fichtlscherer, S., Rosenberger, G., Walter, D.H. et al. 2000: Elevated C-reactive protein levels and impaired endothelial vasoreactivity in patients with coronary artery disease. Circulation 102(9), 1000–6.

Fick, A. 1870: Uber die Messung des Blutquantums in den Herz-ventrikein, Sitzungsbericht der Physikalisch-Medizinischen Gesellschaft Wurzburg 2, 169–70.

Fields, C.E. and Makhoul, R.G. 1998: Vasomotor tone and the role of nitric oxide. Seminars in Vascular Surgery 11(3), 181–92.

Fielden, S.W., Fornwalt, B.K., Jerosch-Herold, M. et al. 2008: A new method for the determination of aortic pulse wave velocity using cross-correlation on 2D PCMR velocity data. Journal of Magnetic Resonance Imaging 27, 1382–7.

Figueroa, A., Hooshmand, S., Figueroa, M. and Bada, A.M. 2010: Cardiovagal baroreflex and aortic hemodynamic responses to isometric exercise and post-exercise muscle ischemia in resistance trained men. Scandinavian Journal of Medicine and Science in Sports 20, 305–9.

Figueroa, C.A., Taylor, C.A., Chiou, A.J. et al. 2009: Magnitude and direction of pulsatile displacement forces acting on thoracic aortic endografts. Journal of Endovascular Therapy 16(3), 350–8.

Filipovsky, J., Svobodova, V. and Pecen, L. 2000: Reproducibility of radial pulse wave analysis in healthy subjects. Journal of Hypertension 18, 1033–40.

Filipovsky, J., Ticha, M., Cifkova, R. et al. 2005: Large artery stiffness and pulse wave reflection: results of a population-based study. Blood Pressure 14, 45–52.

Findlay, J.Y., Gali, B., Keegan, M.T. et al. 2006: Vasotrac arterial blood pressure and direct arterial blood pressure monitoring during liver transplantation. Anesthesia and Analgesia 102(3), 690–3.

Fineschi, M., Gori, T. and Cannon, R.O. III. 2010: Coronary slow-flow phenomenon or syndrome Y: a microvascular angina awaiting recognition. Journal of the American College of Cardiology 56, 239–40.

Finkbohner, J., Johnston, D., Crawford, E.S. et al. 1995: Marfan syndrome: long-term survival and complications after aortic aneurysm repair. Circulation 91(3), 728–33.

Finkelstein, S.M. and Collins, V.R. 1982: Vascular hemodynamic impedance measurement. Progress in Cardiovascular Disease 24, 401–18.

Finkelstein, S.M., Cohn, J.N., Collins, V.R. et al. 1985: Vascular hemodynamic impedance in congestive heart failure. American Journal of Cardiology 55, 423–7.

Finn, A.V., Nakazawa, G., Narula, J. et al. 2007: Culprit plaque in myocardial infarction: going beyond angiography. Journal of the American College of Cardiology 50, 2204–6.

Finn, A.V., Nakano, M., Narula, J. et al. 2010: Concept of vulnerable/unstable plaque. Arteriosclerosis, Thrombosis, and Vascular Biology 30, 1282–92.

Firstenberg, M.S., Vandervoort, P.M., Greenberg, N.L. et al. 2000: Noninvasive estimation of transmitral pressure drop across the normal mitral valve in humans, importance of convective and inertial forces during left ventricular filling. Journal of the American College of Cardiology 36(6), 1942–9.

Fisch, C. 2000: Centennial of the string galvanometer and the electrocardiogram. Journal of the American College of Cardiology 36(6), 1737–45.

Fischer, G.M. and Llaurado, J.G. 1966: Collagen and elastin content in canine arteries selected from functionally different vascular beds. Circulation Research 19, 394–9.

Fischer-Rasokat, U., Brenck, F., Zeiher, A.M. et al. 2009: Radial augmentation index unmasks premature coronary artery disease in younger males. Blood Pressure Monitoring 14, 59–68.

Fisher, C.M. 1969: The arterial lesions underlying lacunes. Acta Neuropathologica 12, 1–15.

Fisher, C.M. 1982: Lacunar strokes and infarcts: a review. Neurology 32, 871–6.

Fisher, C.M. 1985: The ascendancy of diastolic blood pressure over systolic. Lancet 2, 1349–50.

Fisher, J.P., Ogoh, S., Young, C.N. et al. 2008: Regulation of middle cerebral artery blood velocity during dynamic exercise in humans: influence of aging. Journal of Applied Physiology 105(1), 266–73.

Fisher, N.D., Hughes, M., Gerhard-Herman, M. et al. 2003: Flavanol-rich cocoa induces nitric-oxide-dependent vasodilation in healthy humans. Journal of Hypertension 21, 2281–6.

Fishman, A.P. and Richards, D.W. (eds) 1964: Circulation of the blood – men and ideas. New York: Oxford University Press.

Fisman, D.N. and Smilovitch, M. 1997: Intravenous immunoglobulin, blood viscosity and myocardial infarction. Canadian Journal of Cardiology 13(8), 775–7.

Fitch, R.M., Vergona, R., Sullivan, M.E. et al. 2001: Nitric oxide synthase inhibition increases aortic stiffness measured by pulse wave velocity in rats. Cardiovascular Research 51(2), 351–8.

Fitch, R.M., Rutledge, J.C., Wang, Y.X. et al. 2006: Synergistic effect of angiotensin II and nitric oxide synthase inhibitor in increasing aortic stiffness in mice. American Journal of Physiology, Heart and Circulatory Physiology 290, H1190–8.

Fitchett, D.H. 1984: Forearm arterial compliance: a new measure of arterial compliance? Cardiovascular Research 18, 651–6.

Fitchett, D.H. 1991: LV-arterial coupling: interactive model to predict effect of wave reflections on LV energetics. American Journal of Physiology 261, H1026–33.

Fitchett, D.H. 1993a: Effects of vasodilator drugs on calibre and distensibility of small peripheral arteries. In: O'Rourke, M., Safar, M. and Dzau, V. (eds), Arterial vasodilation: mechanisms and therapy. London: Edward Arnold.

Fitchett, D.H. 1993b: Aortofemoral transfer function: a method to determine the instantaneous aortic valve gradient in aortic valve stenosis. Journal of the American College of Cardiology 22(7), 1909–14.

Fitchett, D., Bouthier, J.D., Simon, A.C. et al. 1984: Forearm arterial compliance: the validation of a plethysmographic technique for the measurement of arterial compliance. Clinical Science 67, 69–72.

Fitchett, D.H., Simkus, G.J., Genest, J.J. et al. 1986: The effect of nitroglycerin on left ventricular pulsatile load. Circulation 74, 11–455.

Fitchett, D.H., Simkus, G.J., Beaudry, J.P. et al. 1988a: Reflected pressure waves in the ascending aorta: effect of glyceryl trinitrate. Cardiovascular Research 22, 494–500.

Fitchett, D.H., Simkus, G., Genest, J. et al. 1988b: Effect of nitroglycerin on left ventricular hydraulic load. Canadian Journal of Cardiology, 4(2), 72–5.

Fitzgerald, J.D. 1987: By what means might beta blockers prolong life after acute myocardial infarction? European Heart Journal 8(9), 945–51.

Fleg, J.L., Gerstenblith, G., Zonderman, A.B. et al. 1990: Prevalence and prognostic significance of exercise-induced silent myocardial ischemia detected by thallium scintigraphy and electrocardiography in asymptomatic volunteers. Circulation 81(2), 428–36.

Fleg, J.L., Schulman, S.P., Gerstenblith, G. et al. 1993: Additive effects of age and silent myocardial ischemia on the left ventricular response to upright cycle exercise. Journal of Applied Physiology 75(2), 499–504.

Fleg, J.L., Schulman, S., O'Connor, F. et al. 1994: Effects of acute beta-adrenergic receptor blockade on age-associated changes in cardiovascular performance during dynamic exercise. Circulation 90, 2333–41.

Fleg, J.L., O'Connor, F., Gerstenblith, G. et al. 1995: Impact of age on the cardiovascular response to dynamic upright exercise in healthy men and women. Journal of Applied Physiology 78(3), 890–900.

Fleischer, A., Schulman, H., Farmakides, G. et al. 1985: Umbilical artery velocity waveforms and intrauterine growth retardation. American Journal of Obstetrics Gynecology 151(4), 502–5.

Fleischmann, D., Hastie, T.J., Dannegger, F.C. et al. 2001: Quantitative determination of age-related geometric changes in the normal abdominal aorta. Journal of Vascular Surgery 33(1), 97–105.

Fletcher, G.F. 1994. Cardiovascular response to exercise. Mount Kisco, NY: Futura.

Florian, J.A., Kosky, J.R., Ainslie, K. et al. 2003: Heparan sulfate proteoglycan is a mechanosensor on endothelial cells. Circulation Research 93, e136–42.

Florio, P.J. and Mueller, W.K. 1968: Development of periodic flow in a rigid tube. Paper 68-FE-8, New York: ASME.

Fogel, M.A., Weinberg, P.M., Hoydu, A.K. et al. 1997: Effect of surgical reconstruction on flow profiles in the aorta using magnetic resonance blood tagging. Annals of Thoracic Surgery 63(6), 1691–700.

Fokkema, D.S., VanTeeffelen, J.W., Dekker, S. et al. 2005: Diastolic time fraction as a determinant of subendocardial perfusion. American Journal of Physiology. Heart and Circulatory Physiology 288(5), H2450–6.

Folkow, B. 1990: The 'structural factor' in hypertension. In: Laragh, J.H. and Brenner, B.M. (eds), Hypertension: pathophysiology, diagnosis, and management – with special emphasis on the hypertrophic adaptation of the systemic resistance vessels. New York: Raven Press, pp. 565–81.

Folkow, B. and Svanborg, A. 1993: Physiology of cardiovascular aging. Physiological Reviews 73(4), 725–64.

Folkow, B., Gaskell, P. and Waaler, B. 1970: Blood flow through limb muscles during heavy rhythmic exercise. Acta Physiologica Scandinavica 80, 61–72.

Folkow, B., Haglund, U., Jodal, M. et al. 1971: Blood flow in the calf muscle of man during heavy rhythmic exercise. Acta Physiologica Scandinavica. 81, 157–63.

Folts, J.D. and Rowe, G.G. 1974: Coronary and hemodynamic effects of temporary acute aortic insufficiency in intact anesthetized dogs. Circulation Research 35, 238–46.

Fonck, E., Feigl, G.G., Fasel, J. et al. 2009: Effect of aging on elastin functionality in human cerebral arteries. Stroke 40, 2552–6.

Fonck, E., Prodhom, G., Roy, S. et al. 2007: Effect of elastin degradation on carotid wall mechanics as assessed by a constituent-based biomechanical model. American Journal of Physiology. Heart and Circulatory Physiology 292(6), H2754–63.

Ford, E.S. and Capewell, S. 2007: Coronary heart disease mortality among young adults in the US from 1980 through 2002. Journal of the American College of Cardiology 50, 2128–32.

Ford, L.E. 1980: Effect of afterload reduction on myocardial energetics. Circulation Research 46, 161–6.

Ford, M.D., Xie, Y.J., Wasserman, B.A. et al. 2008: Is flow in the common carotid artery fully developed? Physiological Measurement 29(11), 1335–49.

Ford, M.L., Tomlinson, L.A., Chapman, T.P.E. et al. 2010: Aortic stiffness is independently associated with rate of renal function decline in chronic kidney disease stages 3 and 4. Hypertension 55, 1110–15.

Forette, F., Seuz, M.-L., Staessen, J.A. et al. 2002: The prevention of dementia with antihypertensive treatment. Archives of Internal Medicine 162, 2046–52.

Forrester, J.S., Ganz, W., Dramond, G. et al. 1972: Thermodilution cardiac output determination with a single flow-directed catheter. American Heart Journal 83, 306–11.

Forsberg, F., Stein, A.D., Liu, J.B. et al. 2006: Validating volume flow measurements from a novel semiautomated four-dimensional Doppler ultrasound scanner. Academic Radiology 13(10), 1204–10.

Forsdahl, S.H., Singh, K., Solberg, S. et al. 2009: Risk factors for abdominal aortic aneurysms: a 7-year prospective study: the Tromso Study, 1994–2001. Circulation 119, 2202–8.

Forsen, T., Eriksson, J., Qiao, Q. et al. 2000: Short stature and coronary heart disease: a 35-year follow-up of the Finnish cohorts of The Seven Countries Study. Journal of Internal Medicine 248(4), 326–32.

Forssmann, W. 1929: Die Sondierung des rechten Herzens. Klinische Wochenschrifte 8, 2085–7.

Fourie, P.R., Coetzee, A.R. and Bolliger, C.T. 1992: Pulmonary artery compliance: its role in right ventricular-arterial coupling. Cardiovascular Research 26(9), 839–44.

Fox, K.F., Cowie, M.R., Wood, D.A. et al. 2001: Coronary artery disease as the cause of incident heart failure in the population. European Heart Journal 22, 228–36.

Franco, V., Oparil, S. and Carretero, O.A. 2004: Hypertensive therapy: Part 1. Circulation 109, 2953–8.

Frangos, J.A., Eskin, S.G., McIntire, L.V. et al. 1985: Flow effects on prostacyclin production by cultured human endothelial cells. Science 227(4693), 1477–9.

Frank, O. 1895: 1959: On the dynamics of heart muscle (trans. Chapman, C. and Wasserman, E.). American Heart Journal 58, 282–317, 467–78.

Frank, O. 1899: Die Grundform des arteriellen Pulses. Erste Abhandlung. Mathematische Analyse. Zeitschrift für Biologie 37, 483–526.

Frank, O. 1903: Kritik der elastischen Manometer. Zeitschrift für Biologie 44, 445–613.

Frank, O. 1905: Der puls in den Arterien. Zeitschrift für Biologie 45, 441–553.

Frank, O. 1920: Die Elastizitat der Blutegefasse. Zeitschrift für Biologie 71, 255–72.

Frank, O. 1926a: Die Theorie der Pulswellen. Zeitschrift für Biologie 85, 91–130.

Frank, O. 1926b: Der arterielle Puls. S.B. Ges Morph. U. Physiol., Munchen 37, 33–54.

Frank, O. 1926c: Das Altern der Arterien. S.B. Ges. Morph. U. Physiol., Munchen 37, 23–32.

Frank, O. 1927: Die Theorie der Pulswellen. Zeitschriff fur Biologie 85, 91–130.

Frank, O. 1930: Schatzung des Schlagvolumens des menschlichen Herzens auf Grund der Wellen- und Windkesseltheorie. Zeitschrift für Biologie 90, 405–9.

Frank, R.N. 2004: Diabetic retinopathy. New England Journal of Medicine 350, 48–58.

Franklin, D.L., Baker, D.W. and Ellis, R.M. 1959a: A pulsed ultrasonic flowmeter. IRE Transactions Medical Electronics 6, 204–6.

Franklin, D.L., Schlegel, W. and Rushmer, R.F. 1961: Blood flow measured by Doppler frequency shift back-scattered ultrasound. Science 134, 564–5.

Franklin, D.L., Watson, N.W., Pierson, K.E. et al. 1966: Technique for radio telemetry of blood-flow velocity from unrestrained animals. American Journal of Medical Electronics 5, 24–8.

Franklin, K.J. 1961. William Harvey: Englishman, 1578–1657. London: MacGibbon and Kee.

Franklin, P. 1958. An introduction to Fourier methods and the Laplace transformation. New York: Dover.

Franklin, S.S. 2002: Do diabetes and hypertension interact to accelerate vascular ageing? Journal of Hypertension 20, 1693–6.

Franklin, S.S. and Weber, M.A. 1994: Measuring hypertensive cardiovascular risk: the vascular overload concept. American Heart Journal 128(4), 793–803.

Franklin, S.S., Gustin, W. IV, Wong, N.D. et al. 1997: Hemodynamic patterns of age-related changes in blood pressure. Circulation 96, 308–15.

Franklin, S.S., Khan, S.A., Wong, N.D. et al. 1999: Is pulse pressure useful in predicting risk for coronary heart disease? The Framingham Heart Study. Circulation 100, 354–60.

Franklin, S.S., Khan, S.A., Wong, N.D. et al. 2000: The relation of blood pressure to coronary heart disease risk as a function of age: The Framingham Heart Study. Journal of the American College of Cardiology 35(suppl. A), 291A–292A.

Franklin, S.S., Larson, M.G., Khan, S.A. et al. 2001: Does the relation of blood pressure to coronary heart disease risk change with aging? The Framingham Heart Study. Circulation 103(9), 1245–9.

Franklin, S.S., Wong, N.D., Larson, M.G. et al. 2002: How important is pulse pressure as a predictor of cardiovascular risk? Hypertension 39, e12–13.

Franklin, S.S., Lopez, V.A., Wong, N.D. et al. 2009: Single versus combined blood pressure components and risk for cardiovascular disease: the Framingham Heart Study. Circulation 119, 243–50.

Franzoni, F., Ghiadoni, L., Galetta, F. et al. 2005: Physical activity, plasma antioxidant capacity, and endothelium-dependent vasodilation in young and older men. American Journal of Hypertension 18(4 Pt 1), 510–16.

Frazier, O.H. and Delgado, R.M. 2003: Mechanical circulatory support for advanced heart failure: where does it stand in 2003? Circulation 108, 3064–8.

Freda, B.J., Tang, W.H.W., Van Lente, F. et al. 2002: Cardiac troponins in renal insufficiency. Review and clinical implications. Journal of the American College of Cardiology 40, 2065–71.

Fredriksson, I., Larsson, M. and Stromberg, T. 2009: Measurement depth and volume in laser Doppler flowmetry. Microvascular Research 78, 4–11.

Freis, E.D. and Heath, W.C. 1964: Hydrodynamics of aortic blood flow. Circulation Research 14, 105–16.

Freis, E.D., Heath, W.C., Luchsinger, P.C. and Snell, R.E. 1966: Changes in the carotid pulse which occur with age and hypertension. American Heart Journal 71, 757–65.

Frick, M., Alber, H.F., Hugel, H. et al. 2002: Short- and long-term changes of flow-mediated vasodilation in patients under statin therapy. Clinical Cardiology 25(6), 291–4.

Fridez, P., Rachev, A. and Meister, J.J. 2001: Model of geometrical and smooth muscle tone adaptation of carotid artery subject to step change in pressure. American Journal of Physiology. Heart and Circulatory Physiology 280(6), H2752–60.

Friedman, M.H. and Fry, D.L. 1993: Arterial permeability dynamics and vascular disease. Atherosclerosis 104, 189–94.

Frielingsdorf, J., Seiler, C., Kaufmann, P. et al. 1996: Normalization of abnormal coronary vasomotion by calcium antagonists in patients with hypertension. Circulation 93(7), 1380–7.

Fries, J.F. 1980: Aging, natural death, and the compression of morbidity? New England Journal of Medicine, 303(3), 130–5.

Friesinger, G.C. and Gavin, J.A. 2000: Diabetes and the cardiologists, a call to action. Journal of the American College of Cardiology 35, 1130–3.

Frohlich, E.D. 2001: Local hemodynamic changes in hypertension: insights for therapeutic preservation of target organs. Hypertension 38(6), 1388–94.

Frohlich, E.D. 2003: Treating hypertension – what are we to believe? (Editorials). New England Journal of Medicine 348, 639–41.

Frohlich, E.D. 2004: Left ventricular hypertrophy: a 'factor of risk': mass is reversible, but is the risk? Journal of the American College of Cardiology 43, 2216–8.

Frohlich, E.D. and Sowers, J.R. 2003: Management of diabetic and hypertensive cardiovascular disease. Current Hypertension Reports 5, 309–15.

Frohlich, E.D., Sasaki, O., Chien, Y. et al. 1992a: Changes in cardiovascular mass, left ventricular pumping ability and aortic distensibility after calcium antagonists in Wistar-Kyoto and spontaneously hypertensive rats. Journal of Hypertension 10, 1369–78.

Frohlich, E.D., Apstein, C., Chobanian, A.V. et al. 1992b: The heart in hypertension. New England Journal of Medicine 327, 998–1008.

Fronek, A. 1972: Analysis of recent developments in blood flow measurement. In: Fung, Y.C., Perrone, N. and Aanliker, M. (eds), Biomechanics: its foundations and objectives. Englewood Cliffs, NJ: Prentice-Hall.

Fry, D.L. 1968: Acute vascular endothelial changes associated with increased blood velocity gradients. Circulation Research 22, 165–97.

Fry, D.L. 1969a: Certain histologic and chemical responses of the vascular interface to acutely induced mechanical stress in the aorta of the dog. Circulation Research 24, 93–108.

Fry, D.L. 1969b: Certain chemorheologic considerations regarding the blood vascular interface with particular reference to coronary artery disease. Circulation 39/40(suppl. 4), 38–57.

Fry, D.L. 1972: Localizing factors in arteriosclerosis. In: Likoff, W., Segal, B.L. and Insull, W.J. (eds), Arteriosclerosis and coronary heart disease: the twenty-fourth Hahnemann symposium. New York: Grune and Stratton, pp. 85–104.

Fry, D.L. 1973. Responses of the arterial wall to certain physical factors. Amsterdam: Ciba Foundation Symposium.

Fry, D.L. 1987: Mass transport, atherogenesis, and risk. Arteriosclerosis 7(1), 88–100.

Fry, D.L., Mallos, A.J. and Casper, G.T. 1956: A catheter tip method for measurement of the instantaneous aortic blood velocity. Circulation Research 4, 627–32.

Fry, D.L., Noble, F.W. and Mallos, A.J. 1957a: An evaluation of modern pressure recording systems. Circulation Research 5, 40–6.

Fry, D.L., Noble, F.W. and Mallos, A.J. 1957b: An electric device for instantaneous and continuous computation of aortic blood velocity. Circulation Research 5, 75–8.

Fry, D.L., Griggs, D.M. and Greenfield, J.C. Jr. 1964: In vivo studies of pulsatile blood flow: the relationship of the pressure gradient to the blood velocity. In: Attinger, E.O. (ed.), Pulsatile blood flow. New York: McGraw-Hill, pp. 101–4.

Frydrychowicz, A., Markl, M., Harloff, A. et al. 2007: Flow-sensitive *in-vivo* 4D MR imaging at 3T for the analysis of aortic hemodynamics and derived vessel wall parameters. Zofo Fortschritte auf dem Gebiete der Röntgenstrahlen und der Nuklearmedizin 179(5), 463–72.

Fuchs, R.F. 1900: Zur Physiologie und Wachstummsmechanik des Blutgefassystems. Archiv für die gesamte Physiologie 28, 7.

Fuentes, F., López-Miranda, J., Sánchez, E. et al. 2001: Mediterranean and low-fat diets improve endothelial function in hypercholesterolemic men. Annals of Internal Medicine 134, 1115–19.

Fujii, M., Yaginuma, T., Takazawa, K. et al. 1989: Non-invasive detection for wave reflection in the arterial system by using carotid pulse wave and its clinical application. Journal of Japanese College of Angiology 29(7), 545–51.

Fujita, Y., Satoh, S., Koga, T. et al. 2002: Aortic pulse waveforms for evaluating cardiac performance in the human fetus. Ultrasound in Medicine and Biology 28(10), 1245–50.

Fukuda, D., Yoshiyama, M., Shimada, K. et al. 2006: Relation between aortic stiffness and coronary flow reserve in patients with coronary artery disease. Heart 92(6), 759–62.

Fukuda, S., Shimada, K., Kawasaki, T. et al. 2010: 'Passive exercise' using whole body periodic acceleration: Effects on coronary microcirculation. American Heart Journal 159, 620–6.

Fukui, M., Kitagawa, Y., Nakamura, N. et al. 2003: Augmentation of central arterial pressure as a marker of atherosclerosis in patients with type 2 diabetes. Diabetes Research and Clinical Practice 59, 153–161.

Fukui, M., Ose, H., Kitagawa, Y. et al. 2007: Relationship between low serum endogenous androgen concentrations and arterial stiffness in men with type 2 diabetes mellitus. Metabolism 56, 1167–73.

Fukumoto, Y., Hiro, T., Fujii, T. et al. 2008: Localized elevation of shear stress is related to coronary plaque rupture: a 3-dimensional intravascular ultrasound study with in-vivo color mapping of shear stress distribution. Journal of the American College of Cardiology 51, 645–50.

Fuller, J., Taylor, B.E., Clagett, O.T. et al. 1952: Blood pressure in the aorta during resection and repair of coarctation of the aorta. Journal of Laboratory and Clinical Medicine 39, 10–25.

Fuller, J.H., Shipley, M.J., Rose, G. et al. 1983: Mortality from coronary heart disease and stroke in relation to degree of glycaemia: the Whitehall study. British Medical Journal 287, 867–70.

Fuller, T.J., Nichols, W.W., Brenner, B.J. et al. 1978: Reversible depression in myocardial performance in dogs with experimental phosphorus deficiency. Journal of Clinical Investigation 62, 1194–200.

Fulton, W.F.M. 1965. The coronary arteries: arteriography, microanatomy, and pathogenesis of obliterative coronary artery disease. Springfield, IL: Charles C. Thomas.

Fung, Y.C. 1997. Biomechanics: circulation. New York: Springer.

Fung, Y.C., Zweifach, B.W. and Intaglietta, M. 1966: Elastic environment of the capillary bed. Circulation Research 19, 441–61.

Funk, D.J., Moretti, E.W. and Gan, T.J. 2009: Minimally invasive cardiac output monitoring in the perioperative setting. Anesthesia and Analgesia 108(3), 887–97.

Furberg, C.D., Psaty, B.M. and Meyer, J.V. 1995: Nifedipine. Dose-related increase in mortality in patients with coronary heart disease. Circulation 92(5), 1326–31.

Furchgott, R.F. 1983: Role of endothelium in response of vascular smooth muscle. Circulation Research 53, 557–73.

Furchgott, R.F. 1988: Studies on relaxation of rabbit aorta by sodium nitrate: the basis for the proposal that the acid-activatable inhibitory factor from retractor penis is inorganic nitrate and the endothelium-derived relaxing factor is nitric acid. In: Vanhoutte, P. (ed.), Vasodilation: vascular smooth muscle, peptides, autonomic nerves and endothelium. New York: Raven Press, pp. 401–14.

Furchgott, R.F. and Zawadzki, J.V. 1980: The obligatory role of endothelial cells in the relaxation of arterial smooth muscle by acetylcholine. Nature 288, 373–6.

Furchgott, R.F., Zawadzki, J.V. and Cherry, P.D. 1981: Role of endothelium in vasodilator response to acetylcholine. In: Vanhoutte, P.M. (ed.), Vasodilation. New York: Raven Press, pp. 49–66.

Furlan, J.C. and Fehlings, M.G. 2009: The impact of age on mortality, impairment, and disability among adults with acute traumatic spinal cord injury. Journal of Neurotrauma 26(10), 1707–17.

Furlan, R., Magatelli, R., Palazzolo, L. et al. 2001: Orthostatic intolerance: different abnormalities in the neural sympathetic response to a gravitational stimulus. Autonomic Neuroscience 90(1–2), 83–8.

Fusco, F., Sicuteri, R., Rossi, A. et al. 2009: Patterns of treatment with PDE5 inhibitors in the clinical practice in Italy: longitudinal data from the Erectile Dysfunction Observational Study. Asian Journal of Andrology 11(5), 629–37.

Fuster, V. and Vahl, T.P. 2010: The role of noninvasive imaging in promoting cardiovascular health. Journal of Nuclear Cardiology 17, 781–90.

Fuster, V., Badimon, J., Chesebro, J.H. et al. 1996: Plaque rupture, thrombosis, and therapeutic implications. Haemostasis 26(S4), 269–84.

Fuster, V., Badimon, L., Badimon, J. et al. 1992a: The pathogenesis of coronary artery disease and the acute coronary syndromes I. New England Journal of Medicine 326(4), 242–50.

Fuster, V., Badimon, L., Badimon, J.J. et al. 1992b: The pathogenesis of coronary artery disease and the acute coronary syndromes II. New England Journal of Medicine 326(5), 310–18.

Fye, W.B. 2001: Johann and Daniel Bernoulli. Clinical Cardiology 24(9), 634–5.

Gaasch, W.H. and Little, W.C. 2007: Assessment of left ventricular diastolic function and recognition of diastolic heart failure. Circulation 116, 591–3.

Gabe, I.T. 1965b: The measurement of oscillatory blood flow and impedance in the human external iliac artery. Clinical Science 29, 45–58.

Gabe, I.T. 1972: Pressure measurement in experimental physiology. In: Bergel, D.H. (ed.), Cardiovascular fluid dynamics, vol. 1. London: Academic Press, pp. 11–50.

Gabe, I.T., Karnell, J., Porjé, I.G. et al. 1964: The measurement of input impedance and apparent phase velocity in the human aorta. Acta Physiologica Scandinavica 61, 73–84.

Gabe, I.T., Gault, J.J., Ross, J. et al. 1969: Measurement of instantaneous blood flow velocity and pressure in conscious man with a catheter-tip velocity probe. Circulation 40, 603–14.

Gabor, D. 1946: Theory of communications. Journal of the Institute of Electrical Engineers 93, 429–57.

Gaede, P., Vedel, P., Larsen, N. et al. 2003: Multifactorial intervention and cardiovascular disease in patients with type 2 diabetes. New England Journal of Medicine 348, 383–93.

Galderisi, M. 2008: Reduced coronary flow reserve and arterial stiffness: two faces of the same coin. American Journal of Hypertension 21, 732.

Galderisi, M., de Simone, G., Cicala, S. et al. 2003: Coronary flow reserve in hypertensive patients with appropriate or inappropriate left ventricular mass. Journal of Hypertension 21(11), 2183–8.

Galie, N. and Rubin, L.J. 2004: Pulmonary arterial hypertension: epidemiology, pathobiology, assessment, and therapy. Journal of the American College of Cardiology 43(suppl. S), 1S–90S.

Galiuto, L., Sestito, A., Barchetta, S. et al. 2007: Noninvasive evaluation of flow reserve in the left anterior descending coronary artery in patients with cardiac syndrome X. American Journal of Cardiology 99(10), 1378–83.

Gallagher, D. 1993: Analysis of Pressure Wave Propagation in the Human Upper Limb: Physical determinants and clinical applications. MD thesis, University of New South Wales, Australia.

Gallagher, D., Adji, A. and O'Rourke, M.F. 2004: Validation of the transfer function technique for generating central from peripheral upper limb pressure waveform. American Journal of Hypertension 17, 1059–67.

Gambarin, F.I., Favalli, V., Serio, A. et al. 2009: Rationale and design of a trial evaluating the effects of losartan vs. nebivolol vs. the association of both on the progression of aortic root dilation in Marfan syndrome with FBN1 gene mutations. Journal of Cardiovascular Medicine 10(4), 354–62.

Gan, C.T., Lankhaar, J.W., Westerhof, N. et al. 2007: Noninvasively assessed pulmonary artery stiffness predicts mortality in pulmonary arterial hypertension. Chest 132(6), 1906–12.

Ganaha, F., Miller, D.C., Sugimoto, K. et al. 2002: Prognosis of aortic intramural hematoma with and without penetrating atherosclerotic ulcer: a clinical and radiological analysis. Circulation 106(3), 342–8.

Gandhi, S.K., Powers, J.C., Nomeir, A.-M. et al. 2001: The pathogenesis of acute pulmonary edema associated with hypertension. New England Journal of Medicine 344, 17–22.

Gando, Y., Yamamoto, K., Murakami, H. et al. 2010: Longer time spent in light physical activity is associated with reduced arterial stiffness in older adults. Hypertension 56, 540–6.

Ganne, F., Vasse, M., Beaudeux, J.L. et al. 1999: Increased expression of u-PA and u-PAR on monocytes by LDL and Lp(a) lipoproteins – consequences for plasmin generation and monocyte adhesion. Thrombosis and Haemostasis 81(4), 594–600.

Garcia-Garcia, H.M., Costa, M.A. and Serruys, P.W. 2010: Imaging of coronary atherosclerosis: intravascular ultrasound. European Heart Journal 31(20), 2456–69.

Gardenhire, L.W. 1964: Selecting sample rates. I.S.A. Journal 11, 59–64.

Gardin, J.M., Henry, W.L., Savage, D.D. et al. 1979: Echocardiographic measurements in normal subjects: evaluation of an adult population without chemically apparent heart disease. Journal of Clinical Ultrasound 7(6), 439–47.

Gardin, J.M., Savage, D.D., Ware, J.H. et al. 1987: Effect of age, sex and body surface area on echocardiographic left ventricular mass in normal subjects. Hypertension 9(suppl. II), 36–9.

Gariepy, J., Simon, A., Massonneau, M. et al. 1996: Echographic assessment of carotid and femoral arterial structure in men with essential hypertension. American Journal of Hypertension 9, 126–36.

Garrone, P., Biondi-Zoccai, G., Salvetti, I. et al. 2009: Quantitative coronary angiography in the current era: principles and applications. Journal of Interventional Cardiology 22(6), 527–36.

Gasowski, J., Fagard, R.H., Staessen, J.A. et al. 2002: Pulsatile blood pressure component as predictor of mortality in hypertension: a meta-analysis of clinical trial control groups. Journal of Hypertension 20(1), 145–51.

Gasser, T.C., Ogden, R.W. and Holzapfel, G.A. 2006: Hyperelastic modelling of arterial layers with distributed collagen fibre orientations. Journal of the Royal Society Interface 3(6), 15–35.

Gates, P.E., Tanaka, H., Hiatt, W.R. et al. 2004: Dietary sodium restriction rapidly improves large elastic artery compliance in older adults with systolic hypertension. Hypertension 44, 35–41.

Gatzka, C.D., Cameron, J.D., Kingwell, B.A. et al. 1998: Relation between coronary artery disease, aortic stiffness and left ventricular structure in a population sample. Hypertension 32, 575–78.

Gatzka, C.D., Cameron, J.D., Dart, A.M. et al. for the ANBP2 investigators. 2001a: Correction of carotid augmentation index for heart rate in elderly essential hypertensives. American Journal of Hypertension 14, 573–7.

Gatzka, C.D., Kingwell, B.A., Cameron, J.D. et al. for the ANBP investigators. 2001b: Australian comparative outcome trial of angiotensin-converting enzyme inhibitor- and diuretic-based treatment of hypertension in the elderly. Gender differences in the timing of arterial wave reflection beyond differences in body height. Journal of Hypertension 19(12), 2197–203.

Gault, J.H., Ross, J. and Mason, D.T. 1966: Patterns of brachial arterial blood flow in conscious human subjects with and without cardiac dysfunction. Circulation 34, 833–48.

Geddes, L.A. 1970: The direct and indirect measurement of blood pressure. Chicago: Year Book Medical Publishers.

Geddes, L.A. 1991: Handbook of blood pressure measurement. Clifton, NJ: Humana Press.

Geddes, L.A. and Baker, L.E. 1975. Principles of applied biomedical instrumentation, 2nd edn. New York: John Wiley and Sons.

Geibel, A., Gornandt, L. and Kasper, W. 1991: Reproducibility of Doppler echocardiographic quantification of aortic and mitral valve stenoses, comparison between two echocardiography centers. American Journal of Cardiology 67(11), 1013–21.

Gelb, B.D. 2006: Marfan's syndrome and related disorders – more tightly connected than we thought. New England Journal of Medicine 355, 841–4.

Geleris, P., Stavrati, A. and Boudoulas, H. 2004: Effect of cold, isometric exercise, and combination of both on aortic pulse in healthy subjects. American Journal of Cardiology 93, 265–7.

Gent, A.N. 1972: Fracture of elastomers. In: Liebowitz, H. (ed.), Fracture. New York: Academic Press, 316.

George, W.F. and Lumley, J.L. 1973: The laser Doppler-velocimeter and its application to the measurement of turbulence. Journal Fluid Mechanics 60, 321–62.

Gerdts, E., Papademetriou, V., Palmieri, V. et al. 2002: Correlates of pulse pressure reduction during antihypertensive treatment (losartan or atenolol) in hypertensive patients with ECG left ventricular hypertrophy (the LIFE study). American Journal of Cardiology 89, 399–402.

Gerhard, M., Roddy, M.A., Creager, S.J. et al. 1996: Aging progressively impairs endothelium-dependent vasodilation in forearm resistance vessels of humans. Hypertension 27(4), 849–53.

Gerhardt, U.M., Scholler, C., Bocker, D. and Hohage, H. 2000: Non-invasive estimation of cardiac output in critical care patients. Journal of Clinical Monitoring and Computing 16(4), 263–8.

Gerin, W., Chaplin, W., Schwartz, J.E. et al. 2005: Sustained blood pressure increase after an acute stressor: the effects of the 11 September 2001 attack on the New York City World Trade Center. Journal of Hypertension 23, 279–84.

Gerova, M. and Gero, J. 1967: Effector mechanisms induced by baroreceptor stimulation. In: Baroreceptors and hypertension. Oxford: Pergamon Press, pp. 225–33.

Gerrity, R.G. and Cliff, W.J. 1975: The aortic tunica media of the developing rat: I. Quantitative stereologic and biochemical analysis. Laboratory Investigation 32, 585–600.

Gerstenblith, G., Frederiksen, J., Yin, F.C. et al. 1977: Echocardiographic assessment of a normal adult aging population. Circulation 56(2), 273–8.

Geschwind, H.J., Dupouy, P., Dubois-Randé, J.L. et al. 1994: Restoration of coronary blood flow in severely narrowed and chronically occluded coronary arteries before and after angioplasty; implications regarding restenosis. American Heart Journal 127, 252–62.

Gessner, U. 1969: The performance of the ultrasonic flowmeter in complex velocity profiles. IEEE Transactions in Biomedical Engineering 16, 139–42.

Gessner, U. 1972: Vascular input impedance. In: Bergel, D.H. (ed.), Cardiovascular fluid dynamics, vol. 1. New York: Academic Press, pp. 315–49.

Gessner, U. and Bergel, D.H. 1964: Frequency response of electromagnetic flowmeters. Journal of Applied Physiology 19, 1209–11.

Gessner, U. and Bergel, D.H. 1966: Methods of determining the distensibility of blood vessels. IEEE Transactions in Biomedical Engineering 13, 2–10.

Gevers, L. (ed.). 1994: Arterial pressure wave forms in newborn infants: invasive measurements in clinical practice. Amsterdam: Elinkwijk BV Utrecht.

Gevers, M., Hack, W.W., Ree, E.F. et al. 1993a: Calculated mean arterial blood pressure in critically ill neonates. Basic Research in Cardiology 88, 80–5.

Gevers, M., Hack, W.W., Ree, E.F. et al. 1993b: Arterial blood pressure wave forms in radial and posterior tibial arteries in critically ill newborn infants. Journal Physiology 19, 179–85.

Gevers, M., van Genderingen, H.R., van der Mooren, K. et al. 1995a: Bisferiens peaks in the radial artery pressure wave in newborn infants: a sign of patent ductus arteriosus. Pediatric Research 37(6), 800–5.

Gevers, M., van Genderingen, H.R., Lafeber, H.N. et al. 1995b: Radial artery blood pressure measurement in neonates: an accurate and convenient technique in clinical practice. Journal of Perinatal Medicine 23, 467–75.

Gevers, M., van Genderingen, H.R., Lafeber, H.N. et al. 1996: Accuracy of oscillometric blood pressure measurement in critically ill neonates with reference to the arterial pressure wave shape. Intensive Care Medicine 22, 242–8.

Ghali, J.K., Liao, Y., Cooper, R.S. et al. 1992: Changes in pulmonary hemodynamics with aging in a predominantly hypertensive population. American Journal of Cardiology 70(3), 367–70.

Gheorghiade, M. and Bonow, R.O. 1998: Chronic heart failure in the United States: a manifestation of coronary heart disease. Circulation 97, 282–9.

Ghiadoni, L., Bruno, R.M., Stea, F. et al. 2009: Central blood pressure, arterial stiffness, and wave reflection: new targets of treatment in essential hypertension. Current Hypertension Reports 11(3), 190–6.

Ghiadoni, L., Magagna, A., Versari, D. et al. 2003: Different effect of antihypertensive drugs on conduit artery endothelial function. Hypertension 41(6), 1281–6.

Ghosh, D. and Scheepens, A. 2009: Vascular action of polyphenols. Molecular Nutrition and Food Research 53(3), 322–31.

Giannattasio, C. and Mancia, G. 2002: Arterial distensibility in humans. Modulating mechanisms, alterations in diseases and effects of treatment. Journal of Hypertension 20(10), 1889–99.

Giannattasio, C., Failla, M., Grappiolo, A. et al. 1998: Effects of prolonged immobilization of the limb on radial artery mechanical properties. Hypertension 32(3), 584–7.

Giannattasio, C., Failla, M., Stella, M.L. et al. 1995: Angiotensin-converting enzyme inhibition and radial artery compliance in patients with congestive heart failure. Hypertension 26, 491–6.

Giannattasio, C., Mangoni, A.A., Failla, M. et al. 1997: Combined effects of hypertension and hypercholesterolemia on radial artery function. Hypertension 29(2), 583–6.

Giannattasio, C., Failla, M., Emanuelli, G. et al. 2001b: Local effects of atherosclerotic plaque on arterial distensibility. Hypertension 38(5), 1177–80.

Giannattasio, C., Piperno, A., Failla, M. et al. 2002: Effects of hematocrit changes on flow-mediated and metabolic vasodilation in humans. Hypertension 40(1), 74–7.

Giannattasio, C., Salvi, P., Valbusa, F. et al. 2008: Simultaneous measurement of beat-to-beat carotid diameter and pressure changes to assess arterial mechanical properties. Hypertension 52(5), 896–902.

Gianni, M., Dentali, F., Grandi, A.M. et al. 2006: Apical ballooning syndrome or takotsubo cardiomyopathy: a systematic review. European Heart Journal 27, 1523–9.

Giannoglou, G.D., Soulis, J.V., Farmakis, T.M. et al. 2005: Wall pressure gradient in normal left coronary artery tree. Medical Engineering and Physics 27(6), 455–64.

Gibbons, R.J., Araoz, P.A. and Williamson, E.E. 2007: The year in cardiac imaging. Journal of the American College of Cardiology 50, 988–1003.

Gibbons, R.J., Araoz, P.A. and Williamson, E.E. 2009: The year in cardiac imaging. Journal of the American College of Cardiology 53, 54–70.

Gibbs, C. 1995: Mechanical determinants of myocardial oxygen consumption. Clinical and Experimental Pharmacology and Physiology 22, 1–9.

Gibbs, C.L. 1978: Cardiac energetics. Physiological Reviews 58(1), 174–254.

Gibbs, C.L. and Chapman, J.B. 1979: Cardiac energetics. In: Berne, R.M. (ed.), Handbook of physiology. Circulation. Section 2: The cardiovascular system, vol. I, The heart. Washington, DC: American Physiological Society, pp. 775–804.

Giddens, D.P. and Khalifa, A.M. 1982: Turbulence measurements with pulsed Doppler ultrasound employing a frequency tracking method. Ultrasound in Medicine and Biology 8, 427–37.

Giddens, D.P., Bharadvaj, B.K. and Ku, D.N. 1985: Cerebral and peripheral hemodynamics. In: Altobelli, S.A., Voyles, W.F. and Greene, E.R. (eds), Cardiovascular ultrasonic flowmetry. New York: Elsevier, pp. 125–45.

Giddens, D.P., Zarins, C.K. and Glagov, S. 1993: The role of fluid mechanics in the localization and detection of atherosclerosis (Review). Journal of Biomechanical Engineering 115(4B), 588–94.

Gielen, H., Daniels, O. and van Lier, H. 1999: Natural history of congenital pulmonary valvar stenosis: an echo and Doppler Cardiographic Study. Cardiology in the Young 9(2), 129–35.

Gill, R.W. 1979: Performance of the mean frequency Doppler demodulator. Ultrasound in Medicine and Biology 5, 237–47.

Gill, R.W. 1985: Measurement of blood flow by ultrasound: accuracy and sources of error. Ultrasound in Medicine and Biology 11, 625–41.

Gillebert, T.C., Leite-Moreira, A.F. and De Hert, S.G. 1997: Relaxation-systolic pressure relation. A load-independent assessment of left ventricular contractility. Circulation 95(3), 745–52.

Gimbrone, M.A. and Topper, J.N. 1999: Biology of the vessel wall. In: Chien, K.R. (ed.), Molecular basis of cardiovascular disease. Philadelphia: Saunders, 331–48.

Gimbrone, M.A. Jr. 1999: Endothelial dysfunction, hemodynamic forces, and atherosclerosis. Thrombosis and Haemostasis 82(2), 722–6.

Gimbrone, M.A. Jr., Topper, J.N., Nagel, T. et al. 2000: Endothelial dysfunction, hemodynamic forces, and atherogenesis. Annals of the New York Academy of Sciences 902, 230–9.

Giomarelli, P., Biagioli, B. and Scolletta, S. 2004: Cardiac output monitoring by pressure recording analytical method in cardiac surgery. European Journal of Cardiothoracic Surgery 26, 515–20.

Girard 1813: Cited by Hatschek E. In: The viscosity of liquids, 1928. London: Bell.

Girerd, X., Mourad, J.-J., Copie, X. et al. 1994: Noninvasive detection of an increased vascular mass in untreated hypertensive patients. American Journal of Hypertension 7, 1076–84.

Giunti, S., Barit, D. and Cooper, M.E. 2006: Mechanisms of diabetic nephropathy: role of hypertension. Hypertension 48, 519–26.

Givertz, M.M. 2000: Underlying causes and survival in patients with heart failure. New England Journal of Medicine 342, 1120–22.

Glagov, S. 1979: Relation of structure to function in arterial walls. Artery 5, 295–304.

Glagov, S., Vito, R., Giddens, D.P. and Zarins, C.K. 1992: Micro-architecture and composition of artery walls: relationship to location, diameter and the distribution of mechanical stress. Journal Hypertension 10(suppl. 6), S101–4.

Glagov, S., Weisenberg, E., Zarins, C.K. et al. 1987: Compensatory enlargement of human atherosclerotic coronary arteries. New England Journal of Medicine 316(22), 1371–5.

Glagov, S., Zarins, C., Giddens, D.P. et al. 1988b: Hemodynamics and atherosclerosis: insights and perspectives gained from studies of human arteries. Archives of Pathology and Laboratory Medicine 112, 1018–31.

Glagov, S., Zarins, C.K., Giddens, D.P. et al. 1988a: Establishing the hemodynamic determinants of human plaque configuration, composition and complication. In: Yoshida, Y., Yamaguchi, T., Caro, C.G. et al. (eds), Role of blood flow in atherogenesis. Tokyo: Springer-Verlag, pp. 3–10.

Glor, F.P., Westenberg, J.J. and Vierendeels, J. 2002: Validation of the coupling of magnetic resonance imaging velocity measurements with computational fluid dynamics in a U bend. Artificial Organs 26(7), 622–35.

Glynn, L.E. 1940: Medial defects in the circle of Willis and their relation to aneurysm formation. Journal of Pathology and Bacteriology 51, 213–22.

Gnasso, A., Carallo, C., Irace, C. et al. 1996: Association between intima-media thickness and wall shear stress in common carotid artery in healthy male subjects. Circulation 94, 3257–62.

Gnasso, A., Carallo, C., Irace, C. et al. 2001: Association between wall shear stress and flow-mediated vasodilation in healthy men. Atherosclerosis 156(1), 171–6.

Gokce, N., Keaney, J.F. Jr., Hunter, L.M. et al. 2002: Risk stratification for postoperative cardiovascular events via noninvasive assessment of endothelial function, a prospective study. Circulation 105(13), 1567–72.

Goldberg, R.J. 2009: To the Framingham data, turn, turn, turn. Circulation 119, 1189–91.

Goldblatt, H. 1947: The renal origin of hypertension. Physiological Reviews 27, 120–65.

Goldblatt, H. and Kahn, J.R. 1938: Experimental hypertension: constriction of the aorta at various levels. Journal of the American Medical Association 110, 686.

Goldblatt, P.J. 1995: The Goldblatt experiment: a conceptual. In: Laragh, J.H. and Brenner, B.M. (eds), Hypertension: pathophysiology, diagnosis and management, 2nd edn. New York: Raven Press, pp. 23–35.

Goldman, S., Johnson, G., Cohn, J.N. et al. 1993: Mechanism of death in heart failure. The Vasodilator-Heart Failure Trials. The V-HeFT VA Cooperative Studies Group. Circulation 87(6 suppl.), 124–31.

Goldstein, S. 1938. Modern developments in fluid dynamics. Oxford: Clarendon Press.

Golino, P., Piscione, F., Willerson, J.T. et al. 1991: Divergent effects of serotonin on coronary-artery dimensions and blood flow in patients with coronary atherosclerosis and control patients. New England Journal of Medicine 324(10), 641–8.

Golledge, J., Tsao, P.S., Dalman, R.L. et al. 2008: Circulating markers of abdominal aortic aneurysm presence and progression. Circulation 118, 2382–92.

Gomez-Cerezo, J., Rios Blanco, J.J., Suarez Garcia, I. et al. 2002: Noninvasive study of endothelial function in white coat hypertension. Hypertension 40(3), 304–9.

Gonzalez, E.B. 1995: Arteritis associated with systemic disease. Coronary Artery Disease 6(3), 207–12.

Gonzalo, N., Serruys, P.W. and Regar, E. 2008: Optical coherence tomography: clinical applications and the evaluation of DES. Minerva Cardioangiologica 56, 511–25.

Goonasekera, C.D. and Dillon, M.J. 1995: Random zero sphygmomanometer versus automatic oscillometric blood pressure monitor; is either the instrument of choice? Journal of Human Hypertension 9(11), 885–9.

Gordon, I.L., Stemmer, E.A., Williams, R.A. et al. 1994: Changes in internal carotid blood flow after carotid endarterectomy correlate with preoperative stenosis. American Journal of Surgery 168, 127–30.

Gorge, G., Erbel, R., Niessing, S. et al. 1993: Miniaturized pressure-guide-wire: evaluation in vitro and in isolated hearts. Catheterization and Cardiovascular Diagnosis 30(4), 341–7.

Gorge, G., Erbel, R., Haude, M. et al. 1994: Continuous coronary perfusion balloon catheters in coronary dissections after percutaneous transluminal coronary angioplasty. Acute clinical results and 6-months follow-up. European Heart Journal 15(7), 908–14.

Gorlin, R. and Gorlin, S.G. 1951: Hydraulic formula for calculations of the area of the stenotic mitral value, orthocardiac values and central circulatory shunts. American Heart Journal 41, 1–29.

Gorodeski, G.I. 2002: Update on cardiovascular disease in post-menopausal women. Best Practice Research in Clinical Obstetrics and Gynaecology 16(3), 329–55.

Gosling, R.G. and Budge, M.M. 2003: Terminology for describing the elastic behavior of arteries. Hypertension 41(6), 1180–82.

Gosling, R.G., Newman, D.N., Bowden, N.L.R. et al. 1971: The area ratio of normal aortic junctions: aortic configuration and pulse-wave reflection. British Journal of Radiology 44, 850–3.

Goss, S.A., Johnston, R.L. and Dunn, F. 1978: Comprehensive compilation of empirical ultrasonic properties of mammalian tissues. Journal of the Acoustical Society of America 64(2), 423–57.

Gosse, P. and Clementy, J. 1995: Coronary reserve in experimental hypertrophy. European Heart Journal 16(suppl. 1), 22–5.

Gosse, P., Ansoborlo, P., Renaud, F. et al. 1996: Assessment of arterial distensibility of ambulatory monitoring of QKD interval: reproducibility of the method. Archives des Maladies du Coeur et des Vaisseaux 89, 975–7.

Gosse, P., Lasserre, R., Minifie, C. et al. 2005: Arterial stiffness evaluated by measurement of the QKD interval is an independent predictor of cardiovascular events. American Journal of Hypertension 18, 470–6.

Goto, C., Higashi, Y., Kimura, M. et al. 2003: Effect of different intensities of exercise on endothelium-dependent vasodilation in humans: role of endothelium-dependent nitric oxide and oxidative stress. Circulation 108, 530–5.

Gott, V.L., Green, P.S., Alejo, D.E. et al. 1999: Replacement of the aortic root in patients with Marfan's syndrome. New England Journal of Medicine 240(17), 1307–13.

Gott, V.L., Pyeritz, R.E., Magovern, G.J. et al. 1986: Surgical treatment of aneurysms of the ascending aorta in the Marfan syndrome. New England Journal of Medicine 314, 1070–4.

Gottdiener, J.S., Reda, D.J., Massie, B.M. et al. 1997: Effect of single drug therapy on reduction of left ventricular mass in mild to moderate hypertension: comparison of six antihypertensive agents. Circulation 95, 2007–14.

Gottdiener, J.S., Shemanski, L., Aurigemma, G.P. et al. 1996: Short stature is associated with concentric left ventricular remodeling in the elderly. The cardiovascular health study. Circulation 94, 126.

Gottlieb, I., Miller, J.M., Arbab-Zadeh, A. et al. 2010: The absence of coronary calcification does not exclude obstructive coronary artery disease or the need for revascularization in patients referred for conventional coronary angiography. Journal of the American College of Cardiology 55, 627–34.

Gotto, A.M. Jr. 1995: Lipid lowering, regression, and coronary events. A review of the Interdisciplinary Council on Lipids and Cardiovascular Risk Intervention, Seventh Council Meeting. Circulation 92(3), 646–56.

Gould, K.L. 1978a: Pressure-flow characteristics of coronary stenoses in unsedated dogs at rest and during coronary vasodilation. Circulation Research 43(2), 242–53.

Gould, K.L. 1978b: Non-invasive assessment of coronary stenoses by myocardial perfusion imaging during pharmacologic coronary vasodilation: I. Physiologic basis and experimental validation. American Journal of Cardiology 41, 267–78.

Gould, K.L. 1980: Dynamic coronary stenosis. American Journal of Cardiology 45(2), 286–92.

Gould, K.L. 1988: Identifying and measuring severity of coronary artery stenosis: quantitative coronary arteriography and positron emission tomography. Circulation 78, 237–45.

Gould, K.L. 1990. Coronary artery stenosis – a textbook of coronary pathophysiology, quantitative arteriography, cardiac PET and reversal of coronary artery disease. New York: Elsevier.

Gould, K.L. 1992: Quantitative analysis of coronary artery restenosis after coronary angioplasty – has the rose lost its bloom? Journal of the American College of Cardiology 19(5), 946–7.

Gould, K.L. 1997: Why angina pectoris in aortic stenosis. Circulation 95(4), 790–2.

Gould, K.L. 1998a: Phasic pressure-flow and fluid-dynamic analysis. In: Coronary artery stenosis and reversing atherosclerosis, 2nd edn. London, UK: Arnold, pp. 55–66.

Gould, K.L. 1998b: New concepts and paradigms in cardiovascular medicine: the noninvasive management of coronary artery disease. American Journal of Medicine 104(6A), 2S–17S.

Gould, K.L. and Kelley, K.O. 1982: Physiological significance of coronary flow velocity and changing stenosis geometry during coronary vasodilation in awake dogs. Circulation Research 50(5), 695–704.

Gould, K.L., Lee, D. and Lovgren, K. 1978b: Techniques for arteriography and hydraulic analysis of coronary stenoses in unsedated dogs. American Journal of Physiology 235, H350–6.

Gould, K.L., Lipscomb, K. and Hamilton, G.W. 1974: Physiologic basis for assessing critical coronary stenosis. Instantaneous flow response and regional distribution during coronary hyperemia as measures of coronary flow reserve. American Journal of Cardiology 33(1), 87–94.

Gould, K.L., Nakagawa, Y., Nakagawa, K. et al. 2000: Frequency and clinical implications of fluid dynamically significant diffuse coronary artery disease manifest as graded, longitudinal, base-to-apex myocardial perfusion abnormalities by noninvasive positron emission tomography. Circulation 101(16), 1931–9.

Gouverneur, M., Spaan, J.A., Pannekoek, H. et al. 2006: Fluid shear stress stimulates incorporation of hyaluronan into endothelial cell glycocalyx. American Journal of Physiology. Heart and Circulatory Physiology 290, H452–8.

Gow, B.S. 1966: An electrical caliper for measurement of pulsatile arterial diameter changes in vivo. Journal of Applied Physiology 21(3), 1122–6.

Gow, B.S. 1970: Viscoelastic properties of conduit arteries. Circulation Research 25(suppl. 2), 113–22.

Gow, B.S. 1972: The influence of vascular smooth muscle on the visoelastic properties of blood vessels. In: Bergel, D.H. (ed.), Cardiovascular fluid dynamics. New York: Academic Press, pp. 65–110.

Gow, B.S. 1980: Circulatory correlates: vascular impedance, resistance and capacity. In: Bohr, D.F., Somlyo, A.P. and Sparks, H.V.J. (eds), Handbook of physiology. Section 2: The cardiovascular system, vol. 2, Vascular smooth muscle. Bethesda, MD: American Physiological Society, pp. 353–408.

Gow, B.S. and Taylor, M.G. 1968: Measurement of visco-elastic properties of arteries in the living dog. Circulation Research 23, 111–22.

Gow, B.S. and Hadfield, C.D. 1979: The elasticity of canine and human coronary arteries with reference to postmortem changes. Circulation Research 45, 588–94.

Gow, B.S., Schonfeld, D. and Patel, D.J. 1974: The dynamic elastic properties of the canine left circumflex coronary artery. Journal of Biomechanics 7, 389–95.

Gow, B.S., Legg, M.J., Yu, W. et al. 1992: Does vibration cause poststenotic dilatation in vivo and influence atherogenesis in cholesterol-fed rabbits? Journal of Biomechanical Engineering 114(1), 20–5.

Gozna, E.R., Marble, A.E., Shaw, A. et al. 1974: Age-related changes in the mechanics of the aorta and pulmonary artery of man. Journal of Applied Physiology 36, 407–11.

Grady, D., Herrington, D., Bittner, V. et al. 2002: HERS Research Group. Cardiovascular disease outcomes during 6.8 years of hormone therapy: Heart and Estrogen/progestin Replacement Study follow-up (HERS II). Journal of the American Medical Association 288, 49–57.

Graf, I.M., Schreuder, F.H., Hameleers, J.M. et al. 2009: Wall irregularity rather than intima-media thickness is associated with nearby atherosclerosis. Ultrasound in Medicine and Biology 35, 955–61.

Graham, M.R., Evans, P., Davies, B. et al. 2008: Arterial pulse wave velocity, inflammatory markers, pathological GH and IGF states, cardiovascular and cerebrovascular disease. Vascular Health and Risk Management 4(6), 1361–71.

Granger, C.B., McMurray, J.J.V., Yusuf, S. et al. 2003: Effects of candesartan in patients with chronic heart failure and reduced left-ventricular systolic function intolerant to angiotensin-converting-enzyme inhibitors: the CHARM-Alternative trial. Lancet 362, 772–6.

Grant, B.J., Fitzpatrick, J.M. and Lieber, B.B. 1991: Time-varying pulmonary arterial compliance. Journal of Applied Physiology 70(2), 575–83.

Grashey, H. 1881: Die Wellenbewegung elastischer Rohren und der Arterienpuls des Menschen. Leipzig.

Grassi, G., Giannattasio, C., Failla, M. et al. 1995: Sympathetic modulation of radial artery compliance in congestive heart failure. Hypertension 26(2), 348–54.

Gravlee, G.P., Brauer, S.D., O'Rourke, M.F. et al. 1989a: A comparison of brachial, femoral, and aortic intra-arterial pressures before and after cardiopulmonary bypass. Anaesthesia and Intensive Care 17, 305–11.

Gravlee, G.P., Wong, A.B., Adkins, T.G. et al. 1989b: A comparison of radial, brachial, and aortic pressures after cardiopulmonary bypass. Journal of Cardiothoracic Anesthetics 3, 20–6.

Grazzi, M., Brenner, D.A., Apstein, C.S. and Saupe, K.W. 2001: Exercise intolerance in rats with hypertensive heart disease is associated with impaired diastolic relaxation. Hypertension 37, 204–8.

Green, D.J., Maiorana, A., O'Driscoll, G. et al. 2004: Effect of exercise training on endothelium-derived nitric oxide function in humans. Journal of Physiology 561(Pt 1), 1–25.

Green, H.D. 1950: Circulatory system: physical principles. In: Glasser, O. (ed.), Medical physics, vol. II. Chicago: Year Book Publishers.

Greenberg, S.M. 2006: Small vessels, big problems. New England Journal of Medicine 354, 1451–3.

Greenfield, J.C. Jr and Fry, D.L. 1962: Measurement errors in estimating aortic blood velocity by pressure gradient. Journal of Applied Physiology 17, 1013–19.

Greenfield, J.C. Jr and Patel, D.J. 1962: Relation between pressure and diameter in the ascending aorta of man. Circ Res 10, 778–81.

Greenfield, J.C. Jr. and Griggs, D.M. 1963: Relation between pressure and diameter in main pulmonary artery of man. Journal of Applied Physiology 18, 557–9.

Greenfield, J.C. Jr., Tindall, G.T., Dillon, M.L. et al. 1964: Mechanics of human carotid artery in vivo. Circulation Research 15, 240–6.

Greenfield, J.C. Jr. and Fry, D.L. 1965a: Relationship between instantaneous aortic flow and the pressure gradient. Circulation Research 17, 340–8.

Greenfield, J.C. Jr. and Fry, D.L. 1965b: A critique: relationship of the time derivative of pressure to blood flow. Journal of Applied Physiology 20, 1141–7.

Greenfield, J.C. Jr., Cox, R.L., Hernandez, R.R. et al. 1967: Pressure-flow studies in man during the Valsalva maneuver with observations on the mechanical properties of the ascending aorta. Circulation 35, 653–61.

Greenfield, J.C. Jr., Harley, A., Thompson, H.K. et al. 1968: Pressure-flow studies in man during atrial fibrillation. Journal of Clinical Investigation 47, 2411–21.

Greenfield, J.C. Jr., Starmer, C.F. and Walston, A. 1971: Measurement of aortic blood flow in man by the computed pressure derivative method. Journal of Applied Physiology 31, 792–5.

Greenfield, J.R., Samaras, K, Campbell, L.V. et al. 2003: Physical activity reduces genetic susceptibility to increased central systolic pressure augmentation: a study of female twins. Journal of the American College of Cardiology 42, 264–70.

Greenland, P., Bonow, R.O., Brundage, B.H. et al. 2007: ACCF/AHA 2007 clinical expert consensus document on coronary artery calcium scoring by computed tomography in global cardiovascular risk assessment and in evaluation of patients with chest pain: a report of the American College of Cardiology Foundation Clinical Expert Consensus Task Force (ACCF/AHA Writing Committee to Update the 2000 Expert Consensus Document on Electron Beam Computed Tomography) developed in collaboration with the Society of Atherosclerosis Imaging and Prevention and the Society of Cardiovascular Computed Tomography. Journal of the American College of Cardiology 49, 378–402.

Greenwald, S.E. 2007: Ageing of the conduit arteries. Journal of Pathology 211, 157–72.

Greenwald, S.E., Johnson, R.J. and Haworth, S.G. 1985: Pulmonary vascular input impedance in the newborn and infant pig. Cardiovascular Research 19, 44–50.

Greenwald, S.E., Carter, A.C. and Berry, C.L. 1990: Effect of age on the in vitro reflection coefficient of the aortoiliac bifurcation in humans. Circulation 82, 114–23.

Gregerson, M.I., Bryant, C.A., Hammerle, W.E. et al. 1967: Flow characteristics of human erythrocytes through polycarbonate sieves. Science 157, 825–7.

Gregg, D.E. and Green, H.D. 1940: Registration and interpretation of normal phasic inflow into a left coronary artery by an improved differential manometric method. American Journal of Physiology 130, 114–25.

Gregg, D.E. and Shipley, R.E. 1944: Augmentation of left coronary inflow with elevation of left ventricular pressure, and observations on the mechanism for increased coronary inflow with increased cardiac load. American Journal of Physiology 142, 44–51.

Gregg, D.E. and Fisher, L.C. 1963: Blood supply to the heart. In: Handbook of physiology. Section 2: Circulation, vol. II. Washington, DC: American Physiological Society.

Gregg, D.E., Pritchard, W.H. and Shipley, R.E. 1948: Changes in arterial flow in dog's legs following venous occlusion: evaluation of results obtained with different types of recorders. American Journal of Physiology 153, 153–8.

Grehant, H. and Quinquaud, C.E. 1886: Recherches experimentales sur la mesure du volume de sang qui traverse les paumons en un tempos donné. Comptes Rendues de Societé de Biologie 30, 159–73.

Greve, J.M., Les, A.S., Tang, B.T. et al. 2006: Allometric scaling of wall shear stress from mice to humans: quantification using cine phase-contrast MRI and computational fluid dynamics. American Journal of Physiology, Heart and Circulatory Physiology 291, H1700–8.

Gribbin, B., Pickering, T.G. and Sleight, P. 1979: Arterial distensibility in normal and hypertensive man. Clinical Science 56, 413–17.

Gribbin, B., Steptoe, A. and Sleight, P. 1976: Pulse wave velocity as a measure of blood pressure change. Psychophysiology 13(1), 86–90.

Griffin, K.A., Abu-Amarah, I., Picken, M. et al. 2003: Renoprotection by ACE inhibition or aldosterone blockade is blood pressure-dependent. Hypertension 41, 201–6.

Griffith, T.M., Edwards, D.H. and Hutcheson, I.R. 1994: Oscillations and endothelium-derived relaxing factor. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Chur, Switzerland: Harwood Academic Publishers, pp. 349–80.

Grignola, J.C., Gines, F. and Guzzo, D. 2006: Comparison of the Tei index with invasive measurements of right ventricular function. International Journal of Cardiology 113, 25–33.

Grignola, J.C., Ginés, F., Bia, D. et al. 2007: Improved right ventricular–vascular coupling during active pulmonary hypertension. International Journal of Cardiology 115(2), 171–82.

Groenink, M., de Roos, A., Mulder, B.J.M. et al. 1998: Changes in arterial distensibility and pulse wave velocity assessed with magnetic resonance imaging following beta-blocker therapy in the Marfan syndrome. American Journal of Cardiology 82, 203–8.

Gross, C.M., Kramer, J., Weingartner, O. et al. 2001: Determination of renal arterial stenosis severity: comparison of pressure gradient and vessel diameter. Radiology 220(3), 751–6.

Grossini, E., Molinari, C., Mary, D.A. et al. 2007: Intracoronary ghrelin infusion decreases coronary blood flow in anesthetized pigs. Endocrinology 148(2), 806–12.

Grossman, W. 2000: Defining diastolic dysfunction (Editorial). Circulation 101, 2020–21.

Grossman, W., Jones, D. and McLaurin, L.P. 1975: Wall stress and patterns of hypertrophy in the human left ventricle. Journal of Clinical Investigation 56, 56–64.

Grotenhuis, H.B., Westenberg, J.J., Steendijk, P. et al. 2009: Validation and reproducibility of aortic pulse wave velocity as assessed with velocity-encoded MRI. Journal of Magnetic Resonance Imaging 30(3), 521–6.

Grover, R.F., Wagner, W.W., Mcmurthy, I.F. et al. 1983: Pulmonary circulation. In: Shepherd, J.T. and Abboud, F.M. (eds), Handbook of physiology. Section 2: The cardiovascular system, vol. 3, Peripheral circulation and organ blood flow. Bethesda, MD: American Physiological Society.

Groves, D.H., Powalowski, T. and White, D.N. 1982: A digital technique for tracking moving interfaces. Ultrasound in Medicine and Biology 8, 185–90.

Grundy, S.M. and Small, L.D.L. 1997: Atherogenic dyslipidemia, and the metabolic syndrome. Circulation 95(1), 1–4.

Grundy, S.M., Benjamin, I.K., Burke, G.L. et al. 1999: Diabetes and cardiovascular disease: a statement for healthcare professionals from the American Heart Association. Circulation 100, 1134–46.

Grundy, S.M., Howard, B., Smith, S. et al. 2002: Prevention conference V1: Diabetes and Cardiovascular disease. Circulation 105, 2231–9.

Guagliumi, G. and Sirbu, V. 2008: Optical coherence tomography: high resolution intravascular imaging to evaluate vascular healing after coronary stenting. Catheterization and Cardiovascular Interventions 72, 237–47.

Guagliumi, G., Musumeci, G., Sirbu, V. et al. ODESSA Trial Investigators. 2010: Optical coherence tomography assessment of in vivo vascular response after implantation of overlapping bare-metal and drug-eluting stents. JACC. Cardiovascular Interventions 3(5), 531–9.

Guelen, I., Mattace-Raso, F.U., van Popele, N.M. et al. 2008: Aortic stiffness and the balance between cardiac oxygen supply and demand: the Rotterdam Study. Journal of Hypertension 26(6), 1237–43.

Guerin, A.P., Blacher, J., Pannier, B. et al. 2001: Impact of aortic stiffness attenuation on survival of patients in end-stage renal failure. Circulation 103, 987–92.

Guidelines Subcommittee. 1999: World Health Organization–International Society of Hypertension Guidelines for the Management of hypertension. Journal of Hypertension 17, 151–83.

Guimaraes, G.V., Ciolac, E.G., Carvalho, V.O. et al. 2010: Effects of continuous vs. interval exercise training on blood pressure and arterial stiffness in treated hypertension. Hypertension Research 33, 627–32.

Gujjar, A.R., Muralidhar, K., Banakal, S. et al. 2008: Non-invasive cardiac output by transthoracic electrical bioimpedence in post-cardiac surgery patients: comparison with thermodilution method. Journal of Clinical Monitoring and Computing 22, 175–80.

Gull, W.W. 1872: Chronic Bright's disease with contracted kidney (arterio-capillary fibrosis). British Medical Journal II, 692.

Gulprasutdilog, S. and O'Rourke, M.F. 1996: Comparison of indices from synthesized aortic pressure waves derived from carotid and radial pressure waves. Proceedings of the High Blood Pressure Research Council of Australia, 81.

Gundel, W., Cherry, G., Rajagopalan, B. et al. 1981: Aortic input impedance in man: acute response to vasodilator drugs. Circulation 63, 1305–14.

Guo, X., Pantoni, L., Simoni, M. et al. 2009: Blood pressure components and changes in relation to white matter lesions: a 32-year prospective population study. Hypertension 54, 57–62.

Gupta, T.C. and Wiggers, C.J. 1951: Basic hemodynamic changes produced by aortic coarctation of different degrees. Circulation 3, 17–31.

Gurovich, A.N., Beck, D.T. and Braith, R.W. 2009: Aortic pulse wave analysis is not a surrogate for central arterial pulse wave velocity. Experimental Biology and Medicine 234(11), 1339–44.

Gush, R.J. and King, T.A. 1991: Discrimination of capillary and arterio-venular blood flow in skin by laser Doppler flowmetry. Medical and Biological Engineering and Computing 29, 387–92.

Gustafsson, I. and Hildebrandt, P. 2001: Early failure of the diabetic heart (Editorial). Diabetes Care 24, 3–4.

Gustafsson, L., Appelgren, L. and Myrvold, H.E. 1981: Effects of increased plasma viscosity and red blood cell aggregation on blood viscosity in vivo. American Journal of Physiology 241, H513–18.

Guthikonda, S., Sinkey, C., Barenz, T. et al. 2003: Xanthine oxidase inhibition reverses endothelial dysfunction in heavy smokers. Circulation 107(3), 416–21.

Guyton, A.C. 1963. Circulatory physiology: cardiac output and its regulation. Philadelphia: W.B. Saunders.

Guyton, J.R. 2002: Clinical assessment of atherosclerotic lesions: emerging from angiographic shadows. Circulation 106(11), 1308–09.

Guz, A. 1968: Measurement of cardiac output simultaneously with indicator-dilution technique. In: Cappelen, C. (ed.), New findings in blood flowmetry. Oslo: Universitesforlaget.

Gyllenborg, J., Rasmussen, S.L., Borch-Johnsen, K. et al. 2001: Cardiovascular risk factors in men: the role of gonadal steroids and sex hormone-binding globulin. Metabolism 50, 882–8.

Habashi, J.P., Doyle, J.J., Holm, T.M. et al. 2011: Angiotensin II type 2 receptor signaling attenuates aortic aneurysm in mice through ERK antagonism. Science 332, 361–5.

Habashi, J., Judge, D., Holm, T. et al. 2006: Losartan, and AT1 antagonist, prevents aortic aneurysm in a mouse model of Marfan syndrome. Science 312, 117–21.

Haber, H.L., Simek, C.L., Bergin, J.D. et al. 1993: Bolus intravenous nitroglycerin predominantly reduces afterload in patients with excessive arterial elastance. Journal of the American College of Cardiology 22, 251–7.

Haber, M. and Barnhart, H.X. 2008: A general approach to evaluating agreement between two observers or methods of measurement from quantitative data with replicated measurements. Statistical Methods in Medical Research 17(2), 151–69.

Habib, W.K. and Nanson, E.M. 1968: The causes of hypertension in coarctation of the aorta. Annals of Surgery 168, 771–8.

Haffner, S.M., Lehto, S., Ronnemaa, T. et al. 1998: Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. New England Journal of Medicine 339, 229–34.

Hagenbach, E. 1860: Uber die Bestimming der Sahigkeit einer Flussigkeit durch den Ausfluss aus Rohren. Annales der Physik 109, 382–426.

Haider, A.W., Larson, M.G., Franklin, S.S. et al. 2003: Systolic blood pressure, diastolic blood pressure, and pulse pressure as predictors of risk for congestive heart failure in the Framingham Heart Study. Annals of Internal Medicine 138(1), 10–16.

Haites, N.E., McLennan, F.M., Mowat, D.H. et al. 1985: Assessment of cardiac output by the Doppler ultrasound technique alone. British Heart Journal 53(2), 123–9.

Hajdu, M.A., Heistad, D.D., Siems, J.E. et al. 1990: Effects of aging on mechanics and composition of cerebral arterioles in rats. Circulation Research 66, 1747–54.

Halcox, J.P., Donald, A.E., Ellins, E. et al. 2009: Endothelial function predicts progression of carotid intima-media thickness. Circulation 119(7), 1005–12.

Halcox, J.P., Nour, K.R., Zalos, G. et al. 2002a: The effect of sildenafil on human vascular function, platelet activation, and myocardial ischemia. Journal of the American College of Cardiology 40(7), 1232–40.

Halcox, J.P., Schenke, W.H., Zalos, G. et al. 2002b: Prognostic value of coronary vascular endothelial dysfunction. Circulation 106(6), 653–8.

Hale, J.F., McDonald, D.A. and Womersley, J.R. 1955: Velocity profiles of oscillating arterial flow, with some calculations of viscous drag and the Reynolds number. Journal of Physiology 128, 629–40.

Hales, S. 1733, reproduced 1964: Statistical essays: Containing haemastaticks. No. 22, History of Medicine Series, Library of New York Academy of Medicine. New York: Hafner Publishing.

Hall, W., Sanders, K., Sanders, T. et al. 2008: A high-fat meal enriched with eicosapentaenoic acid reduces postprandial arterial stiffness measured by digital volume pulse analysis in healthy men. Journal of Nutrition 138, 287–91.

Haller, M.J., Samyn, M., Nichols, W.W. et al. 2004: Radial artery tonometry demonstrates arterial stiffness in children with type 1 diabetes. Diabetes Care 27(12), 2911–17.

Haller, M.J., Stein, J., Shuster, J. et al. 2007: Peripheral artery tonometry demonstrates altered endothelial function in children with type 1 diabetes. Pediatric Diabetes 8, 193–8.

Halliday, D. and Resnick, R. 1965. Physics for students of science and engineering, 6th edn. New York: John Wiley.

Hallock, P. 1934: Arterial elasticity in man in relation to age as evaluated by the pulse wave velocity method. Archives of Internal Medicine 54, 770–98.

Haluska, B.A., Jeffries, L., Brown, J. et al. 2010: A comparison of methods for assessing total arterial compliance. Journal of Human Hypertension 24, 254–62.

Hambrecht, R., Fiehn, E., Weigl, C. et al. 1998: Regular physical exercise corrects endothelial dysfunction and improves exercise capacity in patients with chronic heart failure. Circulation 98, 2709–15.

Hambrecht, R., Hilbrich, L., Erbs, S. et al. 2000a: Correction of endothelial dysfunction in chronic heart failure: additional effects of exercise training and oral L-arginine supplementation. Journal of the American College of Cardiology 35(3), 706–13.

Hambrecht, R., Wolf, A., Gielen, S. et al. 2000b: Effect of exercise on coronary endothelial function in patients with coronary artery disease. New England Journal of Medicine 342, 454–60.

Hambrecht, R., Walther, C., Mobius-Winkler, S. et al. 2004: Percutaneous coronary angioplasty compared with exercise training in patients with stable coronary artery disease: a randomized trial. Circulation 109(11), 1371–8.

Hamburg, N.M., Keyes, M.J., Larson, M.G. et al. 2008: Cross-sectional relations of digital vascular function to cardiovascular risk factors in the Framingham Heart Study. Circulation 117(19), 2467–74.

Hamburg, N.M., Palmisano, J., Larson, M.G. et al. 2011: Relation of brachial and digital measures of vascular function in the community: the Framingham Heart Study. Hypertension 57, 390–6.

Hamdan, M.A., Maheshwari, S., Fahey, J.T. et al. 2001: Endovascular stents for coarctation of the aorta: initial results and intermediate-term follow-up. Journal of the American College of Cardiology 38, 1518–23.

Hamilton, P.K., Lockhart, C.J., Quinn, C.E. et al. 2007: Arterial stiffness: clinical relevance, measurement and treatment. Clinical Science 113(4), 157–70.

Hamilton, W.F. 1944: The patterns of the arterial pressure pulse. American Journal of Physiology 141, 235–41.

Hamilton, W.F. 1953: The physiology of the cardiac output. Circulation 8, 527–43.

Hamilton, W.F. 1962: Measurement of the cardiac output. In: Handbook of physiology. Section 2: Circulation, vol. I. Washington, DC: American Physiological Society, pp. 551–84.

Hamilton, W.F. and Dow, P. 1939: An experimental study of the standing waves in the pulse propagated through the aorta. American Journal of Physiology 125, 48–59.

Hamilton, W.F., Brewer, G. and Brotman, I. 1934: Pressure pulse contours in the living animal: I. Analytical description of a new high-frequency hypodermic manometer with illustrative curves of simultaneous arterial and intracardiac pressure. American Journal of Physiology 107, 427–35.

Hamilton, W.F., Woodbury, R.A. and Harper, H.T. 1936: Physiologic relationships between intrathoracic, intraspinal and arterial pressures. Journal of the American Medical Association 107, 853–6.

Han, S.I., Marseille, O., Gehlen, C. et al. 2001: Rheology of blood by NMR. Journal of Magnetic Resonance 152(1), 87–94.

Haneda, T., Nakajima, T., Shirato, K. et al. 1983: Effects of oxygen breathing on pulmonary vascular input impedance in patients with pulmonary hypertension. Chest 83, 520–27.

Hankey, G.J. and Gubbay, S.S. 1987: Focal cerebral ischaemia and infarction due to antihypertensive therapy. Medical Journal of Australia 146(8), 412–14.

Hanon, O., Luong, V., Mourad, J.J. et al. 2001: Aging, carotid artery distensibility, and the Ser422Gly elastin gene polymorphism in humans. Hypertension 38, 1185–9.

Hanon, O., Pequignot, R., Seux, M.L. et al. 2006: Relationship between antihypertensive drug therapy and cognitive function in elderly hypertensive patients with memory complaints. Journal of Hypertension 24, 2101–7.

Hänsel, S., Lässig, G., Pistrosch, F. et al. 2003: Endothelial dysfunction in young patients with long-term rheumatoid arthritis and low disease activity. Atherosclerosis 170, 177–80.

Hansell, J., Henareh, L., Agewall, S. et al. 2004: Non-invasive assessment of endothelial function – relation between vasodilatory responses in skin microcirculation and brachial artery. Clinical Physiology and Functional Imaging 24, 317–22.

Hansen, A.T. 1949: Pressure measurement in the human organism. Acta Physiologica Scandinavica 19(suppl. 68), 1–227.

Hansen, A.T. and Warburg, E. 1950: A theory for elastic liquid-containing membrane manometers. General part. Acta Physiologica Scandinavica 19, 306–32.

Hansen, F., Mangell, P., Sonesson, B. et al. 1995: Diameter and compliance in the human common carotid artery – variations with age and sex. Ultrasound in Medicine and Biology 21, 1–9.

Hansen, T.W., Staessen, J.A., Torp-Pedersen, C. et al. 2006: Ambulatory arterial stiffness index predicts stroke in a general population. Journal of Hypertension 24(11), 2247–53.

Hansson, L., Zanohettl, A., Carruthers, S.G. et al. 1998: Effects of intensive blood-pressure lowering and low-dose aspirin in patients with hypertension: principal results of the hypertension optimal treatment (HOT) randomised trial. Lancet 351, 1755–62.

Harada, A., Okada, T., Niki, K. et al. 2002: On-line noninvasive one-point measurements of pulse wave velocity. Heart Vessels 17(2), 61–8.

Hardung, V. 1952: Uber eine Methode zur Messung der dynamischen Elastizitat und Viskositat kautschukahnlicher Korper, insbesondere von Blutgefassen und anderen elastischen Gewebteilen. Helvetica Physiologica Acta 10, 482–98.

Hardung, V. 1953: Vergleichende Messungen der dynamischen Elastizitat und Viskositat von Blutgefassen, Kautschuk und synthetischen Elastomeren. Helvetica Physiologica Acta 11, 194–211.

Hardung, V. 1958: Wellenwiderstand und Impedanzen der geraden Schlauchleigung. Archives für Kreislfforschung 29, 77–88.

Hardung, V. 1962: Propagation of pulse waves in visco-elastic tubing. In: Hamilton, W. F. and Dow, P. (eds), American Physiological Society Handbook of Physiology. Section 2: Circulation, vol. 1, Washington, DC: p. 107.

Hardy, C.J., Bolster, B.D. Jr., McVeigh, E.R. et al. 1996: Pencil excitation with interleaved Fourier velocity encoding: NMR measurement of aortic distensibility. Magnetic Resonance Medicine 35, 814–19.

Harkness, M.L.R., Harkness, R.D. and McDonald, D.A. 1957: The collagen and elastin content of the arterial wall in the dog. Proceedings of the Royal Society of London B 146, 541–51.

Harloff, A., Simon, J., Brendecke, S. et al. 2010: Complex plaques in the proximal descending aorta: an underestimated embolic source of stroke. Stroke 41, 1145–50.

Harms, M.P., Wesseling, K.H., Pott, F. et al. 1999: Continuous stroke volume monitoring by modelling flow from non-invasive measurement of arterial pressure in humans under orthostatic stress. Clinical Science (London) 97(3), 291–301.

Harris, C.R.S. 1973: The heart and vascular system in ancient Greek medicine. Oxford: Oxford University Press, pp. 397–431.

Harris, R. 1982: Aging of the cardiovascular system. In: Viidik, A. (ed.), Lectures on gerontology. London: Academic Press, pp. 275–327.

Harris, R.A., Nishiyama, S.K., Wray, D.W. et al. 2010: Ultrasound assessment of flow-mediated dilation. Hypertension 55, 1075–85.

Harrison, D.G., Armstrong, M.L., Freiman, P.C. et al. 1987: Restoration of endothelium-dependent relaxation by dietary treatment of atherosclerosis. Journal of Clinical Investigation 80, 1808–11.

Hartley, C., Reddy, A., Entman, M. et al. 2005: Characterization of arterial wave propagation and reflection in mice. Conference Proceedings Annual International Conference of the IEEE Engineering in Medicine and Biology Society 1, 601–4.

Hartley, C.J. 1981: Resolution of frequency aliases in pulsed Doppler velocimeters. IEEE Transactions in Sonics and Ultrasonics SU-28. 69–75.

Hartley, C.J. 1989: Review of intracoronary Doppler catheters. International Journal of Cardiac Imaging 4, 159–68.

Hartley, C.J. and Cole, J.S. 1974a: An ultrasonic pulsed Doppler system for measuring blood flow in small vessels. Journal of Applied Physiology 37, 626–9.

Hartley, C.J. and Cole, J.S. 1974b: A single crystal ultrasonic catheter tip velocity probe. Medical Instrumentation 8, 241–3.

Hartley, C.J., Hanley, H.G., Lewis, R.M. et al. 1978: Synchronized pulsed Doppler blood flow and ultrasonic dimension measurement in conscious dogs. Ultrasound in Medicine and Biology 4, 99–112.

Hartley, C.J., Reddy, A.K. and Taffet, G.E. 2008: *In-vitro* evaluation of sensors and amplifiers to measure left ventricular pressure in mice. Conference Proceedings Annual International Conference of the IEEE Engineering in Medicine and Biology Society 965–8.

Hartley, C.J., Reddy, A.K., Madala, S. et al. 2000: Hemodynamic changes in apolipoprotein E-knockout mice. American Journal of Physiology, Heart and Circulatory Physiology 279, H2326–34.

Hartley, C.J., Reddy, A.K., Madala, S. et al. 2004: Noninvasive ultrasonic measurement of arterial wall motion in mice. American Journal of Physiology, Heart and Circulatory Physiology 287, H1426–32.

Hartley, C.J., Reddy, A.K., Madala, S. et al. 2007: Effects of isoflurane on coronary blood flow velocity in young, old and ApoE(-/-) mice measured by Doppler ultrasound. Ultrasound in Medicine and Biology 33(4), 512–21.

Hartley, C.J., Taffet, G.E., Michael, L.H. et al. 1997: Noninvasive determination of pulse-wave velocity in mice. American Journal of Physiology 273(1 Pt 2), H494–500.

Hartree, W. and Hill, A.V. 1921: The regulation of the supply of energy in muscle contraction. Journal of Physiology 55, 133–58.

Harvey, A. 1649. de Circulatone Sanguinis. Translated by Franklin, K.J. 1957. Blackwell: Oxford.

Harvey, W. 1628: De Motu Cordis. William Fitzer, Frankfurt. Translated as Movement of the heart and blood in animals by Franklin, K.J. 1957. Oxford: Blackwell Scientific.

Hasegawa, H., Kanai, H. and Koiwa, Y. 2004: Detection of lumen-intima interface of posterior wall for measurement of elasticity of the human carotid artery. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 51, 93–108.

Hashimoto, J. and O'Rourke, M.F. 2008: Is arterial stiffness better than blood pressure in predicting cardiovascular risk?. Current Cardiovascular Risk Report 2, 133–40.

Hashimoto, J. and Ito, S. 2009: Some mechanical aspects of arterial aging: physiological overview based on pulse wave analysis. Therapeutic Advances in Cardiovascular Disease 3(5), 367–78.

Hashimoto, J., Chonan, K., Auki, Y. et al. 2002: Pulse wave velocity and the second derivative of the finger photoplethysmogram in treated hypertensive patients, their relationship and associating factors. Journal of Hypertension 20, 2415–22.

Hashimoto, J., Imai, Y. and O'Rourke, M.F. 2007a: Monitoring of antihypertensive therapy for reduction in left ventricular mass. American Journal of Hypertension 20(11), 1229–33.

Hashimoto, J., Imai, Y. and O'Rourke, M.F. 2007b: Indices of pulse wave analysis are better predictors of left ventricular mass reduction than cuff pressure. American Journal of Hypertension 20(4), 378–84.

Hashimoto, J., Nichols, W.W., O'Rourke, M.F. et al. 2008a: Association between wasted pressure effort and left ventricular hypertrophy in

hypertension: influence of arterial wave reflection. American Journal of Hypertension 21, 329–33.
Hashimoto, J., Aikawa, T. and Imai, Y. 2008b: Large artery stiffening as a link between cerebral lacunar infarction and renal albuminuria. American Journal of Hypertension 21, 1304–9.
Hashimoto, J., Westerhof, B.E., Westerhof, N. et al. 2008c: Different role of wave reflection magnitude and timing on left ventricular mass reduction during antihypertensive treatment. Journal of Hypertension 26, 1017–24.
Haskell, W.L., Lee, I.-M., Pate, R.R. et al. 2007: Physical activity and public health: updated recommendation for adults from the American College of Sports Medicine and the American Heart Association. Circulation 116, 1081–93.
Hatle, L. 1984: Maximal blood flow velocities – haemodynamic data obtained noninvasively with CW Doppler. Ultrasound Medicine of Biology 10(2), 225–37.
Hatle, L. 2007: How to diagnose diastolic heart failure – a consensus statement. European Heart Journal 28, 2421–3.
Hatle, L. and Angelsen, B. 1990. Doppler ultrasound in cardiology: physical principles and clinical applications, 3rd edn. Philadelphia: Lea & Febiger.
Hatle, L., Brubakk, A., Tromsdal, A. et al. 1978: Noninvasive assessment of pressure drop in mitral stenosis by Doppler ultrasound. British Heart Journal 40, 131–40.
Hatsuda, S., Shoji, T., Shinohara, K. et al. 2006: Regional arterial stiffness associated with ischemic heart disease in type 2 diabetes mellitus. Journal of Atherosclerosis and Thombosis 13, 144–21.
Hatzaras, I.S., Bible, J.E., Koullias, G.J. et al. 2007: Role of exertion or emotion as inciting events for acute aortic dissection. American Journal of Cardiology 100(9), 1470–2.
Hayakawa, H., Coffee, K. and Raij, L. 1997: Endothelial dysfunction and cardiorenal injury in experimental salt-sensitive hypertension: effects of antihypertensive therapy. Circulation 96(7), 2407–13.
Hayflick, L. 1994: How and why we age. New York: Ballantine.
Haynes, F.W., Ellis, L.B. and Weiss, S. 1936: Pulse wave velocity and arterial elasticity in arterial hypertension, atherosclerosis, and related conditions. American Heart Journal 11, 385–401.
Hayoz, D. and Mazzolai, L. 2007: Endothelial function, mechanical stress and atherosclerosis. Advances in Cardiology 44, 62–75.
Hayoz, D., Rutschmann, B., Perret, F. et al. 1992: Conduit artery compliance and distensibility are not necessarily reduced in hypertension. Hypertension 20, 1–6.
Hayoz, D., Delacrétaz, E., Do, D. et al. 1994: Accuracy of non-invasive blood pressure measurement in the lower limbs by applanation tonometry. Journal of Hypertension 12(suppl. 3), S7.
Hayoz, D., Bernardi, L., Noll, G. et al. 1995: Flow-diameter phase shift. A potential indicator of conduit artery function. Hypertension 26(1), 20–5.
Hayward, C.S. and Kelly, R.P. 1997: Gender-related differences in the central arterial pressure waveform. Journal of the American College of Cardiology 30, 1863–71.
Hayward, C.S., Knight, D.C., Wren, B.G. and Kelly, R.P. 1997: Effect of hormone replacement therapy on non-invasive cardiovascular haemodynamics. Journal of Hypertension 15(9), 987–93.
Hayward, C.S., Kraidly, M., Webb, C.M. et al. 2002: Assessment of endothelial function using peripheral waveform analysis – a clinical application. Journal of the American College of Cardiology 40, 521–8.
He, F.J., Marciniak, M., Visagie, E. et al. 2009: Effect of modest salt reduction on blood pressure, urinary albumin, and pulse wave velocity in white, black, and Asian mild hypertensives. Hypertension 54, 482–8.
He, J. and Whelton, P.K. 1999: Elevated systolic blood pressure and risk of cardiovascular and renal disease, overview of evidence from observational epidemiologic studies and randomized controlled trials. American Heart Journal 138(3 Pt 2), 211–19.
He, Y., Lam, T.H., Jiang, B. et al. 2009: Combined effects of tobacco smoke exposure and metabolic syndrome on cardiovascular risk in older residents of China. Journal of the American College of Cardiology 53, 363–71.
Heagerty, A.M. 1994: Winning rhythm? Lancet 343, 310.
Healy, B. 1990: Endothelial cell dysfunction: an emerging endocrinopathy linked to coronary disease. Journal of the American College of Cardiology 16(2), 357–8.
Heard, D.J., Nichols, W.W., Buss, D. et al. 1996: Comparative cardiopulmonary effects of intramuscular etorphine and carfentanil in goats. American Journal of Veterinary Research 57(1), 87–96.
Hebert, P.R., Rich-Edwards, J.W., Manson, J.E. et al. 1993: Height and incidence of cardiovascular disease in male physicians. Circulation 88(4 Pt 1), 1437–43.
Heckbert, S.R., Post, W., Pearson, G.D. et al. 2006: Traditional cardiovascular risk factors in relation to left ventricular mass, volume, and systolic function by cardiac magnetic resonance imaging: the Multiethnic Study of Atherosclerosis. Journal of the American College of Cardiology 48(11), 2285–92.
Heffernan, K.S., Fahs, C.A., Iwamoto, G.A. et al. 2009: Resistance exercise training reduces central blood pressure and improves microvascular function in African American and white men. Atherosclerosis 207(1), 220–6.
Heffernan, K.S., Jae, S.Y., Willund, K.R. et al. 2008: Racial differences in central blood pressure and vascular function in young men. American Journal of Physiology Heart, Lung and Circulation 295, H2380–7.
Heffernan, K.S., Jae, S.Y., Echols, G.H. et al. 2007: Arterial stiffness and wave reflection following exercise in resistance-trained men. Medicine and Science in Sports and Exercise 39, 842–8.
Heffernan, K.S., Rossow, L., Jae, S.Y. et al. 2006: Effect of single-leg resistance exercise on regional arterial stiffness. European Journal of Applied Physiology 98(2), 185–90.
Heidland, U.E. and Strauer, B.E. 2001: Left ventricular muscle mass and elevated heart rate are associated with coronary plaque disruption. Circulation 104(13), 1477–82.
Heiss, C., Kleinbongard, P., Dejam, A. et al. 2005: Acute consumption of flavanol-rich cocoa and the reversal of endothelial dysfunction in smokers. Journal of the American College of Cardiology 46(7), 1276–83.
Heitzer, T., Ylä-Herttuala, S., Luoma, J. et al. 1996: Cigarette smoking potentiates endothelial dysfunction of forearm resistance vessels in patients with hypercholesterolemia. Role of oxidized LDL. Circulation 93, 1346–53.
Heitzer, T., Schlinzig, T., Krohn, K. et al. 2001: Endothelial dysfunction, oxidative stress, and risk of cardiovascular events in patients with coronary artery disease. Circulation 104(22), 2673–8.
Helmke, B.P. and Davies, P.F. 2002: The cytoskeleton under external fluid mechanical forces: hemodynamic forces acting on the endothelium. Annals of Biomedical Engineering 30, 284–96.
Helmlinger, G., Geiger, R.V., Schreck, S. et al. 1991: Effects of pulsatile flow on cultured vascular endothelial cell morphology. Journal of Biomechanics and Engineering 113, 123–31.
Helps, E.P.W. and McDonald, D.A. 1954: Arterial blood flow calculated from pressure gradients. Journal of Physiology 124, 30P–1P.
Henderson, A.H. 1991: Endothelium in control. British Heart Journal 65, 116–25.
Hennerici, M.G. 2004: The unstable plaque. Cerebrovascular Diseases 17(suppl. 3), 17–22.
Henriques, V. 1913: Uber die Verteilung des Blutes vom linken Herzen zwischen dem Herzen und dem ubrigen Organismus. Biochemische Zeitschrift 56, 230–48.
Henry, R.M.A., Kostense, P.J., Spijkerman, A.M.W. et al. 2003: Arterial stiffness increases with deteriorating glucose tolerance status. The Hoorn Study. Circulation 107, 2089–95.
Henry, W.L., Wilner, L.B. and Harrison, D.C. 1967: A calibrator for detecting bubbles in cardiac catheter-manometer systems. Journal of Applied Physiology 23, 1007–10.
Henry-Feugeas, M.C. 2007: MRI of the 'Alzheimer syndrome'. Journal of Neuroradiology 34, 220–7.
Henry-Feugeas, M.C., De Marco, G., Perretti, I. et al. 2005: Age-related cerebral white matter changes in pulse-wave encephalopathy: observations with three-dimensional MRI. Magnetic Resonance Imaging 23, 929–37.

Henskens, L.H., van Oostenbrugge, R.J., Kroon, A.A. et al. 2008a: Brain microbleeds are associated with ambulatory blood pressure levels in a hypertensive population. Hypertension 51, 62–8.

Henskens, L.H., Kroon, A.A., Van Oostenbrugge, R.J. et al. 2008b: Increased aortic pulse wave velocity is associated with silent cerebral small-vessel disease in hypertensive patients. Hypertension 52, 1120–6.

Henskens, L.H., Kroon, A.A., van Oostenbrugge, R.J. et al. 2009: Associations of ambulatory blood pressure levels with white matter hyperintensity volumes in hypertensive patients. Journal of Hypertension 27, 1446–52.

Herlihy, J.T. 1980: Helically cut vascular strip preparation: geometrical considerations. American Journal of Physiology 238(1), H107–9.

Hermans, M.M., Kooman, J.P., Brandenburg, V. et al. 2007: Spatial inhomogeneity of common carotid artery intima-media is increased in dialysis patients. Nephrology Dialysis Transplantation 22, 1205–12.

Herment, A., Demoment, G. and Dumée, P. 1996: Improved estimation of low velocities in color Doppler imaging by adapting the mean frequency estimator to the clutter rejection filter. IEEE Transactions on Biomedical Engineering 43, 919–27.

Hermeling, E., Reesink, K.D., Reneman, R.S. et al. 2007: Measurement of local pulse wave velocity: effects of signal processing on precision. Ultrasound in Medicine and Biology 33(5), 774–81.

Hermeling, E., Reesink, K.D., Reneman, R.S. et al. 2008: Confluence of incident and reflected waves interferes with systolic foot detection of the carotid artery distension waveform. Journal of Hypertension 26(12), 2374–80.

Hermeling, E., Reesink, K.D., Kornmann, L.M. et al. 2009: The dicrotic notch as alternative time-reference point to measure local pulse wave velocity in the carotid artery by means of ultrasonography. Journal of Hypertension 27, 2028–35.

Hermeling, E., Hoeks, A.P., Winkens, M.H. et al. 2010: Noninvasive assessment of arterial stiffness should discriminate between systolic and diastolic pressure ranges. Hypertension 55(1), 124–30.

Hernandez, R.R., Greenfield, J.C. Jr. and McCall, B.W. 1964: Pressure-flow studies in hypertrophic subaortic stenosis. Journal of Clinical Investigation 43, 401–07.

Herrera, M.D., Mingorance, C., Rodríguez-Rodríguez, R. et al. 2010: Endothelial dysfunction and aging: an update. Ageing Research Reviews 9(2), 142–52.

Herrick, J.B. 1912a: Clinical features of sudden obstruction of the coronary arteries. Journal of the American Medical Association 59, 2015–20.

Herrick, J.B. 1912b: The symptoms of acute coronary obstruction. Association of American Physicians Society Proceedings, 1971–2.

Herrick, J.F. 1942: Poiseuille's observations on blood flow lead to a law in hydrodynamics. American Journal of Physics 10, 33–9.

Herrington, D.M., Fan, L., Drum, M. et al. 2001: Brachial flow-mediated vasodilator responses in population-based research: methods, reproducibility and effects of age, gender and baseline diameter. Journal of Cardiovascular Risk 8(5), 319–28.

Hess, W.R. 1927. Die Verteilung von Querschnitt, Widerstand, Druckgefalle und Stromungsgeschwindigkeit im Blutkreislauf. Handb. d. normale u. path. Physiol. (Bethe), Bd. VII, Teil 2. Berlin: Springer, pp. 904–33.

Hibbard, M.D., Nishimura, R.A., Higano, S.T. et al. 1996: Intravascular ultrasonography. In: John Sutton, M.G., Oldershaw, P.J. and Kotler, M.N. (eds), Echocardiography and Doppler in adults and children, 2nd edn. Cambridge, MA: Blackwell Science, pp. 576–602.

Hickson, S.S., Butlin, M., Broad, J. et al. 2009a: Validity and repeatability of the Vicorder apparatus: a comparison with the SphygmoCor device. Hypertension Research 32(12), 1079–85.

Hickson, S.S., Butlin, M., Mir, F.A. et al. 2009b: The accuracy of central SBP determined from the second systolic peak of the peripheral pressure waveform. Journal of Hypertension 27, 1784–8.

Higashi, Y., Sasaki, S., Kurisu, S. et al. 1999a: Regular aerobic exercise augments endothelium-dependent vascular relaxation in normotensive as well as hypertensive subjects: role of endothelium-derived nitric oxide. Circulation 100, 1194–202.

Higashi, Y., Sasaki, S., Sasaki, N. et al. 1999b: Daily aerobic exercise improves reactive hyperemia in patients with essential hypertension. Hypertension 33, 591–7.

Higashi, Y., Matsuura, H., Kajiyama, G. et al. 2001a: Effects of four antihypertensives on reactive hyperemia in essential hypertension. Cardiology Review 18, 31–3.

Higashi, Y., Sanada, M., Sasaki, S. et al. 2001b: Effect of estrogen replacement therapy on endothelial function in peripheral resistance arteries in normotensive and hypertensive postmenopausal women. Hypertension 37(2 Pt 2), 651–7.

Higginbotham, M.B., Morris, K.G., Coleman, R.E. et al. 1984: Sex-related differences in the normal cardiac response to upright exercise. Circulation 70(3), 357–66.

Hill, A.V. 1965. Trails and trials in physiology. London: Edward Arnold.

Hill, J.M., Zalos, G., Halcox, J.P. et al. 2003: Circulating endothelial progenitor cells, vascular function, and cardiovascular risk. New England Journal of Medicine 348, 593–600.

Hillis, L.D. and Lange, R.A. 1991: Serotonin and acute ischemic heart disease. New England Journal of Medicine 324(10), 688–9.

Hillis, W.S. and Friesinger, G.C. 1976: Reactive hyperemia: an index of the significance of coronary stenoses. American Heart Journal 92, 737–40.

Himburg, H.A., Dowd, S.E. and Friedman, M.H. 2007: Frequency-dependent response of the vascular endothelium to pulsatile shear stress. American Journal of Physiology. Heart and Circulatory Physiology 293, H645–53.

Himburg, H.A., Grzybowski, D.M., Hazel, A.L. et al. 2004: Spatial comparison between wall shear stress measures and porcine arterial endothelial permeability. American Journal of Physiology – Heart and Circulatory Physiology 286(5), H1916–22.

Hinchey, J., Chaves, C., Appignani, B. et al. 1996: A reversible posterior leukoencephalopathy syndrome. New England Journal of Medicine 334, 494–500.

Hingorani, A.D., Cross, J., Kharbanda, R.K. et al. 2000: Acute systemic inflammation impairs endothelium-dependent dilatation in humans. Circulation 102(9), 994–9.

Hingorani, A.D., Shah, T., Casas, J.P. et al. 2009: C-reactive protein and coronary heart disease: predictive test or therapeutic target? Clinical Chemistry 55(2), 239–55.

Hirai, N., Kawano, H., Hirashima, O. et al. 2000: Insulin resistance and endothelial dysfunction in smokers, effects of vitamin C. American Journal of Physiology and Heart Circulatory Physiology 279(3), H1172–8.

Hirai, T., Sasayama, S., Kawasaki, T. et al. 1989: Stiffness of systemic arteries in patients with myocardial infarction. A noninvasive method to predict severity of coronary atherosclerosis. Circulation 80(1), 78–86.

Hiramatsu, O., Goto, M., Yada, T. et al. 1994: Diameters of subendocardial arterioles and venules during prolonged diastole in canine left ventricles. Circulation Research 75, 393–9.

Hirata, K. and O'Rourke, M.F. 2010: Carotid flow augmentation as a risk for small vessel disease of the brain. American Journal of Hypertension 23(9), 932.

Hirata, K., Triposkiadis, F., Sparks, E. et al. 1991: The Marfan syndrome: abnormal aortic elastic properties. Journal of the American College of Cardiology 18, 57–63.

Hirata, K., Wells, A., Vlachopoulos, C. et al. 2001: Estimation of time-related features of the central pressure pulse from the radial artery pressure waveform (Abstract). Journal of the American College of Cardiology 37(2), 256A.

Hirata, K., Vlachopoulos, C., Adji, A. and O'Rourke, M.F. 2002: Reproducibility of pulse wave analysis in a double-blind study. Journal of Hypertension 20(suppl. 4), S168.

Hirata, K., Adji, A., Vlachopoulos, C. et al. 2005a: Effect of sildenafil on cardiac performance in patients with heart failure. American Journal of Cardiology 96(10), 1436–40.

Hirata, K., Vlachopoulos, C., Adji, A. et al. 2005b: Benefits from angiotensin-converting enzyme inhibitor 'beyond blood pressure lowering': beyond blood pressure or beyond the brachial artery? Journal of Hypertension 23(551–6), 903–4.

Hirata, K., Yaginuma, T., O'Rourke, M.F. et al. 2006: Age-related change in the carotid artery flow and pressure pulses: implication to cerebral microvascular disease. Stroke 37, 2552–6.

Hirata, K., O'Rourke, M.F. and Momomura, S. 2008: Flow augmentation index as a risk factor for silent lacunar infarction. Journal of the American College of Cardiology 51(suppl. A), A303.

Hirata, K., O'Rourke, M.F. and Momomura, S. 2007: Effect of nitrate on the carotid late systolic flow augmentation – a new strategy against stroke. Journal of Hypertension 25(suppl. 2), S336–7.

Hiratzka, L.F., Bakris, G.L., Beckman, J.A. et al. 2010: ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM guidelines for the diagnosis and management of patients with thoracic aortic disease: executive summary. A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, American Association for Thoracic Surgery, American College of Radiology, American Stroke Association, Society of Cardiovascular Anesthesiologists, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of Thoracic Surgeons, and Society for Vascular Medicine. Circulation 121(13), e266–369.

Hirose, Y., Hamada, S., Takamiya, M. et al. 1992: Aortic aneurysms: growth rates measured with CT. Radiology 185, 249–52.

Hirooka, Y., Takeshita, A., Imaizumi, T. et al. 1988: Effects of alpha-human atrial natriuretic peptide on the interrelationship of arterial pressure, aortic nerve activity, and aortic diameter. Circulation Research 6, 987–96.

Hirschi, K.K., Rohovsky, S.A. and D'Amore, P.A. 1997: Cell–cell interactions in vessel assembly: a model for the fundamentals of vascular remodelling. Transplant Immunology 5(3), 177–8.

Ho, K. 1982: Effects of ageing on arterial distensibility and left ventricular load in an Australian population. BSc (Med) thesis, University of New South Wales, Australia.

Ho, K.K., Pinsky, J.L., Kannel, W.B. and Levy, D. 1993: The epidemiology of heart failure. The Framingham Study. Journal of the American College of Cardiology 22(4 suppl. A), 6A–13A.

Hobbs, R. 2000: Can heart failure be diagnosed in primary care? (Editorials) British Medical Journal 321, 188–9.

Hobson, E.W. 1957. The theory of functions of a real variable and the theory of Fourier's series. New York: Dover Publications.

Hodis, S. and Zamir, M. 2008: Solutions of the Maxwell viscoelastic equations for displacement and stress distributions within the arterial wall. Physical Review. E, Statistical, Nonlinear, and Soft Matter Physics 78(2 Pt 1), 2–8.

Hoeks, A.P.G., Reneman, R.S. and Peronneau, P.A. 1981: A multi-gate pulsed Doppler system with serial data processing. IEEE Transactions on Sonics and Ultrasonics SU-28, 242–7.

Hoeks, A.P., Ruissen, C.J., Hick, P. and Reneman, R.S. 1984: Methods to evaluate the sample volume of pulsed Doppler systems. Ultrasound in Medicine and Biology 10, 427–34.

Hoeks, A.P., Brands, P.J., Smeets, F.A. et al. 1990: Assessment of the distensibility of superficial arteries. Ultrasound in Medicine and Biology 16(2), 121–8.

Hoeks, A.P.G., Van de Vorst, J.J.W., Dabekaussen, A. et al. 1991: An efficient algorithm to remove low frequency Doppler signals in digital Doppler systems. Ultrasonic Imaging 13, 135–44.

Hoeks, A.P., Brands, P.J. and Reneman, R.S. 1992: Assessment of the arterial distension waveform using Doppler signal processing. Journal of Hypertension 10(6 suppl.), S19–22.

Hoeks, A.P.G., Arts, T.G.J., Brands, P.J. and Reneman, R.S. 1993: Comparison of the performance of the cross correlation and Doppler autocorrelation technique to estimate the mean velocity of simulated ultrasound signals. Ultrasound in Medicine and Biology 19, 727–40.

Hoeks, A.P., Willigers, J.M. and Reneman, R.S. 2000: Effects of assessment and processing techniques on the shape of arterial pressure-distension loops. Journal of Vascular Research 37, 494–500.

Hoeks, A.P.G. and Reneman, R.S. 2001: Flow patterns and arterial wall dynamics. In: Hennerici, M.G. and Meairs, S.P. (ed.), Cerebrovascular Ultrasound. Cambridge: Cambridge University Press, pp. 77–87.

Hoeks, A.P. and Reneman, R.S. 2008: Wall shear stress as measured in vivo: consequences for the design of the arterial system. Medical & Biological Engineering & Computing 46: 499–507.

Hoeks, A.P.G., Hermeling, E. and Reneman, R.S. 2008: Artery wall mechanics determined by ultrasound. In: Yim, P.J. (ed.), Vascular Hemodynamics Rounds. New York: John Wiley & Sons, pp. 133–56.

Hoeks, A.P.G., Reesink, K.D., Hermeling, E. et al. 2008: Local blood pressure rather than shear stress should be blamed for plaque rupture. Journal of the American College of Cardiology 52, 1107–8.

Hoffman, J.I. and Buckberg, G.D. 1978: The myocardial supply: demand ratio – a critical review. American Journal of Cardiology 41(2), 327–32.

Hoffman, J.I. and Chilian, W.M. 2000: Brief commentary on coronary wave-intensity analysis. Journal of Applied Physiology 89(4), 1633–5.

Hoffman, J.I., Piedimonte, G., Maxwell, A.J. et al. 1995: Aspects of coronary vasomotor regulation. Advances in Experimental Medicine and Biology 381, 135–46.

Hoffman, J.I.E. 1984: Maximal coronary flow and the concept of coronary vascular reserve. Circulation 70, 153–9.

Hoffman, J.I.E. 1987: A critical view of coronary reserve. Circulation 75(suppl. 1), I6–11.

Hoffman, J.I.E. 1995: Flow in coronary arteries: when and where. News in Physiological Sciences 10, 191.

Hoffman, W.E., Charbel, F.T., Edelman, G. et al. 1995: Nitrous oxide added to isofluane increases brain activity blood flow and low frequency brain electrical activity. Journal of Neurosurgery and Anesthetics 7(2), 82–8.

Hognestad, A., Aukrust, P., Wergeland, R. et al. 2004: Effects of conventional and aggressive statin treatment on markers of endothelial function and inflammation. Clinical Cardiology 27(4), 199–203.

Holen, J., Nanna, M., Lockhart, J. et al. 1990: Doppler color flow in echocardiography: analytical and in-vitro investigations of the quantitative relationship between orifice flow and color jet dimensions. Ultrasound in Medicine and Biology 16, 543–51.

Holland, D.J., Sacre, J.W., McFarlane, S.J. et al. 2008: Pulse wave analysis is a reproducible technique for measuring central blood pressure during hemodynamic perturbations induced by exercise. American Journal of Hypertension 21, 1100–6.

Hollenberg, N.K., Parving, H.-H., Viberti, G. et al. 2007: Albuminuria response to very high-dose valsartan in type 2 diabetes mellitus. Journal of Hypertension 25, 1921–6.

Holloszy, J.O. 1988: Exercise and longevity: studies on rats. Journal of Gerontology 43, B149–51.

Holman, E. 1955: The development of arterial aneurysms. Surgery, Gynaecology and Obstetrics 100, 599–611.

Holzapfel, G.A. and Ogden, R.W. 2010a: Modelling the layer-specific three-dimensional residual stresses in arteries, with an application to the human aorta. Journal of the Royal Society. Interface 7(46), 787–99.

Holzapfel, G.A. and Ogden, R.W. 2010b: Constitutive modelling of arteries. Proceedings of the Royal Society A 466(2118), 1551–97.

Holzapfel, G.A., Sommer, G., Auer, M. et al. 2007: Layer-specific 3D residual deformations of human aortas with non-atherosclerotic intimal thickening. Annals of Biomedical Engineering 35(4), 530–45.

Hom, J.J., Ordovas, K. and Reddy, G.P. 2008: Velocity-encoded cine MR imaging in aortic coarctation: functional assessment of hemodynamic events. Radiographics 28(2), 407–16.

Homma, S., Hirose, N., Ishida, H. et al. 2001: Carotid plaque and intima-media thickness assessed by B-mode ultrasonography in subjects ranging from young adults to centenarians. Stroke 32, 830–5.

Honda, T., Yano, K., Matsuoka, H. et al. 1994: Evaluation of aortic distensibility in patients with essential hypertension by using cine magnetic resonance imaging. Angiology 45(3), 207–12.

Hong, R.A., Bhandari, A.K., McKay, C.R. et al. 1987: Life-threatening ventricular tachycardia and fibrillation induced by painless myocardial ischemia during exercise testing. Journal of the American Medical Association 257(14), 1937–40.

Honig, C.R. 1979: Contributions of nerves and metabolites to exercise vasodilation: a unifying hypothesis. American Journal of Physiology 236, H705–19.

Hooper, L., Kroon, P.A., Rimm, E.B. et al. 2008: Flavonoids, flavonoid-rich foods, and cardiovascular risk: a meta-analysis of randomized controlled trials. American Journal of Clinical Nutrition 88, 38–50.

Hope, S.A., Tay, D.B., Meredith, I.T. et al. 2002: Comparison of generalized and gender-specific transfer functions for the derivation of aortic waveforms. American Journal of Physiology and Heart Circulatory Physiology 283, H1150–6.

Hope, S.A., Tay, D.B., Meredith, I.T. and Cameron, J.D. 2003: Use of arterial transfer functions for the derivation of aortic waveform characteristics. Journal of Hypertension 21, 1299–305.

Hope, S.A., Tay, D.B., Meredith, I.T. et al. 2004: Physiological conditions influence individual arterial transfer function: implications for the reconstruction of central waveform characteristics. Heart, Lung and Circulation 13(S2), S67.

Hope, S.A., Meredith, I.T., Tay, D. et al. 2007a: 'Generalizability' of a radial-aortic transfer function for the derivation of central aortic waveform parameters. Journal of Hypertension 25, 1812–20.

Hope, S.A., Antonis, P., Adam, D. et al. 2007b: Arterial pulse wave velocity but not augmentation index is associated with coronary artery disease extent and severity: implications for arterial transfer function applicability. Journal of Hypertension 25, 2105–9.

Hopkins, K.D., Lehmann, E.D., Jones, R.L. et al. 1996: A family history of NIDDM is associated with decreased aortic distensibility in normal healthy young adult subjects. Diabetes Care 19(5), 501–3.

Hopkins, R.A., Hammon, J.W., Hale, P.A. et al. 1979: Pulmonary vascular impedance analysis of adaption to chronically elevated blood flow in the awake dog. Circulation Research 45, 267–74.

Hopkins, R.A., Hammon, J.W., Hale, P.A. et al. 1980: An analysis of the pulsatile hemodynamic responses of the pulmonary circulation to acute and chronic pulmonary venous hypertension in the awake dog. Circulation Research 47, 902–10.

Hopkins, R.W. 1991: Energy, poise, and resilience – Daniel Bernoulli, Thomas Young, J.L.M. Poiseuille, and F.A. Simeone. Journal of Vascular Surgery 13(6), 777–84.

Hoppe, H., Segall, J.A., Liem, T.K. et al. 2008: Aortic aneurysm sac pressure measurements after endovascular repair using an implantable remote sensor: initial experience and short-term follow-up. European Radiology 18(5), 957–65.

Hoppe, U.C., Vanderheyden, M., Sievert, H. et al. 2009: Chronic monitoring of pulmonary artery pressure in patients with severe heart failure: multicentre experience of the monitoring Pulmonary Artery Pressure by Implantable device Responding to Ultrasonic Signal (PAPIRUS) II study. Heart 95(13), 1091–7.

Hori, M., Inoue, M., Kitakaze, M. et al. 1985: Altered loading sequence as an underlying mechanism of afterload dependency of ventricular relaxation on the heart in situ. Japanese Circulation Journal 49, 245–54.

Horsfield, K. 1978: Morphometry of the small pulmonary arteries in man. Circulation Research 42, 593–7.

Hoskins, P.R. 1999a: A review of the measurement of blood velocity and related quantities using Doppler ultrasound. Proceedings of the Institute of Mechanical Engineers 213, 391–400.

Hoskins, P.R. 1999b: A comparison of single- and dual-beam methods for maximum velocity estimation. Ultrasound in Medicine and Biology 25, 583–92.

Hoskins, P.R., Fish, P.J., McDicken, W.N. and Moran, C. 1998: Developments in cardiovascular ultrasound. Part 2: arterial applications. Medical & Biological Engineering & Computing 36, 259–69.

Hosoda, K., Kawaguchi, T., Shibata, Y. et al. 2001: Cerebral vasoreactivity and internal carotid artery flow help to identify patients at risk for hyperperfusion after carotid endarterectomy. Stroke 32, 1567–73.

Hosokawa, S., Hiasa, Y., Tomokane, T. et al. 2006: The effects of atorvastatin on coronary endothelial function in patients with recent myocardial infarction. Clinical Cardiology 29(8), 357–62.

Hosokawa, S., Hiasa, Y., Miyazaki, S. et al. 2008: Effects of smoking cessation on coronary endothelial function in patients with recent myocardial infarction. International Journal of Cardiology 128(1), 48–52.

Hostetter, T.H., Rennke, H.C. and Brenner, B.M. 1982: The case for intrarenal hypertension in the initiation and progression of diabetic and other glomerulopathies. American Journal of Medicine 72, 375–80.

Hougaku, H., Fleg, J.L., Lakatta, E.G. et al. 2005: Effect of light-to-moderate alcohol consumption on age-associated arterial stiffening. American Journal of Cardiology 95, 1006–10.

Hrubec, Z. and Ryder, R.A. 1980: Traumatic limb amputations and subsequent mortality from cardiovascular disease and other causes. Journal of Chronic Diseases 33(4), 239–50.

Hsieh, K.Y., O'Rourke, M., Avolio, A. et al. 1989: Pressure wave contour in the ascending aorta of children – paradoxical similarity to the elderly. Australian and New Zealand Journal of Medicine 19(5), 555.

Htay, T. and Liu, M.W. 2005: Drug-eluting stent: a review and update. Vascular Health and Risk Management 1(4), 263–76.

Hu, C.T., Chang, H.R., Hsu, Y.H. et al. 2005: Ventricular hypertrophy and arterial hemodynamics following deprivation of nitric oxide in rats. Life Science 78(2), 164–73.

Hu, J., Jiang, X., Li, N. et al. 2009: Effects of salt substitute on pulse wave analysis among individuals at high cardiovascular risk in rural China: a randomized controlled trial Hypertension Research 32, 181–8.

Huang, P.-H., Huang, S.-S., Chen, Y.-H. et al. 2010: Increased circulating CD31+/annexin V+ apoptotic microparticles and decreased circulating endothelial progenitor cell levels in hypertensive patients with microalbuminuria. Journal of Hypertension 28, 1655–65.

Hueb, W., Lopis, N.H., Gersh, B.J. et al. 2007: Five-year follow-up of the medicine, angioplasty, or surgery study (MASS II): a randomized controlled clinical trial of 3 therapeutic strategies for multivessel coronary artery disease. Circulation 115, 1082–9.

Hueb, W., Soares, P.R., Gersh, B.J. et al. 2004: The medicine, angioplasty, or surgery study (MASS-II): a randomized, controlled clinical trial of three therapeutic strategies for multivessel coronary artery disease: one year results. Journal of the American College of Cardiology 443, 1743–51.

Huez, S., Brimioulle, S., Naeije, R. et al. 2004: Feasibility of routine pulmonary arterial impedance measurements in pulmonary hypertension. Chest 125(6), 2121–8.

Hugel, B., Martinez, M.C., Kunzelmann, C. et al. 2005: Membrane microparticles: two sides of the coin. Physiology 20, 22–7.

Hughes, D.J., Babbs, C.F., Geddes, L.A. et al. 1979: Measurements of Young's modulus of elasticity of the canine aorta with ultrasound. Ultrasound Imaging 1(4), 356–67.

Hughes, D.J., Fearnot, N.E., Babbs, C.F. et al. 1985: Continuous measurement of aortic radius change in vivo with an intra-aortic ultrasonic catheter. Medical and Biological Engineering and Computing 23, 197–202.

Hulsen, H.T., Nijdam, M.-E., Bos, W.-J. et al. 2006: Spurious systolic hypertension in young adults: prevalence of high brachial systolic blood pressure and low central pressure and its determinants. Journal of Hypertension 24, 1027–32.

Humbert, M. and McLaughlin, V.V. 2009: The 4th World Symposium on Pulmonary Hypertension. Journal of the American College of Cardiology 54, S1–2.

Hundley, W.G., Kitzman, D.W., Morgan, T.M. et al. 2001: Cardiac cycle-dependent changes in aortic area and distensibility are reduced in older patients with isolated diastolic heart failure and correlate with exercise intolerance. Journal of the American College of Cardiology 38, 796–802.

Hunter, K.S., Lee, P.F., Lanning, C.J. et al. 2008: Pulmonary vascular input impedance is a combined measure of pulmonary vascular resistance and stiffness and predicts clinical outcomes better than pulmonary vascular resistance alone in pediatric patients with pulmonary hypertension. American Heart Journal 155(1), 166–74.

Hunter, W.C. and Noordergraaf, A. 1976: Can impedance characterize the heart? Journal of Applied Physiology 40, 250–2.

Huntsman, L.L., Stewart, D.K., Barnes, S.R. et al. 1983: Noninvasive Doppler determination of cardiac output in man: clinical validation. Circulation 67, 593–602.

Huo, Y. and Kassab, G.S. 2006: Pulsatile blood flow in the entire coronary arterial tree: theory and experiment. American Journal of Physiology. Heart and Circulatory Physiology 291(3), H1074–87.

Huo, Y. and Ley, K. 2001: Adhesion molecules and atherogenesis. Acta Physiologica Scandinavica 173(1), 35–43.

Hurthle, K. 1920: Uber die Bezeihung zwischen Durchmesser und Wandstarke der Arterien nebst Schatzung des Anteils der einzelnen Gewebe am Aufbau der Wand. Pflugers Archiv für Die gesamte Physiologie 183, 253–70.

Hutchinson, P.J., Palmer, R.M. and Moncada, S. 1987: Comparative pharmacology of EDRF and nitric oxide on vascular strips. European Journal Pharmacology 141(3), 445–51.

Hwa, J., Richards, J.G., Huang, H. et al. 1993: The natural history of aortic dilatation in Marfan syndrome. Medical Journal of Australia 158, 558–62.

Hwa, J.J. and Bevan, J.A. 1986: Stretch-dependent (myogenic) tone in rabbit ear resistance arteries. American Journal of Physiology 250, H87–95.

Hwang, S., Shelkovnikov, S.A. and Purdy, R.E. 2007: Simulated microgravity effects on the rat carotid and femoral arteries: role of contractile protein expression and mechanical properties of the vessel wall. Journal of Applied Physiology 102(4), 1595–603.

Hyman, D.J. and Pavlik, V.N. 2001: Characteristics of patients with uncontrolled hypertension in the United States. New England Journal of Medicine 345, 479–86.

Iberall, A.S. 1967: Anatomy and steady flow characteristics of the arterial system. Mathematical Biosciences 1, 375–95.

Ibrahim, el-S.H., Johnson, K.R., Miller, A.B. et al. 2010: Measuring aortic pulse wave velocity using high-field cardiovascular magnetic resonance: comparison of techniques. Journal of Cardiovascular Magnetic Resonance 12(1), 26.

Ibsen, H., Olsen, M.H., Wachtell, K. et al. 2005: Reduction in albuminuria translates to reduction in cardiovascular events in hypertensive patients. Hypertension 45, 198–202.

Ichihara, A., Hayashi, M., Koura, Y. et al. 2003: Long-term effects of intensive blood-pressure lowering on arterial wall stiffness in hypertensive patients. American Journal of Hypertension 16(11 Pt 1), 959–65.

Ignarro, L.J., Byrns, R.E., Buga, G.M. et al. 1987: Endothelium-derived relaxing factor from pulmonary artery and vein possesses pharmacologic and chemical properties identical to those of nitric oxide radical. Circulation Research 61(6), 866–79.

Ignarro, L.J., Napoli, C. and Loscalzo, J. 2002: Nitric oxide donors and cardiovascular agents modulating the bioactivity of nitric oxide: an overview. Circulation Research 90(1), 21–8.

Ihlen, H., Amlie, J.P., Dale, J. et al. 1984: Determination of cardiac output by Doppler echocardiography. British Heart Journal 51, 54–60.

Iiyama, K., Nagano, M., Yo, Y. et al. 1996: Impaired endothelial function with essential hypertension assessed by ultrasonography. American Heart Journal 132(4), 779–82.

Ikeda, T., Gomi, T., Kobayashi, S. et al. 1994: Role of hypertension in asymptomatic cerebral lacunae in the elderly. Hypertension 23(suppl. I), 259–62.

Ikejima, H., Imanishi, T., Tsujioka, H. et al. 2008: Effects of telmisartan, a unique angiotensin receptor blocker with selective peroxisome proliferator-activated receptor-gamma-modulating activity, on nitric oxide bioavailability and atherosclerotic change. Journal of Hypertension 26(5), 964–72.

Ikonomidis, I., Aznaouridis, K., Protogerou, A. et al. 2006: Arterial wave reflections are associated with left ventricular diastolic dysfunction in Adamantiades-Behçet's disease. Journal of Cardiac Failure 12(6), 458–63.

Ikonomidis, I., Mazarakis, A., Papadopoulos, C. et al. 2007: Weight loss after bariatric surgery improves aortic elastic properties and left ventricular function in individuals with morbid obesity: a 3-year follow-up study. Journal of Hypertension 25, 439–47.

Ikonomidis, I., Lekakis, J., Papadopoulos, C. et al. 2008: Incremental value of pulse wave velocity in the determination of coronary microcirculatory dysfunction in never-treated patients with essential hypertension. American Journal of Hypertension 21(7), 806–13.

Iliopoulos, J. 2006: The aortic wrap procedure: a surgical method of treating age related aortic dilatation and stiffening. Sydney: St Vincent's Clinical School, University of New South Wales.

Imai, C., Muratani, H., Kimura, Y. et al. 1998: Effects of meal ingestion and active standing on blood pressure in patients more than or at 60 years of age. American Journal of Cardiology 81(11), 1310–14.

Imanishi, T., Han, D.K., Hofstra, L. et al. 2002: Apoptosis of vascular smooth muscle cells is induced by Fas ligand derived from monocytes/macrophage. Atherosclerosis 161(1), 143–51.

Imanishi, T., Tsujioka, H., Ikejima, H. et al. 2008a: Renin inhibitor aliskiren improves impaired nitric oxide bioavailability and protects against atherosclerotic changes. Hypertension 52(3), 563–72.

Imanishi, T., Ikejima, H., Tsujioka, H. et al. 2008b: Addition of eplerenone to an angiotensin-converting enzyme inhibitor effectively improves nitric oxide bioavailability. Hypertension 51(3), 734–41.

Imholz, B.P.M., van Montfrans, G.A., Settels, J.J. et al. 1988: Continuous noninvasive blood pressure monitoring: reliability of Finapres device during the Valsalva manoeuver. Cardiovascular Research 22, 390–7.

Imholz, B.P.M., Settels, J.J., van der Meiracker, A.H. et al. 1990a: Non-invasive continuous finger blood pressure measurement during orthostatic stress compared to intra-arterial pressure. Cardiovascular Research 24, 214–21.

Imholz, B.P., Dambrink, J.H., Karemaker, J.M. et al. 1990b: Orthostatic circulatory control in the elderly evaluated by non-invasive continuous blood pressure measurement. Clinical Science (London) 79(1), 73–9.

Imholz, B.P., Parati, G., Manciam, G. et al. 1992: Effects of graded vasoconstriction upon the measurement of finger arterial pressure. Journal of Hypertension 10(9), 979–84.

Imholz, B.P., Langewouters, G.J., van Montfrans, G.A. et al. 1993: Feasibility of ambulatory, continuous 24-hour finger arterial pressure recording. Hypertension 21(1), 65–73.

Imholz, B.P., Wieling, W., van Montfrans, G.A. and Wesseling, K.H. 1998: Fifteen years experience with finger arterial pressure monitoring: assessment of the technology. Cardiovascular Research 38(3), 605–16.

Imura, T., Yamamoto, K., Kanamori, K. et al. 1986: Non-invasive ultrasonic measurement of the elastic properties of the human abdominal aorta. Cardiovascular Research 20(3), 208–14.

Ingelsson, E., Pencina, M.J., Levy, D. et al. 2008: Aortic root diameter and longitudinal blood pressure tracking. Hypertension 52, 473–7.

Ingram, R.H., Szidon, J.P. and Fishman, A.P. 1970: Response of the main pulmonary artery of dogs to neuronally released versus bloodborne norepinephrine. Circulation Research 26, 249–62.

Inouye, A. and Kosaka, H. 1959: A study of new patterns in carotid and femoral arteries of rabbits and dogs with the electromagnetic flowmeter. Journal of Physiology 147, 209–20.

Inouye, A., Kuga, H. and Usui, G. 1955: A new method for recording pressure-flow diagrams applicable to peripheral blood vessels of animals and its application. Japanese Journal Physiology 15, 236–49.

Ioannou, C.V., Morel, D.R., Katsamouris, A.N. et al. 2009: Left ventricle hypertrophy induced by reduced aortic compliance. Journal of Vascular Research 46, 417–25.

Iooss, B., Lhuillier, C. and Jeanneau, H. 2002: Numerical simulation of transit-time ultrasonic flowmeters: uncertainties due to flow profile and fluid turbulence. Ultrasonics 40(9), 1009–15.

Irace, C., Ceravolo, R., Notarangelo, L. et al. 2001: Comparison of endothelial function evaluated by strain gauge plethysmography and brachial artery ultrasound. Atherosclerosis 158(1), 53–9.

ISH Writing Group. 2003: ISH Statement on blood pressure lowering and stroke prevention. Journal of Hypertension 21, 651–63.

Ishide, N., Shimizu, Y., Maruyama, Y. et al. 1980: Effects of changes in the aortic input impedance on systolic pressure-ejected volume relationships in the isolated supported canine left ventricle. Cardiovascular Research 14, 229–43.

Ishihara, F., Jiramatsu, K., Shigematsu, S. et al. 1992a: Role of adrenal androgens in the development of arteriosclerosis as judged by pulse wave velocity and calcification of the aorta. Cardiology 80, 332–8.

Ishihara, M., Sato, H., Tateishi, H. et al. 1992b: Effects of intraaortic balloon pumping on coronary hemodynamics after coronary angioplasty in patients with acute myocardial infarction. American Heart Journal 124, 1133–8.

Ishikawa, T., Hashimoto, J., Morito, R.H. et al. 2008: Association of microalbuminuria with brachial-ankle pulse wave velocity: the Ohasama study. American Journal of Hypertension 21, 413–18.

Isner, J.M., Estes, N.A.M., Thompson, P.D. et al. 1985: Cardiac consequences of cocaine. Circulation 72(suppl. 30), 111–15.

Isner, J., Estes, N.A.M., Thompson, P.D. et al. 1986: Acute cardiac events temporally related to cocaine abuse. New England Journal of Medicine 315, 1438–43.

Isner, J.M., Rosenfield, K., Losordo, D.W. et al. 1991: Combination balloon-ultrasound imaging catheter for percutaneous transluminal angioplasty: validation of imaging, analysis of re-coil, and identification of plaque fracture. Circulation 84, 739–54.

Isogai, Y., Yokose, T., Maeda, T. et al. 1984: The OP-Rheometer system, a new device for analysis of viscosity and viscoelasticity of blood, description and clinical application. Biorheology 1(suppl), 35–41.

Isoyama, S., Maruyama, Y., Ashikawa, K. et al. 1983: Effects of afterload reduction on global left ventricular and regional myocardial functions in the isolated canine heart with stenosis of a coronary arterial branch. Circulation 67, 139–47.

Isselbacher, E. 2001: Diseases of the aorta in heart disease. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease, 6th edn. Philadelphia: Saunders, pp. 1422–56.

Isselbacher, E.M. 2005: Thoracic and abdominal aortic aneurysms. Circulation 111(6), 816–28.

Isselbacher, E.M. 2007: Dissection of the descending thoracic aorta: looking into the future. Journal of the American College of Cardiology 50, 805–7.

Ito, S., Nagasawa, T., Abe, M. et al. 2009: Strain vessel hypothesis: a viewpoint for linkage of albuminuria and cerebro-cardiovascular risk. Hypertension Research 32, 115–21.

Itoh, S., Umemoto, S., Hiromoto, M. et al. 2002: Importance of NAD(P)H oxidase-mediated oxidative stress and contractile type smooth muscle myosin heavy chain SM2 at the early stage of atherosclerosis. Circulation 105(19), 2288–95.

Iversen, H.K., Nielsen, T.H., Olesen, J. et al. 1990: Arterial responses during migraine headache. Lancet 336, 837–9.

Iwanaga, S., Ewing, S.G. and Husseini, W.K. 1995: Changes in contractility and afterload have only slight effects on subendocardial systolic flow impediment. American Journal of Physiology 269, H1202–12.

Izzard, A.S. and Heagerty, A.M. 1995: Hypertension and the vasculature: arterioles and the myogenic response. Journal of Hypertension 13, 1–4.

Izzo, J.L. 2001: Aging and systolic hypertension, cluster patterns and problem-solving strategies to answer the genetic riddle (Editorial commentary). Hypertension 37, 1067–8.

Izzo, J.L. Jr., Levy, D. and Black, H.R. 2000: Importance of systolic blood pressure in older Americans. Hypertension 35, 1021–4.

Izzo, J.L., Manning, T.S. and Shykoff, B.E. 2001: Office blood pressures, arterial compliance characteristics and estimated cardiac load. Hypertension 38, 1467–70.

Jackson, A.C. and Vinegar, A. 1979: A technique for measuring frequency response of pressure, volume, and now transducers. Journal of Applied Physiology 47, 462–7.

Jackson, G. 2010: Testosterone deficiency syndrome (TDS) and the heart. European Heart Journal 31, 1436–7.

Jacob, M.P. 2003: Extracellular matrix remodeling and matrix metalloproteinases in the vascular wall during aging and in pathological conditions. Biomedicine and Pharmacotherapy 57(5–6), 195–202.

Jacob, M.P. 2006: [Extracellular matrix and vascular ageing]. Medical Science 22(3), 273–8.

Jacobs, A.K., Antman, E.M., Faxon, D.P. et al. 2007: Development of systems of care for ST-elevation myocardial infarction patients: Executive Summary. Circulation 116, 217–30.

Jacobs, R., Killiam, H., Barefoot, C. et al. 1972: Human application of a catheter with tip-mounted pressure and flow transducers. Review of Surgery 29, 149–52.

Jagomagi, K., Raamat, R. and Talts, J. 2001: Effect of altering vasoactivity on the measurement of finger blood pressure. Blood Press Monitoring 6(1), 33–40.

Jagomagi, K., Raamat, R., Talts, J. et al. 2003: Portapres and differential oscillometric finger blood pressure changes during deep breathing test in the assessment of BRS index. Clinical Physiology and Functional Imaging 23(1), 9–13.

Jamerson, K., Weber, M.A., Bakris, G.L. et al. 2008: Benazepril plus amlodipine or hydrochlorothiazide for hypertension in high-hisk patients. New England Journal of Medicine 359, 2417–28.

James, F.W. and Kaplan, S. 1974: Systolic hypertension during submaximal exercise after correction of coarctation of aorta. Circulation 50(suppl. 2), 27–34.

Jani, B. and Rajkumar, C. 2006: Ageing and vascular ageing. Postgraduate Medical Journal 82(968), 357–62.

Janicki, J.S. and Patel, D.J. 1968: A force gauge for measurement of longitudinal stresses in a blood vessel in situ. Journal of Biomechanics 1, 19–21.

Jankowski, P., Kawecka-Jaszcz, K., Bryniarski, L. et al. 2004: Fractional diastolic and systolic pressure in the ascending aorta are related to the extent of coronary artery disease. American Journal of Hypertension 17, 641–6.

Jankowski, P., Kawecka-Jaszcz, K., Czarnecka, D. et al. 2008: Aortic Blood Pressure and Survival Study Group. 2008: Pulsatile but not steady component of blood pressure predicts cardiovascular events in coronary patients. Hypertension 51, 848–55.

Janner, J.H., Godtfredsen, N.S., Ladelund, S. et al. 2010: Aortic augmentation index: reference values in a large unselected population by means of the SphygmoCor device. American Journal of Hypertension 23, 180–5.

Jansen, J.R., Schreuder, J.J., Mulier, J.P. et al. 2001: A comparison of cardiac output derived from the arterial pressure wave against thermodilution in cardiac surgery patients. British Journal of Anaesthesia 87(2), 212–22.

Jarauta, E., Mateo-Gallego, R., Bea, A. et al. 2010: Carotid intima-media thickness in subjects with no cardiovascular risk factors. Revista Española de Cardiología 63(1), 97–102.

Jarisch, A. 1928: Kreislauffragen. Deutsche Medizinische Wochenschrift 29, 1211–3.

Jaron, D., Moore, T.W. and He, P. 1983: Theoretical considerations regarding the optimization of cardiac assistance by intraaortic balloon pumping. IEEE Transactions Biomedical Engineering 30(3), 177–85.

Jatoi, N.A., Jerrard-Dunne, P., Feely, J. et al. 2007: Impact of smoking and smoking cessation on arterial stiffness and aortic wave reflection in hypertension. Hypertension 49(5), 981–5.

Jatoi, N.A., Mahmud, A., Bennett, K. et al. 2009: Assessment of arterial stiffness in hypertension: comparison of oscillometric (Arteriograph), piezoelectronic (Complior) and tonometric (SphygmoCor) techniques. Journal of Hypertension 27, 2186–91.

Jegger, D., da Silva, R., Jeanrenaud, X. et al. 2006: Ventricular-arterial coupling in a rat model of reduced arterial compliance provoked by hypervitaminosis D and nicotine. American Journal of Physiology. Heart and Circulatory Physiology 291(4), H1942–51.

Jegger, D., da Silva, R.F., Lartaud, I. et al. 2007: Effects of an aging vascular model on healthy and diseased hearts. American Journal of Physiology. Heart and Circulatory Physiology 293(3), H1334–43.

Jellema, W.T., Wesseling, K.H., Groeneveld, A.B. et al. 1999: Continuous cardiac output in septic shock by simulating a model of the aortic input impedance: a comparison with bolus injection thermodilution. Anesthesiology 90(5), 1317–28.

Jennings, G.L.R. 1995: Mechanisms for reduction of cardiovascular risk by regular exercise. Clinical and Experimental Pharmacology and Physiology 22, 209–11.

Jensen, J.A. 1993a: Range/velocity limitations for time-domain velocity estimation. Ultrasound in Medicine and Biology 19, 741–9.

Jensen, J.A. 1993b: Stationary echo canceling in velocity estimation by time-domain cross-correlation. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 12, 471–7.

Jensen, J.A. 1993c: Implementation of ultrasound time-domain cross-correlation blood velocity estimators. IEEE Transactions on Biomedical Engineering 40, 468–74.

Jensen, L.O., Thayssen, P., Thuesen, L. et al. 2007: Influence of a pressure gradient distal to implanted bare-metal stent on in-stent restenosis after percutaneous coronary intervention. Circulation 116(24), 2802–8.

Jeremy, R.W., Huang, H., Hwa, J. et al. 1994: Relation between age, arterial distensibility, and aortic dilatation in the Marfan Syndrome. American Journal of Cardiology 74, 369–73.

Jessup, M. 2001: Mechanical cardiac-support devices – dreams and devilish details. New England Journal of Medicine 345(20), 1490–93.

Jessup, M. 2003: The less familiar face of heart failure. Journal of the American College of Cardiology 41, 224–6.

Jessup, M. and Brozena, S. 2003: Heart failure. New England Journal of Medicine 348, 2007–18.

Jessup, M., Abraham, W.T., Casey, D.E. et al. 2009: 2009 Focused Update: ACCF/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Circulation 119, 1977–2016.

Jhund, P.S., MacIntyre, K., Simpson, C.R. et al. 2009: Long-term trends in first hospitalization for heart failure and subsequent survival between 1986 and 2003: a population study of 5.1 million people. Circulation 119, 515–23.

Jiang, B., Liu, B., McNeill, K.L. et al. 2008: Measurement of pulse wave velocity using pulse wave Doppler ultrasound: comparison with arterial tonometry. Ultrasound in Medicine and Biology 34(3), 509–12.

Jiang, M.T., Moffat, M.P. and Narayanan, N. 1993: Age-related alterations in the phosphorylation of sarcoplasmic reticulum and myofibrillar proteins and diminished contractile response to isoproterenol in intact rat ventricle. Circulation Research 72(1), 102–11.

Jiang, X.J., O'Rourke, M.F., Jin, W. et al. 2002: Quantification of glyceryl trinitrate effect through analysis of the synthesised ascending aortic pressure waveform. Heart 88, 143–8.

Jiang, X.-J., O'Rourke, M.F., Zhang, Y.-Q. et al. 2007: Superior effect of an angiotensin-converting enzyme inhibitor over a diuretic for reducing aortic systolic pressure. Journal of Hypertension 25, 1095–9.

Joannides, R., Haefeli, W.E., Linder, L. et al. 1995: Nitric oxide is responsible for flow-dependent dilatation of human peripheral conduit arteries in vivo. Circulation 91, 1314–9.

Joannides, R., Bakkali, E.H., Le Roy, F. et al. 1997: Altered flow-dependent vasodilatation of conduit arteries in maintenance haemodialysis. Nephrology Dialysis Transplantation 12, 2623–8.

Jochim, K.E. 1948: Electromagnetic flowmeter. Methods in Medical Research 1, 108–15.

Johnson, E.L., Yock, P.G., Hargrave, V.K. et al. 1989: Assessment of severity of coronary stenoses using a Doppler catheter – validation of a method based on the continuity equation. Circulation 80, 625–35.

Johnson, H.M., Gossett, L.K., Piper, M.E. et al. 2010: Effects of smoking and smoking cessation on endothelial function: 1-year outcomes from a randomized clinical trial. Journal of the American College of Cardiology 55, 1988–95.

Johnson, P.C. 1969: Hemodynamics. Annual Review of Physiology 31, 331–52.

Johnson, P.C. and Intaglietta, M. 1976: Contributions of pressure and flow sensitivity to autoregulation in mesenteric arterioles. American Journal of Physiology 231, 1686–98.

Johnson, W., Omland, T., Hall, C. et al. 2002: Neurohormonal activation rapidly decreases after intravenous therapy with diuretics and vasodilators for class IV heart failure. Journal of the American College of Cardiology 39, 1623–9.

Johnston, K.W., Maruzzo, B.C., Kassam, M. et al. 1981: Methods for obtaining, processing and quantifying Doppler blood velocity waveforms. In: Nicolaides, A.N. and Yao, J.S.T. (eds), Investigation of vascular disorders. New York: Churchill Livingstone, pp. 532–58.

Joly, L., Perret-Guillaume, C., Kearney-Schwartz, A. et al. 2009: Pulse wave velocity assessment by external noninvasive devices and phase-contrast magnetic resonance imaging in the obese. Hypertension 54, 421–6.

Jondeau, G., Boutouyrie, P., Lacolley, P. et al. 1999: Central pulse pressure is a major determinant of ascending aorta dilatation in Marfan syndrome. Circulation 99, 2677–81.

Jones, C.J., Singer, D.R., Watkins, N.V. et al. 1990: Abnormal arterial flow pattern in untreated essential hypertension: possible link with the development of atherosclerosis. Clinical Science 78, 431–5.

Jones, D.W. and Hall, J.E. 2004: 7th report of the JNC on prevention, detection, evaluation, and treatment of high blood pressure and evidence from new hypertension trials. Hypertension 43, 1–3.

Jones, D.W., Appel, L.J., Sheps, S.G. et al. 2003: Measuring blood pressure accurately: new and persistent challenges. Journal of the American Medical Association 289(8), 1027–30.

Jones, W.B. and Griffin, J.B. 1962: Comparison of computed aortic blood velocity with that of electromagnetic flowmeter. Journal of Applied Physiology 17, 482–6.

Jones, W.B. and Reeves, T.J. 1968: Total cardiac output response during four minutes of exercise. American Heart Journal 76, 209–16.

Jones, W.B., Hefner, L.L., Bancroft, J.R. et al. 1959: Velocity of blood flow and stroke volume obtained from the pressure pulse. Journal of Clinical Investigation 38, 2087–90.

Jones, W.B., Russell, R.O. Jr. and Dalton, D.H. 1966: An evaluation of computed stroke volume in man. American Heart Journal 72, 746–50.

Joukowsky, N. 1898: Über den hydraulischen Stoss in Wasserleitungsröhren (On the hydraulic hammer in water supply pipes.) Mémoires de l'Académie Impériale des Sciences de St Pétersbourg (1900), Series 8 9(5), 1–71.

Jourdain, P., Jondeau, G., Funck, F. et al. 2007: Plasma brain natriuretic peptide-guided therapy to improve outcome in heart failure: the STARS-BNP Multicenter Study. Journal of the American College of Cardiology 49, 1733–9.

Jousilahti, P., Tuomilehto, J., Vartiainen, E. et al. 2000: Relation of adult height to cause-specific and total mortality: a prospective follow-up study of 31,199 middle-aged men and women in Finland. American Journal of Epidemiology 151(11), 1112–20.

Jude, B., Agraou, B., McFadden, E.P. et al. 1994: Evidence for time-dependent activation of monocytes in the systemic circulation in unstable angina but not in acute myocardial infarction or in stable angina. Circulation 90, 1662–8.

Jugdutt, B.I., Michorowski, B.L. and Kappagoda, C.T. 1988: Exercise training after anterior Q wave myocardial infarction: importance of regional left ventricular function and topography. Journal of the American College of Cardiology 12, 362–72.

Julien, C. 2006: The enigma of Mayer waves: facts and models. Cardiovascular Research 70(1), 12–21.

Julius, S., Amery, A., Whitlock, L.S. et al. 1967: Influence of age on the hemodynamic response to exercise. Circulation 36(2), 222–30.

Jung, A.D., Kim, W., Park, S.H. et al. 2009: The effect of telmisartan on endothelial function and arterial stiffness in patients with essential hypertension. Korean Circulation Journal 39(5), 180–4.

Junker, R., Heinrich, J., Ulbrich, H. et al. 1998: Relationship between plasma viscosity and the severity of coronary heart disease. Arteriosclerosis, Thrombosis, and Vascular Biology 18(6), 870–5.

Junyent, M., Zambon, D., Gilabert, R. et al. 2008: Carotid atherosclerosis and vascular age in the assessment of coronary heart disease risk beyond the Framingham Risk Score. Atherosclerosis 196, 803–9.

Juonala, M., Kahonen, M., Laitinen, T. et al. 2008: Effect of age and sex on carotid intima-media thickness, elasticity and brachial endothelial function in healthy adults: the cardiovascular risk in Young Finns Study. European Heart Journal 29, 1198–206.

Kaesemeyer, W.H., Caldwell, R.B., Huang., J. et al. 1999: Pravastatin sodium activates endothelial nitric oxide synthase independent of its cholesterol-lowering actions. Journal of the American College of Cardiology 33(1), 234–41.

Kallio, K., Jokinen, E., Raitakari, O.T. et al. 2007: Tobacco smoke exposure is associated with attenuated endothelial function in 11-year-old healthy children. Circulation 115(25), 3205–12.

Kalliokoski, R.J., Kalliokoski, K.K., Penttinen, M. et al. 2006: Structural and functional changes in peripheral vasculature of Fabry patients. Journal of Inherited Metabolic Disease 29(5), 660–6.

Kalmanson, D., Veyrat, C. and Chiche, C. 1970: Venous return disturbances produced by arrhythmias. Cardiovascular Research 4, 279–90.

Kalmanson, D., Veyrat, C. and Chiche, P. 1968: Aspects morphologiqués de L'onde de flux arteriel enregistrée par voie transcutanee chez le sujet normal. Bulletins et Memoires de la Societé Medicale des Hôpitaux de Paris 119, 2–10.

Kalmanson, D., Veyret, C., Derai, C. et al. 1972: Non-invasive technique for diagnosing atrial septal defect and assessing shunt volume using directional Doppler ultrasound. Correlations with phasic flow velocity patterns of the shunt. British Heart Journal 34, 981–91.

Kamath, S.A., Drazner, M.H., Tasissa, G. et al. 2009: Correlation of impedance cardiography with invasive hemodynamic measurements in patients with advanced heart failure: the BioImpedance CardioGraphy (BIG) substudy of the Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE) Trial. American Heart Journal 158(2), 217–23.

Kameyama, T., Asanoi, H., Ishizaka, S. et al. 1991: Ventricular load optimization by unloading therapy in patients with heart failure. Journal of the American College of Cardiology 17, 199–207.

Kamiya, A., Bukhari, R., Togawa, T. et al. 1984: Adaptive regulation of wall shear stress optimizing vascular tree function. Bulletin of Mathematical Biology 46, 127–37.

Kampus, P., Kals, J., Ristimae, T. et al. 2004: High sensitivity C-reactive protein affects central hemodynamics and augmentation index in apparently healthy persons. Journal of Hypertension 22, 1133–9.

Kang, C.-K., Park, C.-A., Lee, H et al. 2009: Hypertension correlates with lenticulostriate arteries visualized by 7T magnetic resonance angiography. Hypertension 54, 1050–6.

Kannel, W.B. 1985: Hypertension and aging. In: Finch, C.E. and Schneider, E.L. (eds), The biology of aging, 2nd edn. New York: Van Nostrand Reinhold, pp. 859–77.

Kannel, W.B. and Gordon, T. 1978: Evaluation of cardiovascular risk in the elderly: the Framingham study. Bulletin of the New York Academy of Medicine 54(6), 573–91.

Kannel, W.B. 1999: Historic perspectives on the relative contributions of diastolic and systolic blood pressure elevation to cardiovascular risk profile. American Heart Journal 138(3 pt 2), 205–10.

Kannel, W.B. and Belanger, A.J. 1991: Epidemiology of heart failure. American Heart Journal 121, 951–7.

Kannel, W.B., Gordon, T. and Schwartz, M.J. 1971: Systolic versus diastolic blood pressure and risk of coronary heart disease. The Framingham study. American Journal of the Cardiology 27(4), 335–46.

Kannel, W.B., Caslelli, W.P., McNamara, P.M. et al. 1972: Role of blood pressure in development of congestive heart failure. The Framingham Study. New England Journal of Medicine 287, 781–7.

Kannel, W.B., Dawber, T.R. and McGee, D.L. 1980a: Perspectives on systolic hypertension. The Framingham study. Circulation 61(6), 1179–82.

Kannel, W.B., Sorlie, P., Castelli, W.P. et al. 1980b: Blood pressure and survival after myocardial infarction: the Framingham study. American Journal of Cardiology 45(2), 326–30.

Kannel, W.B., Wolf, P.A., McGee, D.L. et al. 1981: Systolic blood pressure, arterial rigidity and risk of stroke, the Framingham study. JAMA 245, 1225–29.

Kannel, W.B., Wolf, P.A., Castelli, W.P. et al. 1987: Fibrinogen and risk of cardiovascular disease. The Framingham Study. JAMA 258(9), 1183–6.

Kannel, W.B., Vasan, R.S. and Levy, D. 2003: Is the relation of systolic blood pressure to risk of cardiovascular disease continuous and graded, or are there critical values? Hypertension, 42(4), 453–6.

Kanters, S.D., Elgersma, O.E., Banga, J.D et al. 1998: Reproducibility of measurements of intima-media thickness and distensibility in the common carotid artery. European Journal of Vascular and Endovascular Surgery 16, 28–35.

Kantor, P.F., Abraham, J.R., Dipchand, A.I. et al. 2010: The impact of changing medical therapy on transplantation-free survival in pediatric dilated cardiomyopathy. Journal of the American College of Cardiology 55, 1377–84.

Kantrowitz, A. and Kantrowitz, A. 1953: Experimental augmentation of coronary flow by retardation of the arterial pressure pulse. Surgery 34, 678–87.

Kantrowitz, A., Tjonneland, S. and Freed, P.S. 1968: Initial clinical experience with intra-aortic balloon pumping in cardiogenic shock. Journal of the American Medical Association 203, 113–8.

Kanyanta, V. and Ivankovic, A. 2010: Historic perspectives on the relative contributions of diastolic and systolic blood pressure elevation to cardiovascular risk profile. Journal of the Mechanical Behavior of Biomedical Materials 3, 51–62.

Kapal, E., Martini, F. and Wetterer, E. 1951: Uber die Zuverlassigkeit der bisherigen Bestimmungsart der Pulswellen geschwindigkeit. Zeitschrift der Biologie 104, 75–86.

Kaplan, N.M. 1992: Commentary on 'Blood pressure and fitness for work' by Michael B. Murphy. American Journal of Hypertension 5, 335.

Kaplan, N.M. 1994: Clinical hypertension, 6th edn. Baltimore: Williams and Wilkins.

Kaplan, N.M. 1998: Commentary on the sixth report of the Joint National Committee (JNC-6). American Journal of Hypertension 11, 134–6.

Kapuku, G.K., Seto, S., Mori, H. et al. 1993: Reversal of diastolic dysfunction in borderline hypertension by long-term medical treatment. Longitudinal evaluation by pulsed Doppler echocardiography. American Journal of Hypertension 6(7 pt1), 547–53.

Karalliedde, J., Smith, A., DeAngelis, L. et al. 2008: Valsartan improves arterial stiffness in type 2 diabetes independently of blood pressure lowering. Hypertension 51, 1617–23.

Karamanoglu, M., 1992: Simulation, Measurement and Analysis of the Propagating Pressure Pulse in the Human Arterial System. PhD thesis, University of New South Wales, Australia.

Karamanoglu, M. and Bennett, T.D. 2006: A right ventricular pressure waveform based pulse contour cardiac output algorithm in canines. Cardiovascular Engineering 6(3), 83–92.

Karamanoglu, M., O'Rourke, M.F., Avolio, A.P. et al. 1993: An analysis of the relationship between central aortic and peripheral upper limb pressure waves in man. European Heart Journal 14, 160–7.

Karamanoglu, M., Gallagher, D., Avolio, A.P. et al. 1994: Functional origin of reflected pressure waves in a multibranched model of the human arterial system. American Journal of Physiology 267, H1681–H1688.

Karamanoglu, M., Gallagher, D.E., Avolio, A.P. et al. 1995: Pressure wave propagation in a multibranched model of the human upper limb. American Journal of Physiology 269, H1363–9.

Karatzi, K.N., Papamichael, C.M., Karatzis, E.N. et al. 2005: Red wine acutely induces favorable effects on wave reflections and central pressures in coronary artery disease patients. American Journal of Hypertension 18(9 Pt 1), 1161–7.

Karatzi, K., Papamichael, C., Karatzis, E. et al. 2008: Postprandial improvement of endothelial function by red wine and olive oil antioxidants: a synergistic effect of components of the Mediterranean diet. Journal of the American College of Nutrition 27(4), 448–53.

Karatzi, K., Papaioannou, T.G., Papamichael, C. et al. 2009: Red wine, arterial stiffness and central hemodynamics. Current Pharmaceutical Design 15(3), 321–8.

Karch, S.B. and Billingham, M.E. 1995: Coronary artery and peripheral vascular disease in cocaine users. Coronary Artery Disease 6(3), 220–5.

Karreman, G. 1952: Some contributions to the mathematical biology of blood circulation: reflections of pressure waves in the arterial system. Bulletin of Mathematical Biology 14, 327–50.

Karsch, K.R., Hofmann, M., Rentrop, K.P. et al. 1983: Thrombolysis in acute experimental myocardial infarction. Journal of the American College of Cardiology 1(2 Pt 1), 427–35.

Kasai, C., Namekawa, K., Koyano, A. and Omoto, R. 1985: Real-time two-dimensional blood flow imaging using an autocorrelation technique. IEEE Transactions on Sonics and Ultrasonics SU-32, 458–64.

Kasai, C., Namekawa, K., Koyano, A. et al. 1985: Real-time two-dimensional blood flow imaging using an autocorrelation technique. IEEE Transactions in Sonics and Ultrasonics 32, 458–63.

Kasner, M., Westermann, D., Steendijk, P. et al. 2007: Utility of Doppler echocardiography and tissue Doppler imaging in the estimation of diastolic function in heart failure with normal ejection fraction: a comparative Dopper-conductance catheterization study. Circulation 116, 637–47.

Kass, D.A. 2005: Ventricular arterial stiffening: integrating the pathophysiology. Hypertension 46(1), 185–93.
Kass, D.A. 2007a: Highlighting the R in CRT. Circulation 116, 1434–6.
Kass, D.A. 2008: Mechanical dys-synchrony in congestive heart failure. Journal of the American College of Cardiology 51, 12–17.
Kass, D.A. and Kelly, R.P. 1992: Ventriculo-arterial coupling: concepts, assumptions, and applications. Annals of Biomedical Engineering 20, 41–62.
Kass, D.A., Saeki, A., Tunin, R.S. et al. 1996: Adverse influence of systemic vascular stiffening on cardiac dysfunction and adaptation to acute coronary occlusion. Circulation 93(8), 1533–41.
Kass, D.A., Chen, C.H., Nevo, E. et al. 1998: Estimation of central aortic pressure waveform by mathematical transformation of radial tonometry pressure data (Response). Circulation 98, 186–87.
Kass, D.A., Chen, C.H., Curry, C. et al. 1999: Improved left ventricular mechanics from acute VVD pacing in patients with dilated cardiomyopathy and ventricular conduction delay. Circulation 99, 1567–73.
Kass, D.A., Shapiro, E.P., Kawaguchi, M. et al. 2001: Improved arterial compliance by a novel advanced glycation end-product crosslink breaker. Circulation 104, 1464–70.
Kassab, G.S. 2006: Scaling laws of vascular trees: of form and function. American Journal of Physiology, Heart and Circulatory Physiology 290, H894–903.
Kassab, G.S. and Fung, Y.C. 1995: The pattern of coronary arteriolar bifurcations and the uniform shear hypothesis. Annals of Biomedical Engineering 23, 13–20.
Kastelein, J.J. and De Groot, E. 2008: Ultrasound imaging techniques for the evaluation of cardiovascular therapies. European Heart Journal 29, 849–58.
Kastelein, J.J., Akdim, F., Stroes, E.S. et al. ENHANCE Investigators. 2008: Simvastatin with or without ezetimibe in familial hypercholesterolemia. New England Journal of Medicine 358, 1431–43.
Kastelein, J.J., van Leuven, S.I., Burgess, L. et al. RADIANCE 1 Investigators. 2007: Effect of torcetrapib on carotid atherosclerosis in familial hypercholesterolemia. New England Journal of Medicine 356, 1620–30.
Kato, H., Akagi, T., Sugimura, T. et al. 1995: Kawasaki disease. Coronary Artery Disease 63(3), 194–206.
Katritsis, D., Kaiktsis, L., Chaniotis, A. et al. 2007: Wall shear stress: theoretical considerations and methods of measurement. Progress in Cardiovascular Diseases 49(5), 307–29.
Katsuda, S., Machida, N., Hasegawa, M. et al. 2004: Change in the static rheological properties of the aorta in Kurosawa and Kusanagi-hypercholesterolemic (KHC) rabbits with progress of atherosclerosis. Physiological Measurement 25(2), 205–22.
Katsuda, S., Miyashita, H., Takazawa, K. et al. 2006: Mild hypertension in young Kurosawa and Kusanagi-hypercholesterolaemic (KHC) rabbits. Physiological Measurement 27(12), 1361–71.
Katz, A.M. 1990: Cardiomyopathy of overload. New England Journal of Medicine 322(2), 100–10.
Katz, A.M. 1998: Regression of left ventricular hypertrophy; new hope for dying hearts (Editorial). Circulation 98, 623–4.
Katz, A.M. 2002: Ernest Henry Starling, his predecessors, and the 'Law of the Heart'. Circulation 106(23), 2986–92.
Katz, L.N. 1931: Observations on the external work of the isolated turtle heart. American Journal of Physiology 99, 579–97.
Katz, S.D., Biasucci, L., Sabba, C. et al. 1992: Impaired endothelium-mediated vasodilation in the peripheral vasculature of patients with congestive heart failure. Journal of the American College of Cardiology 19(5), 918–25.
Katz, S.D., Balidemaj, K., Homma, S. et al. 2000: Acute type 5 phosphodiesterase inhibition with sildenafil enhances flow-mediated vasodilation in patients with chronic heart failure. Journal of the American College of Cardiology 36(3), 845–51.
Kaufmann, W. 1963: Fluid mechanics (trans. Chilton, E.G.) New York: McGraw-Hill.
Kawaguchi, M., Hay, I., Fetics, B. et al. 2003: Combined ventricular systolic and arterial stiffening in patients with heart failure and preserved ejection fraction. Implications for systolic and diastolic reserve limitations. Circulation 107, 714–20.
Kawai, C. 1995: Overview: Non-atherosclerotic causes of coronary artery disease. Coronary Artery Disease 6(3), 185–6.
Kawano, H. and Ogawa, H. 2005: Endothelial function and coronary spastic angina. Internal Medicine 44(2), 91–9.
Kawasaki, T., Sasayama, S., Yagi, S. et al. 1987: Non-invasive assessment of the age related changes in stiffness of major branches of the human arteries. Cardiovascular Research 21, 678–87.
Kawasaki, T., Fukuda, S., Shimada, K. et al. 2009: Direct measurement of wall stiffness for carotid arteries by ultrasound strain imaging. Journal of the American Society of Echocardiography 22(12), 1389–95.
Kawecka-Jaszcz, K., Czarnecka, D., Olszanecka, A. et al. 2002: The effect of hormone replacement therapy on arterial blood pressure and vascular compliance in postmenopausal women with arterial hypertension. Journal of Human Hypertension 16, 509–16.
Keane, M.G. and Pyeritz, R.E. 2008: Medical management of Marfan syndrome. Circulation 117, 2802–13.
Kearney, P.M., Whelton, M., Reynolds, K. et al. 2005: Global burden of hypertension: analysis of worldwide data. Lancet 365, 217–23.
Kearney-Schwartz, A., Rossignol, P., Bracard, S. et al. 2009: Vascular structure and function is correlated to cognitive performance and white matter hyperintensities in older hypertensive patients with subjective memory complaints. Stroke 40, 1229–36.
Keith, J.D. 1978: Coarctation of the aorta. In: Keith, J.D., Rowe, D. and Vlad, P. (eds), Heart disease in infancy and childhood. New York: Macmillan, pp. 736–60.
Kelly, R.P. 1992: The pharmacologic potential for reversing the ill-effects of aging and arterial hypertension on the central arterial pulse. Journal of Hypertension 10(suppl. 6), S97–100.
Kelly, R. and Fitchett, D. 1992: Noninvasive determination of aortic input impedance and external left ventricular power output: a validation and repeatability study of a new technique. Journal of the American College of Cardiology 20, 952–63.
Kelly, R. and Kass, D. 1992a: Effect of increased pulsatile load on diastolic function. Circulation 86, 1–554.
Kelly, R. and Kass, D. 1992b: Effect of reduced aortic compliance on cardiac efficiency and contractile function in situ. Heart and Vessels 8, 32.
Kelly, R.P., Hayward, C.S., Avolio, A.P. et al. 1987: Non-invasive study of the arterial pulse in man, utilizing high fidelity pressure transducers and applanation tonometry. Australian and New Zealand Journal of Medicine 17(suppl. 2), 569.
Kelly, R., Hayward, C., Avolio, A. et al. 1988a: Non-invasive registration of the arterial pressure pulse waveform using high-fidelity applanation tonometry. Federation Proceedings FASEB Journal 2(4), A316.
Kelly, R.P., Hayward, C.S., Winter, D. et al. 1988b: Non-invasive determination of aging changes in the arterial pulse. FASEB Journal 2, A317.
Kelly, R., Hayward, C., Avolio, A. et al. 1989a: Noninvasive determination of age-related changes in the human arterial pulse. Circulation 80, 1652–9.
Kelly, R., Karamanoglu, M., Gibbs, H. et al. 1989b: Non-invasive carotid pressure wave registration as an indicator of ascending aortic pressure. Journal of Vascular Medicine and Biology 1, 241–7.
Kelly, R., Gibbs, H., Morgan, J. et al. 1989c: Brachial artery pressure measurements underestimate beneficial effects of nitroglycerin on left ventricular afterload. Journal of the American College of Cardiology 13(2), 231A.
Kelly, R., Daley, J., Avolio, A. et al. 1989d: Arterial dilation and reduced wave reflection: benefit of dilevanol in hypertension. Hypertension 14, 14–21.
Kelly, R., Daley, J., Avolio, A. et al. 1989e: Anti-hypertensive therapy is improved by central effects of arterial dilation and reduced wave reflection. Journal of the American College of Cardiology 13(2), 244A.
Kelly, R., Hayward, C., Ganis, J. et al. 1989f: Non-invasive registration of the arterial pressure pulse waveform using high fidelity applanation tonometry. Journal of Vascular Medicine and Biology 1, 142–9.

Kelly, R.P., Gibbs, H.H., O'Rourke, M.F. et al. 1990a: Nitroglycerin has more favourable effects on left ventricular afterload than apparent from measurement of pressure in a peripheral artery. European Heart Journal 11, 138–44.

Kelly, R., Ting, C.-T., Maughan, W.L. et al. 1990b: Similarity of arterial elastance estimates from ventricular and vascular parameters in man. Circulation 82(4), III-696.

Kelly, R.P., Ting, C.T., Yang, T.M. et al. 1992a: Effective arterial elastance as index of arterial vascular load in humans. Circulation 86, 513–21.

Kelly, R.P., Tunin, R. and Kass, D.A. 1992b: Effect of reduced aortic compliance on cardiac efficiency and contractile function of in situ canine left ventricle. Circulation Research 72, 490–502.

Kelly, R.P., Millasseau, S.C., Ritter, J.M. and Chowienczyk, P.J. 2001: Vasoactive drugs influence aortic augmentation index independently of pulse-wave velocity in healthy men. Hypertension 37(6), 1429–33.

Kemmotsu, O., Yokota, S., Yamamura, T. et al. 1989a: A non-invasive blood pressure monitor based on arterial tonometry. Anesthesia Analgesia 68, 9145.

Kemmotsu, O., Ueda, M., Otsuka, K. et al. 1989b: Evaluation of arterial tonometry for non-invasive, continuous blood pressure monitoring during anesthesia. Anesthesiology 71(3A), A406.

Kemmotsu, O., Ueda, M., Otsuka, K. et al. 1989c: Blood pressure measurement by arterial tonometry in controlled hypotension. Anesthesiology 71(3A), A407.

Kemmotsu, O., Ueda, M., Otsuka, H. et al. 1991a: Arterial tonometry for noninvasive, continuous blood pressure monitoring during anesthesia. Anesthesiology 75(2), 333–40.

Kemmotsu, O., Ueda, M., Otsuka, H. et al. 1991b: Blood pressure measurement by arterial tonometry in controlled hypotension. Anesthesia and Analgesia 73, 54–8.

Kemp, H.G. Jr. 1973: Left ventricular function in patients with the anginal syndrome and normal coronary arteriograms. American Journal of Cardiology 32(3), 375–6.

Kenchaiah, S., Sesso, H.D. and Gaziano, J.M. 2009: Body mass index and vigorous physical activity and the risk of heart failure among men. Circulation 119, 44–52.

Kendall, M.E., Waltson, A., Cobb, F.R. et al. 1971: Pressure-flow studies in man: effect of atrial systole on ventricular function in mitral stenosis. Journal of Clinical Investigation 50, 2653–9.

Kendall, M.E., Rembert, J.C. and Greenfield, J.C. Jr. 1973: Pressure-flow studies in man: the nature of the aortic flow pattern in both valvular mitral insufficiency and the prolapsing mitral valve syndrome. American Heart Journal 86, 359–65.

Kenner, T. 1972: Flow and pressure in the arteries. In: Fung, Y.C., Perrone, N. and Anliker, M. (eds), Biomechanics: its foundations and objectives. Englewood Cliffs, NJ: Prentice-Hall, pp. 38l–434.

Kenner, T., Pessenhofer, H. and Schwaberger, G. 1976: Method for the analysis of the entrainment between heart rate and ventilation rate. European Journal of Physiology 363, 263–5.

Kent, K.C., Zwolak, R.M., Jaff, M.R. et al. Society for Vascular Surgery; American Association of Vascular Surgery; Society for Vascular Medicine and Biology. 2004: Screening for abdominal aortic aneurysm: a consensus statement. Journal of Vascular Surgery 39(1), 267–9.

Keren, H., Burkhoff, D. and Squara, P. 2007: Evaluation of a noninvasive continuous cardiac output monitoring system based on thoracic bioreactance. American Journal of Physiology, Heart and Circulatory Physiology 293, H583–9.

Kern, M.J. 1990: A simplified method to measure coronary blood flow velocity in patients: validation and application of a Judkins-style Doppler-tipped angiographic catheter. American Heart Journal 120, 1202–12.

Kern, M.J. 1998: Accurate measurement of LIMA flow velocity. Catheterization and Cardiovascular Diagnosis 43(3), 363–4.

Kern, M.J. 2000: Coronary Physiology as an important adjunct to coronary intervention. Drugs Today (Barcelona) 36(8), 515–27.

Kern, M.J. and Samady, H. 2010: Current concepts of integrated coronary physiology in the catheterization laboratory. Journal of the American College of Cardiology 55(3), 173–85.

Kern, M.J., Aguirre, F.B., Tatineni, S. et al. 1993a: Enhanced coronary blood flow velocity during intraaortic balloon counterpulsation in critically ill patients. Journal of the American College of Cardiology 21, 359–68.

Kern, M.J., Aguirre, F., Bach, R. et al. 1993b: Augmentation of coronary blood flow by intra-aortic balloon pumping in patients after coronary angioplasty. Circulation 87, 500–11.

Kern, M.J., Aguirre, F.V., Donohue, T.J. et al. 1994: Continuous coronary flow velocity monitoring during coronary interventions: velocity trend patterns associated with adverse events. American Heart Journal 128(3), 426–34.

Kern, M.J., Lerman, A., Bech, J.-W. et al. 2006: Physiological assessment of coronary artery disease in the cardiac catheterization laboratory: a scientific statement from the American Heart Association Committee on Diagnostic and Interventional Cardiac Catheterization, Council on Clinical Cardiology. Circulation 114, 1321–41.

Kesmarky, G., Toth, K. and Habon, L. 1998: Hemorheological parameters in coronary artery disease. Clinical Hemorheology and Microcirculation 18(4), 245–51.

Kesteloot, H.E.C. 1999: Worldwide differences in all-cause and cardiovascular mortality: epidemiological considerations. Medicographia 21, 95–101.

Keyt, A.T. 1883: Facts and new experiments in illustration of the variations of pulse-wave velocity in man, and bearing upon the elucidation of the causes which produce them. Journal of the American Medical Association 1, 605–12.

Khalil, M.E., Basher, A.W., Brown, E.J. and Alhadad, I.A. 2001: A remarkable medical story: benefits of angiotensin-converting enzyme inhibitors in cardiac patients. Journal of the American College of Cardiology 37, 1757–64.

Khan, Z., Millard, R.W. and Gabel, M. 1999: Effect of congestive heart failure on in vivo canine aortic elastic properties. Journal of the American College of Cardiology 33(1), 267–72.

Khan, F., Patterson, D., Belch, J.J. et al. 2008: Relationship between peripheral and coronary function using laser Doppler imaging and transthoracic echocardiography. Clinical Science 115, 295–300.

Khanafer, K.M., Bull, J.L., Upchurch, G.R. Jr. et al. 2007: Turbulence significantly increases pressure and fluid shear stress in an aortic aneurysm model under resting and exercise flow conditions. Annals of Vascular Surgery 21(1), 67–74.

Khir, A.W., O'Brien, A., Gibbs, J.S. and Parker, K.H. 2001: Determination of wave speed and wave separation in the arteries. Journal of Biomechanics 34, 1145–55.

Khir, A.W. and Parker, K.H. 2002: Measurements of wave speed and reflected waves in elastic tubes and bifurcations. Journal of Biomechanics 35(6), 775–83.

Khoshdel, A.R., Thakkinstian, A., Carney, S.L. et al. 2006: Estimation of an age-specific reference interval for pulse wave velocity: a meta-analysis. Journal of Hypertension 24, 1231–7.

Khot, U.N., Novaro, G.M., Popovic, Z.B. et al. 2003: Nitroprusside in critically ill patients with left ventricular dysfunction and aortic stenosis. New England Journal of Medicine 348, 1756–63.

Khouri, E.M. and Gregg, D.E. 1963: Miniature electromagnetic flowmeter applicable to coronary arteries. Journal of Applied Physiology 18, 224–7.

Khouri, E.M., Gregg, D.E. and Rayford, C.R. 1965: Effect of exercise on cardiac output, left coronary flow and myocardial metabolism in the unanesthetized dog. Circulation Research 17, 427–37.

Khouri, E.M., Gregg, D.E. and Lowensohn, H.S. 1968: Flow in the major branches of the left coronary artery during experimental coronary insufficiency in the unanesthetized dog. Circulation Research 23, 99–109.

Kiani, M.F., Cokelet, G.R. and Sarelius, I.H. 1993: Effect of diameter variability along a microvessel segment on pressure drop. Microvascular Research 45, 219–32.

Kidawa, M., Krzeminska-Pakula, M., Peruga, J.Z. et al. 2003: Arterial dysfunction in syndrome X, results of arterial reactivity and pulse wave propagation tests. Heart 89(4), 422–6.

Kieffer, S.A., Linde, L.M., Kegel, S.M. et al. 1961: Mycotic aneurysm distal to coarctation of the aorta. Journal of Thoracic Surgery 42, 507–13.

Kim, E.J., Park, C.G., Park, J.S. et al. 2006: Relationship between blood pressure parameters and pulse wave velocity in normotensive and hypertensive subjects: invasive study. Journal of Human Hypertension 21(2), 141–8.

Kim, J.S., Lee, H.S., Park, H.Y. et al. 2009: Endothelial function in lacunar infarction: a comparison of lacunar infarction, cerebral atherosclerosis and control group. Cerebrovascular Disease 28(2), 166–70.

Kim, M.H., Harris, N.R. and Tarbell, J.M. 2005: Regulation of capillary hydraulic conductivity in response to an acute change in shear. American Journal of Physiology. Heart and Circulatory Physiology 289, H2126–35.

Kim, E.J., Park, C.G., Park, J.S. et al. 2007: Relationship between blood pressure parameters and pulse wave velocity in normotensive and hypertensive subjects: invasive study. Journal of Human Hypertension 21(2), 141–8.

Kimoto, E., Shoji, T., Shinohara, K. et al. 2006: Regional arterial stiffness in patients with type 2 diabetes and chronic kidney disease. Journal of the American Society of Nephrology 17, 2245–52.

Kingwell, B.A. 2000: Nitric oxide-mediated metabolic regulation during exercise: effects of training in health and cardiovascular disease. FASEB Journal 14(12), 1685–96.

Kingwell, B.A. and Gatzka, C.D. 2002: Arterial stiffness and prediction of cardiovascular risk (Editorial). Journal of Hypertension 20, 2337–40.

Kingwell, B.A., Berry, K.L., Cameron, J.D. et al. 1997: Arterial compliance increases after moderate-intensity cycling. American Journal of Physiology. Heart and Circulatory Physiology 273, H2186–91.

Kinlay, S., Fang, J.C., Hikita, H. et al. 1999: Plasma alpha-tocopherol and coronary endothelium-dependent vasodilator function. Circulation 100(3), 219–21.

Kinlay, S., Creager, M.A., Fukumoto, M. et al. 2001: Endothelium-derived nitric oxide regulates arterial elasticity in human arteries in vivo. Hypertension 38, 1049–53.

Kips, J.G., Rietzschel, E.R., De Buyzere, M.L. et al. 2009: Evaluation of noninvasive methods to assess wave reflection and pulse transit time from the pressure waveform alone. Hypertension 53, 142–9.

Kirkeeide, R.L., Gould, K.L. and Parsel, L. 1986: Assessment of coronary stenoses by myocardial perfusion imaging during pharmacologic coronary vasodilation: VII. Validation of coronary flow reserve as a single integrated functional measure of stenosis severity reflecting all its geometric dimensions. Journal of the American College of Cardiology 7, 103–13.

Kirklin, J.W. and Pacifico, A.D. 1978: Surgical treatment of congential heart disease. In: Hurst, J.W. (ed.), The heart, arteries and veins. New York: McGraw Hill, pp. 901–46.

Kirsch, E.W., Radu, N.C., Allaire, E. et al. 2006: Pathobiology of idiopathic ascending aortic aneurysms. Asian Cardiovascular and Thoracic Annals 14(3), 254–60.

Kissane, J. 1985. Anderson's Pathology. St Louis: C.V. Mosby.

Kitabatake, A., Fujii, K., Tanouchi, J. et al. 1990: Doppler echocardiographic quantitation of cross-sectional area under various hemodynamic conditions: an experimental validation in a canine model of supravalvular aortic stenosis. Journal of the American College of Cardiology 15, 1654–61.

Kitabatake, A., Tanouchi, J., Yoshida, Y. et al. 1990: Quantitative color flow imaging to measure the two-dimensional distribution of blood flow velocity and the flow rate. Japanese Circulation Journal 54, 304–8.

Kitabatake, A., Inoue, M., Asao, M. et al. 1983: Noninvasive evaluation of pulmonary hypertension by a pulsed Doppler technique. Circulation 68, 302–9.

Kitahara, T., Ono, K., Tsuchida, A. et al. 2005: Impact of brachial-ankle pulse wave velocity and ankle-brachial blood pressure index on mortality in hemodialysis patients. American Journal of Kidney Disease 46, 688–96.

Kiviniemi, T. 2008: Assessment of coronary blood flow and the reactivity of the microcirculation non-invasively with transthoracic echocardiography. Clinical Physiology and Functional Imaging 28(3), 145–55.

Kjellberg, S.R., Mannheimer, E., Rudhe, U. et al. 1955: Diagnosis of congenital heart disease. Chicago: Year Book Publishers.

Kjellström, B., Braunschweig, F., Löfberg, E. et al. 2009: Changes in right ventricular pressures between hemodialysis sessions recorded by an implantable hemodynamic monitor. American Journal of Cardiology 103(1), 119–23.

Klang, M.J., Whelton, P.K., Randall, B.L. et al. 1996: Blood pressure and end-stage renal disease in men. New England Journal of Medicine 334, 13–18.

Klassen, P.S., Lowrie, E.G., Reddan, D.N. et al. 2002: Association between pulse pressure and mortality in patients undergoing maintenance hemodialysis. Journal of the American Medical Association 287(12), 1548–55.

Klatsky, A.L., Koplik, S., Kipp, H. et al. 2008: The confounded relation of coffee drinking to coronary artery disease. American Journal of Cardiology 101, 825–7.

Klein, L.W., Agarwal, J.B., Schneider, R.M. et al. 1986: Effects of previous myocardial infarction on measurements of reactive hyperemia and the coronary vascular reserve. Journal of the American College of Cardiology 8(2), 357–63.

Kleinstreuer, C., Hyun, S., Buchanan, J.R. Jr. et al. 2001: Hemodynamic parameters and early intimal thickening in branching blood vessels. Critical Reviews in Biomedical Engineering 29(1), 1–64.

Klemsdal, O., Andersson, T.L.G., Matz, J. et al. 1994: Vitamin E restores endothelium dependent vasodilatation in cholesterol fed rabbits: in vivo measurements by photoplethysmography. Cardiovascular Research 28, 1–6.

Klima, T., Spjut, H.J., Coelho, A. et al. 1983: The morphology of ascending aortic aneurysms. Human Pathology 14(9), 810–17.

Klingbeil, A.U., John, S., Schneider, M.P. et al. 2002: AT1-receptor blockade improves augmentation index, a double-blind, randomized, controlled study. Journal of Hypertension 20, 2423–8.

Klinke, W.P., Christie, L.G., Nichols, W.W. et al. 1980: Use of catheter-tip velocity-pressure transducer to evaluate left ventricular function in man: effects of intravenous propranolol. Circulation 61, 946–54.

Klocke, F.J., Ellis, A.K. and Canty, J.M. 1987: Interpretation of changes in coronary flow that accompany pharmacologic interventions. Circulation 75(suppl. 5), 34–8.

Klocke, F.J., Weinstein, I.R., Klocke, J.F. et al. 1981: Zero-flow pressures and pressure-flow relationships during single long diastoles in the canine coronary bed before and during maximum vasodilation. Journal of Clinical Investigation 68, 970–80.

Kloner, R.A. and Rezkalla, S. 2003: Cocaine and the heart. New England Journal of Medicine 348, 487–8.

Klungel, O.H., Heckbert, S.R., Longstreth, W.T. et al. 2001: Antihypertensive drug therapies and the risk of ischemic stroke. Archives of Internal Medicine 161, 37–43.

Knecht, S., Wersching, H., Lohmann, H. et al. 2008: High-normal blood pressure is associated with poor cognitive performance. Hypertension 51, 663–8.

Knez, W.L., Sharman, J.E., Jenkins, D.G. et al. 2008: Central hemodynamics in ultra-endurance athletes. Journal of Science and Medicine in Sport 11, 390–5.

Knockaert, D.C. 2007: Cardiac involvement in systemic inflammatory diseases. European Heart Journal 28, 1797–804.

Kobayashi, S., Yano, M., Kohno, M. et al. 1996: Influence of aortic impedance on the development of pressure-overload left ventricular hypertrophy in rats. Circulation 94, 3362–8.

Koenig, W. 2003: Fibrin(ogen) in cardiovascular disease, an update. Thrombosis and Haemostasis 89(4), 601–9.

Koenig, W., Sund, M., Filipiak, B. et al. 1998: Plasma viscosity and the risk of coronary heart disease: results from the MONICA–Augsburg Cohort Study, 1984–1992. Arteriosclerosis, Thrombosis, and Vascular Biology 18(5), 768–72.

Koenig, W., Sund, M., Lowel, H. et al. 2000: Association between plasma viscosity and all-cause mortality: results from the MONICA–Augsburg Cohort Study, 1984–1992. British Journal of Haematology 109(2), 453–8.

Koh, K.K., Bui, M.N., Hathaway, L. et al. 1999: Mechanism by which quinapril improves vascular function in coronary artery disease. American Journal of Cardiology 83(3), 327–31.

Kohler, M., Craig, S., Nicoll, D. et al. 2008: Endothelial function and arterial stiffness in minimally symptomatic obstructive sleep apnea. American Journal of Respiratory and Critical Care Medicine 178(9), 984–8.

Kohn, R.R. 1978: Principles of mammalian aging, 2nd edn. Englewood Cliffs, NJ: Prentice-Hall.

Kohno, M., Kumada, T., Ozaki, M. et al. 1987: Evaluation of aortic wall distensibility by aortic pressure-dimension relation: effects of nifedipine on aortic wall. Cardiovascular Research 21, 305–12.

Kolin, A. 1936: An electromagnetic flowmeter: principles of the method and its application to blood flow measurements. Proceedings of the Society for Experimental Biology and Medicine 35, 53–6.

Kolin, A. 1937: An electromagnetic recording flowmeter. American Journal of Physiology 119, 355–6.

Kolin, A. 1944: Electromagnetic volumetry: I A method for the determination of fluid velocity distribution in space and time. Journal of Applied Physiology 15, 150–64.

Kolin, A. 1945: An alternating field induction flowmeter of high sensitivity. Review of Scientific Instrumentation 16, 109–16.

Kolin, A. 1960: Blood flow determination by electromagnetic method. In: Glasser, O. (ed.), Medical physics, vol. 3, Chicago: Year Book Medical Publishers, pp. 141–55.

Kolin, A. and Wisshaupt, R. 1963: Single-coil coreless electromagnetic blood flowmeters. IEEE Transactions in Biomedical Electronics 10, 60–7.

Kolin, A., Archer, J. and Ross, G. 1967: An electromagnetic catheter-flowmeter. Circulation Research 21, 889–99.

Koliopanos, A., Zografos, G., Skiathitis, S. et al. 2005: Esophageal Doppler (ODM II) improves intraoperative hemodynamic monitoring during laparoscopic surgery. Surgical Laparoscopy Endoscopy & Percutaneous Techiques 15, 332–8.

Kollias, G.E., Stamatelopoulos, K.S., Papaioannou, T.G. et al. 2009: Diurnal variation of endothelial function and arterial stiffness in hypertension. Journal of Human Hypertension 23(9), 597–604.

Kolodgie, F.D., Virmani, R., Cornhill, J.F. et al. 1991: Increase in atherosclerosis and adventitial mast cells in cocaine abusers: an alternative mechanism of cocaine-associated coronary vasospasm and thrombosis. Journal of the American College of Cardiology 17, 1553–60.

Kolyva, C., Verhoeff, B.J., Spaan, J.A. et al. 2008: Increased diastolic time fraction as beneficial adjunct of alpha1-adrenergic receptor blockade after percutaneous coronary intervention. American Journal of Physiology. Heart and Circulatory Physiology 295(5), H2054–60.

Konhilas, J.P., Irving, T.C. and De Tombe, P.P. 2002: Frank–Starling law of the heart and the cellular mechanisms of length-dependent activation. Pflugers Archives 445(3), 305–10.

Kono, Y., Moriyasu, F., Nada, T. et al. 1997: Gray scale second harmonic imaging of the liver: a preliminary animal study. *Ultrasound in Medicine and Biology* 23, 719–26.

Kontopoulos, A.G., Athyros, V.G., Pehlivanidis, A.N. et al. 2003: Long-term treatment effect of atorvastatin on aortic stiffness in hypercholesterolaemic patients. Current Medical Research and Opinion 19(1), 22–7.

Kööbi, T., Kahonen, M., Iivainen, T. et al. 2003: Simultaneous non-invasive assessment of arterial stiffness and haemodynamics – a validation study. Clinical Physiology and Functional Imaging 23(1), 31–6.

Kool, M.J., Wijnen, J.A., Hoeks, A.P. et al. 1991: Diurnal pattern of vessel-wall properties of large arteries in healthy men. Journal of Hypertension 9(6)(suppl.), S108–9.

Kool, M.J.F., Hoekds, A.P.G., Struijker, H.A.J. et al. 1993: Short- and long-term effects of smoking on arterial wall properties in habitual smokers. Journal of the American College of Cardiology 22, 1881–6.

Kool, M.J., van Merode, T., Reneman, R.S. et al. 1994: Evaluation of reproducibility of a vessel wall movement detector system for assessment of large artery properties. Cardiovascular Research 28(5), 610–14.

Kool, M., Lustermans, F., Dragten, H. et al. 1995: Does lowering of cholesterol levels influence functional properties of large arteries? European Journal of Clinical Pharmacology 48, 217–23.

Koren, M.J., Devereux, R.B., Casale, P.N. et al. 1991: Relation of left ventricular mass and geometry to morbidity and mortality in uncomplicated essential hypertension. Annals of Internal Medicine 114(5), 345–52.

Kornet, L., Lambregts, J.A.C., Hoeks, A.P.G. and Reneman, R.S. 1998: Differences in near-wall shear rate in the carotid artery within subjects are associated with different intima-media thicknesses. Arteriosclerosis, Thrombosis and Vascular Biology 18, 1877–84.

Kornet, L., Hoeks, A.P., Lambregts, J. and Reneman, R.S. 2000: Mean wall shear stress in the femoral arterial bifurcation is low and independent of age at rest. Journal of Vascular Research 37(2), 112–22.

Kornet, L., Hoeks, A.P.G., Lambregts, J. and Reneman, R.S. 1999: In the femoral artery bifurcation, differences in mean wall shear stress within subjects are associated with different intima-media thicknesses. Arteriosclerosis Thrombosis and Vascular Biology 19, 2933–9.

Kornet, L., Lambregts, J., Hoeks, A.P. and Reneman, R.S. 1998: Differences in near-wall shear rate in the carotid artery within subjects are associated with different intima-media thicknesses. Arteriosclerosis Thrombosis and Vascular Biology 18(12), 1877–84.

Korotkoff, N.S. 1905: A contribution to the problem of methods for the determination of blood pressure. Report of the Imperial Milit-Med Academy of St Petersburg 11, 365.

Korsgaard, N., Aalkjaer, C., Heagerty, A.M. et al. 1993: Histology of subcutaneous small arteries from patients with essential hypertension. Hypertension 22, 523–6.

Korteweg, D.J. 1878: Uber die Fortpflanzungsgeschwindigkeit des Schalles in elastischen Rohren. Annals of Physics 241, 525–42.

Kosch, M., Levers, A., Barenbrock, M. et al. 2001: Acute effects of haemodialysis on endothelial function and large artery elasticity. Nephrology Dialysis Transplantation 16, 1663–8.

Kossowsky, W. and Lyon, A. 1984: Cocaine and acute myocardial infarction: a probable connection. Chest 85, 132–3.

Kostis, J.B., Lawrence-Nelson, J., Ranjan, R. et al. for the Systolic Hypertension in the Elderly (SHEP) cooperative Research Group. 2001: Association of increased pulse pressure with the development of heart failure in SHEP. American Journal of Hypertension 14, 798–803.

Kotake, Y., Yamada, T., Nagata, H. et al. 2009: Improved accuracy of cardiac output estimation by the partial CO_2 rebreathing method. Journal of Clinical Monitoring and Computing 23(3), 149–55.

Kouchoukos, N.T., Sheppard, L.C. and McDonald, D.A. 1970: Estimation of stroke volume in the dog by a pulse contour method. Circulation Research 26(5), 611–23.

Kozakova, M., Palombo, C., Mhamdi, L. et al. 2007: Habitual physical activity and vascular aging in a young to middle-age population at low cardiovascular risk. Stroke 38, 2549–55.

Krasuski, R.A., Warner, J.J., Wang, A. et al. 2000: Inhaled nitric oxide selectively dilates pulmonary vasculature in adult patients with pulmonary hypertension irrespective of etiology. Journal of the American College of Cardiology 36, 2204–11.

Kries, J. Von. 1883: Ueber die Beziehungen zwischen Druck und Geschwindigkeit, welche bei der Wellenbewegung in elastischen Schläuchen bestehen. (On the relations between pressure and velocity, which exist in the wave-like motion in elastic tubes.) Festschrift der 56. Versammlung deutscher Naturforscher und Ärzte [gewidmet von der Naturforschenden Gesellschaft zu Freiburg i. B., Supplement zu Band VIII der Berichte über die Verhandlungen der Naturforschenden Gesellschaft zu Freiburg i. B.], 67–88, [Akademische Verlagsbuchhandlung von] JCB Mohr (Paul Siebeck), Freiburg im Breisgau und Tübingen, Germany.

Krikler, D.M. 2000: Sir Thomas Lewis and arrhythmias (Review). ACC Current Journal Review 9, 23–5.

Krivitski, N.M. 1995: Theory and validation of access flow measurement by dilution technique during hemodialysis. Kidney International 48, 244–50.

Kroeker, E.J. and Wood, E.H. 1955: Comparison of simultaneously recorded central and peripheral arterial pressure pulses during rest, exercise and tilted position in man. Circulation Research 3, 623–32.

Kroeker, E.J. and Wood, E.H. 1956: Beat-to-beat alterations in relationship of simultaneously recorded central and peripheral arterial pressure

pulses during Valsalva maneuver and prolonged expiration in man. Journal of Applied Physiology 8, 483–94.
Krogh, A. 1922: Anatomy and physiology of capillaries. New Haven, CT: Yale University Press.
Kromer, E.P., Elsner, D., Holmer, S.R. et al. 1992: Aortic input impedence and neurohormonal activation in patients with mild to moderate chronic congestive heart failure. Cardiovascular Research 26, 265–72.
Krzesinski, J.-M. and Saint-Remy, A. 2006: Spurious systolic hypertension in youth: what does it really mean in clinical practice? Journal of Hypertension 24, 999–1001.
Ku, D.N. and Giddens, D.P. 1987: Laser Doppler anemometer measurements of pulsatile flow in a model carotid bifurcation. Journal of Biomechanics 20(4), 407–21.
Ku, D.N., Giddens, D.P., Phillips, D.J. et al. 1985a: Hemodynamics of the normal human carotid bifurcation: *in vitro* and *in vivo* studies. Ultrasound in Medicine and Biology 11, 13–26.
Ku, D.N., Giddens, D.P., Zarins, C.K. et al. 1985b: Pulsatile flow and atherosclerosis in the human carotid bifurcation. Positive correlation between plaque location and low oscillating shear stress. Arteriosclerosis 5(3), 293–302.
Kubo, S.H., Rector, T.S., Bank, A.J. et al. 1991: Endothelium-dependent vasodilation is attenuated in patients with heart failure. Circulation 84(4), 1589–96.
Kubo, T., Maehara, A., Mintz, G.S. et al. 2010: The dynamic nature of coronary artery lesion morphology assessed by serial virtual histology intravascular ultrasound tissue characterization. Journal of the American College of Cardiology 55, 1590–7.
Kubozono, T., Miyata, M., Ueyama, K. et al. 2007: Clinical significance and reproducibility of new arterial distensibility index. Circulation Journal 71(1), 89–94.
Kuehne, T., Yilmaz, S., Schulze-Neick, I. et al. 2005: Magnetic resonance imaging guided catheterisation for assessment of pulmonary vascular resistance: *in vivo* validation and clinical application in patients with pulmonary hypertension. Heart 91(8), 1064–9.
Kuivaniemi, H., Platsoucas, C.D. and Tilson, M.D. III 2008: Aortic aneurysms. Circulation 117, 242–52.
Kullo, I.J. and Malik, A.R. 2007: Arterial ultrasonography and tonometry as adjuncts to cardiovascular risk stratification. Journal of the American College of Cardiology 49, 1413–26.
Kumar, P., Francis, G.S. and Tang, W.H. 2009: Phosphodiesterase 5 inhibition in heart failure: mechanisms and clinical implications. Nature Reviews. Cardiology 6(5), 349–55.
Kume, T., Kawamoto, T., Okura, H. et al. 2008: Mechanism of increasing systolic coronary flow velocity in patients with aortic regurgitation. Journal of Heart Valve Disease 17(1), 89–93.
Kunz, A.L. and Coulter, N.A. Jr. 1967: Non-Newtonian behavior of blood in oscillatory flow. Biophysics Journal 7, 25–36.
Kuo, A.S., Sato, H., Reoma, J.L. et al. 2009: The relationship between pulmonary system impedance and right ventricular function in normal sheep. Cardiovascular Engineering 9(4), 153–60.
Kupari, M., Hekali, P., Keto, P. et al. 1994: Relation of aortic stiffness to factors modifying the risk of atherosclerosis in healthy people. Arteriosclerosis and Thrombosis 14, 386–94.
Kurita, T., Sakuma, H., Onishi, K. et al. 2009: Regional myocardial perfusion reserve determined using myocardial perfusion magnetic resonance imaging showed a direct correlation with coronary flow velocity reserve by Doppler flow wire. European Heart Journal 30(4), 444–52.
Kuriyama, S., Shimazu, T., Ohmori, K. et al. 2006: Green tea consumption and mortality due to cardiovascular disease, cancer, and all causes in Japan: the Ohsaki study. Journal of the American Medical Association 296, 1255–65.
Kurjak, A., Alfirevic, Z. and Miljan, M. 1988: Conventional and color Doppler in the assessment of fetal and maternal circulation. Ultrasound in Medicine and Biology 14, 337–54.
Kurjiaka, D.T. and Segal, S.S. 1995: Interaction between conducted vasodilation and sympathetic nerve activation in arterioles of hamster striated muscle. Circulation Research 76, 885–91.
Kurtz, T.W. 2003: False claims of blood pressure-independent protection by blockade of the renin angiotensin aldosterone system? Hypertension 41, 193–6.
Kurtz, T.W., Griffin, K.A., Bidani, A.K. et al. 2005: Recommendations for blood pressure measurement in humans and experimental animals. Part 2: Blood pressure measurement in experimental animals: a statement for professionals from the subcommittee of professional and public education of the American Heart Association council on high blood pressure research. Hypertension 45(2), 299–310.
Kussmaul, W.G., Altschuler, J.A., Herrmann, H.C. et al. 1992: Effects of pacing tachycardia and balloon valvuloplasty on pulmonary artery impedance and hydraulic power in mitral stenosis. Circulation 86(6), 1770–9.
Kussmaul, W.G., Wieland, J.M. and Laskey, W.E. 1988: Pressure-flow relations in the pulmonary artery during myocardial ischemia: implication for right ventricular function in coronary disease. Cardiovascular Research 22, 627–38.
Kutz, M.A., Lamping, K.G., Bates, J.N. et al. 1991: Mechanisms responsible for the heterogenous coronary microvascular response to nitroglycerin. Circulation Research 68, 847–55.
Kuvin, J.T., Patel, A.R. and Karas, R.H. 2001a: Need for standardization of noninvasive assessment of vascular endothelial function. American Heart Journal 141(3), 327–8.
Kuvin, J.T., Patel, A.R., Sliney, K.A. et al. 2001b: Peripheral vascular endothelial function testing as a noninvasive indicator of coronary artery disease. Journal of the American College of Cardiology 38(7), 1843–9.
Kuvin, J.T., Patel, A.R., Sliney, K.A. et al. 2003: Assessment of peripheral vascular endothelial function with finger arterial pulse wave amplitude. American Heart Journal 146(1), 168–74.
Kuvin, J.T., Mammen, A., Mooney, P. et al. 2007: Assessment of peripheral vascular endothelial function in the ambulatory setting. Vascular Medicine 12(1), 13–16.
Kwagyan, J., Hussein, S., Xu, S. et al. 2009: The relationship between flow-mediated dilatation of the brachial artery and intima-media thickness of the carotid artery to Framingham risk scores in older African Americans. Journal of Clinical Hypertension 11(12), 713–19.
Laakso, M. 1999: Benefits of strict glucose and blood pressure control in type 2 diabetes: lessons from the UK Prospective Diabetes Study. Circulation 99, 461–2.
LaBarbera, M. 1990: Principles of design of fluid transport systems in zoology. Science 249, 992–1000.
Lacolley, P., Glaser, E., Challande, P. et al. 1995: Structural changes and in situ aortic pressure-diameter relationship in long-term chemical-sympathectomized rats. American Journal of Physiology 269, H407–16.
Lacolley, P., Poitevin, P., Koen, R. et al. 1998: Different effects of calcium antagonists on fluid filtration of large arteries and albumin permeability in spontaneously hypertensive rats. Journal of Hypertension 16, 349–55.
Lacolley, P., Safar, M.E., Regnault, V. et al. 2009: Angiotensin II, mechanotransduction, and pulsatile arterial hemodynamics in hypertension. American Journal of Physiology. Heart and Circulatory Physiology 297(5), H1567–75.
Lacombe, R., Dart, A., Dewar, E. et al. 1992: Arterial elastic properties in man: a comparison of echo-Doppler indices of aortic stiffness. European Heart Journal 13, 1040–5.
Lacro, R.V., Dietz, H.C., Wruck, L.M. et al. 2007: Rationale and design of a randomized clinical trial of β-blocker therapy (atenolol) versus angiotensin II receptor blocker therapy (losartan) in individuals with Marfan syndrome. American Heart Journal 154, 624–31.
Lacy, P.S., O'Brien, D.G., Stanley, A.G. et al. 2004: Increased pulse wave velocity is not associated with elevated augmentation index in patients with diabetes. Journal of Hypertension 22, 1937–44.
Lai, X. and Torp, H. 1999: Interpolation methods for time-delay estimation using cross-correlation method for blood velocity measurement. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 46, 277–90.
Laird, J.D. 1980: Thomas Young M.D. (1773–1829). American Heart Journal 100, 1–8.

Lakatta, E.G. 1989a: Mechanisms of hypertension in the elderly. Journal of the American Geriatric Society 37, 780–90.
Lakatta, E.G. 1989b: Arterial pressure and aging (Review). International Journal of Cardiology 25(suppl. 1), S81–9.
Lakatta, E.G. 1993a: Cardiovascular regulatory mechanisms in advanced age. Physiological Reviews 73(2), 413–67.
Lakatta, E.G. 1993b: Deficient neuroendocrine regulation of the cardiovascular system with advancing age in healthy humans. Circulation 87, 631–6.
Lakatta, E.G. 1995: Cardiovascular system. In: Masoro, E.J. (ed.), Handbook of physiology: A critical, comprehensive presentation of physiologic knowledge and concepts, section 11, Aging. New York: Oxford University Press, pp. 413–74.
Lakatta, E.G. 2000: Cardiovascular aging in health. Clinics in Geriatric Medicine 16, 419–44.
Lakatta, E.G. 2003: Arterial and cardiac aging: major shareholders in cardiovascular disease enterprises. Part III: Cellular and molecular clues to heart and arterial aging. Circulation 107, 490–7.
Lakatta, E.G. and Levy, D. 2003a: Arterial and cardiac aging: major shareholders in cardiovascular disease enterprises. Part I: aging arteries: a 'set up' for vascular disease. Circulation 107, 139–46.
Lakatta, E.G. and Levy, D. 2003b: Arterial and cardiac aging: major shareholders in cardiovascular disease enterprises. Part II: The aging heart in health; links to heart disease. Circulation 107, 346–54.
Lakatta, E.G., Gerstenblith, G. and Weisefldt, M.L. 1997: The aging heart: structure, function, disease. In: Braunwald, E. (ed.), Heart disease: a textbook of cardiovascular medicine, 5th edn. Philadelphia: W.B. Sanders, pp. 1650–1703.
Lakatta, E.G., Gerstenblith, G., Angell, C.S. et al. 1975: Prolonged contraction duration in aged myocardium. Journal of Clinical Investigation 55(1), 61–8.
Lakatta, E.G., Mitchell, J.H., Pomerance, A. et al. 1987: Human aging: changes in structure and function. Journal of the American College of Cardiology 10, 42A–7A.
Lalande, A., Khau van Kien, P., Salve, N. et al. 2002: Automatic determination of aortic compliance with cine-magnetic resonance imaging, an application of fuzzy logic theory. Investigations in Radiology 37(12), 685–91.
Lallemand, R.C., Brown, K.G.E. and Boulten, P.S. 1972: Vessel dimensions in premature atheromatous disease of aortic bifurcation. British Medical Journal 2, 255–7.
Lam, C.S.P. 2010: Heart failure with preserved ejection fraction: invasive solution to diagnostic confusion? Journal of the American College of Cardiology 55, 1711–12.
Lam, C.S.P., Roger, V.L., Rodeheffer, R.J. et al. 2009: Pulmonary hypertension in heart failure with preserved ejection fraction: a community-based study. Journal of the American College of Cardiology 53, 1119–26.
Lam, C.S.P., Xanthakis, V., Sullivan, L.M. et al. 2010: Aortic root remodeling over the adult life course: longitudinal data from the Framingham Heart Study. Circulation 122(9), 884–90.
Lambermont, B., Gerard, P., Detry, O. et al. 1998: Correction of pressure waveforms recorded by fluid-filled catheter recording systems: a new method using a transfer equation. Acta Anaesthesiologica Scandinavica 42, 717–20.
Lambert, E.H. and Wood, E.H. 1947: The use of a resistance wire strain gauge manometer to measure intra-arterial pressure. Proceedings of the Society of Experimental Medicine and Biology 64, 186–90.
Lambert, J., Pijpers, R., van Ittersum, F.J. et al. 1997: Sodium, blood pressure, and arterial distensibility in insulin-dependent diabetes mellitus. Hypertension 30, 1162–8.
Lambossy, P. 1950: Apercu historique et critique sur le probleme de la propagation des ondes dans un liquide compressible enferme dans un tube elastique. Helvetica Physiologica et Pharmacologica Acta 8, 209–27.
Lambossy, P. 1952a: Oscillations forcées d'un liquide incompressible et viscueux dans un tube ridige et horizontal: calcul de la force de frottement. Helvetica Physiologica et Pharmacologica Acta 25, 371–86.
Lambossy, P. 1952b: Manometres a l'observation des variations de la pressure sanguine. Helvetica Physiologica et Pharmacologica Acta 10, 138–60.
Lammie, G.A., Brannan, F., Slattery, J. et al. 1997: Nonhypertensive cerebral small-vessel disease. Stroke 28, 2222–9.
Lammie, G.A., Lindley, R., Keir, S. et al. 2000: Stress-related primary intracerebral hemorrhage: autopsy clues to underlying mechanism. Stroke 31, 1426–8.
Landes, G. 1949: Die Berechung des Schlagvolumens mit berlicksichtigung der Reflexionen, verteilter Elastizitat, Masse unde Reibung. Archiv für Kreislaufforschung 15, 1–23.
Landowne, M. 1957: A method using induced waves to study pressure propagation in human arteries. Circulation Research 5, 594–601.
Landowne, M. 1958: The relation between intra-arterial pressure and impact pulse wave velocity with regard to age and arteriosclerosis. Journal of Gerontology 13, 153.
Lane, D., Beevers, M., Barnes, N. et al. 2002: Inter-arm differences in blood pressure, when are they clinically significant? Journal of Hypertension, 20, 1089–95.
Lane, H.A., Smith, J.C. and Davies, J.S. 2006: Noninvasive assessment of preclinical atherosclerosis. Vascular Health and Risk Management 2(1), 19–30.
Lang, R.M., Borow, K.M., Neumann, A. et al. 1986: Systemic vascular resistance: an unreliable index of left ventricular afterload. Circulation 74(5), 1114–23.
Langenberg, C., Hardy, R., Kuh, D. and Wadsworth, M.E. 2003: Influence of height, leg and trunk length on pulse pressure, systolic and diastolic blood pressure. Journal of Hypertension 21(3), 537–43.
Langewouters, G.J. 1982: Visco-elasticity of the human aorta in vitro in relation to pressure and age. PhD thesis, Free University of Amsterdam, The Netherlands.
Langewouters, G.J., Wesseling, K.H. and Goedhard, W.J.A. 1984: The static elastic properties of 45 human thoracic and 20 abdominal aortas in vitro and the parameters of a new model. Journal of Biomechanics 17, 425–35.
Langewouters, G.J., Wesseling, K.H. and Goedhard, W.J.A. 1985: The pressure dependent dynamic elasticity of 35 thoracic and 16 abdominal aortas in vitro described by a live component model. Journal of Biomechanics 18, 613–22.
Langewouters, G.J., de Wit, B., van der Hoeven, G.M. et al. 1990: Feasibility of continuous non-invasive 24 hr ambulatory measurement of finger arterial blood pressure with Portapres. Journal of Hypertension 8(S3), 87.
Langille, B.L. 1996: Arterial remodeling: relation to hemodynamics. Canadian Journal of Physiology and Pharmacology 74(7), 834–41.
Lankhaar, J.W., Vonk Noordegraaf, A. and Marcus, J.T. 2004: A computed method for noninvasive MRI assessment of pulmonary arterial hypertension. Journal of Applied Physiology 97, 794.
Lankhaar, J.W., Westerhof, N., Faes, T.J. et al. 2006: Quantification of right ventricular afterload in patients with and without pulmonary hypertension. American Journal of Physiology. Heart and Circulatory Physiology 291(4), H1731–7.
Lankhaar, J.W., Westerhof, N., Faes, T.J.C. et al. 2008: Pulmonary vascular resistance and compliance stay inversely related during treatment of pulmonary hypertension. European Heart Journal 29, 1688–95.
Länne, T., Stale, H., Bengtsson, H. et al. 1992a: Noninvasive measurement of diameter changes in the distal abdominal aorta in man. Ultrasound in Medicine and Biology 18(5), 451–7.
Länne, T., Sonesson, B., Bergqvist, D. et al. 1992b: Diameter and compliance in the male human abdominal aorta: influence of age and aortic aneurysm. European Journal of Vascular Surgery 6, 178–84.
Länne, T., Hansen, F., Mangell, P. and Sonesson, B. 1994: Differences in mechanical properties of the common carotid artery and abdominal aorta in healthy males. Journal of Vascular Surgery 20(2), 218–25.
Lansman, J.B. 1988: Going with the flow. Nature 331, 481–2.
Lantelme, P., Mestre, C., Lievre, M. et al. 2002: Heart rate, an important confounder of pulse wave velocity assessment. Hypertension 39(6), 1083–7.

Lanza, G.A., Buffon, A., Sestito, A. et al. 2008: Relation between stress-induced myocardial perfusion defects on cardiovascular magnetic resonance and coronary microvascular dysfunction in patients with cardiac syndrome X. Journal of the American College of Cardiology 51, 466–72.

Lanzarini, L., Fontana, A., Lucca, E. et al. 2002: Noninvasive estimation of both systolic and diastolic pulmonary artery pressure from Doppler analysis of tricuspid regurgitant velocity spectrum in patients with chronic heart failure. American Heart Journal 144(6), 1087–94.

Laogun, A.A., Ajayi, N.O. and Lagundoye, S.B. 1979: Variation of aortic bifurcation area ratio with age in Nigerians. African Journal of Medical Science 8(3–4), 79–83.

Laragh, J.H. and Brenner, B.M. (eds), 1995: Hypertension: pathophysiology, diagnosis and management. New York: Raven Press.

Larbi, A., Franceschi, C., Mazzatti, D. et al. 2008: Aging of the immune system as a prognostic factor for human longevity. Physiology 23, 64–74.

LaRosa, J.C., Grundy, S.M., Waters, D.D. et al. 2005: Intensive lipid lowering with atorvastatin in patients with stable coronary disease. New England Journal of Medicine 352, 1425–35.

Lasance, H.A.J., Wesseling, K.H. and Ascoop, C.A. 1976: Peripheral pulse contour analysis in determining stroke volume. In: Progress Report 5, Institute of Medical Physics, Da Costakade 45, Utrecht: The Netherlands, 59–62.

Laskey, W.K. and Kussmaul, W.G. 1987: Arterial wave reflection in cardiac failure. Circulation 75, 711–22.

Laskey, W.K., Kussmaul, W.G., Martin, J.L. et al. 1985: Characteristics of vascular hydraulic load in patients with heart failure. Circulation 72, 61–71.

Laskey, W.K., Ferrari, V.A., Palevsky, H.I. et al. 1993: Pulmonary artery hemodynamics in primary pulmonary hypertension. Journal of the American College of Cardiology 21(2), 406–12.

Laskey, W.K., Kussmaul, W.G. and Noordegraaf, A. 1995: A computed method for noninvasive MRI assessment of pulmonary arterial hypertension. Circulation 92, 1473–8.

Laszt, L. and Muller, A. 1952a: Uber den Druckverlauf im Bereiche der Aorta. Helvetica Physiologica Acta 10, 1–19.

Laszt, L. and Muller, A. 1952b: Gleichzeitige Druckmessung in der Aorta abdominalis und ihren Hauptasten. Helvetica Physiologica Acta 10, 259–72.

Laszt, L. and Muller, A. 1952c: Vergleich er Druckverhaltnisse in den Gefassen des Halses und der oberen Extremitaten mit dem Drucke in der Aorta ascendens. Helvetica Physiologica Acta 10, 469–81.

Latham, R.D. 1989: Pulse propagation in the systemic arterial tree. In: Westerhof, N. and Gross, D.R. (eds), Vascular dynamics. New York: Plenum, pp. 49–67.

Latham, R.D., Westerhof, N., Sipkema, P. et al. 1985: Regional wave travel and reflections along the human aorta: a study with six simultaneous micromonometric pressures. Circulation 72, 1257–69.

Latham, R.D., Rubal, B.J., Westerhof, N. et al. 1987: Nonhuman primate model for regional wave travel and reflections along aortas. American Journal of Physiology 253, H299–306.

Latham, R.D., Rubal, B.J., Sipkema, P. et al. 1988a: Ventricular/vascular coupling and regional arterial dynamics in the chronically hypertension baboon: correlation with cardiovascular structural adaptation. Circulation Research 63, 798–811.

Latham, R.D., Sipkema, D., Westerhof, N. et al. 1988b: Aortic input impedance during Mueller Maneuver: an evaluation of 'effective length'. Journal of Applied Physiology 65, l604–l0.

Latham, R.D., Tran, C.C., Fanton, J.W. et al. 1992: Aortic wave reflection and input impedance as a function of posture in a chronic primate model. Physiologist 35(suppl. 1), S53–54.

Latini, G., Rosati, E., De Felice, C. et al. 2008: Sildenafil administration to a patient with refractory persistent pulmonary hypertension of the newborn. Journal of Maternal–Fetal and Neonatal Medicine 21(9), 671–3.

Latini, R., Masson, S., Anand, I.S. et al. 2007: Prognostic value of very low plasma concentrations of troponin T in patients with stable chronic heart failure. Circulation 116, 1242–9.

Latson, T.W., Hunter, W.C., Katoh, N. et al. 1988: Effect of nitroglycerin on aortic impedance, diameter, and pulse-wave velocity. Circulation Research 62, 884–90.

Lauer, M.S. 2009: Elements of danger – the case of medical imaging. New England Journal of Medicine 361, 841–2.

Laufs, U., La Fata, V., Plutzky, J. et al. 1998: Upregulation of endothelial nitric oxide synthase by HMG CoA reductase inhibitors. Circulation 97(12), 1129–35.

Laughlin, G.A., Goodell, V. and Barrett-Connor, E. 2010: Extremes of endogenous testosterone are associated with increased risk of incident coronary events in older women. Journal of Clinical Endocrinology and Metabolism 95, 740–7.

Laurant, P., Adrian, M. and Berthelot, A. 2004: Effect of age on mechanical properties of rat mesenteric small arteries. Canadian Journal of Physiology and Pharmacology 82(4), 269–75.

Laurent, P., Albaladejo, P., Blacher, J. et al. 2003: Heart rate and pulse pressure amplification in hypertensive subjects. American Journal of Hypertension 16(5 Pt 1), 363–70.

Laurent, S. and Boutouyrie, P. 2007: Recent advances in arterial stiffness and wave reflection in human hypertension. Hypertension 49, 1202–6.

Laurent, S. and Cockcroft, J. 2008. Central aortic blood pressure. Amsterdam: Elsevier.

Laurent, S., Lacolley, P., Brunel, P. et al. 1990: Flow-dependent vasodilation of brachial artery in essential hypertension. American Journal of Physiology 258, H1004–11.

Laurent, S., Hayoz, D., Trazzi, S. et al. 1993: Isobaric compliance of the radial artery is increased in patients with essential hypertension. Journal of Hypertension 11, 89–98.

Laurent, S., Girerd, X., Mourad, J.J. et al. 1994: Elastic modulus of the radial artery wall material is not increased in patients with essential hypertension. Arteriosclerosis and Thrombosis 14(7), 1223–31.

Laurent, S., Boutouyrie, P., Asmar, R. et al. 2001a: Aortic stiffness is an independent predictor of all-cause and cardiovascular mortality in hypertensive patients. Hypertension 37, 1236–41.

Laurent, S., Tropeano, A.I., Lillo-Lelouet, A. et al. 2001b: Local pulse pressure is a major determinant of large artery remodelling. Clinical Experiments in Pharmacological Physiology 28(12), 1011–14.

Laurent, S., Kingwell, B., Bank, A. et al. 2002: Clinical applications of arterial stiffness, therapeutics and pharmacology. American Journal of Hypertension 15(5), 453–8.

Laurent, S., Katsahian, S., Fassot, C. et al. 2003: Aortic stiffness is an independent predictor of fatal stroke in essential hypertension. Stroke 34, 1203–6.

Laurent, S., Cockcroft, J., Van Bortel, L. et al. 2006: European Network for Non-invasive Investigation of Large Arteries. Expert consensus document on arterial stiffness: methodological issues and clinical applications. European Heart Journal 27, 2588–605.

Laurent, S., Briet, M. and Boutouyrie, P. 2009: Large and small artery cross-talk and recent morbidity-mortality trials in hypertension. Hypertension 54, 388–92.

Lavallee, P.C., Bonnin, P., Labreuche, J. et al. 2006: Flow-mediated vasodilatation of carotid and brachial arteries in healthy subjects and in lacunar stroke patients. Ultrasound in Medicine and Biology 32, 1165–9.

Lawrence-Brown, M.M., Norman, P.E., Jamrozik, K. et al. 2001: Initial results of ultrasound screening for aneurysm of the abdominal aorta in Western Australia: relevance for endoluminal treatment of aneurysm disease. Cardiovascular Surgery 9(3), 234–40.

Lawson, W.E., Hui, J.C., Soroff, H.S. et al. 1992: Efficacy of enhanced external counterpulsation in the treatment of angina pectoris. American Journal of Cardiology 70(9), 859–62.

Lawson, W.E., Hui, J.C. and Cohn, P.F. 2000: Long-term prognosis of patients with angina treated with enhanced external counterpulsation: five-year follow-up study. Clinical Cardiology 23(4), 254–8.

Lawton, R.W. 1954: The thermoelastic behavior of isolated aortic strips in the dog. Circulation Research 2, 344–53.

Lawton, R.W. 1955: Measurements on the elasticity and damping of isolated aortic strips in the dog. Circulation Research 3, 403–8.

Lawton, R.W. and Greene, L.C. 1956: A method for the in situ study of aortic elasticity in the dog. Report No. NADC-MA-5603. AMAL, US Naval and Air Development Center.

Laxminarayan, S. 1979: The calculation of forward and backward waves in the arterial system. Medical and Biological Engineering and Computing 17(1), 130.

Lazarevic, A.M., Nakatani, S., Okita, Y. et al. 2006: Determinants of rapid progression of aortic root dilatation and complications in Marfan syndrome. International Journal of Cardiology 106(2), 177–82.

Le Carpentier, Y., Chemla, D. and Riou, B. 1991: Does load dependence of relaxation differ between left and right cardiac muscle? Circulation Research 68, 903.

Lea, J., Greene, T., Hebert, L. et al. 2005: The relationship between magnitude of proteinuria reduction and risk of end-stage renal disease. Archives of Internal Medicine 165, 947–53.

Learoyd, B.M. and Taylor, M.G. 1966: Alterations with age in the visco-elastic properties of human arterial walls. Circulation Research 18, 278–92.

Leather, H.A., Segers, P., Berends, N. et al. 2002: Effects of vasopressin on right ventricular function in an experimental model of acute pulmonary hypertension. Critical Care Medicine 30, 2604–05.

Lebrun, C.E., van der Schouw, Y.T., Bak, A.A. et al. 2002: Arterial stiffness in postmenopausal women, determinants of pulse wave velocity. Journal of Hypertension 20(11), 2165–72.

Leclercq, C., Faris, O., Tunin, R. et al. 2002: Systolic improvement and mechanical resynchronization does not require electrical synchrony in the dilated failing heart with left bundle-branch block. Circulation 106, 1760–3.

Le-Cong, P. and Zweifach, B.W. 1979: In vivo and in vitro velocity measurements in microvasculature with laser. Microvascular Research 17, 131–41.

Lederle, F. 2002: Small abdominal aortic aneurysms. New England Journal of Medicine 347, 1114.

Lederle, F.A., Johnson, G.R., Wilson, S.E. et al. 2000: The aneurysm detection and management study screening program: validation cohort and final results. Aneurysm Detection and Management Veterans Affairs Cooperative Study Investigators. Archives of Internal Medicine 160(10), 1425–30.

Lederle, F., Wilson, S., Johnson, G. et al. 2002: Immediate repair compared with surveillance of small abdominal aortic aneurysms. New England Journal of Medicine 346, 1437–44.

Ledingham, J.M. 1995: The vascular fault in hypertension: Byrom's work revisited. In: Laragh, J.H. and Brenner, B.M. (eds), Hypertension: pathophysiology, diagnosis and management, 2nd edn. New York: Raven Press, pp. 37–53.

Ledoux, L.A.F., Brands, P.J. and Hoeks, A.P.G. 1997: Reduction of the clutter component in Doppler ultrasound signals based on singular value decomposition: a simulation study. Ultrasonic Imaging 19, 1–18.

Lee, B., Godfrey, M., Vitale, E. et al. 1991: Linkage of Marfan syndrome and a phenotypically related disorder to two different fibrillin genes. Nature 352, 330–4.

Lee, B.K., Kwon, H.M., Hong, B.K. et al. 2001: Hemodynamic effects on atherosclerosis-prone coronary artery, wall shear stress/rate distribution and impedance phase angle in coronary and aortic circulation. Yonsei Medical Journal 42(4), 375–83.

Lee, B.K., Alexy, T., Wenby, R.B. et al. 2007: Red blood cell aggregation quantitated via Myrenne aggregometer and yield shear stress. Biorheology 44(1), 29–35.

Lee, D., Ha, M., Kim, J. et al. 2001: Effects of smoking cessation on changes in blood pressure and incidence of hypertension. Hypertension 37, 194–8.

Lee, D.S., Gona, P., Vasan, R.S. et al. 2009: Relation of disease pathogenesis and risk factors to heart failure with preserved or reduced ejection fraction: insights from the Framingham Heart Study of the National Heart, Lung, and Blood Institute. Circulation 119, 3070–7.

Lee, H.T. and Banzett, R.B. 1997: Mechanical links between locomotion and breathing: can you breathe with your legs? News in Physiological Sciences 12, 273–8.

Lee, N.B. and Park, C.G. 2009: Reproducibility of regional pulse wave velocity in healthy subjects. Korean Journal of Internal Medicine 24(1), 19–23.

Lee, R.T., Grodzinsky, A.J., Frank, E.H. et al. 1991: Structure-dependent dynamic mechanical behavior of fibrous caps from human atherosclerotic plaques. Circulation 83, 1764–70.

Lee, R.T., Richardson, S.G., Loree, H.M. et al. 1992: Prediction of mechanical properties of human atherosclerotic tissue by high-frequency intravascular ultrasound imaging – an in vitro study. Arteriosclerosis and Thrombosis 12, 1–5.

Lee, R.T., Loree, H.M., Cheng, G.C. et al. 1993: Computational structural analysis based on intravascular ultrasound imaging before in vitro angioplasty: Prediction of plaque fracture locations. Journal of the American College of Cardiology 21, 777–82.

Lee, R.T., Loree, H.M. and Fishbein, M.C. 1994: High stress regions in saphenous vein bypass graft atherosclerotic lesions. Journal of the American College of Cardiology 24(7), 1639–44.

Lee, Y.W. 1960. Statistical theory of communication. New York: John Wiley & Sons.

Legalery, P., Seronde, M.F., Meneveau, N. et al. 2003: Measuring pressure-derived fractional flow reserve through four French diagnostic catheters. American Journal of Cardiology 91(9), 1075–8.

Legget, M.E., Unger, T.A., O'Sullivan, C. et al. 1995: Aortic root dilation in Marfan's syndrome: relationship to outcome. Journal of the American College of Cardiology February, 245A.

Leguy, C.A., Bosboom, E.M., Hoeks, A.P et al. 2009a: Assessment of blood volume flow in slightly curved arteries from a single velocity profile. Journal of Biomechanics 42, 1664–72.

Leguy, C.A., Bosboom, E.M., Hoeks, A.P et al. 2009b: Model-based assessment of dynamic arterial blood volume flow from ultrasound measurements. Medical and Biological Engineering and Computing 47, 641–8.

Lehmann, E.D. and Gosling, R.G. 1991: Measuring aortic distensibility. Lancet 338, 1075.

Lehmann, E.D., Gosling, R.G. and Sönksen, P.H. 1992a: Arterial wall compliance in diabetes. Diabetic Medicine 9, 114–19.

Lehmann, E.D., Watts, G.F. and Gosling, R.G. 1992b: Aortic distensibility and hypercholesterolaemia. Lancet 340, 1171–2.

Lehmann, E.D., Parker, J.R., Hopkins, K.D. et al. 1993: Validation and reproducibility of pressure-corrected aortic distensibility measurements using pulse-wave-velocity Doppler ultrasound. Journal of Biomedical Engineering 15(3), 221–8.

Lehmann, E.D., Hopkins, K.D., Jones, R.L et al. 1995: Aortic distensibility in patients with cerebrovascular disease. Clinical Science 89, 247–53.

Lehmann, E.D., Hopkins, K.D. and Gosling, R.G. 1995a: Atherosclerosis in the ascending aorta and risk of ischaemic stroke. Lancet 346, 589–90.

Leier, C.V., Huss, P., Margorien, R.D. et al. 1983: Improved exercise capacity and differing arterial and venous tolerance during chronic isosorbide dinitrate therapy for congestive cardiac failure. Circulation 67, 817–22.

Leitz, K.H. and Arndt, J.O. 1968: Die Durchmesser-Druck-Bezichung des intakten Gefassgebietes der A. carotis communis von Katzen. Pflugers Archiv für die gesamte Physiologie 301, 50–69.

Lekakis, J., Abraham, P., Balbarini, A. et al. 2011: Methods for evaluating endothelial function: a position statement from the European Society of Cardiology Working Group on Peripheral Circulation. European Journal of Cardiovascular Prevention and Rehabilitation (in press).

Lemogoum, D., Van Bortel, L., Leeman, M. et al. 2006: Ethnic differences in arterial stiffness and wave reflections after cigarette smoking. Journal of Hypertension 24, 683–9.

Lenard, Z., Fulop, D., Visontai, Z. et al. 2000: Static versus dynamic distensibility of the carotid artery in humans. Journal of Vascular Research 37(2), 103–11.

Lenfant, C. 1994: Report of the task force on research in heart failure. Circulation 90(3), 1118–23.

Lenfant, C. 1995: Integrative physiology: remember the big picture. Circulation 91, 1901.

Lenters, V., Uiterwaal, C.S., Beelen, R. et al. 2010: Long-term exposure to air pollution and vascular damage in young adults. Epidemiology 21, 512–20.

Lerman, A. and Zeiher, A.M. 2005: Endothelial function: cardiac events. Circulation 111(3), 363–8.

Letcher, R.L., Chien, S., Pickering, T.G. et al. 1981: Direct relationship between blood pressure and blood viscosity in normal and hypertensive subjects. Role of fibrinogen and concentration. American Journal of Medicine 70(6), 1195–202.

Leung, F.P., Yung, L.M., Laher, I. et al. 2008: Exercise, vascular wall and cardiovascular diseases: an update (Part 1). Sports Medicine 38(12), 1009–24.

Leung, M.C., Meredith, I.T. and Cameron, J.D. 2005: Aortic stiffness affects the coronary blood flow response to percutaneous coronary intervention. American Journal of Physiology. Heart and Circulatory Physiology 290(2), H624–30.

Leung, W.H., Lau, C.P. and Wong, C.K. 1993: Beneficial effect of cholesterol-lowering therapy on coronary endothelium-dependent relaxation in hypercholesterolaemic patients. Lancet 341(8859), 1496–500.

Leusen, I., Demeester, G. and Bouckaert, J.J. 1954: Influence des reflexes sino-carotidiens due le debit cardiaque et la resistance peripherique apres hemorragie. Archives of International Physiology 62, 535–9.

Levenson, J. and Simon, A. 1988: Heterogeneity of response of peripheral arteries to antihypertensive drugs in essential hypertension: basic effects and functional consequences. Drugs 35, 34–9.

Levenson, J.A., Peronneau, P.P., Simon, A.C. et al. 1981: Pulsed Doppler determination of diameter, blood flow velocity and volumic flow of brachial artery in man. Cardiovascular Research 15, 164–70.

Levenson, J., Simon, A.C., Safar, M.E. et al. 1984a: Large arteries in hypertension: acute effects of a new calcium entry blocker, nitrendipine. Journal of Cardiovascular Pharmacology 6(suppl. 7): S1006–10.

Levenson, J., Simon, A.C., Bouthier, J.D. et al. 1984b: Post-synaptic alpha-blockade and brachial artery compliance in essential hypertension. Journal of Hypertension 2(1), 37–41.

Levenson, J., Sang, K.H.L., Devynck, M.A. et al. 1987a: The role of antihypertensive drugs in counteracting adverse influence on large arteries. American Heart Journal 114, 992–7.

Levenson, J.A., Simon, A.C., Cambien, F.A. et al. 1987b: Cigarette smoking and hypertension: factors independently associated with blood hyperviscosity and arterial rigidity. Arteriosclerosis 7, 572–7.

Levenson, J., Gariepy, J., Megnien, J.L. et al. 1992: Diuretics and arteriolar resistance and arterial compliance in human hypertension. European Heart Journal 13(suppl. G), 48–52.

Levin, H.R., Oz, M.C., Chen, J.M. et al. 1995: Reversal of chronic ventricular dilation in patients with end-stage cardiomyopathy by prolonged mechanical unloading. Circulation 91, 2717–20.

Levine, T.B., Francis, G.S., Goldsmith, S.R. et al. 1982: Activity of the sympathetic nervous system and renin-angiotensin system assessed by plasma hormone levels and their relation to hemodynamic abnormalities in congestive heart failure. American Journal of Cardiology 49, 1659–66.

Levy, B.I. 1999: Mechanics of the large artery vascular wall. Pathological Biology (Paris) 47(6), 634–40.

Levy, B.I., Babalis, D., Lacolley, P. et al. 1988a: Cardiac hypertrophy and characteristic impedance in spontaneously hypertensive rats. Journal of Hypertension 6(suppl. 4), S110–11.

Levy, B., Michel, J.B., Saltzman, J.L. et al. 1988b: Effects of chronic inhibition of converting enzyme on mechanical and structural properties of arteries in rat renovascular hypertension. Circulation Research 63, 227–39.

Levy, D. and Brink, S. 2005: A change in heart. New York: Vintage Books.

Levy, D. and Thom, T. 1998: Death rates from coronary disease – progress and a puzzling paradox (Editorial). New England Journal of Medicine 339, 915–16.

Levy, D., Garrison, R.J., Savage, D.D. et al. 1990: Prognostic implications of echocardiographically determined left ventricular mass in the Framingham Heart Study. New England Journal of Medicine 322, 1561–6.

Levy, D., Kenchaiah, S., Larson, M.G. et al. 2002: Long-term trends in the incidence of and survival with heart failure. New England Journal of Medicine 347, 1397–402.

Levy, D., Larson, M.G., Benjamin, E.J. et al. 2007: Framingham Heart Study 100K Project: genome-wide associations for blood pressure and arterial stiffness. BMC Medical Genetics 8(suppl. 1), S3.

Levy, D., Larson, M.G., Vasan, R.S. et al. 1996: The progression from hypertension to congestive heart failure. Journal of the American Medical Association 275, 1557–62.

Levy, D., Merz, C.N.B., Cody, R.J. et al. 1999: Hypertension detection, treatment and control: a call to action for cardiovascular specialists. Journal of the American College of Cardiology 34, 1360–62.

Levy, M.N. 1958: Relative influence of variations in arterial and venous pressures on resistance to flow. American Journal of Physiology 192, 164–70.

Lewis, E.F., Tsang, S.W., Fang, J.C. et al. 2004: Frequency and impact of delayed decisions regarding heart transplantation on long-term outcomes in patients with advanced heart failure. Journal of the American College of Cardiology 43, 794–802.

Lewis, E.J., Hunsicker, L.G., Clarke, W.R. et al. 2001: Renoprotective effect of the angiotensin–receptor antagonist irbesartan in patients with nephropathy due to type 2 diabetes. New England Journal of Medicine 345, 851–60.

Lewis, J.F., Kuo, L.C., Nelson, J.G. et al. 1984: Pulsed Doppler echocardiographic determination of stroke volume and cardiac output: clinical validation of two new methods using the apical window. Circulation 70, 425–31.

Lewis, O. 1997: Frederick Henry Horatio Akbar Mahomed, 'a brave and ambitious explorer'. Journal of Human Hypertension 11(5), 255–61.

Lewis, R.P., Boudoulas, H., Leier, C.V. et al. 1982: Usefulness of the systolic time intervals in cardiovascular clinical cardiology. Transactions of the American Clinical and Climatological Associations 93, 108–20.

Lewis, T. 1906: The factors influencing the prominence of the dicrotic wave. Journal of Physiology 34, 414–29.

Lewis, T. 1933: Material relating to coarctation of the aorta of the adult type. Heart 16, 205–43.

Lewis, T. 1934: Diseases of the heart. London: Macmillan, p. 49.

Lewis, T.T., Sutton-Tyrrell, K., Penninx, B.W. et al. 2010: Race, psychosocial factors, and aortic pulse wave velocity: the health, aging, and body composition study. Journals of Gerontology. Series A, Biological Sciences and Medical Sciences 65, 1079–85.

Lewy, B. 1897: Die Reibung des Blutes. Pflugers Archiv für die gesamte Physiologie 65, 447–72.

Leye, M., Brochet, E., Lepage, L. et al. 2009: Size-adjusted left ventricular outflow tract diameter reference values: a safeguard for the evaluation of the severity of aortic stenosis. Journal of the American Society of Echocardiography 22, 445–451.

Li, H. and Förstermann, U. 2009: Prevention of atherosclerosis by interference with the vascular nitric oxide system. Current Pharmaceutical Design 15(27), 3133–45.

Li, J.K. 1985: Pulse wave reflections at the aorto-iliac junction. Angiology 36, 516–21.

Li, J.K. 1986: Time domain resolution of forward and reflected waves in the aorta. IEEE Transactions of Biomedical Engineering 33(8), 783–5.

Li, J.K., Melbin, J., Riffle, R.A. et al. 1981: Pulse wave propagation. Circulation Research 49, 442–52.

Li, M.X., Beech-Brandt, J.J., John, L.R. et al. 2007: Numerical analysis of pulsatile blood flow and vessel wall mechanics in different degrees of stenoses. Journal of Biomechanics 40(16), 3715–24.

Li, S., Chen, W., Srinivasan, S.R. and Berenson, G.S. 2004: Childhood blood pressure as a predictor of arterial stiffness in young adults: the Bogalusa Heart Study. Hypertension 43, 541–6.

Li, Y., Hansen, T.W. and Staessen, J.A. 2010: More information on the reproducibility of the ambulatory arterial stiffness index. American Journal of Hypertension 23(2), 113–14.

Li, Y., Wang, J.G., Dolan, E. et al. 2006: Ambulatory arterial stiffness index derived from 24-hour ambulatory blood pressure monitoring. Hypertension 47(3), 359–64.

Liang, Y.L., Teede, H., Shiel, L.M. et al. 1997: Effects of oestrogen and progesterone on age-related changes in arteries of postmenopausal women. Clinical and Experimental Pharmacology and Physiology 24, 457–9.

Liang, Y.-L., Teede, H., Kotsopoulos, D. et al. 1998: Non-invasive measurements of arterial structure and function, repeatability, interrelationships and trial sample size. Clinical Science 95, 669–79.

Liao, J.K. and Laufs, U. 2005: Pleiotropic effects of statins. Annual Review of Pharmacology and Toxicology 45, 89–118.

Liao, J.K., Bettman, M.A., Sandor, T. et al. 1991: Differential impairment of vasodilator responsiveness of peripheral resistance and conduit vessels in humans with atherosclerosis. Circulation Research 68, 1027–34.

Liao, D., Arnett, D.K., Tyroler, H.A. et al. 1999: Arterial stiffness and the development of hypertension. The ARIC study. Hypertension 34(2), 201–16.

Libby, P. 2001a: Current concepts of the pathogenesis of the acute coronary syndromes. Circulation 104(3), 365–72.

Libby, P. 2001b: Managing the risk of atherosclerosis: the role of high-density lipoprotein. American Journal of Cardiology 88(12A), 3N–8N.

Libby, P. 2001c: The vascular biology of atherosclerosis. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease, 6th edn. Philadelphia: Saunders, 995–1009.

Libby, P. 2002: Atherosclerosis: a new view. Scientific American 286(5), 46–55.

Libby, P. 2003: Vascular biology of atherosclerosis: overview and state of the art. American Journal of Cardiology 91(3A), 3A–6A.

Libby, P. and Crea, F. 2010: Clinical implications of inflammation for cardiovascular primary prevention. European Heart Journal 31, 777–83.

Libby, P., Plutzky, J. et al. 2002: Diabetic macrovascular disease. The glucose paradox? Circulation 106, 2760–3.

Libby, P., Bonow, R.O., Mann, D.L. et al. 2008: Braunwald's heart disease, 8 edn. Philadelphia: Saunders.

Libby, P., Okamoto, Y., Rocha, V.Z. et al. 2010: Inflammation in atherosclerosis: transition from theory to practice. Circulation Journal 74, 213–20.

Libby, P., Ridker, P.M. and Maseri, A. 2002: Inflammation and atherosclerosis. Circulation 105(9), 1135–43.

Libby, P., Ridker, P.M., Hansson, G.K. et al. 2009: Inflammation in atherosclerosis: from pathophysiology to practice. Journal of the American College of Cardiology 54, 2129–38.

Lie, J.T. and Hammond, P.I. 1988: Pathology of the senescent heart: observations in autopsy studies of patients 90–105 years old. Mayo Clinic Proceedings 63, 552–64.

Lieb, W., Larson, M.G., Benjamin, E.J. et al. 2009: Multimarker approach to evaluate correlates of vascular stiffness: the Framingham Heart Study. Circulation 119, 37–43.

Lieber, A., Millasseau, S., Bourhis, L. et al. 2010: Aortic wave reflection in women and men. American Journal of Physiology. Heart and Circulatory Physiology 299, H236–42.

Lightvoet, C. and Eversdijk, C.H. 1981: Real-time compound scanning. Ultrasound in Medicine and Biology 3, 51.

Lightwood, J.M. and Glantz, S.A. 2009: Declines in acute myocardial infarction after smoke-free laws and individual risk attributable to secondhand smoke. Circulation 120, 1373–9.

Liljestrand, G. 1957: Le prix Nobel en 1956: Nobel Foundation.

Lin, K., Kazmi, K.S., Law, M. et al. 2007: Measuring elevated microvascular permeability and predicting hemorrhagic transformation in acute ischemic stroke using first-pass dynamic perfusion CT imaging. American Journal of Neuroradiology 28(7), 1292–8.

Lind, L. 2006: Systolic and diastolic hypertension impair endothelial vasodilatory function in different types of vessels in the elderly: the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS) study. Journal of Hypertension 24(7), 1319–27.

Lind, L., Fors, N., Hall, J. et al. 2005: A comparison of three different methods to evaluate endothelium-dependent vasodilation in the elderly: the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS) study. Arteriosclerosis, Thrombosis, and Vascular Biology 25(11), 2368–75.

Lind, L., Andersson, J., Hansen, T. et al. 2009: Atherosclerosis measured by whole body magnetic resonance angiography and carotid artery ultrasound is related to arterial compliance, but not to endothelium-dependent vasodilation – the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS) study. Clinical Physiology and Functional Imaging 29(5), 321–9.

Lind, L., Hall, J., Larsson, A. et al. 2000: Evaluation of endothelium-dependent vasodilation in the human peripheral circulation. Clinical Physiology 20(6), 440–8.

Lind, L., Hall, J. and Johansson, K. 2002: Evaluation of four different methods to measure endothelium-dependent vasodilation in the human peripheral circulation. Clinical Science 102, 561–7.

Lind, L., Pettersson, K. and Johansson, K. 2003: Analysis of endothelium-dependent vasodilation by use of the radial artery pulse wave obtained by applanation tonometry. Clinical Physiology and Functional Imaging 23(1), 50–7.

Lind, L., Sarabi, M., Millgård, J. et al. 1999: Endothelium-dependent vasodilation and structural and functional changes in the cardiovascular system are dependent on age in healthy subjects. Clinical Physiology 19, 400–9.

Linde, L., Kiowski, W., Buhler, F.R. et al. 1990: Indirect evidence for release of endothelium-derived relaxing factor in human forearm circulation in vivo. Blunted response in essential hypertension. Circulation 81(6), 1762–7.

Lindeman, J.H.N., Abdul-Hussien, N., van Bockel, J.H. et al. 2009: Clinical trial of doxycycline for matrix metalloproteinase-9 inhibition in patients with an abdominal aneurysm: doxycycline selectively depletes aortic wall neutrophils and cytotoxic T cells. Circulation 119, 2209–16.

Linden, R.J. 1958: A hydraulic pressure wave generator. Journal of Physiology 142, 44P–6.

Lindley, P.B. 1974: Engineering design with natural rubber. Malayan Rubber Fund Board. The Natural Rubber Producers' Research Association Technical Bulletin, 4th edn, 8, pp. 17–9.

Linford, R.G. and Ryan, N.W. 1965: Pulsatile flow in rigid tubes. Journal of Applied Physiology 20, 1078–82.

Ling, S.C., Atabek, H.B., Fry, D.L. et al. 1968: Application of heated film velocity and shear probes to hemodynamic studies. Circulation Research 23: 789–801.

Ling, S.C., Atabek, H.B., Letzing, W.G. et al. 1973: Nonlinear analysis of aortic flow in living dogs. Circulation Research 33, 198–212.

Lip, G.Y.H. 2001: Regression of left ventricular hypertrophy and improved prognosis, some HOPE now … or hype? (Editorial). Circulation 104, 1582–4.

Lipowsky, H.H. 2005: Microvascular rheology and hemodynamics. Microcirculation 12(1), 5–15.

Lipowsky, H.H., Usami, S. and Chien, S. 1980: In vivo measurements of apparent viscosity in the mesentery of the cat. Microvascular Research 19, 297–319.

Lisik, W., Schoenberg, L., Lasky, R.E. et al. 2007: Statins benefit outcomes of renal transplant recipients on a sirolimus-cyclosporine regimen. Transplant Proceedings 39, 3086–92.

Little, W.C. and Cheng, C.P. 1993: Effect of exercise on left ventricular-arterial coupling assessed in the pressure-volume plane. American Journal of Physiology 264(5 Pt 2), H1629–33.

Little, W.C., Braden, G. and Applegate, R.J. 1995: Angiographic evaluation of the extent and progression of coronary artery disease: limitations of 'Lumenology'. Clinical Cardiology Newsletter, American Heart Association, Spring 6–11.

Liu, J.E., Palmieri, V., Roman, M.J. et al. 2001: The impact of diabetes on left ventricular filling pattern in normotensive and hypertensive adults, the Strong Heart Study. Journal of the American College of Cardiology 37, 1943–9.

Liu, L., Wang, J.-G., Gong, L. et al. 1998: Comparison of active treatment and placebo for older patients with isolated systolic hypertension. Journal of Hypertension 16, 1823–9.

Liu, P.Y., Liu, Y.W., Lin, L.J. et al. 2009: Evidence for statin pleiotropy in humans: differential effects of statins and ezetimibe on rho-associated

coiled-coil containing protein kinase activity, endothelial function, and inflammation. Circulation 119, 131–8.
Liu, X.Q., Huang, G.Y., Liang, X.V. et al. 2009: Endothelial progenitor cells and arterial functions in the late convalescence period of Kawasaki disease. Acta Paediatrica 98(8), 1355–9.
Liu, Z., Brin, K.P. and Yin, F.C. 1986: Estimation of total arterial compliance, an improved method and evaluation of current methods. American Journal of Physiology 251(3 Pt 2), H588–600.
Liu, Z., Hesse, C., Curry, T.B. et al. 2009: Ambulatory arterial stiffness index is not correlated with the pressor response to laboratory stressors in normotensive humans. Journal of Hypertension 27(4), 763–8.
Liu, Z., Holbelink, D.R. and Gerdes, A.M. 1991: Regional changes in hemodynamics and cardiac myocyte size in rats with aortocaval fistulas: II. Long-term effects. Circulation Research 69, 59–65.
Lloyd-Jones, D.M., Evans, J.C., Larson, M.G. et al. 1999: Differential impact of systolic and diastolic blood pressure level on JNC-VI staging. Hypertension 34, 381–5.
Lloyd-Jones, D.M., Larson, M.G., Leip, E.P. et al. 2002: Lifetime risk for developing congestive heart failure: the Framingham Heart Study. Circulation 106, 3068–72.
Lloyd-Jones, D.M., Leip, E.P., Larson, M.G. et al. 2006: Prediction of lifetime risk for cardiovascular disease by risk factor burden at 50 years of age. Circulation 113, 791–8.
Lloyd-Jones, D.M., Adams, R., Carnethon, M. et al. 2009: Heart Disease and Stroke Statistics-2009 Update: A Report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Circulation 119, e21–181.
Lloyd-Jones, D.M. 2010: Cardiovascular risk prediction: basic concepts, current status, and future directions. Circulation 121, 1768–77.
Lodder, J., Bamford, J.M., Sandercock, P.A. et al. 1990: Are hypertension or cardiac embolism likely causes of lacunar infarction? Stroke 21(3), 375–81.
Loeys, B.L., Schwarze, U., Holm, T. et al. 2006: Aneurysm syndromes caused by mutations in the TGF-β receptor. New England Journal of Medicine 355, 788–98.
Logan, S.E. 1975: On the fluid mechanics of human coronary artery stenosis. IEEE Transactions on Biomedical Engineering 22(4), 327–34.
Lohman, P.H.M., Sankaranarayanan, K. and Ashby, J. 1992: Choosing the limits to life. Nature 357, 185–6.
Loimaala, A., Groundstroem, K., Rinne, M. et al. 2009: Effect of long-term endurance and strength training on metabolic control and arterial elasticity in patients with type 2 diabetes mellitus. American Journal of Cardiology 103, 972–7.
Lojanapiwat, B., Weerusawin, T. and Kuanprasert, S. 2009: Erectile dysfunction as a sentinel marker of endothelial dysfunction disease. Singapore Medical Journal 50(7), 698–701.
Lominadze, D., Dean, W.L., Tyagi, S.C. et al. 2010: Mechanisms of fibrinogen-induced microvascular dysfunction during cardiovascular disease. Acta Physiologica 198(1), 1–13.
London, G., Guerin, A., Pannier, B. et al. 1992: Increased systolic pressure in chronic uremia: role of arterial wave reflections. Hypertension 20, 10–19.
London, G.M., Guerin, A.P., Pannier, B. et al. 1995: Influence of sex on arterial hemodynamics and blood pressure. Role of body height. Hypertension 26(3), 514–29.
London, G.M., Blacher, J., Pannier, B. et al. 2001: Arterial wave reflections and survival in end-stage renal failure. Hypertension 38, 434–8.
London, G.M. and Cohn, J.N. 2002: Prognostic application of arterial stiffness, task forces. American Journal of Hypertension 15(8), 754–8.
London, G.M., Asmar, R.G., O'Rourke, M.F. et al. on behalf of the REASON Project Investigators. 2004a: Mechanism(s) of selective systolic blood pressure reduction after a low-dose combination of perindopril/indapamide in hypertensive subjects: comparison with atenolol. Journal of the American College of Cardiology 43, 92–9.
London, G.M., Marchais, S.J., Guerin, A.P. et al. 2004b: Arterial stiffness: pathophysiology and clinical impact. Clinical and Experimental Hypertension 26(7–8), 689–99.
Lopez-Garcia, E., van Dam, R.M., Li, T.Y. et al. 2008: The relationship of coffee consumption with mortality. Annals of Internal Medicine 148, 904–14.
Lopez-Palop, R., Pinar, E., Lozano, I. et al. 2002: [Clinical utilization of the coronary pressure wire]. Revista Espanola De Cardiologia 55(3), 251–7.
Lord, R.S.A. 1986: Surgery of occlusive cerebrovascular disease. St Louis: C.V. Mosby.
Lorell, B.H. 1995: Diastolic heart failure. ACC Current Journal Review 4(2), 52–4.
Lorenz, M.W., von Kegler, S., Steinmetz, H. et al. 2006: Carotid intima-media thickening indicates a higher vascular risk across a wide age range: prospective data from the Carotid Atherosclerosis Progression Study (CAPS). Stroke 37, 87–92.
Lorenz, M.W., Markus, H.S., Bots, M.L. et al. 2007: Prediction of clinical cardiovascular events with carotid intima-media thickness: a systematic review and meta-analysis. Circulation 115, 459–67.
Lorenz, M.W., Schaefer, C., Steinmetz, H. et al. 2010: Is carotid intima media thickness useful for individual prediction of cardiovascular risk? Ten-year results from the Carotid Atherosclerosis Progression Study (CAPS). European Heart Journal 31, 2041–8.
Loscalzo, J., Creager, M.A. and Dzau, V.J. (eds), 1996: Vascular medicine: a textbook of vascular biology and diseases, 2nd edn. Boston: Little, Brown and Company.
Loupas, T., Ellwood, D.A., Gill, R.W. et al. 1995a: Computer analysis of the early diastolic notch in Doppler sonograms of the uterine arteries. Ultrasound in Medicine and Biology 21, 1001–11.
Loupas, T., Powers, J.T. and Gill, R.W. 1995b: An axial velocity estimator for ultrasound blood flow imaging, based on a full evaluation of the Doppler equation by means of a two-dimensional autocorrelation approach. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 42, 672–88.
Loutzenhizer, R., Bidani, A.K. and Wang, X. 2004: Systolic pressure and the myogenic response of the renal afferent arteriole. Acta Physiologica Scandinavica 181, 407–13.
Loutzenhiser, R., Griffin, K., Williamson, G. et al. 2006: Renal autoregulation: new perspectives regarding the protective and regulatory roles of the underlying mechanisms. American Journal of Physiology. Regulatory, Integrative and Comparative Physiology 290, R1153–67.
Love, A.E.H. 1944: A treatise on the mathematical theory of elasticity, 4th edn. New York: Dover.
Lowe, G., Rumley, A., Norrie, J. et al. 2000: Blood rheology, cardiovascular risk factors, and cardiovascular disease, the West of Scotland Coronary Prevention Study. Thrombosis and Haemostasis 84(4), 553–8.
Lowe, G.D., Lee, A.J., Rumley, A. et al. 1997: Blood viscosity and risk of cardiovascular events: the Edinburgh Artery Study. British Journal of Haematology 96(1), 168–73.
Lowe, G.D.O. (ed.) 1988: Nature and clinical importance of blood rheology: clinical blood rheology, Vol. 1. Boca Raton, FL: CRC.
Lowe, G.D.O., Barbenel, J.C. and Forbes, C.D. 1981: Clinical aspects of blood viscosity and cell deformability. Berlin: Springer-Verlag.
Lowensohn, H.S., Khouri, E.M., Gregg, D.E. et al. 1976: Phasic right coronary artery blood flow in conscious dogs with normal and elevated right ventricular pressures. Circulation Research 39(6), 760–6.
Lu, T.M., Hsu, N.W., Chen, Y.H. et al. 2001: Pulsatility of ascending aorta and restenosis after coronary angioplasty in patients <60 years of age with stable angina pectoris. American Journal of Cardiology 88, 964–8.
Lucas, C.L., Wilcox, B.R. and Coulter, N.A. 1975: Pulmonary vascular response to atrial septal defect closure in children. Journal of Surgical Research 18, 571–86.
Lucas, C.L., Wilcox, B.R., Ha, B. and Henry, G.W. 1988: Comparison of time domain algorithms for estimating aortic characteristic impedance in humans. IEEE Transactions on Biomedical Engineering 35(1), 62–8.
Luchsinger, P.C., Snell, R.E., Patel, D.J. et al. 1964: Instantaneous pressure distribution along the human aorta. Circulation Research 15, 503–10.
Luciani, L. 1911: Human physiology. (trans. F.A. Welby), London: Macmillan.

Ludmer, P.L., Selwyn, A.P., Shook, T.L. et al. 1986: Paradoxical vasoconstriction induced by acetylcholine in atherosclerotic coronary arteries. New England Journal of Medicine 315(17), 1046–51.

Ludwig, C. 1847: Contributions to the knowledge of the influence of the respiratory movements upon the blood flow in the arterial system. In: Ruskin, A. and Charles, C.T. (eds), Classics in arterial hypertension. Springfield, IL: Charles C. Thomas.

Lundbäck, M., Mills, N.L., Lucking, A. et al. 2009: Experimental exposure to diesel exhaust increases arterial stiffness in man. Particle and Fibre Toxicology 6, 7.

Lundholm, L. and Mohme-Lundholm, E. 1966: Length at inactivated contractile elements, length-tension diagram, active state and tone of vascular smooth muscle. Acta Physiologica Scandinavia 68, 347–59.

Lund-Johansen, P. and Omvik, P. 1995: Hemodynamic patterns of untreated hypertensive disease. In: Laragh, J.H. and Brenner, B.M. (eds), Hypertension: pathophysiology, diagnosis and management. New York: Raven Press, pp. 323–42.

Lüscher, T.F. and Noll, G. 1993: Endothelial-dependent vasomotion in aging, hypertension, and heart failure. Circulation 87(suppl. VII), VII-97–VII-103.

Lüscher, T.F., Pieper, M., Tendera, M. et al. 2009: A randomized placebo-controlled study on the effect of nifedipine on coronary endothelial function and plaque formation in patients with coronary artery disease: the ENCORE II study. European Heart Journal 30(13), 1590–7.

Lydakis, C., Momen, A., Blaha, C. et al. 2008: Changes of central haemodynamic parameters during mental stress and acute bouts of static and dynamic exercise. Journal of Human Hypertension 22, 320–8.

Lyons, K. and Dalbow, M. 1986: Room temperature injectate and iced injectate for cardiac output: a comparative study. Critical Care Nurse 6(1), 48–50.

Maarek, B., Simon, A, Ch., Levenson, J. et al. 1986: Chronic effects of pindolol on the arterioles, large arteries, and veins of the forearm in mild to moderate essential hypertension. Clinical Pharmacology and Therapeutics 39(4), 403–8.

MAAS Investigators. 1994: Effect of simvastatin in coronary atheroma: the Multicenter Anti-Atheroma Study (MAAS). Lancet 344(8923), 633–8.

MacIsaac, A.I., Thomas, J.D. and Topol, E.J. 1993: Toward the quiescent coronary plaque. Journal of the American College of Cardiology 22(4), 1228–41.

Mackenzie, I.S., Wilkinson, I.B. and Cockcroft, J.R. 2002: Assessment of arterial stiffness in clinical practice. Quarterly Journal of Medicine 95(2), 67–74.

Mackenzie, J. 1902: The study of the pulse: arterial, venous and hepatic, and of the movements of the heart. Edinburgh: Young J. Pentland.

Mackenzie, J. 1917: Principles of diagnosis and treatment of heart affections, 2nd edn. London: Frowde.

Mackenzie, J. 1926: Principles of diagnosis and treatment of heart affections, 3rd edn. London: Oxford University Press.

Mackenzie, J. and Orr, J. 1926: Principles of diagnosis and treatment in heart affections, 3rd edn. London: Oxford.

Mackey, R.H., Tyrrell, K.S. and Vaitkevicius, P.V. 2002: Correlates of aortic stiffness in elderly individuals: a subgroup of the cardiovascular health study. American Journal of Hypertension 15, 16–23.

MacMahon, S. 2000: Blood pressure and the risk of cardiovascular disease. New England Journal of Medicine 342, 50–1.

MacMahon, S., Peto, R., Cutler, J. et al. 1990: Blood pressure, stroke, and coronary heart disease. Part 1, Prolonged differences in blood pressure: Prospective observational studies corrected for the regression dilution bias. Lancet 335, 765–74.

MacSweeney, S.T.R., Young, G., Greenhalgh, R.M. et al. 1992: Mechanical properties of the aneurysmal aorta. British Journal of Surgery 79, 1281–4.

Madden, K.M., Lockhart, C., Cuff, D. et al. 2009: Short-term aerobic exercise reduces arterial stiffness in older adults with type 2 diabetes, hypertension, and hypercholesterolemia. Diabetes Care 32, 1531–5.

Madhavan, S., Ooi, W.L., Cohen, H. et al. 1994: Relation of pulse pressure and blood pressure reduction to the incidence of myocardial infarction. Hypertension 23, 395–401.

Maeda, S., Miyauchi, T., Kakiyama, T. et al. 2001: Effects of exercise training of 8 weeks and detraining on plasma levels of endothelium-derived factors, endothelin-1 and nitric oxide, in healthy young humans. Life Sciences 69(9), 1005–16.

Maeda, S., Tanabe, T., Otsuki, T. et al. 2008: Acute exercise increases systemic arterial compliance after 6-month exercise training in older women. Hypertension Research 31(2), 377–81.

Maeder, M.T., Thompson, B.R., Brunner-La Rocca, H-P. et al. 2010: Hemodynamic basis of exercise limitation in patients with heart failure and normal ejection fraction. Journal of the American College of Cardiology 56, 855–63.

Maeta, H. and Hori, M. 1985: Effects of a lack of aortic 'Windkessel' properties on the left ventricle. Japanese Circulation Journal 49, 232–7.

Magalski, A., Adamson, P., Gadler, F. et al. 2002: Continuous ambulatory right heart pressure measurements with an implantable hemodynamic monitor: a multicenter, 12-month follow-up study of patients with chronic heart failure. Journal of Cardiac Failure 8(2), 63–70.

Maggiorini, M., Brimioulle, S., De Canniere, D. et al. 1998: Effects of pulmonary embolism on pulmonary vascular impedance in dogs and minipigs. Journal of Applied Physiology 84(3), 815–21.

Mahmud, A. and Feely, J. 2001: Acute effect of caffeine on arterial stiffness and aortic pressure waveform. Hypertension 38, 227–31.

Mahmud, A. and Feely, J. 2002a: Reduction in arterial stiffness with angiotensin II antagonist is comparable with and addictive to ACE Inhibition. American Journal of Hypertension 15, 321–5.

Mahmud, A. and Feely, J. 2002b: Divergent effect of acute and chronic alcohol on arterial stiffness. American Journal of Hypertension 15, 240–3.

Mahmud, A. and Feely, J. 2003a: Effect of smoking on arterial stiffness and pulse pressure amplification. Hypertension 41(1), 183–7.

Mahmud, A. and Feely, J. 2003b: Spurious systolic hypertension of youth: fit young men with elastic arteries. American Journal of Hypertension 16, 229–32.

Mahmud, A. and Feely, J. 2004: Effects of passive smoking on blood pressure and aortic pressure waveform in healthy young adults – influence of gender. British Journal of Clinical Pharmacology 57, 37–43.

Mahomed, F.A. 1872: The physiology and clinical use of the sphygmograph. Medical Time Gazette 1, 62.

Mahomed, F.A. 1874: The aetiology of Bright's disease and the prealbuminuric stage. Medical Chirurgical Transactions 57, 197–228.

Mahomed, F.A. 1877: On the sphygmographic evidence of arterio-capillary fibrosis. Transactions of the Pathology Society 28, 394–7.

Mahomed, F.A. 1879: Chronic Bright's disease and its essential symptoms. Lancet 1, 46.

Mahomed, F.A. 1881: Chronic Bright's disease without albuminuria. Guy's Hospital Report 15, 295.

Maisel, A.S., Krishnaswamy, P., Nowak, R.M. et al. 2002: Rapid measurement of B-type natriuretic peptide in the emergency diagnosis of heart failure. New England Journal of Medicine 347, 161–7.

Maisel, A.S., McCord, J., Nowak, R.M. et al. 2003: Bedside B-type natriuretic peptide in the emergency diagnosis of heart failure with reduced or preserved ejection fraction: results from the Breathing Not Properly (BNP) multinational study. Journal of the American College of Cardiology 41, 2010–17.

Mäkimattila, S., Liu, M.L., Vakkilainen, J. et al. 1999: Impaired endothelium-dependent vasodilation in type 2 diabetes. Relation to LDL size, oxidized LDL, and antioxidants. Diabetes Care 22, 973–81.

Maki-Petaja, K.M., Hall, F.C., Booth, A.D. et al. 2006: Rheumatoid arthritis is associated with increased aortic pulse-wave velocity, which is reduced by anti-tumor necrosis factor-alpha therapy. Circulation 114, 1185–92.

Malayeri, A.A., Natori, S., Bahrami, H. et al. 2008: Relation of aortic wall thickness and distensibility to cardiovascular risk factors (from the Multi-Ethnic Study of Atherosclerosis [MESA]). American Journal of Cardiology 102(4), 491–6.

Malek, A. and Izumo, S. 1992: Physiological fluid shear stress causes downregulation of endothelin-1 mRNA in bovine aortic endothelium. American Journal of Physiology 263(2 Pt 1), C389–96.

Malek, A.M. and Izumo, S. 1994: Molecular aspects of signal transduction of shear stress in the endothelial cell. Journal of Hypertension 12, 989–99.

Malek, A.M., Greene, A.L. and Izumo, S. 1993: Regulation of endothelin 1 gene by fluid shear stress is transcriptionally mediated and independent of protein kinase C and cAMP. Proceedings of the National Academy of Sciences of the United States of America 90, 5999–6003.

Malek, A.M., Alper, S.L. and Izumo, S. 1999: Hemodynamic shear stress and its role in atherosclerosis. Journal of the American Medical Association 282(21), 2035–42.

Malik, A.R., Kondragunta, V. and Kullo, I.J. 2008: Forearm vascular reactivity and arterial stiffness in asymptomatic adults from the community. Hypertension 51(6), 1512–18.

Mall, F. 1888: Konig. Sachs. Ges. Wiss. Abhandl. Math. Cl., 14: 151 (cited by Iberall, 1967).

Mall, F.P. 1906: A study of the structural unit of the liver. American Journal of Anatomy 5, 227–308.

Mallos, A.J. 1962: An electrical caliper for continuous measurement of relative displacement. Journal of Applied Physiology 17, 131–4.

Maloney, J.E., Bergel, D.H., Glazier, J.B. et al. 1968: Transmission of pulsatile blood pressure and flow through the isolated lung. Circulation Research 23, 11–24.

Mancia, G. 2010: Effects of intensive blood pressure control in the management of patients with type 2 diabetes mellitus in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial. Circulation 122, 847–9.

Mancia, G., De Backer, G., Dominiczak, A. et al., The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). 2007a: 2007 Guidelines for the management of arterial hypertension. European Heart Journal 28, 1462–536.

Mancia, G., De Backer, G., Dominiczak, A. et al., The Task Force for the Management of Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). 2007b: 2007 Guidelines for the management of arterial hypertension. Journal of Hypertension 25, 1105–87.

Mancia, G., Giannattasio, C. and Grassi, G. 1998: Arterial distensibility in cardiovascular diseases. Journal of Nephrology 11(6), 284–8.

Mancini, G.B. 2002: Emerging role of angiotensin II type 1 receptor blockers for the treatment of endothelial dysfunction and vascular inflammation. Canadian Journal of Cardiology 18(12), 1309–16.

Mancini, G.B. 2004: Vascular structure versus function: is endothelial dysfunction of independent prognostic importance or not? Journal of the American College of Cardiology 43(4), 624–8.

Mancini, G.B., Henry, G.C., Macaya, C. et al. 1996: Angiotensin-converting enzyme inhibition with quinapril improves endothelial vasomotor dysfunction in patients with coronary artery disease. The TREND (Trial on Reversing Endothelial Dysfunction) Study. Circulation 94(3), 258–65.

Mandell, B.F. and Hoffman, G.S. 2001: Rheumatic disease and the cardiovascular system in heart disease. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease. Philadelphia: Saunders, pp. 2199–210.

Manecke, G.R. Jr. and Auger, W.R. 2007: Cardiac output determination from the arterial pressure wave: clinical testing of a novel algorithm that does not require calibration. Journal of Cardiothoracic and Vascular Anesthesia 21(1), 3–7.

Mang, K. 1976: Impedance studies in the arterial system with arterio-venous shunt. BSc thesis, New South Wales Institute of Technology, Sydney, Australia.

Mangoni, A.A., Mircoli, L., Giannattasio, C. et al. 1996: Heart rate-dependence of arterial distensibility in vivo. Journal of Hypertension 14(7), 897–901.

Mani, K., Bjorck, M., Lundkvist, J. et al. 2009: Improved long-term survival after abdominal aortic aneurysm repair. Circulation 120, 201–11.

Manisty, C., Mayet, J., Tapp, R.J. et al. 2010: Wave reflection predicts cardiovascular events in hypertensive individuals independent of blood pressure and other cardiovascular risk factors: an ASCOT (Anglo-Scandinavian Cardiac Outcome Trial) substudy. Journal of the American College of Cardiology 56(1), 24–30.

Manisty, C.H., Mayet, J., Tapp, R.J. et al. 2009: Atorvastation treatment is associated with less augmentation of carotid pressure waveform in hypertension: a substudy of the ASCOT. Hypertension 54, 1009–13.

Manning, T.S., Shykoff, B.E. and Izzo, J.L. 2002: Validity and reliability of diastolic pulse contour analysis (Windkessel model) in humans. Hypertension 39, 963–8.

Mannion, T.C., Vita, J.A., Keaney, J.F. Jr. et al. 1998: Non-invasive assessment of brachial artery endothelial vasomotor function: the effect of cuff position on level of discomfort and vasomotor responses. Vascular Medicine 3, 263–7.

Manuel, F.E. 1968: A portrait of Isaac Newton. Cambridge, MA: Belknap Press of Harvard University Press.

Mao, S.S., Ahmadi, N., Shah, B. et al. 2008: Normal thoracic aorta diameter on cardiac computed tomography in healthy asymptomatic adults: impact of age and gender. Academic Radiology 15, 727–834.

Maple-Brown, L.J., Piers, L.S., O'Rourke, M.F. et al. 2005: Central obesity is associated with reduced peripheral wave reflection in Indigenous Australians irrespective of diabetes status. Journal of Hypertension 23, 1403–7.

Marasek, K. and Nowicki, A. 1994: Comparison of the performance of three maximum Doppler frequency estimators coupled with different spectral estimation methods. Ultrasound in Medicine and Biology 20, 629–38.

March, H.W., Hultgren, H.W. and Gerbode, F. 1960: Immediate and remote effects of resection on the hypertension in coarctation of the aorta. British Heart Journal 22, 361–73.

Marchais, S.J., Guerin, A.P., Pannier, B.M. et al. 1993: Wave reflections and cardiac hypertrophy in chronic uremia. Influence of body size. Hypertension 22(6), 876–83.

Marchiando, R.J. and Elston, M.P. 2003: Automated ambulatory blood pressure monitoring: clinical utility in the family practice setting. American Family Physician 67(11), 2343–50.

Marcus, M.L., Koyanagi, S., Harrison, D.G. et al. 1983: Abnormalities in the coronary circulation that occur as a consequence of cardiac hypertrophy. American Journal of Medicine 75(3A), 62–6.

Marder, V.J. and Sherry, S. 1988a: Thrombolytic therapy: current status: I. New England Journal of Medicine 318(23), 1512–20.

Marder, V.J. and Sherry, S. 1988b: Thrombolytic therapy: current status: II. New England Journal of Medicine 318(24), 1585–93.

Marey, E.J. 1860: Recherches sur le pouls au moyen d'un nouvel appareil enregisteur: le sphygmographe. Paris: E. Thunot et Cie.

Marey, E.J. 1863: Physiologie medicale de la circulation du sang. Paris: Adrien Delahaye.

Marey, E.J. 1875: Pression et vetesse du sang. In: Physiologic experimentale. Paris: G. Masson.

Marey, E.J. 1881: La Circulation du Sang. Paris: G Masson.

Marfan, A.B. 1896: Un cas de déformation congénitale des quatre membres, plus prononcee aux extrémités, caracterisée par l'allongement des os avec un certain degree d'amincissement et memoires. Bulletins de la Société Medicale des Hospitaux de Paris 13, 220–7.

Mark, D.B., Berman, D.S., Budoff, M.J. et al. 2010: ACCF/ACR/AHA/NASCI/SAIP/SCAI/SCCT 2010 Expert consensus document on coronary computed tomographic angiography. Journal of the American College of Cardiology 55, 2663–99.

Markl, M., Wallis, W., Brendecke, S. et al. 2010: Estimation of global aortic pulse wave velocity by flow-sensitive 4D MRI. Magnetic Resonance in Medicine 63(6), 1575–82.

Marks, L.A. and Groch, A. 2000: Optimizing cuff width for noninvasive measurement of blood pressure. Blood Pressure Monitoring 5(3), 153–8.

Markus, R.H., Korcarz, C., McCray, G. et al. 1994: Noninvasive method for determination of arterial compliance using Doppler echocardiography and subclavian pulse tracings. Circulation 89, 2688–99.

Maroko, P.R., Kjekshus, J.K., Sobel, B.E. et al. 1971: Factors influencing infarct size following experimental coronary artery occlusions. Circulation 43, 67–82.

Maron, B.J. 2000: The paradox of exercise. New England Journal of Medicine 343, 1409–11.

Maron, B.J., Chaitman, B.R., Ackerman, M.J. et al. 2004: Recommendations for physical activity and recreational sports participation for young patients with genetic cardiovascular disease. Circulation 109, 2807–16.

Maron, B.J., Humphries, J.O., Rowe, R.D. et al. 1973: Prognosis of surgically corrected coarctation of the aorta: a 20-year postoperative appraisal. Circulation 47(1), 119–26.

Maron, B.J., Moller, J.H., Seidman, C.E. et al. 1998: Impact of laboratory molecular diagnosis on contemporary diagnostic criteria for genetically transmitted cardiovascular diseases: hypertrophic cardiomyopathy, long-QT syndrome, and Marfan syndrome. Circulation 98, 1460–71.

Marques, K.M., Spruijt, H.J., Boer, C. et al. 2002: The diastolic flow-pressure gradient relation in coronary stenoses in humans. Journal of the American College of Cardiology 39(10), 1630–6.

Marsh, N. and Marsh, A. 2000: A short history of nitroglycerine and nitric oxide in pharmacology and physiology. Clinical and Experimental Pharmacology and Physiology 27(4), 313–9.

Martí-Fàbregas, J., Belvís, R., Guardia, E. et al. 2003: Prognostic value of pulsatility index in acute intracerebral hemorrhage. Neurology 61, 1051–56.

Martin, D.C.C. 1994: Ascending aortic flow in congestive heart failure. Master's thesis, University of New South Wales, Sydney, Australia.

Martin, G.M., LaMarco, K., Strauss, E. et al. 2003: Research on aging: the end of the beginning. Science 299, 1339–41.

Martin, H., Hu, J., Gennser, G. et al. 2000: Impaired endothelial function and increased carotid stiffness in 9-year-old children with low birthweight. Circulation 102(22), 2739–44.

Martin, J.S., Beck, D.T., Gurovich, A.N. et al. 2010: The acute effects of smokeless tobacco on central aortic blood pressure and wave reflection characteristics. Experimental Biology and Medicine (Maywood) 235(10), 1263–8.

Martino, F., Loffredo, L., Carnevale, R. et al. 2008: Oxidative stress is associated with arterial dysfunction and enhanced intima-media thickness in children with hypercholesterolemia: the potential role of nicotinamide-adenine dinucleotide phosphate oxidase. Pediatrics 122(3), e648–55.

Maruyama, Y. 2009: Aging-related arterial–cardiac interaction in Japanese men. Heart and Vessels 24, 406–12.

Maruyama, Y., Nishioka, O., Nozaki, E. et al. 1993: Effects of arterial distensibility on left ventricular ejection in the depressed contractile state. Cardiovascular Research 27, 182–7.

Marwick, T.H. and Grimm, R.A. 2010: Extending the use of cardiac resynchronization therapy: do we need a new algorithm? Journal of the American College of Cardiology 56, 763–5.

Marwick, T.H., Hordern, M.D., Miller, T. et al. 2009: Exercise training for type 2 diabetes mellitus: impact on cadiovascular risk. A scientific statement from the American Heart Association. Circulation 119, 3244–62.

Maseri, A. 1991: Coronary vasoconstriction: visible and invisible. New England Journal of Medicine 325, 1579–80.

Maseri, A. 1997: Exploring the hidden side of the moon. New England Journal of Medicine 336(14), 1014–6.

Maseri, A., Crea, F., Kaski, J.C. et al. 1991: Mechanisms of angina pectoris in syndrome X [Editorial]. Journal of the American College of Cardiology 17(2), 499–506.

Maseri, A., Severi, S., De Nes, M. et al. 1978: 'Variant' angina: one aspect of a continuous spectrum of vasospastic myocardial ischemia. American Journal of Cardiology 42, 1019–35.

Mason, D.T. 1978: Afterload reduction and cardiac performance. Physiologic basis of systemic vasodilators as a new approach in treatment of congestive heart failure. American Journal of Medicine 65, 106–25.

Mason, D.T., Gabe, I.T., Mills, C.J. et al. 1970: Applications of the catheter-tip electromagnetic velocity probe in the study of the central circulation in man. American Journal Medicine 49(4), 465–71.

Masoro, E.J. 1981: Handbook of physiology in aging. Boca Raton, FL: CRC Press.

Masoudi, F.A., Havranek, E.P., Smith, G. et al. 2003: Gender, age and heart failure with preserved left ventricular systolic function. Journal of the American College of Cardiology 41, 217–23.

Massie, B., Ports, T., Chatterjee, K. et al. 1981: Long term vasodilation therapy for heart failure: clinical response and its relationships to hemodynamic measurements. Circulation 63(2), 269–78

Massie, B.M. 2003: Natriuretic peptide measurements for the diagnosis of 'nonsystolic' heart failure: good news and bad. Journal of the American College of Cardiology 41, 2018–21.

Masson, I., Boutouyrie, P., Laurent, S. et al. 2008: Characterization of arterial wall mechanical behavior and stresses from human clinical data. Journal of Biomechanics 41(12), 2618–27.

Masuyama, T., Uematsu, M., Doi, Y. et al. 1994: Abnormal coronary flow dynamics at rest and during tachycardia associated with impaired left ventricular relaxation in humans: implication for tachycardia-induced myocardial ischemia. Journal of the American College of Cardiology 24(7), 1625–32.

Mathew, J., Sleight, P., Lonn, E. et al., for the HOPE Investigators 2001: Reduction of cardiovascular risk by regression of electrocardiographic markers of left ventricular hypertrophy by the angiotensin-converting enzyme inhibitor ramipril. Circulation 104, 1615–21.

Mathews, L. and Singh, K.R.K. 2008: Cardiac output monitoring. Annals of Cardiac Anaesthesia 11, 56–68.

Mathieu, P., Poirier, P., Pibarot, P. et al. 2009: Visceral obesity: the link among inflammation, hypertension, and cardiovascular disease. Hypertension 53, 577–84.

Matsuda, Y., Akita, H., Terashima, M. et al. 2000: Carvedilol improves endothelium-dependent dilatation in patients with coronary artery disease. American Heart Journal 140(5), 753–9.

Matsui, Y., Eguchi, K., O'Rourke, M.F. et al. 2009: Differential effects between a calcium channel blocker and a diuretic when used in combination with angiotensin II receptor blocker on central aortic pressure in hypertensive patients. Hypertension 54, 716–23.

Matsui, Y., Eguchi, K., Shibasaki, S. et al. 2010: Impact of arterial stiffness reduction on urinary albumin excretion during antihypertensive treatment. Journal of Hypertension 28, 1752–60.

Matsumoto, C., Tomiyama, H., Yamada, J. et al. 2009: Association of blood pressure levels with the effects of alcohol intake on the vasculature in Japanese men. Hypertension Research 32, 127–32.

Matsuoka, O., Otsuka, K., Murakami, S. et al. 2005: Arterial stiffness independently predicts cardiovascular events in an elderly community – Longitudinal Investigation for the Longevity and Aging in Hokkaido County (LILAC) study. Biomedicine and Pharmacotherapy 59, S40–4.

Matt, P., Schoenhoff, F., Habashi, J. et al. 2009: Circulating transforming growth factor-beta in Marfan syndrome. Circulation 120, 526–32.

Mattace-Raso, F.U., van der Cammen, T.J., Hofman, A. et al. 2006: Arterial stiffness and risk of coronary heart disease and stroke: the Rotterdam Study. Circulation 113, 657–63.

Matter, C.M., Stuber, M. and Nahrendorf, M. 2009: Imaging of unstable plaque: how far have we got? European Heart Journal 30, 2566–74.

Mathews, L. 2007: Paradigm shift in hemodynamic monitoring. Internet Journal of Anesthesiology 11, 1–37.

Matthews, K.A., Crawford, S.L., Chae, C.U. et al. 2009: Are changes in cardiovascular disease risk factors in midlife women due to chronological aging or to the menopausal transition? Journal of the American College of Cardiology 54, 2366–73.

Mauck, G.W., Smithe, C.R., Geddes, L.A. et al. 1980: The meaning of the point of maximum oscillation in cuff pressure in the indirect measurement of blood pressure. II. Journal of Biomechanical Engineering 102, 28–33.

Mauritz, G.J., Marcus, J.T., Boonstra, A. et al. 2008: Non-invasive stroke volume assessment in patients with pulmonary arterial hypertension: left-sided data mandatory. Journal of Cardiovascular Magnetic Resonance 10(1), 51.

Mayer, O. Jr., Filipovský, J., Pešta, M. et al. 2010: The interaction of endothelial nitric oxide synthase polymorphism and current smoking in terms of increased arterial stiffness. Physiological Research 59(4), 529–36.

Mayeux, R. 2010: Early Alzheimer's disease. New England Journal of Medicine 362, 2194–201.

Mayrovitz, H.N. 1987: An optimal flow-radius equation for microvessel non-Newtonian blood flow. Microvascular Research 34, 380–4.
Mazzaro, L., Almasi, S.J., Shandas, R. et al. 2005: Aortic input impedance increases with age in healthy men and women. Hypertension 45(6), 1101–6.
McCall, D.O., McGartland, C.P., McKinley, M.C. et al. 2009: Dietary intake of fruits and vegetables improves microvascular function in hypertensive subjects in a dose-dependent manner. Circulation 119(16), 2153–60.
McCarron, P., Okasha, M., McEwen, J. and Smith, G.D. 2002: Height in young adulthood and risk of death from cardiorespiratory disease: a prospective study of male former students of Glasgow University, Scotland. American Journal of Epidemiology 155(8), 683–7.
McCarty, C.A., Dowrick, A., Cameron, J. et al. 2008: Novel measures of cardiovascular health and its association with prevalence and progression of age-related macular degeneration: the CHARM Study. BMC Ophthalmology 8, 25.
McCrindle, B.W. 1999: Coarctation of the aorta. Current Opinion in Cardiology 14, 448–52.
McCue, S., Dajnowiec, D., Xu, F. et al. 2006: Shear stress regulates forward and reverse planar cell polarity of vascular endothelium in vivo and in vitro. Circulation Research 98, 939–46.
McCutcheon, E.P. 1973: Chronically implanted cardiovascular instrumentation. New York: Academic Press.
McCutcheon, E.P., Evans, J.M. and Staniler, R.R. 1972: Direct blood-pressure measurement: gadgets versus progress. Anesthesia and Analgesia 51, 746–58.
McDicken, W.N., Sutherland, G.R., Moran, C.M. et al. 1992: Colour Doppler velocity imaging of the myocardium. Ultrasound in Medicine and Biology 18, 651–4.
McDonald, D.A. 1952: The occurrence of turbulent flow in the rabbit aorta. Journal of Physiology 118, 340–7.
McDonald, D.A. 1955: The relation of pulsatile pressure to flow in arteries. Journal of Physiology 127, 533–52.
McDonald, D.A. 1960: Blood flow in arteries. London: Edward Arnold.
McDonald, D.A. 1968a: The flow properties of blood as a factor in the stability of pulsatile flow. Proceedings of the Symposium on Biorheology. New York: Interscience 205–13.
McDonald, D.A. 1968b: Regional pulse-wave velocity in the arterial tree. Journal of Applied Physiology 24, 73–8.
McDonald, D.A. 1974: Blood flow in arteries, 2nd edn. London: Edward Arnold.
McDonald, D.A. and Gessner, U. 1968: Wave attenuation in visco-elastic arteries. In: Copley, A.L. (ed.), Hemorheology. Oxford: Pergamon Press, pp. 113–25.
McDonald, D.A. and Nichols, W.W. 1973: Cardiac output derived from the time derivative and phase velocities of aortic pressure waves. Medical and Biological Engineering 11, 678–90.
McDonald, D.A. and Taylor, M.G. 1956: An investigation of the arterial system using an hydraulic oscillator. Journal of Physiology 133, 74P.
McDonald, D.A. and Taylor, M.G. 1959: The hydrodynamics of the arterial circulation. Progress in Biophysics 9, 107–73.
McEniery, C.M., Qasem, A., Schmitt, M. et al. 2003: Endothelin-1 regulates arterial pulse wave velocity in vivo. Journal of the American College of Cardiology 42(11), 1975–81.
McEniery, C.M., Schmitt, M., Qasem, A. et al. 2004: Nebivolol increases arterial distensibility in vivo. Hypertension 44(3), 305–10.
McEniery, C.M., Yasmin, Hall, I.R. et al. 2005a: Normal vascular aging: differential effects on wave reflection and aortic pulse wave velocity: the Anglo-Cardiff Collaborative Trial (ACCT). Journal of the American College of Cardiology 46, 1753–60.
McEniery, C.M., Yasmin, X., Wallace, S. et al. 2005b: Increased stroke volume and aortic stiffness contribute to isolated systolic hypertension in young adults. Hypertension 46, 221–6.
McEniery, C.M., Wallace, S., Mackenzie, I.S. et al. 2006: Endothelial function is associated with pulse pressure, pulse wave velocity, and augmentation index in healthy humans. Hypertension 48(4), 602–8.
McEniery, C.M., Wilkinson, I.B. and Avolio, A.P. 2007: Age, hypertension and arterial function. Clinical and Experimental Pharmacology and Physiology 34, 665–71.
McEniery, C.M., Yasmin, X., McDonnell, B. et al. 2008: Central pressure: variability and impact of cardiovascular risk factors: the Anglo-Cardiff Collaborative Trial II. Hypertension 51, 1476–82.
McEniery, C.M., McDonnell, B.J., So, A. et al. 2009: Aortic calcification is associated with aortic stiffness and isolated systolic hypertension in healthy individuals. Hypertension 53, 524–31.
McEniery, C.M., Spratt, M., Munnery, M. et al. 2010a: An analysis of prospective risk factors for aortic stiffness in men: 20-year follow-up from the Caerphilly prospective study. Hypertension 56(1), 36–43.
McEniery, C.M., Yasmin, X., Maki-Petaja, K.M. et al. 2010b: The impact of cardiovascular risk factors on aortic stiffness and wave reflections depends on age: the Anglo-Cardiff Collaborative Trial (ACCT III). Hypertension 56(4), 591–7.
McEniery, C.M., Bolton, C.E., Fawke, J. et al. 2011: Cardiovascular consequences of extreme prematurity: the EPICure study. Journal of Hypertension 29, 1367–73.
McFadden, E.P., Clarke, J.G., Davies, G.J. et al. 1991: Effect of intracoronary serotonin on coronary vessels in patients with stable angina and patients with variant angina. New England Journal of Medicine 324, 648–54.
McGavock, J.M., Lingvay, I., Zib, I. et al. 2007: Cardiac steatosis in diabetes mellitus: a 1H-magnetic resonance spectroscopy study. Circulation 116, 1170–5.
McGeechan, K., Macaskill, P., Irwig, L. et al. 2008: Assessing new biomarkers and predictive models for use in clinical practice: a clinician's guide. Archives of Internal Medicine 168, 2304–10.
McGill, H.C. Jr., McMahan, C.A., Malcom, G.T. et al. 1995a: Relation of glycohemoglobin and adiposity to atherosclerosis in youth. Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Research Group. Arteriosclerosis Thrombosis and Vascular Biology 15(4), 431–40.
McGill, H.C. Jr., Strong, J.P., Tracy, R.E. et al. 1995b: Relation of a postmortem renal index of hypertension to atherosclerosis in youth. The Pathobiological Determinants of Atherosclerosis in Youth (PDAY) Research Group. Arteriosclerosis Thrombosis and Vascular Biology 15(12), 2222–8.
McGill, H.C. Jr., McMahan, C.A., Malcom, G.T. et al. 1997: Effects of serum lipoproteins and smoking on atherosclerosis in young men and women. The PDAY Research Group. Pathobiological Determinants of Atherosclerosis in Youth. Arteriosclerosis Thrombosis and Vascular Biology 17(1), 95–106.
McGinnis, J.M. and Foege, W.H. 2004: The immediate vs the important. Journal of the American Medical Association 291(10), 1263–4.
McGrath, B.P., Liang, Y.L., Teede, H. et al. 1998: Age-related deterioration in arterial structure and function in postmenopausal women, impact of hormone replacement therapy. Arteriosclerosis, Thrombosis, and Vascular Biology 18(7), 1149–56.
McGuire, D.K., Levine, B.D., Williamson, J.W. et al. 2001a: A 30-year follow-up of the Dallas Bed Rest and Training Study. (Pt 1) Effect of age on the cardiovascular response to exercise. Circulation 104, 1350–57.
McGuire, D.K., Levine, B.D., Williamson, J.W. et al. 2001b: A 30-year follow-up of the Dallas Bed Rest and Training Study. (Pt 2) Effect of age on the cardiovascular adaptation to exercise training. Circulation 104, 1358–66.
Mchedlishvili, G.I. and Varazashvili, M.N. 1982: Effect of the blood flow rate in the carotid artery on the hematocrit of the blood distributed to the brain. Biulleten eksperimentalnoi Biogogii i Meditsing 93(5), 12–14.
McIntyre, P.D., Bhargave, B., Hogg, K.J. et al. 1992: The effect of i.v. sumatriptan, a selective 5-HT1 receptor agonist on central haemodynamics and the coronary circulation. British Journal of Clinical Pharmacology 34, 541–6.
McLachlan, E.M. 1962: Post extrasystolic T-wave changes and myocardial ischaemia. Australia and New Zealand Medical Journal 61, 397–401.

McLaren, G.D. and Danta, G. 1987: Cerebral infarction due to presumed haemodynamic factors in ambulant hypertensive patients. Clinical and Experimental Neurology 23(55), 55–66.

McLeod, F.D. 1967: A directional Doppler flowmeter. Digest of the 7th International Conference on Medical & Biological Engineering, Stockholm, pp. 196–217.

McLeod, F.D. 1970: Calibration of CW and pulse Doppler flowmeters. Proceedings of the 23rd Annual Conference on Engineering in Medicine and Biology 12, 271.

McVeigh, G.E., Bratteli, C.W., Morgan, D.J. et al. 1999: Age-related abnormalities in arterial compliance identified by pressure pulse contour analysis, aging and arterial compliance. Hypertension 33(6), 1392–8.

Meade, T.W., Mellows, S., Brozovic, M. et al. 1986: Haemostatic function and ischaemic heart disease, principal results of the Northwick Park Heart Study. Lancet 2(8506), 533–7.

Meadows, W.R., Draur, R.A. and Osadjan, C.E. 1971: Dicrotism in heart disease. Correlations with cardiomyopathy, pericardial tamponade, youth, tachycardia, and normotension. American Heart Journal 82(5), 596–608.

Meaume, S., Benetos, A., Henry, O.F. et al. 2001: Aortic pulse wave velocity predicts cardiovascular mortality in subjects >70 years of age. Arteriosclerosis, Thrombosis, and Vascular Biology 21, 2046–50.

Medical Research Council Working Party. 1992: MRC Trial of treatment of hypertension in older adults: principal results. British Medical Journal 304, 405–12.

Medley, T.L., Cole, T.J., Gatzka, C.D. et al. 2002: Fibrillin-1 genotype is associated with aortic stiffness and disease severity in patients with coronary artery disease. Circulation 105(7), 810–5.

Meeks, W.M. 2002: Pathophysiology of hypertension in the elderly. Seminars in Nephrology 22(1), 65–70.

Meerson, F.Z. 1961: On the mechanism of compensatory hyperfunction and insufficiency of the heart. Cor Et Vasa 3, 161–77.

Megnien, J.L., Simon, A., Denarie, N. et al. 1998: Aortic stiffening does not predict coronary and extracoronary atherosclerosis in asymptomatic men at risk for cardiovascular disease. American Journal of Hypertension 11, 293–301.

Megnien, J.L., Simon, A., Valensi, P. et al. 1992: Comparative effects of diabetes mellitus and hypertension on physical properties of human large arteries. Journal of the American College of Cardiology 20, 1562–8.

Meguro, T., Nagatomo, Y., Nagae, A. et al. 2009: Elevated arterial stiffness evaluated by brachial-ankle pulse wave velocity is deleterious for the prognosis of patients with heart failure. Circulation Journal 73, 673–80.

Mehdizadeh, A. and Norouzpour, A. 2009: New insights in atherosclerosis: endothelial shear stress as promoter rather than initiator. Medical Hypotheses 73(6), 989–93.

Mehdizadeh, A., Fazelzadeh, A. and Karimi, H. 2009: Alpha particle vascular brachytherapy in the treatment of in-stent restenosis. International Journal of Cardiology 136(2), 220–1.

Mehta, J.L. 1995: Endothelium, coronary vasodilation, and organic nitrates. American Heart Journal 129(2), 382–91.

Mehta, J.L., Nichols, W.W. and Donnelly, W.H. 1989: Protection by superoxide dismutase from myocardial dysfunction and attenuation of vasodilator reserve after coronary occlusion and reperfusion in dog. Circulation Research 65, 1283–95.

Mehta, J.L., Nicolini, F.A., Nichols, W.W. and Saldeen, T.G. 1991: Concurrent nitroglycerin administration decreases thrombolytic potential of tissue-type plasminogen activator. Journal of the American College of Cardiology 17(3), 805–11.

Mehta, R.H., O'Gara, P.T., Bossone, E. et al. 2002: Acute type A aortic dissection in the elderly, clinical characteristics, management, and outcomes in the current era. Journal of the American College of Cardiology 40, 685–92.

Meijboom, L.J., Timmermans, J., Zwinderman, A.H. et al. 2005: Aortic root growth in men and women with the Marfan's syndrome. American Journal of Cardiology 96(10), 1441–4.

Meinders, J.M. and Hoeks, A.P. 2004: Simultaneous assessment of diameter and pressure waveforms in the carotid artery. Ultrasound in Medicine and Biology 30, 147–54.

Meinders, J.M., Brands, P.J., Willigers, J.M et al. 2001a: Assessment of the spatial homogeneity of artery dimension parameters with high frame rate 2-D B-mode. Ultrasound in Medicine and Biology 27, 785–94.

Meinders, J.M., Kornet, L., Brands, P.J. and Hoeks, A.P. 2001b: Assessment of local pulse wave velocity in arteries using 2D distension waveforms. Ultrasonic Imaging 23, 199–215.

Meisner, J.E. and Remington, J.W. 1962: Pulse contour changes in carotid and foreleg arterial systems. American Journal of Physiology 202, 527–35.

Meissner, I., Whisnant, J.P., Khandheria, B.K. et al. 1999: Prevalence of potential risk factors for stroke assessed by transesophageal echocardiography and carotid ultrasonography: the SPARC study. Stroke prevention: assessment of risk in a community. Mayo Clinic Proceedings 74(9), 862–9.

Melkumyants, A.M. and Balashov, S.A. 1990: Effect of blood viscosity on arterial flow-induced dilator response. Cardiovascular Research 24, 165–8.

Melkumyants, A.M., Balashov, S.A. and Khayutin, V.M. 1989: Endothelium dependent control of arterial diameter by blood viscosity. Cardiovascular Research 23(9), 741–7.

Menard, J., Day, M., Chatellier, G. et al. 1992: Some lessons from systolic hypertension in the elderly program (SHEP). American Journal of Hypertension 5(5), 325–30.

Mendall, M.A., Strachan, D.P., Butland, B.K. et al. 2000: C-reactive protein, relation to total mortality, cardiovascular mortality and cardiovascular risk factors in men. European Heart Journal 21(19), 1584–90.

Menke, A., Guallar, E., Rohrmann, S. et al. 2010: Sex steroid hormone concentrations and risk of death in US men. American Journal of Epidemiology 171(5), 583–92.

Merchant, N., Searles, C.D., Pandian, A. et al. 2009: Nebivolol in high-risk, obese African Americans with stage 1 hypertension: effects on blood pressure, vascular compliance, and endothelial function. Journal of Clinical Hypertension (Greenwich) 11(12), 720–5.

Meredith, P.A., Ostergren, J., Anad, I. et al. 2008: Clinical outcomes according to baseline blood pressure in patients with low ejection fraction in CHARM (candesartan in heart failure: assessment of reduction in mortality and morbidity) program. Journal of the American College of Cardiology 52, 2000–7.

Merillon, J.P., Motte, G., Masquet, C. et al. 1976: Evaluation de l'élasticite statique et de l'impedance caracteristique de l'aorte. Archives des Maladies du Coeur et des Vaisseaux 69, 653–9.

Merillon, J.P., Motte, G., Fruchaud, J. et al. 1978: Evaluation of the elasticity and characteristic impedance of the ascending aorta in man. Cardiovascular Research 12, 401–6.

Merillon, J.P., Motte, G., Fontenier, G. et al. 1979: Impedance aortique et postcharges ventriculaires. Coeur 10, 61–73.

Merillon, J.P., Fontenier, G., Chastre, J. et al. 1980: Etude du spectre d'impedance chez l'homme normal et hypertendu. Archives des Maladies Coeur 73, 83–90.

Merillon, J.P., Fontenier, G.J., Lerallut, J.F. et al. 1982a: Aortic input impedance in normal man and arterial hypertension: its modification during changes in aortic pressure. Cardiovascular Research 16(11), 646–56.

Merillon, J.P., Motte, G., Masquet, C. et al. 1982b: [Changes in the physical properties of the arterial system and left ventricular performance with age and in permanent arterial hypertension: their interrelation]. Archives Des Maladies Du Coeur Et Des Vaisseaux 75, Spec. No.: 127–32.

Merillon, J.P., Motte, G., Masquet, G. et al. 1982c: Relationship between physical properties of the arterial system and left ventricular performance in the course of aging and human hypertension. European Heart Journal 3(suppl. A), 95–101.

Merillon, J.P., Fontenier, G. and Lerallut, J.F. 1984: Aortic input impedance in heart failure: comparison with normal subjects and its changes during vasodilator therapy. European Heart Journal 5, 447–55.

MERIT-HF Study Group. 1999: Effect of metoprolol CR/XL in chronic heart failure: Metoprolol CR/XL randomised intervention trail in congestive heart failure (MERIT-HF). Lancet 353, 2001–7.

Merkus, D., Kajiya, F., Vink, H. et al. 1999: Prolonged diastolic time fraction protects myocardial perfusion when coronary blood flow is reduced. Circulation 100(1), 75–81.

Merrill, E.W. 1969: Rheology of blood. Physiological Reviews 49, 863–88.

Merrill, E.W., Benis, A.M., Gilliland, E.R. et al. 1965: Pressure-flow relations of human blood in hollow fibers at low flow rates. Journal of Applied Physiology 20, 954–67.

Merrill, E.W., Gilliland, E.R., Cokelet, G. et al. 1963: Rheology of human blood, near and at zero flow. Effects of temperature and haematocrit level. Biophysical Journal 3, 199–213.

Messerli, F.H. 1995: Occasional notes: this day 50 years ago. New England Journal of Medicine 332(15), 1038–9.

Messerli, F.H. 2007: Cerebroprotection by hypertension in ischemic stroke: the crumbling of a hypothesis. Circulation 115, 2907–8.

Messerli, F.H. and Grossman, E. 2002: Pedal edema – not all dihydropyridine calcium antagonists are created equal. American Journal of Hypertension 15, 1019–20.

Messerli, F.H., Frohlich, E.D., Suarez, D.H. et al. 1981: Borderline hypertension: relationship between age, hemodynamics and circulating catecholamines. Circulation 64(4), 760–4.

Messerli, F.H., Sundgaard-Riise, K., Ventura, H.O. et al. 1984: Clinical and hemodynamic determinants of left ventricular dimensions. Archives of Internal Medicine 144(3), 477–81.

Messerli, F.H., Ventura, H.O. and Amodeo, C. 1985b: Osler's maneuver and pseudohypertension. New England Journal of Medicine 312, 1548–51.

Messerli, F.H., White, W.B. and Staessen, J.A. 2002: If only cardiologists did properly measure blood pressure. Blood pressure recordings in daily practice and clinical trials. Journal of the American College of Cardiology 40, 2201–3.

Mestas, J. and Ley, K. 2008: Monocyte–endothelial cell interactions in the development of atherosclerosis. Trends in Cardiovascular Medicine 18(6), 228–32.

Meuwissen, M., Chamuleau, S.A., Siebes, M. et al. 2008: The prognostic value of combined intracoronary pressure and blood flow velocity measurements after deferral of percutaneous coronary intervention. Catheterization and Cardiovascular Interventions 71(3), 291–7.

Meyer, J.V., Borgstrom, P., Lindbom, L. et al. 1988: Vasomotion patterns in skeletal muscle arterioles during changes in arterial pressure. Microvascular Research 35, 193–203.

Meyers, D.G., Neuberger, J.S. and He, J. 2009: Cardiovascular effect of bans on smoking in public places: a systematic review and meta-analysis. Journal of the American College of Cardiology 54, 1249–55.

Meyers, M.R. and Gokce, N. 2007: Endothelial dysfunction in obesity: etiological role in atherosclerosis. Current Opinion in Endocrinology, Diabetes and Obesity 14(5), 365–9.

Michaels, A.D., Accad, M., Ports, T.A. and Grossman, W. 2002: Left ventricular systolic unloading and augmentation of intracoronary pressure and Doppler flow during enhanced external counterpulsation. Circulation 106(10), 1237–42.

Michaels, A.D., Tacy, T., Teitel, D. et al. 2009: Invasive left ventricular energetics during enhanced external counterpulsation. American Journal of Therapeutics 16(3), 239–46.

Michel, J.B., Virmani, R., Arbustini, E. et al. 2011: Intraplaque haemorrhages as the trigger of plaque vulnerability. European Heart Journal March 12. [Epub ahead of print].

Michelakis, E., Tymchak, W., Lien, D. et al. 2002: Oral sildenafil is an effective and specific pulmonary vasodilator in patients with pulmonary arterial hypertension: comparison with inhaled nitric oxide. Circulation 105(20), 2398–403.

Michelson, G., Harazny, J.M., Schmieder, R.E. et al. 2007: Fourier analysis of the envelope of the ophthalmic artery blood flow velocity: age- and blood pressure-related impact. Hypertension 50, 964–9.

Michikawa, T., Nishiwaki, Y., Nomiyama, T. et al. 2008: Job strain and arteriosclerosis in three different types of arteries among male Japanese factory workers. Scandinavian Journal of Work, Environment and Health 34, 48–54.

Middleman, S. 1995. Modeling axisymmetric flows, dynamics of films, jets, and drops. San Diego: Academic Press.

Midei, A.J. and Matthews, K.A. 2009: Social relationships and negative emotional traits are associated with central adiposity and arterial stiffness in healthy adolescents. Health Psychology 28, 347–53.

Milei, J., Parodi, J.C., Ferreira, M. et al. 2003: Atherosclerotic plaque rupture and intraplaque hemorrhage do not correlate with symptoms in carotid artery stenosis. Journal of Vascular Surgery 38(6), 1241–7.

Milewicz, D.M. 1995: Ultrasonic characterization of the aortic architecture in Marfan patients (Editorial). Circulation 91(4), 1272–4.

Millar, H.D. and Baker, L.E. 1973: A stable ultraminiature catheter-tip pressure transducer. Medicine in Biology and Engineering 11, 86–9.

Millasseau, S.C., Guigui, F.G., Kelly, R.P. et al. 2000: Noninvasive assessment of the digital volume pulse. Comparison with the peripheral pressure pulse. Hypertension 36(6), 952–6.

Millaseau, S.C., Kelly, R.P., Ritter, J.M. et al. 2002: Determination of age–related increases in large artery stiffness by digital pulse contour analysis. Clinical Science 103, 371–7.

Millasseau, S.C., Stewart, A.D., Patel, S.J. et al. 2005: Evaluation of carotid-femoral pulse wave velocity: influence of timing algorithm and heart rate. Hypertension 45(2), 222–6.

Miller, D.D., Donohue, T.J., Younis, L.T. et al. 1994: Correlation of pharmacological 99m Tc-Sestamibi myocardial perfusion imaging with poststenotic coronary flow reserve in patients with angiographically intermediate coronary artery stenoses. Circulation 89, 2150–60.

Miller, K.A., Siscovick, D.S., Sheppard, L. et al. 2007: Long-term exposure to air pollution and incidence of cardiovascular events in women. New England Journal of Medicine 356(5), 447–58.

Miller, M., Mangano, C.C., Beach, V. et al. 2010: Divergent effects of joyful and anxiety-provoking music on endothelial vasoreactivity. Psychosomatic Medicine 72, 354–6.

Miller, R.R., Vismara, L.A., Williams, D.O. et al. 1976: Pharmacological mechanisms for left ventricular unloading in clinical congestive heart failure: differential effects of nitroprusside, phentolamine and nitroglycerine on cardiac function and peripheral resistance. Circulation Research 39, 127–37.

Millgard, J., Hägg, A., Kahan, T. et al. 2000: Left ventricular hypertrophy is associated with an attenuated endothelium-dependent vasodilation in hypertensive men. Blood Pressure 9, 309–14.

Mills, C.J. 1966: A catheter-tip electromagnetic velocity probe. Physics in Medicine and Biology 11, 323–4.

Mills, C.J. 1972: Measurement of pulsatile flow and flow velocity. In: Bergel, D.H. (ed.), Cardiovascular fluid dynamics, vol. 1. New York: Academic Press, pp. 51–90.

Mills, C.J. and Shillingford, J.P. 1967: A catheter tip electromagnetic velocity probe and its evaluation. Cardiovascular Research 1, 263–73.

Mills, C.J., Gabe, I.T., Gault, J.H. et al. 1970: Pressure-flow relationships and vascular impedance in man. Cardiovascular Research 4, 405–17.

Mills, R.M., Billett, J.M. and Nichols, W.W. 1992: Endothelial dysfunction early after heart transplantation – assessment with intravascular ultrasound and Doppler. Circulation 86, 1171–4.

Mills, R. and Bhatt, D.L. 2004: The Yin and Yang of arterial inflammation. Journal of the American College of Cardiology 44(1), 50–2.

Milnor, W.R. 1975: Arterial impedance as ventricular afterload. Circulation Research 36, 565–70.

Milnor, W.R. 1989. Hemodynamics, 2nd edn. Baltimore: Williams Wilkins.

Milnor, W.R. and Bertram, C.D. 1978: The relation between arterial viscoelasticity and wave propagation in the canine femoral artery in vivo. Circulation Research 43, 870–9.

Milnor, W.R. and Nichols, W.W. 1975: A new method of measuring propagation coefficients and characteristic impedance in blood vessels. Circulation Research 36, 631–9.

Milnor, W.R., Bergel, D.H. and Bargainer, J.D. 1966: Hydraulic power associated with pulmonary blood flow and its relation to heart rate. Circulation Research 19, 467–80.

Milnor, W.R., Conti, C.R., Lewis, K.B. et al. 1969: Pulmonary arterial pulse wave velocity and impedance in man. Circulation Research 25, 637–49.

Milsum, J.H. and Roberge, F.A. 1973: Physiological regulation and control. In: Rosen, R. (ed.), Foundations of mathematical biology. New York: Academic Press.

Minami, J., Ishimitsu, T., Ohrui, M. et al. 2009: Association of smoking with aortic wave reflection and central systolic pressure and metabolic syndrome in normotensive Japanese men. American Journal of Hypertension 22, 617–23.

Mintz, G.S., Nissen, S.E., Anderson, W.D. et al. 2001: American College of Cardiology Clinical Expert Consensus Document on Standards for Acquisition, Measurement and Reporting of Intravascular Ultrasound Studies (IVUS). A report of the American College of Cardiology Task Force on Clinical Expert Consensus Documents. Journal of the American College of Cardiology 37(5), 1478–92.

Mirsky, I. and Janz, R.F. 1976: The effect of age on the wall stiffness of the human thoracic aorta: a large deformation anisotropic elastic analysis. Journal of Theoretical Biology 59, 467–84.

Mitchell, G.F. 2009a: Arterial stiffness and wave reflection: biomarkers of cardiovascular risk. Artery Research 3(2), 56–64.

Mitchell, G.F. 2009b: Clinical achievements of impedance analysis. Medical and Biological Engineering and Computing 47, 153–63.

Mitchell, G.M. and Izzo, J.I. 2003: Evaluation of arterial stiffness. In: Hypertension primer, 3rd edn. Dallas: American Heart Association, pp. 351–5.

Mitchell, G.F., Pfeffer, M.A., Westerhof, N. et al. 1994: Measurement of aortic input impedance in rats. American Journal of Physiology 267, H1907–15.

Mitchell, G.F., Pfeffer, M.A., Finn, P.V. et al. 1996: Equipotent antihypertensive agents variously affect pulsatile hemodynamics and regression of cardiac hypertrophy in spontaneously hypertensive rats. Circulation 94, 2923–9.

Mitchell, G.F., Moye, L.A., Braunwald, E. et al. 1997a: Sphygmomanometrically determined pulse pressure is a powerful independent predictor of recurrent events after myocardial infarction in patients with impaired left ventricular function. SAVE investigators. Survival and Ventricular Enlargement. Circulation 96(12), 4254–60.

Mitchell, G.F., Tardif, J.C., Arnold, J.M. et al. 2001: Pulsatile hemodynamics in congestive heart failure. Hypertension 38(6), 1433–9.

Mitchell, G.F., Izzo, J.L., Lacourciere, Y. et al. 2002: Omapatrilat reduces pulse pressure and proximal aortic stiffness in patients with systolic hypertension, results of the Conduit Hemodynamics of Omapatrilat International Research Study. Circulation 105, r131–7.

Mitchell, G.F., Lacourciere, Y., Ouellet, J.P. et al. 2003: Determinants of elevated pulse pressure in middle-aged and older subjects with uncomplicated systolic hypertension, the role of proximal aortic diameter and the aortic pressure-flow relationship. Circulation 108(13), 1592–8.

Mitchell, G.F., Parise, H., Benjamin, E.J. et al. 2004a: Changes in arterial stiffness and wave reflection with advancing age in healthy men and women. The Framingham Heart Study. Hypertension 43, 1239–45.

Mitchell, G.F., Parise, H., Vita, J.A. et al. 2004b: Local shear stress and brachial artery flow-mediated dilation: the Framingham Heart Study. Hypertension 44, 134–9.

Mitchell, G.F., Lacourciere, Y., Arnold, J.M.O. et al. 2005a: Changes in aortic stiffness and augmentation index after acute converting enzyme or vasopeptidase inhibition. Hypertension 46, 1111–17.

Mitchell, G.F., Vita, J.A., Larson, M.G. et al. 2005b: Cross-sectional relations of peripheral microvascular function, cardiovascular disease risk factors, and aortic stiffness: the Framingham Heart study. Circulation 112, 3722–8.

Mitchell, G.F., Arnold, J.M.O., Dunlap, M.E. et al. 2006: Pulsatile hemodynamic effects of candesartan in patients with chronic heart failure: the CHARM program. European Journal of Heart Failure 8, 191–7.

Mitchell, G.F., Dunlap, M.E., Warnica, W. et al. 2007a: Long-term trandolapril treatment is associated with reduced aortic stiffness: the prevention of events with angiotensin-converting enzyme inhibition hemodynamic substudy. Hypertension 49(6), 1271–7.

Mitchell, G.F., Guo, C.-Y., Benjamin, E. et al. 2007b: Cross-sectional correlates of increased aortic stiffness in the community: the Framingham Heart Study. Circulation 115, 2628–36.

Mitchell, G.F., Gudnason, V., Launer, L.J. et al. 2008: Hemodynamics of increased pulse pressure in older women in the community-based age, gene/environment susceptibility – Reykjavik study. Hypertension 51, 1123–8.

Mitchell, G.F., Hwang, S.J., Vasan, R.S. et al. 2010: Arterial stiffness and cardiovascular events: the Framingham Heart Study. Circulation 121(4), 505–11.

Mitchell, J.R.A. and Schwartz, C.J. 1965. Arterial disease. Philadelphia: F.A. Davis.

Mittal, N., Zhou, Y., Linares, C. et al. 2005: Analysis of blood flow in the entire coronary arterial tree. American Journal of Physiology. Heart and Circulatory Physiology 289(1), H439–46.

Mittleman, M.A., Maclure, M., Tofler, G.H. et al. 1993: Triggering of acute myocardial infarction by heavy physical exertion: protection against triggering by regular exertion. New England Journal of Medicine 329(23), 1677–83.

Miwa, Y., Masai, H. and Shimizu, M. 2009: Differential effects of calcium-channel blockers on vascular endothelial function in patients with coronary spastic angina. Circulation Journal 73(4), 713–17.

Miyachi, M., Kawano, H., Sugawara, J. et al. 2004: Unfavorable effects of resistance training on central arterial compliance: a randomized intervention study. Circulation 110, 2858–63.

Miyaki, A., Maeda, S., Yoshizawa, M. et al. 2009: Effect of habitual aerobic exercise on body weight and arterial function in overweight and obese men. American Journal of Cardiology 104, 823–8.

Miyano, I., Nishinaga, M., Takata, J. et al. 2010: Association between brachial-ankle pulse wave velocity and 3-year mortality in community-dwelling older adults. Hypertension Research 33, 678–82.

Miyashita, H., Irokawa, M. and Yaginuma, T. 1993: Importance of a pulsatile load reduction in regression of cardiac hypertrophy with antihypertensive therapy: enalapril versus nifedipine. Circulation 88, 1–499.

Miyashita, H., Ikeda, U., Tsuruya, Y. et al. 1994: Noninvasive evaluation of the influence of aortic wave reflection on left ventricular ejection during auxotonic contraction. Heart and Vessels 9(1), 30–9.

Miyashita, H., Ikeda, U., Irokawa, M. et al. 1995: Importance of aortic wave reflections in age-associated central blood pressure changes in non-hypertensive humans. Journal of American Geriatrics Society 43, 1069–70.

Miyashita, T., Sugimachi, M., Sato, T. et al. 2000: A novel servo-control system that imposes desired aortic input impedance on insitu rat heart. American Journal of Physiology 278, H998–1007.

Miyashita, H., Aizawa, A., Hashimoto., J. et al. 2010: Cross-sectional characterization of all classes of antihypertensives in terms of central blood pressure in Japanese hypertensive patients. American Journal of Hypertension 23, 260–8.

Mo, L.Y.L., Yun, L.C.M. and Cobbold, R.S.C. 1988: Comparison of four digital maximum frequency estimators. Ultrasound in Medicine and Biology 14, 355–63.

Mochizuki, S., Vink, H., Hiramatsu, O. et al. Role of hyaluronic acid glycosaminoglycans in shear-induced endothelium-derived nitric oxide release. American Journal of Physiology. Heart and Circulatory Physiology 285, H722–6.

Modan, M., Peles, E., Halkin, H. et al. 1998: Increased cardiovascular disease mortality rates in traumatic lower limb amputees. American Journal of Cardiology 82(10), 1242–7.

Modena, M.G., Bonetti, L., Coppi, F. et al. 2002: Prognostic role of reversible endothelial dysfunction in hypertensive postmenopausal women. Journal of the American College of Cardiology 40(3), 505–10.

Moehring, M.A. and Spencer, M.P. 2002: Power M-mode Doppler (PMD) for observing cerebral blood flow and tracking emboli. Ultrasound in Medicine and Biology 28, 49–57.

Moens, A.I. 1878: Die Pulskurve. Leiden.

Moffitt, E.A., Sethna, D.H., Gray, R.J. et al. 1984: Rate–pressure product correlates poorly with myocardial oxygen consumption during anaesthesia in coronary patients. Canadian Anaesthetists Society Journal 31(1), 5–12.

Mohiaddin, R.H. and Longmore, D.B. 1989: MRI studies of atherosclerotic vascular disease: structural evaluation and physiologic measurements. British Medical Journal 45(4), 968–90.

Mohlenkamp, S., Lehmann, N., Breuckmann, F. et al. 2008: Running: the risk of coronary events: prevalence and prognostic relevance of coronary atherosclerosis in marathon runners. European Heart Journal 29, 1903–10.

Mokdad, A.H., Marks, J.S., Stroup, D.F., Gerberding, J.L. et al. 2004: Actual causes of death in the United States, 2000. Journal of the American Medical Association 291(10), 1238–45.

Molloi, S. and Wong, J.T. 2007: Regional blood flow analysis and its relationship with arterial branch lengths and lumen volume in the coronary arterial tree. Physics in Medicine and Biology 52(5), 1495–503.

Mombouli, J.V. and Vanhoutte, P.M. 1999: Endothelial dysfunction: from physiology to therapy. Journal of Molecular and Cellular Cardiology 31, 61–74.

Moncada, S. 1991: Nitric oxide, physiology, pathology, and clinical relevance (Paul Dudley White International Lecture). Circulation 84(suppl. II), IIB.

Moncada, S., Palmer, R.M. and Higgs, E.A. 1991: Nitric oxide: physiology, pathophysiology, and pharmacology. Pharmacological Reviews 43(2), 109–42.

Monti, L.D. and Piatti, P.M. 2005: Role of endothelial dysfunction and insulin resistance in angina pectoris and normal coronary angiogram. Herz 30(1), 48–54.

Mookerjee, A., Al-Jumaily, A.M. and Lowe, A. 2010: Arterial pulse wave velocity measurement: different techniques, similar results-implications for medical devices. Biomechanics and Modeling in Mechanobiology 9(6), 773–81.

Moon, J.J., Matsumoto, M., Patel, S. et al. 2005: Role of cell surface heparan sulfate proteoglycans in endothelial cell migration and mechanotransduction. Journal of Cellular Physiology 203, 166–76.

Moore, W. 2005: The coach driver's knee. New York: Broadway Books, pp. 1–44.

Moraes, R. and Evans, D.H. 1995: Effects of nonuniform insonation by catheter-tipped Doppler transducers on velocity estimation. Ultrasound in Medicine and Biology 21, 779–791.

Moraes, R., Aydin, N. and Evans, D.H. 1995: The performance of three maximum frequency envelope detection algorithms for Doppler signals. Journal of Vascular Investigation 1, 126–34.

Moreno, P.R., Falk, E., Palacios, I.F. et al. 1994: Macrophage infiltration in acute coronary syndromes: implications for plaque rupture. Circulation 90, 775–8.

Morgan, A.J. and Hosking, S.L. 2007: Non-invasive vascular impedance measures demonstrate ocular vasoconstriction during isometric exercise. British Journal of Ophthalmology 91(3), 385–90.

Morgan, G.W. and Kiely, J.P. 1954: Wave propagation in a viscous liquid contained in a flexible tube. Journal of the Acoustic Society of America 26, 323–8.

Morgan, G.W. and Ferrante, W.R. 1955: Wave propagation in elastic tubes filled with streaming liquid. Journal of the Acoustic Society of America 27, 715–25.

Morita, S., Kuboyama, I., Asou, T. et al. 1991: The effect of extraanatomic bypass on aortic input impedance studied in open chest dogs. Should the vascular prosthesis be compliant to unload the left ventricle? Journal of Thoracic and Cardiovascular Surgery 102(5), 774–83.

Moritz, A.R. and Oldt, M.R. 1937: Arteriosclerosis in hypertensives and non-hypertensives. American Journal of Pathology 13, 679–728.

Morley, J.E. and Reese, S.S. 1989: Clinical implications of the aging heart. American Journal of Medicine 86, 77–86.

Morovic, S., Jurasic, M.J., Martinic Popovic, I. et al. 2009: Vascular characteristics of patients with dementia. Journal of Neurological Science 283, 41–3.

Morris, C.L., Smith, C.M. II and Blackshear, P.L. Jr. 1987: A new method for measuring the yield stress in thin layers of sedimenting blood. Biophysics Journal 52, 229–40.

Morris, M.J. and O'Rourke, M.F. 1965: Steady and pulsatile work of the left and right ventricles. Proceedings of Australian Physiological Society, 28.

Morrison, T.M., Choi, G., Zarins, C.K. et al. 2009: Circumferential and longitudinal cyclic strain of the human thoracic aorta: age-related changes. Journal of Vascular Surgery 49(4), 1029–36.

Moschowitz, E. 1950: Hyperplastic arteriosclerosis versus atherosclerosis. Journal of the American Medical Association 143, 861–5.

Mosley, W.J. II, Greenland, P., Garside, D.B. et al. 2007: Predictive utility of pulse pressure and other blood pressure measures for cardiovascular outcomes. Hypertension 49, 1256–64.

Moss, S.W. 2006a: Alonzo Thrasher Keyt. Clinical Cardiology 29, 471–3.

Moss, S.W. 2006b: The sphygmograph in America: writing the pulse. American Journal of Cardiology 97, 580–7.

Mottram, P., Shige, H. and Nestel, P. 1999: Vitamin E improves arterial compliance in middle-aged men and women. Atherosclerosis 145, 399–404.

Mottram, P.M., Haluska, B., Yuda, S. et al. 2004: Patients with a hypertensive response to exercise have impaired systolic function without diastolic dysfunction or left ventricular hypertrophy. Journal of the American College of Cardiology 43, 848–53.

Moulopoulos, S.D., Topaz, S. and Kolff, W.J. 1962: Diastolic balloon pumping (with carbon dioxide) in the aorta – a mechanical assistance to the failing circulation. American Heart Journal 63, 669–74.

Mourad, J.J., Safar, M.E. and O'Rourke, M.F. 2002: Who is fooling us? (Letter to the editor). Lancet 360, 89.

Moutet, J.P., Herment, A., Guglielmi, J.P. et al. 1983: Estimation of blood flow quality by statistical analysis or an ultrasonic Doppler signal: application to the study of perturbations caused by a vascular stenosis. Cardiovascular Research 17, 678–90.

Movsesian, M., Stehlik, J., Vandeput, F. et al. 2009: Phosphodiesterase inhibition in heart failure. Heart Failure Review 14, 255–63.

Mowat, D.H., Haites, N.E. and Rawles, J.M. 1983: Aortic blood velocity measurement in healthy adults using a simple ultrasound technique. Cardiovascular Research 17(2), 75–80.

Mueller, R.L. and Sanborn, T.A. 1995: The history of interventional cardiology: cardiac catheterization, angioplasty, and related interventions. American Heart Journal 129, 146–72.

Muiesan, M.L. and Paini, A. 2009: Local carotid artery pulse wave velocity: foot to foot or dicrotic notch? Journal of Hypertension 27, 1962–3.

Mukkamala, R., Reisner, A.T., Hojman, H.M. et al. 2006: Continuous cardiac output monitoring by peripheral blood pressure waveform analysis. IEEE Transactions on Biomedical Engineering 53(3), 459–67.

Mulè, G., Cottone, S., Cusimano, P. et al. 2009: The association of microalbuminuria with aortic stiffness is independent of C-reactive protein in essential hypertension. American Journal of Hypertension 22, 1041–7.

Mullan, B.A., Young, I.S., Fee, H. et al. 2002: Ascorbic acid reduces blood pressure and arterial stiffness in type 2 diabetes. Hypertension 40, 804–9.

Mullen, M.J., Kharbanda, R.K., Cross, J. et al. 2001: Heterogenous nature of flow-mediated dilatation in human conduit arteries in vivo: relevance to endothelial dysfunction in hypercholesterolemia. Circulation Research 88(2), 145–51.

Mullens, W., Abrahams, Z., Francis, G.S. et al. 2008: Sodium nitroprusside for advanced low-output heart failure. Journal of the American College of Cardiology 52, 200–7.

Müller, A. 1954: Uber die Verwendung des Pitot-Rohres zur Geschwindigkeitsmessung. Helvetica Physiologica Acta 12, 98–111.

Muller, J., Wallukat, G., Weng, Y.G. et al. 1997: Weaning from mechanical cardiac support in patients with idiopathic dilated cardiomyopathy. Circulation 96, 542–9.

Mulvany, M.J. 1992: A reduced elastic modulus of vascular wall components in hypertension? Hypertension 20(1), 7–9.

Mulvany, M.J. 1993: Resistance vessel structure and the pathogenesis of hypertension. Journal of Hypertension 11(suppl. 5), S7–12.

Munir, S., Jiang, B., Guilcher, A. et al. 2008: Exercise reduces arterial pressure augmentation through vasodilation of muscular arteries in humans. American Journal of Physiology. Heart and Circulatory Physiology 294(4), H1645–50.

Munkvad, S., Nieuwenhuizen, W. and Jespersen, J. 1990: Plasma HMW fibrinogen in patients with ischaemic heart disease. Scandinavian Journal of Clinical Laboratory Investigations 50(3), 347–9.

Murakami, T., Takeda, A., Takei, K. et al. 2010: Aortic pressure wave reflection in children. Hypertension Research 33(3), 225–8.

Muramatsu, J., Kobayashi, A., Hasegawa, N. and Yokouchi, S. 1997: Hemodynamic changes associated with reduction in total cholesterol by treatment with the HMG-CoA reductase inhibitor pravastatin. Atherosclerosis 130, 179–82.

Murdoch, J.L., Walker, B.A., Halpern, B.L. et al. 1972: Life expectancy and causes of death in the Marfan syndrome. New England Journal of Medicine 286, 804–8.

Murgo, J.P. 1998: Systolic ejection murmurs in the era of modern cardiology: what do we really know? Journal of the American College of Cardiology 32(6), 1596–602.

Murgo, J.P. and Millar, H. 1972: A new cardiac catheter for high fidelity differential pressure recordings. 25th ACEMB, 303.

Murgo, J.P. and Westerhof, N. 1984: Input impedance of the pulmonary arterial system in normal man. Circulation Research 54, 666–73.

Murgo, J.P. and Westerhof, N. 1987: Arterial reflections and pressure waveforms in humans. In: Yin, F.C.P. (ed.), Ventricular/vascular coupling: clinical physiological and engineering aspects. New York: Springer-Verlag, pp. 140–58.

Murgo, J.P., Cox, R.H. and Peterson, L.H. 1971: Cantilever transducer for continuous measurement of arterial diameter in vivo. Journal of Applied Physiology 31, 948–53.

Murgo, J.P., Altobelli, S.A., Dorethy, J.F. et al. 1975: Normal ventricular ejection dynamics in man during rest and exercise. In: Leon, D.F. and Sharer, J.A. (eds), Physiologic principles of heart sounds and murmurs. New York: American Heart Association, p. 92.

Murgo, J.P., Westerhof, N., Giolma, J.P. et al. 1980a: Aortic input impedance in normal man: relationship to pressure wave shapes. Circulation 62, 105–16.

Murgo, J.P., Alter, B.R., Dorethy, J.F. et al. 1980b: Dynamics of left ventricular ejection in obstructive and nonobstructive hypertrophic cardiomyopathy. Journal of Clinical Investigation 66, 1369–82.

Murgo, J.P., Westerhof, N., Giolma, J.P. et al. 1981a: Manipulation of ascending aortic pressure and flow wave reflections with the Valsalva maneuver: relationship to input impedance. Circulation 63, 122–32.

Murgo, J.P., Westerhof, N., Giolma, J.P. et al. 1981b: Effects of exercise on aortic input impedance and pressure wave forms in normal humans. Circulation Research 48(3), 334–43.

Murphy, E.A., Rowsell, H.C., Downie, H.G. et al. 1962: Encrustation and atherosclerosis: the analogy between early in vivo lesions and deposits which occur in extracorporeal circulations. Canadian Medical Association Journal 87, 259–74.

Murray, C.D. 1926a: The physiological principle of minimum work: I. The vascular system and the cost of blood volume. Proceedings of the National Academy of Sciences of the United States of America 12(3), 207–14.

Murray, C.D. 1926b: The physiological principle of minimum work applied to the angle of branching of arteries. Journal of General Physiology 9, 835–41.

Murrell, W. 1879: Nitroglycerin as a remedy for angina pectoris. Lancet 80, 80–1, 113–5, 51–2, 225–7.

Mustafa, S., Elgazzar, A.H., Essam, H. et al. 2007: Hyperthermia alters kidney function and renal scintigraphy. American Journal of Nephrology 27(3), 315–21.

Mustard, J.F., Murphy, E.A., Rowsell, H.C. et al. 1962: Factors influencing thrombus formation in vivo. American Journal of Medicine 33, 621–47.

Mustata, S., Chan, C., Lai, V. et al. 2004: Impact of an exercise program on arterial stiffness and insulin resistance in hemodialysis patients. Journal of the American Society of Nephrologists 15, 2713–8.

Myers, C.W., Farquhar, W.B., Forman, D.E. et al. 2002: Carotid distensibility characterized via the isometric exercise pressor response. American Journal of Physiology – Heart and Circulatory Physiology 283(6), H2592–8.

Myers, J. 2003: Exercise and cardiovascular health. Circulation 107, e2–5.

Myers, J. 2009: Exercise capacity and prognosis in chronic heart failure. Circulation 119, 3165–7.

Myers, L.J. and Capper, W.L. 2004: Exponential taper in arteries: an exact solution of its effect on blood flow velocity waveforms and impedance. Medical Engineering and Physics 26(2), 147–55.

Myhre, E.S.P., Johansen, A., Bjornstad, J. et al. 1986: The effect of contractility and preload on matching between the canine left ventricle and afterload. Circulation 73, 161–71.

Nabel, E.G., Selwyn, A.P. and Ganz, P. 1990: Large coronary arteries in humans are responsive to changing blood flow: an endothelium-dependent mechanism that fails in patients with atherosclerosis. Journal of the American College of Cardiology 16, 349–56.

Nabel, E.G. and Lauer, M.S. 2009: The cardiovascular programs of the National Heart, Lung, and Blood Institute: from vision to action to impact. Journal of the American College of Cardiology 53, 1082–3.

Nadasy, G.L., Varbiro, S., Szekeres, M. et al. 2010: Biomechanics of resistance artery wall remodeling in angiotensin-II hypertension and subsequent recovery. Kidney and Blood Pressure Research 33(1), 37–47.

Nagai, M., Hoshide, S. and Kario, K. 2010: Hypertension and dementia. American Journal of Hypertension 23, 116–24.

Nagai, Y., Fleg, J.L., Kemper, M.K. et al. 1999: Carotid arterial stiffness as a surrogate for aortic stiffness, relationship between carotid artery pressure–strain elastic modulus and aortic pulse wave velocity. Ultrasound in Medicine and Biology 25(2), 181–8.

Naghavi, M., Libby, P., Falk, E. et al. 2003a: From vulnerable plaque to vulnerable patients: a call for new definitions and risk assessment strategies: Part I. Circulation 108, 1664–78.

Naghavi, M., Libby, P., Falk, E., Casscells, S.W. et al. 2003b: From vulnerable plaque to vulnerable patient: a call for new definitions and risk assessment strategies: Part II. Circulation 108(15), 1772–8.

Nahser, P.J. Jr., Brown, R.E., Oskarsson, H. et al. 1995: Maximal coronary flow reserve and metabolic coronary vasodilation in patients with diabetes mellitus. Circulation 91(3), 635–40.

Naidu, M.U., Reddy, B.M., Yashmaina, S. et al. 2005: Validity and reproducibility of arterial pulse wave velocity measurement using new device with oscillometric technique: a pilot study. BioMedical Engineering OnLine 4(49), 1–14.

Naissides, M., Pal, S., Mamo, J.C. et al. 2006: The effect of chronic consumption of red wine polyphenols on vascular function in postmenopausal women. European Journal of Clinical Nutrition 60, 740–5.

Najjar, S.S. 2009: Heart failure with preserved ejection fraction: failure to preserve, failure of reserve, and failure on the compliance curve. Journal of the American College of Cardiology 54, 419–21.

Najjar, S., Scuteri, A. and Lakatta, E.G. 2005: Arterial aging: is it an immutable cardiovascular risk factor? Hypertension 46, 454–62.

Nakamura, T., Moriyasu, F., Ban, N. et al. 1989: Quantitative measurement of abdominal arterial blood flow using image-directed Doppler ultrasonography: superior mesenteric, splenic, and common hepatic arterial blood flow in normal adults. Journal of Clinical Ultrasound 17, 261–8.

Nakashima, Y. and Shiokawa, Y.K. 1990: Alterations of elastic architecture in human aortic dissecting aneurysm. Laboratory Investigation 62(6), 751–60.

Nakashima, Y., Kurozumi, T., Sueishi, K. et al. 1990: Dissecting aneurysm: a clinicopathologic and histopathologic study of 111 autopsied cases. Human Pathology 21(3), 291–6.

Nakanishi, N., Yoshida, H., Kawashimo, H. et al. 2001: Alcohol consumption and risk for increased aortic pulse wave velocity in middle-aged Japanese men. Angiology 52, 533–42.

Nakayama, Y., Nakanishi, N., Hayashi, T. et al. 2001: Pulmonary artery reflection for differentially diagnosing primary pulmonary hypertension

and chronic pulmonary thromboembolism. Journal of the American College of Cardiology 38, 214–8.
Nakazawa, G., Finn, A.V., Vorpahl, M. et al. 2009: Incidence and predictors of drug-eluting stent fracture in human coronary artery: a pathologic analysis. Journal of the American College of Cardiology 54, 1924–31.
Nakazawa, G., Yazdani, S.K., Finn, A.V. et al. 2010: Pathological findings at bifurcation lesions: the impact of flow distribution on atherosclerosis and arterial healing after stent implantation. Journal of the American College of Cardiology 55, 1679–87.
Namasivayam, M., McDonnell, B.J., McEniery, C.M. et al. 2009a: Does wave reflection dominate age-related change in aortic blood pressure across the human life span? Hypertension 53, 979–85.
Namasivayam, M., Adji, A. and O'Rourke, M.F. 2009b: Mechanisms for change in aortic augmentation in age. Hypertension 53, 1114.
Namasivayam, M., Adji, A. and O'Rourke, M.F. 2010: Aortic augmentation index and aging: mathematical resolution of a physiological dilemma? Hypertension 56, e9–10.
Nanton, M.A. and Olley, P.A. 1976: Residual hypertension after coarctectomy in children. American Journal of Cardiology 37, 769–72.
Napoli, C. and Ignarro, L.J. 2009: Nitric oxide and pathogenic mechanisms involved in the development of vascular diseases. Archives of Pharmaceutical Research 32(8), 1103–8.
Naqvi, T.Z. and Rafique, A.M. 2008: Echocardiography-guided pacemaker optimization and radial artery tonometry. Journal of Cardiac Failure 14, 583–9.
Narula, J., Haider, N., Virmani, R. et al. 1996: Apoptosis in myocytes in end-stage heart failure. New England Journal of Medicine 335, 1182–9.
National Heart Foundation and Australian Institute of Health. 1990: Risk Factor Prevalence Study No. 3 1989. Canberra: National Heart Foundation & Australian Institute of Health.
National Heart Foundation of Australia Report 1995: Heart and stroke facts. Canberra: National Heart Foundation of Australia.
Neil, E. 1983: Peripheral circulation: historical aspects. In: Shepherd, J.T. and Abboud, F.M. (eds), American Physiology Society Handbook of Physiology. Section 2: The cardiovascular system. vol. III, Peripheral circulation and organ blood flow. Bethesda, MD: American Physiological Society, pp. 1–19.
Nelson, M.E., Rejeski, W.J., Blair, S.N. et al. 2007: Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. Circulation 116, 1094–5.
Nelson, M.R., Stepanek, J., Cevette, M. et al. 2010: Noninvasive measurement of central vascular pressures with arterial tonometry: clinical revival of the pulse pressure waveform? Mayo Clinic Proceedings, 85, 460–72.
Nemcsik, J., Egresits, J., El Hadj Othmane, T. et al. 2009: Validation of arteriograph – a new oscillometric device to measure arterial stiffness in patients on maintenance hemodialysis. Kidney and Blood Pressure Research 32(3), 223–9.
Nemes, A., Forster, T. and Csanády, M. 2008: Diminished coronary flow velocity reserve and aortic distensibility in elderly patients with chest pain and negative coronary angiograms. Aging Clinical and Experimental Research 20(4), 297–301.
Nemes, A., Soliman, O.I., Geleijnse, M.L. et al. 2007: Increased aortic stiffness in glycogenosis type 2 (Pompe's disease). International Journal of Cardiology 120(1), 138–41.
Nerem, R.M. Cellular reactions to blood flow. 1988. In: Yoshida, Y., Yamaguchi, T., Caro, C.G. et al. (eds), Role of blood flow in atherogenesis. Tokyo: Springer-Verlag, pp. 153–6.
Nerem, R.M. 1992: Vascular fluid mechanics, the arterial wall, and atherosclerosis. Journal of Biomedical Engineering 114, 274–82.
Nerem, R.M., Rumberger, J.A., Gross., D.R. et al. 1974: Hot-film anemometer velocity measurements of arterial blood flow in horses. Circulation Research 34, 193–203.
Nerem, R.M., Rumberger, J.A., Gross, D.R. et al. 1976: Hot film coronary artery velocity measurements in horses. Cardiovascular Research 10, 301–13.
Neschis, D.G., Scalea, T.M., Flinn, W.R. et al. 2008: Blunt aortic injury. New England Journal of Medicine 359, 1708–16.
Nestel, P., Fujii, A. and Zhang, L. 2007: An isoflavone metabolite reduces arterial stiffness and blood pressure in overweight men and postmenopausal women. Atherosclerosis 192, 184–9.
Nestel, P.J., Pomeroy, S.E., Sasahara, T. et al. 1997a: Arterial compliance in obese subjects is improved with dietary plant n-3 fatty acid from flaxseed oil despite increased LDL oxidizability. Arteriosclerosis, Thrombosis, and Vascular Biology 17(6), 1163–70.
Nestel, P.J., Yamashita., T., Sasahara, T. et al. 1997b: Soy isoflavones improve systemic arterial compliance but not plasma lipids in menopausal and perimenopausal women. Arteriosclerosis, Thrombosis, and Vascular Biology 17(12), 3392–8.
Neubert, H.K.P. 1963. Instrument transducers. Oxford: Clarendon Press.
Neunteufl, T., Heher, S., Kostner, K. et al. 2002: Contribution of nicotine to acute endothelial dysfunction in long-term smokers. Journal of the American College of Cardiology 39, 251–6.
Newby, D.E., Wright, R.A., Labinjoh, C. et al. 1999: Endothelial dysfunction, impaired endogenous fibrinolysis, and cigarette smoking: a mechanism for arterial thrombosis and myocardial infarction. Circulation 99, 1411–15.
Newhouse, V.L., Varner, L.W. and Bendick, P.J. 1977: Geometrical spectral broadening in ultrasonic Doppler systems. IEEE Transactions on Biomedical Engineering BME- 24, 478–80.
Newhouse, V.L., Furgason, E.S., Johnson, G.F. et al. 1980a: The dependence of ultrasound Doppler bandwidth on beam geometry. IEEE Transactions on Sonics and Ultrasonics. SU-27, 50–9.
Newhouse, V.L., LeCong, P., Furgason, E.S. and Ho, C.T. 1980b: On increasing the range of pulsed Doppler systems for blood flow measurements. Ultrasound in Medicine and Biology 6, 233–7.
Newman, D.L., Bowden, N.L.R. and Gosling, R.G. 1975: The dynamic and static elastic response of the abdominal aorta of the dog. Cardiovascular Research 9, 679–84.
Newman, D.L., Gosling, R.G. and Bowden, N.L.R. 1971: Changes in aortic distensibility and area ratio with the development of atherosclerosis. Atherosclerosis 14, 231–40.
Newman, F.H. and Searle, V.H.L. 1957. The general properties of matter, 5th edn. London: Edward Arnold.
Ng, J.M., Chow, M.Y., Ip-Yam, P.C. et al. 2007: Evaluation of partial carbon dioxide rebreathing cardiac output measurement during thoracic surgery. Journal of Cardiothoracic and Vascular Anesthesia 21(5), 655–8.
Ng, K.G., Ting, C.M., Yeo, J.H. et al. 2004: Progress on the development of the MediWatch ambulatory blood pressure monitor and related devices. Blood Pressure Monitoring 9(3), 149–65.
Ngai, A.C. and Winn, H.R. 1995: Modulation of cerebral arteriolar diameter by intraluminal flow and pressure. Circulation Research 77, 832–40.
NHLBI (National Heart Lung and Blood Institute Conference) 1994: Report of the task force on research in heart failure. Washington, DC: Public Health Services, National Institutes of Health, US Department of Health and Human Services.
Nicholls, S.J., Tuzcu, E.M., Sipahi, I. et al. 2007a: Statins, high-density lipoprotein cholesterol, and regression of coronary atherosclerosis. Journal of the American Medical Association 297, 499–508.
Nicholls, S.J., Andrews, J. and Moon, K.W. 2007b: Exploring the natural history of atherosclerosis with intravascular ultrasound. Expert Review of Cardiovascular Therapy 5(2), 295–306.
Nicholls, S.J., Tuzcu, E.M., Kalidindi, S. et al. 2008: Effect of diabetes on progression of coronary therosclerosis and arterial remodeling: a pooled analysis of 5 intravascular ultrasound trials. Journal of the American College of Cardiology 52(4), 255–62.
Nichols, W.W. and O'Rourke, M.F. 1990. McDonald's blood flow in arteries, 3rd edn. London: Edward Arnold.
Nichols, W.W. and O'Rourke, M.F. 1998: McDonald's blood flow in arteries, 4th edn. London: Edward Arnold.
Nichols, W.W. and O'Rourke, M.F. 2005: McDonald's blood flow in arteries, 5th edn. London: Edward Arnold.

Nichols, A.B., Gabrieli, C.F.O., Fenoglio, J.J. et al. 1984: Quantification of relative coronary arterial stenosis by cinevideodensitometric analysis of coronary arteriograms. Circulation 69, 512–22.

Nichols, W.W. 1970: Cardiac output derived from the aortic pressure. PhD dissertation, University of Alabama in Birmingham, USA.

Nichols, W.W. 1983: Continuous measurement of cardiac output from the aortic pressure waveform. In: Ghista, D.N., Van Vollenhoven, E., Yang, W.J. et al. (eds), Advances in cardiovascular physics, part II. Basel: Kaizer, pp. 1–15.

Nichols, W.W. 1994: Determinants of systolic hypertension in older persons. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Chur, Switzerland: Harwood Academic Publishers, pp. 315–32.

Nichols, W.W. and McDonald, D.A. 1972: Wave velocity in the proximal aorta. Medical and Biological Engineering and Computing 10, 327–35.

Nichols, W.W. and Walker, W.E. 1974: Experience with the Millar PC-350 catheter-tip pressure transducer. Biomedical Engineering 9, 58–60.

Nichols, W.W. and Pepine, C.J. 1982: Left ventricular afterload and aortic input impedance: implications of pulsatile blood flow. Progress in Cardiovascular Diseases 24, 293–306.

Nichols, W.W. and Pepine, C.J. 1992: Ventricular/vascular interaction in health and heart failure. Comprehensive Therapy 18(7), 12–19.

Nichols, W.W. and Edwards, D.G. 2001: Arterial elastance and wave reflection augmentation of systolic blood pressure: deleterious effects and implications for therapy. Journal of Cardiovascular and Pharmacological Therapy 6(1), 5–21.

Nichols, W.W. and Singh, B.M. 2002: Augmentation index as a measure of peripheral vascular disease state. Current Opinion in Cardiology 17, 543–51.

Nichols, W.W. 2005: Clinical measurement of arterial stiffness obtained from noninvasive pressure waveforms. American Journal of Hypertension 18(1 Pt 2), 3S–10S.

Nichols, W.W. and O'Rourke, M.F. 2006a: Aging: a physical perspective. In: Safar, M.E. and O'Rourke, M.F. (eds), Handbook of hypertension, vol 23. Edinburgh: Elsevier, pp. 379–98.

Nichols, W.W. and O'Rourke, M.F. 2006b: Principles of measurement, preventing and treating arterial stiffness. In: Safar, M.E. and O'Rourke, M.F. (eds), Arterial stiffness in hypertension, vol 23. Amsterdam: Elsevier.

Nichols, W.W. and Epstein, B.J. 2009: Actions of selected cardiovascular hormones on arterial stiffness and wave reflections. Current Pharmaceutical Design 15(3), 304–20.

Nichols, W.W. and O'Rourke, M.F. 2009: Aortic pulse wave velocity, reflection site distance, and augmentation index. Hypertension 53, e9.

Nichols, W.W., Conti, C.R., Walker, W.W. et al. 1977a: Input impedance of the systemic circulation in man. Circulation Research 40, 451–8.

Nichols, W.W., Conti, C.R. and Pepine, C.J. 1977b: Instantaneous force-velocity-length relations in the intact human heart. American Journal of Cardiology 40, 754–60.

Nichols, W.W., Pepine, C.J., Millar, H.D. et al. 1978: Percutaneous left ventricular catheterization with an ultraminiature catheter-tip pressure transducer. Cardiovascular Research 12, 566–8.

Nichols, W.W., Pepine, C.J., Conti, C.R. et al. 1980a: Evaluation of a new catheter-mounted electromagnetic velocity sensor during cardiac catheterization. Catheterization and Cardiovascular Diagnosis 6, 1–11.

Nichols, W.W., Pepine, C.J., Geiser, E.A. et al. 1980b: Vascular load defined by the aortic input impedance spectrum. Federation Proceedings 39(2), 196–201.

Nichols, W.W., Pepine, C.J., Conti, C.R. et al. 1981: Quantitation of aortic insufficiency using a catheter-tip velocity transducer. Circulation 64, 375–80.

Nichols, W.W., Pepine, C.J. and Conti, C.R. 1983: Catheter tip manometer system: pressure and velocity measure. In: Ghista, D.N., van Vollenhoven, E., Yang, W.J. et al. (eds), Advances in cardiovascular physics, part II. Basel: Kaizer, pp. 144–76.

Nichols, W.W., O'Rourke, M.F., Avolio, A.P. et al. 1985a: Effects of age on ventricular–vascular coupling. American Journal of Cardiology 55, 1179–84.

Nichols, W.W., Paley, D.M., Thompson, L.V. et al. 1985b: Experimental evaluation of a multisensor velocity-pressure catheter. Medical and Biological Engineering and Computing 23, 79–83.

Nichols, W.W., Avolio, A.P. and O'Rourke, M.F. 1986a: Ascending aortic impedance patterns in the kangaroo: their explanation and relation to pressure wave forms. Circulation Research 59, 247–55.

Nichols, W.W., O'Rourke, M.F., Avolio, A.P. et al. 1986b: Ventricular vascular interaction in patients with mild systemic hypertension and normal peripheral resistance. Circulation 74, 455–62.

Nichols, W.W., O'Rourke, M.F., Conti, C.R. et al. 1987: Age related changes in left ventricular–arterial coupling. In: Yin, F.C.P. (ed.), ventricular/vascular coupling: clinical, physiological and engineering aspects. New York: Springer-Verlag, pp. 79–114.

Nichols, W.W., Mehta, J.L., Donnelly, W.H. et al. 1988a: Reduction in coronary vasodilator reserve following coronary occlusion and reperfusion in anesthetized dog: role of endothelium-derived relaxing factor, myocardial neutrophil infiltration and prostaglandins. Journal of Molecular and Cellular Cardiology 20, 943–54.

Nichols, W.W., Mehta, J.L., Thompson, L. et al. 1988b: Synergistic effects of LTC4 and TxA2 on coronary flow and myocardial function. American Journal of Physiology 255(1), H153–9.

Nichols, W.W., Nicolini, F.A., Saldeen, T.G. and Mehta, J.L. 1991: Combined thrombolytic effects of tissue-plasminogen activator and a fibrinogen-degradation product peptide 6A or iloprost. Journal of Cardiovascular Pharmacology 18(2), 231–6.

Nichols, W.W., Nicolini, F.A. and Pepine, C.J. 1992: Determinants of isolated systolic hypertension in the elderly. Journal of Hypertension 10(suppl. 6), S73–7.

Nichols, W.W., Avolio, A.P., Kelly, R.P. et al. 1993: Effects of age and of hypertension on wave travel and reflections. In: O'Rourke, M.F., Safar, M. and Dzau, V. (eds), Arterial vasodilation: mechanisms and therapy. London: Edward Arnold, pp. 23–40.

Nichols, W.W., Nicolini, F.A., Yang, B.C. et al. 1994a: Adenosine protects against attenuation of flow reserve and myocardial function after coronary occlusion and reperfusion. American Heart Journal 127(5), 1201–11.

Nichols, W.W., Nicolini, F.A., Yang, B. et al. 1994b: Attenuation of coronary flow reserve and myocardial function after temporary subtotal coronary artery occlusion and increased myocardial oxygen demand in dogs. Journal of the American College of Cardiology 24(3), 795–803.

Nichols, W.W., Lambert, C.R. and Pepine, C.J. 1994c: Recording cardiovascular variables. In: Pepine, C.J., Hill, J.A. and Lambert, C.R. (eds), Diagnostic and therapeutic cardiac catheterization, 2nd edn. Baltimore: Williams and Wilkins, pp. 195–207.

Nichols, W.W., Schuler, B. and O'Rourke, M.F. 2002: Ramipril and cardiovascular risk reduction (Correspondence). Circulation 105, e194.

Nichols, W.W., Estrada, J.C., Braith, R.W. et al. 2006: Enhanced external counterpulsation treatment improves arterial wall properties and wave reflection characteristics in patients with refractory angina. Journal of the American College of Cardiology 48(6), 1208–14.

Nichols, W.W., Pierce, G.L. and Braith, R.W. 2007: Does hormone treatment alter arterial properties in post menopausal women? Expert Review of Endocrinology and Metabolism 2, 653–65.

Nichols, W.W., Denardo, S.J., Wilkinson, I.B. et al. 2008: Effects of arterial stiffness, pulse wave velocity, and wave reflections on the central aortic pressure waveform. Journal of Clinical Hypertension (Greenwich) 10(4), 295–303.

Nicolini, F.A., Mehta, J.L., Nichols, W.W. et al. 1991: Leukocyte elastase inhibition and t-PA-induced coronary artery thrombolysis in dogs: beneficial effects on myocardial histology. American Heart Journal 122, 1245–51.

Nicolli, G., Burzotta, F., Galiuto, L. et al. 2009a: Myocardial no-reflow in humans. Journal of the American College of Cardiology 54, 281–92.

Nicolli, G., Burzotta, F., Galiuto, L. et al. 2009b: Stent overexpansion and myocardial no-reflow: reply. Journal of the American College of Cardiology 54, 2340–1.

Niebauer, J. and Cooke, J.P. 1996: Cardiovascular effects of exercise: role of endothelial shear stress. Journal of the American College of Cardiology 28(7), 1652–60.

Nienaber, C.A. and Eagle, K.A. 2003a: Aortic dissection: new frontiers in diagnosis and management: Part I: from etiology to diagnostic strategies. Circulation 108(5), 628–35.

Nienaber, C.A. and Eagle, K.A. 2003b: Aortic dissection: new frontiers in diagnosis and management: Part II: therapeutic management and follow-up. Circulation 108(6), 772–8.

Nijdam, M.E., Plantinga, Y., Hulsen, H.T. et al. 2008: Pulse pressure amplification and risk of cardiovascular disease. American Journal of Hypertension 21(4), 388–92.

Nili, N., Zhang, M., Strauss, B.H. et al. 2002: Biochemical analysis of collagen and elastin synthesis in the balloon injured rat carotid artery. Cardiovascular Pathology 11(5), 272–6.

Nilsson, G.E., Tenland, T. and Obert, P.A. 1980: A new instrument for continuous measurement of tissue blood flow by light beating spectroscopy. IEEE Transactions on Biomedical Engineering 27, 12–19.

Nilsson, P.M., Lurbe, E. and Laurent, S. 2008: The early life origins of vascular ageing and cardiovascular risk: the EVA syndrome. Journal of Hypertension 26, 1049–57.

Nilsson, P.M., Boutouyrie, P. and Laurent, S. 2009: Vascular aging: a tale of EVA and ADAM in cardiovascular risk assessment and prevention. Hypertension 54(1), 3–10.

Nisanci, Y., Sezer, M., Umman, B. et al. 2002: Relationship between pressure-derived collateral blood flow and diabetes mellitus in patients with stable angina pectoris: a study based on coronary pressure measurement. Journal of Invasive Cardiology 14(3), 118–22.

Nishimura, R.A., Higano, S.T. and Holmes, D.R. Jr. 1993: Use of intracoronary ultrasound imaging for assessing left main coronary artery disease. Mayo Clinic Proceedings 68(2), 134–40.

Nissen, S, Tuzcu, E, Libby, P et al. 2004: Effect of antihypertensive agents on cardiovascular events in patients with coronary disease and normal blood pressure: the CAMELOT study: a randomized controlled trial. JAMA 292, 2217–25.

Nissen, S.E. 1994: Principles and applications of digital imaging in cardiac and coronary angiography. In: Pepine, C.J., Hill, J.A. and Lambert, C.R. (eds), Diagnostic and therapeutic cardiac catheterization, 2nd edn. Baltimore: Williams & Wilkins, pp. 162–81.

Nissen, S.E. 2002: Application of intravascular ultrasound to characterize coronary artery disease and assess the progression or regression of atherosclerosis. American Journal of Cardiology 89(4A), 24B–31B.

Nissen, S.E. and Yock, P. 2001: Intravascular ultrasound, novel pathophysiological insights and current clinical applications. Circulation 103(4), 604–16.

Nissen, S.E. and Wolski, K. 2007: Effect of rosiglitazone on the risk of myocardial infarction and death from cardiovascular causes. New England Journal of Medicine 356, 2457–71.

Nissen, S.E., Gurley, J.C., Grines, C.L. et al. 1991: Intravascular ultrasound assessment of lumen size and wall morphology in normal subjects and patients with coronary artery disease. Circulation 84(3), 1087–99.

Nissen, S.E., Hirshfeld, J.W. and Simon, R. 2000: The international angiographic compression study. European Heart Journal 21(8), 601–03.

Nissen, S.E., Tuzcu, E.M., Schoenhagen, P. et al. REVERSAL Investigators. 2004: Effect of intensive compared with moderate lipid-lowering therapy on progression of coronary atherosclerosis: a randomized controlled trial. Journal of the American Medical Association 291(9), 1071–80.

Nissen, S.E., Nicholls, S.J., Sipahi, I. et al. 2006: Effect of very high-intensity statin therapy on regression of coronary atherosclerosis: the ASTEROID trial. Journal of the American Medical Association 295(13), 1556–65.

Noble, M.I.M. 1968: The contribution of blood momentum to left ventricular ejection in the dog. Circulation Research 23, 663–70.

Noble, M.I.M. 1979a. The cardiac cycle. London: Blackwell.

Noble, M.I.M. 1979b: Left ventricular load, arterial impedance and their interrelationship. Cardiovascular Research 13, 183–98.

Noble, M.I.M., Gabe, I.T. and Guz, A. 1967: Blood pressure and flow in the ascending aorta of conscious dogs. Cardiovascular Research 1, 9–20.

Noda, T., Cheng, C.P., de Tombe, P. et al. 1993: Curvilinearity of left ventricular end-systolic pressure–volume and dp/dt max end-diastolic volume relations. American Journal of Physiology 265, H910–17.

Noda, T., Yaginuma, T., O'Rourke, M.F. et al. 2006: Effects of nifedipine on systemic and pulmonary vascular impedance in subjects undergoing cardiac catheterization. Hypertension Research 29, 505–13.

Noguchi, N., Teramoto, K., Ochiai, T. et al. 2006: The close participation of ET-1 and NO in human hepatic hemodynamics. Hepatology Research 36(2), 86–93.

Nohria, A., Gerhard-Herman, M., Creager, M.A. et al. 2006: Role of nitric oxide in the regulation of digital pulse volume amplitude in humans. Journal of Applied Physiology 101(2), 545–8.

Nollen, G.J., Groenink, M., Tijssen, J.G. et al. 2004: Aortic stiffness and diameter predict progressive aortic dilatation in patients with Marfan syndrome. European Heart Journal 25(13), 1146–52.

Nomura, K., Nakao, M., Karita, K. et al. 2005: Association between work-related psychological stress and arterial stiffness measured by brachial-ankle pulse-wave velocity in young Japanese males from an information service company. Scandinavian Journal of Work, Environment and Health 31, 352–9.

Noordergraaf, A. 1978. Circulatory system dynamics. New York: Academic Press, pp. 137–9.

Noordergraaf, A. and Melbin, J. 1978: Ventricular afterload: a succinct yet comprehensive definition. American Heart Journal 95, 545–7.

Noordzij, M., Uiterwaal, C.S., Arends, L.R. et al. 2005: Blood pressure response to chronic intake of coffee and caffeine: a meta-analysis of randomized controlled trials. Journal of Hypertension 23, 921–8.

Noris, M., Morigin, M., Donadelli, M. et al. 1995: Nitric oxide synthesis by cultured endothelial cells is modulated by flow conditions. Circulation Research 76, 536–43.

Normand, H., Lemarchand, E., Arbeille, P. et al. 2007: Beat-to-beat agreement of noninvasive tonometric and intra-radial arterial blood pressure during microgravity and hypergravity generated by parabolic flights. Blood Pressure Monitoring 12(6), 357–62.

Nowicki, A. and Reid, J.M. 1981: An infinite gate pulse Doppler. Ultrasound in Medicine and Biology 7, 41–50.

Nowicki, A., Karlowicz, P., Piechocki, M. and Secomski, W. 1985: Method for the measurement of the maximum Doppler frequency. Ultrasound in Medicine and Biology 11, 479–86.

Nozaki, T., Sugiyama, S., Koga, H. et al. 2009: Significance of a multiple biomarkers strategy including endothelial dysfunction to improve risk stratification for cardiovascular events in patients at high risk for coronary heart disease. Journal of the American College of Cardiology 54, 601–8.

Nurnberger, J., Keflioglu-Scheiber, A., Saez, A.M.O. et al. 2002: Augmentation index is associated with cardiovascular risk. Journal of Hypertension 20, 2407–14.

Nussbacher, A., Gloth, S.T., Fleg, J.L. et al. 1995: Increasing arterial compliance improves ejection fraction during maximal exercise in older individuals. Circulation 93, 1–211.

O'Brien, E. and Staessen, J.A. 1999: What is 'hypertension'? Lancet 353(9164), 1541–3.

O'Brien, E., Asmar, R., Beilin, L. et al. 2003: European Society of Hypertension recommendations for conventional, ambulatory and home blood pressure measurement. Journal of Hypertension 21, 821–48.

O'Brien, E., Beevers, G. et al. 2001a: Blood pressure measurement. Part III – Automated sphygmomanometry, ambulatory blood pressure measurement. British Medical Journal 322, 1110–14.

O'Brien, E., Beevers, G. and Lip, G.Y.H. 2001b: Blood pressure measurement. Part IV – Automated sphygmomanometry, self blood pressure measurement. British Medical Journal 322, 1167–70.

O'Brien, E., Waeber, B., Parati, G. et al. on behalf of the European Society of Hypertension Working Group on Blood Pressure Monitoring 2001c: Blood pressure measuring devices: recommendations for the European Society of Hypertension. British Medical Journal 322, 531–6.

O'Leary, D.H. and Bots, M.L. 2010: Imaging of atherosclerosis: carotid intima-media thickness. European Heart Journal 31, 1682–9.

O'Leary, D.H., Polak, J.F., Kronmal, R.A. et al. for the Cardiovascular Health Study Collaborative Research Group 1999: Carotid-artery intima and media thickness as a risk factor for myocardial infarction and stroke in older adults. New England Journal of Medicine 340, 14–22.

O'Neill, S. 2010: Arterial stiffness in women, during the menopausal transition and beyond, as a predictor of cardiac disease: an assessment of the contribution of hormonal factors. PhD thesis, University of Queensland, School of Medicine.
O'Rourke, M.F. 1965a: Pressure and flow in arteries. MD thesis. University of Sydney, Australia.
O'Rourke, M.F. 1965b: Dynamic accuracy of the electromagnetic flowmeter. Journal of Applied Physiology 20, 142–7.
O'Rourke, M.F. 1967a: Pressure and flow waves in systemic arteries and the anatomical design of the arterial system. Journal of Applied Physiology 23, 139–49.
O'Rourke, M.F. 1967b: Steady and pulsatile energy losses in the systemic circulation under normal conditions and in simulated arterial disease. Cardiovascular Research 1, 313–26.
O'Rourke, M.F. 1968: Impact pressure, lateral pressure and impedance in the proximal aorta and pulmonary artery. Journal of Applied Physiology 25, 533–41.
O'Rourke, M.F. 1970a: Arterial hemodynamics in hypertension. Circulation Research 26/27(suppl. II), 123–33.
O'Rourke, M.F. 1970b: Influence of ventricular ejection on the relationship between central aortic and brachial pressure pulse in man. Cardiovascular Research 4, 291–300.
O'Rourke, M.F. 1971: The arterial pulse in health and disease. American Heart Journal 82, 687–702.
O'Rourke, M.F. 1976: Pulsatile arterial haemodynamics in hypertension. Australian and New Zealand Journal of Medicine 6(suppl. 2), 40–8.
O'Rourke, M.F. 1977: Arterial counterpulsation in management of ischaemic heart disease. Australian and New Zealand Journal of Surgery 47, 21–6.
O'Rourke, M.F. 1980: Comments on 'Pulmonary vascular impedance analysis of adaptation to chronically elevated blood flow in the awake dog'. Circulation Research 46, 731.
O'Rourke, M.F. 1981a: Commentary on: Aortic wavelength as a determinant of the relationship between heart rate and body size in mammals. American Journal of Physiology 240, R393–5.
O'Rourke, M.F. 1981b: Valsalva maneuver and input impedance. Circulation 64, 1075.
O'Rourke, M.F. 1982a: Vascular impedance in studies of arterial and cardiac function. Physiological Reviews 62, 570–623.
O'Rourke, M.F. 1982b. Arterial function in health and disease. Edinburgh: Churchill Livingstone.
O'Rourke, M.F. 1982c: Vascular impedance: a call for standardization. In: Kenner, T., Busse, R. and Hinghefer-Szalkay, H. (eds), Cardiovascular system dynamics: model and measurements. New York: Plenum Press, pp. 175–9.
O'Rourke, M.F. 1983a: Hypertension is a myth. Australian and New Zealand Journal of Medicine 13, 84–90.
O'Rourke, M.F. 1985: Basic concepts for the understanding of large arteries in hypertension. Journal of Cardiovascular Pharmacology 7, S14–21.
O'Rourke, M.F. 1986: Intra-aortic balloon counterpulsation. European Heart Journal 7, 400–3.
O'Rourke, M.F. 1988: What is the arterial pressure? Australian and New Zealand Journal of Medicine 18, 649–50.
O'Rourke, M.F. 1990a: Arterial stiffness, systolic blood pressure and logical treatment of arterial hypertension. Hypertension 15, 339–47.
O'Rourke, M.F. 1990b: Coupling between the left ventricle and arterial system in hypertension. European Heart Journal 11(suppl. G), 24–8.
O'Rourke, M.F. 1990c: Effects of nitrates on pressure wave reflection. In: Kelly, D.T. (ed.), Nitrates in the nineties. Tasmania: Excerpta Medica, pp. 25–32.
O'Rourke, M.F. 1992: Frederick Akbar Mahomed. Historical perspective. Hypertension 19, 212–7.
O'Rourke, M.F. 1993: Method for ascertaining the pressure pulse and related parameters in the ascending aorta from the contour of the pressure pulse in the peripheral arteries. US Patent 5,265,011. Washington: US Patent Office.
O'Rourke, M.F. 1994: Arterial haemodynamics and ventricular–vascular interaction in hypertension. Blood Pressure 3, 33–7.
O'Rourke, M.F. 1996: Pseudosystolic hypertension in youth. Proceedings of the 16th Scientific Meeting of the International Society of Hypertension, Glasgow, S147.
O'Rourke, M.F. 1999: Isolated systolic hypertension, pulse pressure, and arterial stiffness as risk factors for cardiovascular disease. Current Hypertension Reports 1(3), 204–11.
O'Rourke, M.F. 2000a: Basis and implications of change in arterial pressure with age. Vascular Medicine 5, 209–11.
O'Rourke, M.F. 2000b: Effects of ramipril on cardiovascular events in high risk patients. New England Journal of Medicine 343, 64–65.
O'Rourke, M.F. 2001: Diastolic heart failure, diastolic LV dysfunction and exercise intolerance. Journal of the American College of Cardiology 38, 305–5.
O'Rourke, M.F. 2002a: From theory into practice: arterial hemodynamics in clinical hypertension. Journal of Hypertension 20, 1901–15.
O'Rourke, M.F. 2002b: Target organ damage, use of pulse wave analysis as a manifestation of aortic degeneration in assessment of hypertension. Vascular Medicine 7, 83–86.
O'Rourke, M.F. 2003: Accurate measurement of arterial pressure. Journal of Human Hypertension 17, 445–7.
O'Rourke, M.F. 2004b: Mechanism of a hypertensive response to exercise. Journal of the American College of Cardiology 44, 1527.
O'Rourke, M.F. 2005: Beyond blood pressure: subtle effects of drug classes. Arteriosclerosis, Thrombosis, and Vascular Biology 25, 2238–9.
O'Rourke, M.F. 2008: How stiffening of the aorta and elastic arteries leads to compromised coronary flow. Heart 94, 690–1.
O'Rourke, M.F. 2009a: Time domain analysis of the arterial pulse in clinical medicine. Medical and Biological Engineering and Computing 47(2), 119–29.
O'Rourke, M.F. 2009b: Link between macrocirculation and microcirculation in isolated systolic hypertension of older subjects. American Journal of Hypertension 22, 469.
O'Rourke, M.F. 2010: The CHARM of a paradox. Journal of the American College of Cardiology 55(3), 257.
O'Rourke, M.F. and Adji, A. 2008: Basis for the use of central blood pressure measurements in office clinical practice. Journal of the American Society of Hypertension 2, 28–38.
O'Rourke, M.F. and Adji, A. 2010a: Central pressure and pulse wave amplification in the upper limb. Hypertension 55, e1–2.
O'Rourke, M.F. and Adji, A. 2010b: Clinical use of applanation tonometry: hope remains in Pandora's box. Journal of Hypertension 28, 229–33.
O'Rourke, M.F. and Clubb, J. 2011: Guidelines for assessment of cardiovascular disease in life insurance. Journal of the American College of Cardiology 57, 1570–1.
O'Rourke, M.F. and Avolio, A.P. 1980: Pulsatile flow and pressure in human systemic arteries: studies in man and in a multi-branched model of the human systemic arterial tree. Circulation Research 46(3), 363–72.
O'Rourke, M.F. and Avolio, A.P. 1986a: Structural basis for increased distensibility of systemic muscular arteries with arterial vasodilator agents. Journal of Molecular and Cellular Cardiology 18(suppl. 2), 374.
O'Rourke, M.F. and Avolio, A.P. 1986b: A functional model of the human arterial wall. Australian and New Zealand Journal of Medicine 16, 566.
O'Rourke, M.F. and Avolio, A.P. 1992: Improved cardiovascular performance with optimal entrainment between heart rate and step rate during running in man. Coronary Artery Disease 3, 963–9.
O'Rourke, M.F. and Avolio, A.P. 2008: Arterial transfer function: background, applications and reservations. Journal of Hypertension 26, 8–10.
O'Rourke, M.F. and Cartmill, T.B. 1971: Influence of aortic coarctation on pulsatile haemodynamics in the proximal aorta. Circulation 44, 281–92.
O'Rourke, M. and Frohlich, E.D. 1999: Pulse pressure: is this a clinically useful risk factor? Hypertension 34, 372–4.
O'Rourke, M.F. and Franklin, S.S. 2006: Arterial stiffness: reflections on the arterial pulse. European Heart Journal 27(21), 2497–8.
O'Rourke, M.F. and Gallagher, D.E. 1992: Continuous noninvasive recording of arterial pressure. American Journal of Hypertension 5, 857–8.
O'Rourke, M.F. and Gallagher, D.E. 1996: Pulse wave analysis. Journal of Hypertension 14(5(suppl. 5)), S147–57.

O'Rourke, M.F. and Hashimoto, J. 2007: Mechanical factors in arterial aging. Journal of the American College of Cardiology 50, 1–13.
O'Rourke, M.F. and Hashimoto, J. 2008: Arterial stiffness: a modifiable cardiovascular risk factor? Journal of Cardiopulmonary Rehabilitation and Prevention 28, 225–37.
O'Rourke, M.F. and Hayward, C.S. 2009: The pulse of cardiology: quo vadis? Journal of the American College of Cardiology 54, 714–17.
O'Rourke, M. and Kass, D.A. 2001: Ray Kelly. Hypertension 37, e23.
O'Rourke, M.F. and Kelly, R.P. 1993: Wave reflection in the systemic circulation and its implications in ventricular function. Journal of Hypertension 11, 327–37.
O'Rourke, M.F. and Lei, J. 1997: Separation of systolic from diastolic dysfunction as a cause of cardiac failure by analysis of the arterial pulse wave. Australian and New Zealand Journal of Medicine 28, 114.
O'Rourke, M.F. and Milnor, W.R. 1971: Relationship between differential pressure and flow in the main pulmonary artery of the dog. Cardiovascular Research 5, 558–65.
O'Rourke, M.F. and Nichols, W.W. 2000b: Effect of ramipril on cardiovascular events in high-risk patients. New England Journal of Medicine 343, 64–5; author reply 66.
O'Rourke, M.F. and Nichols, W.W. 2002: Potential for use of pulse wave analysis in determining the interaction between sildenafil and glyceryl trinitrate. Clinical Cardiology 25, 295–9.
O'Rourke, M.F. and Nichols, W.W. 2004: Change in wave reflection with advancing age in normal subjects. Hypertension 44, e10–11.
O'Rourke, M.F. and Nichols, W.W. 2004: Shear stress and flow-mediated dilation. Hypertension 44, 119–20.
O'Rourke, M.F. and Nichols, W.W. 2005: Aortic diameter, aortic stiffness, and wave reflection increases with age and isolated systolic hypertension. Hypertension 45, 652–8.
O'Rourke, M.F. and Nichols, W.W. 2009a: Vasodilator therapy in cardiac failure: what was new is old (and reply). Journal of the American College of Cardiology 53, 898.
O'Rourke, M.F. and Nichols, W.W. 2009b: 'Microvascular angina' or 'vis a tergo'. Journal of the American College of Cardiology 54, 877–85.
O'Rourke, M.F. and Pauca, A.L. 2004: Augmentation of the aortic and central arterial pressure waveform. Blood Pressure Monitoring 9(4), 179–85.
O'Rourke, M.F. and Safar, M.E. 2005: Relationship between aortic stiffening and microvascular disease in brain and kidney: cause and logic of therapy. Hypertension 46, 200–4.
O'Rourke, M.F. and Takazawa, K. 2009: Flawed measurement of brachial tonometry for calculating aortic pressure? Hypertension 54(5), e131.
O'Rourke, M.F. and Taylor, M.G. 1966: Vascular impedance of the femoral bed. Circulation Research 18, 126–39.
O'Rourke, M.F. and Taylor, M.G. 1967: Input impedance of the systemic circulation. Circulation Research 20, 365–80.
O'Rourke, M.F. and Yaginuma, T. 1984: Wave reflections and the arterial pulse. Archives of Internal Medicine 144, 366–71.
O'Rourke, M.F., Adji, A. and Hoegler, S. 2005: Calibration of non-invasively recorded upper limb pressure waves. Hypertension 46, e15–16.
O'Rourke, M.F., Blazek, J.V., Morreels, C.L. et al. 1968: Pressure wave transmission along the human aorta: changes with age and in arterial degenerative disease. Circulation Research 23, 567–79.
O'Rourke, M.F., Chang, V.P., Windsor, H.M. et al. 1975: Acute severe cardiac failure complicating myocardial infarction: experience with 100 patients referred for consideration of mechanical left ventricular assistance. British Heart Journal 37, 169–81.
O'Rourke, M.F., Sammel, N.L. and Chang, V.P. 1979: Arterial counterpulsation in severe refractory heart failure complicating acute myocardial infarction. British Heart Journal 41, 308–16.
O'Rourke, M.F., Yaginuma, T. and Avolio, A.P. 1984: Physiological and pathophysiologic implications of ventricular/vascular coupling. Annals of Biomedical Engineering 12, 119–34.
O'Rourke, M.F., Avolio, A.P., Nichols, W.W. et al. 1985: Terazosin hemodynamics in patients with cardiac failure. Journal of the American College of Cardiology 5, 543.
O'Rourke, M.F., Avolio, A.P. and Nichols, W.W. 1986a: Left ventricular-systemic arterial coupling in humans and strategies to improve coupling in disease states. In: Yin, F.C.P. (ed.), Ventricular/vascular coupling: clinical, physiological, and engineering aspects. New York: Springer-Verlag, pp. 1–19.
O'Rourke, M.F., Avolio, A.P. and Nichols, W.W. 1986b: The kangaroo as a model for the study of hypertrophic cardiomyopathy in man. Cardiovascular Research 20, 398–402.
O'Rourke, M.F., Avolio, A.P., Lauren, P.D. et al. 1987: Age-related changes of elastic lamellae in the human thoracic aorta. Journal of the American College of Cardiology 9, 53A.
O'Rourke, M.F., Baron, D.W., Keogh, A. et al. 1988: Limitation of myocardial infarction by early infusion of recombinant tissue-type plasminogen activator. Circulation 77(6), 1311–15.
O'Rourke, M.F., Kelly, R.P., Avolio, A.P. et al. 1989a: Effects of arterial dilator agents on central aortic systolic pressure and on left ventricular hydraulic load. American Journal of Cardiology 63, 38I–44I.
O'Rourke, M.F., Kelly, R.P., Avolio, A.P. et al. 1989b: Potential for reversing the ill-effects of aging and of arterial hypertension on central aortic systolic pressure and on left ventricular hydraulic load by arterial dilator agents. Australian and New Zealand Journal of Medicine 19, 320.
O'Rourke, M.F., Avolio, A.P., Karamanoglu, M. et al. 1990: Derivation of ascending aortic pressure waveform from the brachial pressure pulse in man. Australian and New Zealand Journal of Medicine 20(suppl. I), 328.
O'Rourke, M.F., Avolio, A.P., Karamanoglu, M. et al. 1991: Derivation of ascending aortic pressure waveform from the brachial pressure pulse in man. Medical and Biological Engineering and Computing 29(suppl. I), 157.
O'Rourke, M.F., Kelly, R.P. and Avolio, A.P. 1992a. The arterial pulse. Philadelphia: Lea & Febiger.
O'Rourke, M.F., Karamanoglu, M. and Avolio, A.P. 1992b: A modeling analysis of aging and vasoactive drugs on the human arterial pulse. Journal of the American College of Cardiology 19(3), 74A.
O'Rourke, M.F., Avolio, A.P. and Karamanoglu, M. 1992c: Use of transfer functions to determine central from peripheral pressure pulse. Journal of the American College of Cardiology 19, 227A.
O'Rourke, M.F., Safar, M.E. and Dzau, V.J. (ed.), 1993a: Arterial vasodilation: mechanisms and therapy. London: Edward Arnold.
O'Rourke, M.F., Avolio, A.P., Stelliou, V. et al. 1993b: The rhythm of running: can the heart join in? Australian and New Zealand Journal of Medicine, 23, 708–10.
O'Rourke, M.F., Vlachopoulos, C. and Graham, R. 2000: Spurious systolic hypertension in youth. Vascular Medicine 5, 141–5.
O'Rourke, M.F., Pauca, A. and Jiang, X.J. 2001: Pulse wave analysis. British Journal of Clinical Pharmacology 51, 507–22.
O'Rourke, M.F., Staessen, J.A., Vlachopoulos, C. et al. 2002a: Clinical applications of arterial stiffness: definitions and reference values (Reviews). American Journal of Hypertension 15, 426–44.
O'Rourke, M., Pauca, A. and Kon, N. 2002b: Generation of ascending aortic from radial artery pressure waveform. Journal of the American College of Cardiology 39(suppl. B), 177B.
O'Rourke, M.F., Safar, M.E. and Nichols, W.W. 2004a: Proximal aortic diameter and aortic pressure-flow relationship in systolic hypertension. Circulation 109, e227–e228.
O'Rourke, M.F., Nichols, W.W. and Safar, M.E. 2007: Effects of angiotensin-converting enzyme inhibitors on central blood pressure. Hypertension 50 e63; author reply, e64.
O'Rourke, M.F., Weber, T. and Adji, A. 2010a: Aortic stiffness in hypertrophic cardiomyopathy. Journal of the American College of Cardiology 55, 504–5.
O'Rourke, M.F., Safar, M.E. and Dzau, V. 2010b: The cardiovascular continuum extended: aging effects on the aorta and microvasculature. Vascular Medicine 15(6), 461–8.
O'Rourke, M.F., Avolio, A., Safar, M. et al. 2010c: Changes in the central arterial pressure pulse with aging and reply. Journal of the American College of Cardiology 55, 2183.
O'Rourke, M.F., Safar, M. and Roman, M.J. 2010d: Central pressure waveforms and cardiovascular events. Circulation 122, e512.

O'Sullivan, J.J., Derrick, G. and Darnell, R. 2002: Prevalence of hypertension in children after early repair of coarctation of the aorta, a cohort study using casual and 24-hour blood pressure measurement. Heart 88, 163–6.

Ofili, E., Kern, J.J., Tatineni, S. et al. 1991: Detection of coronary collateral flow by a Doppler-tipped guide wire during coronary angioplasty. American Heart Journal 122, 221–5.

Ofili, E.O., Kern, M.J., Labovitz, A.J. et al. 1993: Analysis of coronary blood flow velocity dynamics in angiographically normal and stenosed arteries before and after endolumen enlargement by angioplasty. Journal of the American College of Cardiology 21, 308–16.

Ogasawara, Y. 1984: Development of high-frequency ultrasonic Doppler flowmeters. Iyodenshi To Seitai Kogaku 22(5), 366–7.

Oh, Y.T., Kim, H.S., Chun, M. et al. 1999: The effect of external electron beam on neointima in rat carotid artery injury model. International Journal of Radiation Oncology Biology Physics 44(3), 643–8.

Ohkubo, T., Imai, Y., Tsuji, I. et al. 1998: Home blood pressure measurement has a stronger predictive power for mortality than does screening blood pressure measurement: a population-based observation in Ohasama, Japan. Journal of Hypertension 16(7), 971–5.

Ohlsson, A., Nordlander, R., Bennett, T. et al. 1998: Continuous ambulatory haemodynamic monitoring with an implantable system. The feasibility of a new technique. European Heart Journal 19, 174–84.

Ohnishi, H., Saitoh, S., Takagi, S. et al. 2003: Pulse wave velocity as an indicator of atherosclerosis in impaired fasting glucose, the tanno and sobetsu study. Diabetes Care 26(2), 437–40.

Ohtsuka, S., Kakihana, M., Watanabe, H. et al. 1994: Chronically decreased aortic distensibility causes deterioration of coronary perfusion during increased left ventricular contraction. Journal of the American College of Cardiology 24(5), 1406–14.

Oka, S. 1967: Rheology of blood. Koubunski 16, 425–35.

Okamoto, M., Miyatake, K., Kinoshita, N. et al. 1984: Analysis of blood flow in pulmonary hypertension with the pulsed Doppler flowmeter combined with cross-sectional echocardiography. British Heart Journal 51, 407–15.

Okamoto, R.J., Xu, H., Kouchoukos, N.T. et al. 2003: The influence of mechanical properties on wall stress and distensibility of the dilated ascending aorta. Journal of Thoracic and Cardiovascular Surgery 126, 842–50.

Okamoto, T., Masuhara, M. and Ikuta, K. 2008: Effects of low-intensity resistance training with slow lifting and lowering on vascular function. Journal of Human Hypertension 22, 509–11.

Okimoto, H., Ishigaki, Y., Koiwa, Y. et al. 2008: A novel method for evaluating human carotid artery elasticity: possible detection of early stage atherosclerosis in subjects with type 2 diabetes. Atherosclerosis 196, 391–7.

Olesen, J. 1994: Understanding the biologic basis of migraine. New England Journal of Medicine 331(25), 1713–14.

Oliver, J.J. and Webb, D.J. 2003: Noninvasive assessment of arterial stiffness and risk of atherosclerotic events. Arteriosclerosis, Thrombosis, and Vascular Biology 23, 554–66.

Oliver, J.J., Dear, J.W. and Webb, D.J. 2010: Clinical potential of combined organic nitrate and phosphodiesterase type 5 inhibitor in treatment-resistant hypertension. Hypertension 56, 62–7.

Olivetti, G., Melissari, M., Capasso, J.M. et al. 1991: Cardiomyopathy of the aging human heart; myocyte loss and reactive cellular hypertrophy. Circulation Research 68, 1560–8.

Olschewski, H., Simonneau, G., Galie, N. et al. 2002: Inhaled Iloprost for severe pulmonary hypertension. New England Journal of Medicine 347, 322–9.

Olshansky, S.J., Carnes, B.A. and Butler, R.N. 2001: If humans were built to last. Scientific American March issue.

Olshansky, S.J., Hayflick, L. and Carnes, B. 2002: No truth to the fountain of youth. Scientific American June issue.

Olsson, R.A. and Bunger, R. 1987: Metabolic control of coronary blood flow. Progress Cardiovascular Disease 29(5), 369–87.

Omboni, S., Parati, G., Castiglioni, P. et al. 1998: Continuous ambulatory haemodynamic monitoring with an implantable system. The feasibility of a new technique. Hypertension 32, 52–8.

Ong, P.J., Patrizi, G., Chong, W.C. et al. 2000: Testosterone enhances flow-mediated brachial artery reactivity in men with coronary artery disease. American Journal of Cardiology 85(2), 269–72.

Ootaki, Y., Kamohara, K., Akiyama, M. et al. 2005: Phasic coronary blood flow pattern during a continuous flow left ventricular assist support. European Journal of Cardiothoracic Surgery 28(5), 711–16.

Ootaki, Y., Ootaki, C., Kamohara, K. et al. 2008: Phasic coronary blood flow patterns in dogs vs. pigs: an acute ischemic heart study. Medical Science Monitor 14(10), BR193–7.

Oparil, S. and Izzo, J.L. 2006: Pulsology rediscovered: commentary on the CAFE study. Circulation 113, 1162–3.

Opatowski, I. 1967: Elastic deformations of arteries. Journal of Applied Physiology 23, 772–8.

Opie, L.H. 1995: Risks and benefits of calcium antagonists. Lancet 346(8980), 961.

Orchard, R.C. and Craigie, E. 1980: Dicrotic pulse after open heart surgery. Circulation 62, 1107–14.

Oréa, V., Kanbar, R., Chapuis, B. et al. 2007: Transfer function analysis between arterial pressure and renal sympathetic nerve activity at cardiac pacing frequencies in the rat. Journal of Applied Physiology 102(3), 1034–40.

Ornish, D., Brown, S.E., Scherwitz, L.W. et al. 1990: Can lifestyle changes reverse coronary heart disease? Lancet 336, 129–33.

Orr, J.S., Gentile, C.L., Davy, B.M. et al. 2008: Large artery stiffening with weight gain in humans: role of visceral fat accumulation. Hypertension 51, 1519–24.

Oshinski, J.N., Curtin, J.L. and Loth, F. 2006: Mean-average wall shear stress measurements in the common carotid artery. Journal of Cardiovascular Magnetic Resonance 8(5), 717–22.

Osler, W. 1892. The principles and practice of medicine. New York: Appleton.

Osler, W. 1906. The principles and practice of medicine, 6th edn. New York: D. Appleton.

Osranek, M., Eisenach, J.H., Khandheria, B.K. et al. 2008: Arterioventricular coupling and ventricular efficiency after antihypertensive therapy: a noninvasive prospective study. Hypertension 51(2), 275–81.

Ostad, M.A., Eggeling, S., Tschentscher, P. et al. 2009: Flow-mediated dilation in patients with coronary artery disease is enhanced by high dose atorvastatin compared to combined low dose atorvastatin and ezetimibe: results of the CEZAR study. Atherosclerosis 205(1), 227–32.

Ostchega, Y., Dillon, C., Prineas, R.J. et al. 2006: Tables for the selection of correct blood pressure cuff size based on self-reported height and weight and estimating equations for mid-arm circumference: data from the US National Health and Nutrition Examination Survey. Journal of Human Hypertension 20(1), 15–22.

Otsuki, T., Maeda, S., Iemitsu, M. et al. 2007a: Relationship between arterial stiffness and athletic training programs in young adult men. American Journal of Hypertension 20, 967–73.

Otsuki, T., Maeda, S., Iemitsu, M. et al. 2007b: Vascular endothelium-derived factors and arterial stiffness in strength- and endurance-trained men. American Journal of Physiology. Heart and Circulatory Physiology 292(2), H786–91.

Otsuki, T., Takanami, Y., Aoi, W. et al. 2008: Arterial stiffness acutely decreases after whole-body vibration in humans. Acta Physiologica 194, 189–94.

Ottervanger, J.P., Paalman, H.J.A., Boxma, G.L. et al. 1993: Transmural myocardial infarction with sumatriptan. Lancet 341, 861–2.

Otto, C., Geiss, H.C., Laubach, E. et al. 2002: Effects of direct adsorption of lipoproteins apheresis on lipoproteins, low-density lipoprotein subtypes, and hemorheology in hypercholesterolemic patients with coronary artery disease. Therapeutic Apheresis 6(2), 130–5.

Otto, C., Richter, W.O. and Schwandt, P. 2000: Contribution of fibrinogen and lipoproteins to plasma viscosity in hypercholesterolemia and hypertriglyceridemia, evaluation by selective depletion of low-density lipoproteins or fibrinogen. Metabolism 49(6), 810–13.

Ou, P., Celermajer, D.S., Mousseaux, E. et al. 2007: Vascular remodeling after 'successful' repair of coarctation: impact of aortic arch geometry. Journal of the American College of Cardiology 49(8), 883–90.

Ou, P., Celermajer, D.S., Raisky, O. et al. 2008a: Angular (Gothic) aortic arch leads to enhanced systolic wave reflection, central aortic stiffness, and increased left ventricular mass late after aortic coarctation repair: evaluation with magnetic resonance flow mapping. Journal of Thoracic and Cardiovascular Surgery 135(1), 62–8.

Ou, P., Celermajer, D.S., Jolivet, O. et al. 2008b: Increased central aortic stiffness and left ventricular mass in normotensive young subjects after successful coarctation repair. American Heart Journal 55(1), 187–93.

Oulis, P., Kouzoupis, A., Kyrkou, K. et al. 2010: Reversal of increased arterial stiffness in severely depressed women after 6-week antidepressant treatment. Journal of Affective Disorders 122, 164–6.

Paajanen, T.A., Oksala, N.K.J., Kuukasjarvi, P. et al. 2010: Short stature is associated with coronary heart disease: a systematic review of the literature and a meta-analysis. European Heart Journal 31, 1802–9.

Packer, M. 1989: Second generation calcium channel blockers in the treatment of chronic heart failure. Journal of the American College of Cardiology 14, 1339–42.

Packer, M., Carver, J.R., Rodeheffer, R.J. et al. 1991: Effect of oral milrinone on mortality in severe heart failure. The PROMISE Study Research Group. New England Journal of Medicine 325, 1468–75.

Packer, M., Coats, A.J.S., Fowler, M.B. et al. 2001: Effect of carvedilol on survival in severe chronic heart failure. New England Journal of Medicine 344, 1651–8.

Packer, M., Meller, J., Gorlin, R. et al. 1979: Hemodynamic and clinical tachyphylaxis to prazosin-mediated afterload reduction in severe congestive heart failure. Circulation 59(3), 531–9.

Packer, M., O'Connor, C.M., Ghali, J.K. et al. 1996: Effect of amlodipine on morbidity and mortality in severe chronic heart failure. Prospective Randomized Amlodipine Survival Evaluation Study Group. New England Journal Medicine 335(15), 1107–14.

Paeng, D.G. and Shung, K.K. 2003: Cyclic and radial variation of the Doppler power from porcine whole blood. IEEE Transactions on Ultrasonics, Ferroelectronics and Frequency Control 50, 614–22.

Paeng, D.G., Cao, P.J. and Shung, K.K. 2001: Doppler power variation from porcine blood under steady and pulsatile flow. Ultrasound in Medicine and Biology 27, 1245–54.

Paeng, D.G., Chiao, R.Y. and Shung, K.K. 2004: Echogenicity variations from porcine blood I: the 'bright collapsing ring' under pulsatile flow. Ultrasound in Medicine and Biology 30, 45–55.

Pagani, M., Schwartz, P.J., Bishop, V.S. et al. 1975: Reflex sympathetic changes inaortic diastolic pressure-diameter relationship. American Journal of Physiology 229(2), 286–90.

Painter, P.R., Edén, P. and Bengtsson, HU. 2006: Pulsatile blood flow, shear force, energy dissipation and Murray's law. Theoretical Biology and Medical Modelling 3, 31.

Paini, A., Boutouyrie, P., Calvet, D. et al. 2006: Carotid and aortic stiffness: determinants of discrepancies. Hypertension 47, 371–6.

Palatini, P. and Parati, G. 2010: Persistently elevated heart rate accelerates the progression of arterial stiffness. Journal of Hypertension 28, 653–6.

Palatini, P., Mos, L., Mormino, P. et al. 1989: Blood pressure changes during running in humans: the 'beat' phenomenon. Journal of Applied Physiology 67(1), 52–9.

Palmer, B.F. 2002: Renal dysfunction complicating the treatment of hypertension. New England Journal of Medicine 347, 1256–61.

Palmer, R.M., Ferrige, A.G. and Moncada, S. 1987: Nitric oxide release accounts for the biological activity of endothelium-derived relaxing factor. Nature 327, 524–6.

Palmieri, V., Celentano, A., Roman, M.J. et al. 2003: Relation of fibrinogen to cardiovascular events is independent of preclinical cardiovascular disease, the Strong Heart Study. American Heart Journal 145(3), 467–74.

Palmieri, V., Storto, G., Arezzi, E. et al. 2005: Relations of left ventricular mass and systolic function to endothelial function and coronary flow reserve in healthy, new discovered hypertensive subjects. Journal of Human Hypertension 19(12), 941–50.

Panerai, R.B., Sammons, E.L., Smith, S.M. et al. 2006: Cerebral critical closing pressure estimation from Finapres and arterial blood pressure measurements in the aorta. Physiological Measurement 27(12), 1387–402.

Paniagua, O.A., Bryant, M.B. and Panza, J.A. 2000: Transient hypertension directly impairs endothelium-dependent vasodilation of the human microvasculature. Hypertension 36(6), 941–4.

Paniagua, O.A., Bryant, M.B. and Panza, J.A. 2001: Role of endothelial nitric oxide in shear stress-induced vasodilation of human microvasculature: diminished activity in hypertensive and hypercholesterolemic patients. Circulation 103(13), 1752–8.

Pannier, B.M., Safar, M.E., Laurent, S. et al. 1989a: Indirect, noninvasive evaluation of pressure wave transmission in essential hypertension. Angiology 40, 29–35.

Pannier, B.M., Lafleche, A.B., Girerd, X.J.M. et al. 1994: Arterial stiffness and wave reflections following acute calcium blockade in essential hypertension. American Journal of Hypertension 7, 168–76.

Pannier, B.M., Guerin, A.P., Marchais, S.J. et al. 2001: Different aortic reflection wave responses following long-term angiotensin-converting enzyme inhibition and beta-blocker in essential hypertension. Clinical and Experimental Pharmacology and Physiology 28(12), 1074–7.

Pannier, B.M., Avolio, A.P., Hoeks, A. et al. 2002: Methods and devices for measuring arterial compliance in humans. American Journal of Hypertension 15(8), 743–53.

Pannier, B., Guerin, A.P., Marchais, S.J. et al. 2005: Stiffness of capacitive and conduit arteries: prognostic significance for end-stage renal disease patients. Hypertension 45, 592–6.

Panting, J.R., Gatehouse, P.D., Yang, G.Z. et al. 2002: Abnormal subendocardial perfusion in cardiac syndrome X detected by cardiovascular magnetic resonance imaging. New England Journal of Medicine 346, 1948–53.

Pantos, I., Patatoukas, G., Efstathopoulos, E.P. et al. 2007a: In vivo wall shear stress measurements using phase-contrast MRI. Expert Review of Cardiovascular Therapy 5(5), 927–38.

Pantos, J., Efstathopoulos, E. and Katritsis, D.G. 2007b: Vascular wall shear stress in clinical practice. Current Vascular Pharmacology 5(2), 113–19.

Pantos, I., Efstathopoulos, E.P. and Katritsis, D.G. 2009: Two and three-dimensional quantitative coronary angiography. Cardiology Clinics 27(3), 491–502.

Panza, J.A. 2001: High-normal blood pressure – more 'high' than 'normal' (Editorials). New England Journal of Medicine 345, 1337–40.

Panza, J.A., Quyyumi, A.A., Brush, J.E. Jr. et al. 1990: Abnormal endothelium-dependent vascular relaxation in patients with essential hypertension. New England Journal of Medicine 323(1), 22–7.

Papageorgiou, G.L. and Jones, N.B. 1989: Hydraulic input impedance measurements in physical models of the arterial wall. Journal of Biomedical Engineering 11(6), 471–7.

Papageorgiou, G.L., Jones, B.N., Redding, V.J. et al. 1990: The area ratio of normal arterial junctions and its implications in pulse wave reflections. Cardiovascular Research 24, 478–84.

Papaioannou, T.G., Karatzi, K., Karatzis, E. et al. 2005: Acute effects of caffeine on arterial stiffness, wave reflections, and central aortic pressures. American Journal of Hypertension 18, 129–36.

Papaioannou, T.G., Stamatelopoulos, K.S., Georgiopoulos, G. et al. 2009: Arterial wave reflections during the menstrual cycle of healthy women: a reproducibility study. Hypertension 54, 1021–7.

Papamichael, C., Karatzi, K., Karatzis, E. et al. 2006: Combined acute effects of red wine consumption and cigarette smoking on haemodynamics of young smokers. Journal of Hypertension 24(7), 1287–92.

Papamichael, C.M., Karatzi, K.N., Papaioannou, T.G. et al. 2008: Acute combined effects of olive oil and wine on pressure wave reflections: another beneficial influence of the Mediterranean diet antioxidants? Journal of Hypertension 26(2), 223–9.

Parati, G., Casadei, R., Groppelli, A. et al. 1989: Comparison of finger and intra-arterial blood pressure monitoring at rest and during laboratory testing. Hypertension 13, 647–50.

Park, S.W., Park, S.J., Kim, J.J. et al. 1995: Endothelial dysfunction of spasm-related coronary artery in patients with variant angina. Journal of the American College of Cardiology. February: 321A.

Parker, B.A., Trehearn, T.L. and Meendering, J.R. 2009: Pick your Poiseuille: normalizing the shear stimulus in studies of flow mediated dilation. Journal of Applied Physiology 107, 1357–9.

Parker, K.H. 1977: Instability in arterial blood flow. In: Hwang, N.H.C. and Normann, N.A. (eds), Cardiovascular flow dynamics and measurements. Baltimore: University Park Press, pp. 633–63.

Parker, K.H. and Jones, C.J. 1990: Forward and backward running waves in the arteries: analysis using the method of characteristics. Journal of Biomechanical Engineering 112(3), 322–6.

Parmacek, M.S. and Epstein, J.A. 2009: Cardiomyocyte renewal. New England Journal of Medicine 361, 86–8.

Parmar, K.M., Larman, H.B., Dai, G. et al. 2006: Integration of flow-dependent endothelial phenotypes by Kruppel-like factor 2. Journal of Clinical Investigation 116, 49–58.

Parmley, W.W. 1997: Do we practice geriatric cardiology? Journal of the American College of Cardiology 29(1), 217–18.

Parving, H.H., Lehnert, H., Brochner-Mortensen, J. et al. 2001: The effect of irbesartan on the development of diabetic nephropathy in patients with type 2 diabetes. New England Journal of Medicine 345, 870–8.

Pase, M.P., Pipingas, A., Kras, M. et al. 2010: Healthy middle-aged individuals are vulnerable to cognitive deficits as a result of increased arterial stiffness. Journal of Hypertension 28, 1724–9.

Pasierski, T., Pearson, A.C. and Labovitz, A.J. 1991: Pathophysiology of isolated systolichypertension in elderly patients: Doppler echocardiographic insights. American Heart Journal 122(2), 528–34.

Pasierski, T.J., Binkley, P.F. and Pearson, A.C. 1992: Evaluation of aortic distensibility with transesophageal echocardiography. American Heart Journal 123(5), 1288–92.

Pasipoularides, A. 1990: Clinical assessment of ventricular ejection dynamics with and without outflow obstruction. Journal of the American College of Cardiology 15(4), 859–82.

Pasipoularides, A., Murgo, J.P., Bird, J.J. et al. 1984: Fluid dynamics of aortic stenosis, mechanisms for the presence of subvalvular pressure gradients. American Journal of Physiology 246(4 Pt 2), H542–H550.

Passerini, A.G., Polacek, D.C., Shi, C. et al. 2004: Coexisting proinflammatory and antioxidative endothelial transcription profiles in a disturbed flow region of the adult porcine aorta. Proceedings of the National Academy of Sciences of the United States of America 101, 2482–7.

Patel, A.R., Kuvin, J.T., DeNofrio, D. et al. 2003: Peripheral vascular endothelial function correlates with exercise capacity in cardiac transplant recipients. American Journal of Cardiology 91(7), 897–9.

Patel, A.R., Kuvin, J.T., Pandian, N.G. et al. 2001: Heart failure etiology affects peripheral vascular endothelial function after cardiac transplantation. Journal of the American College of Cardiology 37(1), 195–200.

Patel, D.J. and Fry, D.L. 1964: In situ pressure–radius–length measurements in ascending aorta of anesthetized dogs. Journal of Applied Physiology 19, 413–16.

Patel, D.J. and Fry, D.L. 1966: Longitudinal tethering of arteries in dogs. Circulation Research 19, 1011–21.

Patel, D.J. and Vaishnev, R.N. 1972: The rheology of large blood vessels. In: Bergel, D.H. (ed.), Cardiovascular Fluid Dynamics. London: Academic Press, pp. 2–62.

Patel, D.J. and Vaishnav, R.N. 1980. Basic hemodynamics and its role in disease processes. Baltimore: University Park Press.

Patel, D.J., Schilder, D.P. and Mallos, A.J. 1960: Mechanical properties and dimensions of the major pulmonary arteries. Journal of Applied Physiology 15, 92–6.

Patel, D.J., Mallos, A.J. and Fry, D.L. 1961: Aortic mechanics in the living dog. Journal of Applied Physiology 16, 293–9.

Patel, D.J., de Freitas, F.M., Greenfield, J.C. Jr et al. 1963: Relationship of radius to pressure along the aorta in living dogs. Journal of Applied Physiology 18, 1111–17.

Patel, D.J., Defreitas, F.M. and Fry, D.L. 1963a: Hydraulic input impedance to aorta and pulmonary artery in dogs. Journal of Applied Physiology 18, 134–40.

Patel, D.J., Defreitas, F., Greenfield, J.C. et al. 1963b: Relationship of radius to pressure along the aorta in living dogs. Journal of Applied Physiology 18, 1111–7.

Patel, D.J., Greenfield, J.C. and Fry, D.L. 1964: In vivo pressure–length–radius relationship of certain blood vessels in man and dog. In: Attinger, E.O. (ed.), Pulsatile blood flow. New York: McGraw-Hill, pp. 293–302.

Patel, D.J., Mason, D.T., Ross, J. et al. 1965a: Harmonic analysis of pressure pulses obtained from the heart and great vessels of man. American Heart Journal 69, 785–94.

Patel, D.J., Greenfield, J.C., Austen, W.G. et al. 1965b: Pressure–flow relationships in the ascending aorta and femoral artery of man. Journal of Applied Physiology 20, 459–63.

Patel, D.J., Janicki, J.S. and Carew, T.E. 1969: Static anisotropic elastic properties of the aorta in living dogs. Circulation Research 25, 765–79.

Patel, D.J., Janicki, J.S., Vaishnav, R.N. et al. 1973: Dynamic anisotropic viscoelastic properties of the aorta in living dogs. Circulation Research 32, 93–107.

Patel, M.B., Kaplan, I.V., Patni, R.N. et al. 1999: Sustained improvement in flow-mediated vasodilation after short-term administration of dobutamine in patients with severe congestive heart failure. Circulation 99(1), 60–4.

Patel, M.D. and Katz, S.D. 2005: Phosphodiesterase 5 inhibition in chronic heart failure and pulmonary hypertension. American Journal of Cardiology 96(12B), 47M–51M.

Patrianakos, A.P., Karakitsos, D.N., de Groot, E. et al. 2006: Alteration of proximal aorta biophysical properties in patients with end stage renal disease. Heart 92(2), 228–32.

Patterson, G.C., Shepherd, J.T. and Whelan, R.F. 1957: The resistance to blood flow in the upper and lower limb vessels in patients with coarctation of the aorta. Clinical Science 16, 627–32.

Patterson, S.W., Piper, W. and Starling, E.H. 1914: The regulation of the heart beat. Journal of Physiology 48, 465–513.

Pauca, A., O'Rourke, M. and Kon, N. 2001: Prospective evaluation of a method for estimating ascending aortic pressure from the radial artery pressure waveform. Hypertension 38, 932–7.

Pauca, A.L., Kon, N.D. and O'Rourke, MF. 2004: The second peak of the radial artery pressure wave represents aortic systolic pressure in hypertensive and elderly patients. British Journal of Anaesthesia 92, 651–7.

Pauca, A.L., Kon, N.D. and O'Rourke, M.F. 2005: Benefit of glyceryl trinitrate on arterial stiffness is directly due to effects on peripheral arteries. Heart 91, 1428–32.

Pauca, A.L., Wallenhaupt, S.L., Kon, N.D. et al. 1992: Does radial artery pressure accurately reflect aortic pressure? Chest 102, 1193–98.

Paulsen, P.K. and Hasenkam, J.M. 1983: Three-dimensional visualization of velocity profiles in the ascending aorta in dogs, measured with a hot-film anemometer. Journal of Biomechanics 16(3), 201–10.

Paulus, W.J. 2010: Culprit mechanism(s) for exercise intolerance in heart failure with normal ejection fraction. Journal of the American College of Cardiology 56, 864–6.

Paulus, W., Claes, V.A. and Brutsaert, D.L. 1979: Physiologic loading of isolated feline cardiac muscle; the interaction between muscle contraction and vascular impedance in the production of pressure and flow waves. Circulation Research 44, 491–7.

Paulus, W.J., Tschope, C., Sanderson, J.E. et al. 2007: How to diagnose diastolic heart failure: a consensus statement on the diagnosis of heart failure with normal left ventricular ejection fraction by the Heart Failure and Echocardiography Associations for the European Society of Cardiology. European Heart Journal 28, 2539–50.

Pavlopoulos, H. and Nihoyannopoulos, P. 2009: Pulse pressure/stroke volume: a surrogate index of arterial stiffness and the relation to segmental relaxation and longitudinal systolic deformation in hypertensive disease. European Journal of Echocardiography 10(4), 519–26.

Pawlak, K., Naumnik, B., Brzosko, S. et al. 2004: Oxidative stress – a link between endothelial injury, coagulation activation, and atherosclerosis in haemodialysis patients. American Journal of Nephrology 24(1), 154–61.

Payne, R.A., Symeonides, C.N., Webb, D.J. et al. 2006: Pulse transit time measured from the ECG: an unreliable marker of beat-to-beat blood pressure. Journal of Applied Physiology 100(1), 136–41.
Payne, R.A., Wilkinson, I.B. and Webb, D.J. 2010: Arterial stiffness and hypertension: emerging concepts. Hypertension 55, 9–14.
Payvandi, L., Dyer, A., McPherson, D. et al. 2009: Physical activity during daily life and brachial artery flow-mediated dilation in peripheral arterial disease. Vascular Medicine 14, 193–201.
PEACE Trial Investigators. 2004: Angiotensin-converting enzyme inhibition in stable coronary artery disease. New England Journal of Medicine 351, 3058–68.
Pearson, A.C., Gudipati, C.V. and Labovitz, A.J. 1991a: Effects of aging on left ventricular structure and function. American Heart Journal 121, 871–5.
Pearson, A.C., Gudipati, C., Nagelhout, D. et al. 1991b: Echocardiographic evaluation of cardiac structure and function in elderly subjects with isolated systolic hypertension. Journal of the American College of Cardiology 17, 422–30.
Pearson, A.C., Guo, R., Orsinelli, D.A. et al. 1994: Transesophageal echocardiographic assessment of the effects of age, gender, and hypertension on thoracic aortic wall size, thickness, and stiffness. American Heart Journal 128, 344–51.
Pearson, G.D., Devereux, R.B., Loeys, B. et al. 2008: Report of the National Heart, Lung, and Blood Institute and National Marfan Foundation Working Group on research in Marfan syndrome and related disorders. Circulation 118, 785–91.
Pearson, T.C. 1987: Rheology of the absolute polycythaemias. Baillieres Clinical Haematology 1(3), 637–64.
Pearson, T.C. 2001: Hemorheology in the erythrocytoses. Mount Sinai Journal of Medicine 68(3), 182–91.
Pedersen, O.M., Aslaksen, A. and Vik-Mo, H. 1993: Ultrasound measurement of the luminal diameter of the abdominal aorta and iliac arteries in patients without vascular disease. Journal of Vascular Surgery 17, 596–601.
Pelliccia, A., Kinoshita, N., Pisicchio, C. et al. 2010: Long-term clinical consequences of intense, uninterrupted endurance training in Olympic athletes. Journal of the American College of Cardiology 55, 1619–25.
Peñáz, J. 1973: Photo-electric measurement of blood pressure, volume and flow in the finger. International Conference on Medical and Biological Engineering, Dresden.
Peñáz, J., Voigt, A. and Teichmann, W. 1976: [Contribution to the continuous indirect blood pressure measurement]. Zeitschrift für die Gesamte Innere Medizin und ihre Grenzgebiete 31(24), 1030–3.
Peng, H.H., Chung, H.W., Yu, H.Y. et al. 2006: Estimation of pulse wave velocity in main pulmonary artery with phase contrast MRI: preliminary investigation. Journal of Magnetic Resonance Imaging 24(6), 1303–10.
Pennell, D.J. 2008: Perfusion abnormality, normal coronaries, and chest pain. Journal of the American College of Cardiology 51, 473–5.
Pennington, D.G. and Swartz, M.T. 1992: Assisted circulation and mechanical heart. In: Braunwald, E. (ed.), Heart disease – a textbook of cardiovascular medicine, 4th edn. Philadelphia: W.B. Saunders.
Penny, W.F., Rockman, H., Long, J. et al. 1995: Heterogeneity of vasomotor response to acetylcholine along the human coronary artery. Journal of the American College of Cardiology 25, 1046–55.
Pentimone, F., Del Corso, L., Meola, M. et al. 1994: [Aging of the aorta: a morphological study]. Clinica Terapeutica 144(5), 413–8.
Pepine, C.J. 1998a: Clinical implications of endothelial dysfunction. Clinical Cardiology 21(11), 795–9.
Pepine, C.J. 1998b: The effects of angiotensin-converting enzyme inhibition on endothelial dysfunction: potential role in myocardial ischemia. American Journal of Cardiology 82(10A), 23S–7S.
Pepine, C.J., Andrews, T., Deanfield, J.E. et al. 1996: Relation of patient characteristics to cardiac ischemia during daily life activity (an Asymptomatic Cardiac Ischemia Pilot Data Bank Study). American Journal of Cardiology 77(15), 1267–72.
Pepine, C.J. and Nichols, W.W. 1988: Effects of transient increase in intrathoracic pressure on hemodynamic determinants of myocardial oxygen supply and demand. Clinical Cardiology 11, 831–7.
Pepine, C.J. and Nichols, W.W. 2007: The pathophysiology of chronic ischemic heart disease. Clinical Cardiology 30(2 suppl. 1), I4–9.
Pepine, C.J., Hill, J.A. and Lambert, C.R. (eds), 1998: Diagnostic and therapeutic cardiac catheterization, 3rd edn. Baltimore: Williams & Wilkins.
Pepine, C.J., Nichols, W.W. and Conti, C.R. 1978: Aortic input impedance in heart failure. Circulation 58(3), 460–5.
Pepine, C.J., Nichols, W.W., Curry, R.C.J.R. et al. 1979: Aortic input impedance during nitroprusside infusion: a reconsideration of afterload reduction and beneficial action. Journal of Clinical Investigation 64, 643–54.
Pepine, C.J., von Mering, G.O., Kerensky, R.A. et al. 2007: Phytoestrogens and coronary microvascular function in women with suspected myocardial ischemia: a report from the Women's Ischemia Syndrome Evaluation (WISE) Study. Journal of Women's Health 16(4), 481–8.
Perkins, B.A., Ficociello, L.H., Silva, K.H. et al. 2003: Regression of microalbuminuria in type 1 diabetes. New England Journal of Medicine 348, 2285–93.
Perkins, K.A., Epstein, L.H., Marks, B.L. et al. 1989: The effect of nicotine on energy expenditure during light physical activity. New England Journal of Medicine 320, 898–903.
Perlini, S., Solda, P.L. and Piepoli, M. 1991: Time course of pressure and flow in ascending aorta during ejection. International Journal of Cardiology 30, 169–79.
Perlman, J.M., McMenamin, J.B. and Volpe, J.J. 1983: Fluctuating cerebral blood flow velocity in the respiratory distress syndrome. New England Journal of Medicine 309, 204–9.
Perloff, D., Grim, C., Flack, J. et al. 1993: Human blood pressure determination by sphygmomanometry. Circulation 88(5), 2460–70.
Perloff, J.K. 1983: The physiologic mechanisms of cardiac and vascular physical signs. Journal of the American College of Cardiology 1, 184–98.
Perls, T. 1995: The oldest old. Scientific American January 272, 70–5.
Peronneau, P., Sandmann, W. and Xhaard, M. 1977: Blood flow patterns in large arteries. In: White, D.N. and Brown, R.E. (eds), Ultrasound in medicine, vol. 3B. New York: Plenum Press, pp. 1193–207.
Peronneau, P.A. and Leger, F. 1969: Doppler ultrasonic pulsed blood flowmeter. In: Proceedings of the 18th International Congress on Medical and Biological Engineering, Chicago, pp. 10–11.
Peronneau, P.A., Hinglais, J., Pellet, M. et al. 1970: Velocimetre sanguin par effet Doppler a emission ultra-sonore pulsee. A: Description de l'Appareil-Resultats. L'Onde Electrique 50, 369–84.
Peronneau, P.A., Bournat, J.P., Bugnon, A. et al. 1974a: Theoretical and practical aspects of pulsed Doppler flowmetry: real-time applications to the measure of instantaneous velocity profiles. In: Reneman, R.S. (ed.), Cardiovascular Applications of Ultrasound. Amsterdam: North-Holland, pp. 66–84.
Peronneau, P.A., Hinglais, J.R., Xhaard, M. et al. 1974b: The effects of curvature and stenosis on pulsatile flow in vivo and in vitro. In: Reneman, R.S. (ed.), Cardiovascular Applications of Ultrasound. Amsterdam: North-Holland, pp. 203–15.
Perski, A., Olsson, G., Landou, C. et al. 1992: Minimum heart rate and coronary atherosclerosis: independent relations to global severity and rate of progression of angiographic lesions in men with myocardial infarction at a young age. American Heart Journal 123, 609–16.
Perticone, F., Ceravolo, R., Pujia, A. et al. 2001: Prognostic significance of endothelial dysfunction in hypertensive patients. Circulation 104(2), 191–6.
Peteiro, J., Campos, V.V. and Valle, J. 1998: Hemodynamic comparison by Doppler echocardiography of valves in the aortic position, value of the continuity equation to assess prosthetic dysfunction. Echocardiography 15(4), 325–36.
Perry, H.M. Jr, Smith, W.M., McDonald, R.H. et al. 1989: Morbidity and mortality in the Systolic Hypertension in the Elderly Program (SHEP) pilot study. Stroke 20(1), 4–13.
Perry, I.J. and Beevers, D.G. 1989: ACE inhibitors compared with thiazide diuretics as first-step antihypertensive therapy. Cardiovascular Drug Therapy 3(6), 815–19.

Perticone, F., Ceravolo, R., Maio, R. et al. 1998: Angiotensin-converting enzyme gene polymorphism is associated with endothelium-dependent vasodilation in never treated hypertensive patients. Hypertension 31, 900–5.

Perticone, F., Maio, R., Ceravolo, R. et al. 1999: Relationship between left ventricular mass and endothelium-dependent vasodilation in never-treated hypertensive patients. Circulation 99, 1991–6.

Peter, I., Kelley-Hedgepeth, A., Huggins, G.S. et al. 2009: Association between arterial stiffness and variations in oestrogen-related genes. Journal of Human Hypertension 23, 636–44.

Peterson, J.C., Adler, S., Bukart, J.M. et al. for the Modification of Diet in Renal Disease (MDRD) Study Group 1995: Blood pressure control, proteinuria and the progression of renal disease. Annals of Internal Medicine 123, 754–62.

Peterson, L.H. 1954: The dynamics of pulsatile blood flow. Circulation Research 2, 127–39.

Peterson, L.H. 1966: General types of dimensional transducer. In: Rushmer, R.F. (ed.), Methods in medical research, vol. 1. Chicago: Year Book Medical Publishers, pp. 5–23.

Peterson, L.H. and Shepard, R.B. 1955: Some relationships of blood pressure to cardiovascular system. Surgical Clinics of North America December, 1613–28.

Peterson, L.H., Jensen, R.E. and Parnell, J. 1960: Mechanical properties of arteries in vivo. Circulation Research 8, 622–39.

Petrie, M.C., Berry, C., Stewart, S. and McMurray, J.J.V. 2001: Failing ageing hearts (Review). European Heart Journal 22, 1978–90.

Petzina, R., Ugander, M, Gustafsson, L. et al. 2007: Hemodynamic effects of vacuum-assisted closure therapy in cardiac surgery: assessment using magnetic resonance imaging. Journal of Thoracic and Cardiovascular Surgery 133(5), 1154–62.

Pfafferott, C., Nash, G.B. and Meiselman, H.J. 1985: Red blood cell deformation in shear flow. Effects of internal and external phase viscosity and of in vivo aging. Biophysics Journal 47, 695–704.

Pfafferott, C., Wenby, R. and Meiselman, H.J. 1982: Morphologic and internal viscosity aspects of RBC rheologic behavior. Blood Cells 8, 65–78.

Pfeffer, J.M., Pfeffer, M.A., Fletcher, P.J. et al. 1991: Progressive ventricular remodeling in rat with myocardial infarction. American Journal of Physiology. Heart and Circulatory Physiology 260, H1406–14.

Pfeffer, M.A. 2010: ACCORD(ing) to a trialist. Circulation 122, 841–3.

Pfeffer, M.A. and Pfeffer, J.M. 1990: Reversing cardiac hypertrophy in hypertension. New England Journal of Medicine 322(19), 1388–90.

Pfeffer, M.A., Braunwald, E., Moyé, L.A. et al. 1992: Effect of captopril on mortality and morbidity in patients with left ventricular dysfunction after myocardial infarction. New England Journal of Medicine 327, 669–77.

Phan, A., Shufelt, C. and Merz, C.N. 2009: Persistent chest pain and no obstructive coronary artery disease. Journal of the American Medical Association 301(14), 1468–74.

Phan, T.T., Abozguia, K., Nallur Shivu, G. et al. 2009: Heart failure with preserved ejection fraction is characterized by dynamic impairment of active relaxation and contraction of the left ventricle on exercise and associated with myocardial energy deficiency. Journal of the American College of Cardiology 54, 402–9.

Phelps, J.E. and DePaola, N. 2000: Spatial variations in endothelial barrier function in disturbed flow in vitro. American Journal of Physiology. Heart and Circulatory Physiology 278, H469–H476.

Philippe, E.G., Hebert, J.L., Coirault, C. et al. 1998: A comparison between systolic aortic root pressure and finger blood pressure. Chest 113(6), 1466–74.

Phillips, C., Hedner, J., Berend, N. et al. 2005: Diurnal and obstructive sleep apnea influences on arterial stiffness and central blood pressure in men. Sleep 28, 604–9.

Phillips, F.A., Brind, S.H. and Levy, M.N. 1955: The immediate influence of increased venous pressure upon resistance to flow in the dog's hind leg. Circulation Research 3, 357–62.

Pianin, E. 2003: Danish professor denounced for 'Scientific Dishonesty'. The Washington Post Company: Jan 8, p. A20.

Picano, E. 2003: Diabetic cardiomyopathy: the importance of being earliest. Journal of the American College of Cardiology 42, 454–7.

Pickering, G. 1968. High blood pressure, 2nd edn. London: J. & A. Churchill.

Pickering, G. 1982: Systemic arterial hypertension. In: Fishman, A.P. and Richards, D.W. (eds), Circulation of the blood – men and ideas. Baltimore: American Physiological Society/Williams and Wilkins, pp. 487–544.

Pickering, T.G. 1995: Hypertension: definition, natural histories and consequences. In: Laragh, J.H. and Brenner, B.M. (eds), Hypertension: pathophysiology, diagnosis and management, 2nd edn. New York: Raven Press, pp. 2–16.

Pickering, T.G. 2008: Does treating hypertension prevent dementia? Journal of Clinical Hypertension 10, 866–70.

Pickering, T.G., Hall, J.E., Appel, L.J. et al. 2005a: Recommendations for blood pressure measurement in humans and experimental animals. Part 1: blood pressure measurement in humans. A statement for professionals from the subcommittee of professional and public education of the American Heart Assocation Council on High Blood Pressure Research. Hypertension 45, 142–61.

Pickering, T.G., Hall, J.E., Appel, L.J. et al. 2005b: Recommendations for blood pressure measurement in humans and experimental animals. Part 1: blood pressure measurement in humans: a statement for professionals from the Subcommittee of Professional and Public Education of the American Heart Association Council on High Blood Pressure Research. Circulation 111(5), 697–716.

Piene, H. 1986: Pulmonary arterial impedance and right ventricular functon. Physiological Reviews 66(3), 606–52.

Piene, H. and Sund, T. 1979: Flow and power output of right ventricle facing load with variable input impedance. American Journal Physiology 237(2), H125–30.

Piene, H. and Sund, T. 1982: Does normal pulmonary impedance constitute the optimum load for the right ventricle? American Journal of Physiology 242, H154–60.

Pieper, H.P. and Paul, L.T. 1969: Response of aortic smooth muscle in intact dogs. American Journal of Physiology 217, 154–60.

Pieper, H.P. and Wetterer, E. 1953: Elektrische Registrierung der Blutstromungsgeschwindigkeir mit neuartigen Strompendeln. Verhandlungen der Dtschen Gesellschaft für Kreislaufforsch 19, 264–9.

Pieper, H.P. and Wetterer, E. 1952: Strompendel fur elektrische Registrierung der Blutromungsgeschwindigkeit. Zeitschrift für Biologie 105, 214–23.

Pierce, G.L., Schofield, R.S., Casey, D.P. et al. 2008: Effects of exercise training on forearm and calf vasodilation and proinflammatory markers in recent heart transplant recipients: a pilot study. European Journal of Cardiovascular Prevention and Rehabilitation 15(1), 10–18.

Pieretti, J., Roman, M.J., Devereux, R.B. et al. 2007: Systemic lupus erythematosus predicts increased left ventricular mass. Circulation 116, 419–26.

Pignoli, P. and Longo, T. 1986: Ultrasound evaluation of atherosclerosis. Methodological problems and technological developments. European Surgical Research 18(3–4), 238–53.

Pignoli, P., Tremoli, E., Poli, A. et al. 1986: Intimal plus medial thickness of the arterial wall: a direct measurement with ultrasound imaging. Circulation 74, 1399–406.

Pijls, N.H., De Bruyne, B., Bech, G.J. et al. 2000: Coronary pressure measurement to assess the hemodynamic significance of serial stenoses within one coronary artery: validation in humans. Circulation 102(19), 2371–7.

Pijls, N.H., De Bruyne, B., Peels, K. et al. 1996: Measurement of fractional flow reserve to assess the functional severity of coronary-artery stenoses. New England Journal of Medicine 334, 1703–8.

Pilgrim, J.A. 1994: Psychological aspects of high and low blood pressure (Editorial). Psychological Medicine 24(1), 9–14.

Pina, I.L., Apslein, C.S., Balady, G.J. et al. 2003: Exercise and heart failure: a statement from the AHA Committee Exercise, Rehabilitation, and Prevention. Circulation 107, 1210–25.

Pini, C., Natalizi, A., Gerosa, P.F. et al. 2008: Validation of the Artsana CS 410 automated blood pressure monitor in adults according to the

International Protocol of the European Society of Hypertension. Blood Pressure Monitoring 13(3), 177–82.
Pini, R., Cavallini, M.C., Palmieri, V. et al. 2008: Central but not brachial blood pressure predicts cardiovascular events in an unselected geriatric population: the ICARe Dicomano study. Journal of the American College of Cardiology 51, 2432–9.
Pinon, F., Merino, J.F., Ferrer, J.C. et al. 2002: Plasma lipids and blood fluidity in patients with polygenic hypercholesterolaemia treated with fluvastatin. Clinical Hemorheology Microcirculatory 27(3–4), 193–9.
Pipes, L.A. 1958. Applied mathematics for engineers and physicists, 2nd edn. New York: McGraw-Hill.
Pitsavos, C., Toutouzas, K., Dernellis, J. et al. 1998: Aortic stiffness in young patients with heterozygous familial hypercholesterolemia. American Heart Journal 135, 604–08.
Pitt, B. 2004: ACE inhibitors for patients with vascular disease without left ventricular dysfunction – may they rest in PEACE. New England Journal of Medicine 351, 2115–7.
Pitt, B., Remme, W., Zannad, F. et al. 2003: Eplerenone, a selective aldosterone blocker, in patients with left ventricular dysfunction after myocardial infarction. New England Journal of Medicine 348, 1309–21.
Plantinga, Y., Ghiadoni, L., Magagna, A et al. 2008: Peripheral wave reflection and endothelial function in untreated essential hypertensive patients with and without the metabolic syndrome. Journal of Hypertension 26(6), 1216–22.
Plass, K.G. 1964: A new ultrasonic flowmeter for intravascular application. IEEE Transactions on Biomedical Engineering, 154–6.
Pletcher, M.J., Tice, J.A., Pignone, M. et al. 2004: Using the coronary artery calcium score to predict coronary heart disease events: a systematic review and meta-analysis. Archives of Internal Medicine 164, 1285–92.
Poggianti, E., Venneri, L., Chubuchny, V. et al. 2003: Aortic valve sclerosis is associated with systemic endothelial dysfunction. Journal of the American College of Cardiology 41, 136–41.
Poh, K.K., Levine, R.A., Solis, J. et al. 2008: Assessing aortic valve area in aortic stenosis by continuity equation: a novel approach using real-time three-dimensional echocardiography. European Heart Journal 29(20), 2526–35.
Pohl, U., Holtz, J., Busse, R. et al. 1986: Crucial role of endothelium in the vasodilator response to increased flow in vivo. Hypertension 8(1), 37–44.
Poirier, P., Bogaty, P., Garneau, C. et al. 2001: Diastolic dysfunction in normotensive men with well-controlled type 2 diabetes. Diabetes Care 24, 5–10.
Poiseuille, J.L.M. 1828. Recherches sur la Force du Coeur Aortique (Dissertation). Paris: Didot le Jeune.
Poiseuille, J.L.M. 1830: Recherches sure les causes du mouvement du sang dans les veines. Journal de Physiologie Experimentale et. Pathologie 10, 277–95.
Poisson 1831: Cited by Prandtl and Tietjens in Fundamentals of hydro- and aeromechanics, 1934. New York: Dover.
Pollack, G.H., Reddy, R.V. and Noordergraaf, A. 1968: Input impedance, wave travel, and reflections in the human pulmonary arterial tree. Studies using an electrical analog. Transactions in Biomedical Engineering 151–64.
Polónia, J., Barbosa, L., Silva, J.A. et al. 2009: Improvement of aortic reflection wave responses 6 months after stopping smoking: a prospective study. Blood Pressure Monitoring 14(2), 69–75.
Polónia, J., Barbosa, L., Silva, J.A. et al. 2010: Different patterns of peripheral versus central blood pressure in hypertensive patients treated with β-blockers either with or without vasodilator properties or with angiotensin receptor blockers. Blood Pressure Monitoring 15(5), 235–9.
Polonsky, T.S., McClelland, R.L., Jorgensen, N.W. et al. 2010: Coronary artery calcium score and risk classification for coronary heart disease prediction. Journal of the American Medical Association 303, 1610–16.
Pons-Llado, G., Ballester, M., Borras, X. et al. 2000: Myocardial cell damage in human hypertension. Journal of the American College of Cardiology 36, 2198–203.
Pope, C.A. 3rd, Burnett, R.T., Krewski, D. et al. 2009: Cardiovascular mortality and exposure to airborne fine particulate matter and cigarette smoke: shape of the exposure–response relationship. Circulation 120, 941–8.
Poppas, A., Shroff, S.G., Korcarz, C.E. et al. 1997: Serial assessment of the cardiovascular system in normal pregnancy. Role of arterial compliance and pulsatile arterial load. Circulation 95, 2407–15.
Poredos, P., Orehek, M. and Tratnik, E. 1999: Smoking is associated with dose-related increase of intima-media thickness and endothelial dysfunction. Angiology 50(3), 201–8.
Porje, IG. 1946: Studies of the arterial pulse wave, particularly in the aorta. Acta Physiologica Scandinavica 13(suppl 42), 1–68.
Porjé, I.G. 1967: The Enery design of the human circulatory system. Cardiologia 51, 293–306.
Porjé, I.G. and Rudewald, B. 1957: Studies on a new theory of determination of some fundamental hemodynamic data in a circulation model, in normal persons and in aortic valvular diseases. Opuscula Medica 2, 280–93.
Porjé, I.G. and Rudewald, B. 1961: Hemodynamic studies with differential pressure technique. Acta Physiologica Scandinavica 51, 116–35.
Port, S., Cobb, F.R., Coleman, R.E. and Jones, R.H. 1980: Effect of age on the response of the left ventricular ejection fraction to exercise. New England Journal of Medicine 303, 1133–7.
Port, S., Demer, L., Jennrich, R. et al. 2000: Systolic blood pressure and mortality. Lancet 255, 175–80.
Porter, T.R., D'Sa, A., Turner, C. et al. 1993: Myocardial contrast echocardiography for the assessment of coronary blood flow reserve: validation in humans. Journal of the American College of Cardiology 21, 349–55.
Postel-Vinay, N. 1996. A century of arterial hypertension 1896–1996. Chichester: John Wiley.
Potkay, J.A. 2008: Long term, implantable blood pressure monitoring systems. Biomedical Microdevices 10(3), 379–92.
Potthast, S., Mitsumori, L., Stanescu, L.A. et al. 2010: Measuring aortic diameter with different MR techniques: comparison of three-dimensional (3D) navigated steady-state free-precession (SSFP), 3D contrast-enhanced magnetic resonance angiography (CE-MRA), 2D T2 black blood, and 2D cine SSFP. Journal of Magnetic Resonance Imaging 31(1), 177–84.
Pouleur, H., Covell, J.W. and Ross, J.J. 1979: Effects of alterations in aortic input impedance on the force–velocity–length relationship in the intact canine heart. Circulation Research 45, 126–36.
Powell, J.T., Brady, T. and Greenhalgh, R. 2002: Small abdominal aortic aneurysms. New England Journal of Medicine 347, 1114–5.
Prandtl, L. and Tietjens, O.G. 1934. Fundamentals of hydro- and aeromechanics. New York: Dover.
Prec, O., Katz, L.N., Sennett, L. et al. 1949: Determination of kinetic energy of the heart in man. American Journal of Physiology 159, 483–91.
Pressman, G.L. and Newgard, P.M. 1963: A transducer for the continuous external measurement of arterial blood pressure. IEEE Transactions on Biomedical Electronics 10, 73–81.
Prichard, B.N. and Vallance, P. 2004: ESH/ESC guidelines. Journal of Hypertension 22, 859–62.
Pries, A.R., Albrecht, K.H. and Gaehtgens, P. 1981: Model studies on phase separation at a capillary orifice. Biorheology 18, 355–67.
Pries, A.R., Secomb, T.W., Gesner, T. et al. 1994: Resistance to blood flow in microvessels in vivo. Circulation Research 75, 904–15.
Pries, A.R., Reglin, B. and Secomb, T.W. 2005: Remodeling of blood vessels: responses of diameter and wall thickness to hemodynamic and metabolic stimuli. Hypertension 46(4), 725–31.
Pries, A.R., Habazettl, H., Ambrosio, G. et al. 2008: A review of methods for assessment of coronary microvascular disease in both clinical and experimental settings. Cardiovascular Research 80(2), 165–74.
Primatesta, P., Falaschetti, E., Gupta, S. et al. 2001: Association between smoking and blood pressure: evidence from the health survey for England. Hypertension 37, 187–93.
Prinzmetal, M., Kennamer, R., Merliss, R. et al. 1959: Angina pectoris: 1. A variant form of angina pectoris. American Journal of Medicine 27, 375–88.

Pritchard, W.H., Gregg, D.E., Shipley, R.F. et al. 1943: A study of flow and pattern responses in peripheral arteries to the injection of vasomotor drugs. American Journal of Physiology 138, 731–40.

Prokop, E.K., Palmer, R.F. and Wheat, M.W. Jr. 1970: Hydrodynamic forces in dissecting aneurysms. In vitro studies in a Tygon model and in dog aortas. Circulation Research 27(1), 121–7.

Promonet, C., Anglade, D., Menaouar, A. et al. 2000: Time-dependent pressure distortion in a catheter-transducer system: correction by fast flush. Anesthesiology 92(1), 208–18.

Prospective Studies Collaboration. 2002: Age-specific relevance of usual blood pressure to vascular mortality, one million adults in 61 prospective studies. Lancet 360, 1903–13.

Protogerou, A.D., Lekakis, J., Ikonomidis, I. et al. 2006: Pressure wave reflections, central blood pressure, and aortic stiffness in patients with Adamantiades-Behcet's disease: a cross-sectional case-control study underlining the role of chronic corticosteroid treatment. American Journal of Hypertension 19(7), 660–6.

Protogerou, A.D., Safar, M.E., Iaria, P. et al. 2007c: Diastolic blood pressure and mortality in the elderly with cardiovascular disease. Hypertension 50(1), 172–80.

Protogerou, A.D., Papaioannou, T.G., Lekakis, J.P. et al. 2009a: The effect of antihypertensive drugs on central blood pressure beyond peripheral blood pressure. Part I: (patho)-physiology, rationale and perspective on pulse pressure amplification. Current Pharmaceutical Design 15(3), 267–71.

Protogerou, A.D., Stergiou, G.S., Vlachopoulos, C. et al. 2009b: The effect of antihypertensive drugs on central blood pressure beyond peripheral blood pressure. Part II: evidence for specific class-effects of antihypertensive drugs on pressure amplification. Current Pharmaceutical Design 15(3), 272–89.

Protogerou, A.D., Papadogiannis, D. and Blacher, J. 2010: Central pulse pressure versus peripheral pulse pressure: case still open? European Heart Journal.

Pruett, J.D., Bourland, J.D. and Geddes, L.A. 1988: Measurement of pulse-wave velocity using a beat-sampling technique. Annals of Biomedical Engineering 16(4), 341–7.

Puls, R.J. and Heizer, K.W. 1967: Pulse wave changes with aging. Journal of the American Geriatric Society 15, 153–65.

Pyeritz, R.E. 2001: Genetics and cardiovascular disease. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease, 6th edn. Philadelphia: Saunders, pp. 2000–3.

Pyke, K.E. and Tschakovsky, M.E. 2005: The relationship between shear stress and flow-mediated dilatation: implications for the assessment of endothelial function. Journal of Physiology 568(Pt 2), 357–69.

Pyke, K.E. and Tschakovsky, M.E. 2007: Peak vs. total reactive hyperemia: which determines the magnitude of flow-mediated dilation? Journal of Applied Physiology 102, 1510–19.

Pyke, K.E., Dwyer, E.M. and Tschakovsky, M.E. 2004: Impact of controlling shear rate on flow-mediated dilation responses in the brachial artery of humans. Journal of Applied Physiology 97(2), 499–508.

Pyke, K.E., Poitras, V. and Tschakovsky, M.E. 2008: Brachial artery flow-mediated dilation during handgrip exercise: evidence for endothelial transduction of the mean shear stimulus. American Journal of Physiology. Heart and Circulatory Physiology 294, H2669–79.

Qasem, A. and Avolio, A. 2008: Determination of aortic pulse wave velocity from waveform decomposition of the central aortic pressure pulse. Hypertension 51(2), 188–95.

Querfurth, H.W. and LaFerla, F.M. 2010: Alzheimer's disease. New England Journal of Medicine 362, 329–44.

Quick, C.M., Berger, D.S. and Noordegraaf, A. 1998: Apparent arterial compliance. American Journal of Physiology 274, H1393–1403.

Quick, C.M., Berger, D.S., Stewart, R.H. et al. 2006: Resolving the hemodynamic inverse problem. IEEE Transactions on Bio-medical Engineering 53(3), 361–8.

Quyyumi, A.A. 1998: Endothelial function in health and disease: new insights into the genesis of cardiovascular disease. American Journal of Medicine 105, 32S–39S.

Quyyumi, A.A., Mulcahy, D., Andrews, N.P. et al. 1997: Coronary vascular nitric oxide activity in hypertension and hypercholesterolemia: comparison of acetylcholine and substance P. Circulation 95, 104–110.

Rabben, S.I., Baerum, S., Sørhus, V. et al. 2002: Ultrasound-based vessel wall tracking: an auto-correlation technique with RF center frequency estimation. Ultrasound in Medicine and Biology 28(4), 507–17.

Raddino, R., Ferrari, R., Scarabelli, T.M. et al. 2002: Clinical implications of rheology in cardiovascular diseases. Recenti Progressi in Medicina 93(3), 186–99.

Rader, R.D., Meehan, J.P. and Henriksen, J.K.C. 1973: An implantable blood pressure and flow transmeter. IEEE Transactions on Biomedical Engineering 37–43.

Radke, N.F., Lucas, C.L. and Wilcox, B.R. 1984: Detection of pulmonary vascular disease in infants using input impedance spectra. Circulation 70(suppl. 2), II–458.

Radke, N.F., Lucas, C.L., Wilcox, B.R. et al. 1985: Infant pulmonary vascular model based on the pulmonary input impedance spectrum. Annals of Biomedical Engineering 13, 531–50.

Radomski, M.W., Palmer, R.M. and Moncada, S. 1987: Comparative pharmacology of endothelium-derived relaxing factor, nitric oxide and prostacyclin in platelets. British Journal Pharmacology 92(1), 181–7.

Radonic, T., de Witte, P., Baars, M.J. et al. 2010: Losartan therapy in adults with Marfan syndrome: study protocol of the multi-center randomized controlled COMPARE trial. Trials 11(1), 3.

Rajagopalan, S., Brook, R., Mehta, R.H. et al. 2002: Effect of losartan in aging-related endothelial impairment. American Journal of Cardiology 89(5), 562–6.

Rajkumar, C., Kingwell, B.A., Cameron, J.D. et al. 1997: Hormonal therapy increases arterial compliance in postmenopausal women. Journal of the American College of Cardiology 30(2), 350–56.

Rajzer, M.W., Wojciechowska, W., Klocek, M. et al. 2008: Comparison of aortic pulse wave velocity measured by three techniques: Complior, SphygmoCor and Arteriograph. Journal of Hypertension 26(10), 2001–7.

Ramsey, M. III. 1991: Blood pressure monitoring: automated oscillometric devices. Journal of Clinical Monitoring 7(1), 56–67.

Randall, J.E. 1958: Statistical properties of pulsatile pressure and flow in the femoral artery of the dog. Circulation Research 6, 689–98.

Randall, J.E. and Stacy, R.W. 1956: Mechanical impedance of the dog's hind leg to pulsatile blood flow. American Journal of Physiology 187, 94–8.

Randall, O.S., van den Bos, G.C. and Westerhof, N. 1984: Systemic compliance: does it play a role in the genesis of essential hypertension?. Cardiovascular Research 18(8), 455–62.

Ranke, C., Hendrickx, P., Roth, U. et al. 1992: Color and conventional image-directed Doppler ultrasonography: accuracy and sources of error in quantitative blood flow measurements. Journal of Clinical Ultrasound 20(3), 187–93.

Ranpuria, R., Hall, M., Chan, C.T. et al. 2008: Heart rate variability (HRV) in kidney failure: measurement and consequences of reduced HRV. Nephrology Dialysis Transplantation 23(2), 444–9.

Raskin, N.H. 1994: Headache. Western Journal of Medicine 161, 299–302.

Rasulo, F.A., De Peri, E. and Lavinio, A. 2008: Transcranial Doppler ultrasonography in intensive care. European Journal of Anaesthesiology – Supplement 42, 167–73.

Ratcliffe, M. 2000: Batista's operation: what have we learned? (Editorial). Journal of the American College of Cardiology 36, 2115–8.

Ravikumar, R., Deepa, R., Shanthirani, C.S. et al. 2002: Comparison of carotid intima-media thickness, arterial stiffness, and brachial artery flow mediated dilatation in diabetic and nondiabetic subjects. (The Chennai Urban Population Study [CUPS–9]). American Journal of Cardiology 90, 702–7.

Razavi, R., Hill, D.L., Keevil, S.F. et al. 2003: Cardiac catheterisation guided by MRI in children and adults with congenital heart disease. Lancet 362(9399), 1877–82.

Read, R.C., Kuida, H. and Johnson, J.A. 1958: Venous pressure and total peripheral resistance in the dog. American Journal of Physiology 192, 609–12.

Recchia, D., Sharkey, A.M., Bosner, M.S. et al. 1995: Sensitive detection of abnormal aortic architecture in Marfan syndrome with high-frequency ultrasonic tissue characterization. Circulation 91(4), 1036–43.

Reddy, A.K., Li, Y.H., Pham, T.T. et al. 2003: Measurement of aortic input impedance in mice: effects of age on aortic stiffness. American Journal of Physiology. Heart and Circulatory Physiology 285(4), H1464–70.

Reddy, A.K., Madala, S., Jones, A.D. et al. 2009a: Multichannel pulsed Doppler signal processing for vascular measurements in mice. Ultrasound in Medicine and Biology 35(12), 2042–54.

Reddy, A.K., Namiranian, K., Lloyd, E.E. et al. 2009b: Effect of isoflurane on aortic impedance in mice. Conference Proceedings – IEEE Engineering in Medicine and Biology Society 1, 1104–5.

Reddy, A.K., Taffet, G.E. and Hartley, C.J. 2008: Aortic impedance in Little mice. Conference Proceedings – IEEE Engineering in Medicine and Biology Society 2008, 1397–8.

Redfield, M.M. 2002: Heart failure – an epidemic of uncertain proportions (Editorials). New England Journal of Medicine 347, 1442–4.

Redfield, M.M. 2004: Understanding 'Diastolic' heart failure. New England Journal of Medicine 350, 1930–31.

Redfield, M.M., Jacobsen, S.J., Burnett, J.C. et al. 2003: Burden of systolic and diastolic ventricular dysfunction in the community: appreciating the scope of the heart failure epidemic. Journal of the American Medical Association 289, 194–202.

Redheuil, A., Yu, W.-C., Wu, C.O. et al. 2010: Reduced ascending aortic strain and distensibility: earliest manifestations of vascular aging in humans. Hypertension 55(2), 319–26.

Reed, D., Reed, C., Stemmermann, G. et al. 1992: Are aortic aneurysms caused by atherosclerosis? Circulation 85, 205–11.

Reference Values for Arterial Stiffness Collaboration 2010: Determinants of pulse wave velocity in healthy people and in the presence of cardiovascular risk factors: establishing normal and reference values. European Heart Journal 31(19), 2338–50.

Reffelmann, T. and Kloner, R.A. 2003: Therapeutic potential of phosphodiesterase 5 inhibition for cardiovascular disease. Circulation 108(2), 239–44.

Regan, H.K., Lynch, J.J. and Regan, C.P. 2009: Long term assessment of blood pressure transducer drift in rhesus monkeys chronically instrumented with telemetry implants. Journal of Pharmacological and Toxicological Methods 59(1), 35–8.

Rehill, N., Beck, C.R., Yeo, K.R. et al. 2006: The effect of chronic tobacco smoking on arterial stiffness. British Journal of Clinical Pharmacology 61(6), 767–73.

Reichel, H. and Baumann, K. 1979: The effect of systolic rise in arterial pressure on stroke volume and aortic flow. In: Bauer, R.D. and Busse, R. (eds), The arterial system. Berlin: Springer-Verlag, pp. 227–35.

Reifenstein, G.H., Levine, S.A. and Gross, R.E. 1947: Coarctation of the aorta; a review of 104 autopsied cases of the adult type, 2 years of age or older. American Heart Journal 33, 146–8.

Reid, J.M., Davis, D.L., Ricketts, H.J. et al. 1974: A new Doppler flowmeter system and its operation with catheter mounted transducers. In: Reneman, R.S. (ed.), Cardiovascular applications of ultrasound. New York: American Elsevier, pp. 183–97.

Reiken, S., Wehrens, X.H.T, Vest, J.A. et al. 2003: Beta-blockers restore calcium release channel function and improve cardiac muscle performance in human heart failure. Circulation 107, 2459–66.

Reinhart, W.H. 2001: Molecular biology and self-regulatory mechanisms of blood viscosity: a review. Biorheology 38(2–3), 203–12.

Reinhart, W.H., Hausler, K., Schaller, P. et al. 1998: Rheological properties of blood as assessed with a newly designed oscillating viscometer. Clinical Hemorheology and Microcirculation 18(1), 59–65.

Reinke, W., Gaehtgens, P. and Johnson, P.C. 1987: Blood viscosity in small tubes: effect of shear rate, aggregations, and sedimentation. American Journal of Clinical Physiology 253, H540–7.

Reis, S.E., Holubkov, R., Lee, J.S. et al. 1999: Coronary flow velocity response to adenosine characterizes coronary microvascular function in women with chest pain and no obstructive coronary disease. Results from the pilot phase of the Women's Ischemia Syndrome Evaluation (WISE) study. Journal of the American College of Cardiology 33(6), 1469–75.

Reis, S.E., Holubkov, R., Conrad Smith, A.J. et al. 2001: Coronary microvascular dysfunction is highly prevalent in women with chest pain in the absence of coronary artery disease: results from the NHLBI WISE study. American Heart Journal 141(5), 735–41.

Reitsma, S., Slaaf, D.W., Vink, H. et al. 2007: The endothelial glycocalyx: composition, functions, and visualization. Pflügers Archiv – European Journal of Physiology 454, 345–59.

Remington, J.W. 1957. Tissue elasticity. Washington, DC: American Physiological Society.

Remington, J.W. 1963: The physiology of the aorta and major arteries. In: American Physiological Society Handbook of physiology, Section 2, Circulation, vol. 2. Washington, DC: American Physiology Society, pp. 799–838.

Remington, J.W. 1965: Quantitative synthesis of head and foreleg arterial pulses in the dog. American Journal of Physiology 208, 968–83.

Remington, J.W. and Hamilton, W.F. 1947: The evaluation of the work of the heart. American Journal of Physiology 150, 292–8.

Remington, J.W. and Wood, E.H. 1956: Formation of peripheral pulse contour in man. Journal of Applied Physiology 9, 433–42.

Remington, J.W. and O'Brien, L.J. 1970: Construction of aortic flow pulse from pressure pulse. American Journal of Physiology 218, 437–47.

Remington, J.W., Noback, C.R., Hamilton, W.F. et al. 1948: Volume elasticity characteristics of the human aorta and prediction of the stroke volume from the pressure pulse. American Journal of Physiology 153, 298–308.

Reneman, R.S. 1993: Endothelial cells as mechanoreceptors. News in Physiological Sciences 8, 55–6.

Reneman, R.S. and Arts, T. 1985: Dynamic capacitance of epicardial coronary arteries in vivo. Journal of Biomechanical Engineering 107, 29–33.

Reneman, R.S. and Hoeks, A.P. 2000: Noninvasive vascular ultrasound: an asset in vascular medicine. Cardiovascular Research 45(1), 27–35.

Reneman, R.S. and Hoeks, A.P. 2008: Wall shear stress as measured in vivo: consequences for the design of the arterial system. Medical and Biological Engineering and Computing 46(5), 499–507.

Reneman, R.S. and Spencer, M.P. 1979: Local Doppler audio spectra in normal and stenosed carotid arteries in man. Ultrasound in Medicine and Biology 5(1), 1–11.

Reneman, R.S., Van Merode, T., Hick, P. et al. 1985: Flow velocity patterns in and distensibility of the carotid artery bulb in subjects of various ages. Circulation 71, 500–9.

Reneman, R.S., van Merode, T., Hick, P. and Hoeks, A.P.G. 1986a: Cardiovascular applications of multi-gate pulsed Doppler systems. Ultrasound in Medicine and Biology 12, 357–70.

Reneman, R.S., van Merode, T., Hick, P. et al. 1986b: Age-related changes in carotid artery wall properties in men. Ultrasound in Medicine and Biology 12, 465–471.

Reneman, M.S., Meinders, J.M. and Hoeks, A.P. 2005: Non-invasive ultrasound in arterial wall dynamics in humans: what have we learned and what remains to be solved. European Heart Journal 26(10), 960–6.

Reneman, R.S., Arts, T. and Hoeks, A.P. 2006: Wall shear stress – an important determinant of endothelial cell function and structure – in the arterial system in vivo. Journal of Vascular Research 43, 251–69.

Rensing, B.J., Hermans, W.R., Vos, J. et al. 1992: Angiographic risk factors of luminal narrowing after coronary balloon angioplasty using balloon measurements to reflect stretch and elastic recoil at the dilation site. The CARPORT Study Group. American Journal of Cardiology 69, 584–91.

Rerkpattanapipat, P., Hundley, W.G., Link, K.M. et al. 2002: Relation of aortic distensibility determined by magnetic resonance imaging in patients more than or at 60 years of age to systolic heart failure and exercise capacity. American Journal of Cardiology 90(11), 1221–5.

Résal, M.H. 1876: Note sur les petits mouvements d'un fluide incompressible dans un tuyau elastique. Journal de Mathematique Pures Appliques Liouville 2, 342–4.

Resnick, L.M., Militianu, D., Cunnings, A.J. et al. 1997: Direct magnetic resonance determination of aortic distensibility in essential hypertension, relation to age, abdominal visceral fat, and in situ intracellular free magnesium. Hypertension 30(3 Pt 2), 654–9.

Resnick, N. and Gimbrone, M.A.J. 1995: Hemodynamic forces are complex regulators of endothelial gene expression. FASEB Journal 9, 874–82.

Reuben, S.R. 1970: Wave transmission in the pulmonary arterial system in disease in man. Circulation Research 27, 523–9.

Reuben, S.R. and Kitchen, A.H. 1975: Pulmonary artery input impedance in pulmonary hypertension. Progress in Respiratory Research 9, 261–6.

Reuben, S.R, Swadling, J.P. and Lee, G. de J. 1970: Velocity profiles in the main pulmonary artery of dogs and man measured with a thin film resistance anemometer. Circulation Research 27, 955–1001.

Reuben, S.R., Swadling, J.P., Gersh, B.J. et al. 1971: Impedance and trasmission properties of the pulmonary arterial system. Cardiovascular Research 5, 1–9.

Reusz, G.S., Cseprekal, O., Temmar, M. et al. 2010: Reference values of pulse wave velocity in healthy children and teenagers. Hypertension 56, 217–24.

Reymond, P., Merenda, F., Perren, F. et al. 2009: Validation of a one-dimensional model of the systemic arterial tree. American Journal of Physiology. Heart and Circulatory Physiology 297(1), H208–22.

Reynolds, A.J. 1974. Turbulent flows in engineering. New York: John Wiley.

Reynolds, O. 1883: An experimental investigation of the circumstances which determine whether the motion of water shall be direct or sinusoid, and of the law of resistance in parallel channels. Philosophical Transactions of the Royal Society of London 174, 935–87.

Reynolds, S.R.M., Light, F.W., Ardran, G.M. et al. 1952: The qualitative nature of pulsatile flow in the umbilical vessels, with observations on flow in the aorta. Johns Hopkins Hospital Bulletin 91, 83–104.

Rhee, M.Y., Na, S.H., Kim, Y.K. et al. 2007: Acute effects of cigarette smoking on arterial stiffness and blood pressure in male smokers with hypertension. American Journal of Hypertension 20, 637–41.

Rhode, E. 1912: Öber den Einfluss der mechanischen Bedingungen auf die Tatigkeit und den Sauerstoffverbrauch der Warmbluterherzens. Naunyn-Schmeidebergs Archives 68, 401–34.

Rice, S.O. 1944: Mathematical analysis of random noise. Bell System Technical Journal 23, 282–332.

Richard, V., Joannides, R., Henry, J.P. et al. 1996: Fixed-dose combination of perindopril with indapamide in spontaneously hypertensive rats: haemodynamic, biological and structural effects. Journal of Hypertension 14(12), 1447–54.

Richards, T.G. and Williams, T.D. 1953: Velocity changes in the carotid and femoral arteries of dogs during the cardiac cycle. Journal of Physiology 120, 257–66.

Richardson, A.W., Denison, A.B. and Green, H.D. 1952: A newly modified electromagnetic blood flowmeter of high fidelity flow registration. Circulation 5, 430–6.

Richardson, P.D., Davies, M.J. and Born, G.V. 1989: Influence of plaque configuration and stress distribution on fissuring of coronary atherosclerotic plaques. Lancet 2, 1462–3.

Rich-Edwards, J.W., Manson, J.E., Stampfer, M.J. et al. 1995: Height and the risk of cardiovascular disease in women. American Journal of Epidemiology 142(9), 909–17.

Richenbacher, W.E. and Pierce, W.S. 2001: Treatment of heart failure: assisted circulation. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Heart disease. Philadelphia: W.B. Saunders, pp. 600–14.

Richey Sharrett, A., Coady, S.A., Folsom, A.R. et al. 2004: ARIC Study. Smoking and diabetes differ in their associations with subclinical atherosclerosis and coronary heart disease – the ARIC Study. Atherosclerosis 172(1), 143–9.

Ricklefs, R. and Finch, C. 1995. Aging, a natural history. New York: Scientific American Library.

Riddle, M.C. 2010: Effects of intensive glucose lowering in the management of patients with type 2 diabetes mellitus in the Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial. Circulation 122, 844–6.

Ridker, P.M., Buring, J.E., Cook, N.R. and Rifai, N. 2003: C-reactive protein, the metabolic syndrome, and risk of incident cardiovascular events: an 8-year follow-up of 14,719 initially healthy American women. Circulation 107(3), 391–7.

Ridker, P.M., Cushman, M., Stampfer, M.J. et al. 1997: Inflammation, aspirin, and the risk of cardiovascular disease in apparently healthy men. New England Journal of Medicine 336(14), 973–9.

Ridker, P.M., Rifai, N., Pfeffer, M.A. et al. 1999: Long-term effects of pravastatin on plasma concentration of C-reactive protein. The Cholesterol and Recurrent Events (CARE) Investigators. Circulation 100(3), 230–5.

Rietzschel, E.R., Boykens, E., De Buyzere, M.L. et al. 2001a: A comparison between systolic and diastolic pulse contour analysis in the evaluation of arterial stiffness. Hypertension 37, e15–22.

Rietzschel, E.R., De Buyzere, M.L., Duprez, D.A. et al. 2001b: Bypassing complex aortic wave morphology, a simple and direct assessment of aortic augmentation index based on aortic–radial parallelism (Abstract). American Journal of Hypertension 14, 124A–5A.

Rigby, B.J. 1964: Effect of cyclic extension on the physical properties of tendon collagen and its possible relation to biological ageing of collagen. Nature 202, 1072–4.

Riksen, N.P., Rongen, G.A. and Smits, P. 2009: Acute and long-term cardiovascular effects of coffee: implications for coronary heart disease. Pharmacology and Therapeutics 121(2), 185–91.

Riley, W.A., Freedman, D.S., Higgs, N.A. et al. 1986: Decreased arterial elasticity associated with cardiovascular disease risk factors in the young. Bogalusa Heart Study. Arteriosclerosis 6, 378–86.

Riley, W.A., Barnes, R.W., Applegate, W.B. et al. 1992a: Reproducibility of noninvasive ultrasonic measurement of carotid atherosclerosis. The Asymptomatic Carotid Artery Plaque Study. Stroke 23(8), 1062–8.

Riley, W.A., Barnes, R.W., Evans, G.W. and Burke, G.L. 1992b: Ultrasonic measurement of the elastic modulus of the common carotid artery. The atherosclerosis risk in communities (ARIC) study. Stroke 23, 952–6.

Riley, W.A., Craven, T., Romont, A. and Furberg, C. 1996: Assessment of temporal bias in longitudinal measurements of carotid intimal-media thickness in the asymptomatic carotid artery progression study (ACAPS). Ultrasound in Medicine and Biology 22, 405–11.

Rindt, C.C. and Steenhoven, A.A. 1996: Unsteady flow in a rigid 3-D model of the carotid artery bifurcation. Journal of Biomechanical Engineering 118, 90–6.

Rindt, C.C.M., Van Steenhoven, A.A., Janssen, J.D. et al. 1990: A numerical analysis of steady flow in a three-dimensional model of the carotid artery bifurcation. Journal of Biomechanics 23, 461–73.

Risk Factor Prevalence Study Management Committee (RFPSMC) 1989: Preliminary survey analysis. In: Risk Factor Prevalence Study (ed.), Survey No. 3 1989. Canberra: National Heart Foundation of Australia.

Ritz, E. 2003: Albuminuria and vascular damage – the vicious twins. New England Journal of Medicine 348, 2349–52.

Riva-Rocci, S. 1896: Un nuovo sfigomanometro. Gazzetta Medicia di Torino 47, 981.

Rizzo, J.A., Coady, M.A. and Elefteriades, J.A. 1998: Procedures for estimating growth rates in thoracic aortic aneurysms. Journal of Clinical Epidemiology 51(9), 747–54.

Roach, M. and Burton, A.C. 1957: Reason for the shape of the distensibility curves of arteries. Canadian Journal of Biochemistry and Physiology 35, 681–90.

Roach, M.R. 1963: An experimental study of the production and time course of poststenotic dilatation in the femoral and carotid arteries of adult dogs. Circulation Research 13, 537–51.

Roach, M.R. 1977a: Biophysical analyses of blood vessel walls and blood flow. Annual Review of Physiology 39, 51–71.

Roach, M.R. 1977b: The effects of bifurcations and stenoses on arterial disease. In: Hwang, N.H.C. and Normann, N.A. (eds), Cardiovascular flow dynamics and measurements. Baltimore: University Park Press, pp. 489–539.

Roach, M.R. 1983: The pattern of elastin in the aorta and large arteries of mammals. In: Development of the vascular system. London: Pitman, pp. 37–55.

Roach, M.R. and Burton, A.C. 1959: The effect of age on the elasticity of human iliac arteries. Canadian Journal of Biochemistry 37, 557–70.

Roach, M.R. and MacLean, N.F. 1993: The importance of taper proximal and distal to Y-bifurcations in arteries. Frontiers of Medical and Biological Engineering 5(2), 127–33.

Robb, A.O., Mills, N.L., Din, J.N. et al. 2009: Influence of the menstrual cycle, pregnancy, and preeclampsia on arterial stiffness. Hypertension 53(6), 952–8.

Roberts, J.C. Jr., Moses, C. and Wilkins, R.H. 1959a: Autopsy studies in atherosclerosis: I. Distribution and severity of atherosclerosis in patients dying without morphologic evidence of atherosclerotic catastrophe. Circulation 20, 511–19.

Roberts, J.C. Jr., Wilkins, R.H. and Moses, C. 1959b: Autopsy studies in atherosclerosis: II. Distribution and severity of atherosclerosis in patients dying with morphologic evidence of atherosclerotic catastrophe. Circulation 20, 520–6.

Roberts, L.N., Similey, J.R. and Manning, G.W. 1953: A comparison of direct and indirect blood-pressure determinations. Circulation 8, 232–42.

Rodeheffer, R.J., Gerstenblith, G., Beard, E. et al. 1986: Postural changes in cardiac volumes in men in relation to adult age. Experimental Gerontology 21(4–5), 367–78.

Rodeheffer, R.J., Gerstenblith, G., Becker, L.C. et al. 1984: Exercise cardiac output is maintained with advancing age in healthy human subjects: cardiac dilatation and increased stroke volume compensate for a diminished heart rate. Circulation 69(2), 203–13.

Rodig, G., Prasser, C., Keyl, C. et al. 1999: Continuous cardiac output measurement: pulse contour analysis vs thermodilution technique in cardiac surgical patients. British Journal of Anaesthesia 82(4), 525–30.

Rodondi, N., Marques-Vidal, P., Butler, J. et al. 2010: Markers of atherosclerosis and inflammation for prediction of coronary heart disease in older adults. American Journal of Epidemiology 171, 540–9.

Rodriguez, B.L., Labarthe, D.R., Huang, B. et al. 1994: Rise of blood pressure with age; new evidence of population differences. Hypertension 24, 779–85.

Rogers, W.J., Hu, Y.L., Coast, D. et al. 2001: Age-associated changes in regional aortic pulse wave velocity. Journal of the American College of Cardiology 38(4), 1123–9.

Rohde 1910: Stoffwechseluntersuchungen am berlebenden Warmblterherzen. Zeitschrift für Physiologische Chemie 68, 81–135.

Rollo, D. 1963: Pressure pulse wave transmission in the arterial system. BSc(Med) thesis, University of Sydney, Australia.

Romagnoli, S., Romano, S.M., Bevilacqua, S. et al. 2009: Cardiac output by arterial pulse contour: reliability under hemodynamic derangements. Interactive Cardiovascular and Thoracic Surgery 8(6), 642–6.

Roman, M.J. and Salmon, J.E. 2007: Cardiovascular manifestations of rheumatologic diseases. Circulation 116, 2346–55.

Roman, M.J., Devereux, R.B., Kramer-Fox, R. et al. 1989: Two-dimensional echocardiographic aortic root dimensions in normal children and adults. American Journal of Cardiology 64, 507–12.

Roman, M. 2010: Central blood pressure and outcome meta-analysis. Paper presented at: Annual Meeting of the American Society of Hypertension, New York, NY.

Roman, M.J., Saba, S., Pini, R. et al. 1992: Parallel cardiac and vascular adaptation in hypertension. Circulation 86, 1909–18.

Roman, M.J., Pini, R., Pickering, T.G. et al. 1993: Non-invasive measurements of arterial compliance in hypertensive compared with normotensive adults. Journal of Hypertension 10(suppl. 6), S115–118.

Roman, M.J., Pickering, T.G., Schwartz, J.E. et al. 1995a: Association of carotid atherosclerosis and left ventricular hypertrophy. Journal of the American College of Cardiology 25, 83–90.

Roman, M.J., Pickering, T.G., Pini, R. et al. 1995b: Prevalence and determinants of cardiac and vascular hypertrophy in hypertension. Hypertension 26(2), 369–73.

Roman, M.J., Ganau, A., Saba, P.S. et al. 2000: Impact of arterial stiffening on left ventricular structure. Hypertension 36, 489–94.

Roman, M.J., Shanker, B., Davis, A. et al. 2003: Prevalence and correlates of accelerated atherosclerosis in systemic lupus erythematosus. New England Journal of Medicine 349, 2399–406.

Roman, M.J., Devereux, R.B., Schwartz, J.E. et al. 2005: Arterial stiffness in chronic inflammatory diseases. Hypertension 46(1), 194–9.

Roman, M.J., Naqvi, T.Z., Gardin, J.M. et al. 2006: Clinical application of noninvasive vascular ultrasound in cardiovascular risk stratification: a report from the American Society of Echocardiography and the Society of Vascular Medicine and Biology. Journal of the American Society of Echocardiography 19, 943–54.

Roman, M.J., Devereux, R.B., Kizer, J.R. et al. 2007: Central pressure more strongly relates to vascular disease and outcome than does brachial pressure: the Strong Heart Study. Hypertension 50(1), 197–203.

Roman, M.J., Devereux, R.B., Kizer, J.R. et al. 2009: High central pulse pressure is independently associated with adverse cardiovascular outcome: the Strong Heart Study. Journal of the American College of Cardiology 54, 1730–4.

Roman, M.J., Okin, P.M., Kizer, J.R. et al. 2010: Relations of central and brachial blood pressure to left ventricular hypertrophy and geometry: the Strong Heart Study. Journal of Hypertension 28(2), 384–8.

Romero, J.C. 1991: The role of nitric oxide and prostaglandins in the maintenance of renal function and blood pressure. Circulation 84(suppl. 4), IID–IIE.

Rongen, G.A., Bos, W.J., Lenders, J.W. et al. 1995: Comparison of intrabrachial and finger blood pressure in healthy elderly volunteers. American Journal Hypertension 8(3), 237–48.

Ronniger, R. 1954: Uber eine Methode zur Libersichtlichen darstellung haemodynamischer Zusammenhange. Archiv für Kreislaufforschung 21, 127–34.

Rose, E.A. and Frazier, O.H. 1997: Resurrection after mechanical circulatory support (Editorial). Circulation 96, 393–5.

Rose, E.A., Gelijns, A.C., Moskowitz, A.J. et al. 2001: Long-term use of a left ventricular assist device for end-stage heart failure. New England Journal of Medicine 345, 1435–43.

Rose, J.S., Nanna, M., Rahimtoola, S.H. et al. 1984: Accuracy of determination of changes in cardiac output by transcutaneous continuous-wave Doppler computer. American Journal of Cardiology 54, 1099–101.

Rosenfield, K., Losordo, D.W., Ramaswamy, K. et al. 1991: Three-dimensional reconstruction of human coronary and peripheral arteries from images recorded during two-dimensional intravascular ultrasound examination. Circulation 84(5), 1938–56.

Rosenson, R.S. and Lowe, G.D. 1998: Effects of lipids and lipoproteins on thrombosis and rheology. Atherosclerosis 140(2), 271–80.

Rosenson, R.S., Tangney, C.C. and Mosca, L.J. 1998: Hormone replacement therapy improves cardiovascular risk by lowering plasma viscosity in postmenopausal women. Arteriosclerosis, Thrombosis, and Vascular Biology 18(12), 1902–5.

Rosenthal, N. 2001: High hopes for the heart. New England Journal of Medicine 344, 1785–7.

Ross, J. Jr. 1976: Afterload mismatch and preload reserve. Progress in Cardiovascular Diseases 18, 225–64.

Ross, J. Jr., Covell, J.W. and Sonnenblick, E.H. 1966: Contractile state of the heart characterised by force–velocity relations in variable afterloaded and isovolumic hearts. Circulation Research 18, 149–63.

Ross, R. 1986: The pathogenesis of atherosclerosis – an update. New England Journal of Medicine 314, 488–500.

Ross, R. 1992: The pathogenesis of atherosclerosis. In: Braunwald, E. (ed.), Heart disease – a textbook of cardiovascular medicine, 4th edn. Philadelphia: W.B. Saunders, pp. 1106–24.

Ross, R. 1999: Atherosclerosis; an inflammatory disease. New England Journal of Medicine 340, 115–26.

Rossen, J.D. and Winniford, M.D. 1993: Effect of increases in heart rate and arterial pressure on coronary flow reserve in humans. Journal of the American College of Cardiology 21, 343–8.

Rossi, A.C., Brands, P.J. and Hoeks, A.P. 2009: Nonlinear processing in B-mode ultrasound affects carotid diameter assessment. Ultrasound in Medicine and Biology 35, 736–47.

Rossi, A.C., Brands, P.J. and Hoeks, A.P. 2010: Automatic localization of intimal and adventitial carotid artery layers with noninvasive ultrasound: a novel algorithm providing scan quality control. Ultrasound in Medicine and Biology 36(3), 467–79.

Rosvall, M., Janzon, L., Berglund, G. et al. 2005a: Incidence of stroke is related to carotid IMT even in the absence of plaque. Atherosclerosis 179, 325–31.

Rosvall, M., Janzon, L., Berglund, G. et al. 2005b: Incident coronary events and case fatality in relation to common carotid intima-media thickness. Journal of Internal Medicine 257(5), 430–7.

Rott, N. et al. 1990: Note on the history of the Reynolds number. Annual Review of Fluid Mechanics 22, 1–11.

Roux, A., Motreff, P., Perriot, J. et al. 2010: Early improvement in peripheral vascular tone following smoking cessation using nicotine replacement therapy: aortic wave reflection analysis. Cardiology 117, 37–43.

Rowell, L.B., Brengelmann, G.L., Blackman, J.R. et al. 1968: Disparities between aortic and peripheral pulse pressures induced by upright exercise and vasomotor changes in man. Circulation 37, 954–64.

Roy, C.S. 1881: The elastic properties of the arterial wall. Journal of Physiology 3, 125–59.

Roy, L.P., Tiller, D.J. and Jones, D.L. 1984: The range of blood pressures in Australian children. Medical Journal of Australia 141(1), 9–12.

Rozanski, A., Blumenthal, J.A. and Kaplan, J. 1999: Impact of psychological factors on the pathogenesis of cardiovascular disease and implications for therapy. Circulation 99, 2192–217.

Rozenman, Y., Schwartz, R.S., Shah, H. et al. 2007: Wireless acoustic communication with a miniature pressure sensor in the pulmonary artery for disease surveillance and therapy of patients with congestive heart failure. Journal of the American College of Cardiology 49(7), 784–9.

Rubanyi, G.M. 1996. Endothelium in clinical practice. New York: Marcel Decker.

Rubenstein, M.H., Finn, A.V., Leinbach, R.C. et al. 2004: Short-term intravenous eptifibatide infusion combined with reduced dose recombinant tissue plasminogen activator inhibits platelet recruitment at sites of coronary artery injury. Journal of the American College of Cardiology 43(2), 287–94.

Ruberg, F.L. 2007: Myocardial lipid accumulation in the diabetic heart. Circulation 116, 1110–12.

Rubin, G.D., Paik, D.S., Johnston, P.C. and Napel, S. 1998: Measurement of the aorta and its branches with helical CT. Radiology 206(3), 823–9.

Rubin, L.J., Badesch, D.B., Barst, R.J. et al. 2002: For the Bosentan Randomized Trial of Endothelin Antagonist Therapy Study Group. Bosentan therapy for pulmonary arterial hypertension. New England Journal of Medicine 346, 896–903.

Rubin, M.R., Maurer, M.S., Diamond, B.E. et al. 2002: Vascular stiffness is increased in patients with primary hyperparathyroidism. Journal of Bone and Mineral Research 17(suppl. 1), SU394.

Rubinshtein, R., Kuvin, J.T., Soffler, M. et al. 2010: Assessment of endothelial function by non-invasive peripheral arterial tonometry predicts late cardiovascular adverse events. European Heart Journal 31, 1142–8.

Rucker, R.B. and Tinker, D. 1977: Structure and metabolism of arterial elastin. International Review of Pathology 17, 1–47.

Rudewald, B. 1962: Haemodynamics of the human ascending aorta as studied by means of a differential pressure technique. Acta Physiologica Scandinavica 54(suppl), 187–96.

Rushmer, R.F. 1970. Cardiovascular dynamics, 3rd edn. Philadelphia: W.B. Saunders.

Rushmer, R.F., Baker, D.W., Johnson, W.L. et al. 1967: Clinical applications of a transcutaneous ultrasonic flow detector. Journal of the American Medical Association 199, 326–8.

Russell, R.W. 1975: How does blood-pressure cause stroke? Lancet ii, 1283–5.

Russell, C.J., Exley, A.R. and Ritchie, A.J. 2003: Widespread coronary inflammation in unstable angina. New England Journal of Medicine 348, 1931.

Russell, R.W.R. 1963: Observations on intracerebral aneurysms. Brain 86, 425.

Russo, G., Leopold, J.A. and Loscalzo, J. 2002: Vasoactive substances: nitric oxide and endothelial dysfunction in atherosclerosis. Vascular Pharmacology 38(5), 259–69.

Rusting, R.L. 1992: Why do we age?. Scientific American 267(6), 130–5, 138–41.

Rutan, G.H., Kuller, L.H., Neaton, J.D. et al. 1988: Mortality associated with diastolic hypertension and isolated systolic hypertension among men screened for multiple risk factor intervention trial. Circulation 77, 504–14.

Rutan, G.H., Kuller, L.H., Neaton, J.D. et al. 1986: Isolated systolic hypertension and subsequent mortality in MRFIT screenees. Circulation 74(suppl. 2), 11–489.

Rutan, G.H., McDonald, R.H. and Kuller, L.H. 1989: A historical perspective of elevated systolic vs diastolic blood pressure from an epidemiological and clinical trial viewpoint. Journal of Clinical Epidemiology 42(7), 663–73.

Ryan, T.J. 2002: The coronary angiogram and its seminal contributions to cardiovascular medicine over five decades. Circulation 106(6), 752–6.

Rydén, L., Jirström, K., Bendahl, P.O. et al. 2005: Tumor-specific expression of vascular endothelial growth factor receptor 2 but not vascular endothelial growth factor or human epidermal growth factor receptor 2 is associated with impaired response to adjuvant tamoxifen in premenopausal breast cancer. Journal of Clinical Oncology 23(21), 4695–704.

Ryerson, C.J., Nayar, S., Swiston, J.R. et al. 2010: Pharmacotherapy in pulmonary arterial hypertension: a systematic review and meta-analysis. Respiratory Research 11(1), 12.

Sa Cunha, R., Pannier, B., Benetos, A. et al. 1997: Association between high heart rate and high arterial rigidity in normotensive and hypertensive subjects. Journal of Hypertension 15(12 Pt 1), 1423–30.

Saba, P.S., Roman, M.J., Pini, R. et al. 1993: Relation of arterial pressure waveform to left ventricular and carotid anatomy in normotensive subjects. Journal of the American College of Cardiology 22, 1873–80.

Saba, P., Ganau, A. and Roman, M.J. 1995a: Female gender is associated with early return of pressure waves in normotensive and hypertensive subjects. European Heart Journal 16, 64.

Saba, P.S., Roman, M.J., Ganau, A. et al. 1995b: Relationship of effective arterial elastance to demographic and arterial characteristics in normotensive and hypertensive adults. Journal of Hypertension 13, 971–7.

Saba, P.S., Ganau, A., Devereux, R.B. et al. 1999: Impact of arterial elastance as a measure of vascular load on left ventricular geometry in hypertension. Journal of Hypertension 17(7), 7–15.

Sabbah, H.N. and Stein, P.D. 1976: Effect of erythrocytic deformability upon turbulent blood flow. Biorheology 13, 309–14.

Sabbah, H.N. and Stein, P.D. 1979: Contribution of semilunar leaflets to turbulent blood flow. Biorheology 16, 101–8.

Sabbah, H.N. and Stein, P.D. 1982: Hemodynamics of multiple versus single 50 percent coronary arterial stenoses. American Journal of Cardiology 50, 276–80.

Sabbah, H.N., Hawkins, E.T. and Stein, P.D. 1984: Flow separation in renal arteries. Arteriosclerosis 4, 28–33.

Saeki, A., Recchia, F. and Kass, D.A. 1995: Systolic flow augmentation in heart ejecting into a model of stiff aging vasculature; influence on myocardial perfusion-demand balance. Circulation Research 76(1), 132–41.

Safar, M., Laurent, S., Safavian, A. et al. 1988: Sodium and large arteries in hypertension: effects of indapamide. American Journal of Medicine 84, 15–19.

Safar, M.E. 1980: Management of hypertension in the elderly. New England Journal of Medicine 303, 1233–40.

Safar, M.E. 1987: Arterial and venous systems in essential hypertension. Dordrecht: Martinus Nijhoff.

Safar, M.E. 1989: Pulse pressure in essential hypertension: clinical and therapeutical implications. Journal of Hypertension 7, 769–76.

Safar, M.E. 2000: Pulse pressure, arterial stiffness, and cardiovascular risk. Current Opinion in Cardiology 15, 258–63.

Safar, M.E. 2001: Epidemiological findings imply that goals for drug treatment of hypertension need to be revised (Editorial). Circulation 103, 1188–90.

Safar, M.E. 2002: Mechanical factor predicting cardiovascular risk and drug treatment of hypertension. Journal of Hypertension 20, 349–52.
Safar, M.E. 2008: Pulse pressure, arterial stiffness and wave reflections (augmentation index) as cardiovascular risk factors in hypertension. Therapeutic Advances in Cardiovascular Disease 2(1), 13–24.
Safar, M.E. and O'Rourke, M.F. 1993. The arterial system in hypertension. Dordrecht: Kluwer.
Safar, M.E. and Frohlich, E.D. 1995: The arterial system in hypertension. A prospective view. Hypertension 26(1), 10–14.
Safar, M.E. and London, G.M. for the Clinical Committee of Arterial Structure and Function, on behalf of the Working Group on Vascular Structure and Function of the European Society of Hypertension. 2000: Therapeutic studies and arterial stiffness in hypertension: recommendations of the European Society of Hypertension. Journal of Hypertension 18, 1527–35.
Safar, M.E. and Benetos, A. 2003: Factors influencing arterial stiffness in systolic hypertension in the elderly, role of sodium and the renin–angiotensin system. American Journal of Hypertension 16(3), 249–58.
Safar, M.E. and Smulyan, H. 2004: Coronary ischemic disease, arterial stiffness, and pulse pressure. American Journal of Hypertension 17, 624–6.
Safar, M.E. and O'Rourke, M.F. 2006: Arterial stiffness in hypertension. In: Birkenhager, W.H. and Reid J.L. (eds)., Handbook of hypertension, vol 23. London: Elsevier.
Safar, M.E., Bouthier, J.A., Levinson, J.A. et al. 1983: Peripheral large arteries and the response to antihypertensive treatment. Hypertension 5(suppl. 3), 63–8.
Safar, M.E., Hornych, A.F., Levenson, J.A. et al. 1981a: Central haemodynamics and plasma prostaglandin E2 in borderline and sustained essential hypertensive patients before and after indomethacin. Clinical Science (London) 61(suppl 7), 323–5s.
Safar, M.E., Peronneau, P.A., Levenson, J.A. et al. 1981b: Pulsed Doppler: diameter, blood flow velocity and volumic flow of the brachial artery in sustained essential hypertension. Circulation 63, 393–400.
Safar, M.E., Simon, A.Ch. and Levenson, J.A. 1984: Structural changes of large arteries in sustained essential hypertension. Hypertension 6(suppl. 3), 117–21.
Safar, M.E., Levy, B.I. and Struijker-Boudier, H. 2003: Current perspectives on arterial stiffness and pulse pressure in hypertension and cardiovascular diseases. Circulation 107, 2864–9.
Safar, M.E., London, G.M., Asmar, R.G. et al. 1986a: An indirect approach for the study of the elastic modulus of the brachial artery in patients with essential hypertension. Cardiovascular Research 20, 563–7.
Safar, M.E., Laurent, S.L., Bouthier, J.D. et al. 1986b: Effect of converting enzyme inhibitors on hypertensive large arteries in humans. Journal of Hypertension 4(suppl. 5), S285–9.
Safar, M.E., Laurent, S., Safavian, A.L. et al. 1987a: Pulse pressure in sustained essential hypertension: a haemodynamic study. Journal of Hypertension 5(2), 213–8.
Safar, M.E., Toto-Moukouo, J.J., Asmar, R.A. et al. 1987b: Increased pulse pressure in patients with arteriosclerosis obliterans of the lower limbs. Arteriosclerosis 7(3), 232–7.
Safar, M.E., Henry, O. and Meaume, S. 2002a: Aortic pulse wave velocity, an independent marker of cardiovascular risk. American Journal of Geriatric Cardiology 11, 295–98.
Safar, M.E., Blacher, J., Pannier, B. et al. 2002b: Central pulse pressure and mortality in end-stage renal disease. Hypertension 39, 735–8.
Safar, M.E., Levy, B.I. and Struijker-Boudier, H. 2003: Current perspectives on arterial stiffness and pulse pressure in hypertension and cardiovascular disease. Circulation 107, 2864–9.
Safar, M.E., London, G.M. and Plante, G.E. 2004: Arterial stiffness and kidney function. Hypertension 43, 163–8.
Safar, M.E., Blacher, J., Protogerou, A. et al. 2008: Arterial stiffness and central hemodynamics in treated hypertensive subjects according to brachial blood pressure classification. Journal of Hypertension 26(1), 130–7.
Safar, M.E., Temmar, M., Kakou, A. et al. 2009: Sodium intake and vascular stiffness in hypertension. Hypertension 54, 203–9.
Sagawa, K., Maughan, L., Suga, H. et al. 1988. Cardiac contractions and the pressure–volume relationship. New York: Oxford University Press.
Sage, P.R., De la Lande, I.S., Stafford, I. et al. 2000: Nitroglycerin tolerance in human vessels, evidence for impaired nitroglycerin bioconversion. Circulation 102, 2810–15.
Sagie, A., Benjamin, E.J., Galderisi, M. et al. 1993: Echocardiographicassessment of left ventricular structure and diastolic filling in elderly subjects with borderline isolated systolic hypertension (the Framingham Heart Study). American Journal of Cardiology 72(9), 662–5.
Sakai, T., Takazawa, K., Maeda, K. et al. 1992: Changes in flow velocity pattern in the left ventricular outflow tract after vasoconstriction and vasodilation assessed by Doppler echocardiography. Journal of Cardiology (Japan) 50(5), 712–26.
Sakai, T., Takazawa, K., Fujita, M. et al. 1993: Changes in flow velocity pattern in the left ventricular outflow tract before and after administration of nitroglycerin as assessed by Doppler echocardiography. Journal of Cardiology (Japan) 23(suppl. 37), 25–33.
Sakuragi, S., Abhayaratna, K., Gravenmaker, K.J. et al. 2009: Influence of adiposity and physical activity on arterial stiffness in healthy children: the Lifestyle of Our Kids study. Hypertension 53, 611–16.
Sakurai, M., Yamakado, T., Kurachi, H. et al. 2007: The relationship between aortic augmentation index and pulse wave velocity: an invasive study. Journal of Hypertension 25, 391–7.
Salans, A.H., Katz, L.N., Graham, G.R. et al. 1951: A study of the central and peripheral arterial pressure pulse in man: correlation with simultaneously recorded electrokymograms. Circulation 4, 510–21.
Salomaa, V., Riley, W., Kark, J.D. et al. 1995: Non-insulin-dependent diabetes mellitus and fasting glucose and insulin concentrations are associated with arterial stiffness indexes: the ARIC study. Circulation 91, 1432–43.
Salvi, P., Lio, G., Labat, C. et al. 2004: Validation of a new non-invasive portable tonometer for determining arterial pressure wave and pulse wave velocity: the PulsePen device. Journal of Hypertension 22(12), 2285–93.
Salvi, P., Magnani, E., Valbusa, F. et al. 2008: Comparative study of methodologies for pulse wave velocity estimation. Journal of Human Hypertension 22(10), 669–77.
Samaras, K., Hayward, C.S., Sullivan, D. et al. 1999: Effects of postmenopausal hormone replacement therapy on central abdominal fat, glycemic control, lipid metabolism, and vascular factors in type 2 diabetes: a prospective study. Diabetes Care 22, 1401–7.
Samijo, S.K., Willigers, J.M., Barkhuysen, R. et al. 1998: Wall shear stress in the common carotid artery as function of age and gender. Cardiovascular Research 39, 515–22.
Samijo, S.K., Willigers, J.M., Brands, P.J. et al. 1997: Reproducibility of shear rate and shear stress assessment by means of ultrasound in the common carotid artery of young human males and females. Ultrasound in Medicine and Biology 23(4), 583–90.
Sandor, B. 1972. Fundamentals of cyclic stress and strain. Madison: University of Wisconsin.
Santamore, W.P., Kent, R.L., Crey, R.A. et al. 1982: Synergistic effects of pressure, distal resistance, and vasoconstriction of stenosis. American Journal of Physiology 243, H236–42.
Santana, D.B., Barra, J.G., Grignola, J.C. et al. 2005: Pulmonary artery smooth muscle activation attenuates arterial dysfunction during acute pulmonary hypertension. Journal of Applied Physiology 98(2), 605–13.
Santhanam, L., Christianson, D.W., Nyhan, D. et al. 2008: Arginase and vascular aging. Journal of Applied Physiology 105(5), 1632–42.
Sanz, J., Kariisa, M., Dellegrottaglie, S. et al. 2009a: Evaluation of pulmonary artery stiffness in pulmonary hypertension with cardiac magnetic resonance. JACC. Cardiovascular Imaging 2(3), 286–95.
Sanz, J., Moreno, P.R. and Fuster, V. 2009b: The year in atherothrombosis. Journal of the American College of Cardiology 53, 1326–37.
Saouti, N, Westerhof, N., Helderman, F. et al. 2010: Right ventricular oscillatory power is a constant fraction of total power irrespective of

pulmonary artery pressure. American Journal of Respiratory and Critical Care Medicine 182(10), 1315–20.
Saqqur, M., Dean, N., Schebel, M. et al. 2004: Improved detection of microbubble signals using power M-mode Doppler. Stroke 35(1), e14–17.
Sargent, R.P., Shepard, R.M. and Glantz, S.A. 2004: Reduced incidence of admissions for myocardial infarction associated with public smoking ban: before and after study. BMJ 328, 977–80.
Sarnoff, S.J., Braunwald, E., Welch, G.H. et al. 1958: Hemodynamic determinants of oxygen consumption of the heart with special reference to the tension–time index. American Journal of Physiology 192, 148–56.
Sasayama, S. and Asanoi, H. 1991: Coupling between ventricular and arterial properties. In: Sasayama, S. and Suga, H. (eds), Recent progress in failing heart syndrome. Tokyo: Springer.
Sato, M. and Ohshima, N. 1994: Flow-induced changes in shape and cytoskeletal structure of vascular endothelial cells. Biorheology 31, 143–53.
Sato, T., Nishinaga, M., Kawamoto, A. et al. 1993: Accuracy of a continuous blood pressure monitor based on arterial tonometry. Hypertension 21, 866–74.
Savage, M.T., Ferro, C.J., Pinder, S.J. et al. 2002a: Reproducibility of derived central arterial waveforms in patients with chronic renal failure. Clinical Science 103, 59–65.
Savage, M.T., Ferro, C.J., Sassano, A. et al. 2002b: The impact of arteriovenous fistula formation on central hemodynamic pressures in chronic renal failure patients: a prospective study. American Journal of Kidney Disease 40, 753–9.
Sawchuk, A.P., Unthank, J.L., Davis, T.E. and Dalsing, M.C. 1994: A prospective, in vivo study of the relationship between blood flow hemodynamics and atherosclerosis in a hyperlipidemic swine model. Journal of Vascular Surgery 19(1), 58–63.
Scalia, G.M., Khoo, S.K. and O'Neill, S. 2010: Age-related changes in heart function by serial echocardiography in women aged 40–80 years. Journal of Women's Health 19(9), 1741–5.
Scarabin, P.Y., Arveiler, D., Amouyel, P. et al. 2003: Plasma fibrinogen explains much of the difference in risk of coronary heart disease between France and Northern Ireland. The PRIME study. Atherosclerosis 166(1), 103–9.
Schaper, W., Levi, P., Flameng, W. et al. 1973: Myocardial steal produced by coronary vasodilation in chronic coronary artery occlusion. Basic Research in Cardiology 68, 3–20.
Schievink, W.I. 2001: Spontaneous dissection of the carotid and vertebral arteries (Review). New England Journal of Medicine 344, 898–906.
Schievink, W.L., Michels, V.V., Mokri, B. et al. 1995: Brief report: a familial syndrome of arterial dissections with lentiginosis. New England Journal of Medicine 332(9), 576–9.
Schiffrin, E.L. 2004: Vascular stiffening and arterial compliance. Implications for systolic blood pressure. American Journal of Hypertension 17(12 Pt 2), 39S–48S.
Schillaci, G., De Socio, G.V.L, Pirro, M. et al. 2005: Impact of treatment with protease inhibitors on aortic stiffness in adult patients with human immunodeficiency virus infection. Arteriosclerosis, Thrombosis, and Vascular Biology 25, 2381–5.
Schillaci, G., Pirro, M., Mannarino, M.R. et al. 2006: Relation between renal function within the normal range and central and peripheral arterial stiffness in hypertension. Hypertension 48, 616–21.
Schillaci, G., Pucci, G. and Cziraki, A. 2009: Uncertainties in estimating the site of arterial wave reflection. Hypertension 53, e7.
Schimmler, W. 1965: [On age-related changes in the elasticity of the aorta and iliac artery in man]. Klinische Wochenschrift 43, 587–90.
Schimmler, W. 1975: [A longitudinal study of the relationship between the pulse wave velocity in the aorta-iliaca vessel and the blood pressure (author's transl)]. Basic Research in Cardiology 70(1), 46–57.
Schlaikjer, M., Torp-Pedersen, S. and Jensen, J.A. 2003: Simulation of RF data with tissue motion for optimizing stationary echo canceling filters. Ultrasonics 41, 415–19.
Schlatmann, T.J.M. and Becker, A.E. 1977: Histologic changes in the normal aging aorta: implications for dissecting aortic aneurysm. American Journal of Cardiology 39, 13–20.
Schleier, J. 1919: Der Energieverbrauch in der Blutbahn. Pflugers Archiv für die gesamte Physiologie 173, 172–223.
Schlichting, H. 1968. Boundary layer theory, 6th edn. New York: McGraw-Hill.
Schmid-Schonbein, H. 1976: Microrheology of erythrocytes, blood viscosity, and the distributions of blood flow in the microcirculation. In: International review of physiology, cardiovascular physiology II, vol. 9. Baltimore: University Park Press, pp. 1–62.
Schmid-Schonbein, G.W. and Zweifach, B.W. 1975: RBC velocity profiles in arterioles and venules of the rabbit omentum. Microvascular Research 10, 153–64.
Schmidt-Trucksäss, A., Grathwohl, D. et al. 1999: Structural, functional, and hemodynamic changes of the common carotid artery with age in male subjects. Arteriosclerosis, Thrombosis and Vascular Biology 19(4), 1091–7.
Schmidt, A.M., Yan, S.D., Wautier, J.L. and Stern, D. 1999: Activation of receptor for advanced glycation end products: a mechanism for chronic vascular dysfunction in diabetic vasculopathy and atherosclerosis. Circulation Research 84, 489–97.
Schmidt-Trucksäss, A., Schmid, A., Brunner, C. et al. 2000: Arterial properties of the carotid and femoral artery in endurance- trained and paraplegic subjects. Journal of Applied Physiology 89, 1956–63.
Schmidt-Trucksäss, A., Cheng, D.C., Sandrock, M. et al. 2001: Computerized analysing system using the active contour in ultrasound measurement of carotid artery intima-media thickness. Clinical Physiology 21, 561–9.
Schmidt-Lucke, C., Rossig, L., Fichtlscherer, S. et al. 2005: Reduced number of circulating endothelial progenitor cells predicts future cardiovascular events: proof of concept for the clinical importance of endogenous vascular repair. Circulation 111, 2981–7.
Schmidt-Trucksäss, A., Sandrock, M., Cheng, D.C et al. 2003a: Quantitative measurement of carotid intima-media roughness–effect of age and manifest coronary artery disease. Atherosclerosis 166, 57–65.
Schmidt-Trucksäss, A., Schmid, A., Dorr, B. and Huonker, M. 2003b: The relationship of left ventricular to femoral artery structure in male athletes. Medicine and Science in Sports and Exercise 35(2), 214–9.
Schmieder, R.E. 2008: Hypertensive retinopathy: a window to vascular remodeling in arterial hypertension. Hypertension 51, 43–4.
Schmieder, R.E., Martus, P. and Klingbeil, A. 1996: Reversal of left ventricular hypertrophy in essential hypertension. A meta-analysis of randomized double-blind studies. Journal of the American Medical Association 275(19), 1507–13.
Schmitt, M., Avolio, A., Qasem, A. et al. 2005: Basal NO locally modulates human iliac artery function in vivo. Hypertension 46(1), 227–31.
Schmitz, K.H., Arnett, D.K., Bank, A. et al. 2001: Arterial distensibility and physical activity in the ARIC study. Medicine and Science in Sports and Exercise 33, 2065–71.
Schneider, M.P., Klingbeil, A.U., Delles, C. et al. 2004: Effect of irbesartan versus atenolol on left ventricular mass and voltage: results of the CardioVascular Irbesartan Project. Hypertension 44, 61–6.
Schneider, R., Golzman, B., Turkot, S. et al. 2005: Effect of weight loss on blood pressure, arterial compliance, and insulin resistance in normotensive obese subjects. American Journal of the Medical Sciences 330, 157–60.
Schoenhagen, P., Tuzcu, E.M, Apperson-Hansen, C. et al. 2006: Determinants of arterial wall remodeling during lipid-lowering therapy: serial intravascular ultrasound observations from the Reversal of Atherosclerosis with Aggressive Lipid Lowering Therapy (REVERSAL) trial. Circulation 113(24), 2826–34.
Schoenhagen, P., Ziada, K.M., Kapadia, S.R. et al. 2000: Extent and direction of arterial remodeling in stable versus unstable coronary syndromes: an intravascular ultrasound study. Circulation 101(6), 598–603.
Schofield, R.S., Edwards, D.G., Schuler, B.T. et al. 2003: Vascular effects of sildenafil in hypertensive cardiac transplant recipients. American Journal of Hypertension 16(10), 874–7.
Schofield, R.S., Schuler, B.T., Edwards, D.G. et al. 2002a: Amplitude and timing of central aortic pressure wave reflections in heart transplant recipients. American Journal of Hypertension 15, 809–15.

Schofield, I., Malik, R., Izzard, A. et al. 2002b: Vascular structural and functional changes in type 2 diabetes mellitus: evidence for the roles of abnormal myogenic responsiveness and dyslipidemia. Circulation 106, 3037–43.

Schram, M.T., Henry, R.M.A., van Dijk, R.A.J.M. et al. 2004: Increased central artery stiffness in impaired glucose metabolism and type 2 diabetes. The Hoorn Study. Hypertension 43, 176–81.

Schreuder, J.J., van der Veen, F.H., van der Velde, E.T. et al. 1995: Beat-to-beat analysis of left ventricular pressure–volume relation and stroke volume by conductance catheter and aortic model flow in cardiomyoplasty patients. Circulation 91, 2010–17.

Schroeder, J.S. and Gao, S.-Z. 1995: Accelerated graft coronary artery disease in heart-transplant recipients. Coronary Artery Disease 6(3), 226–34.

Schuff-Werner, P. and Holdt, B. 2002: Selective hemapheresis: an effective new approach in the therapeutic management of disorders associated with rheological impairment, mode of action and possible clinical indications. Artificial Organs 26(2), 117–23.

Schulman, S.P., Lakatta, E.G., Fleg, J.L. et al. 1992: Age-related decline in left ventricular filling at rest and exercise. American Journal of Physiology 263, H1932–8.

Schulman, S.P., Weiss, J.L., Becker, L.C. et al. 1990: The effects of antihypertensive therapy on left ventricular mass in elderly patients. New England Journal of Medicine 322(19), 1350–6.

Schultz, D.L., Tunstall-Pedoe, D.S., Lee, G. de J. et al. 1969: Velocity distribution and transition in the arterial system. In: Ciba Foundation symposium on circulatory and respiratory mass transport. London: Churchill, 172–99.

Schulz, W., Jost, S., Kober, G. et al. 1985: Relation of anti-anginal efficacy of nifedipine to degree of coronary arterial narrowing and to presence of coronary collateral vessels. American Journal of Cardiology 55, 26–32.

Schulze, P.C. 2009: Beneficial effects of moderate exercise in arterial hypertension. Hypertension 53, 600–1.

Schumacher, W., Cockcroft, J., Timpson, N.J. et al. 2009: Association between C-reactive protein genotype, circulating levels, and aortic pulse wave velocity. Hypertension 53(2), 150–7.

Schumacher, W.A., Buda, A.J. and Lucchesi, B.R. 1984: Streptokinase thrombolysis in experimental coronary artery thrombosis: pattern of reflow and effect of a stenosis. International Journal of Cardiology 6(5), 615–27.

Schutte, A.E., Huisman, H.W., van R.ooyen, J.M. et al. 2004: Validation of the Finometer device for measurement of blood pressure in black women. Journal of Human Hypertension 18(2), 79–84.

Schwartz, D., Brasowski, E., Raskin, Y. et al. 2001: The outcome of non-selective vs selective nitric oxide synthase inhibition in lipopolysaccharide treated rats. Journal of Nephrology 14, 110–14.

Schwartz, B.G., Economides, C., Mayeda, G.S. et al. 2009: The endothelial cell in health and disease: its function, dysfunction, measurement and therapy. International Journal of Impotence Research 22(2), 77–90.

Schwartz, J.S. 1983: Effect of distal coronary pressure on rigid and compliant coronary stenoses. American Journal Physiology 245(6), H1054–60.

Scognamiglio, R., Rahimtoola, S.H., Fasoli, G. et al. 1994: Nifedipine in asymptomatic patients with severe aortic regurgitation and normal left ventricular function. New England Journal of Medicine 331(11), 689–94.

Scolletta, S., Romano, S.M., Biagioli, B. et al. 2005: Pressure recording analytical method (PRAM) for measurement of cardiac output during various haemodynamic states. British Journal of Anaesthesia 95(2), 159–65.

Scott, J.A., Coombes, J.S., Prins, J.B. et al. 2008: Patients with type 2 diabetes have exaggerated brachial and central exercise blood pressure: relation to left ventricular relative wall thickness. American Journal of Hypertension 21, 715–21.

Scuteri, A., Brancati, A.M., Gianni, W. et al. 2005: Arterial stiffness is an independent risk factor for cognitive impairment in the elderly: a pilot study. Journal of Hypertension 23, 1211–16.

Scuteri, A., Cacciafesta, M., Di Bernaroo, M.G. et al. 1995: Pulsatile versus steady state component of blood pressure in elderly women: an independent risk factor for cardiovascular disease. Journal of Hypertension 13, 185–91.

Scuteri, A., Coluccia, R., Castello, L. et al. 2009: Left ventricular mass increase is associated with cognitive decline and dementia in the elderly independently of blood pressure. European Heart Journal 30(12), 1525–9.

Scuteri, A., Lakatta, E.G., Bos, A.J. and Fleg, J.L. 2001: Effect of estrogen and progestin replacement on arterial stiffness indices in postmenopausal women. Aging (Milano) 13(2), 122–30.

Seals, D.R., Tanaka, H., Clevenger, C.M. et al. 2001: Blood pressure reductions with exercise and sodium restriction in postmenopausal women with elevated systolic pressure: role of arterial stiffness. Journal of the American College of Cardiology 38, 506–13.

Seals, D.R., Walker, A.E., Pierce, G.L. et al. 2009: Habitual exercise and vascular ageing. Journal of Physiology 587(Pt 23), 5541–9.

Secomb, T.W. 1987: Flow-dependent rheological properties of blood in capillaries. Microvascular Research 34, 46–58.

Secomb, T.W., Skalak, R., Ozkya, N. et al. 1986: Flow of axisymmetric red blood cells in capillaries. Journal of Fluid Mechanics 163, 405–23.

Seed, W.A. and Wood, N.B. 1970: Development and evaluation of a hot-film velocity probe for cardiovascular studies. Cardiovascular Research 4(2), 253–63.

Seed, W.A. and Thomas, I.R. 1972: The application of hot-film anemometry to the measurement of blood flow velocity in man. In: Cockrell, D.J. (ed.), Fluid-dynamic measurements in the industrial and medical environments. Proceedings of Disa Conference. Leicester, UK: Leicester University Press, pp. 298–304.

Seed, W.A. and Wood, N.B. 1971: Velocity patterns in the aorta. Cardiovascular Research 5, 319–30.

Seely, E.W. and Williams, G.H. 2001: The heart. In: Braunwald, E., Zipes, D. and Libby, P. (eds), Endocrine disorder in heart disease, 6th edn. Philadelphia: Saunders, pp. 2165–6.

Segadal, L. and Matre, K. 1987: Blood velocity distribution in the human ascending aorta. Circulation, 76(1), 90–100.

Segal, J., Gaudiani, V. and Nishimura, T. 1991: Continuous determination of cardiac output using a flow-directed Doppler pulmonary artery catheter. Journal of Cardiothoracic and Vascular Anesthesia 5(4), 309–15.

Segal, J., Kern, M.J., Scott, N.A. et al. 1992: Alterations of phasic coronary artery flow velocity in humans during percutaneous coronary angioplasty. Journal of the American College of Cardiology 20, 276–86.

Segal, J., Nassi, M., Ford, A.J. Jr. and Schuenemeyer, T.D. 1990: Instantaneous and continuous cardiac output in humans obtained with a Doppler pulmonary artery catheter. Journal of the American College of Cardiology 16(6), 1398–407.

Segal, J., Pearl, R.G., Ford Jr. et al. 1989: Instantaneous and continuous cardiac output obtained with a Doppler pulmonary artery catheter. Journal of the American College of Cardiology 13(6), 1382–92.

Segers, P. and Verdonck, P. 2000: Role of tapering in aortic wave reflection, hydraulic and mathematical model study. Journal of Biomechanics 33(3), 299–306.

Segers, P., De Backer, J., Devos, D. et al. 2006: Aortic reflection coefficients and their association with global indexes of wave reflection in healthy controls and patients with Marfan's syndrome. American Journal of Physiology. Heart and Circulatory Physiology 290(6), H2385–92.

Segers, P., De Buyzere, M., De Backer, T. et al. 2000: A non-invasive cardiovascular index for the quantification of arterial load. Acta Cardiologica 55(2), 79–85.

Segers, P., Qasem, A., De Backer, T. et al. 2001: Peripheral 'oscillatory' compliance is associated with aortic augmentation index. Hypertension 37, 1434–9.

Segers, P., Georgakopoulos, D., Afanasyeva., M. et al. 2005a: Conductance catheter-based assessment of arterial input impedance, arterial function, and ventricular–vascular interaction in mice. American Journal of Physiology. Heart and Circulatory Physiology 288(3), H1157–64.

Segers, P., Rietzschel, E., Heireman, S. et al. 2005b: Carotid tonometry vs synthesized aorta pressure waves for the estimation of central systolic blood pressure and augmentation index. American Journal of Hypertension 18, 1168–73.

Segers, P., Mahieu, D., Kips, J. et al. 2007a: The use of a generalized transfer function: different processing, different results. Journal of Hypertension 25(9), 1783–7.

Segers, P., Rietzschel, E.R., De Buyzere, M.L. et al. 2007b: Noninvasive (input) impedance, pulse wave velocity, and wave reflection in healthy middle-aged men and women. Hypertension 49(6), 1248–55.

Segers, P., Rietzschel, E.R., De Buyzere, M.L. et al. 2007c: Assessment of pressure wave reflection: getting the timing right! Physiological Measurement 28(9), 1045–56.

Segers, P., Mahieu, D., Rietzschel, E.R. et al. 2008: Impact of radial artery pressure waveform calibration on estimated central pressure using a transfer function approach. Hypertension 52, e24–5.

Segers, P., Mahieu, D., Kips, J. et al. 2009: Amplification of the pressure pulse in the upper limb in healthy, middle-aged men and women. Hypertension 54(2), 414–20.

Seidel, C.L. and Murphy, R.A. 1976: Stress relaxation in hog carotid artery as related to contractile activity. Blood Vessels 13, 78–91.

Seiler, C., Hess, O.M., Buechi, M. et al. 1993: Influence of serum cholesterol and other coronary risk factors on vasomotion of angiographically normal coronary arteries. Circulation 88, 2139–48.

Selimovic, N., Rundqvist, B., Bergh, C.H. et al. 2007: Assessment of pulmonary vascular resistance by Doppler echocardiography in patients with pulmonary arterial hypertension. Journal of Heart and Lung Transplantation 26(9), 927–34.

Sellke, F.W., Myers, P.R., Bates, J.N. et al. 1990: Influence of vessel size on the sensitivity of porcine coronary microvessels to nitroglycerin. American Journal of Physiology 258, H515–H520.

Sellke, F.W., Kagaya, Y., Johnson, R.G. et al. 1992: Endothelial modulation of porcine coronary microcirculation perfused via immature collaterals. American Journal of Physiology 262(6 Pt 2), H1669–75.

Selzer, R.H., Hodis, H.N., Kwong-Fu, H. et al. 1994: Evaluation of computerized edge tracking for quantifying intima-media thickness of the common carotid artery from B-mode ultrasound images. Atherosclerosis 111, 1–11.

Selzer, F., Sutton-Tyrell, K., Fitzgerald, S. et al. 2001: Vascular stiffness in women with systemic lupus erythematosus. Hypertension 37, 1075–82.

Selzer, R.H., Mack, W.J., Lee, P.L et al. 2001: Improved common carotid elasticity and intima-media thickness measurements from computer analysis of sequential ultrasound frames. Atherosclerosis 154, 185–93.

Senen, K., Yetkin, E., Turhan, H. et al. 2004: Increased thrombolysis in myocardial infarction frame counts in patients with isolated coronary artery ectasia. Heart and Vessels 19(1), 23–6.

Senni, M. and Redfield, M.M. 2001: Heart failure with preserved systolic function (Review). Journal of the American College of Cardiology 38, 1277–82.

Senni, M., Tribouilloy, C.M., Rodeheffer, R.J. et al. 1998: Congestive heart failure in the community; a study of all incident cases in Olmsted County, Minnesota, in 1991. Circulation 98, 2282–9.

Senzaki, H., Iwamoto, Y., Ishido, H. et al. 2007: Arterial haemodynamics in patients after repair of tetralogy of Fallot: influence on left ventricular after load and aortic dilatation. Heart 4(1), 70–4.

Seow, C.Y. 2000: Response of arterial smooth muscle to length perturbation. Journal of Applied Physiology 89(5), 2065–72.

Serruys, P.W. 2006: Fourth Annual American College of Cardiology International Lecture: A journey in the interventional field. Journal of the American College of Cardiology 47, 1754–68.

Serruys, P.W., Sijlstra, F., Laarman, G.J. et al. 1989: A comparison of two methods to measure coronary flow reserve in the setting of coronary angioplasty: intracoronary blood flow velocity measurement with a Doppler catheter, and digital subtraction cineangiography. European Heart Journal 10, 725–36.

Sever, P.S., Dahlof, B., Poulter, N.R. et al. 2001: Rationale, design, methods and baseline demography of participants of the Anglo-Scandinavian Cardiac Outcomes Trial. Journal of Hypertension 19, 1139–47.

Sever, P.S., Poulter, N.R., Dahlöf, B. et al. 2005: Different time course for prevention of coronary and stroke events by atorvastatin in the Anglo-Scandinavian Cardiac Outcomes Trial-Lipid-Lowering Arm (ASCOT-LLA). American Journal of Cardiology 96(5A), 39–44F.

Shaddy, R.E., Boucek, M.M., Hsu, D.T. et al. 2007: Carvedilol for children and adolescents with heart failure: a randomized controlled trial. Journal of the American Medical Association 298(10), 1171–9.

Shadwick, R.E. 1999: Mechanical design in arteries. Journal of Experimental Biology 202(Pt 23), 3305–13.

Shah, R.V., Desai, A.S. and Givertz, M.M. 2010: The effect of renin-angiotensin system inhibitors on mortality and heart failure hospitalization in patients with heart failure and preserved ejection fraction: a systematic review and meta-analysis. Journal of Cardiac Failure 16, 260–7.

Shai, I., Spence, J.D., Schwarzfuchs, D. et al; DIRECT Group. 2010: Dietary intervention to reverse carotid atherosclerosis Circulation 121, 1200–8.

Shammash, J.R., Trost, J.C., Gold, J.M. et al. 2001: Perioperative beta-blocker withdrawal and mortality in vascular surgical patients. American Heart Journal 141, 148–53.

Shapiro, B.P., Lam, C.S.P., Patel, J.B. et al. 2007: Acute and chronic ventricular–arterial coupling in systole and diastole: insights from an elderly hypertensive model. Hypertension 50, 503–11.

Sharir, T., Feldman, M.D., Haber, H. et al. 1994: Ventricular systolic assessment in patients with dilated cardiomyopathy by preload-adjusted maximal power; validation and noninvasive application. Circulation 89, 2045–53.

Sharma, B.K., Sagar, S., Singh, A.P. et al. 1992: Takayasu's disease in India. Heart Vessels 7(suppl.), 37–43.

Sharma, P., Lohani, B. and Chataut, S.P. 2009: Ultrasonographic evaluation of carotid intima-media thickness in hypertensive and normotensive individuals. Nepal Medical College Journal 11(2), 133–5.

Sharman, J.E, McEniery, C., Campbell, R. et al. 2005: The effect of exercise on large artery haemodynamics in healthy young men. European Journal of Clinical Investigation 35, 738–44.

Sharman, J.E., Lim, R., Qasem, A.M. et al. 2006: Validation of a generalized transfer function to noninvasively derived central blood pressure during exercise. Hypertension 47, 1203–8.

Sharman, J.E., Brown, J., Holland, D.J. et al. 2009a: Influence of altered blood rheology on ventricular–vascular response to exercise. Hypertension 54(5), 1092–8.

Sharman, J.E., Davies, J.E., Jenkins, C. et al. 2009b: Augmentation index, left ventricular contractility and wave reflection. Hypertension 54, 1099–105.

Sharman, J.E., McEniery, C.M., Campbell, R. et al. 2008: Nitric oxide does not significantly contribute to changes in pulse pressure amplification during light aerobic exercise. Hypertension 51, 856–61.

Sharon, A., Shpirer, I., Kaluski, E. et al. 2000: High-dose intravenous isosorbide-dinitrate is safer and better than Bi-PAP ventilation combined with conventional treatment for severe pulmonary edema. Journal of the American College of Cardiology 36, 832–7.

Sharp, M.K. and Dharmalingham, R.K. 1999: Development of a hydraulic model of the human systemic circulation. ASAIO Journal 45, 535–40.

Sharp, M.K., Pantalos, G.M., Minich, L. et al. 2000: Aortic input impedance in infants and children. Journal of Applied Physiology 88, 2227–39.

Shave, R., Baggish, A., George, K. et al. 2010: Exercise-induced cardiac troponin elevation: evidence, mechanisms, and implications. Journal of the American College of Cardiology 56, 169–76.

Shaw, L.J., Bugiardini, R. and Merz, C.N. 2009: Women and ischemic heart disease: evolving knowledge. Journal of the American College of Cardiology 54, 1561–75.

Shechter, M., Marai, I., Marai, S. et al. 2007: The association of endothelial dysfunction and cardiovascular events in healthy subjects and patients with cardiovascular disease. Israel Medical Association Journal 9(4), 271–6.

Shechter, M., Issachar, A., Marai, I. et al. 2009: Long-term association of brachial artery flow-mediated vasodilation and cardiovascular events in middle-aged subjects with no apparent heart disease. International Journal of Cardiology 134(1), 52–8.

Sheehan, R., Perloff, J.K., Fishbein, M.C. et al. 2005: Pulmonary neovascularity: a distinctive radiographic finding in Eisenmenger syndrome. Circulation 112, 2778–85.

Shekelle, P.G., Rich, M.W., Morton, S.C. et al. 2003: Efficacy of angiotensin-converting enzyme inhibitors and beta-blockers in the management of left ventricular systolic dysfunction according to race, gender, and diabetic status. Journal of the American College of Cardiology 41, 1529–38.

Shen, Y. and Vatner, S.F. 1995: Mechanism of impaired myocardial function during progressive coronary stenosis in conscious pigs: hibernation versus stunning? Circulation Research 76, 479–88.

SHEP Cooperative Research Group. 1991: Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension. Final results of the Systolic Hypertension in the Elderly Program (SHEP). Journal of the American Medical Association 265(24), 3255–64.

Shercliff, J.A. 1962: The theory of electromagnetic measurement. Cambridge: Cambridge University Press.

Sherman, S.E., D'Agostino, R.B., Cobb, J.L et al. 1994: Does exercise reduce mortality rates in the elderly? Experience from the Framingham Heart Study. American Heart Journal 128(5), 965–72.

Shiburi, C.P., Staessen, J.A., Maseko, M. et al. 2006: Reference values for SphygmoCor measurements in South Africans of African ancestry. American Journal of Hypertension 19, 40–6.

Shim, C.Y., Park, S., Choi, D. et al. 2011: Sex differences in central hemodynamics and their relationship to left ventricular diastolic function. Journal of the American College of Cardiology 57(10), 1226–33.

Shimada, K., Miyashita, H., Kawamoto, A. et al. 1994: Pathophysiology and end-organ damage in elderly hypertensives. Journal of Hypertension 12(suppl. 6), S7–12.

Shimamoto, H. and Shimamoto, Y. 1995: Lisinopril improves aortic compliance and renal flow: comparison with nifedipine. Hypertension 25(3), 327–34.

Shimoni, N., Kaplan, M. and Keidar, S. 2003: Cardiovascular diseases in patients with high levels of plasma high density lipoprotein: association with increased plasma oxidative state. Israel Medical Association Journal 5(10), 702–05.

Shin, S., Park, M.S., Jang, J.H. et al. 2004: Measurement of red blood cell aggregation by analysis of light transmission in a pressure-driven slit flow system. Korea-Australia Rheology Journal 16(3), 129–34.

Shipley, R.E., Gregg, D.E. and Schroeder, E.F. 1943: An experimental study of flow patterns in various peripheral arteries. American Journal of Physiology 138, 718–30.

Shirai, K., Utino, J., Otsuka, K. et al. 2006: A novel blood pressure-independent arterial wall stiffness parameter; cardio-ankle vascular index (CAVI). Journal of Atherosclerosis and Thrombosis 13(2), 101–7.

Shiran, A., Adawi, S., Ganaeem, M. et al. 2009: Accuracy and reproducibility of left ventricular outflow tract diameter measurement using transthoracic when compared with transesophageal echocardiography in systole and diastole. European Journal of Echocardiography 10(2), 319–24.

Shoji, T., Emoto, M., Shinohara, K. et al. 2001: Diabetes mellitus, aortic stiffness, and cardiovascular mortality in end-stage renal disease. Journal of the American Society of Nephrology 12(10), 2117–24.

Shokawa, T., Imazu, M., Yamamoto, H. et al. 2005: Pulse wave velocity predicts cardiovascular mortality: findings from the Hawaii-Los Angeles-Hiroshima study. Circulation Journal 69(3), 259–64.

Shores, J., Berger, K.R., Murphy, E.A. et al. 1994: Progression of aortic dilatation and the benefit of long-term beta-adrenergic blockade in Marfan's syndrome. New England Journal of Medicine 330(19), 1335–41.

Shrestha, I., Takahashi, T., Nomura, E. et al. 2009: Association between central systolic blood pressure, white matter lesions in cerebral MRI and carotid atherosclerosis. Hypertension Research 32, 869–74.

Shroff, G.R., Cen, Y.Y., Duprez, D.A. et al. 2009: Relationship between carotid artery stiffness index, BNP and high-sensitivity CRP. Journal of Human Hypertension 23(12), 783–7.

Sibley, D.H., Millar, H.D., Hartley, C.J. and Whitlow, P.L. 1986: Subselective measurement of coronary blood flow velocity using a steerable Doppler catheter. Journal of the American College of Cardiology 8(6), 1332–40.

Sicard, G.A.M.D. 2009: The impact of a well structured vascular registry in assessing the long-term survival after repair of abdominal aortic aneurysms. Circulation 120, 188–9.

Sie, M.P., Yazdanpanah, M., Mattace-Raso, F.U. et al. 2009: Genetic variation in the renin-angiotensin system and arterial stiffness. The Rotterdam Study. Clinical and Experimental Hypertension 31(5), 389–99.

Siebenhofer, A., Kemp, C.R.W., Sutton, A.J. et al. 1999: The reproducibility of central aortic blood pressure measurements in healthy subjects using applanation tonometry and sphygmocardiography. Journal of Human Hypertension 13, 625–9.

Sierksma, A., Lebrun, C.E., van der Schouw, Y.T. et al. 2004: Alcohol consumption in relation to aortic stiffness and aortic wave reflections: a cross-sectional study in healthy postmenopausal women. Arteriosclerosis, Thrombosis, and Vascular Biology 24, 342–8.

Sievers, C., Klotsche, J., Pieper, L. et al. 2010: Low testosterone levels predict all-cause mortality and cardiovascular events in women: a prospective cohort study in German primary care patients. European Journal of Endocrinology 163, 699–708.

Siewiorek, G.M., Wholey, M.H. and Finol, E.A. 2009: In vitro performance assessment of distal protection filters: pulsatile flow conditions. Journal of Endovascular Therapy 16(6), 735–43.

Sigrist, M.K., Chiarelli, G., Levin, A. et al. 2010: Pulse wave velocity measurements are reproducible in multiple trained observers: a short report. Nephron Clinical Practice 116(1), c60–4.

Simionescu, M. 2007: Implications of early structural-functional changes in the endothelium for vascular disease. Arteriosclerosis, Thrombosis, and Vascular Biology 27(2), 266–74.

Simkus, G.J. and Fitchett, D.H. 1990: Radial arterial pressure measurements may be a poor guide to the beneficial effects of nitroprusside on left ventricular systolic pressure in congestive heart failure. American Journal of Cardiology 66, 323–6.

Simon, A.B. and Zloto, A.E. 1974: Coarctation of the aorta. Longitudinal assessment of operated patients. Circulation 50(3), 456–64.

Simon, A.C., Safar, M.E., Levenson, J.A. et al. 1979a: Systolic hypertension: hemodynamic mechanism and choice of antihypertensive treatment. American Journal of Cardiology 44, 505–11.

Simon, A.C., Safar, M.E., Levenson, J.A. et al. 1979b: An evaluation of large arteries compliance in man. American Journal of Physiology 237, H550–4.

Simon, A.C., Levenson, J.A., Levy, B.Y. et al. 1982: Effect of nitroglycerin on peripheral large arteries in hypertension. British Journal of Clinical Pharmacology 14(2), 241–6.

Simon, A.C., Laurent, S., Levenson, J.A. et al. 1983a: Estimation of forearm arterial compliance in normal and hypertensive men from simultaneous pressure and flow measurements in the brachial artery, using a pulsed Doppler device and a first-order arterial model during diastole. Cardiovascular Research 17, 331–8.

Simon, A.C., Safar, M.E., Levenson, J.A. et al. 1983b: Action of vasodilating drugs on small and large arteries of hypertensive patients. Journal of Cardiovascular Pharmacology 5, 626–31.

Simon, A.C., Levenson, J.A., Safar, A.M. et al. 1984: ACE inhibition and brachial artery haemodynamics in hypertension. British Journal of Clinical Pharmacology 18(suppl. 2), S2435–7.

Simon, A.C., Levenson, J., Bouthier, J.D. et al. 1985: Effects of chronic administration of Enalapril and Propranolol on large arteries in essential hypertension. Journal of Cardiovascular Pharmacology 7, 856–61.

Simon, A.C., Pithois, M.I. and Levenson, J. 1991b: Physiopharmacological approach to mechanical factors of hypertension in the atherosclerotic process. Journal of Human Hypertension 5(suppl. 1), 15–21.

Simon, G. 2004: Pathogenesis of structural vascular changes in hypertension. Journal of Hypertension 22, 3–10.

Simon, A., Chironi, G. and Megnien, J.L. 2010a: Relevance of screening symptom-free population for coronary and noncoronary calcification burden. Hypertension 55(4), 840–1.

Simon, A., Megnien, J.L. and Chironi, G. 2010b: The value of carotid intima-media thickness for predicting cardiovascular risk. Arteriosclerosis, Thrombosis and Vascular Biology 30, 182–5.

Simpson, C.F., Kling, J.M. and Palmer, R.F. 1970: β-Aminopropionitrile-induced dissecting aneurysms of turkeys: treatment with propranolol. Toxicology and Applied Pharmacology 16, 143–53.
Singh, T.P., Almond, C. and Kantor, P.F. 2010: Are angiotensin-converting enzyme inhibitors and beta-blockers ineffective in children with dilated cardiomyopathy and heart failure? Journal of the American College of Cardiology 56, 823–4.
Singhal, S., Henderson, R., Horsfield, K. et al. 1973: Morphometry of the human pulmonary arterial tree. Circulation Research 33, 190–97.
Sipahi, I., Tuzcu, E.M., Schoenhagen, P. et al. 2006: Static and serial assessments of coronary arterial remodeling are discordant: an intravascular ultrasound analysis from the Reversal of Atherosclerosis with Aggressive Lipid Lowering (REVERSAL) trial. American Heart Journal 152(3), 544–50.
Sipkema, P. and Westerhof, N. 1975: Effective length of the arterial system. Annals of Biomedical Engineering 3(3), 296–307.
Sipkema, P., Westerhof, N. and Randall, O.S. 1980: The arterial system characterised in the time domain. Cardiovascular Research 14, 270–9.
Siscovick, D.S., Weiss, N.S., Fletcher, R.H. et al. 1984: The incidence of primary cardiac arrest during vigorous exercise. New England Journal of Medicine 311, 874–7.
Skalak, R., Ozkaya, N. and Secomb, T.W. 1986: Biomechanics of capillary blood flow. In: Schmid-Schonbein, G.W. (ed.), Frontiers in biomechanics. New York: Springer, pp. 299–313.
Skulstad, H., Edvardsen, T., Urheim, S. et al. 2002: Postsystolic shortening in ischemic myocardium: active contraction or passive recoil? Circulation 106, 718–24.
Skurnick, J.H., Aladjem, M. and Aviv, A. 2010: Sex differences in pulse pressure trends with age are cross-cultural. Hypertension 55, 40–7.
Skyler, J.S., Bergenstal, R., Bonow, R.O. et al. 2009: Intensive glycemic control and the prevention of cardiovascular events: implications of the ACCORD, ADVANCE, and VA Diabetes Trials. A position statement of the ADA and a scientific statement of the ACC Foundation and the AHA. Circulation 119, 351–7.
Sleight, P. and Yusuf, S. 2002: Who is fooling us? Lancet 360(9336), 873–4.
Slife, D.M., Latham, R.D., Sipkema, P. et al. 1990: Pulmonary arterial compliance at rest and exercise in normal humans. American Journal of Physiology 258, H1823–8.
Slørdahl, S.A., Piene, H., Linker, D.T. et al. 1991: Segmental aortic wall stiffness from intravascular ultrasound at normal and subnormal aortic pressure in pigs. Acta Physiologica Scandinavica 143, 227–32.
Sloth, E., Kruse, M., Houlind, K.C. et al. 1997: The impact of ischemic heart disease on main pulmonary artery blood flow patterns, a comparison between magnetic resonance phase velocity mapping and transesophageal color Doppler. Cardiovascular Research 36(3), 377–85.
Smadja, D.M., Gaussem, P., Mauge, L. et al. 2009: Circulating endothelial cells: a new candidate biomarker of irreversible pulmonary hypertension secondary to congenital heart disease. Circulation 119, 374–81.
Smellie, W.S. 2008: What is a significant difference between sequential laboratory results? Journal of Clinical Pathology 61(4), 419–25.
Smirk, F.H. 1957: High arterial pressure. Oxford: Blackwell.
Smirk, F.H. and Alstad, K.S. 1951: Treatment of arterial hypertension by penta- and hexamethonium salts. British Medical Journal 1(4717), 1217–28.
Smith, A.R. and Hagen, T.M. 2003: Vascular endothelial dysfunction in aging: loss of Akt-dependent endothelial nitric oxide synthase phosphorylation and partial restoration by (R)-alpha-lipoic acid. Biochemical Society Transactions 31(Pt 6), 1447–9.
Smith, G.L., Masoudi, F.A., Vaccarino, V. et al. 2003: Outcomes in heart failure patients with preserved ejection fraction: mortality, readmission, and functional decline. Journal of the American College of Cardiology 41, 1510–18.
Smith, J.C., Page, M.D., John, R. et al. 2000: Augmentation of central arterial pressure in mild primary hyperparathyroidism. Journal of Clinical Endocrinology and Metabolism 85(10), 3515–9.
Smith, K.L., Cameron, P.A., Peeters, A. et al. 2000: Automatic external defibrillators, changing the way we manage ventricular fibrillation. Medical Journal of Australia 172, 384–8.
Smith, M.L., Long, D.S., Damiano, E.R. et al. 2003: Near-wall micro-PIV reveals a hydrodynamically relevant endothelial surface layer in venules in vivo. Biophysical Journal 85, 637–45.
Smith, S.C. Jr, Greenland, P. and Grundy, S.M. 2000: AHA Conference Proceedings. Prevention conference V: beyond secondary prevention: identifying the high-risk patient for primary prevention: executive summary. American Heart Association. Circulation 101(1), 111–16.
Smith, S.C., Allen, J., Blair, S.N. et al. 2006: AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update. Circulation 113, 2363–72.
Smith, S.M., Samani, N.J., Sammons, E.L. et al. 2008: Influence of non-invasive measurements of arterial blood pressure in frequency and time-domain estimates of cardiac baroreflex sensitivity. Journal of Hypertension 26(1), 76–82.
Smith, T.W. 1996. Cardiovascular therapeutics. Philadelphia: W.B. Saunders.
Smith, T.W., Braunwald, E. and Kelly, R.A. 1992: The management of heart failure. In: Braunwald, E. (ed.), Heart disease – a textbook of cardiovascular medicine, 4th edn. Philadelphia: W.B. Saunders, pp. 464–519.
Smith, T.W., Kelly, R.A., Stevenson, L.W. et al. 1997: The management of heart failure. In: Braunwald, E. (ed.), Heart disease: a textbook of cardiovascular medicine, 5th edn. Philadelphia: W.B. Saunders, pp. 492–515.
Smith, W.M. 1994: Large arteries and epidemiological aspects of hypertension. In: Safar, M.E. and O'Rourke, M.F. (eds), The arterial system in hypertension. Dordrecht: Kluwer Academic, pp. 107–18.
Smulyan, H. 2007: Nitrates, arterial function, wave reflections and coronary heart disease. Advances in Cardiology 44, 302–14.
Smulyan, H., Csermely, T.J., Mookherjee, S. et al. 1983: Effect of age on arterial distensibility in asymptomatic humans. Arteriosclerosis 3, 199–205.
Smulyan, H., Vardan, S., Griffiths, A. et al. 1984: Forearm arterial distensibility in systolic hypertension. Journal of the American College of Cardiology 3(2), 387–93.
Smulyan, H., Mookherjee, S. and Warner, R.A. 1986: The effect of nitroglycerin on forearm arterial distensibility. Circulation 73, 1264–9.
Smulyan, H., Marchais, S.J., Pannier, B. et al. 1998: Influence of body height on pulsatile arterial hemodynamic data. Journal of the American College of Cardiology 31(5), 1103–9.
Smulyan, H., Asmar, R.G., Rudnicki, A. et al. 2001: Comparative effects of aging in men and women on the properties of the arterial tree. Journal of the American College of Cardiology 37, 1374–80.
Smulyan, H., Siddiqui, D.S., Carlson, R.J. et al. 2003: Clinical utility of aortic pulses and pressures calculated from applanated radial-artery pulses. Hypertension 42(2), 150–55.
Smulyan, H., Sheehe, P.R. and Safar, M.E. 2008: A preliminary evaluation of the mean arterial pressure as measured by cuff oscillometry. American Journal of Hypertension 21, 166–171.
Snellen, H.A. 1980: E.J. Marey and cardiology. Rotterdam: Kooyker.
Snellen, H.A. 1983: Two pioneers of electrocardiogram, the correspondence between Einthoven and Lewis from 1908–1926. Rotterdam: Donker Academic Publication.
Snellen, H.A. 1984: History of cardiology. Rotterdam: Donker Academic Publication.
Snow, V., Weiss, K.B., Mottur-Pilson, C. et al. 2003: The evidence base for tight blood pressure control in the management of type 2 diabetes mellitus. Annals of Internal Medicine 138, 587–92.
Soderstrom, S., Nyberg, G., O'Rourke, M.F. et al. 2002: Can a clinically useful aortic pressure wave be derived from a radial pressure wave? British Journal of Anaesthesia 88, 481–8.
Soga, J., Nakamura, S., Nishioka, K. et al. 2008: Relationship between augmentation index and flow-mediated vasodilation in the brachial artery. Hypertension Research 31(7), 1293–8.
Soiza, R.L., Davie, M.M. and Williams, D.J.P. 2010: Use of the augmentation index to predict short-term outcome after acute ischemic stroke. American Journal of Hypertension 23, 737–42.
Sokolnikoff, I.S. 1939. Advanced calculus. New York: McGraw Hill.

Solomon, C.G. 2003: Reducing cardiovascular risk in type 2 diabetes. New England Journal of Medicine 348, 457–9.
Solomon, S.D., Foster, E., Bourgoun, M. et al. 2010: Effect of cardiac resynchronization therapy on reverse remodeling and relation to outcome. Multicenter Automatic Defibrillator Implantation Trial: Cardiac Resynchronization Therapy. Circulation 122, 985–92.
Solomon, S.D., Janardhanan, R., Verma, A. et al. 2007: Effect of angiotensin receptor blockade and antihypertensive drugs on diastolic function in patients with hypertension and diastolic dysfunction: a randomised trial. Lancet 369, 2079–87.
SOLVD Investigators. 1991: Effect of enalapril on survival in patients with reduced left ventricular ejection fractions and congestive heart failure. New England Journal of Medicine 325, 293–302.
SOLVD Investigators. 1992: Effect of enalapril on mortality and the development of heart failure in asymptomatic patients with reduced left ventricular ejection fractions. New England Journal of Medicine 327, 685–91.
Somer, J.C. 1968: Electronic sector scanning for ultrasonic diagnosis. Ultrasonics 6, 153–9.
Somes, G.W., Pahor, M., Shorr, R.I. et al. 1999: The role of diastolic blood pressure when treating isolated systolic hypertension. Archives of Internal Medicine 159, 2004–9.
Somlyo, A.V. and Somlyo, A.P. 1968: Electromechanical and pharmacomechanical coupling in vascular smooth muscle. Journal of Pharmacology and Experimental Therapeutics 159, 129–45.
Sommer, F. and Schulze, W. 2005: Treating erectile dysfunction by endothelial rehabilitation with phosphodiesterase 5 inhibitors. World Journal of Urology 23(6), 385–92.
Sonesson, B., Hansen, F., Stale, H. et al. 1993: Compliance and diameter in the human abdominal aorta – the influence of age and sex. European Journal of Vascular Surgery 7, 690–7.
Sonesson, B., Länne, T., Hansen, F. et al. 1994: Infrarenal aortic diameter in the healthy person. European Journal of Vascular Surgery 8, 89–95.
Song, J.-M., Kim, S.-D., Kim, J.-H. et al. 2007: Long-term predictors of descending aorta aneurysmal change in patients with aortic dissection. Journal of the American College of Cardiology 50, 799–804.
Sonnenblick, E.H. 1962: Force–velocity relations in mammalian heart muscle. American Journal of Physiology 202, 931.
Sonnenblick, E.H. and Strobeck, J.D. 1977: Derived indices of ventricular and myocardial function. New England Journal of Medicine 296, 978–82.
Sorensen, K.E., Celermajer, D.S., Spiegelhalter, D.J. et al. 1995: Non-invasive measurement of human endothelium dependent arterial responses: accuracy and reproducibility. British Heart Journal 74(3), 247–53.
Sotiriou, C.G. and Cheng, J.W. 2000: Beneficial effects of statins in coronary artery disease – beyond lowering cholesterol. Annals of Pharmacotherapy 34(12), 1432–9.
Souza, R. 2008: Assessment of compliance in pulmonary arterial hypertension. European Heart Journal 29, 1603–4.
Sowers, J.R. and Bakris, G.L. 2000: Antihypertensive therapy and the risk of type 2 diabetes mellitus. New England Journal of Medicine 342, 969–70.
Sowers, J.R., Epstein, M. and Frohlich, E.D. 2001: Diabetes, hypertension, and cardiovascular disease, an update (Review). Hypertension 37, 1053–9.
Spaan, J., Kolyva, C., van den Wijngaard, J. et al. 2008: Coronary structure and perfusion in health and disease. Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences 366(1878), 3137–53.
Spaan, J.A.E., Breuls, N.P.W. and Laird, J.D. 1981: Diastolic–systolic coronary flow differences are caused by intramyocardial pump action in the anesthetized dog. Circulation Research 49, 584–93.
Speden, R.N. 1973: The maintenance of arterial constriction at different transmural pressures. Journal of Physiology 229, 361–81.
Speden, R.N. 1975: Muscle load and constriction of the rabbit ear artery. Journal of Physiology 248, 531–53.
Spence, D.J. 2004: Preventing dementia by treating hypertension and preventing stroke. Hypertension 44, 20–21.
Spence, J.D., Sibbald, W.J. and Cape, R.D. 1978: Pseudohypertension in the elderly. Clinical Science and Molecular Medicine (suppl. 4), 399s–402s.
Spencer, K.T., Lang, R.M., Neumann, A. et al. 1991: Doppler and electromagnetic comparisons of instantaneous aortic flow characteristics in primates. Circulation Research 68, 1369–77.
Spencer, M.P. and Denison, A.B. 1959: The square wave electromagnetic flowmeter: theory of operation and design of magnetic probes for clinical and experimental application. IRE Transactions on Medical Electronics 6, 220–8.
Spencer, M.P. and Denison, A.B. 1963: Pulsatile blood flow in the vascular system. In: American Physiology Society Handbook of Physiology Section 2: Circulation, vol. 2. Washington, DC: American Physiological Society, pp. 839–64.
Spencer, M.P. and Greiss, F.C. 1962: Dynamics of ventricular ejection. Circulation Research 10, 274–9.
Sperling, W., Bauer, R.D., Busse, R. et al. 1975: The resolution of arterial pulses into forward and backward waves as an approach to the determination of the characteristic impedance. Pflugers Archiv 355(3), 217–27.
Spieker, L.E., Hurlimann, D., Ruschitzka, F. et al. 2002: Mental stress induces prolonged endothelial dysfunction via endothelin-A receptors. Circulation 105, 2817–20.
Spina, M., Garbisa, S., Hinnie, J. et al. 1983: Age-related changes in composition and mechanical properties of the tunica media of the upper thoracic human aorta. Arteriosclerosis 3(1), 64–76.
Spragg, D.D., Dong, J., Fetics, B.J. et al. 2010: Optimal left ventricular endocardial pacing sites for cardiac resynchronization therapy in patients with ischemic cardiomyopathy. Journal of the American College of Cardiology 56(10), 774–81.
Springer, F., Günther, R.W. and Schmitz-Rode, T. 2008: Aneurysm sac pressure measurement with minimally invasive implantable pressure sensors: an alternative to current surveillance regimes after EVAR? Cardiovascular and Interventional Radiology 31(3), 460–7.
Springer, S., Fife, A., Lawson, W. et al. 2001: Psychosocial effects of enhanced external counterpulsation in the angina patient: a second study. Psychosomatics 42(2), 124–32.
St John Sutton, M.G. and Ritman, E.L. 1982: Effects of progressive reduction in coronary blood flow on regional and global left ventricular contraction and relaxation during normal and increased afterload: a roentgen videometric study. Cardiovascular Research 16, 535–45.
Stacy, R.W., Williams, D.T., Worden, R.E. et al. 1955: Essentials of biological and medical physics. New York: McGraw-Hill.
Stadler, A.A., Zilow, E.P. and Linderkamp, O. 1990: Blood viscosity and optimal hematocrit in narrow tubes. Biorheology 27(5), 779–88.
Stadler, R.W., Ibrahim, S.F. and Lees, R.S. 1998: Measurement of the time course of peripheral vasoactivity: results in cigarette smokers. Atherosclerosis 138(1), 197–205.
Stadler, R.W., Karl, W.C. and Lees, R.S. 1996a: New methods for arterial diameter measurement from B-mode images. Ultrasound in Medicine and Biology 22(1), 25–34.
Stadler, R.W., Karl, W.C. and Lees, R.S. 1996b: The application of echo-tracking methods to endothelium-dependent vasoreactivity and arterial compliance measurements. Ultrasound in Medicine and Biology 22, 35–42.
Stadler, R.W., Taylor, J.A. and Lees, R.S. 1997: Comparison of B-mode, M-mode and echo-tracking methods for measurement of the arterial distension waveform. Ultrasound in Medicine and Biology 23(6), 879–87.
Staessen, J.A. 2002: Definition of new targets in cardiovascular prevention from young into old age (Editorial). European Heart Journal 23, 507–9.
Staessen, J.A., Fagard, R., Thijs, L. et al. 1997: Randomised double-blind comparison of placebo and active treatment for older patients with isolated systolic hypertension. Lancet 350, 757–64.
Staessen, J.A., Gasowski, J. and Wang, J.G. 2000a: Outcome trials in older patients with isolated systolic hypertension. European Heart Journal 2, D13–16.
Staessen, J.A., Gasowski, J., Wang, J.G. et al. 2000b: Risks of untreated and treated isolated systolic hypertension in the elderly, meta-analysis of outcome trials. Lancet 355, 865–72.

Staessen, J.A., Wang, J.G. and Thijs, L. 2001b: Cardiovascular risk and blood pressure reduction, a meta-analysis. Lancet 358, 1305–15.

Staessen, J.A., van der Heijden-Spek, J.J., Safar, M.E. et al. 2001c: Menopause and the characteristics of the large arteries in a population study. Journal of Human Hypertension 15, 511–18.

Staessen, J.A., Wang, J. and Birkenhager, W.H. 2003: Outcome beyond blood pressure control? European Heart Journal 24, 504–14.

Staessen, J.A., Richard, T. and Birkenhager, W.H. 2007: Less atherosclerosis and lower blood pressure for a meaningful life perspective with more brain. Hypertension 49, 389–400.

Staessen, J.A., Richart, T., Wang, Z. et al. 2010: Implications of recently published trials of blood pressure lowering drugs in hypertensive or high-risk patients. Hypertension 55, 819–31.

Stale, H., Gennser, G. and Marsal, K. 1990: Blood flow velocity and pulsatile diameter changes in the fetal descending aorta: a longitudinal study. American Journal of Obstetrics and Gynecology 163, 26–9.

Stale, H., Marsál, K., Gennser, G. et al. 1991: Aortic diameter pulse waves and blood flow velocity in the small, for gestational age, fetus. Ultrasound in Medicine and Biology 17, 471–8.

Stamatelopoulos, K.S., Manios, E., Barlas, G. et al. 2010: Time rate of blood pressure variation is superior to central hemodynamics as an associate of carotid intima media thickness. Journal of Hypertension 28, 51–8.

Stamler, R., Stamler, J., Riedlinger, W.F. et al. 1978: Weight and blood pressure. Findings in hypertension screening of 1 million Americans. Journal of the American Medical Association 240(15), 1607–10.

Stamler, J., Daviglus, M.L., Garside, D.B. et al. 2000a: Relationship of baseline serum cholesterol levels in 3 large cohorts of younger men to long-term coronary, cardiovascular, and all-cause mortality and to longevity. Journal of the American Medical Association 284(3), 311–18.

Stamos, T.D. and Rosenson, R.S. 1999: Low high density lipoprotein levels are associated with an elevated blood viscosity. Atherosclerosis 146(1), 161–5.

Stampfer, M.J. and Malinow, M.R. 1995: Can lowering homocysteine levels reduce cardiovascular risk? New England Journal of Medicine 332(5), 328–9.

Stangl, V., Witzel, V., Baumann, G. et al. 2008: Current diagnostic concepts to detect coronary artery disease in women. European Heart Journal 29(6), 707–17.

Starling, E.H. 1918: The Linacre lecture on the law of the heart. London: Longman.

Starling, M.R. 1993: Left ventricular–arterial coupling relations in the normal human heart. American Heart Journal 125, 1659–66.

Starling, R.C., McCarthy, P.M., Buda, T. et al. 2000: Results of partial left ventriculectomy for dilated cardiomyopathy. Journal of the American College of Cardiology 36, 2098–103.

Starr, A.I. 1957: Studies made by simulating systole at necropsy. State of peripheral circulation in cadavers. Journal of Applied Physiology 11, 174–80.

Stary, H.C. 2003. Atlas of atherosclerosis: progression and regression, 2nd edn. London: Parthenon Publishing.

Stary, H.C., Blankenhorn, D.H., Chandler, A.B. et al. 1992: A definition of the intima of human arteries and of its atherosclerosis-prone regions: a report from the committee on vascular lesions of the council on arteriosclerosis, American Heart Association. Circulation 85(1), 391–405.

Stary, H.C., Chandler, A.B., Dinsmore, R.E. et al. 1995: A definition of advanced types of atherosclerotic lesions and a histologic classification of atherosclerosis. A report from the Committee on Vascular Lesions of the Council on Arteriosclerosis, American Heart Association. Arteriosclerosis, Thrombosis and Vascular Biology 15(9), 1512–31.

Staub, D., Schinkel, A.F., Coll, B. et al. 2010: Contrast-enhanced ultrasound imaging of the vasa vasorum: from early atherosclerosis to the identification of unstable plaques. Journal of the American College of Cardiology Imaging 3(7), 761–71.

Stead, E. 1965: Pressures and pulses. Circulation 31, 481–4.

Steele, J.M. 1941: Evidence for general distribution of peripheral resistance in coarctation of the aorta: report of three cases. Journal of Clinical Investigation 20, 473–80.

Stefanadis, C., Wooley, C.F., Bush, C.A. et al. 1987: Aortic distensibility abnormalities in coronary artery disease. American Journal of Cardiology 59, 1300–4.

Stefanadis, C., Wooley, C.F., Bush, C.A. et al. 1989: Segmental analysis of the ascending aorta: Definition of normality and classification of aortic dilatation. Journal of Cardiology 19, 945–53.

Stefanadis, C., Stratos, C., Boudoulas, H. et al. 1990: Distensibility of the ascending aorta: comparison of invasive and non-invasive techniques in healthy men and in men with coronary artery disease. European Heart Journal 11, 990–6.

Stefanadis, C., Vlachopoulos, C., Karayannocos, P. et al. 1995a: Effect of vasa vasorum flow on structure and function of the aorta in experimental animals. Circulation 91, 2669–78.

Stefanadis, C., Stratos, C., Vlachopoulos, C. et al. 1995b: Pressure–diameter relationship of the human aorta – a new method of determination by the application of a special ultrasound dimension catheter. Circulation 92, 2210–19.

Stefanadis, C., Tsiamis, E., Vlachopoulos, C. et al. 1997: Unfavorable effect of smoking on the elastic properties of the human aorta. Circulation 95, 31–8.

Stefanadis, C., Vlachopoulos, C., Tsiamis, E. et al. 1998b: Unfavorable effects of passive smoking on aortic function in men. Annals of Internal Medicine 128, 426–34.

Stefanadis, C., Diamantopoulos, L., Vlachopoulos, C. et al. 1999a: Thermal heterogeneity within human atherosclerotic coronary arteries detected in vivo: a new method of detection by application of a special thermography catheter. Circulation 99, 1965–71.

Stefanadis, C., Tsiamis, E., Dernellis, J. et al. 1999b: Effect of estrogen on aortic function in postmenopausal women. American Journal of Physiology 276(2 Pt 2), H658–62.

Stegall, H.F. 1967: A simple, inexpensive, sinusoidal pressure generator. Journal Applied Physiology 22(3), 591–2.

Stegall, H.F. 1974: Ultrasonic measurement of organ dimensions. In: Reneman, R.S. (ed.), Cardiovascular applications of ultrasound. Amsterdam: North Holland, pp. 150–61.

Stegall, H.F., Rushmer, R.F. and Baker, D.W. 1966: A transcutaneous ultrasonic blood velocity meter. Journal of Applied Physiology 21, 707–11.

Stehbens, W.E. 1975: The role of hemodynamics in the pathogenesis of atherosclerosis. Progress in Cardiovascular Diseases 18, 89–103.

Stehbens, W.E. 1979: Chronic changes in the walls of experimentally produced aneurysms in sheep. Surgery, Gynecology and Obstetrics 149, 43–8.

Stehbens, W.E. 1994: The experimental and iatrogenic production. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Switzerland: Harwood Academic Publishers, pp. 253–68.

Stein, J.H. and Rosenson, R.S. 1998: Treatment of severe hypertriglyceridemia lowers plasma viscosity. Atherosclerosis 137(2), 401–5.

Stein, J.H., Korcarz, C.E., Hurst, R.T. et al; American Society of Echocardiography Carotid Intima-Media Thickness Task Force. 2008: Use of carotid ultrasound to identify subclinical vascular disease and evaluate cardiovascular disease risk: a consensus statement from the American Society of Echocardiography Carotid Intima-Media Thickness Task Force. Endorsed by the Society for Vascular Medicine. Journal of the American Society of Echocardiography 21, 93–111; quiz 189–90.

Stein, P.D. 1981. A physical and physiologic basis for the interpretation of cardiac auscultation: evaluations based primarily on second sound and ejection murmurs. Mount Kisco, NY: Futura Publishing.

Stein, P.D., Sabbah, H.N. and Blick, E.F. 1975: Contribution of erythrocytes to turbulent blood flow. Biorheology 12, 293–9.

Stein, P.D. and Sabbah, H.N. 1976: Turbulent blood flow in the ascending aorta of humans with normal and diseased aortic valves. Circulation Research 39, 58–65.

Stein, P.D., Sabbah, H.N. and Pitha, J.V. 1977: Continuing disease process of calcific aortic stenosis: role of microthrombi and turbulent flow. American Journal Cardiology 39, 159–63.

Stein, P.D., Sabbah, H.N. and Anbe, D.T. 1979a: Comparison of disturbances of flow in the main pulmonary artery and ascending aorta of man. Biorheology 16, 357–62.

Stein, P.D., Sabbah, H.N., Anbe, D.T. et al. 1979b: Blood velocity in the abdominal aorta and common iliac artery of man. Biorheology 16, 249–55.

Stein, P.D., Walburn, F.J. and Blick, E.F. 1980: Damping effect of distensible tubes on turbulent flow: implications in the cardiovascular system. Biorheology 17, 275–81.

Stein, P.D., Walburn, F.J. and Sabbah, H.N. 1982: Turbulent stresses in the region of aortic and pulmonary valves. Journal of Biomechanical Engineering 104, 238–44.

Stein, P.D., Sabbah, H.N. and Marzilli, M. 1985: Intramyocardial pressure and coronary extravascular resistance. Journal of Biomechanical Engineering 107, 46–50.

Steingart, R.M., Meller, J., Barovick, J. et al. 1980: Pulsed Doppler echocardiographic measurement of beat-to-beat changes in stroke volume in dogs. Circulation 62, 542–8.

Steinke, W., Kloetzsch, C. and Hennerici, M. 1990: Carotid artery disease assessed by color Doppler flow imaging: correlation with standard Doppler sonography and angiography. AJNR: American Journal of Neuroradiology 11, 259–66.

Stelliou, V. 1993: Experimental investigation of the interaction between arterial blood pressure oscillations and body movement during running in humans. M Biomed Eng thesis, University of New South Wales, Australia.

Stensland-Bugge, E., Bønaa, K.H. and Joakimsen, O. 1997: Reproducibility of ultrasonographically determined intima-media thickness is dependent on arterial wall thickness. The Tromsø Study. Stroke 28, 1972–80.

Stepp, D.W., Merkus, D., Nishikawa, Y. et al. 2001: Nitric oxide limits coronary vasoconstriction by a shear stress-dependent mechanism. American Journal of Physiology and Heart Circulatory Physiology 281(2), H796–803.

Stergiopulos, N., Westerhof, B. and Westerhof, N. 1998: Physical basis of pressure transfer from periphery to aorta: a model-based study. American Journal of Physiology 274, H1386–92.

Stergiopulos, N., Westerhof, B.E. and Westerhof, N. 1999: Total arterial inertance as the fourth element of the windkessel model. American Journal of Physiology 276, H81–8.

Stergiou, G.S., Giovas, P.P., Neofytou, M.S. et al. 2006: Validation of the Microlife BPA100 Plus device for self-home blood pressure measurement according to the International Protocol. Blood Pressure Monitoring 11(3), 157–60.

Stevanov, M., Baruthio, J., Gounot, D. et al. 2001: In vitro validation of MR measurements of arterial pulse-wave velocity in the presence of reflected waves. Journal of Magnetic Resonance Imaging 14(2), 120–7.

Stevens, C.M., Meehan, J.P. and Raden, R.D. 1973: Blood pressure measurement with chronically implanted, intravascular transducers. In: McCutcheon, E.P. (ed.), Chronically implanted cardiovascular instrumentation. New York: Academic Press, pp. 235–45.

Stevenson, L.W. 2010: Counting performance with therapies for heart failure: aiming for quality or quantity? Circulation 122, 561–6.

Stevenson, L.W. and Rose, E. 2003: Left ventricular assist devices: bridges to transplantation, recovery, and destination for whom? Circulation 108, 3059–63.

Stewart, A.D., Jiang, B., Millasseau, S.C. et al. 2006: Acute reduction of blood pressure by nitroglycerin does not normalize large artery stiffness in essential hypertension. Hypertension 48(3), 404–10.

Stewart, A.D., Millasseau, S.C., Kearney, M.T. et al. 2003: Effects of inhibition of basal nitric oxide synthesis on carotid-femoral pulse wave velocity and augmentation index in humans. Hypertension 42, 915–8.

Stewart, K.J. 2002: Exercise training and the cardiovascular consequences of type 2 diabetes and hypertension: plausible mechanisms for improving cardiovascular health. Journal of the American Medical Association 288, 1622–32.

Stewart, K.J., Bacher, A.C., Turner, K.L. et al. 2005: Effect of exercise on blood pressure in older persons: a randomized controlled trial. Archives of Internal Medicine 165, 756–62.

Stewart, R., Xue, Q.-L., Masaki, K. et al. 2009: Change in blood pressure and incident dementia. A 32-year prospective study. Hypertension 54, 233–40.

Stojanovic, M.M., O'Brien, E., Lyons, S. and Stanton, A.V. 2003: Silent myocardial ischemia in treated hypertensives with and without left ventricular hypertension. Blood Pressure Monitoring 8, 45–51.

Stokes, G. 1845: Trans. Cambridge Phil. Soc. 8. Cited by Rouse, H. and Ince, S., History of Hydraulics 1980. Ames, Ia: University of Iowa Publications.

Stokes, G.S., Barin, E.S. and Gilfillan, K.L. 2003: Effects of isosorbide mononitrate and AII inhibition on pulse wave reflection in hypertension. Hypertension 41, 297–301.

Stokes, G.S., Ryan, M., Brnabic, A. et al. 1999: A controlled study of the effects of isosorbide mononitrate on arterial blood pressure and pulse wave form in systolic hypertension. Journal of Hypertension 17, 1767–73.

Stolz, E., Kaps, M., Kern, A. et al. 1999: Transcranial color-coded duplex sonography of intracranial vens and sinuses in adults: reference data from 130 volunteers. Stroke 30, 1070–5.

Stone, D.N. and Dujardin, J.P.L. 1984: Changes in smooth muscle tone influence characteristic impedance of the aorta. American Journal of Physiology 246, H1–7.

Stone, H.L. 1973: Implantation of solid state pressure transducers. In: McCutcheon, E.P. (ed.), Chronically implanted cardiovascular instrumentation. New York: Academic Press, pp. 229–33.

Stone, P.H. 2004: Triggering myocardial infarction. New England Journal of Medicine 351, 1716–8.

Stone, P.H., Muller, J.E., Turi, Z.G. et al. 1983: Efficacy of nifedipine therapy in patients with refractory angina pectoris: significance of the presence of coronary vasospasm. American Heart Journal 106, 644–52.

Stone, P.H., Coskun, A.U., Yeghiazarians, Y. et al. 2003: Prediction of sites of coronary atherosclerosis progression: in vivo profiling of endothelial shear stress, lumen, and outer vessel wall characteristics to predict vascular behavior. Current Opinion in Cardiology 18(6), 458–70.

Stone, P.H., Coskun, A.U., Kinlay, S. et al. 2007: Regions of low endothelial shear stress are the sites where coronary plaque progresses and vascular remodelling occurs in humans: an in vivo serial study. European Heart Journal 28(6), 705–10.

Strain, W.D., Chaturvedi, N., Nihoyannopoulos, P. et al. 2005: Differences in the association between type 2 diabetes and impaired microvascular function among Europeans and African Caribbeans. Diabetologia 48(11), 2269–77.

Stramba-Badiale, M. 2010: Women and research on cardiovascular diseases in Europe: a report from the European Heart Health Strategy (EuroHeart) project. European Heart Journal 31, 1677–81.

Stramm, R.B. and Martin, R.P. 1983: Quantification of pressure gradients across stenotic valves by Doppler ultrasound. Journal of the American College of Cardiology 2, 707–18.

Strandness, D.E.J. and Sumner, D.S. 1975. Hemodynamics for surgeons. New York: Grune and Stratton.

Stratos, C., Stefanadis, C. and Kallikazaros, I. 1992: Ascending aorta distensibility abnormalities in hypertensive patients and response to nifedipine administration. American Journal of Medicine 93, 505–12.

Stratton, J.R., Levy, W.C., Cerqueira, M.D. et al. 1994: Cardiovascular responses to exercise; effects of aging and exercise training in healthy men. Circulation 89(4), 1648–55.

Strök, T.V., Möckel, M., Eichstädt, H. et al. 1991: Noninvasive assessment by pulsed Doppler ultrasound of left ventricular filling behavior in long distance runners during marathon race. American Journal of Cardiology 68, 1237–41.

Strózecki, P., Adamowicz, A., Włodarczyk, Z. et al. 2010: Factors associated with increased arterial stiffness in renal transplant recipients. Medical Science Monitor 16(6), CR301–6.

Struijker-Boudier, H.A.J., Baumann, M., Cohuet, G. et al. 2006: Large arteries, microcirculation and the mechanism of hypertension. In: Safar, M.E. and O'Rourke, M.F. (eds), Handbook of hypertension. Edinburgh: Elsevier, pp. 21–39.

Stuart, J. and Kenny, M.W. 1980: Blood rheology. Journal of Clinical Pathology 33(5), 417–29.

Studer, U., Fricke, G. and Scheu, H. 1970: Testing of an improved ultrasound flowmeter: technical description and results of testing in vitro. Cardiovascular Research 4, 380–7.

Sudhir, K., MacGregor, J.S., Barbant, S.D. et al. 1993: Assessment of coronary conductance and resistance vessel reactivity in response to nitroglycerin, ergonovine and adenosine: in vivo studies with simultaneous intravascular two-dimensional and Doppler ultrasound. Journal of the American College of Cardiology 21(5), 1261–8.

Studinger, P., Lenard, Z., Kovats, Z. et al. 2003: Static and dynamic changes in carotid artery diameter in humans during and after strenuous exercise. Journal of Physiology 550(Pt 2), 575–83.

Stys, T., Lawson, W.E., Hui, J.C. et al. 2001: Acute hemodynamic effects and angina improvement with enhanced external counterpulsation. Angiology 52(10), 653–8.

Su, H.M., Lee, K.T., Chu, C.S. et al. 2007: Effects of heart rate on brachial-ankle pulse wave velocity and ankle-brachial pressure index in patients without significant organic heart disease. Angiology 58(1), 67–74.

Suga, H. 1979: Total mechanical energy of a ventricle model and cardiac oxygen consumption. American Journal of Physiology 236, H498–505.

Suga, H. 1990: Ventricular energetics. Physiological Reviews 70(2), 247–70.

Suga, H. and Sagawa, K. 1974: Instantaneous pressure–volume relationships and their ratio in the excised, supported canine left ventricle. Circulation Research 35, 117–26.

Suga, H., Sagawa, K. and Shoukas, A.A. 1973: Load independence of the instantaneous pressure–volume ratio of the canine left ventricle and effects of epinephrine and heart rate on the ratio. Circulation Research 32, 314–22.

Sugahara, H. 1968: Pulsatile hemodynamics. Nihon Rinsho 26, 242–51.

Sugawara, J., Otsuki, T., Tanabe, T. et al. 2003: The effects of low-intensity single-leg exercise on regional arterial stiffness. Japanese Journal of Physiology 53(3), 239–41.

Sugawara, J., Hayashi, K., Yokoi, T. et al. 2008: Age-associated elongation of the ascending aorta in adults. JACC. Cardiovascular Imaging 1(6), 739–48.

Sugawara, J., Komine, H., Hayashi, K. et al. 2009: Reduction in alpha-adrenergic receptor-mediated vascular tone contributes to improved arterial compliance with endurance training. International Journal of Cardiology 135(3), 346–52.

Sugawara, J., Hayashi, K. and Tanaka, H. 2010b: Distal shift of arterial pressure wave reflection sites with aging. Hypertension 56, 920–5.

Sugawara, J., Komine, H., Yoshiwaza, M. et al. 2010c: Racial differences in relation between carotid and radial augmentation index. Artery Research 4, 15–18.

Suh, H.S., Park, Y.W., Kang, J.H. et al. 2005: Vascular endothelial dysfunction tested by blunted response to endothelium-dependent vasodilation by salbutamol and its related factors in uncomplicated pre-menopausal obese women. International Journal of Obesity (London) 29(2), 217–22.

Sui, B., Gao, P., Lin, Y. et al. 2008: Assessment of wall shear stress in the common carotid artery of healthy subjects using 3.0-tesla magnetic resonance. Acta Radiologica 49(4), 442–9.

Sukhova, G.K., Williams, J.K. and Libby, P. 2002: Statins reduce inflammation in atheroma of nonhuman primates independent of effects on serum cholesterol. Arteriosclerosis Thrombosis and Vascular Biology 22(9), 1452–8.

Suleiman, M., Aronson, D., Reisner, S.A. et al. 2003: Admission C-reactive protein levels and 30-day mortality in patients with acute myocardial infarction. American Journal of Medicine 115(9), 695–701.

Sumiya, C., Arai, Y., Takayama, M. et al. 2010: Vitamin D deficiency and lifestyle factors in the oldest old. Journal of the American Geriatric Society 58(11), 2242–4.

Sun, P., Dwyer, K.M., Merz, C.N. et al. 2000: Blood pressure, LDL cholesterol, and intima-media thickness: a test of the 'response to injury' hypothesis of atherosclerosis. Arteriosclerosis, Thrombosis and Vascular Biology 20(8), 2005–10.

Sun, Y., Most, A.S., Ohley, W. et al. 1983: Estimation of instantaneous blood flow through a rigid, coronary artery stenosis in anaesthetized domestic swine. Cardiovascular Research 17, 499–504.

Sunagawa, K., Bukhoff, D., Lim, K.D. et al. 1982: Impedance loading servopump system for exercised canine ventricle. American Journal of Physiology 243, H346–50.

Sunagawa, K., Maughan, W.L., Burkhoff, D. et al. 1983: Left ventricular interaction with arterial load studied in isolated canine ventricle. American Journal of Physiology 245, H773–80.

Sunagawa, K., Maughan, W.L. and Sagawa, K. 1985a: Optimal arterial resistance for the maximal stroke work studied in isolated canine left ventricle. Circulation Research 56, 586–95.

Sunagawa, K., Maughan, W.L. and Sagawa, K. 1985b: Stroke volume effect of changing arterial input impedance over selected frequency ranges. American Journal of Physiology 248, H477–84.

Sung, J., Ouyang, P., Bacher, A.C. et al. 2002: Peripheral endothelium-dependent flow-mediated vasodilatation is associated with left ventricular mass in older persons with hypertension. American Heart Journal 144(1), 39–44.

Sung, J., Song, Y.-M., Ebrahim, S. et al. 2009: Fasting blood glucose and the risk of stroke and myocardial infarction. Circulation 119, 812–19.

Superko, H.R. 1998: Did grandma give you heart disease? The new battle against coronary artery disease. American Journal of Cardiology 82(9A), 34Q–46Q.

Sütsch, G., Jenni, R., von Segesser, L. et al. 1991: Predictability of aortic dissection as a function of aortic diameter. European Heart Journal 12, 1247–56.

Sutton-Tyrrell, K., Mackey, R.H., Holubkov, R. et al. 2001a: Measurement variation of aortic pulse wave velocity in the elderly. American Journal of Hypertension 14(5 Pt 1), 463–8.

Sutton-Tyrrell, K., Newman, A., Simonsick, E.M. et al. 2001b: Aortic stiffness is associated with visceral adiposity in older adults enrolled in the study of health, aging, and body composition. Hypertension 38(3), 429–33.

Sutton-Tyrrell, K., Najjar, S.S., Boudreau, R.M. et al. for the Health ABC Study. 2005: Elevated aortic pulse wave velocity, a marker of arterial stiffness, predicts cardiovascular events in well-functioning older adults. Circulation 111, 3384–90.

Suwa, N., Niwa, T. and Fukasuwa, H. 1963: Estimation of intravascular blood pressure gradient by mathematical analysis of arterial casts. Tohoku Journal of Experimental Medicine 79, 168–98.

Suzuki, H., Takeyama, Y., Koba, S. et al. 1994: Small vessel pathology and coronary hemodynamics in patients with microvascular angina. International Journal of Cardiology 43(2), 139–50.

Svardsudd, K. and Wilhelmsen, L. 1980: Change of blood pressure in relation to other variables and to development of hypertensive disease indices in a longitudinal population study. The study of men born in 1913. European Heart Journal 1(5), 355–9.

Svennson, P., de Faire, U., Sleight, P. et al. 2001: Comparative effects of ramipril on ambulatory and office blood pressures: A HOPE substudy. Hypertension 38, e28–32.

Swales, J.D. 1996a: Frederick Akbar Mahomed (1849–1884) pioneer of clinical research. Journal of Human Hypertension 10, 137–42.

Swan, L., Kraidly, M., Vonder Muhll, I. et al. 2010: Surveillance of cardiovascular risk in the normotensive patient with repaired aortic coarctation. International Journal of Cardiology 139, 283–8.

Swedberg, K. 2009: Beta-blockers in worsening heart failure: good or bad? European Heart Journal 30, 2177–9.

Swedberg, K., Pfeffer, M., Granger, C. et al. 1999: Candesartan in heart failure – assessment of reduction in mortality and morbidity (CHARM): rationale and design. Charm-Programme Investigators. Journal of Cardiac Failure 5, 276–82.

Sweitzer, N.K., Shenoy, M., Stein, J.H. et al. 2007: Increases in central aortic impedance precede alterations in arterial stiffness measures in type 1 diabetes. Diabetes Care 30(11), 2886–91.

Swillens, A. and Segers, P. 2008: Assessment of arterial pressure wave reflection: methodological considerations. Artery Research 2, 122–31.

Switzer, D.F. and Nanda, N.C. 1985: Doppler color flow mapping. Ultrasound in Medicine and Biology 11, 403–16.

Syme, D.A., Gamperl, A.K., Braun, M.H. et al. 2006: Wave reflection effects in the central circulation of American alligators (Alligator

mississippiensis): what the heart sees. American Journal of Physiology. Heart and Circulatory Physiology 291(4), H1670–8.
Systolic Hypertension in Elderly Program Cooperative Research Group (SHEP). 1991: Prevention of stroke by antihypertensive drug treatment in older persons with isolated systolic hypertension: final results of the Systolic Hypertension in the Elderly Program (SHEP). Journal of the American Medical Association 265(24), 3255–64.
Systolic Hypertension in Elderly Program Cooperative Research Group (SHEP). 1993: Implications of the systolic hypertension in the elderly program. Hypertension 21, 335–43.
Syyed, R., Reeves, J.T., Welsh, D. et al. 2008: The relationship between the components of pulmonary artery pressure remains constant under all conditions in both health and disease. Chest 133(3), 633–9.
Tabara, Y., Yuasa, T., Oshiumi, A. et al. 2007: Effect of acute and long-term aerobic exercise on arterial stiffness in the elderly. Hypertension Research 30(10), 895–902.
Taddei, S., Virdis, A., Mattei, P. et al. 1995: Aging and endothelial function in normotensive subjects and patients with essential hypertension. Circulation 91(7), 1981–7.
Taddei, S., Virdis, A., Mattei, P. et al. 1997: Hypertension causes premature aging of endothelial function in humans. Hypertension 29(3), 736–43.
Taddei, S., Galetta, F., Virdis, A. et al. 2000: Physical activity prevents age-related impairment in nitric oxide availability in elderly athletes. Circulation 101, 2896–901.
Tadros, T.M., Klein, M.D. and Shapira, O.M. 2009: Ascending aortic dilatation associated with bicuspid aortic valve: pathophysiology, molecular biology, and clinical implications. Circulation 119, 880–90.
Taegtmeyer, H., McNulty, P. and Young, M.E. 2002: Adaptation and maladaptation of the heart in diabetes. Part I: General concepts. Circulation 105, 1727–33.
Taeymans, Y., Théroux, P., Lespérance, J. et al. 1992: Quantitative angiographic morphology of the coronary artery lesions at risk of thrombotic occlusion. Circulation 85, 78–85.
Tahvanainen, A., Taurio, J., Mäki-Jouppi, J. et al. 2006: Increased wall tension in response to vasoconstrictors in isolated mesenteric arterial rings from patients with high blood pressure. Basic and Clinical Pharmacology and Toxicology 99(6), 440–9.
Tajaddini, A., Kilpatrick, D.L., Schoenhagen, P. et al. 2005: Impact of age and hyperglycemia on the mechanical behavior of intact human coronary arteries: an ex vivo intravascular ultrasound study. American Journal of Physiology. Heart and Circulatory Physiology 288(1), H250–5.
Takagi, T., Yoshida, K., Akasaka, T. et al. 1997: Intravascular ultrasound analysis of reduction in progression of coronary narrowing by treatment with pravastatin. American Journal of Cardiology 79(12), 1673–6.
Takazawa, K. 1987: A clinical study of the second component of left ventricular systolic pressure. Journal of the Tokyo Medical College 45, 256–70.
Takazawa, K. 1993: Clinical utility of the acceleration plethysmogram (the second derivative of the plethysmogram for circulatory monitoring). Intensive Care Unit and Coronary Care Unit 17(4), 347–55.
Takazawa, K., Maeda, K., Iida, N. et al. 1988: Acceleration plethysmogram. Current Medical Therapy (Japan) 20, 1716–20.
Takazawa, K., Fujita, M., Yabe, K. et al. 1993a: Clinical usefulness of the second derivative of a plethysmogram (acceleration plethysmogram: APG). Journal of Cardiology 23(suppl. 37), 207–17.
Takazawa, K., Maeda, K., Fujita, M. et al. 1993b: Underestimation of effect of vasodilator agents by peripheral blood pressure measurement: the cause and strategy. Circulation 88(4, pt 2), I–263.
Takazawa, K., O'Rourke, M.F., Fujita, M. et al. 1995a: Estimation of ascending aortic pressure from radial arterial pressure using a generalised transfer function. Therapeutic Research (Japan) 17, 5–14.
Takazawa, K., Tanaka, N., Takeda, K. et al. 1995b: Underestimation of vasodilator effects of nitroglycerin by upper limb blood pressure. Hypertension 26, 520–3.
Takazawa, K., O'Rourke, M.F., Fujita, M. et al. 1996: Estimation of ascending aortic pressure from radial arterial pressure using a generalised transfer function. Zeitschrift für Kardiologie 85(suppl. 3), 137–9.
Takazawa, K., Tanaka, H., Fujita, M. et al. 1998: Assessment of vasoactive agents and vascular aging by the second derivative of photoplethysmogram waveform. Hypertension 32, 365–70.
Takazawa, K., Kobayashi, H., Shindo, N. et al. 2007: Relationship between radial and central arterial pulse wave and evaluation of central aortic pressure using the radial arterial pulse wave. Hypertension Research 30, 219–28.
Taki, A., Hetterich, H., Roodaki, A. et al. 2010: A new approach for improving coronary plaque component analysis based on intravascular ultrasound images. Ultrasound in Medicine and Biology 36(8), 1245–58.
Tall, A.R. 2002: Exercise to reduce cardiovascular risk – how much is enough? New England Journal of Medicine 347(19), 1522–4.
Tan, L.-B., Brilla, C. and Weber, K.T. 1992: Prevention of structural changes in the heart in hypertension by angiotensin converting enzyme inhibition. Journal of Hypertension 10(suppl. 1), S31–4.
Tanaka, A., Kawarabayashi, T., Fukuda, D. et al. 2004: Circadian variation of plaque rupture in acute myocardial infarction. American Journal of Cardiology 93(1), 1–5.
Tanaka, A., Imanishi, T., Kaitabata, H. et al. 2008: Morphology of exertion-triggered plaque rupture in patients with acute coronary syndrome: an optical coherence tomography study. Circulation 118, 2368–73.
Tanaka, H., DeSouza, C. and Seals, D.R. 1998: Absence of age-related increase in central arterial stiffness in physically active women. Arteriosclerosis Thrombosis and Vascular Biology 18, 127–32.
Tanaka, H., Dinenno, F.A., Monahan, K.D. et al. 2000: Aging, habitual exercise, and dynamic arterial compliance. Circulation 102(11), 1270–5.
Tanaka, H., Dinenno, F.A., Monahan, K.D et al. 2001: Carotid artery wall hypertrophy with age is related to local systolic blood pressure in healthy men. Arteriosclerosis, Thrombosis and Vascular Biology 21, 82–7.
Tanaka, A., Shimada, K., Sano, T. et al. 2005: Multiple plaque rupture and C-reactive protein in acute myocardial infarction. Journal of the American College of Cardiology 45(10), 1594–9.
Tang, R., Hennig, M., Thomasson, B. et al. 2000: Baseline reproducibility of B-mode ultrasonic measurement of carotid artery intima-media thickness: the European Lacidipine Study on Atherosclerosis (ELSA). Journal of Hypertension 18, 197–201.
Tangelder, G.J., Slaab, D.W., Muijtjens, A.M.M. et al. 1986: Velocity profiles of blood platelets and red blood cells flowing in arterioles of the rabbit mesentery. Circulation Research 59, 505–14.
Tanriverdi, H., Evrengul, H., Kilic, I.D. et al. 2010: Aortic pressures, stiffness and left ventricular function in coronary slow flow phenomenon. Cardiology 116(4), 261–7.
Tapp, R.J., Sharp, A., Stanton, A.V. et al. 2010: Differential effects of antihypertensive treatment on left ventricular diastolic function: an ASCOT (Anglo-Scandinavian Cardiac Outcomes Trial) Substudy. Journal of the American College of Cardiology 55, 1875–81.
Tarazi, R.C. 1982: The role of the heart in hypertension. Clinical Science 63, 347S–58S.
Tarbell, J.M. and Pahakis, M.Y. 2006: Mechanotransduction and the glycocalyx. Journal of Internal Medicine 259, 339–50.
Taubert, D., Roesen, R. and Schomig, E. 2007: Effect of cocoa and tea intake on blood pressure: a meta-analysis. Archives of Internal Medicine 167, 626–34.
Tavazzi, L. 2001: Towards a more precise definition of heart failure aetiology (Editorial). European Heart Journal 22, 192–5.
Tavel, M.E. 1985. Clinical phonocardiography and external pulse recording, 4th edn. Chicago: Year Book Medical Publishers.
Taviani, V., Patterson, A.J., Graves, M.J. et al. 2010: Accuracy and repeatability of fourier velocity encoded M-mode and two-dimensional cine phase contrast for pulse wave velocity measurement in the descending aorta. Journal of Magnetic Resonance Imaging 31(5), 1185–94.
Taxt, T. and Jirik, R. 2004: Superresolution of ultrasound images using the first and second harmonic signal. IEEE Transactions on Ultrasonics, Ferroelectronics and Frequency Control 51, 163–75.

Taylor, A., Ziesche, S., Yancy, C. et al. 2004: Combination of isosorbide dinitrate and hydralazine in blacks with heart failure. New England Journal of Medicine 351, 2049–57.

Taylor, D.E. and Tukmachi, E.S. 1985: Contribution of internal and external carotid beds to common carotid artery input impedance in the dog. Quarterly Journal of Experimental Physiology 70(2), 177–87.

Taylor, D.E. and Tukmachi, E.S. 1987: Input impedance of the canine vertebral artery. Quarterly Journal of Experimental Physiology 72(2), 171–80.

Taylor, D.O., Edwards, L.B., Boucek, M.M. et al. 2006: Registry of the International Society for Heart and Lung Transplantation: twenty-third official adult heart transplantation report 2006. Journal of Heart and Lung Transplantation 25, 869–79.

Taylor, J. 2010a: Sports and cardiac function 1: exercise is a potent stressor on the heart. European Heart Journal 31, 6–8.

Taylor, J. 2010b: Sports and cardiac function 2: to screen or not to screen athletes for cardiac problems? European Heart Journal 31, 136–8.

Taylor, M.G. 1957a: An approach to the analysis of the arterial pulse wave: I. Oscillations in an attenuating line. Physics in Medicine and Biology 1, 258–69.

Taylor, M.G. 1957b: An approach to the analysis of the arterial pulse wave: II. Fluid oscillations in an elastic tube. Physics in Medicine and Biology 1, 321–9.

Taylor, M.G. 1959a: Wave travel in arteries. PhD thesis, University of London, UK.

Taylor, M.G. 1959b: An experimental determination of the propagation of fluid oscillations in a tube with a visco-elastic wall; together with an analysis of the characteristics required in an electrical analogue. Physics in Medicine and Biology 4, 63–82.

Taylor, M.G. 1959c: The influence of the anomalous viscosity of blood upon its oscillatory flow. Physics in Medicine and Biology 3, 273–90.

Taylor, M.G. 1964: Wave travel in arteries and the design of the cardiovascular system. In: Attinger, E.O. (ed.), Pulsatile blood flow. New York: McGraw-Hill, pp. 343–67.

Taylor, M.G. 1965: Wave travel in a nonuniform transmission line, in relation to pulses in arteries. Physics in Medicine and Biology 10, 539–50.

Taylor, M.G. 1966a: The input impedance of an assembly of randomly branching elastic tubes. Biophysics Journal 6, 29–51.

Taylor, M.G. 1966b: Wave transmission through an assembly of randomly branching elastic tubes. Biophysical Journal 6, 697–716.

Taylor, M.G. 1966c: An introduction to some recent developments in arterial hemodynamics. Australian Annals of Medicine 15, 71–86.

Taylor, M.G. 1966d: Use of random excitation and spectral analysis in the study of frequency dependent parameters of the cardiovascular system. Circulation Research 18, 585–95.

Taylor, M.G. 1967: The elastic properties of arteries in relation to the physiological functioning of the arterial system. Gastroenterology 52, 358–63.

Taylor, M.G. 1969: Arterial impedance and distensibility. In: Fishman, A.P. and Gecht, H.H. (eds), The pulmonary circulation and interstitial space. Chicago: University of Chicago, pp. 341–54.

Taylor, M.G. 1973: Hemodynamics. Annual Review of Physiology 35, 87–116.

Taylor, M.G. 1994: Developments in arterial dynamics. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Chur, Switzerland: Harwood Academic, pp. 1–19.

Taylor, R.C. and Pagliarello, G. 2003: Prophylactic beta-blockade to prevent myocardial infarction perioperatively in high-risk patients who undergo general surgical procedures. Canadian Journal of Surgery 46, 216–22.

Taylor, S.H. and Donald, K.W. 1960: Circulation studies at rest and during exercise in coarctation of the aorta before and after operation. British Heart Journal 22, 117–39.

Teede, H.J., Giannopoulos, D., Dalais, F.S. et al. 2006: Randomised, controlled, cross-over trial of soy protein with isoflavones on blood pressure and arterial function in hypertensive subjects. Journal of the American College of Nutrition 25(6), 533–40.

Teirstein, P.S., Yock, P.G. and Popp, R.L. 1985: The accuracy of Doppler ultrasound measurement of pressure gradients across irregular, dual, and tunnel like obstructions to blood flow. Circulation 72, 577–84.

Temmar, M., Liabeuf, S., Renard, C. et al. 2010b: Pulse wave velocity and vascular calcification at different stages of chronic kidney disease. Journal of Hypertension 28, 163–9.

Ter Avest, E., Stalenhoef, A.F. and de Graaf, J. 2007: What is the role of non-invasive measurements of atherosclerosis in individual cardiovascular risk prediction? Clinical Science (London) 112(10), 507–16.

Terai, M., Ohishi, M., Ito, N. et al. 2008: Comparison of arterial functional evaluations as a predictor of cardiovascular events in hypertensive patients: the non-invasive atherosclerotic evaluation in hypertension (NOAH) study. Hypertension Research 31, 1135–45.

The ADVANCE Collaboration Group. 2008: Intensive blood glucose control and vascular outcomes in patients with type 2 diabetes. New England Journal of Medicine 358, 2560–72.

The China Salt Substitute Collaborative Group. 2007: Salt substitution: a low-cost strategy for blood pressure control among rural Chinese. A randomized, controlled trial. Journal of Hypertension 25, 2011–18.

The International Study of Unruptured Intracranial Investigators. 1998: Unruptured intracranial aneurysms – risk of rupture and risk of surgical intervention. New England Journal of Medicine 339, 1725–33.

The PROGRESS Collaborative Group. 2003: Effects of blood pressure lowering with perindopril and indapamide therapy on dementia and cognitive decline in patients with cerebrovascular disease. Archives of Internal Medicine 163, 1069–75.

Thijssen, D.H., Dawson, E.A., Black, M.A. et al. 2008a: Heterogeneity in conduit artery function in humans: impact of arterial size. American Journal of Physiology, Heart and Circulatory Physiology 295, H1927–34.

Thijssen, D.H., van Bemmel, M.M., Bullens, L.M. et al. 2008b: The impact of baseline diameter on flow-mediated dilation differs in young and older humans. American Journal of Physiology, Heart and Circulatory Physiology 295(4), H1594–8.

Thomas, D.J., Marshall, J., Russell, R.W. et al. 1977: Effect of haematocrit on cerebral blood-flow in man. Lancet 2(8045), 941–3.

Thomas, F., Blacher, J., Benetos, A. et al. 2008: Cardiovascular risk as defined in the 2003 European blood pressure classification: the assessment of an additional predictive value of pulse pressure on mortality. Journal of Hypertension 26(6), 1072–7.

Thomas, V. 1985: Pioneering research in surgical shock and cardiovascular surgery. Thesis, University of Pennsylvania, Philadelphia, USA.

Thompson, R.W. 2002: Detection and management of small aortic aneurysms (Editorial). New England Journal of Medicine 346, 1484–6.

Thompson, R.B., van den Bos, E.J., Esposito, D.J. et al. 2003: The effects of acute afterload change on systolic ventricular function in conscious dogs with normal vs. failing hearts. European Journal of Heart Failure 5(6), 741–9.

Thubrikar, M.J., Baker, J.W. and Nolan, S.P. 1988: Inhibition of atherosclerosis associated with reduction of arterial intramural stress in rabbits. Arteriosclerosis 8(4), 410–20.

Thuillez, C. and Richard, V. 2005: Targeting endothelial dysfunction in hypertensive subjects. Journal of Human Hypertension 19(suppl. 1), S21–5.

Thurston, R.C. and Matthews, K.A. 2009: Racial and socioeconomic disparities in arterial stiffness and intima media thickness among adolescents. Social Science and Medicine 68, 807–13.

Thury, A., van Langenhove, G., Carlier, S.G. et al., DEBATE Investigators. 2002: Doppler Endpoints Balloon Angioplasty Trial Europe. High shear stress after successful balloon angioplasty is associated with restenosis and target lesion revascularization. American Heart Journal 144(1), 136–43.

Tickner, E.G. and Sacks, A.H. 1967: A theory for the static elastic behavior of blood vessels. Biorheology 4, 151–68.

Tillin, T., Chambers, J., Malik, I. et al. 2007: Measurement of pulse wave velocity: site matters. Journal of Hypertension 25, 383–9.

Tillmanns, H., Neumann, F.J., Parekh, N. et al. 1991: Calcium antagonists and myocardial microperfusion. Drugs 1(1), 1–6.

Tilson, M.D. and Stansel, H.C. 1980: Differences in results for aneurysm vs occlusive disease after bifurcation grafts. Archives of Surgery 115, 1173–5.

TIMI Study Group. 1985: Special report: The thrombolysis in myocardial infraction (TIMI) trial. New England Journal of Medicine 312(14), 932–4.

Timmers, H.J., Wieling, W., Karemaker, J.M. et al. 2003: Denervation of carotid baro- and chemoreceptors in humans. Journal of Physiology 553(Pt 1), 3–11.

Timmins, L.H., Wu, Q., Yeh, A.T. et al. 2010: Structural inhomogeneity and fiber orientation in the inner arterial media. American Journal of Physiology. Heart and Circulatory Physiology 298(5), H1537–45.

Ting, C.T., Brin, K.P., Lin, S.J. et al. 1986: Arterial hemodynamics in human hypertension. Journal of Clinical Investigation 78, 1462–71.

Ting, C.T., Chang, M.S., Wang, S.P. et al. 1990: Regional pulse wave velocities in hypertensive and normotensive humans. Cardiovascular Research 24, 865–72.

Ting, C.T., Choy, C.Y., Chang, M.S. et al. 1991: Arterial hemodynamics in human hypertension; effects of adrenergic blockade. Circulation 84, 1049–57.

Ting, C.T., Yang, T.M., Chen, J.W. et al. 1993: Arterial hemodynamics in human hypertension. Effects of angiotensin converting enzyme inhibition. Hypertension 22(6), 839–46.

Ting, C.T., Chen, C.H., Chang, M.S. et al. 1995a: Short- and long-term effects of antihypertensive drugs on arterial reflections, compliance, and impedance. Hypertension 26(3), 524–30.

Ting, C.T., Chen, J.W., Chang, M.S. et al. 1995b: Arterial hemodynamics in human hypertension: effects of the calcium-channel antagonist nifedipine. Hypertension 25, 1326–32.

Tinken, T.M., Thijssen, D.H., Hopkins, N. et al. 2010: Shear stress mediates endothelial adaptations to exercise training in humans. Hypertension 55(2), 312–18.

Tivesten, A., Vandenput, L., Labrie, F. et al. 2009: Low serum testosterone and estradiol predict mortality in elderly men. Journal of Clinical Endocrinology and Metabolism 94, 2482–8.

Tobis, J.M., Mallery, J.A., Gessert, J. et al. 1989: Intravascular ultrasound cross-sectional arterial imaging before and after balloon angioplasty in vitro. Circulation 80, 873–82.

Toda, T., Tsuda, N., Nishimori, I. et al. 1980: Morphometrical analysis of the aging process in human arteries and aorta. Acta Anatomica 106, 35–44.

Tofield, A. 2010: No sports: Churchill revisited. European Heart Journal 31, 1154–8.

Tofler, G.H., Mittleman, M.A. and Muller, J.E. 1996: Physical activity and the triggering of myocardial infarction: the case for regular exercise. Heart 75, 323–5.

Tomaru, T., Uchida, Y., Sonoki, H. et al. 1989: The thrombolytic effects of native tissue-type plasminogen activator (AK-124) on experimental canine coronary thrombosis. Angiology 40(5), 429–35.

Tominaga, R., Smith, W.A., Massiello, A. et al. 1994: Chronic nonpulsatile blood flow. I. Cerebral autoregulation in chronic nonpulsatile biventricular bypass: carotid blood flow response to hypercapnia. Journal of Thoracic Cardiovascular Surgery 108(5), 907–12.

Tomiyama, H. and Yamashina, A. 2010: Non-invasive vascular function tests: their pathophysiological background and clinical application. Circulation Journal 74(1), 24–33.

Tomiyama, H., Koji, Y., Yambe, M. et al. 2005a: Elevated C-reactive protein augments increased arterial stiffness in subjects with the metabolic syndrome. Hypertension 45(5), 997–1003.

Tomiyama, H., Koji, Y., Yambe, M. et al. 2005b: Brachial-ankle pulse wave velocity is a simple and independent predictor of prognosis in patients with acute coronary syndrome. Circulation Journal 69(7), 815–22.

Tomiyama, H., Hashimoto, H., Tanaka, H. et al. 2010: Continuous smoking and progression of arterial stiffening: a prospective study. Journal of the American College of Cardiology 55(18), 1979–87.

Tomochika, Y., Okuda, F., Tanaka, N. et al. 1996: Improvement of atherosclerosis and stiffness of the thoracic descending aorta with cholesterol-lowering therapies in familial hypercholesterolemia. Arteriosclerosis Thrombosis and Vascular Biology 16(8), 955–62.

Tonino, P.A.L., Fearon, W.F., De Bruyne, B. et al. 2010: Angiographic versus functional severity of coronary artery stenoses in the FAME study: fractional flow reserve versus angiography in multivessel evaluation. Journal of the American College of Cardiology 55, 2816–21.

Topol, E.J. (ed.), 1988: Acute coronary intervention. New York: Alan R. Liss.

Topol, E.J. 2007. Textbook of cardiovascular medicine, 3rd edn. Baltimore: Lippincott Williams and Wilkins.

Topouchian, J.A., El Assaad, M.A., Orobinskaia, L.V. et al. 2005: Validation of two devices for self-measurement of brachial blood pressure according to the International Protocol of the European Society of Hypertension: the SEINEX SE-9400 and the Microlife BP 3AC1-1. Blood Pressure Monitoring 10(6), 325–31.

Topper, J.N. and Gimbrone, M.A. 1999: Blood flow and vascular gene expression: fluid shear stress as a modulator of endothelial phenotype. Molecular Medicine Today 5, 40–6.

Topper, J.N., Cai, J., Falb, D. et al. 1996: Identification of vascular endothelial genes differentially responsive to fluid mechanical stimuli: cyclooxygenase-2, manganese superoxide dismutase, and endothelial cell nitric oxide synthase are selectively up-regulated by steady laminar shear stress. Proceedings of the National Academy of Sciences of the United States of America 93, 10417–22.

Toprak, A., Reddy, J., Chen, W. et al. 2009: Relation of pulse pressure and arterial stiffness to concentric left ventricular hypertrophy in young men (from the Bogalusa Heart Study). American Journal of Cardiology 103(7), 978–84.

Torella, D., Leosco, D., Indolfi, C. et al. 2004: Aging exacerbates negative remodeling and impairs endothelial regeneration after balloon injury. American Journal of Physiology. Heart and Circulatory Physiology 287(6), H2850–60.

Torii, R., Wood, N.B., Hadjiloizou, N. et al. 2009: Stress phase angle depicts differences in coronary artery hemodynamics due to changes in flow and geometry after percutaneous coronary intervention. American Journal of Physiology. Heart and Circulatory Physiology 296(3), H765–76.

Torp, H. 1997: Clutter rejection filters in color flow imaging: a theoretical approach. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 44, 417–24.

Torp, H., Kristoffersen, K. and Angelsen, B.A.J. 1994: Autocorrelation techniques in color flow imaging: signal model and statistical properties of the autocorrelation estimates. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 41, 604–12.

Tortoli, P. 1989: A tracking FFT-processor for pulsed Doppler analysis beyond the Nyquist limit. IEEE Transactions on Biomedical Engineering BME-36, 232–7.

Tortoli, P. 1996: Spectral velocity profiles for detailed ultrasound flow analysis. IEEE Transactions on Ultrasonics, Ferroelectronics, and Frequency Control 43, 654–9.

Tortoli, P., Manes, G. and Atzeni, C. 1985: Velocity profile reconstruction using ultrafast spectral analysis of Doppler ultrasound. IEEE Transactions on Sonics & Ultrasonics SU-32, 555–61.

Tortoli, P., Guidi, F., Guidi, G. and Atzeni, C. 1996: Spectral velocity profiles for detailed ultrasound flow analysis. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control 43, 654–8.

Tortoli, P., Morganti, T., Bambi, G. et al. 2006: Noninvasive simultaneous assessment of wall shear rate and wall distension in carotid arteries. Ultrasound in Medicine and Biology 32(11), 1661–70.

Tortoli, P., Valgimigli, F. and Guidi, G. 1989: Clinical evaluation of a new anti-aliasing technique for ultrasound pulsed Doppler analysis. Ultrasound in Medicine and Biology 15, 749–56.

Tortoli, P., Bambi, G., Guidi, F. et al. 2002: Toward a better quantitative measurement of aortic flow. Ultrasound in Medicine and Biology 28(2), 249–57.

Tortoli, P., Michelassi, V., Bambi, G. et al. 2003: Interaction between secondary velocities, flow pulsation and vessel morphology in the common carotid artery. Ultrasound in Medicine and Biology 29(3), 407–15.

Toto-Moukouo, J.J., Achimastos, A., Asmar, R.G. et al. 1986: Pulse wave velocity in patients with obesity and hypertension. American Heart Journal 112, 136–40.

Touboul, P.J., Hennerici, M.G., Meairs, S. et al. 2006: Mannheim Carotid Intima-Media Thickness Consensus (2004–2006). An update on behalf of the advisory board of the 3rd and 4th Watching the Risk Symposium 13th and 15th European Stroke Conferences, Mannheim, Germany, 2004, and Brussels, Belgium, 2006. Cerebrovascular Disease 23, 75–80.

Tounian, P., Aggoun, Y., Dubern, B. et al. 2001: Presence of increased stiffness of the common carotid artery and endothelial dysfunction in severely obese children: a prospective study. Lancet 358(9291), 1400–4.

Towbin, J.A., Lowe, A.M., Colan, S.D. et al. 2006: Incidence, causes, and outcomes of dilated cardiomyopathy in children. Journal of the American Medical Association 296(15), 1867–76.

Townsend, R.R., Wimmer, N.J., Chirinos, J.A. et al. 2010: Aortic PWV in chronic kidney disease: a CRIC ancillary study. American Journal of Hypertension 23(3), 282–9.

Tozawa, M., Iseki, K., Iseki, C. and Takishita, S. 2002: Pulse pressure and risk of total mortality and cardiovascular events in patients on chronic hemodialysis. Kidney International 61(2), 717–26.

Trachet, B., Reymond, P., Kips, J. et al. 2010: Numerical validation of a new method to assess aortic pulse wave velocity from a single recording of a brachial artery waveform with an occluding cuff. Annals of Biomedical Engineering 38(3), 876–88.

Tracy, R.P. 2003: Emerging relationships of inflammation, cardiovascular disease and chronic diseases of aging. International Journal of Obesity and Related Metabolic Disorders 27(suppl. 3), S29–34.

Tranquart, F., Grenier, N., Eder, V. and Pourcelot, L. 1999: Clinical use of ultrasound tissue harmonic imaging. Ultrasound in Medicine and Biology 25, 889–94.

Treasure, C.B., Manoukian, S.V., Klein, J.L. et al. 1992: Epicardial coronary artery responses to acetylcholine are impaired in hypertensive patients. Circulation Research 71(4), 776–81.

Treasure, C.B., Klein, J.L., Weintraub, W.S. et al. 1995: Beneficial effects of cholesterol-lowering therapy on the coronary endothelium in patients with coronary artery disease. New England Journal of Medicine 332(8), 481–7.

Trivedi, S., Aroney, C.N., Walters, D.L. et al. 2005: Measurement of myocardial fractional flow reserve is a cost-effective way to identify coronary artery lesions of indeterminate severity that warrant revascularisation. Heart, Lung and Circulation 14(4), 239–41.

Tropeano, A.I., Boutouyrie, P., Katsahian, S. et al. 2004: Glucose level is a major determinant of carotid intima-media thickness in patients with hypertension and hyperglycemia. Journal of Hypertension 22, 2153–60.

Trudinger, B.J., Giles, W.B., Cook, C.M. et al. 1985: Fetal umbilical artery flow velocity waveforms and placental resistance: clinical significance. British Journal of Obstetrics and Gynaecology 92, 23–30.

Tsagalou, E.P., Anastasiou-Nana, M., Agapitos, E. et al. 2008: Depressed coronary flow reserve is associated with decreased myocardial capillary density in patients with heart failure due to idiopathic dilated cardiomyopathy. Journal of the American College of Cardiology 52, 1391–8.

Tsai, A.G., Friesenecker, B., McCarthy, M. et al. 1998: Plasma viscosity regulates capillary perfusion during extreme hemodilution in hamster skinfold model. American Journal of Physiology 275(6 Pt 2), H2170–80.

Tsai, A.G., Acero, C., Nance, P.R. et al. 2005: Elevated plasma viscosity in extreme hemodilution increases perivascular nitric oxide concentration and microvascular perfusion. American Journal of Physiology. Heart and Circulatory Physiology 288(4), H1730–9.

Tsang, T.S., Barnes, M.E., Gersh, B.J. et al. 2004: Risks for atrial fibrillation and congestive heart failure in patients $\geq$65 years of age with abnormal left ventricular diastolic relaxation. American Journal of Cardiology 93, 54–8.

Tsiara, S., Elisaf, M. and Mikhailidis, D.P. 2003: Early vascular benefits of statin therapy. Current Medical Research Opinions 19(6), 540–56.

Tsoucaris-Kupfer, D., Benetos, A., Legrand, M. et al. 1993: Pulse pressure gradient along the aortic tree in normotensive Wistar-Kyoto and spontaneously hypertensive rats: effect of nicardipine. Journal of Hypertension 11, 135–9.

Tsuchikura, S., Shoji, T., Kimoto, E. et al. 2010: Central versus peripheral arterial stiffness in association with coronary, cerebral and peripheral arterial disease. Atherosclerosis 211(2), 480–5.

Tunstall-Pedoe, D.S. 1970: Velocity-distribution of blood flow in major arteries of animals and man. PhD thesis, Oxford University, UK.

Tunstall-Pedoe, D.S. 1972: Blood velocity measurements in the diagnosis of aortic incompetence. In: Roberts, C. (ed.), Blood flow measurement. London: Spectre Press.

Tuomilehto, J., Salonen, J.T. and Nissinen, A. 1984: Isolated systolic hypertension and its relationship to the risk of myocardial infarction, cerebrovascular disease and death in a middle-aged population. European Heart Journal 5(9), 739–44.

Turczyński, B., Szyguła, J., Słowińska, L. et al. 1999: [Blood and serum viscosity in cardiologic X syndrome]. Polskie Archiwum Medycyny Wewnetrzne 102(5), 979–83.

Turczynski, B., Pierzchala, K., Slowinska, L. et al. 2002: Dynamics of the changes of blood and plasma rheological properties in ischaemic stroke. Wiadomosci Lekarskie 55(3–4), 189–96.

Turiel, M., Atzeni, F., Tomasoni, L. et al. 2009: Non-invasive assessment of coronary flow reserve and ADMA levels: a case-control study of early rheumatoid arthritis patients. Rheumatology (Oxford) 48(7), 834–9.

Turin, T.C., Kita, Y., Rumana, N. et al. 2010: Brachial-ankle pulse wave velocity predicts all-cause mortality in the general population: findings from the Takashima study, Japan. Hypertension Research 33(9), 922–5.

Turner, C.L., Tebbs, S., Smielewski, P. and Kirkpatrick, P.J. 2001: The influence of hemodynamic stress factors on intracranial aneurysm formation. Journal of Neurosurgery 95, 764–770.

Turner, M.J., Irwig, L., Bune, A.J. et al. 2006: Lack of sphygmomanometer calibration causes over- and under-detection of hypertension: a computer simulation study. Journal of Hypertension 24(10), 1931–8.

Turner, M.J., van Schalkwyk, J.M. and Irwig, L. 2008: Lax sphygmomanometer standard causes overdetection and underdetection of hypertension: a computer simulation study. Blood Pressure Monitoring 13(2), 91–9.

Tuzcu, E.M., Kapadia, S.R., Tutar, E. et al. 2001: High prevalence of coronary atherosclerosis in asymptomatic teenagers and young adults: evidence from intravascular ultrasound. Circulation 103(22), 2705–10.

Tzoulaki, I., Liberopoulos, G. and Ioannidis, J.P. 2009: Assessment of claims of improved prediction beyond the Framingham risk score. Journal of the American Medical Association 302, 2345–52.

Uebaba, K., O'Rourke, M.F., Sindone, A.P. et al. 2002: Arterial pulse wave analysis for the assessment of cardiac failure, value of non-invasive applanation tonometry of radial artery. Japanese Journal of Applied Physiology 32, 147–57.

Ueda, H., Hayashi, T., Tsumura, K. et al. 2004: The timing of the reflected wave in the ascending aortic pressure predicts restenosis after coronary stent placement. Hypertension Research 27, 535–40.

Ueda, I., Tagawa, T., Watanabe, S. et al. 2008: Comparability and reproducibility of the carotid-femoral pulse wave velocity measurements using a multi-element carotid tonometry sensor. Journal of Human Hypertension 22(10), 699–703.

Uehata, A., Gerhard, M.D., Meredith, I.T. et al. 1993: Close relationship of endothelial dysfunction in coronary and brachial artery. Circulation 88(suppl. I), 618.

Uehata, A., Lieberman, E.H., Gerhard, M.D. et al. 1997: Noninvasive assessment of endothelium-dependent flow-mediated dilation of the brachial artery. Vascular Medicine 2(2), 87–92.

Uiterwaal, C.S.P.M., Anthony, S., Launer, L.J. et al. 1997: Birth weight, growth, and blood pressure, an annual follow-up study of children aged 5 through 21 years. Hypertension 30, 267–71.

UK Prospective Diabetes Study Group. 1998: Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes, UKPDS 38. British Medical Journal 317, 703–13.

UK, Small Aneurysm Trial Participants. 2002: Long-term outcomes of immediate repair compared with surveillance of small abdominal arotic aneurysms. New England Journal of Medicine 346, 1445–52.

Unverferth, D.V., Fetters, J.K., Unverferth, B.J. et al. 1983: Human myocardial histologic characteristics in congestive heart failure. Circulation 68(6), 1194–200.

Urbina, E.M., Srinivasan, S.R., Kieltyka, R.L. et al. 2004: Correlates of carotid artery stiffness in young adults: the Bogalusa Heart Study. Atherosclerosis 176(1), 157–64.

Urbina, E.M., Williams, R.V., Alpert, B.S. et al. 2009b: Noninvasive assessment of subclinical atherosclerosis in children and adolescents: recommendations for standard assessment for clinical research: a scientific statement from the American Heart Association. Hypertension 54(5), 919–50.

Urbina, E.M., Kimball, T.R., Khoury, P.R. et al. 2010: Increased arterial stiffness is found in adolescents with obesity or obesity-related type 2 diabetes mellitus. Journal of Hypertension 28, 1692–8.

Ures, S., Gatto, I.M.C., Prates, J.C. et al. 1988: The transverse diameter of the abdominal part of the aorta: an anatomo-radiological study through computerized tomography. Anatomischer Anzeiger (Jena) 166, 341–50.

Urshel, C.W., Covell, J.W., Sonnenblick, E.H. et al. 1968a: Effects of decreased aortic compliance on performance of the left ventricle. American Journal of Physiology 214, 298–304.

Urshel, C.W., Covell, J.W., Sonnenblick, E.H. et al. 1968b: Myocardial mechanics in aortic and mitral valvular regurgitation: the concept of instantaneous impedance as a determinant of the performance of the intact heart. Journal of Clinical Investigation 47, 867–83.

Ursino, M., Artioli, E. and Gallerani, M. 1994: An experimental comparison of different methods of measuring wave propagation in viscoelastic tubes. Journal of Biomechanics 27(7), 979–90.

Urry, D.W., Hugel, T., Seitz, M. et al. 2002: Elastin: a representative ideal protein elastomer. Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences 357(1418), 169–84.

US National Health Survey 1977: US National Health Survey. Washington, DC: Public Health Services, National Institutes of Health, US Department of Health and Human Services.

Uther, J.B., Peterson, L.K., Shabetai, R. et al. 1973: Measurement of ascending aortic flow patterns in man. Journal of Applied Physiology 34, 513–18.

Utsugi, M., Saijo, Y., Yoshioka, E. et al. 2009: Relationship between two alternative occupational stress models and arterial stiffness: a cross-sectional study among Japanese workers. International Archives off Occupational and Environmental Health 82, 175–83.

Vaccarino, V., Holford, T.R. and Krumholz, H.M. 2000: Pulse pressure and risk for myocardial infarction and heart failure in the elderly. Journal of the American College of Cardiology 36(1), 130–8.

Vahedi, K., Hofmeijer, J., Juetller, E. et al. 2007: Early decompressive surgery in malignant infarction of the middle cerebral artery: a pooled analysis of three randomized controlled trials. Lancet Neurology 6, 215–22.

Vaitkevicius, P.V., Fleg, J.L., Engel, J.H. et al. 1993: Effects of age and aerobic capacity on arterial stiffness in healthy adults. Circulation 88(1), 1456–62.

Vaitkevicius, P.V., Lane, M., Spurgeon, H. et al. 2001: A cross-link breaker has sustained effects on arterial and ventricular properties in older Rhesus monkeys. Proceedings of the National Academy of Sciences of the United States of America 98, 1171–5.

Valdueza, J.M., Schmierer, K., Mehraein, S. et al. 1996: Assessment of normal flow velocity in basal cerebral veins: a transcranial Doppler ultrasound study. Stroke 27, 1121–5.

Vallance, P. and Chan, N. 2001: Endothelial function and nitric oxide, clinical relevance (Editorial). Heart 85, 342–50.

Van Bommel, R.J., Delgado, V., Schalij, M.J. et al. 2010: Critical appraisal of the use of cardiac resynchronization therapy beyond current guidelines. Journal of the American College of Cardiology 56, 754–62.

Van Bortel, L.M., Kool, M.J., Boudier, H.A. et al. 1995: Effects of antihypertensive agents on local arterial distensibility and compliance. Hypertension 26(3), 531–4.

Van Bortel, L.M., Balkestein, E.J., van der Heijden-Spek, J.J. et al. 2001: Non-invasive assessment of local arterial pulse pressure: comparison of applanation tonometry and echo-tracking. Journal of Hypertension 19, 1037–44.

Van Bortel, L., Struijker-Boudier, H. and Safar, M.E. 2001a: Pulse pressure, arterial stiffness, and drug treatment of hypertension. Hypertension 38, 914–21.

Van Bortel, L.M., Balkestein, E.J., Van Der Heijden-Spek, J.J. et al. 2001b: Non-invasive assessment of local arterial pulse pressure, comparison of applanation tonometry and echo-tracking. Journal of Hypertension 19, 1037–44.

Van Bortel, L.M., Duprez, D., Starmans-Kool, M.J. et al. 2002: Clinical applications of arterial stiffness, Task Force III, recommendations for user procedures. American Journal of Hypertension 15(5), 445–52.

Van Citters, R.L. 1966: Mutual inductance transducers. In: Rushmer, R.F. (ed.), Methods in medical research. Chicago: Year Book Medical Publishers, pp. 26–30.

Van Citters, R.L. and Franklin, D.L. 1969a: Radio telemetry techniques for study of cardiovascular dynamics in ambulatory primates. Annals of the New York Academy of Science 162, 137–55.

Van Citters, R.L. and Franklin, D.L. 1969b: Cardiovascular performance of Alaska sled dogs during exercise. Circulation Research 24, 33–42.

van den Berg, B.M., Nieuwdorp, M., Stroes, E.S. et al. 2006: Glycocalyx and endothelial (dys) function: from mice to men. Pharmacology Reports 58(suppl.), 75–80.

van den Berg, B.M., Spaan, J.A. and Vink, H. 2009: Impaired glycocalyx barrier properties contribute to enhanced intimal low-density lipoprotein accumulation at the carotid artery bifurcation in mice. Pflügers Archiv – European Journal of Physiology 457, 1199–206.

van den Berkmortel, F., Wollersheim, H., van Langen, H. et al. 1998: Dynamic vessel wall properties and their reproducibility in subjects with increased cardiovascular risk. Journal of Human Hypertension 12(6), 345–50.

Van den Bos, G.C., Westerhof, N., Elzinga, G. et al. 1976: Reflection in the systemic arterial system: effects of aortic and carotid occlusion. Cardiovascular Research 10, 565–73.

Van den Bos, G.C., Westerhof, N. and Randall, O.S. 1982: Pulse wave reflection: can it explain the differences between systemic and pulmonary pressure and flow waves? Circulation Research 51, 479–85.

van den Elzen, A.P., Sierksma, A., Oren, A. et al. 2005: Alcohol intake and aortic stiffness in young men and women. Journal of Hypertension 23, 731–5.

van der Heijden-Spek, J.J., Staessen, J.A., Fagard, R.H. et al. 2000: Effect of age on brachial artery wall properties differs from the aorta and is gender dependent, a population study. Hypertension 35(2), 637–42.

van Dijk, E.J., Breteler, M.M., Schmidt, R. et al. 2004: The association between blood pressure, hypertension, and cerebral white matter lesions. Hypertension 44, 625–30.

Van Doornum, S., McColl, G., Jenkins, A. et al. 2003: Screening for atherosclerosis in patients with rheumatoid arthritis. Comparison of two in vivo tests of vascular function. Arthritis and Rheumatism 48, 72–80.

van Egmond, J., Hasenbos, M. and Crul, J.F. 1985: Invasive v. non-invasive measurement of arterial pressure. Comparison of two automatic methods and simultaneously measured direct intra-arterial pressure. British Journal of Anaesthesiology 57(4), 434–44.

van Ittersum, F.J., Wijering, R.M., Lambert, J. et al. 1998: Determinants of the limits of agreement between the sphygmomanometer and the SpaceLabs 90207 device for blood pressure measurement in health volunteers and insulin-dependent diabetic patients. Journal of Hypertension 16(8), 1125–30.

van Leeuwen-Segarceanu, E.M., Tromp, W.F., Bos, W.J. et al. 2010: Comparison of two instruments measuring carotid-femoral pulse wave velocity: Vicorder versus SphygmoCor. Journal of Hypertension 28(8), 1687–91.

van Merode, T., Brands, P.J., Hoeks, A.P. et al. 1993: Faster ageing of the carotid artery bifurcation in borderline hypertensive subjects. Journal of Hypertension 11, 171–6.

van Popele, N.M., Bos, W.J., de Beer, N.A. et al. 2000a: Arterial stiffness as underlying mechanism of disagreement between an oscillometric blood pressure monitor and a sphygmomanometer. Hypertension 36(4), 484–8.

van Trijp, M.J., Bos, W.J., Uiterwaal, C.S. et al. 2004: Determinants of AIx in young men: the ARYA study. European Journal of Clinical Investigation 34, 825–30.

van Veldhuisen, D.J., Cohen-Solal, A., Böhm, M. et al. 2009: Beta-blockade with nebivolol in elderly heart failure patients with impaired and preserved left ventricular ejection fraction: data from SENIORS (Study of Effects of Nebivolol Intervention on Outcomes and Rehospitalization in Seniors With Heart Failure). Journal of the American College of Cardiology 53, 2150–8.

Vandenbrink, A.M., Reekers, M., Bax, W.A. et al. 1998: Coronary side-effect potential of current and prospective antimigraine drugs. Circulation 98, 25–30.

Vane, J. and Henderson, A. (eds), 1992: Nitric oxide – the rational basis for nitrate therapy. London: William Harvey Research Conferences.

Vane, J.R., Anggard, E.E. and Botting, R.M. 1990: Regulatory functions of the vascular endothelium. New England Journal of Medicine 323(1), 27–36.

Vanhoutte, P.M. 1988: The endothelium – modulator of vascular smooth muscle tone. New England Journal of Medicine 319(8), 512–13.

Vanhoutte, P.M. 2009a: Endothelial dysfunction and vascular disease. Acta Physiologica (Oxford) 196(2), 193–22.

Vanhoutte, P.M. 2009b: Endothelial dysfunction: the first step toward coronary arteriosclerosis. Circulation Journal 73(4), 595–601.

Vanhoutte, P.M., Rubanyi, G.M., Miller, V.M. et al. 1986: Modulation of vascular smooth muscle contraction by the endothelium. Annual Review of Physiology 48, 307–20.

Vappou, J., Luo, J. and Konofagou, E.E. 2010: Pulse wave imaging for noninvasive and quantitative measurement of arterial stiffness in vivo. American Journal of Hypertension 23, 393–8.

Vardan, S., Mookherjee, S., Warner, R. et al. 1983: Systolic hypertension in the elderly: hemodynamic response to long-term thiazide diuretic therapy and its side effects. Journal of the American Medical Association 250, 2807–13.

Vasan, R. 2006: Biomarkers of cardiovascular disease: molecular basis and practical considerations. Circulation 113, 2335–62.

Vasan, R.S. 2008: Pathogenesis of elevated peripheral pulse pressure: some reflections and thinking forward. Hypertension 51, 33–6.

Vasan, R.S. 2009: A risk score for risk factors: rationale and roadmap for preventing hypertension. Hypertension 54, 454–6.

Vasan, R.S. 2010: Editor's note. Circulation, 121, 1685.

Vasan, R.S. and Levy, D. 2000: Defining diastolic heart failure, a call for standardized diagnostic criteria. Circulation 101, 2118–21.

Vasan, R.S. and Benjamin, E.J. 2001: Diastolic heart failure – no time to relax. New England Journal of Medicine 344, 56–9.

Vasan, R.S., Larson, M.G. and Levy, D. 1995: Determinants of echocardiographic aortic root size: the Framingham Heart Study. Circulation 91(3), 734–40.

Vasan, R.S., Benjamin, E.J. and Levy, D. 1996: Congestive heart failure with normal left ventricular systolic function: clinical approaches to the diagnosis and treatment of diastolic heart failure. Archives of Internal Medicine 156, 146–57.

Vasan, R.S., Larson, M.G., Leip, E.P. et al. 2001: Impact of high–normal blood pressure on the risk of cardiovascular disease. New England Journal of Medicine 345, 1291–7.

Vatner, S.F. 1985: Regulation of coronary resistance vessels and large coronary arteries. American Journal of Cardiology 56, 16E–22E.

Vatner, S.F. and Hintze, T.H. 1982: Effects of calcium-channel antagonist on large and small coronary arteries in conscious dogs. Circulation 66, 579–88.

Vatner, S.F., Higgins, C.B., Franklin, D. et al. 1971a: Effects of digitalis glycoside on coronary and systemic dynamics in conscious dogs. Circulation Research 28, 470–9.

Vatner, S.F., Higgins, C.B., Patrick, T. et al. 1971b: Effects of cardiac depression and of anesthesia on the myocardial action of a cardiac glycoside. Journal of Clinical Investigation 50, 2585–95.

Vatner, S.F., Pagani, M., Manders, W.T. et al. 1980: Alpha-adrenergic vasoconstriction and nitroglycerin vasodilation of large coronary arteries in the conscious dog. Journal of Clinical Investigation 65, 5–14.

Vatner, S.F., Pasipoularides, A. and Mirsky, I. 1984: Measurement of arterial pressure-dimension relationships in conscious animals. Annals of Biomedical Engineering 12(5), 521–34.

Vavuranakis, M., Stefanadis, C., Triandaphyllidi, E. et al. 1999: Coronary artery distensibility in diabetic patients with simultaneous measurements of luminal area and intracoronary pressure: evidence of impaired reactivity to nitroglycerin. Journal of the American College of Cardiology 34, 1075–81.

Vavuranakis, M., Stamatopoulos, I., Papaioannou, T.G. et al. 2007: Alterations of pressure waveforms along the coronary arteries and the effect of microcirculatory vasodilation. International Journal of Cardiology 117(2), 254–9.

Vavuranakis, M., Kakadiaris, I.A, O'Malley, S.M. et al. 2008: A new method for assessment of plaque vulnerability based on vasa vasorum imaging, by using contrast-enhanced intravascular ultrasound and differential image analysis. International Journal of Cardiology 130, 23–9.

Veith, F.J., Hobson, R.W., Williams, R.A. et al. (eds), 1994: Vascular surgery – principles and practice, 2nd edn. New York: McGraw-Hill.

Velagaleti, K.S., Pencina, M.J., Murabito, J.M. et al. 2008: Long-term trends in the incidence of heart failure after myocardial infarction. Circulation 118, 2057–62.

Verbeke, F., Segers, P., Heireman, S. et al. 2005: Noninvasive assessment of local pulse pressure: importance of brachial-to-radial pressure amplification. Hypertension 46, 244–8.

Verberk, W.J., Kroon, A.A., Jongen-Vancraybex, HA et al. 2007: The applicability of home blood pressure measurement in clinical practice: a review of literature. Vascular Health and Risk Management 3(6), 959–66.

Verdecchia, P., Carini, G., Circo, A. et al. 2001: Left ventricular mass and cardiovascular morbidity in essential hypertension: the MAVI Study. Journal of the American College of Cardiology 38, 1829–35.

Verdecchia, P., Angeli, F., Borgioni, C. et al. 2003: Changes in cardiovascular risk by reduction of left ventricular mass in hypertension: a meta-analysis. American Journal of Hypertension 16, 895–9.

Verdejo, H.E., Castro, P.F., Concepción, R. et al. 2007: Comparison of a radiofrequency-based wireless pressure sensor to swan-ganz catheter and echocardiography for ambulatory assessment of pulmonary artery pressure in heart failure. Journal of the American College of Cardiology 50(25), 2375–82.

Verhamme, P. and Hoylaerts, M.F. 2006: The pivotal role of the endothelium in haemostasis and thrombosis. Acta Clinica Belgica 61(5), 213–19.

Verhave, J.C., Fesler, P., du Cailar, G. et al. 2005: Elevated pulse pressure is associated with low renal function in elderly patients with isolated systolic hypertension. Hypertension 45, 586–91.

Verlohren, S., Muller, D.N., Luft, F.C. et al. 2009: Immunology in hypertension, preeclampsia, and target-organ damage. Hypertension 54, 439–43.

Verma, S. and Anderson, T.J. 2002: Fundamentals of endothelial function for the clinical cardiologist. Circulation 105(5), 546–9.

Verma, S. and Gupta, M.K. 2008: Aliskiren improves nitric oxide bioavailability and limits atherosclerosis. Hypertension 52(3), 467–9.

Vermeer, S.E., Prins, N.D., den Heijer, T. et al. 2003: Silent brain infarct and the risk of dementia and cognitive decline. New England Journal of Medicine 348, 1215–22.

Vermeersch, S.J., Rietzschel, E.R., De Buyzere, M.L. et al. 2008: Determining carotid artery pressure from scaled diameter waveforms: comparison and validation of calibration techniques in 2026 subjects. Physiological Measurement 29, 1267–80.

Vermeersch, S.J., Rietzschel, E.R., Buyzere, M.L.D. et al. 2008: Age and gender related patterns in carotid-femoral PWV and carotid and femoral stiffness in a large healthy, middle-aged population. Journal of Hypertension 26, 1411–19.

Vernooij, M.W., Ikram, M.A., Tanghe, H.L. et al. 2007: Incidental findings on brain MRI in the general population. New England Journal of Medicine 357, 1821–8.

Versari, D., Daghini, E., Virdis, A. et al. 2009: Endothelial dysfunction as a target for prevention of cardiovascular disease. Diabetes Care 32(suppl. 2), S314–21.

Verstraete, M. and Lijnen, H.R. 1994: Novel thrombolytic agents. Cardiovascular Drugs and Therapy 8(6), 801–11

Veyrat, C. 2001: Those who faced turbulence and launched the era of flow dynamic concepts for cardiac investigation. Cardiovascular Research 51(2), 205–16.

Viberti, G. and Wheeldon, N.M. for the MicroAlbuminuria Reduction with VALsartan (MARVAL) Study Investigators. 2002: Microalbuminuria reduction with valsartan in patients with type 2 diabetes mellitus, a blood pressure-independent effect Circulation 106, 672–8.

Vierhout, R.R. and Vendrick, A.J.H. 1961: Hydraulic pressure generator for testing the dynamic characteristics of catheters and manometers. Journal of Laboratory and Clinical Medicine 58, 330–3.

Vierordt, K. 1855. Die Lehre vom Arterienpuls. Braunschweig: F. Vieweg.

Vijan, S. and Hayward, R.A. 2003: Treatment of hypertension in type 2 diabetes mellitus, blood pressure goals, choice of agents, and setting priorities in diabetes care. Annals of Internal Medicine 138, 593–602.

Villari, B., Vassalli, G., Schneider, J. et al. 1997: Age dependency of left ventricular diastolic function in pressure overload hypertrophy. Journal of the American College of Cardiology 29(1), 181–6.

Vinicor, F. 1999: When is diabetes diabetes? Journal of the American Medical Association 281, 1222–4.

Vink, H. and Duling, B.R. 1996: Identification of distinct luminal domains for macromolecules, erythrocytes, and leukocytes within mammalian capillaries. Circulation Research 79, 581–9.

Virchow, R. 1856: Phlogose und Thrombose in Gefassystem, Gesammelte Abhandlungen zur Wissenschaftlichen Medicin. Frankfurt-am-Main: Meidinger Sohn.

Virmani, R., Avolio, A.P., Mergner, W.J. et al. 1991: Effect of aging on aortic morphology in populations with high and low prevalence of hypertension and atherosclerosis. American Journal of Pathology 139(5), 1119–29.

Virmani, R., Rabinowitz, M., Simialek, J.E. et al. 1988: Cardiovascular effects of cocaine: an autopsy study of 40 patients. American Heart Journal 115, 1068–76.

Virmani, R., Kolodgie, F.D., Burke, A.P. et al. 2005: Atherosclerotic plaque progression and vulnerability to rupture: angiogenesis as a source of intraplaque hemorrhage. Arteriosclerosis, Thrombosis, and Vascular Biology 25(10), 2054–61.

Virmani, R., Burke, A.P., Farb, A. et al. 2006: Pathology of the vulnerable plaque. Journal of the American College of Cardiology 47(8, suppl. 1), C13–18.

Vita, J.A. and Keaney, J.F. Jr. 2000: Exercise – toning up the endothelium (Editorial). New England Journal of Medicine 342, 503–05.

Vita, J.A. and Keaney, J.F. Jr. 2002: Endothelial function, a barometer for cardiovascular risk? Circulation 106(6), 640–2.

Vita, J.A., Treasure, C.B., Nabel, E.G. et al. 1990: Coronary vasomotor response to acetylcholine relates to risk factors for coronary artery disease. Circulation 81, 491–7.

Vlachopoulos, C. and O'Rourke, M. 2000a: Genesis of the normal and abnormal arterial pulse. (invited review) Current Problems in Cardiology 25(5), 297–368.

Vlachopoulos, C. and O'Rourke, M.F. 2000b: Diastolic pressure, systolic pressure, or pulse pressure. Current Hypertension Reports 2, 271–9.

Vlachopoulos, C. and O'Rourke, M.F. 2001: Cardiovascular system: vascular. In: Encyclopedia of aging. New York: Springer, pp. 153–7.

Vlachopoulos, C., Hirata, K. and O'Rourke, M.F. 2001: Pressure-altering agents affect central aortic pressures more than is apparent from upper limb measurements in hypertensive patients: the role of arterial wave reflections. Hypertension 38(6), 1456–60.

Vlachopoulos, C., Hirata, K. and O'Rourke, M.F. 2003a: Effect of sildenafil on arterial stiffness and wave reflection. Vascular Medicine, 8, 243–8.

Vlachopoulos, C., Hirata, K., Stefanadis, C. et al. 2003b: Caffeine increases aortic stiffness in hypertensive patients. American Journal of Hypertension 16, 63–6.

Vlachopoulos, C., Alexopoulos, N., Panagiotakos, D. et al. 2004a: Cigar smoking has an acute detrimental effect on arterial stiffness. American Journal of Hypertension 17, 299–303.

Vlachopoulos, C., Tsekoura, D., Alexopoulos, N. et al. 2004b: Type 5 phosphodiesterase inhibition by sildenafil abrogates acute smoking-induced endothelial dysfunction. American Journal of Hypertension 17, 1040–4.

Vlachopoulos, C., Aznaouridis, K., Alexopoulos, N. et al. 2005: Effect of dark chocolate on arterial function in healthy individuals. American Journal of Hypertension 18, 785–91.

Vlachopoulos, C., Alexopoulos, N., Dima, I. et al. 2006a: Acute effect of black and green tea on aortic stiffness and wave reflections. Journal of the American College of Nutrition 25, 216–23.

Vlachopoulos, C., Aznaouridis, K., Ioakeimidis, N. et al. 2006b: Unfavourable endothelial and inflammatory state in erectile dysfunction patients with or without coronary artery disease. European Heart Journal 27, 2640–8.

Vlachopoulos, C., Alexopoulos, N., Aznaouridis, K. et al. 2007a: Relation of habitual cocoa consumption to aortic stiffness and wave reflections, and to central hemodynamics in healthy individuals. American Journal of Cardiology 99, 1473–5.

Vlachopoulos, C., Aznaouridis, K., Dagre, A. et al. 2007b: Protective effect of atorvastatin on acute systemic inflammation-induced endothelial dysfunction in hypercholesterolaemic subjects. European Heart Journal 28, 2102–9.

Vlachopoulos, C., Aznaouridis, K., Ioakeimidis, N. et al. 2008: Arterial function and intima-media thickness in hypertensive patients with erectile dysfunction. Journal of Hypertension 26, 1829–36.

Vlachopoulos, C., Ioakeimidis, N., Rokkas, K. et al. 2009a: Cardiovascular effects of phosphodiesterase type 5 inhibitors. Journal of Sexual Medicine 6(3), 658–74.

Vlachopoulos, C., Terentes-Printzios, D., Ioakeimidis, N. et al. 2009b: PDE5 inhibitors in non-urological conditions. Current Pharmaceutical Design 15, 3521–39.

Vlachopoulos, C., Xaplanteris, P., Alexopoulos, N. et al. 2009c: Divergent effects of laughter and mental stress on arterial stiffness and central hemodynamics. Psychosomatic Medicine 71, 446–53.

Vlachopoulos, C., Aznaouridis, K. and Stefanadis, C. 2010a: Prediction of cardiovascular events and all-cause mortality with arterial stiffness: a systematic review and meta-analysis. Journal of the American College of Cardiology 55, 1318–27.

Vlachopoulos, C., Aznaouridis, K., O'Rourke, M.F. et al. 2010b: Prediction of cardiovascular events and all-cause mortality with central haemodynamics: a systematic review and meta-analysis. European Heart Journal 31, 1865–71.

Vlachopoulos, C., Aznaouridis, K., O'Rourke, M.F. et al. 2010c: Towards the final verdict: recentral pulse pressure vs peripheral pulse pressure: case still open? European Heart Journal (in press).

Vlachopoulos, C., Kardara, D., Anastasakis, A. et al. 2010d: Arterial stiffness and wave reflections in marathon runners. American Journal of Hypertension 23(9), 974–9.

Vlahakes, G.J. 1999: Catheter-based treatment of aortic dissection (Editorial). New England Journal of Medicine 340, 1585–6.

Vogel, R.A. 1999: Cholesterol lowering and endothelial function. American Journal of Medicine 107, 479–87.

Vogel, R.A. 2001: Measurement of endothelial function by brachial artery flow-mediated vasodilation. American Journal of Cardiology 88(2A), 31E–4E.

Vogel, R.A. 2003: Vintners and vasodilators: are French red wines more cardioprotective? Journal of the American College of Cardiology 41, 479–81.

Vogel, R. 2008: Listening to the endothelim: a story of signal and noise. Journal of the American College of Cardiology 51, 1965–6.

Vogel, R.A., Corretti, M.C. and Plotnick, G.D. 1996: Changes in flow-mediated brachial artery vasoactivity with lowering of desirable cholesterol levels in healthy middle-aged men. American Journal of Cardiology 77(1), 37–40.

Vogel, R.A., Corretti, M.C. and Plotnick, G.D. 2000: A comparison of brachial artery flow-mediated vasodilation using upper and lower arm arterial occlusion in subjects with and without coronary risk factors. Clinical Cardiology 23(8), 571–5.

Volpe, M., Savoia, C., De Paolis, P. et al. 2002: The renin-angiotensin system as a risk factor and therapeutic target for cardiovascular and renal disease. Journal of the American Society of Nephrology 13(suppl. 3), S173–8.

von Deschwanden, P., Muller, A. and Laszt, L. 1956: Beitraege zur haemodynamik. XX International Physiological Congress, Bruxelles: pp. 930–1.

von Klot, S., Mittleman, M.A., Dockery, D.W. et al. 2008: Intensity of physical exertion and triggering of myocardial infarction: a case-crossover study. European Heart Journal 29, 1881–8.

von Kodolitsch, Y., Csosz, S.K., Koschyk, D.H. et al. 2003: Intramural hematoma of the aorta. Predictors of progression to dissection and rupture. Circulation 107, 1158–63.

von Kries, J. 1892. Studien zur Pulslehre. Akademische Verlagsbuchhandlung von JCB Mohr. Freiburg: Paul Siebeck.

von Mering, G.O., Arant, C.B., Wessel, T.R. et al. 2004: Abnormal coronary vasomotion as a prognostic indicator of cardiovascular events in women: results from the National Heart, Lung, and Blood Institute-Sponsored Women's Ischemia Syndrome Evaluation (WISE). Circulation 109, 722–5.

von Restorff, W., Höfling, B., Holtz, J. et al. 1975: Effect of increased blood fluidity through hemodilution on general circulation at rest and during exercise in dogs. Pflügers Archiv – European Journal of Physiology 357(1–2), 25–34.

von Rokitansky, C. 1852. A manual of pathological anatomy (trans. Day, G.E.). London: The Sydenham Society.

von Tempelhoff, G.F., Nieman, F., Heilmann, L. et al. 2000: Association between blood rheology, thrombosis and cancer survival in patients with gynecologic malignancy. Clinical Hemorheology and Microcirculation 22(2), 107–30.

Voutilainen, S., Kupari, M., Hippelainen, M. et al. 1991: Factors influencing Doppler indexes of left ventricular filling in healthy persons. American Journal of Cardiology 68(6), 653–9.

Vulliemoz, S., Stergiopulos, N. and Meuli, R. 2002: Estimation of local aortic elastic properties with MRI. Magnetic Resonance in Medicine 47(4), 649–54.

Vuurmans, J.L.T., Boer, W.H., Bos, W.W. et al. 2002: Contribution of volume overload and angiotensin II to the increased pulse wave velocity of hemodialysis patients. Journal of the American Society of Nephrology 13, 177–83.

Waaler, B.A., Eriksen, M. and Toska, K. 1991: The effect of meal size on postprandial increase in cardiac output. Acta Physiologica Scandinavica 142(1), 33–9.

Wachtell, K., Bella, J., Rokkedal, J. et al. 2002: Change in diastolic left ventricular filling after one year of antihypertensive treatment: the Losartan Intervention for Endpoint Reduction in Hypertension (LIFE) study. Circulation 105, 1071–6.

Wachter, R., Schmidt-Schweda, S., Westermann, D. et al. 2009: Blunted frequency-dependent upregulation of cardiac output is related to impaired relaxation in diastolic heart failure. European Heart Journal 30, 3027–36.

Waddell, T.K., Dart, A.M., Medley, T.L. et al. 2001: Carotid pressure is a better predictor of coronary artery disease than brachial pressure. Hypertension 38, 927–31.

Wadwa, R.P., Urbina, E.M., Anderson, A.M. et al. 2010: Measures of arterial stiffness in youth with type 1 and type 2 diabetes: the SEARCH for diabetes in youth study. Diabetes Care 33(4), 881–6.

Wagenseil, J.E. and Mecham, R.P. 2009: Vascular extracellular matrix and arterial mechanics. Physiological Reviews 89(3), 957–89.

Waksman, R., Weiss, A.T., Gotsman, M.S. and Hasin, Y. 1993: Intra-aortic balloon counterpulsation improves survival in cardiogenic shock complicating acute myocardial infarction. European Heart Journal 14(1), 71–4.

Walburn, F.J. and Stein, P.D. 1981: Effect of vessel tapering on the transition to turbulent flow: implications in the cardiovascular system. Journal of Biomechanical Engineering 103, 116–20.

Walburn, F.J., Blick, E.F. and Stein, P.D. 1979: Effect of the branch-to-trunk area ratio on the transition to turbulent flow: implications in the cardiovascular system. Biorheology 16, 411–17.

Walburn, F.J., Blick, E.F. and Stein, P.D. 1980: Comparison of power density spectra of turbulent flow through tubes obtained with hot film and laser Doppler anemometers. Biorheology 17, 267–73.

Walburn, F.J., Sabbah, H.N. and Stein, P.D. 1985: Turbulent stresses in the region of a Hancock porcine bioprosthetic aortic valve. Journal of Biomechanical Engineering 107, 200–5.

Waldstein, S.R., Rice, S.C., Thayer, J.F. et al. 2008: Pulse pressure and pulse wave velocity are related to cognitive decline in the Baltimore Longitudinal Study of Aging. Hypertension 51, 99–104.

Walinsky, P., Santamore, W.P., Wiener, L. et al. 1979: Dynamic changes in the haemodynamic severity of coronary artery stenosis in a canine model. Cardiovascular Research 13(2), 113–18.

Walker, A.B., Chattington, P.D., Buckingham, R.E. et al. 1999: The thiazolidinedione rosiglitazone (BRL-49653) lowers blood pressure and protects against impairment of endothelial function in Zucker fatty rats. Diabetes 48, 1448–53.

Wallace, S.M., Yasmin, McEniery, C.M. et al. 2007: Isolated systolic hypertension is characterized by increased aortic stiffness and endothelial dysfunction. Hypertension 50(1), 228–33.

Wallerath, T., Poleo, D., Li, H. et al. 2003: Red wine increases the expression of human endothelial nitric oxide synthase: a mechanism that may contribute to its beneficial cardiovascular effects. Journal of the American College of Cardiology 41, 471–8.

Walmsley, J.G. 1984: Structure of small blood vessels related to smooth muscle mechanics. In: Bevan, J.A., Maxwell, R.A., Fugiwara, M. et al. (eds), Vascular neuroeffector mechanisms. New York: Raven Press.

Walpola, P.L., Gotlieb, A.I. and Langille, B.L. 1993: Monocyte adhesion and changes in endothelial cell number, morphology, and F-actin distribution elicited by low shear stress in vivo. American Journal of Pathology 142, 1392–400.

Walpola, P.L., Gotlieb, A.I., Cybulsky, M.I. et al. 1995: Expression of ICAM-1 and VCAM-1 and monocyte adherence in arteries exposed to altered shear stress. Arteriosclerosis, Thrombosis, and Vascular Biology 15, 2–10.

Wang, B., Yang, Y. and Xiang, J. 2000: [A noninvasive method for radial pulse-wave velocity and the determinants of pulse-wave velocity]. Sheng Wu Yi Xue Gong Cheng Xue Za Zhi 17(2), 179–82.

Wang, C.X., Yang, T. and Shuaib, A. 2006: Clot fragments formed from original thrombus obstruct downstream arteries in the ischemic injured brain. Microcirculation 13(3), 229–36.

Wang, G.H. and Hu, D.Y. 2005: Effect of pulse wave velocity on coronary flow reserve in patients with essential hypertension. Zhonghua Yi Xue Za Zhi 85(1), 54–7.

Wang, J.G., Staessen, J.A., Li, Y. et al. 2006: Carotid intima-media thickness and antihypertensive treatment: a meta-analysis of randomized controlled trials. Stroke 37, 1933–40.

Wang, J.J., O'Brien, A.B., Shrive, N.G. et al. 2003: Time-domain representation of ventricular-arterial coupling as a windkessel and wave system. American Journal of Physiology. Heart and Circulatory Physiology 284(4), H1358–68.

Wang, J.-M., Huang, Y.-J., Wang, Y. et al. 2007: Increased circulating $CD31^{+}/CD42^{-}$ microparticles are associated with impaired systemic artery elasticity in healthy subjects. American Journal of Hypertension 20, 957–64.

Wang, K.-L., Cheng, H.-M., Chuang, S.-Y. et al. 2009: Central or peripheral systolic or pulse pressure: which best relates to target organs and future mortality? Journal of Hypertension 27, 461–7.

Wang, K.-L., Cheng, H.-M., Sung, S.-H. et al. 2010: Wave reflection and arterial stiffness in the prediction of 15-year all-cause and cardiovascular mortalities: a community-based study. Hypertension 55, 799–805.

Wang, M. and Lakatta, E.G. 2006: Central arterial aging: humans to molecules. In: Safar, M.E. and O'Rourke, M.F. (eds), Arterial stiffness in hypertension, vol 23. Amsterdam: Elsevier, pp. 137–60.

Wang, T.J. 2007: Significance of circulating troponins in heart failure: if these walls could talk. Circulation 116, 1217–20.

Wang, T.J., Gona, P., Larson, M.G. et al. 2006: Multiple biomarkers for the prediction of first major cardiovascular events and death. New England Journal of Medicine 355, 2631–9.

Ward, A., Malloy, P. and Rippe, J. 1987: Exercise prescription guidelines for normal and cardiac populations. Cardiology Clinics 5(2), 197–210.
Ware, J.H. 2006: The limitations of risk factors as prognostic tools. New England Journal of Medicine 355, 2615–17.
Waring, W.S., Goudsmit, J., Marwick, J. et al. 2003: Acute caffeine intake influences central more than peripheral blood pressure in young adults. American Journal of Hypertension 16, 919–24.
Warltier, D.C., Buck, J.D., Brooks, H.L. et al. 1983: Coronary hemodynamics and subendocardial perfusion distal to stenoses. International Journal of Cardiology 4, 173–83.
Warltier, D.C., Pagel, P.S. and Kersten, J.R. 2000: Approaches to the prevention of perioperative myocardial ischemia. Anesthesiology 92, 253–9.
Warnholtz, A., Nickenig, G., Schulz, E. et al. 1999: NADH-oxidase-mediated superoxide production in the early stages of atherosclerosis: evidence for involvement of the renin–angiotensin system. Circulation 99(15), 2027–33.
Warnke, K.C. and Skalak, T.C. 1990: The effects of leukocytes on blood flow in a model skeletal muscle capillary network. Microvascular Research 40, 118–36.
Warnke, K.C. and Skalak, T.C. 1992: Leukocyte plugging in vivo in skeletal muscle arteriolar trees. American Journal of Physiology 262, H1149–55.
Warriner, R.K., Johnston, K.W. and Cobbold, R.S. 2008: A viscoelastic model of arterial wall motion in pulsatile flow: implications for Doppler ultrasound clutter assessment. Physiological Measurement 29(2), 157–79.
Wassmann, S., Hilgers, S., Laufs, U. et al. 2002: Angiotensin II type 1 receptor antagonism improves hypercholesterolemia-associated endothelial dysfunction. Arteriosclerosis, Thrombosis, and Vascular Biology 22(7), 1208–12.
Watanabe, H., Ohtsuka, S., Kakihana, M. et al. 1992: Decreased aortic compliance aggravates subendocardial ischaemia in dogs with stenosed coronary artery. Cardiovascular Research 26, 1212–18.
Watanabe, H., Ohtsuka, S., Kakihana, M. et al. 1993: Coronary circulation in dogs with an experimental decrease in aortic compliance. Journal of the American College of Cardiology 21(6), 1497–506.
Waters, D., Craven, T.E. and Lesperance, J. 1993: Prognostic significance of progression of coronary atherosclerosis. Circulation 87, 1067–75.
Watson, S., Wenzel, R.R., di Matteo, C. et al. 1998: Accuracy of a new wrist cuff oscillometric blood pressure device. Comparisons with intraarterial and mercury manometer measurements. American Journal of Hypertension 11, 1469–74.
Wauthy, P., Pagnamenta, A., Vassalli, F. et al. 2004: Right ventricular adaptation to pulmonary hypertension: an interspecies comparison. American Journal of Physiology. Heart and Circulatory Physiology 286(4), H1441–7.
Wayland, H. 1967: Rheology and the microcirculation. Gastroenterology 52, 342–55.
Wayland, H. and Johnson, P.C. 1967: Erythrocyte velocity measurement in microvessels by a two slit photometric method. Journal of Applied Physiology 22, 333–7.
Wazer, J.R. 1963: Viscosity and Flow Measurements. In: A Laboratory Handbook of Rheology. New York: Interscience Publishers.
Weatherall, D.J., Ledingham, J.G. and Warrell, D.A. 1983. Oxford textbook of medicine. New York: Oxford University Press, pp. 21–68.
Weaver, J.PA., Evans, A. and Walder, D.N. 1969: The effect of increased fibrinogen content on the viscosity of blood. Clinical Science 36, 1–10.
Webb, C.M., Elkington, A.G., Kraidly, M.M. et al. 2008: Effects of oral testosterone treatment on myocardial perfusion and vascular function in men with low plasma testosterone and coronary heart disease. American Journal of Cardiology 101, 618–24.
Weber, E.H. 1850: Ber. der Sachs ges. der Wiss. 166 (cited by Lambossy, 1950).
Weber, K.T. 1997: Extracellular matrix remodelling in heart failure: a role for de novo angiotensin II generation. Circulation 96, 4065–82.
Weber, K.T. and Janicki, J.S. 1977: Myocardial oxygen consumption: the role of wall force and shortening. American Journal of Physiology 233, H421.
Weber, K.T. and Janicki, J.S. 1974: Intra-aortic balloon counterpulsation: a review of physiologic principles, clinical results and device safety. Annals of Thoracic Surgery 17(6), 602–36.
Weber, K.T. and Janicki, J.S. 1977: Instantaneous force–velocity–length relations in isolated dog heart. American Journal of Physiology 232, H241–9.
Weber, K.T., Janicki, J.S. and Walker, A.A. 1972: Intra-aortic balloon pumping: an analysis of several variables affecting balloon performance. Transactions American Society of Artificial Internal Organs 18, 486–92.
Weber, K.T., Janicki, J.S., Reeves, R.C. et al. 1974: Determinants of stroke volume in the isolated canine heart. Journal of Applied Physiology 37, 742–7.
Weber, K.T., Anversa, P., Armstrong, P.W. et al. 1992: Remodeling and reparation of the cardiovascular system. Journal of the American College of Cardiology 20, 3–16.
Weber, T. 2010: Wave reflection in acute ischemic stroke. American Journal of Hypertension 23, 704–7.
Weber, R., Stergiopulos, N., Brunner, H.R. et al. 1996: Contributions of vascular tone and structure to elastic properties of a medium-sized artery. Hypertension 27(3 Pt 2), 816–22.
Weber, T., Ammer, M., Rammer, M. et al. 2009: Noninvasive determination of carotid-femoral pulse wave velocity depends critically on assessment of travel distance: a comparison with invasive measurement. Journal of Hypertension 27(8), 1624–30.
Weber, T., Auer, J., Eisserer, G. et al. 2003: Arterial stiffness and cardiovascular drugs. Current Pharmaceutical Design 9(13), 1049–63.
Weber, T., Auer, J., O'Rourke, M.F. et al. 2004: Arterial stiffness, wave reflection and the risk of coronary artery disease. Circulation 109(2), 184–9.
Weber, T., Auer, J., O'Rourke, M.F. et al. 2005: Increased arterial wave reflections predict severe cardiovascular events in patients undergoing percutaneous coronary interventions. European Heart Journal 26, 2657–63.
Weber, T., Auer, J., O'Rourke, M.F. et al. 2006: Prolonged mechanical systole and increased arterial wave reflections in diastolic dysfunction. Heart 92, 1616–22.
Weber, T., Maas, R., Auer, J. et al. 2007: Arterial wave reflections and determinants of endothelial function a hypothesis based on peripheral mode of action. American Journal of Hypertension 20(3), 256–62.
Weber, T., O'Rourke, M.F., Ammer, M. et al. 2008: Arterial stiffness and arterial wave reflections are associated with systolic and diastolic function in patients with normal ejection fraction. American Journal of Hypertension 21, 1194–202.
Weber, T., O'Rourke, M.F., Lassnig, E. et al. 2010: Pulse waveform characteristics predict cardiovascular events and mortality in patients undergoing coronary angiography. Journal of Hypertension 28, 797–805.
Webster, J.G. (ed.), 1978: Medical instrumentation. Boston: Houghton Mifflin.
Weinbaum, S., Zhang, X., Han, Y. et al. 2003: Mechanotransduction and flow across the endothelial glycocalyx. Proceedings of the National Academy of Sciences of the United States of America 100, 7988–95.
Weinberg, C.E., Hertzberg, J.R., Ivy, D.D. et al. 2004: Extraction of pulmonary vascular compliance, pulmonary vascular resistance, and right ventricular work from single-pressure and Doppler flow measurements in children with pulmonary hypertension: a new method for evaluating reactivity: in vitro and clinical studies. Circulation 110(17), 2609–17.
Weisfeldt, M.L. 1980: Aging of the cardiovascular system. New England Journal of Medicine 303, 1172–4.
Weisfeldt, M.L., Lakatta, E.G. and Gerstenblith, G. 1992: Aging and the heart. In: Braunwald, E. (ed.), Heart disease – a textbook of cardiovascular medicine, 4th edn. Philadelphia: W.B. Saunders, pp. 1656–66.
Weiss, E. 1939: Recent advances in the pathogenesis and treatment of hypertension – a review. Psychosomatic Medicine 1, 180.
Weissler, A.M., Harris, L.C. and White, G.D. 1963: Left ventricular ejection time index in man. Journal of Applied Physiology 18(5), 919–23.
Weissler, A.M. 1968: The heart in heart failure. Annals of Internal Medicine 69(5), 929–40.

Weissler, A.M., Hussmave, W.S. and Schoenfeld, C.V. 1968: Systolic time intervals in heart failure in man. Circulation 37, 149–59.
Welkowitz, W. and Li, J.K. 1984: Modeling and optimization of assisted circulation. IEEE Transactions on Biomedical Engineering 31(12), 899–902.
Wells, M.K. 1969: On the determination of the elastic properties of blood vessels from their wave transmission characteristics. Stanford University Rep. No. SUDAAR-368.
Wells, P.N.T. 1969: Physical Principles of Ultrasonic Diagnosis. London: Academic Press.
Wells, M.K., Winter, D.C., Nelson, A.W. et al. 1974: Hemodynamic patterns in coronary arteries. In: Nerem, R.M. (ed.), Fluid dynamic aspects of arterial disease. Columbus: Ohio State University College of Engineering, pp. 36–8.
Wells, P.N.T. 1995: Today's state of the art: does colour velocity imaging overtake colour Doppler? Journal of Vascular Investigation 1, 38–43.
Wells, R.E. and Merrill, E.W. 1961: The variability of blood viscosity. American Journal of Medicine 31, 505–9.
Wermers, R.A., Khosla, S., Atkinson, E.J. et al. 1998: Survival after the diagnosis of hyperparathyroidism, a population-based study. American Journal of Medicine 104, 115–22.
Werner, D., Schneider, M., Weise, M. et al. 1999: Pneumatic external counterpulsation: a new noninvasive method to improve organ perfusion. American Journal of Cardiology 84(8), 950–52, A7–8.
Werner, N., Kosiol, S., Schiegl, T. et al. 2005: Circulating endothelial progenitor cells and cardiovascular outcomes. New England Journal of Medicine 353, 999–1007.
Wessel, T.R., Arant, C.B., McGorray, S.P. et al. 2007: Coronary microvascular reactivity is only partially predicted by atherosclerosis risk factors or coronary artery disease in women evaluated for suspected ischemia. Clinical Cardiology 30(2), 69–74.
Wesseling, K.H. 1976: TNO pulse contour cardiac output computer probably as accurate as clinical Fick or indicator dilution methods. In: Progress Report 5, Institute of Medical Physics, Da Costakade 45, Utrecht, Netherlands, p. 63.
Wesseling, K.H. 1995: A century of noninvasive arterial pressure measurement: from Marey to Penaz and finapres. Homeostasis 36, 50–66.
Wesseling, K.H., Smith, N.T., Nichols, W.W. et al. 1974: Beat-to-beat cardiac output from the arterial pressure pulse contour. In: Feldman, S.A.et al. (ed.), Measurements in anesthesia. Leiden, The Netherlands: Leiden University Press.
Wesseling, K.H., De Wit, B., Settels, J.J. et al. 1982: On the indirect registration of finger blood pressure after Penaz. Functional Biology and Medicine 1, 245–50.
Wesseling, K.H., Settels, J.J., van der Hoeven, G.M.A. et al. 1985: Effects of peripheral vasoconstriction on the measurement of blood pressure in a finger. Cardiovascular Research 19, 139–45.
Wesseling, K.H., Jansen, J.R.C., Settels, J.J. et al. 1993: Computation of aortic flow from pressure in humans using a nonlinear, three-element model. Journal of Applied Physiology 74(5), 2566–73.
Wesseling, K.H., De Wit, B., van der Hoeven, G.M.A. et al. 1995: Physical, calibrating finger vascular physiology for finapres. Homeostasis 36, 67–82.
Wessells, H., Teal, T.H., Engel, K. et al. 2006: Fluid shear stress-induced nitric oxide production in human cavernosal endothelial cells: inhibition by hyperglycaemia. BJU International 97(5), 1047–52.
Westerbacka, J., Leinonen, E., Salonen, J.T. et al. 2005: Increased augmentation of central blood pressure is associated with increases in carotid intima media thickness in type 2 diabetic patients. Diabetologia 48, 1654–62.
Westerbacka, J., Uosukainen, A., Makimattila, S. et al. 2000: Insulin-induced decrease in large artery stiffness is impaired in uncomplicated type 1 diabetes mellitus. Hypertension 35, 1043–48.
Westerbacka, J., Seppala-Lindroos, A. and Yki-Jarvinen, H. 2001: Resistance to acute insulin induced decreases in large artery stiffness accompanies the insulin resistance syndrome. Journal of Clinical Endocrinology and Metabolism 86(11), 5262–8.
Westerhof, N. 2003: Special issue on mechanics of the cardiovascular system. Journal of Biomechanics 36(5), 621–2.
Westerhof, N. and Noordergraaf, A. 1970: Arterial viscoelasticity: a generalized model. Effect on input impedance and wave travel in the systemic tree. Journal of Biomechanics 3, 357–79.
Westerhof, N. and Elzinga, G. 1974: The relation between end-diastolic volume and source impedance of the left ventricle. Archives Internationales de Physiologie et de Biochimie 82, 326–9.
Westerhof, N. and Elzinga, G. 1978: The apparent source resistance of heart and muscle. Annals of Biomedical Engineering 6, 16–32.
Westerhof, N. and Elzinga, G. 1991: Normalized input impedance and arterial decay time over heart period are independent of animal size. American Journal of Physiology 261, R126–33.
Westerhof, N. and O'Rourke, M.F. 1995: Haemodynamic basis for the development of left ventricular failure in systolic hypertension and for its logical therapy. Journal of Hypertension 13, 943–52.
Westerhof, N. and Stergiopulos, N. 2000: Models of the arterial tree. Studies in Health Technology and Informatics 71, 65–77.
Westerhof, N. and Westerhof, B. 2010: Return time of reflected wave is not a measure of aortic stiffness. Artery 10, 52.
Westerhof, N., Bosman, F., De Vries, C.J. et al. 1969: Analog studies of the human systemic arterial tree. Journal of Biomechanics 2, 121–43.
Westerhof, N., Sipkema, P., van der Bos, G.C. et al. 1972: Forward and backward waves in the arterial system. Cardiovascular Research 6(6), 648–56.
Westerhof, N., Elzinga, G. and Van den Bos, G.C. 1973: Influence of central and peripheral changes on the hydraulic input impedance of the systemic arterial tree. Medical and Biological Engineering and Computing 11, 710–23.
Westerhof, N., Van den Bos, G.C. and Laxminarayan, S. 1978: Arterial reflection. In: Bauer, R.D. and Busse, R. (eds), The arterial system. Berlin: Springer, pp. 48–62.
Westerhof, N., Sipkema, P., Elzinga, G. et al. 1979: Arterial impedance. In: Hwang, H.C., Gross, D.R. and Patel, D.J. (eds), Quantitative cardiovascular studies. Baltimore: University Park Press.
Westerhof, N., Boer, C., Lamberts, R.R. et al. 2006: Cross-talk between cardiac muscle and coronary vasculature. Physiological Reviews 86(4), 1263–308.
Westerhof, B.E., van den Wijngaard, J.P., Murgo, J.P. et al. 2008a: Location of a reflection site is elusive: consequences for the calculation of aortic pulse wave velocity. Hypertension 52, 478–83.
Westerhof, B.E., Guelen, I., Stok, W.J. et al. 2008b: Individualization of transfer function in estimation of central aortic pressure from the peripheral pulse is not required in patients at rest. Journal of Applied Physiology 105, 1858–63.
Westerhof, N., Lankhaar, J.W. and Westerhof, B.E. 2009: The arterial Windkessel. Medical and Biological Engineering and Computing 47(2), 131–41.
Westerhof, N., Stergiopulos, N. and Noble, M.I.M. 2010. Snapshots of hemodynamics, 2nd edn. London: Springer.
Westling, H., Jansson, L., Jonson, B. et al. 1984: Vasoactive drugs and elastic properties of human arteries in vivo, with special reference to the action of nitroglycerin. European Heart Journal 5, 609–16.
Wetterer, E. 1937: Eine neue Methode zur Registrierung der Blutstromungsgeschwindigkeit am uneroffneten Gefass. Zeitschrift für Biologie 98, 26–36.
Wetterer, E. 1954: Flow and pressure in the arterial system, their hemodynamic relationship, and the principles of their measurement. Minnesota Medicine 37(2), 77–86.
Wetterer, E. 1956: Die Wirkung der Herztatigkeit auf die Dynamik der Arteriensystems. Verhandlungen der Deutschen Gesellschaft für Kreislaufforschung 22, 26–60.
Wetterer, E. and Deppe, B. 1940: Zeitschrift für Biologie, 100, 205; 99, 320 (cited by Wetterer, 1954).
Wetterer, E. and Kenner, T. 1968: Grundlagen Dynamik des Arterienpulses. Berlin: Springer-Verlag.

Wetterer, E., Bauer, R.D. and Busse, R. 1977a: Arterial dynamics. In: Jaffrin, M.Y. (ed.), Cardiovascular and Pulmonary Dynamics INSERM-EUROMECH PARIS 71, 7–42.

Wetterer, E., Busse, R., Bauer, R.D. et al. 1977b: Photoelectric device for contact-free recording of the diameters of exposed arteries in situ. Pflugers Archives die gesamte Physiologie 368, 149–52.

Wexler, L., Bergel, D.H., Gabe, I.T. et al. 1968: Velocity of blood flow in normal human venae cavae. Circulation Research 23, 349–59.

Wezler, K. and Knebel, R. 1937: Zeitschrift für Biologie 98, 99–127.

Wezler, K. and Boger, A. 1939: Die Dynamik des arteriellen Systems. Der arterielle Blutdruck und sein Komponenten. Ergebnisse der Physiologie, Biologischen Chemie und experimentellen Pharmakologie 41, 292–606.

Wheat, M.W. Jr. 1980: Acute dissecting aneurysms of the aorta: diagnosis and treatment–1979. American Heart Journal 99, 373–87.

Wheatley, R.M., Dockery, S.P., Kurz, M.A. et al. 1994: Interactions of nitroglycerin and sulfhydryl-donating compounds in coronary microvessels. American Journal of Physiology 266, H291–97.

Whelan, A.P., Sutherland, W.H., McCormick, M.P. et al. 2004: Effects of white and red wine on endothelial function in subjects with coronary artery disease. International Medicine Journal 34(5), 224–8.

Whitaker, S.R.F. and Winton, F.R. 1933: The apparent viscosity of blood flowing in the isolated hind limb of the dog and its variation with corpuscular concentration. Journal of Physiology 78, 339–69.

Whitcomb, B.L., Prochazka, A., LoVerde, M. et al. 1995: Failure of the community-based Vita-Stat automated blood pressure device to accurately measure blood pressure. Archives of Family Medicine 4(5), 419–24.

White, H.D., Norris, R.M., Brown, M.A. et al. 1987: Left ventricular end-systolic volume as the major determinant of survival after recovery from myocardial infarction. Circulation 76, 44–51.

White, K.C., Kavanaugh, J.F., Wang, D. et al. 1994: Hemodynamics and wall shear rate in the abdominal aorta of dogs – effects of vasoactive agents. Circulation Research 75, 637–49.

White, P.D. 1951a. Heart disease. New York: Macmillan, pp. 561–2.

White, P.D. 1951b: Studies on arteriosclerosis; clinical aspects. Journal of Gerontology 6, 151–3.

White, W.B., Lund-Johansen, P. and Omvik, P. 1990: Assessment of four ambulatory blood pressure monitors and measurements by clinicians versus intra-arterial blood pressure at rest and during exercise. American Journal of Cardiology 65, 60–6.

White, W.B., Berson, A.S., Robbins, C. et al. 1993: National standard for measurement of resting and ambulatory blood pressures with automated sphygmomanometers. Hypertension 21, 504–9.

White, W.B., Moscufo, N., Guttmann, C. et al. 2010: The progression of white matter disease of the brain and decline in cognitive function is predicted best by 24-hour systolic blood pressure in the very elderly. Journal of Clinical Hypertension 12(suppl. 1), A65.

Whitmore, R.L. 1968. Rheology of the circulation. Oxford: Pergamon Press.

Whittaker, S.R. and Winton, F.R. 1933: The apparent viscosity of blood flowing in the isolated hindlimb of the dog, and its variation with corpuscular concentration. Journal of Physiology 78(4), 339–69.

Widlansky, M.E. 2009: Shear stress and flow-mediated dilation: all shear responses are not created equally. American Journal of Physiology. Heart and Circulatory Physiology 296, H31–2.

Widlansky, M.E., Gokce, N., Keaney, J.F. Jr. et al. 2003: The clinical implications of endothelial dysfunction. Journal of the American College of Cardiology 42(7), 1149–60.

Wiedemann, G. 1856: Ann Der Physik, 99, 221. Cited by Hatchet, E. 1828: The Viscosity of Liquids. London: Bell.

Wiedemann, M.P. 1974. Microcirculation. Stroudsburg, PN: Dowden, Hutchinson and Ross.

Wiggers, C.J. 1928. The pressure pulses in the cardiovascular system. London: Longman.

Wiggers, C.J. and Wegria, R. 1938: Active changes in size and distensibility of the aorta during acute hypertension. American Journal of Physiology 124, 603–11.

Wikstrand, J. and Wendelhag, I. 1994: Methodological considerations of ultrasound investigation of intima-media thickness and lumen diameter. Journal of Internal Medicine 236, 555–9.

Wikström, J., Grönros, J. and Gan, L.M. 2008: Adenosine induces dilation of epicardial coronary arteries in mice: relationship between coronary flow velocity reserve and coronary flow reserve in vivo using transthoracic echocardiography. Ultrasound in Medicine and Biology 34(7), 1053–62.

Wilbert-Lampen, U., Leistner, D., Greven, S. et al. 2008: Cardiovascular events during World Cup soccer. New England Journal of Medicine 358, 475–83.

Wilcken, D.E.L., Charlier, A.A., Hoffman, J.I.E. et al. 1964: Effects of alterations in aortic impedance on the performance of the ventricles. Circulation Research 14, 283–93.

Wilcox, B.R. and Lucas, C.L. 1980: Pulmonary input impedance in children with left-right shunt. Journal of Surgical Research 29, 40–9.

Wildman, R.P., Mackey, R.H., Bostom, A. et al. 2003: Measures of obesity are associated with vascular stiffness in young and older adults. Hypertension 42, 468–73.

Wildman, R.P., Farhat, G.N., Patel, A.S. et al. 2005: Weight change is associated with change in arterial stiffness among healthy young adults. Hypertension 45, 187–92.

Wilhelmsen, L., Svardsudd, K., Korsan-Bengtsen, K. et al. 1984: Fibrinogen as a risk factor for stroke and myocardial infarction. New England Journal of Medicine 311(8), 501–5.

Wilkens, H., Guth, A., Konig, J. et al. 2001: Effect of inhaled iloprost plus oral sildenafil in patients with primary pulmonary hypertension 104, 1218–22.

Wilkins, P.A., Ducharme, N.G., Lowe, J.E. et al. 1994: Measurements of blood flow and xanthine oxidase activity during postischemic reperfusion of the large colon of ponies. American Journal of Veterinary Research 55(8), 1168–77.

Wilkinson, I., Megson, I.L., MacCallum, H. et al. 1999: Oral vitamin C reduces arterial stiffness and platelet aggregation in humans. Journal of Cardiovascular Pharmacology 34, 690–3.

Wilkinson, I., Qasem, A., McEniery, C.M. et al. 2002: Nitric oxide regulates local arterial distensibility in vivo. Circulation 105(2), 213–17.

Wilkinson, I.B. and Webb, D.J. 2001: Venous occlusion plethysmography in cardiovascular research, methodology and clinical applications. British Journal of Clinical Pharmacology 52(6), 631–46.

Wilkinson, I.B., Fuchs, S.A., Jansen, I.M. et al. 1998: Reproducibility of pulse wave velocity and augmentation index measured by pulse wave analysis. Journal of Hypertension 16(12 Pt 2), 2079–84.

Wilkinson, I.B., Christison, D.J.W. and Cockcroft, J.R. 2000a: Isolated systolic hypertension, a radical rethink (Editorials). British Medical Journal 320, 1685.

Wilkinson, I.B., MacCallum, H., Rooijmans, D.F. et al. 2000b: Increased augmentation index and systolic stress in type I diabetes mellitus. Quarterly Journal of Medicine 93, 441–8.

Wilkinson, I.B., Franklin, S.S., Hall, I.R. et al. 2001: Pulse pressure amplification explains why diastolic pressure predicts risk in younger subjects. Hypertension 38, 1461–6.

Wilkinson, I.B., Hall, I.R., MacCallum, H. et al. 2002a: Pulse-wave analysis: clinical evaluation of a noninvasive, widely applicable method for assessing endothelial function. Arteriosclerosis, Thrombosis, and Vascular Biology 22, 147–52.

Wilkinson, I.B., Prasad, K., Hall, I.R. et al. 2002b: Increased central pulse pressure and augmentation index in subjects with hypercholesterolemia. Journal of the American College of Cardiology 39(6), 1005–11.

Wilkinson, I.B., Franklin, S.S. and Cockcroft, J.R. 2004: Nitric oxide and the regulation of large artery stiffness: from physiology to pharmacology. Hypertension 44, 112–6.

Willekes, C., Hoeks, A.P., Bots, M.L et al. 1999: Evaluation of off-line automated intima-media thickness detection of the common carotid artery based on M-line signal processing. Ultrasound in Medicine and Biology 25, 57–64.

Willerson, J.T. and Kereiakes, D.J. 2003: Editors' commentary: mechanical circulatory support. Circulation 108, 3069–70.

Willett, F., Curzen, N., Adams, J. et al. 1992: Coronary vasospasm induced by subcutaneous sumatriptan. British Medical Journal 304, 1415.
Willett, W.C. 2002: Balancing life-style and genomics research for disease prevention. Science 296, 695–8.
Williams, A., Davies, S., Stuart, A.G. et al. 2008: Medical treatment of Marfan syndrome: a time for change. Heart 94(4), 414–21.
Williams, B. 1999: The unique vulnerability of diabetic subjects to hypertensive injury. Journal of Human Hypertension 13, S3–8.
Williams B. 2008: The year in hypertension. Journal of the American College of Cardiology **51**, 1803–17.
Williams, B. and O'Rourke, M. 2001: A sub-study of the ASCOT trial. The conduit artery functional endpoint (CAFÉ) study in ASCOT. Journal of Human Hypertension 15, S69–73.
Williams, B., Lacy, P.S., Thom, S.M. et al. 2006: Differential impact of blood pressure-lowering drugs on central aortic pressure and clinical outcomes. Circulation 113, 1213–25.
Williams, J.K., Adams, M.R., Herrington, D.M. et al. 1992: Short-term administration of estrogen and vascular responses of atherosclerotic coronary arteries. Journal of the American College of Cardiology 20(2), 452–7.
Williams, M.A., Haskell, W.L., Ades, P.A. et al. 2007: Resistance exercise in individuals with and without cardiovascular disease: 2007 update: a scientific statement from the American Heart Association Council on Clinical Cardiology and Council on Nutrition, Physical Activity, and Metabolism. Circulation 116, 572–84.
Williams, M.R., Westerman, R.A., Kingwell, B.A. et al. 2001: Variations in endothelial function and arterial compliance during the menstrual cycle. Journal of Clinical Endocrinology and Metabolism 86, 5389–95.
Williams, R., Needles, A., Cherin, E. et al. 2007: Noninvasive ultrasonic measurement of regional and local pulse-wave velocity in mice. Ultrasound in Medicine and Biology 33(9), 1368–75.
Williams, T.I. 1969. A biographical dictionary of scientists. New York: Wiley-Interscience.
Williamson, E.B., Bronas, U.G. and Dengel, D.R. 2008: Automated edge detection versus manual edge measurement in analysis of brachial artery reactivity: a comparison study. Ultrasound in Medicine and Biology 34(9), 1499–503.
Willich, S.N., Lewis, M., Löwel, H. et al. 1993: Physical exertion as a trigger of acute myocardial infarction. New England Journal of Medicine 329, 1684–90.
Willink, R.D. and Evans, D.H. 1996: The effect of geometrical spectral broadening on the estimation of mean blood velocity using wide and narrow ultrasound beams. IEEE Transactions in Biomedical Engineering 43, 238–248.
Willum-Hansen, T., Staessen, J.A., Torp-Pedersen, C. et al. 2006: Prognostic value of aortic pulse wave velocity as index of arterial stiffness in the general population. Circulation 113(5), 664–70.
Wilmot, M., Ghadami, A., Whysall, B. et al. 2006: Transdermal glyceryl trinitrate lowers blood pressure and maintains cerebral blood flow in recent stroke. Hypertension 47, 1209–15.
Wilson, D.G., Bellamy, M.F., Ramsey, M.W. et al. 1999: Endothelial function in Marfan syndrome: selective impairment of flow-mediated vasodilation Circulation 99, 909–15.
Wilson, J.R. 1995: Exercise intolerance in heart failure: importance of skeletal muscle. Circulation 91(2), 559–60.
Wilson, P.W., Pencina, M., Jacques, P. et al. 2008: C-reactive protein and reclassification of cardiovascular risk in the Framingham Heart Study. Circulation Cardiovascular Quality and Outcomes 1(2), 92–7.
Wilson, R.F. and White, C.W. 1986: Intracoronary papaverine: an ideal coronary vasodilator for studies of the coronary circulation in conscious humans. Circulation 73, 444–51.
Wilson, R.F., Laughlin, D.E., Ackell, P.H. et al. 1985: Transluminal, subselective measurement of coronary artery blood flow velocity and vasodilator reserve in man. Circulation 72(1), 82–92.
Wilson, S.R., Givertz, M.M., Stewart, G.C. et al. 2009: Ventricular assist devices: the challenges of outpatient management. Journal of the American College of Cardiology 54, 1647–59.
Winbury, M.M., Howe, B.B. and Hefner, M.A. 1969: Effect of nitrates and other coronary dilators on large and small coronary vessels: an hypothesis for the mechanism of action of nitrates. Journal Pharmacology Experimental Therapy 168(1), 70–95.
Wing, L.M.H., Rei, C.M., Ryan, P. et al. 2003: A comparison of outcomes with angiotensin-converting-enzyme inhibitors and diuretics for hypertension in the elderly. New England Journal of Medicine 348, 583–92.
Wingfield, D., Freeman, G.K. and Bulpitt, C.J. 2002: Selective recording in blood pressure readings may increase subsequent mortality. Quarterly Journal of Medicine 95(9), 571–7.
Winker, M.A. and Murphy, M.B. 1991: Isolated systolic hypertension in the elderly. Journal of the American Medical Association 265(24), 3301–2.
Winniford, M.D. and Lambert, C.R. 1994: Blood flow measurement. In: Pepine, C.J., Hill, J.A. and Lambert, C.R. (eds), Diagnostic and therapeutic cardiac catheterization, 2nd edn. Baltimore: Williams and Wilkins, pp. 321–54.
Wissler, R.W. and Strong, J.P. 1998: Risk factors and progression of atherosclerosis in youth. PDAY Research Group. Pathological Determinants of Atherosclerosis in Youth. American Journal of Pathology 153(4), 1023–33.
Witzig, K. 1914: Uber erzwungene Wellenbewegungen zaher, inkompressibler Flussigkeiten in elastischen Rohren. Inaug. Diss. Bern. Bern: Wyss.
Wojciechowska, W., Staessen, J.A., Stolarz, K. et al. 2004: Association of peripheral and central arterial wave reflections with the CYP11B2 -344C allele and sodium excretion. Journal of Hypertension 22, 2311–19.
Wolak, A., Gransar, H., Thomson, L.E. et al. 2008: Aortic size assessment by noncontrast cardiac computed tomography: normal limit by age, gender, and body surface area. JACC. Cardiovascular Imaging 1, 200–9.
Wolak, T., Kim, H., Ren, Y. et al. 2009: Osteopontin modulates angiotensin II-induced inflammation, oxidative stress, and fibrosis of the kidney. Kidney International 76(1), 32–43.
Wolinsky, H. 1972: Long-term effects of hypertension on the rat aortic wall and their relation to concurrent aging changes: morphological and chemical studies. Circulation Research 30, 301–9.
Wolinsky, H. and Glagov, S. 1964: Structural basis for the static mechanical properties of the aortic media. Circulation Research 14, 400–13.
Wolinsky, H. and Glagov, S. 1967: Nature of species differences in the medial distribution of aortic vasa vasorum in mammals. Circulation Research 20, 409–21.
Wolinsky, H. and Glagov, S. 1969: Comparison of abdominal and thoracic aortic medial structure in mammals: deviation of man from the usual pattern. Circulation Research 25, 677–86.
Wollersheim, H. and van Zwieten, P.A. 1993: Treatment of Raynaud's phenomenon. European Heart Journal 14, 147–9.
Womersley, J.R. 1955a: Oscillatory flow in arteries: effect of radial variation in viscosity on rate of flow. Journal of Physiology 127, 38P–9P.
Womersley, J.R. 1955b: Method for the calculation of velocity, rate of flow and viscous drag in arteries when the pressure gradient is known. Journal of Physiology 127, 553–63.
Womersley, J.R. 1955c: Oscillatory motion of a viscous liquid in a thin-walled elastic tube: I. The linear approximation for long waves. Philosophical Magazine 46, 199–221.
Womersley, J.R. 1955d: Oscillatory flow in arteries: effect of radial variation in viscosity on rate of flow. Journal of Physiology 127, 38–9.
Womersley, J.R. 1957a: Oscillatory flow in arteries: the constrained elastic tube as a model of arterial flow and pulse transmission. Physics in Medicine and Biology 2, 178–87.
Womersley, J.R. 1957b: The mathematical analysis of the arterial circulation in a state of oscillatory motion. Technical Report Wade-TR. 56–614. Dayton, OH: Wright Air Development Center.
Womersley, J.R. 1958: Oscillatory flow in arteries: the reflection of the pulse wave at junctions and rigid inserts in the arterial system. Physics in Medicine and Biology 2, 313–23.
Wong, A.Y.K., Klassen, G.A. and Johnstone, D.E. 1984: Hemodynamics of coronary artery stenosis. Canadian Journal of Physiology and Pharmacology 62, 59–69.

Wong, B.J., Simmons, G., Bopp, C. et al. 2009: Commentaries on viewpoint: pick your Poiseuille: normalizing the shear stimulus in studies of flow-mediated dilation. Journal of Applied Physiology 107, 1360–5.

Wong, E.Y., Nikolov, H.N., Thorne, M.L. et al. 2009: Clinical Doppler ultrasound for the assessment of plaque ulceration in the stenosed carotid bifurcation by detection of distal turbulence intensity: a matched model study. European Radiology 19(11), 2739–49.

Wong, M., Toh, L., Wilson, A. et al. 2003: Reduced arterial elasticity in rheumatoid arthritis and the relationship to vascular disease risk factors and inflammation. Arthritis and Rheumatism 48, 81–9.

Woo, Y.R. and Yoganathan, A.P. 1985: Two component laser Doppler anemometer for measurement of velocity and turbulent shear stress near prosthetic heart valves. Medical Instruments 19, 224–31.

Wood, E.H., Leusen, I.R., Warner, H.R. et al. 1954: Measurement of pressures by cardiac catheters in man. Minnesota Medicine 37, 87–92.

Wood, N.B. 1999: Aspects of fluid dynamics applied to the larger arteries. Journal of Theoretical Biology 199(2), 137–61.

Wood, P. 1968. Diseases of the heart and circulation. London: Eyre & Spottiswoode.

Woodbury, R.A. and Hamilton, W.F. 1937: Blood pressure studies in small animals. American Journal of Physiology 19, 663–74.

Woolam, G.L., Schnur, P.L., Vallbona, C. et al. 1962: The pulse wave velocity as an early indicator of atherosclerosis in diabetic subjects. Circulation 25, 533–9.

Worthley, M.I., Kanani, R.S., Sun, Y.H. et al. 2007: Effects of tetrahydrobiopterin on coronary vascular reactivity in atherosclerotic human coronary arteries. Cardiovascular Research 76(3), 539–46.

Wright, R.S., Anderson, J.L., Adams, C.D. et al. 2011: 2011 ACCF/AHA Focused Update Incorporated Into the ACC/AHA 2007 Guidelines for the Management of Patients With Unstable Angina/Non-ST-Elevation Myocardial Infarction A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines Developed in Collaboration With the American Academy of Family Physicians, Society for Cardiovascular Angiography and Interventions, and the Society of Thoracic Surgeons. Journal of the American College of Cardiology 57(19), e215–367.

Wu, G., Du, Z., Hu, C. et al. 2006: Angiogenic effects of long-term enhanced external counterpulsation in a dog model of myocardial infarction. American Journal of Physiology. Heart and Circulatory Physiology 290(1), H248–54.

Wu, W.-C., Mohler, E. III., Ratcliffe, S.J. et al. 2009: Skeletal muscle microvascular flow in progressive peripheral artery disease: assessment with continuous arterial spin-labeling perfusion magnetic resonance imaging. Journal of the American College of Cardiology 53, 2372–7.

Wu, X., Huang, Z., Stamler, J. et al. 1996: Changes in average blood pressure and incidence of high blood pressure 1983–1984 to 1987–1988 in four population cohorts in the People's Republic of China. Journal of Hypertension 14, 1267–74.

Wu, Y., Yu, Y. and Kovács, S.J. 2007: Contraction-relaxation coupling mechanism characterization in the thermodynamic phase plane: normal vs. impaired left ventricular ejection fraction. Journal of Applied Physiology 102(4), 1367–73.

Wu, C.C., Lin, W.C., Zhang, G. et al. 2011: Accuracy evaluation of RBC velocity measurement in nail-fold capillaries. Microvascular Research 81(3), 252–60.

Wylie, C.R. 1960. Advanced engineering mathematics. New York: McGraw-Hill.

Xie, J., Hu, D., Wang, X. et al. 2009: Smoking state determined by cotinine and arterial stiffness. Circulation Journal 73(8), 1537–42.

Yabe, R., Takazawa, K., Maeda, K. et al. 1991: The influence of ascending aortic augmentation index (reflection coefficient) to left ventricular relaxation. Circulation 84, 565.

Yaginuma, T., Avolio, A.P., O'Rourke, M.F. et al. 1986: Effect of glyceryl trinitrate on peripheral arteries alters left ventricular hydraulic load in man. Cardiovascular Research 20(2), 153–60.

Yaginuma, T., Noda, T., Tsuchiya, M. et al. 1985: Interaction of left ventricular contraction and aortic input impedance in experimental and clinical studies. Japanese Circulation Journal 49, 206–14.

Yamaguchi, R., Ujiie, H., Haida, S. et al. 2008: Velocity profile and wall shear stress of saccular aneurysms at the anterior communicating artery. Heart Vessels 23(1), 60–6.

Yamamoto, K., Sakata, Y., Ohtani, T. et al. 2009: Heart failure with preserved ejection fraction: what is known and unknown. Circulation Journal 73, 404–10.

Yamamoto, T., Kimura, A., Tanaka, H. et al. 1994: Characteristics of the velocity profile in aorto-renal bifurcation. In: Hosoda, S., Yaginuma, T., Sugawara, M. et al. (eds), Recent progress in cardiovascular mechanics. Chur, Switzerland: Harwood Academic Publishers, pp. 239–52.

Yamasaki, Y., Kawamori, R., Matsushima, H. et al. 1994: Atherosclerosis in carotid artery of young IDDM patients monitored by ultrasound high-resolution B-mode imaging. Diabetes 43(5), 634–9.

Yancy, C.W. 2008: Vasodilator therapy for decompensated heart failure. Journal of the American College of Cardiology 52, 208–10.

Yang, C., Grattoni, C.A., Muggeridge, A.H. et al. 2000: A model for steady laminar flow through a deformable gel-coated channel. Journal of Colloid Interface Science 226(1), 105–111.

Yanof, H.M. 1972. Biomedical electronics, 2nd edn. Philadelphia: F.A. Davis.

Yanof, H.M., Rosen, A.L., McDonald, N.M. et al. 1963: A critical study of the response of manometers to forced oscillations. Physics in Medicine and Biology 66, 407–22.

Yao, J.S., Flinn, W.R. and Bergan, J.J. 1984: Non-invasive vascular diagnostic testing: techniques and clinical applications. Progress in Cardiovascular Disease 26, 459–94.

Yao, Y., Rabodzey, A. and Dewey, C.F. Jr. 2007: Glycocalyx modulates the motility and proliferative response of vascular endothelium to fluid shear stress. American Journal of Physiology. Heart and Circulatory Physiology 293, H1023–30.

Yarnell, J.W., Baker, I.A., Sweetnam, P.M. et al. 1991: Fibrinogen, viscosity, and white blood cell count are major risk factors for ischemic heart disease. The Caerphilly and Speedwell collaborative heart disease studies. Circulation 83(3), 836–44.

Yaron, M., Greenman, Y., Rosenfeld, J.B. et al. 2009: Effect of testosterone replacement therapy on arterial stiffness in older hypogonadal men. European Journal of Endocrinology 160, 839–46.

Yarows, S.A. and Amerena, J.V. 1999: Determination of accuracies of 10 models of home blood pressure monitors using an oscillometric simulator. Blood Pressure Monitoring 4(1), 45–52.

Yarows, S.A. and Brook, R.D. 2000: Measurement variation among 12 electronic home blood pressure monitors. American Journal of Hypertension 13(3), 276–82.

Yasmin and Brown, M.J. 1999: Similarities and differences between augmentation index and pulse wave velocity in the assessment of arterial stiffness. Quarterly Journal of Medicine 92(10), 595–600.

Yasmin, McEniery, C.M., Wallace, S. et al. 2004: C-reactive protein is associated with arterial stiffness in apparently healthy individuals. Arteriosclerosis, Thrombosis, and Vascular Biology 24(5), 969–74.

Yasue, H., Nakagawa, H., Itoh, T. et al. 2008: Coronary artery spasm – clinical features, diagnosis, pathogenesis, and treatment. Journal of Cardiology 51(1), 2–17.

Yasuno, S., Ueshima, K., Oba, K. et al. 2010: Is pulse pressure a predictor of new-onset diabetes in high-risk hypertensive patients? A subanalysis of the Candesartan Antihypertensive Survival Evaluation in Japan (CASE-J) Trial. Diabetes care 33(5), 1122–7.

Yeboah, J., Crouse, J.R., Hsu, F.C. et al. 2007: Brachial flow-mediated dilation predicts incident cardiovascular events in older adults: the Cardiovascular Health Study. Circulation 115(18), 2390–7.

Yeboah, J., Folsom, A.R., Burke, G.L. et al. 2009: Predictive value of brachial flow-mediated dilation for incident cardiovascular events in a population-based study: the multi-ethnic study of atherosclerosis. Circulation 120(6), 502–9.

Yeh, R.W., Sidney, S., Chandra, M. et al. 2010: Population trends in the incidence and outcomes of acute myocardial infarction. New England Journal of Medicine 362, 2155–65.

Yeo, T.W., Lampah, D.A., Gitawati, R. et al. 2007: Impaired nitric oxide bioavailability and L-arginine reversible endothelial dysfunction in

adults with falciparum malaria. Journal of Experimental Medicine 204(11), 2693–704.
Yeo, T.W., Lampah, D.A., Gitawati, R. et al. 2008: Angiopoietin-2 is associated with decreased endothelial nitric oxide and poor clinical outcome in severe falciparum malaria. Proceedings of the National Academy of Sciences of the United States of America 105(44), 17097–102.
Yetman, A.T. 2007: Cardiovascular pharmacotherapy in patients with Marfan syndrome. American Journal of Cardiovascular Drugs 7(2), 117–26.
Yetman, A.T., Bornemeier, R.A. and McCrindle, B.W. 2005: Usefulness of enalapril versus propranolol or atenolol for prevention of aortic dilation in patients with the Marfan syndrome. American Journal of Cardiology 95, 1125–7.
Yetman, A.T. and Graham, T. 2009: The dilated aorta in patients with congenital cardiac defects. Journal of the American College of Cardiology 53, 461–7.
Yiallourou, S.R., Walker, A.M. and Horne, R.S. 2006: Validation of a new noninvasive method to measure blood pressure and assess baroreflex sensitivity in preterm infants during sleep. Sleep 29(8), 1083–8.
Yin, F.C. and Liu, Z.R. 1989: Estimating arterial resistance and compliance during transient conditions in humans. American Journal of Physiology 257, H190–7.
Yin, F.C.P. 1986. Ventricular/vascular coupling: clinical, physiological and engineering aspects. New York: Springer-Verlag.
Yin, F.C.P., Brin, K.P., Ting, C. et al. 1989: Arterial hemodynamic indexes in Marfan's syndrome. Circulation 79, 854–62.
Yin, F.C.P., Surgeon, H.A. and Kallman, C.H. 1983a: Age-associated alterations in viscoelastic properties of canine aortic strips. Circulation Research 53, 464–72.
Yin, F.C.P., Guzman, P.A., Brin, K.P. et al. 1983b: Effects of nitroprusside on hydraulic vascular loads on the right and left ventricle of patients with heart failure. Circulation 67, 1330–9.
Yin, F.C.P., Weisfeldt, M. and Milnor, W.R. 1981: Role of aortic input impedance in the decreased cardiovascular response to exercise with aging in dogs. Journal of Clinical Investigation 68, 28–38.
Yock, P.G., Fitzgerald, P.J., Jang, Y.T. et al. 1990: Initial trials of a combined ultrasound imaging/mechanical atherectomy catheter. Journal of the American College of Cardiology 15(suppl. A), 105A.
Yoder, M.C., Mead, L.E., Prater, D. et al. 2007: Redefining endothelial progenitor cells via clonal analysis and hematopoietic stem/progenitor cell principals. Blood 109, 1801–9.
Yoo, Y.M., Managuli, R. and Kim, Y. 2003: Adaptive clutter filtering for ultrasound color flow imaging. Ultrasound in Medicine and Biology 29, 1311–20.
Yoshida, Y., Oyama, T., Wang, S. et al. 1988: Underlying morphological changes in the arterial wall at bifurcations for atherogenesis. In: Yoshida, Y., Yamaguchi, T., Caro, C.G. et al. (eds), Role of blood flow in atherogenesis. Tokyo: Springer-Verlag, pp. 33–40.
Yoshio, H., Shimizu, M., Kita, Y. et al. 1995: Effects of short-term aminophylline administration on cardiac functional reserve in patients with syndrome X. Journal of the American College of Cardiology 25(7), 1547–51.
Yoshizawa, M., Maeda, S., Miyaki, A. et al. 2009: Effect of 12 weeks of moderate intensity resistance training on arterial stiffness: a randomised controlled trial in women aged 32–59 years. British Journal of Sports Medicine 43, 615–18.
Young, D.F. 1979: Fluid mechanics of arterial stenoses. Journal of Biomechanical Engineering 101, 157–73.
Young, T. 1808: Hydraulic investigations, subservient to an intended Croonian Lecture on the Motion of the Blood. Philosophical Transactions of the Royal Society of London 98, 164–86.
Young, T. 1809: On the functions of the heart and arteries (The Croonian Lecture). Philosophical Transactions of the Royal Society of London 99, 1–31.
Yu, W.C., Chuang, S.Y., Lin, Y.P. et al. 2008: Brachial-ankle vs carotid-femoral pulse wave velocity as a determinant of cardiovascular structure and function. Journal of Human Hypertension 22(1), 24–31.
Yudkin, J.S. 1999: The United Kingdom Prospective Diabetes Study – everything you needed to know about diabetes but were afraid to ask (Editorial). European Heart Journal 20, 781–3.
Yusuf, S. and Pitt, B. 2002: A lifetime of prevention: the case of heart failure. Circulation 106(24), 2997–8.
Yusuf, S., Reddy, S., Ounpuu, S. and Anand, S. 2001: Global burden of cardiovascular diseases: Part II: variations in cardiovascular disease by specific ethnic groups and geographic regions and prevention strategies. Circulation 104(23), 2855–64.
Yusuf, S., Sleight, P., Pogue, J. et al. for the Heart Outcomes Prevention Evaluation Study (HOPE) Investigators. 2000: Effects of an angiotensin-converting-enzyme inhibitor, Ramipril, on cardiovascular events in high-risk patients. New England Journal of Medicine 342, 145–53.
Zahka, K.G., Hu, N., Brin, K.P. et al. 1989: Aortic impedance and hydraulic power in the chick embryo from stages 18 to 29. Circulation Research 64, 1091–5.
Zamir, M. 1976: Optimality principles in arterial branching. Journal of Theoretical Biology 62, 227–51.
Zamir, M. 1977: Shear forces and blood vessel radii in the cardiovascular system. Journal of General Physiology 69, 449–61.
Zamir, M. 2005. The physics of coronary blood flow. New York: Springer.
Zamora, M.R., O'Brien, R.F., Rutherford, R.B. et al. 1990: Serum endothelin-1 concentrations and cold provocation in primary Raynaud's phenomenon. Lancet 336, 1144–7.
Zamir, M., Sinclair, P. and Wonnacott, T.H. 1992: Relation between diameter and flow in major branches of the arch of the aorta. Journal of Biomechanics 25, 1303–10.
Zanchetti, A., Hansson, L., Clement, D. et al. 2003: Benefits and risks of more intensive blood pressure lowering in hypertensive patients of the HOT study with different risk profiles: does a J-shaped curve exist in smokers? Journal of Hypertension 21(4), 797–804.
Zanchi, A., Stergiopulos, N., Brunner, H.R. et al. 1998: Differences in the mechanical properties of the rat carotid artery in vivo, in situ, and in vitro. Hypertension 32(1), 180–5.
Zannoli, R., Schiereck, P., Celletti, F. et al. 1999: Effects of wave reflection timing on left ventricular mechanics. Journal of Biomechanics 32(3), 249–54.
Zarins, C.K. and Glagov, S. 1994: Pathophysiology of human atherosclerosis. In: Veith, F.J., Hobson II, R.W., Williams, R.A. et al. (eds), Vascular surgery – principles and practice, 2nd edn. New York: McGraw-Hill, pp. 21–39.
Zarins, C.K., Giddens, D.P., Bharadvaj, B.K. et al. 1983: Carotid bifurcation: quantitative correlation of plague localization with flow velocity profiles and wall shear stress. Circulation Research 53, 502–14.
Zarins, C.K., Xu, C. and Glagov, S. 2001: Atherosclerotic enlargement of the human abdominal aorta. Atherosclerosis 155, 157–64.
Zaroff, L.I., Kreel, I., Sobel, H.J. et al. 1959: Multiple and infraductal coarctations of the aorta. Circulation 20, 910–17.
Zatzman, M., Stacy, R.W., Randall, J. et al. 1954: Time course of stress relaxation in isolated arterial segments. American Journal of Physiology 177, 299–302.
Zebekakis, P.E., Nawrot, T., Thijs, L. et al. 2005: Obesity is associated with increased arterial stiffness from adolescence until old age. Journal of Hypertension 23, 1839–46.
Zelano, J.A., Li, J.K. and Welkowitz, W. 1990: A closed-loop control scheme for intra-aortic balloon pumping. IEEE Transactions on Biomedical Engineering 37, 182–92.
Zhao, L., Mason, N.A., Morrell, N.W. et al. 2001: Sildenafil inhibits hypoxia-induced pulmonary hypertension. Circulation 104, 424–8.
Zhou, Y., Kassab, G.S. and Molloi, S. 1999: On the design of the coronary arterial tree: a generalization of Murray's law. Physics in Medicine and Biology 44(12), 2929–45.
Zhu, T., Pang, Q., McCluskey, S.A. et al. 2008: Effect of propofol on hepatic blood flow and oxygen balance in rabbits. Canadian Journal of Anaesthesia 55(6), 364–70.
Zile, M.R. 2003: Heart failure with preserved ejection fraction: is this diastolic heart failure? Journal of the American College of Cardiology 41, 1519–22.

Zile, M.R., Gaasch, W.H., Carroll, J.D. et al. 2001: Heart failure with a normal ejection fraction: is measurement of diastolic function necessary to make the diagnosis of diastolic heart failure? Circulation 104, 779–82.

Zile, M. and Brutsaert, D. 2002a: New concepts in diastolic dysfunction and diastolic heart failure: Part 1. Circulation 105, 1387–97.

Zile, M. and Brutsaert, D. 2002b: New concepts in diastolic dysfunction and diastolic heart failure: Part 2. Circulation 105, 1503–8.

Zile, M.R., Baicu, C.F. and Gaasch, W.H. 2004: Diastolic heart failure – abnormalities in active relaxation and passive stiffness of the left ventricle. New England Journal of Medicine 350, 1953–9.

Zile, M.R., Bourge, R.C., Bennett, T.D. et al. 2008: Application of implantable hemodynamic monitoring in the management of patients with diastolic heart failure: a subgroup analysis of the COMPASS-HF trial. Journal of Cardiac Failure 14(10), 816–23.

Zimmer, H.G. and Millar, H.D. 1998: Technology and application of ultraminiature catheter pressure transducers. Canadian Journal of Cardiology 14(10), 1259–66.

Zizek, B., Poredos, P. and Videcnik, V. 2001: Endothelial dysfunction in hypertensive patients and in normotensive offspring of subjects with essential hypertension. Heart 85(2), 215–17.

Zoghbi, W.A., Farmer, K.L., Soto, J.G. et al. 1986: Accurate noninvasive quantification of stenotic aortic valve area by Doppler echocardiography. Circulation 73(3), 452–9.

Zoungas, S., Cameron, J.D., Kerr, P.G. et al. 2007: Association of carotid intima-medial thickness and indices of arterial stiffness with cardiovascular disease outcomes in CKD. American Journal of Kidney Diseases 50, 622–30.

Zuckerman, B.D. and Yin, F.C.P. 1989a: Aortic impedance and compliance in hypertensive rats. American Journal of Physiology 257, H553–62.

Zuckerman, B.D. and Yin, F.C.P. 1989b: Clinical implications of the aging heart. American Journal of Medicine 86(2), 250.

Zulliger, M.A., Kwak, N.T., Tsapikouni, T. et al. 2002: Effects of longitudinal stretch on VSM tone and distensibility of muscular conduit arteries. American Journal of Physiology. Heart and Circulatory Physiology 283(6), H2599–605.

Zulliger, M.A., Rachev, A. and Stergiopulos, N. 2004: A constitutive formulation of arterial mechanics including vascular smooth muscle tone. American Journal of Physiology. Heart and Circulatory Physiology 287(3), H1335–43.

Zuo, J.L., Li, Y., Yan, Z.J. et al. 2010: Validation of the central blood pressure estimation by the SphygmoCor system in Chinese. Blood Pressure Monitoring 15(5), 268–74.

Zureik, M., Ducimetière, P., Touboul, P.J. et al. 2000: Common carotid intima-media thickness predicts occurrence of carotid atherosclerotic plaques: longitudinal results from the Aging Vascular Study (EVA) study. Arteriosclerosis, Thrombosis and Vascular Biology 20(6), 1622–9.

Zureik, M., Temmar, M., Adamopoulos, C. et al. 2002: Carotid plaques, but not common carotid intima-media thickness, are independently associated with aortic stiffness. Journal of Hypertension 20, 85–93.

Zusman, R.M., Christensen, D.M., Federman, E.B. et al. 1989: Nifedipine, but not propranolol, improves left ventricular systolic and diastolic function in patients with hypertension. American Journal of Cardiology 64, 51F–61F.

Zweifach, B.W. 1974: Quantitative studies of microvascular structure and function: I. Analysis of pressure distribution in the terminal vascular bed in cat mesentery. Circulation Research 34, 843–57.

Zweifach, B.W. and Lipowsky, H.H. 1977: Quantitative studies of microcirculatory structure and function: III. Microvascular hemodynamics of cat mesentery and rabbit omentum. Circulation Research 41, 380–90.

Zweifach, B.W. and Lipowsky, H.H. 1984: Pressure-flow relations in blood and lymph microcirculation. In: American Physiological Society Handbook of Physiology. Section 2: The cardiovascular system, vol. 4. Bethesda, MD: American Physiological Society, pp. 251–307.