

Leaders in Cardiovascular Medicine

Bernard Gersh: from South Africa to the Mayo Clinic via Oxford, England

In a new series profiling the world's leading and most influential cardiologists, *EHJ* **CardioPulse** Mark Nicholls reports

An avid reader with interests with a variety of outdoor hobbies, Dr Bernard Gersh, MB ChB DPhil, is Professor of Medicine at Mayo Clinic College of Medicine in Rochester, Minnesota.

Born in Johannesburg, South Africa, he received his MB ChB from the University of Cape Town and later obtained a doctorate in philosophy from Oxford University. Striking a balance between teaching, investigation, and active clinical work, his major interests include natural history and therapy of acute and chronic coronary artery disease; clinical electrophysiology; cardiomyopathies; acute and chronic coronary artery disease; clinical electrophysiology; hypertrophic cardiomyopathy; and valvular heart disease.

Today, he plays a key role at the renowned Mayo Clinic, a centre where clinical cardiology is structured around a large outpatient practice with a corresponding inpatient practice and most cardiologists participating in both.

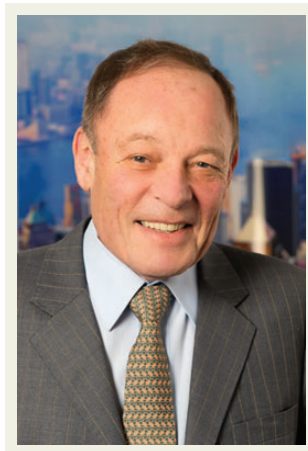
Dr Gersh has written more than 650 articles and 125 book chapters during his career. He is also the editor of 11 books and sits on the editorial boards of 25 scholarly journals, including the *European Heart Journal*. Over the years, he has won a number of academic and teaching honours which have included the Teacher of the Year award from the Division of Cardiovascular Diseases at the Mayo Clinic and the Hatter Award for the Advancement of Cardiovascular Sciences from University College London and the University of Cape Town.

Where did you grow up and what is your background?

I grew up in Africa, namely in Zambia, but I was educated at Prep and High School in Natal in South Africa. From there, I went to the University of Cape Town and then to Oxford University in England, where I was a Rhodes Scholar. In regard to my family background, my family came from Eastern Europe at the turn of the last century, and my late father was a pioneer in the development of the colony of Northern Rhodesia which subsequently became Zambia. I am married but was previously divorced and have two children by my first marriage, a step-daughter, and two children by my second marriage.

How did your interest in cardiology and science develop?

My interest in cardiology developed while I was a medical student when I became interested in the physiology of the cardiovascular system. I also felt that I did not have an aptitude or interest in the biochemical aspects of medicine and in this respect cardiology attracted me, in that this was the era of biomedical engineering and the heart viewed as a 'simple pump'. Subsequently, when I did my PhD at Oxford, I worked in the field of cardiovascular physiology.



Bernard Gersh

Where did you undergo your medical training, and what is your current position and role?

My undergraduate medical training was at the University of Cape Town. Subsequently, I became a member of the Royal College of Physicians of the UK and a Fellow of the College of Physicians in South Africa. I worked as a resident and then a consultant at the University of Cape Town for several years before coming to the Mayo Clinic. After that, I spent ~6 years as the W. Proctor Harvey Teaching Professor of Cardiology and as Chief of the Division of Cardiology at Georgetown University Medical Center in Washington, DC before returning to the Mayo Clinic. My current position is Professor of Medicine in the Division of Cardiology at the Mayo Clinic, and I have clinical, educational, and research responsibilities. I also obtained the D.Phil. degree at the University of Oxford as a Rhodes Scholar from 1967 to 1970.

Who are the people who have influenced you the most and why?

I was strongly influenced by the late Professor Velva Schrire who developed the discipline of cardiology at the University of Cape Town in the 1950s. I was also influenced by my supervisor at Oxford University, namely Dr Cedric Prys Roberts, who really had

a great influence on my ability to write and present data. In the USA, I was hugely influenced in many ways by the Chief of the Division of Cardiology and subsequently the Department of Medicine at the Mayo Clinic, Dr Robert L. Frye.

What are the key areas of research for you?

I have widespread interest in acute and chronic coronary artery disease; clinical electrophysiology, particularly atrial fibrillation and syncope; anticoagulation; hypertrophic cardiomyopathy; valvular heart disease; and in stem cells.

How has your research evolved over the years?

I originally did basic research in the field of cardiovascular physiology, but subsequently my interests have focused upon using large databases to answer clinical questions. I also have a long-standing interest in clinical epidemiology and population-based studies, and have been active in utilizing the Olmsted County database to address clinical issues.

What piece of work are you most proud of?

The work I am most proud of are my contributions to the natural history of atrial fibrillation and the concept that atrial fibrillation in many patients is a 'vascular disease' related to risk factors such as obesity, hypertension, and vascular stiffness leading to diastolic dysfunction and atrial enlargement. This has been a consistent theme throughout 20 years of work. I am also proud of the contributions I have made to the understanding of the results of coronary bypass surgery, particularly in older patients, and the role I have played in the studies that took place during the exciting evolution of acute reperfusion therapy. I have also written extensively and shared the guidelines on the management of hypertrophic cardiomyopathy.

What do you do outside of your profession, your interests away from medicine?

My hobbies and interests revolve around skiing, hiking, and fly fishing (though in this area I accept that I am very much a novice), and in the summer months biking. My major hobby I think is reading, primarily non-fiction and with an interest in modern history, and I am passionate about wildlife and wildlife photography.

Which book would you take away with you to a remote island?

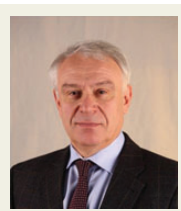
One of the most enjoyable books I have read over the last few years has been 'Boys in the Boat'. I might also take with me the volumes by Rick Atkinson on World War II. A very fascinating book is by Trevor Carnaby called 'Beat About the Bush: Mammals' which is just a treasure trove of interesting observations on the mammals of Africa. For light relief, I would take with me the satirical comic novel of the 1920s English urban and rural society life by A.G. MacDonnell entitled, 'England, Their England'.

What advice would you give to young researchers as they set out on a path toward success within the field?

I would emphasize to them the terrific rewards of combining both a clinical and research career and the opportunities it will also provide for them to be part of the larger community of academic physicians and educators. I would warn them ahead of time that they will be totally over-committed for the rest of their life and that a successful career requires far more than an 8:00 to 5:00 work schedule.

EACPR country of the month initiative: Russia

The structure of health care in Russia reported by Professor Sergey Boytsov MD PhD, National CVD Prevention Coordinator



**Professor Sergey Boytsov,
National Research Centre
for Preventive Medicine,
Ministry of Healthcare of
Russian Federation**



Healthcare

Healthcare in the Russian Federation is predominantly free of charge according to Federal Law and the program of the state guarantees free medical care provision for all citizens.

Russia has formed a three-tier system of healthcare.

First level: medical organizations near residences, work, or study place that provide care for common diseases.

Second level: inter-municipal or district health organizations primarily for urgent and scheduled specialized care for major causes of mortality.

The third level: regional republic hospitals and centres, that provide specialized, and high-tech medical services for the full spectrum of pathology.

Risk factors

Despite the fact that in the last decade there was a decrease in mortality from cardiovascular diseases (CVD), CVD mortality data for 2013 remained high (745.9 in men and 476.4 in women per 100 000 inhabitants).

In the past 10 years, the prevalence of smoking has declined to 44% for men, but has increased by 14% for women. Slightly over one-third of the population has insufficient physical activity.

The incidence of obesity (BMI \geq 30 kg/m²) has increased significantly in recent years: about one-third of women and one-quarter of men are obese.

During those years, the frequency of arterial hypertension (AH) in men also significantly increased which lead to an increase in the overall prevalence of AH in the population from 40% in 2003–2004 to 44% in 2013. More than half of the Russian population has hypercholesterolaemia.

Prevention methods and main actors

Russia has recently adopted legislation which prioritizes prevention in healthcare and has ratified international agreements including the WHO Framework Convention on Tobacco Control.

Primary health care (PHC) provides 60% of all medical services. All PHC organizations have prevention units or offices for prevention and assistance with smoking cessation. In 2009–2010 health centres (HC) were created to promote healthy lifestyles and prevent chronic non-communicable diseases (NCDs).

The country has a number of professional medical societies, such as the Russian Society of Cardiology (RSC), the Russian National Society of Preventive Cardiology (RNSPC), and the Russian Society for Prevention of Non-communicable Diseases (RSPND).

In the 1990s the Russian National Research Centre for Preventive Medicine (NRCPM) has been designated as a WHO Collaborating Centre for the development and implementation of NCDs prevention policy and programs.

Prevention activities

Since 1997, the journal 'Preventive Medicine' has been published on a regular basis to highlight the problems of promoting good health, prevention, and treatment of NCDs and injuries.

Joint Russian-European schools for physicians on cardiovascular prevention and rehabilitation were held in Russia's large cities.

Over the last 15 years NRCPM has been teaching courses for decision-makers regarding planning, implementation, and evaluation of regional programs for prevention, as well as long-distance training of PHC physicians on primary and secondary NCDs prevention and promotion of healthy lifestyles.

In 2014 the Russian government approved the State Program 'Development of Healthcare' which included 11 sub-programs. The first is titled 'Disease Prevention and Promotion of Healthy Lifestyle. Development of Primary Healthcare'. Programs for NCDs prevention and promotion of healthy lifestyle have been developed for all administrative entities and are currently being implemented.

Cardiac rehabilitation

In 2012 the Russian Ministry of Healthcare stipulated procedures for the organization of medical rehabilitation. Rehabilitation system for patients after myocardial infarction or cardiac surgery is carried out in three phases by multidisciplinary teams led by cardiologists and is covered by the Fund of Obligatory Medical Insurance. The goal of the Russian Ministry of Healthcare is to provide cardiac rehabilitation for 25% of those in need by the end of 2015 with subsequent expansion by 10–15% annually, which is a rise from the 15% at present.

Aims for the future

The key actions for the next 5 years:

Promotion of healthy lifestyle: creation of inter-sectorial commissions in all regions of the country; routine training of decision-makers and the development of inter-sectorial roadmaps for interagency cooperation in promoting a healthy lifestyle.

Risk factors: reaching targets recommended by the WHO in the reduction of prevalence of risk factors.

Smoking: ensure complete elimination of tobacco use in all health organizations.

Counselling and management: increasing the proportion of people receiving intensive counselling on healthy lifestyle. Provide medical correction of risk factors within a system of drug insurance.

Cardiac rehabilitation: organizing cardiac rehabilitation programmes in all major hospitals and clinics, as well as establishing specialized centres in the major cities.

Patrizio Lancellotti: a new *European Heart Journal International* Associate Editor



A Professor of Cardiology at University of Liège, Belgium, joins the *European Heart Journal* Editorial staff

Patrizio Lancellotti a native of Charleroi, Belgium, is an MD graduate from the University of Liege, Belgium in 1995. Before entering medical studies he obtained a Diploma in chemistry in 1988. Following his internship he went on to specialize in cardiology.

He received his cardiology license in 2000 and continued with training in heart transplantation and intensive care medicine. He holds a PhD degree and is a Fellow of the European Society of Cardiology (FESC).

Currently he is Professor of Cardiology at the University of Liège, CHU Sart Tilman, Liège, Belgium and holds several positions in Liege:

- Director of the Cardiology Intensive Care unit at University Hospital of Liège
- Head of the Echocardiography Laboratory and the Heart Valve Clinic
- Director of the GIGA Cardiovascular Sciences Research Programme at the University of Liège,

Dr Lancellotti joins the *EHJ* editorial staff as a specialist in cardiovascular imaging and is on the editorial boards of a number of journals:

- Associate Editor, *European Heart Journal-Cardiovascular Imaging*
- Deputy Editor in Chief, *Acta Cardiologica*
- Associated Editor in Chief, *Revue Médicale de Liège*
- Editorial board, *Cardiovascular Ultrasound*
- Editorial board, *Journal of Cardiovascular Medicine*
- Editorial board, *Journal of Cardiovascular Echocardiography*
- Editorial board, *Journal of Cardiology and Therapy*
- Editorial board, *European Cardiology Review (ECR)*
- Editorial board, *International Journal of Diagnostic Imaging*
- Editorial board, *Journal of Cerebrovascular Diseases*
- Editorial board, *British Society Echocardiography Journal*
- Editorial board, *Journal of American Society of Cardiology*

Patrizio Lancellotti is an active member of the ESC and participates in many of the Society's activities with enthusiasm. He has been an active Board Councillor of the ESC since 2014 and President of the European Association of Cardiovascular Imaging from 2012 to 2014.

Not only a Fellow of the European Society of Cardiology since 2010, Patrizio became a Fellow of the American College of Cardiology in 2012 and an honorary member of the British Society of Echocardiography in 2014.

Dr Lancellotti has been Chair/Co-Chair of EACVI Recommendation Papers on Echocardiographic assessment of native valvular regurgitation; the use of Echocardiography in Acute Cardiovascular Care; Expert consensus for multi-modality imaging evaluation of cardiovascular complications of radiotherapy in adults; imaging assessment of prosthetic valves and stress echocardiography in non-ischæmic heart disease.

In addition, chair of the ESC/EACVI Imaging Task Force, chair of the EACVI Highlight Book, and co-chair of ESC Guidelines for the management of infective endocarditis 2015 and ESC Position Paper on Anti-Cancer Treatments and Cardiovascular Complications: prevention, detection, and management.

Dr Lancellotti has published in more than 330 peer-reviewed papers, several book chapters, and has been the editor or co-editor of some major cardiology textbooks. These include the ESC Textbook of Cardiovascular Imaging, the EACVI Echocardiography Textbook, the EACVI Handbook of Echocardiography, and Secondary mitral valve regurgitation.

His areas of major research interest include valvular disease and cardiac effects in malignancy.

The recipient of a number of awards in medicine, Patrizio Lancellotti is married and has three daughters. He is a fan of classic opera, reads philosophy, and finds time to jog regularly in his busy schedule.

Dr Guido Pieleles, a paediatric cardiology lecturer, discusses research to identify the effects of exercise on young hearts with Mark Nicholls

Knowledge of the impact of exercise on young hearts remains relatively limited

At present, studies have only offered a partial insight into how exercise affects young people's hearts simply because echocardiograms in children have traditionally been conducted while patients are at rest, making it more difficult to assess cardiac performance and functional abnormalities.

However, new research is endeavouring to bring a fresh dimension to that knowledge by monitoring cardiac function at rest and during maximum exercise while simultaneously assessing exercise capacity, performance, and pulmonary function.



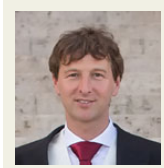
The project is led by the Bristol Heart Institute at the University of Bristol, which was founded in 1995 and brings together more than 200 researchers and clinicians in the field of cardiovascular science and disease.

Partners include Toshiba Medical Systems, Bristol's Clinical Research and Imaging Centre (CRICBristol), the University of Exeter's Children's Health and Exercise Research Centre, and Manchester United Football Medicine and Science team (Dr Steve McNally and Dr Dave Perry), which already has a close partnership with Toshiba as the Japanese company provides equipment for the club's medical suite at its training ground.

Participants in the study are 100 children born with congenital heart defects, 100 healthy children and 100 junior athletes from the Manchester United Academy, who will have their hearts monitored by imaging technology under stress during exercise.

The screening will be conducted using the Toshiba Artida cardiac ultrasound system with follow-ups on a Toshiba MRI scanner, with the first stage already under way to test 40 children with congenital heart disease (CHD), 40 healthy children and 20 elite athletes, with the 300 cross-group tests and findings to be completed by 2016.

The overall aim of the project is to more precisely identify the safe levels of exercise for children with CHD, clearly define the positive benefits that regular exercise delivers to normal healthy children over time, and offer better identification of abnormalities which sometimes do not present themselves at rest.



Leading the research project is Dr Guido Pieles, NIHR-Clinical Lecturer in Paediatric Cardiology at the University of Bristol and Bristol Congenital Heart Centre, who explained the study comes at a time when physical activity in children is falling.

'In the UK, only every third teenager fulfils international activity recommendations, 30% of children are obese or overweight as the most recent BHF statistics show, and this is obviously a concern as many studies have shown that activity and exercise participation in childhood influence adult cardiovascular fitness risk. This is particularly true for children with congenital heart disease'.

Dr Pieles said data are needed to examine cardiac exercise adaptations in children with CHD and exercise echo with simultaneous metabolic assessment by oxygen consumption measurement and peripheral muscle oxygen uptake (by near infrared spectroscopy) can do this.

'Exercise echo might reveal cardiac dysfunction in CHD children not apparent at rest. We will also investigate the relationship between exercise heart function and metabolic exercise parameters to find out what is the cause of exercise limitations in children with CHD, and also look at peripheral muscle oxygen uptake, as some studies suggest it is also impaired in CHD'.

The research team also hopes the project will help find out if there is ventricular dysfunction, at what level of exercise, and also if recovery from intense exercise is abnormal in these children. He added: 'The big challenge in CHD is that it is not one disease. Different defects with different pathophysiologies require lesion specific and individual assessment, as particularly after operations the problems are very varying and the right ventricle or the left ventricle can be involved in exercise pathology individually and with their interaction'.

The significant gaps within existing knowledge in CHD include pathophysiology of exercise limitations, heart function during higher exercise intensities, adaptations of the operated CHD heart to exercise training, correlation between resting echo parameters, and ex-echo parameters (measurement of RV and LV function including 2-D strain and TDI during staged exercise stress echocardiography from low to high exercise intensity).

'Cardiac function at exercise is the "true" and important parameter', he said.

Dr Pieles pointed out the 'significant progress in research' to prevent sudden cardiac death (SCD) in adult athletes, but that no screening protocols yet exist for the childhood and adolescent athletes under 16. 'However, these young athletes nowadays train as much as the adults and are at risk of SCD and they should benefit from pre-participation screening too. The problem is there is not sufficient scientific data to formulate evidenced-based guidelines'.

The aim of the collaboration with Manchester United is to help provide 'normative young athlete data' to develop screening guidelines, though in trying to improve scanning protocols and applications, the challenge is in defining what is really useful, predictive, correlates to clinical outcome, and provides diagnostic aides.

What sets this latest research apart is the ways in which it is being conducted. These include: state-of-the-art echo imaging techniques during staged exercise and correlation to metabolic, pulmonary, and peripheral muscle parameters; recovery parameters; longitudinal assessment in children with data on development of parameters over years; resting and exercise ECG and echo data on under-16 athletes; and a research team that also includes a paediatric exercise physiologist (Professor Craig Williams) and a sports cardiologist (Dr Graham Stuart) and the support of a first class research centre, the NIHR Bristol Cardiovascular Biomedical Research Unit.



Dr Pieles hopes that there will be clear benefits to cardiology and to young patients such as fine tuning of cardiac function assessment in CHD children; the ability to pick up cardiac dysfunction at early stages; better risk stratification and improvement in timing of re-operation; and the ability to design and test exercise training programmes that are tailored to individual pathophysiology using the information of the research; and deliver scanning protocols that are efficient and beneficial to patients in National Health Service clinical care within 5 years.

'This is a unique study, using the latest technology to visualize the heart while it is "at work" during exercise. We hope it will enable us to improve scanning protocols and applications, lead to a more precise and earlier diagnosis of heart function abnormalities and better monitoring of treatment progress in our young patients with congenital heart disease. Our research will also help evaluate the benefits of exercise for the heart in obesity and other conditions caused by increasing sedentary lifestyles and poor diet', he said.

'Not only will it allow us to identify effective diagnosis and treatment pathways for children with congenital heart disease but it will also provide new insights in the search for the right screening tools for heart abnormalities in youth athletes'.

Note: TDI: tissue Doppler imaging, an echocardiography technique for assessment of function.

Conflict of interest: The research partnership between Toshiba and the University of Bristol is a contractual research partnership that determines the independence of the research from either parties' interests.

G.P. is an employee of Bristol University. His lectureship is funded through a National Institute for Health Research (NIHR) Academic Clinical Lectureship in Paediatric Cardiology at Bristol University.

Book Review

Heart Disease in Women

Authors: Navin C. Nanda, MD; Nurgül Keser, MD

First edition: 2015

Hardback, 500 pages

Number of illustrations: 0

Number of images: 500

Publishers: JayPee Medical

ISBN (print): 9789351522942

Cardiovascular disease is the leading cause of death among women worldwide, with different regional patterns of leading causes such as ischaemic heart disease, hypertensive disorders, stroke, rheumatic heart disease, and heart failure in low-, low- to middle-, and high-income countries. Heart disease kills more women than men and there is little awareness that one in two women will die of cardiovascular disease, compared with an average of one in 25 women due to cancer. Increased incidence of smoking, obesity, diabetes, and the use of contraceptive pills have led to a higher incidence of heart disease in women under 55 years. Advanced maternal age in high-income countries, as well as a high prevalence of rheumatic heart disease and cardiomyopathy in low- to middle-income countries, has led to an increase in maternal death due to cardiovascular disease in the past decade.

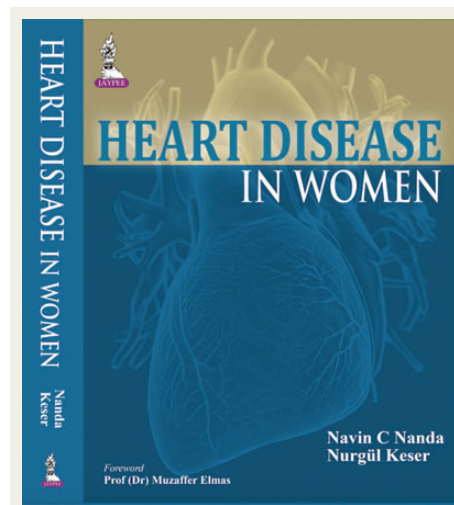
The book *'Heart Disease in Women'* covers an important gap in knowledge. It focuses on all aspects of heart disease in women and attempts to dispel existing misconceptions.

The book is organized into eight sections, consisting of a total of 32 chapters, and deals with myths and facts about this silent epidemic, aspects of prevention, risk factors, coronary artery disease, and valvular heart disease, as well as the specific aspects of heart disease in pregnant women.

Having internationally renowned authors from Turkey, the USA, Egypt, India, Australia, and the Netherlands, the book provides a global perspective in a number of chapters.

I particularly enjoyed reading chapter 10 on job burnout, job strain, and cardiovascular disease. This chapter also has excellent figures.

The chapter by Reema Chugh 'Management of heart disease in pregnancy – A Clinician's approach' will be of particular importance for residents, as well as clinicians, who see patients who are pregnant and have cardiovascular disease in multidisciplinary clinics.



The chapter on 'Cardiovascular implications of cancer in women' by Charu Gandotra highlights common risk factors, but also summarizes very well the cardiotoxicity of cancer chemotherapy—an increasingly important topic for many physicians.

The editors highlighted in the preface the overlap of content and chapters. However, I feel that the book would have benefited with shortening some of the chapters, removing many duplicated tables—e.g. on medication, risk factor profiling, and cardiovascular changes in pregnancy. The condition peripartum cardiomyopathy appears in a special chapter but also in several other chapters in great detail. On the other hand, the hypertensive disorders of pregnancy and the long-term risk implications of preeclampsia on chronic hypertension could be more detailed, adding recent literature published in that field.

Altogether this is a very comprehensive book on all aspects of cardiovascular disease in women which will benefit healthcare providers such as nurses, generalists, specialist physicians, internal medicine physicians, obstetricians, and cardiologists.

