European Heart Journal (2011) **32**, 1301–1310
doi:10.1093/eurheartj/ehr121

CARDIOPULSE

Women's heart health: the focus of this issue

To raise awareness that women do not receive equal access to cardiovascular care as men, the *European Heart Journal* (*EHJ*) has this month brought together a special gender issue.

Data from the World Health Organisation (WHO) shows that cardiovascular disease in Europe accounts for 55% of deaths in women compared with just 43% of deaths in men.

'It's very important that physicians are aware that coronary artery disease (CAD) is a frequent disease among women, that gets more common as they get older', said Prof. Thomas F. Lüscher, editor of the *EHJ*, adding that women themselves often underestimate the importance of CAD. They are much more concerned by breast cancer, a disease that is responsible for only 3% of female deaths (about 1 in 35 women in the USA).

Two studies published in this month's themed issue raise particular concerns that women are being prescribed fewer drugs than men. 'We were shocked to find that even after infarction—the most dramatic CV situation we have—there's still a considerable underutilisation of drugs in women', said Lüscher.

In the first *study*, cardiologists from the University of Bologna (Bologna, Italy), and the University of Toronto (Toronto, Ontario, Canada), analysed the medical details of 4471 men and 2087 women who had experienced an acute coronary syndrome between 1999 and 2003. The details (which included 23 clinical variables) were recorded on the Canadian Registry of ACS I and II. Results of the study, led by Prof. Raffaele Bugiardini from the University of Bologna (Italy), show that women were statistically less likely to receive β-blockers, lipid-modifying agents, and angiotensin-converting enzyme inhibitors than men.

In the second study, Nina Johnston and colleagues from Uppsala University Hospital (Uppsala, Sweden) analysed the use of cardiovascular medications and diagnostic coronary angiography between 2006 and 2008 in 7195 men and 5005 women with suspected CAD after experiencing chest pain who were all registered in the Swedish Coronary Angiograpy and Angioplasty Register (SCAAR).

Results showed that prior to undergoing angiography, 83% of women had been prescribed aspirin compared with 86.1% of men ($P = 0.001$).

Furthermore, the study showed that in the youngest age group (those aged under 59 years), 78.8% of women who underwent angiography were found to have normal or non-significant CAD compared with 42.3% of men ($P < 0.001$) and, furthermore, that 18.2% of men were diagnosed with left main or three-vessel disease compared with 4.2% of women ($P < 0.001$). This, say the authors, underlines the difficulty that clinicians face in their daily practice of diagnosing CAD in women.

In an accompanying editorial: Noel Bairey Merz, from Cedar Sinai Medical Center (CA, USA), draws attention to the paradox—evident from the Swedish study—where young women have a higher prevalence of angina compared with men, yet on examination by coronary angiography are found to have a lower prevalence of obstructive CAD.

In her editorial entitled 'The Yentil Syndrome is Alive and Well' (after the 1983 film starring Barbara Streisand about a Jewish girl who dresses and lives like a man to receive an education), Bairey Merz argued that women need to present with 'male pattern' obstructive CAD to be diagnosed and treated for CAD.

'Biological sex-based differences', she wrote, are likely to be a key contributor to the under utilization of guideline therapy in women, since higher proportions of women suffer from microvascular coronary dysfunction and are therefore less likely to present with obstructive CAD. In the Women's Ischemia Syndrome Evaluation (WISE) study, in *JACC* 2006. Bairey Merz estimated that around 3 million women in the USA suffer from ischaemic heart disease (IHD) in the absence of obstructive CAD.

'We can conclude from these and other studies that the presence or absence of obstructive CAD, e.g. "male-pattern" IHD, remains a key decision point for medication prescribing for practicing physicians. Because higher proportions of women with IHD present without obstructive CAD or undergo less coronary angiography, relatively fewer women will be treated, including those with evident ACS', wrote Bairey Merz, adding that urgent studies aimed at improved the diagnostics and therapies for microvascular coronary dysfunction are needed.

The need for more 'specific attention and research on female aspects of cardiovascular care' is further emphasized in the paper 'Red alert for Women's Heart', which reports on the proceedings of a workshop held in Brussels in September 2010, that emphasized the need for improved representation of women in clinical trials for cardiovascular drugs.

'In clinical studies measures should become standard to include more women with appropriate steps in study design and analysis', wrote the authors, led by Angela Mass from Isala Klinieken (Zwolle, Netherlands).

Cardiologists, said Professor Lüscher, need to correct for the tendency to under prescribe evidence-based therapies for CAD in women. 'We all need to ensure that the full benefit of modern cardiology is available to women and that they're properly represented in clinical trials', he said.

J. Fricker

Portrait of C. Noel Bairey Merz, MD, FACC, FAHA

A key opinion leader on women's cardiovascular disease and an editorial author for this Gender Focus *EHJ* issue, speaks to Judy Ozkan

C. Noel Bairey Merz is Professor of Medicine at Cedars-Sinai Medical Centre, Los Angeles, CA, USA. She holds the Women's Guild Chair in Women's Health and is Director of the Women's Heart Centre as well as the Preventive and Rehabilitative Cardiac Centre. Her research interests include: ischaemic heart disease, women and heart disease, mental stress and heart disease, the role of exercise and stress management in reversing disease, and the role of nutrition in heart disease.

Descended from one of colonial America's founding families, Bairey's determination to push back the boundaries embodies the spirit of the Galts of Williamsburg, VA, USA, who sought to improve the health of fellow settlers by establishing the Galt Apothecary Shop and the first mental hospital in the colonies.

A graduate of Harvard University she became fascinated by cardiovascular physiology in medical school. 'I was also gratified by the many therapeutics strategies available and the fact that they could be employed in cardiovascular disease and prevention'.

Among inspirational undergraduate teachers was Dr Suzanne Oparil who taught the Bairey how to approach research and helped her develop an interest in an investigative career. In medical school, Drs Dolf Hutter and Roman DeSanctis of the Massachusetts General Hospital 'taught me that physiology trumps anatomy, a lesson I have never forgotten and which is being borne out 30 years later by the COURAGE and BARI-2D trials'.[1,2] Drs Elizabeth Nabel and Nanette Wenger—both women in senior positions—became role models as pioneering women in cardiology.

Her work preference is: 'Investigation first, followed by patient care, teaching and mentoring'. She enjoys international travel and the opportunity to combine the intellectual pursuit of cardiovascular science with visits to colleagues and collaborators abroad.

Recently, Bairey has devoted more time to fundraising to ensure that: 'The important work in women's health and heart disease will endure beyond the politics'.

Her work has won many prizes, including: the McCue Female Cardiologist Award 2009. The 2005 Red Dress Award for Leadership in Cardiovascular Research in Women; the 2005 Voluntary Hospital Association Inc. Best Practices Awards for Special Achievement Award for an individual who has made an outstanding contribution to health care.

Staff at Cedars-Sinai Medical Centre on National Wear Red Day—first Friday of February (to raise awareness of heart disease as the leading killer of women)

The McCue Award came as a validation of her work into gender inequalities—a stance that has not always been easy to maintain in the face of scepticism. 'I started in the 1990s when the US National Heart Lung and Blood Institute (NHBLI) selected me as Scientific Chair of the Women's Ischemic Syndrome Evaluation (WISE). In its 17 years, the WISE and related work has brought light to many paradoxes of gender-related pathophysiology of ischaemic heart disease in women. We believe this, and the work of others has contributed to the recent decline in deaths among women from cardiovascular disease CVD'.[3]

'Despite this success, to go forward, we need to bring this work "out of the women's room". There are still some sceptics and physicians who are not open to novel ideas that question the dominant paradigms. Demonstration that the principles of micro vascular coronary dysfunction and female-pattern ischemic heart disease are relevant to about half of women and about one-third of men is an important message that we now need to pursue to optimise health for both men and women'.

The WISE study is a particular source of pride. Bairey Merz believes that her investigative intellect, which helps her ask the

right questions, combined with her leadership skills have allowed her to chair the project which encompasses over 65 site investigators, and over 100 investigative staff, to maximize discovery and productivity. WISE has now expanded to include over 18 ancillary and subinvestigations that continue to explore biological gender differences in an interdisciplinary and translational fashion with the goal of optimizing outcomes for all women with, or at risk from, ischaemic heart disease.

Bairey Merz is a prolific lecturer and member of many professional organizations, including the American Heart Association (AHA) and the American College of Cardiology (ACC). Her expertise has made her a sought-after media spokesperson.

Her current research includes work with endothelial progenitor cells, stem cell therapies, genetics and genomics, and relations to auto-immune disease co-morbidity. 'We remain 30 years behind male-pattern disease investigation and understanding. If we continue to find the 10–20% sex differences in physiology and pathophysiology that we have found in our work to date, there is much to do to identify sex-specific diagnostic and treatment algorithms and approaches for the many millions of established female and male ischemic heart disease patients in the world'.

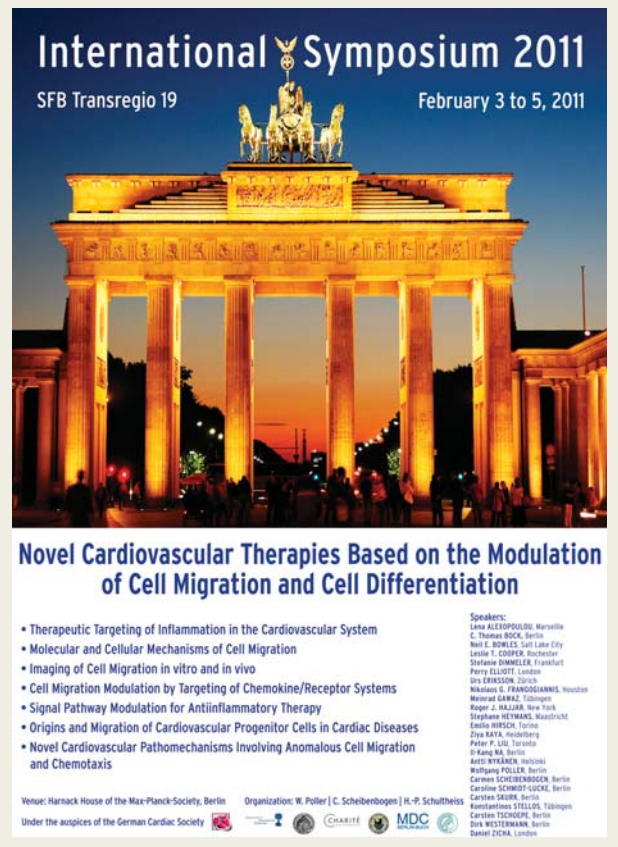
Scanning the horizon, her team is particularly excited about the observed superiority of female vs. male stem cells involved in tissue repair and regeneration. This appears to apply even when they are given to males. This should dispel any doubts that the benefits of her work are restricted to women. 'The unlocking of female physiology offers great promise for new preventive and therapeutic strategies for women and men'.

References

1. Boden WE, O'Rourke RA, Teo KK *et al* Optimal medical therapy with or without PCI for stable coronary disease (COURAGE). *N Engl J Med* 2007;**356**:1503–1516.
2. BARI 2D Study Group. A randomized trial of therapies for type 2 diabetes and coronary artery disease. *N Engl J Med* 2009;**360**:2503–2515.
3. Noel Bairey Merz C *et al*., for the WISE Investigators. Insights from the NHLBI-Sponsored Women's Ischemia Syndrome Evaluation (WISE) Study: Part II: gender differences in presentation, diagnosis, and outcome with regard to gender-based pathophysiology of atherosclerosis and macrovascular and microvascular coronary disease. *J Am Coll Cardiol* 2006;**47**:S21–S29 doi:10.1016/j.jacc.2004.12.084

The development of novel cardiovascular therapies for the future

An international symposium in February 2011 discussed recent research on cell migration and differentiation



A recent symposium on *Novel Cardiovascular Therapies Based on the Modulation of Cell Migration and Cell Differentiation* aimed to summarize and discuss a broad spectrum of recent research dealing with physiological mechanisms governing the normal migration of cardiovascular and immune system cells in healthy individuals, as opposed to the disturbances of cell migration and chemotaxis found in certain cardiac diseases. These processes are still incompletely understood, although they play key roles in the maintenance of proper cardiac structure and functions, and beyond for tissue repair and healing in general. Further, it appears that targeted modulation (by new drugs, proteins, peptides, antibodies, and regulatory RNAs) of immune cell and of cardiovascular progenitor cell migration has high therapeutic potential. To fully exploit the therapeutic potential of migration and chemotaxis modulators in cardiac disease, however, requires extensive experimental and preclinical studies in disease models. The symposium was organized by SFB Transregio 19, a research network funded by the German Research Foundation (DFG). It served to delineate several promising target mechanisms and therapeutic tools to be evaluated in the near future, with special emphasis on interactions between immune cells and the heart in a number of clinically important cardiac disorders.

Development of novel cell migration modulators for anti-inflammatory and cardiovascular treatment is a complex task, since any modulator will necessarily interfere with a balanced system of physiological regulators directing proper positioning of diverse immune cell types within the body. Whereas this should serve for efficient pathogen elimination, lack of proper control

over these processes may result in counterproductive chronic inflammation and progressive tissue injury instead of healing (*Figures 1* and *2*).

The meeting discussed molecular and cellular mechanisms of cell migration, the *in vivo* imaging of immune cell and cardiovascular progenitor cell trafficking, and recent approaches towards therapeutic exploitation of two classes of evolutionary ancient biological systems.

First, innate immunity as an evolutionary preserved primordial defence line against tissue injury was reported to influence the individual risk of acquiring viral cardiomyopathies (N. Bowles, Salt Lake City), suppress or trigger autoimmune pathogenesis via recently discovered Toll-like receptor interactions (L. Alexopouolou, Marseille), and influence inflammatory cell migration to injured myocardium and thereby infarct healing (P. Liu, Toronto).

Secondly, endogenous cell migration regulators were discussed as a new class of therapeutic tools and targets in cardiovascular medicine. Pharmacological research has made important progress in developing small molecule drugs with more specific and efficient immune cell migration potential (E. Hirsch, Torino). A fundamental problem encountered with this type of single-target approaches arises from the complexity of any inflammation with multiple interacting and redundant factors being involved. In contrast, certain endogenous proteins physiologically released during tissue injury and healing address multiple receptors and signal pathways, and act on the immune response in a more phase-specific manner than current drugs or single-target antibodies (Z. Kaya, Heidelberg). Recent work suggests the use of such endogenous proteins as novel 'parent compounds' for anti-inflammatory and cardiovascular drug development, which may solve certain problems encountered with single-target approaches (W. Poller, Berlin).

Another highly innovative topic was the use of hitherto neglected anatomical structures of the immune system as targets for therapy. A. Nykänen (Helsinki) reported on successful targeting of lymphatic vessel activation for the suppression of cardiac transplant rejection. The investigation of cardiac lymphatic vessel functions in heart diseases is certainly an upcoming issue of major interest for future therapeutic research in the field.

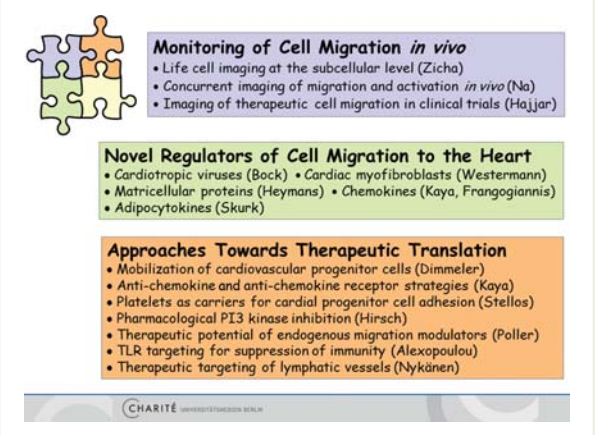


Figure 1 Structure and some key topics of the symposium.

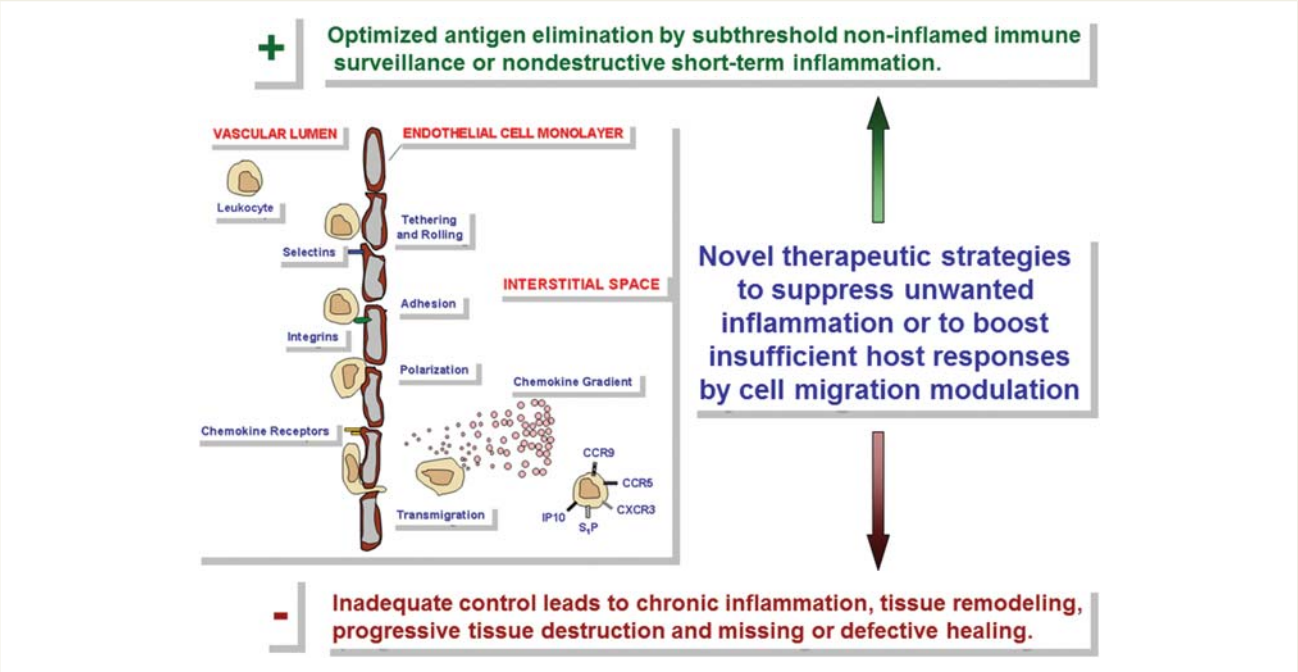


Figure 2 Immune cell migration and its therapeutic modulation = addressing a delicate balance between efficient pathogen or injured tissue elimination, with non-destructive and short-term inflammation, vs. chronic inflammation associated with progressive and often insidious tissue injury.

The symposium emphasized that the development of novel cardiovascular therapies based on cell migration modulation requires close interdisciplinary cooperation, in particular between scientists from the cardiovascular field and from the immunological sciences. The resulting synergisms are likely to solve the complex challenges encountered when clinical translation of experimental strategies is attempted.

Wolfgang Poller, MD, PhD and *Heinz-Peter Schultheiss*, MD, PhD, Professors of Cardiology, Charité University Hospital, Berlin, Germany

Development of cardiology research in Japan

Japanese cardiology researchers are starting to catch up with the west in the clinical trials area but are well ahead in some fields including iPS cells

Most cardiology research in Japan is performed by medical doctors. Basic scientists have shown limited interest in the subject, preferring to pursue genetics and molecular biology or cancer research.

More basic research is needed in cardiology, says Prof. Toyoaki Murohara, MD, PhD, professor of medicine in the Department of Cardiology at Nagoya University Graduate School of Medicine and chairman of the International Committee of the Japanese Circulation Society. But because most medical research is performed by medical doctors 'it's a very narrow gate to get into the medical research for a pure scientist', he says.

Toyoaki Murohara

Japan has a tradition of very strong university departments in engineering and physics, and most of the country's Nobel prizes have been in these subjects. Susumu Tonegawa is the exception; he won the Nobel Prize for Physiology or Medicine in 1987 for his discovery of the genetic principle for generation of antibody diversity. But although he was born in Nagoya, Japan, at the time of the award, Tonegawa was working at the Massachusetts Institute of Technology (MIT) in the USA.

The result, says Murohara, is that 'most of the very sharp students want to go to the engineering or physics departments [and] not so many good students go into medical research'.

Another disincentive is that scientists who work on basic medical research full time find it difficult to make a living. In Japan, there is no system whereby scientists can allocate part of their funding towards a salary; grants are from the government and are to pay for research only. Universities pay a salary but it is small.

Given that doctors do the bulk of cardiology research in Japan, it's a worry that fewer are opting to do any research at all. About 6 years ago, the government overhauled the intern/fellowship system. Today, when doctors graduate from medical school, they must go straight into further clinical training. The government stipulates that graduates must do 2–3 years of 100% clinical training after which most hospitals require a 3-year clinical Fellowship. It amounts to 5–6 years before they can start medical research and means that the number of doctors who enter the graduate school to do a PhD following medical school has decreased dramatically.

Murohara says the changes are intended to mirror the system in the USA. 'They do a Fellowship for 5 years and then some doctors actually start medical research', he says.

But in Japan, many doctors are opting out of research altogether. By the time they have finished the clinical Fellowship, most of them are already married and have children. The majority of doctors are interested in clinically oriented work and are keen to become experts in complicated procedures like percutaneous coronary intervention (PCI) and catheter ablation or control of patients with severe heart failure.

Murohara is working to change the system—a difficult task since it was only just implemented. He would like medical graduates to be able to select a clinically oriented or research oriented path after just 4 years of clinical training. Doctors would then be 28 when they began medical research instead of 30. He thinks it should be possible since medical students gain some clinical experience during their undergraduate course.

Funding for cardiology research in Japan comes principally from the Japanese Ministry of Education, Culture, Sports, Science and Technology, but the weakness of the economy at the moment means that money is tight.

One area of research—induced pluripotent stem (iPS) cells—has received a large amount of money from the government. These iPS cells were first produced by Prof. Shinya Yamanaka from Kyoto University in mice[1] then humans.[2] They bypass the need for embryonic stem cells, thus doing away with any ethical problems.

Funding is also available from a small number of government-related groups and some private foundations, and industry makes donations to universities.

When it comes to topics, heart failure research is increasing in popularity because of a large number of patients. Japanese law

on cardiac and other organ transplantation was recently modified and now more and more cardiac transplantations are being performed in the country. 'More people are interested in doing research about heart failure including cardiac transplantation', says Murohara.

But he thinks that ischaemic heart disease will be the most popular field of cardiology research in Japan in the future. Japanese cardiologists like to perform PCI instead of coronary artery bypass grafting (CABG), a preference shared with patients, making the ratio of PCI to CABG much larger in Japan compared with western countries. Studies investigate stent function, restenosis rate, success rate, and new devices like biodegradable stents and drug-eluting stents.

Japan is behind the USA and some European countries with regard to large clinical trials and large observational clinical studies, and many Japanese doctors are keen to run large randomized clinical trials. The biggest problem is that Japanese patients do not like to participate in double-blinded placebo-controlled trials because they insist on knowing which drug they have been prescribed.

For this reason, trialists have adopted the prospective, randomized, open-label, blinded endpoint (PROBE) design, which is not blinded to the physician or patient. An independent, blinded committee adjudicates the endpoint of each patient. The method was developed by the Swedish doctor Björn Dahlöf and is used in other countries, but it is vulnerable to physician bias.

In time, Japanese patients may accept blinded trials and the PROBE design could be a stepping stone to more sophisticated studies.

Murohara says that the most exciting areas of cardiology research in future will be regenerative medicine, including reprogramming of somatic cells such as iPS cells, and microRNA-related research.

In the field of regenerative medicine, groups in Japan have found that there are cardiac progenitor cells within bone marrow or cardiac tissues and a group in Kyoto is running a clinical trial using patients' own cardiac progenitor cells.

In the last couple of years, there has been growing interest in the relationship between the expression of microRNAs and disease. The use of drugs to suppress or enhance microRNAs in order to change the function of cardiac tissues is a *hot topic*.

J. Taylor, MPhil

References

1. Takahashi K, Yamanaka S. Induction of pluripotent stem cells from mouse embryonic and adult fibroblast cultures by defined factors. *Cell* 2006;**126**:663–676.
2. Takahashi K, Tanabe K, Ohnuki M, Narita M, Ichisaka T, Tomoda K, Yamanaka S. Induction of pluripotent stem cells from adult human fibroblasts by defined factors. *Cell* 2007;**131**:861–872.

Personal experience of émigré cardiologist Cihan Cevik, MD, FESC

From the heart of Istanbul to the Texas Heart Institute

A childhood dream becomes a reality for Dr Cevik, who exchanged the Bosphorus for the Gulf of Mexico to pursue academic cardiology

I was seven, when watching my father seeing his patients in the office attached to our house. I knew then, that I wanted to be a 'heart doctor' also. He was perhaps one of the most dedicated and hard working doctors I have ever seen, and I was inspired by his passion, the relationships he forged, and his great clinical skills. My life was then defined, but it was no ordinary path.

As any other aspiring physician in Turkey, I studied hard for 1 year to qualify for medical school, and was accepted to one of the best schools in Turkey. I graduated in the top percentile and was invited to be at my first choice, Kosylou Heart and Research Hospital. There I trained under Dr Mehmet Ozkan, FESC, who taught me the fundamentals of echocardiography. Additionally, I collaborated with him on my first publication, which was in the *American Journal of Cardiology*. From that moment on I knew I wanted to be in academics and wanted to go where the opportunities were limitless—the USA.

In 2004, I became a fully trained cardiologist in Turkey. This was perhaps the most important year of my life, not because I was able to treat my own patients, but because this is where I saw my dream starting to become reality. I was eating Turkish meatballs with coffee in a café at the Bosphorus with Dr R. David Fish, a well-respected interventional cardiologist from Houston, TX, USA, who came to lecture at a cardiology conference. With limited English, I remember explaining to him my intentions, goals, and dreams, to become an academic cardiologist in the USA. I had no idea of the obstacles that would entail.

Two months later, I received an email from Dr Fish that took me out my seat and literally, into my so-called 'American Dream'. I was invited to join his team at the Texas Heart Institute in Houston, TX, USA, to do Interventional Cardiology research for 1 year. This was one of the happiest days of my life. I joined him in 2005 and was most impressed by his personality, mentorship, and his outstanding approach to patient care. During that trial period, I learnt English, and committed to my journey to the USA, knowing it wasn't going to be an easy path. I would have to repeat my training a 7-year task, leave my culture, language, family, and learn how to survive in a totally different health-care system.

I began with the Unites States Medical Licensing Exam (USMLE), and then applied to the residency match to find a completely different process. Instead of testing into my choice, there were interviews with a highly competitive pool of applicants. I matched to Texas Tech University Health Sciences Center (TTUHSC) in Lubbock, TX, USA, and flew in directly from Turkey with only two pieces of luggage. I remember feeling the fierce wind, seeing the dirt storms and tumbleweed, attending rodeos, tailgating, and Texas Tech football games. I was greeted by, my now serious girlfriend, Jenny Plake, who helped me become accustomed to Texas traditions, and struggles in the US culture.

I also met Dr Kenneth Nugent who was very instrumental in my development as a clinician. At TTUHSC, Dr Nugent was an extremely dedicated professor who continued to develop and stimulate research activities with his residents. Although a pulmonologist, we co-authored over 50 papers in cardiology. My English improved, I adapted well to West Texas culture, and immensely enjoyed those 3 years of my life.

Cihan with Kenneth Nugent and wife

After that, I joined the Texas Heart Institute St Luke's Episcopal Hospital for my cardiology Fellowship. It was a privilege to return and practice in a top-ranked heart hospital and a wonderful feeling to work alongside prestigious doctors such as James T. Willerson and Denton A. Cooley, doing what I love—being a 'heart doctor'. I reunited with Dr Fish, an extremely skilled and caring interventional cardiologist, who I was extremely fortunate to work with again and had the honour to work with a great teacher and cardiology programme director Dr James M. Wilson.

I haven't seen my family in over 4 years but I talk to them regularly by phone. They reassure me that I made the right choice and are happy to see my achievements. My father regularly follows my publications and is proud to have made such a big impact on my life. I still collaborate in research studies with my cardiology colleagues in Turkey and although my Turkish is starting to diminish, I still keep up with Turkish online newspapers. I will admit, I miss authentic Turkish food, but Houston is an international city with many dining options, including Mediterranean restaurants.

Overall, the path for foreign physicians is a tough road made even harder for me because I was fully trained before coming to the USA—having to unlearn certain things and relearn new, but improved systems. Whereas Turkey has a more clinically driven medical system and is very practical; the USA is more evidence-based with a more regulated medical atmosphere. Alongside, the USA requires a high standard of patient care which coupled with world renowned technology, results in a very competitive environment. Another notable difference, the USA is more patient-focused and dedicated to thorough training and continued medical education. The US system has enabled me to challenge myself and contribute to cardiology literature with almost 100 publications. This country continues to impress and inspire me to be the best I can be.

I have made a great choice and my aspirations have become reality. There are still hurdles to cross, but with all the adversity I have overcome I am confident I will be able to handle upcoming challenges.

Cihan Cevik

Portrait of National Cardiology and Society: Iceland

Cardiologists on this island in the North Atlantic between Europe and the USA, draw on the best from both cultures for their small population

Thorarinn Gudnason

Iceland

Iceland, just below the Arctic Circle, is of spectacular natural beauty, mountainous, with volcanoes, glaciers, and hot springs. The population of only 320 000 are highly educated, and in spite of its northern latitude, the climate is relatively warm because of the Gulf Stream.

Medical education started in Iceland in 1760, and a medical school in the University of Iceland has educated doctors since 1911. Medical school takes 6 years, followed by a year of internship. Young doctors interested in cardiology frequently spend their intern year and 2–3 years training in general internal medicine. After that, they leave the country for 5–10 years to train abroad as there is no specialist training in cardiology available. All Icelandic cardiologists have therefore trained abroad either in the USA or Europe, usually in Sweden, Norway, and Denmark, but also other European countries.

'The practice of cardiology reflects the multiple influences from abroad and is a mix from different cultures in cardiovascular medicine; European, American and Scandinavian. I believe this variety results in good care for cardiac patients, as we try to take the best from each area and combine them into an Icelandic model'.

The Icelandic Society of Cardiology (ISC) has 75 members, 38 of which are cardiologists. Of these, 26 (8/100 000 population) are professionally active and currently living in Iceland. There is therefore a high ratio of cardiologists/population.

'As president of the Icelandic Society of Cardiology, my aims are to further increase both quality control and research. This can be achieved by participating in cardiovascular registries and research in collaboration with the other Nordic countries which have many well established nationwide registries. I worked with such registries in Göteborg, Sweden and after returning home I started collaborating with my Swedish colleagues so that the registries would include the Icelandic population. Today we are successfully participating in the Swedish Coronary Angiography and Angioplasty registry (SCAAR) on invasive cardiology, a registry on coronary care units (RIKS-HIA), and a registry on cardiac surgery'.

'We also want to improve quality by increasing the endorsement of ESC Clinical Guidelines in Iceland and to participate in the ESC surveys and registries'.

The main Cardiology Clinic in Iceland is at Landspitali University Hospital in the capital Reykjavik, which has the only invasive cardiology centre in the country. The majority of the population lives within a 100 km of Reykjavik. There is a small cardiology department for general cardiology and teaching in Akureyri, Northern Iceland.

About 700 percutaneous coronary interventions (PCIs) are performed each year, which is among the highest per capita in Europe. There are 1800 diagnostic coronary angiograms and 200 coronary bypass operations performed annually. The stent rate in PCI is over 90 and 40% are drug-eluting stents (DES). Compared with many other countries, fewer DES are used. This may partially be explained by a low incidence of diabetes in the country. The clinical restenosis rate with this approach is low, only around 4% according to the SCAAR quality registry where Iceland has participated since 2007.

At Landspitali University Hospital, there are three invasive laboratories and the PCI lab has 24 h PCI service for STEMI (around 150 per year, >95% go for primary PCI). The 30-day mortality after acute myocardial infarction (AMI) is low and is

decreasing. The in-hospital mortality rate for AMI decreased from 8.7% in 2003 to 3.7% in 2008. Almost all cardiovascular procedures are performed in Iceland; however, some operations on neonates and young children, all heart transplantations and percutaneous valve replacements (TAVI), have hitherto been sent abroad to Denmark, Sweden, or the USA.

The ISC does not have its own journal but members publish scientific work and health policy opinions in the Icelandic Medical Journal (Læknablaðið). Members also contribute to the Icelandic Association of Internal Medicine's biannual scientific meeting and the annual congress of the Icelandic Medical Association (Læknadagar).

Cardiovascular research has become more important in the last decades and has a growing international impact. Research has been an increasing part of most cardiologists' work and career opportunities in research have increased considerably. More than 50% of Icelandic cardiologists have a PhD.

Research in genetics, epidemiology, prevention, and cardiovascular registries has been very prominent in recent years. Participation in large multicentre clinical trials has also been important during the last two decades. Active players in cardiovascular research are the Icelandic Society of Cardiology, Cardiovascular Research Institute of Landspitali University Hospital, and the Medical Faculty of the University of Iceland; deCODE Genetics, and the Icelandic Heart Association. Much of the current research programmes are collaborations between two or more of these associations.

Some examples of recent and ongoing projects are genetics in atrial fibrillation, hypertension, atherosclerosis, and stroke. Studies on the evolution of cardiovascular risk burden, the AGES research project, and the TASTE study on the effects of thrombus aspiration in ST-segment elevation myocardial infarction (STEMI).

Thorarinn Gudnason, MD, PhD, FESC, FACC, consultant cardiologist Landspitali University Hospital, Reykjavik, and President of the Icelandic Society of Cardiology.

People's corner: Awards

Patrick W. Serruys senior consulting editor of the EHJ receives ACC 2011 Lifetime Achievement Award

Professor Serruys, interventional cardiologist at Erasmus Medical Centre, Netherlands was awarded the prestigious '2011 Lifetime Achievement Award' by the American College of Cardiology (ACC) on 4 April, 2011. The Association presented him this internationally prestigious award for his outstanding contribution in the development of treatment for cardiovascular diseases. Serruys is the second physician from Holland to ever be awarded this prize. The first was Professor Durrer 25 years ago.

In addition to his extraordinary contribution to the developments of treatment for cardiovascular diseases, Prof Serruys will also be receiving the prize for his position as a role model in the fields of scientific research, patient research and education, where he has been the supervisor of more than 60 international PhD students. The American College of Cardiology (ACC) awards the prize to physicians who have worked as cardiologists for at least 30 years and who are recognized nationally and internationally as leading experts in their field.

Prof Felix Zijlstra, head of the Thorax Center at Erasmus MC is proud of his colleague: 'Patrick Serruys has dedicated his life to further improving the treatment of patients with cardiovascular diseases. He was, for example, an important force internationally behind the introduction of stents in the treatment of cardiovascular diseases and the many improvements that followed on from this at a later stage. This discovery is now widely used in the treatment of many cardiovascular patients. It is a privilege to be able to continue this work together within our department and this prize gives our work an extra stimulus.'

Worldwide, Serruys has become a big name in the research field. Professor Huibert Pols, Dean of the Medical Faculty at Erasmus MC states: 'Research led by Serruys that has been published in scientific journals is frequently cited by other international scientists. When compared to all other cardiologists in Holland, the published research carried out by, or headed by Serruys over the last 40 years has been quoted most often. This is an extraordinary achievement of which Erasmus MC is very proud. In our view, the prize is well deserved recognition for the hard work of Serruys'.

The award ceremony took place in New Orleans, USA, during the 60th Annual Scientific Session of the ACC, April 2011.

Paul Cummins, Managing Editor *EuroIntervention*

People's corner: In Memorium

Otto Martin Hess, MD, Professor of Cardiology at the University Hospital of Bern, Switzerland

At the age of 64, shortly before his planned retirement, Otto Martin Hess succumbed to an exacerbation of a chronic disease. Otto has been an important figure in European and worldwide cardiology for the past 30 years. Born and raised in the Zurich area of Switzerland, he went to the medical school of Zurich University where he graduated in 1973. After becoming board certified as an internist and cardiologist at the local university hospital he spent a couple of years in the United States, in San Diego and later in Ann Arbor, to further his knowledge and skills in haemodynamics, myocardial perfusion, and cardiovascular imaging. Until 1996 he was the leading figure of academic cardiology in Zurich by the side of his tutor, Hans-Peter Krayenbühl and an avid interventional cardiologist in the footsteps of the local hero Andreas Grüntzig. He was then called to the University Hospital of Bern where he acted as Deputy Chief of Cardiology until his untimely death. During the last 6 years he was in addition, Head of the Cardiovascular Department encompassing cardiology, angiology, and cardiovascular surgery. A lesser known activity of his was innovation. During the past 20 years, he successfully developed a preventive multi-pill, a coronary stent, and an implantable heart valve, to name just a few.

Otto was a devoted doctor for his patients, an astute clinician, and a gifted teacher for students, doctors, and medical personnel in general. He was well versed in talking to lay people and the media, convincingly submitting his gospel for a healthy lifestyle. He has been a highly solicited speaker at national and international meetings as well as a coveted partner in research and teaching courses. He wrote and helped writing countless articles in the best of journals and contributed to review articles and books. He was one of the lead editors of a top German cardiology book. He has continuously supported among others the Medical School of the University of Bari, Italy, as a guest professor since 1989 and he has been a recipient of numerous prizes. He has also had important tasks as a reviewer and editor of cardiovascular journals, hereby both fostering research and assuring quality of publications.

Above all, Otto has been liked and adored by virtually everybody because of his never-tiring, energetic, and motivating personality, which he not only displayed in professional activities but also on many social occasions with peers and pupils. Together with his wife of 32 years and his two daughters, one a lawyer and one a doctor, we mourn this tremendous loss and will keep Otto's memory in the midst of our hearts for good.

Bernhard Meier, MD, Bern, Switzerland

CardioPulse contact: Andros Tofield, MD, FRCS, FACEP, Managing Editor CardioPulse, *EHJ*. Email: docandros@bluewin.ch