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Final announcement: European Society of Cardiology Congress 2009

'ESC 2009 promises to be a true festival of cardiology. There will be opportunities for hearing about the latest groundbreaking trials, continuing education, and unrivalled moments for networking with colleagues from all disciplines of cardiology', says Professor Fausto Pinto, Chairperson of the Congress Programme committee.

ESC 2009, the world's biggest international meeting in Cardiology will be held in Barcelona, Spain, 29 August to 2 September.

The meeting, expecting to attract 30 000 delegates, will provide opportunities for education, hearing about the latest groundbreaking research, and gaining deeper insights into the most recent developments and innovations in the diagnosis, treatment, and prevention of Cardiovascular Disease. Delegates will include clinicians, basic scientists, epidemiologists, nurses, technicians, and key opinion leaders in the field.

The latest results will be presented in the Hotline and Clinical trials sessions, with unique opportunities for delegates to have face-to-face interactions with the investigators. Over 4000 abstracts featuring original research will be show-cased at the meeting.

The *educational* aspects of the Congress include 'Meet and Read with the Experts' sessions, the highly acclaimed FOCUS sessions with live transmissions, and practical take home message. The latest ESC guidelines will be reported on.

Prevention and *risk* factor identification is this year's theme, giving an opportunity for doctors, scientists, governments, and the general public to come together to discuss ways of decreasing the burden of cardiovascular disease on society. Altogether there are 50 separate sessions on prevention, and a special abstract session focusing on prevention research.

Additional *highlights* of this year's meeting include new joint sessions with sister society's, such as the European Society of Medical Oncology, looking at issues such as the cardiovascular effects of oncology drugs. A full day on Congenital Heart Disease and a new joint session with the European Commission exploring how the Commission supports cardiovascular research. A strong component is dedicated to basic science, including a hotline session looking at the latest development, a translational bench to bedside track, and a special abstract session.

Why should people attend the ESC Congress 2009?

The ESC 2009 Congress represents the largest meeting in the world addressing issues in cardiovascular medicine. The meeting, during 5 days in 30 lecture theatres, provides a unique forum bringing together all the different disciplines and players in cardiology, including doctors, basic scientists, epidemiologists, nurses, technicians, and key opinion leaders. Additionally, it covers both specific issues in different disciplines as well as broader issues affecting all fields of cardiology. It will provide delegates with great opportunities for education, including 'Meet and Read with the Experts, and, to hear about the latest research'. There will be valuable opportunities for networking, exchanging ideas, and getting to know interesting new people and how cardiology is practised in different countries. Let us not forget our industry partners who will be holding over 80 satellite symposia and workshops and showcasing the latest innovations in pharmaceuticals and equipment, in what is probably the world's largest medical exhibition centre.

What new features can delegates expect?

This year there are lots of new innovations. Immediately after the Hotlines and Clinical Trial updates, abstracts and slides will be available on-line. This year a new translational tract has been formed, with over 20 sessions dedicated to the clinical implications of basic science and getting it closer to clinicians. There will be a set of new joint sessions with sister societies, e.g. the European Society of Medical Oncology looking at issues such as the cardiovascular effects of oncology drugs, and, a new joint session with the European Commission that will be exploring how the European Commission supports cardiovascular Research. We have expanded the number of sessions in the popular 'Meet and Read with the Experts' as well as the sessions 'Meet the Trialists', where delegates have a unique opportunity for face-to-face interaction with the presenters of the main clinical trials. Another new session is 'Meet the Editors', where the ESC Editors Network will address the most challenging issues in publishing national cardiovascular journals.

For the first time, there will be opportunities to gain hands-on image and device education from clinical experts. The sessions, which are being held in purpose-built classrooms, have been organized by our industry partners, and will be available free, on a first come first served basis. There will also be over 80 satellite symposia and workshops featuring the latest innovations in pharmaceuticals and equipment.

Finally, there will be a special lecture on heart failure, honouring the memory of Professor Philip Poole Wilson, a former president of the ESC, who sadly died earlier this year.

What can we expect from this year Congress highlight on prevention?

Because cardiovascular disease is the main cause of morbidity and mortality and recognizing the major advances that have been made in this field, we felt that prevention and risk factor identification represent an important theme to highlight. Entitled 'Prevention of Cardiovascular Disease from cell to man to society', this offers the opportunity for doctors, scientists, governments, and the general population to come together to discuss ways of decreasing the burden of cardiovascular disease on society. Altogether there will be 50 separate sessions on prevention in the pre-arranged programme (Highlight/Prevention Track).

A special abstract session on Prevention will be held, with a jury deciding on the best abstract for an award. Our president Roberto Ferrari will deliver a keynote lecture of a special prevention project taking place in his home town of Ferrara. The Spanish Society will be running a public event on prevention in Barcelona for the duration of the meeting.

What is on offer for clinical cardiologists?

A large part of the programme will be dedicated to practical clinical science, giving delegates a valuable opportunity to update skills. The meet-the-expert lunch time and evening sessions will focus on the practical management of cardiovascular disease. A set of five sessions will be dedicated to the new ESC Guidelines. The FOCUS Cardiology Practice Sessions and the Session organized by the Council for Cardiology Practice on Take Home Message for Practitioners will also provide important practical messages.

In the main sessions there will be overviews of some of the fastest moving areas in the field of cardiovascular medicine which are relevant to clinical practice. The Hotline sessions and Clinical Trial Updates will give delegates the latest news on drugs, equipment, and procedures. For the first time, the *European Heart Journal* will consider these trials for fast-track review and simultaneous online publication.

What is on offer for basic scientists?

Basic science is an area we are really trying to push since it is a key to the development of new concepts in cardiovascular medicine. There will be a new Ketty Schwartz lecture on basic science, a Hotline session devoted to the latest developments in basic science and a translational bench to bedside track, with about 35 sessions. There will be plenty of abstracts on basic science and a special young investigators award for basic scientists. We are hoping that more basic scientists than ever-before will be attracted to the meeting.

What is happening with abstracts?

This year we have had a record number of abstract submissions—9848 in total—reflecting how the meeting is now the main platform for cardiovascular research. Each abstract has been peer reviewed leading to the final selection of around 4000. The abstracts are presented in a range of formats including the featured research sessions (where the best abstracts are selected), the young investigators awards (submitted by presenters under 35), oral abstracts, moderated posters, and finally the usual posters where people exchange views on a one-to-one basis. We have also redesigned our abstract presentation space. What is really interesting is that we have had a lot more submissions from countries outside Europe, reflecting the truly international dimension of the meeting.

What sessions should you attend for a quick overview of the latest advances in cardiology?

On Monday and Tuesday, the Associations Tracks will hold five meetings updating delegates on major developments that have taken place in our sub-specialities over the past year, and highlights from our sub-speciality annual meetings. There will be sessions providing updates on the latest ESC clinical guidelines then on the final day, the Highlight session will provide the meeting with a 'nutshell', giving an overview of the new and exciting developments in basic and clinical sciences presented at ESC 2009.

How will Barcelona provide a good backdrop for ESC 2009?

Barcelona is a truly wonderful venue. The city offers an excellent congress centre, good transport links, and is a really interesting place for delegates to take a bit of time out. You have magnificent Gaudi architecture, superb cuisine and a world famous football team. In fact it's the perfect mix—that is so long as you do not get too distracted from the meeting.

Pioneers in cardiology: Göran Hansson

Inflammation and atheroma: a new Swedish centre seeks novel therapeutic approaches to cardiovascular disease

Ten specialist groups at the Karolinska Institute, Stockholm, Sweden, have been combined with new money, a new focus, and a new awareness of what each can contribute to a greater understanding of the role of inflammation in atherosclerotic disease, Professor Göran Hansson MD, PhD, Co-coordinator of the Centre for Inflammation and Cardiovascular Disease (CERIC), speaks to Barry Shurlock MA, PhD

The Centre for Inflammation and Cardiovascular Disease (CERIC) of the Karolinska Institute has had its first birthday in June [2009]. Its origins can be traced back to 1982 when Prof. Göran K. Hansson was returning from a postdoc [Fogarty Postdoctoral Fellowship] at the University of Washington, Seattle, USA, with an idea that had been rattling around in his head for some time. He wanted to know whether the arterial wall is, in some way, associated with components of the immune system.

Using the then new technology of monoclonal antibodies, he decided to map the distribution of macrophages in plaque. He recalls that he set up a 'pipeline' between vascular surgeon Dr Jan Holm MD in the operating theatre, who supplied carotid artery plaques from endarterectomies, and research student Lena Jonasson, in the lab. Using a specific antibody, they were surprised to find that two-thirds of all plaque cells were HLA-DR positive, and that many of these were smooth muscle cells. But no similar cells were found in the surrounding normal artery.

It was the start of the recognition of a new paradigm for cardiovascular disease (CVD), that atherosclerotic plaque is the result of inflammatory processes involving activated T cells. The concept of inflammation being involved in atheroma was controversial—in fact, in their initial publication, to please the referees, Prof. Hansson and his colleagues had to downplay findings of activated T cells in plaque. And there still are many cardiovascular specialists who question the role of inflammation in atheroma.

But Prof. Hansson points out that epidemiological studies have shown increased rates of CVD with rheumatoid arthritis and other autoimmune diseases. And he and many others have obliged writers of textbooks to stop explaining atherogenesis as an irreversible process due to proliferative expansion of smooth muscle cells.

Despite what appears to be this huge shift in thinking on atherogenesis, the clinical implications at the moment seem minimal. Commenting on the new paradigm in relation to current practice, Prof. Hansson said: 'It's not an exclusive paradigm. Hypercholesterolaemia leads to LDL entering the artery wall and starting a range of inflammatory processes. If you reduce cholesterol you reduce LDL and thereby reduce inflammation and atheroma. I think we have contributed to a new understanding of the pathogenesis of atheroma, but I don't see anything [in current practice] that's causing problems with inflammation'.

The opportunity for Prof Hansson and his colleagues to further explore the links between chronic inflammatory diseases (CID), such as rheumatoid arthritis (RA), multiple sclerosis (MS), and psoriasis, and CVD came in 2007 when the Swedish Research Council (SRC) in its Linnaeus Programme launched a national scheme to develop centres of excellence in many areas of intellectual endeavour. Prof. Hansson and nine other senior researchers in Stockholm made a successful application to join forces in CERIC, with funding of 90 million SEK (about 9.5 million Euros) secured over a period of 10 years.

No new building is envisaged—'brains not bricks,' commented Prof. Hansson—as all the 150 staff from the 10 groups will continue to be located physically either on the clinical campus in the Centre for Molecular Medicine (CMM)

Kick-off CMM-CVD Group

and in the Solna district of Stockholm, or 'across the road' on the pre-clinical campus in the Department of Biochemistry and Biophysics. In its first year, SRC is contributing a million Euros to CERIC, to which are added substantial existing grants from the Swedish Heart-Lung Foundation and others amounting to 1.5 million Euros.

Prof. Hansson commented: 'We are focusing on immune cells in the atherosclerotic lesion, investigating mechanisms and key factors in the search for diagnostic and therapeutic opportunities. We are interested in finding the relationship between atherosclerotic heart disease and chronic inflammatory diseases. Textbooks used to say that people with RA have "clean vessels", but a follow-up study carried out about 10 years ago showed that CVD mortality and morbidity is doubled, and with SLE [systemic lupus erythematosis] it's even greater, about fivefold higher. These are noteworthy observations'.

The aims of CERIC are, first, 'to determine why chronic inflammation sometimes, but not always, results in increased atherosclerosis and leads to MI or stroke' and, secondly, 'to identify novel therapy targets and investigate the effects of targeted therapies against CID and inflammation-dependent CVD'.

A key element will involve longitudinal studies to show which CID-associated events increase CVD risks and when these occur, thereby providing strategies for preventing CVD. Unravelling common genetic and environmental risk factors for CID and CVD, and also determining shared steps in molecular pathogenesis, will be high on the list of priorities at CERIC. Cellular immunity will not only be studied in existing animal models of CID and CVD, but also in new strains of animals that have been cross-bred to give models that mimic both CID and CVD.

Vital resources for these studies include biobanks already in place at the Karolinska Institute, said Prof Hansson. These include biobanks of DNA and mRNA-derived cDNA from case–control studies involving about 3000 cases of RA, 1000 MS, and 1700 MI. In addition, there are more than 2500 cases of affected siblings and parents originating from the EU-funded Procardis Study, which is directed at the Karolinska University Hospital by Prof. Anders Hamsten MD, and collaborates with other centres, including the Clinical Trials Service Unit of the Department of Cardiovascular Medicine of the University of Oxford, Oxford, UK.

Also expected to contribute hugely to the work at CERIC is a tissue biobank with more than 300 samples of plaque from the carotid artery. In order to make full use of these resources, and to handle the large amounts of genetic information generated, novel purpose-written bioinformatics software is being developed. The expectation is that this work will form the core of a new academic centre for medical informatics and computational medicine. Prof. Hansson commented: 'From the biobanks we can pick up genes associated with atherosclerotic disease and also with 2 or 3 inflammatory diseases and then move to studies in animal models. There is a paucity of data on the genes and environmental influences shared between different CIDs and between CID and CVD, and CERIC has the potential to unravel these risk factors'.

He expects that one of the great benefits in the way that CERIC has been set up is that there will be two-way traffic between CID and CVD, so that, for example, the current use of TNF blockers for treating RA may turn out to be useful in CVD. Similarly, recent observations that statins are anti-inflammatory could impact on the treatment of RA. He added: 'I expect that in 10 years time we will have new drugs for treating CVD – we can't *make* the drugs at CERIC but we can identify the targets. We shall probably be using existing therapies in a better way. And I expect we will have better diagnostic and monitoring tools for both early and late atherosclerotic disease'.

Prof. Hansson emphasized that CERIC has been designed to provide an opportunity for extensive collaboration between biochemists with knowledge of prostaglandins, leukotrienes, and other immunological molecules and molecular pathologists with experience of inflammatory processes and immunity. He runs the centre with the help of two senior colleagues from the Department of Medicine of the Karolinska University Hospital and the CMM, namely Prof. Cecilia Söderberg-Nauclér, MD, for her expertise in virology and vascular biology, and Dr Marie Wahren-Herlenius, Prof. of Experimental Rheumatology, for her expertise in humoral immunity, autoimmunity, and autoimmune diseases.

Although CERIC is starting with a largely Swedish base of researchers, it intends to reach out to recruit new talent wherever it is to be found. Advertisements have already been placed to recruit outstanding young scientists as *forskarassistents*, or Research Assistant Professors, who will be given the freedom for 2 years to develop their own research groups. A number of new postdocs is also envisaged, and the first ones are about to be advertised. A programme of visiting scientists will also be set up, particularly to import 'new ideas and new technologies'.

Integration of the resources of the research groups within CERIC is a key management theme, so that 'people in different labs are aware of what's going on elsewhere, and if they have a problem they can easily find someone to address a question to', explained Prof. Hansson. Each of the 10 constituent research groups will be given a slot to run a weekly seminar (with 'beer and sandwiches'). Twice-yearly 'retreats' are also planned, starting last autumn [2008] when CERIC researchers retreated to a conference centre to the north of Stockholm. Organized like a mini-convention, there were poster sessions, discussions of strategy, and projects of common interest (and 'beer and wine'). The activities of the centre will be posted on an ever-necessary webpage that is under construction (www.ceric.se). Not content with assessing their own performance, at the next autumn retreat Prof.

Hansson and colleagues will invite the scrutiny of five external advisers from Europe and the USA.

Prof. Hansson read medicine at Gothenburg University, where he spent much of his research career, before being appointed to the chair of cardiovascular research at the Karolinska Institute in 1995. For more than a decade he has been a member, and more recently the permanent secretary, of the bodies [the Nobel Assembly and the Nobel Committee] which, with the help of external assessors, evaluates each year the hundreds of nominations for the Nobel Prize for Physiology or Medicine, and eventually makes a decision.

As regards the honours he has himself received, he is particularly proud of 2007. In that year he was asked to deliver the Lyman Duff Memorial Lecture of the AHA (honouring a Canadian pathologist) and received the Anitschkow Prize of the European Atherosclerosis Society. Also in 2007 he was elected to the Royal Swedish Academy of Science. He is a partner of the Leducq Transatlantic Network of Excellence of Atherothrombosis, co-ordinated from Harvard Medical School, Boston, MA, USA. He is also a partner of the European Vascular Genomics Network and has participated in several Europe-wide integrated research projects under framework schemes of the EU.

Pioneers in medicine

Big trials, big results, and huge rewards for medicine

Dr Salim Yusuf, Professor of Medicine at McMaster University, Ontario, Canada, has been instrumental in initiating the concept of large simple trials and that of meta-analysis, both of which dictate the way that clinical research is conducted today. Here, he talks to Helen Jaques about his remarkable career, from humble beginnings in India to director of international cardiovascular disease (CVD) trials.

Dr Salim Yusuf began his career studying medicine at St John's Medical College in Bangalore, India, after which he moved to University of Oxford, Oxford, UK, on a Rhodes Scholarship to undertake a DPhil. While studying the effects of beta-blockers on myocardial infarction (MI), Dr Yusuf and his mentors at Oxford, Professor Peter Sleight and Professor Richard Peto, recognized that in order to find reliable evidence as to what common treatments would do, they needed to look at a lot of patients. 'I think what was wrong with trials up to that time is that they were far too small to detect the kinds of plausible treatment benefits that one could expect', says Dr Yusuf. In addition, clinical trials up to this point were inexplicably far too complex. As Dr Yusuf points out, 'we collected a lot of information per person but we didn't collect a lot of people'.

It was out of these issues that the concept of large simple trials was born. Dr Yusuf and his colleagues suggested that studying thousands of patients at several different centres was the only way to provide reliable evidence on the risks and benefits of a particular treatment. By cutting back on the number of variables assessed, and thus the amount of data collected per patient, such trials could be simplified and thus made financially and logistically feasible. The first of the four International Study of Infarct Survival (ISIS) trials was initiated to test the idea of large simple trials. ISIS-1 included 16 027 patients with suspected acute MI and found that beta-blockers reduced mortality by 15%. The study thus validated not only the efficacy of this treatment but also the concept of large simple trials.

While ISIS-1 was underway, Dr Yusuf and his colleagues were working on another somewhat revolutionary idea. At the time, several small trials on the effects of beta-blockers had been published, but given the size of these studies and the variation in outcomes it was inappropriate to base clinical decisions on the results of one trial alone. If many small trials were combined, however, this defect of size could be rectified and a trend that could guide treatment might well emerge. Dr Yusuf and his colleagues decided to conduct an overview of these 65-odd trials, thus undertaking one of the first ever meta-analysis studies. Their analysis suggested that long-term beta blockade for a year or so following discharge after an MI reduces mortality by about 25%. The results of ISIS-1 soon confirmed this prediction, proving the value of meta-analysis as a statistical method.

Dr Yusuf went on to validate the concept of large simple trials in several subsequent studies. The Studies of Left Ventricular Dysfunction (SOLVD)[1] collectively involved almost 7000 patients with heart failure (HF), a syndrome that was initially considered too complex to be studied with large simple trials. The SOLVD trials were a success, however, showing that angiotensin-converting-enzyme (ACE) inhibitors reduced mortality in patients with congestive HF and actually prevented HF in people with left ventricular dysfunction who have no symptoms. The SOLVD trials included several elegant

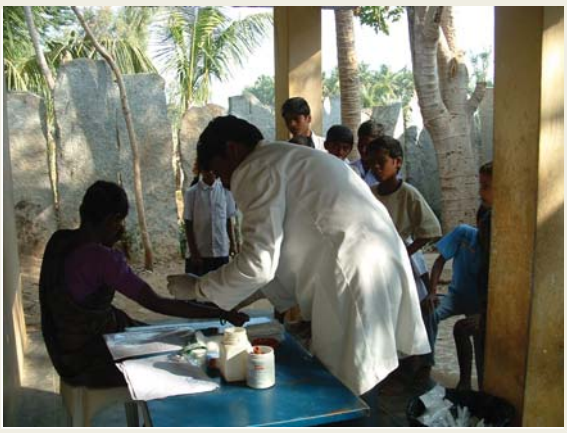
sub-studies that focused on detailed information, such as mechanisms, that would by design be overlooked by the large simple trial. 'This was one of the first studies in the world that married the new and the old', says Dr Yusuf, 'new is large simple trials, whereas old refers to the embedded, nested, detailed sub-studies. Every HF trial since then has followed to varying degrees concepts around the SOLVD trial'.

Having studied patients with clear cardiac problems, Dr Yusuf then turned his attention towards preventing cardiac events in asymptomatic individuals. The Heart Outcomes Prevention Evaluation (HOPE) evaluated the effects of the ACE inhibitor ramipril in 9297 patients who were at high risk for cardiovascular events but who did not have left ventricular dysfunction or HF. HOPE was a resounding success, showing that ACE inhibitors prevented HF, stroke, and heart attack in otherwise healthy individuals with no signs of HF, as well as prevented death from cardiovascular causes or indeed from any cause.[2] 'It's one of the most spectacular results I've been involved with', says Dr Yusuf.

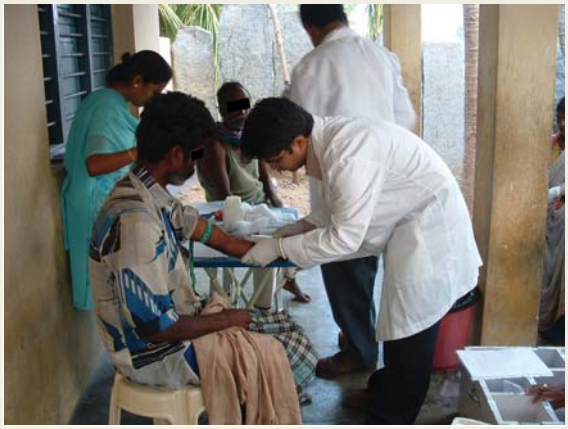
When asked about the research he is most proud of, however, Dr Yusuf gives the massive INTERHEART study top mention. Before INTERHEART took place, knowledge of the risk factors for CVD was largely derived from studies in developed countries. In addition, it was widely assumed that heart attacks in different populations occurred for different reasons. INTERHEART was a case-controlled study that assessed the aetiology and causes of acute MI across many different cultures and populations. INTERHEART was a huge undertaking—the study enrolled more than 27 000 people from 52 countries. 'There's never been a study like it in history before;, confirms Dr Yusuf.

The results of INTERHEART showed that the causes of heart attack were the same worldwide in all ethnic groups, and that nine simple factors, several of which are modifiable, accounted for over 90% of the risk of acute MI.[3] These astonishing findings indicate that the same approaches to CVD prevention can be applied in all populations worldwide and also that most cases of MI can be prevented by targeting the nine identified risk factors. In addition, INTERHEART globalized epidemiological research. 'Just like the ISIS trials were a movement, [INTERHEART] actually made research, or participation in research, accessible to the little guy in Botswana or Bangladesh or India or China or Chile', says Dr Yusuf.

Dr Yusuf has a unique perspective on 'the little guy in India',

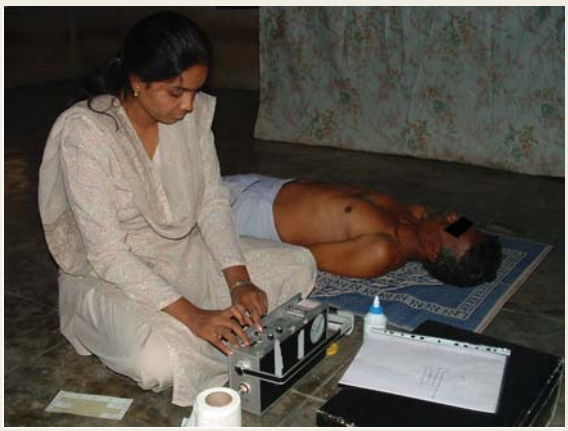


Rural medicine setting in India



Rural clinic in India

having been a visiting professor at his alma mater in Bangalore for almost 20 years. 'To see medicine being practiced at St John's [is] refreshing because there's so much people do with so little there



ECG in rural India

compared with in the West where there's so much important technology', says Dr Yusuf. The chance to work with the poor and disadvantaged is one of Dr Yusuf's driving passions; 'I think our work globally in the poor and not so poor countries has probably been the aspect of my work that has given me the deepest satisfaction', he says. 'It's the research we're doing in these countries, in the lower and middle income countries, that I think are dearest to my heart'.

Asking big questions and answering them with big trials has been the focus of Dr Yusuf's career. It is this ambitious approach that sets Dr Yusuf apart as one of the top clinical trialists in the world.

Helen Jaques is a freelance medical writer and editor.

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Pioneers in cardiology: a new generation of imaging specialists

Cardiologists and radiologists train in cardiac magnetic resonance at new Lausanne Centre

By training together, cardiologists and radiologists will benefit from the knowledge and viewpoint of the other speciality, says Dr Juerg Schwitter, MD, FESC, Director, Cardiac MR Centre, University Hospital, Lausanne (Centre Hospitalier Universitaire Vaudois, CHUV)

A paradigm shift in cardiology education is occurring around Lake Geneva, with a new Cardiac MR Centre that opens its doors on May 1. Launched by the University Hospital of Lausanne (CHUV), the Centre will perform high-quality clinical work-up of cardiac patients, deliver state-of-the-art training in CMR to cardiologists and radiologists, and pursue research.

Cardiac MR Centre founders Prof. Pierre Vogt, Cardiology chairman CHUV, Prof. Juerg Schwitter, Director of the Centre, and Prof. Reto Meuli, Radiology chairman from 1 June 2009 (current Chair: Prof. Pierre Schnyder). Copyright granted by: Cemcav/Chuv/Sophie Huguenot

Combining education for two specialities and focussing on one organ system is an unusual approach. Traditionally, radiologists have focussed on using one technique for different organs, while cardiologists have concentrated on one organ and perhaps one technique.

'Now we will put the focus on a combination of different modalities on one organ', says Dr Juerg Schwitter, Director of the Centre. 'I think the Centre is dependent on having both specialties on board, and that could be how medicine or cardiology evolves because the techniques that we can use today are really challenging'.

Two staff physicians—one from cardiology and one from radiology—will be employed by the Centre, and each will devote 40% of their time to their role. In addition there will be two assistant Fellow physicians—again one from radiology and one from cardiology—who will train at the Centre for 3 months. Over the course of a year, the Centre will host eight such physicians, four from each specialty.

Plans are also underway to have one or two post-doctoral research Fellows who spend 1–2 years at the Centre working on larger research projects as well as participating in clinical work. How soon this develops will depend on getting sponsors into place.

Cardiologists and radiologists will receive exactly the same training, and by learning together will benefit from the knowledge and viewpoint of the other specialty.

For Fellows who stay for 3 months, the aim is that they will learn the principle of how MR works, which indications it should be used for, and how to analyse the data it produces. Dr Schwitter explains: 'In these three months it would not be the aim that they would run the scanner or would read or analyse the examinations independently, but they would learn to interpret the data with guidance by the staff of the Centre'.

Those who opt for a 1 or 2 year stay will work towards a level 2 certification, which means that they can then read and perform investigations by themselves.

The definitions of training expertise—levels 1, 2, and 3—are endorsed and set out by the European Society of Cardiology

(ESC) Working Group on Cardiovascular Magnetic Resonance, of which Dr Schwitter is past chairman. The Society for Cardiovascular Magnetic Resonance (SCMR), an international society based in the USA and with a large European membership, uses the same criteria.

Most of the Fellows who train at the Centre in Lausanne will gain level 1 or 2. Dr Schwitter says: 'I think for me the most important point would be for every cardiologist and radiologist to have level 1, so that a well educated cardiologist knows the indications for the technique and has had some exposure to it'. The current CMR indications are also summarized in 'CMR-Update', a booklet put together just recently by the EuroCMR Working Group of the ESC. The booklet can be ordered through www.herz-mri.ch and is a useful guide for every cardiologist. The training in the Centre will also closely follow the material presented in 'CMR-Update'.

Level 2 is suitable for cardiac imagers who want to perform the method by themselves, and Dr Schwitter says many more of these people are needed. Level 3 requires more procedures to be done, more expertise, and a broader knowledge of different techniques of CMR and rare diseases. These people have enough training to run a Centre at a hospital that also offers education in CMR.

The ESC working group has defined what criteria they would like to see in every training programme and the aim is that attendees will hold a log book with evidence of the types of and numbers of cases they have done. Fellows who attend the Centre in Lausanne for 1–2 years should subsequently take a 2.5 h exam held at the annual Euro CMR meeting, which will be held this year in Athens from May 21 to 23. Together with the log book and credit points from the institutions they have studied at, they can then be awarded level 2 accreditation.

While the Centre is in its infancy, all Fellows will come in a rotation scheme from the University Hospital of Lausanne.

Main building: University Hospital Lausanne

At the moment there is funding for one radiologist and one cardiologist Fellow at a time.

The next step will be to have agreement with other university hospitals in Europe for an exchange programme, and connections are already being made with The London Chest Hospital in the UK and Nantes University Hospital in France.

How open the programme will be to external Fellows from other universities in future will depend on finances. One option would be for these Fellows to apply for a grant that funds them to work on a larger research project for 1–2 years. In addition to research they would also attend the clinical reading sessions and have contact with clinical cases.

Research at the Centre will focus on three areas: the study of endothelial function to understand atherosclerosis; the development of MR-compatible cardiac devices such as pacemakers and ICDs; and using hyperpolarized contrast media to investigate metabolism in the heart.

For the latter topic, the Centre will work with the Centre for Biomedical Imaging (CIBM), a network around Lake Geneva that includes the Ecole Polytechnique Fédérale de Lausanne (EPFL), and the universities and university hospitals of Lausanne and Geneva.

CIBM focuses on imaging, particularly neuroimaging, and has developed new contrast media to monitor metabolism in the brain. The increase in diabetes, obesity, and the metabolic syndrome mean that understanding cardiac metabolism is becoming more important, so the Cardiac MR Centre will create a cardiac core in the CIBM network and transform the work on metabolism in the brain into work on the cardiovascular system.

'It's a very attractive and completely novel type of research that we can do in the heart', says Dr Schwitter. 'With this new contrast media we can have a look in realtime at the metabolism of the heart in a way that we could not do before. There are maybe a handful of sites which have the techniques to go for these metabolic studies, so this is a very strong situation for our Centre in research'.

In addition, EPFL, an engineering school, is based in Lausanne and has expertise in imaging, so Fellows from the Centre who stay for 1–2 years will be able to work on new cardiac techniques.

The Centre is just opening its doors to the first rotation of Fellows and Dr Schwitter anticipates that being exposed to something new will make for an interesting period in their education. Fellows will not be overloaded by a conveyor belt of patients, but rather will have time to read about the patients and techniques so that they are prepared for each case.

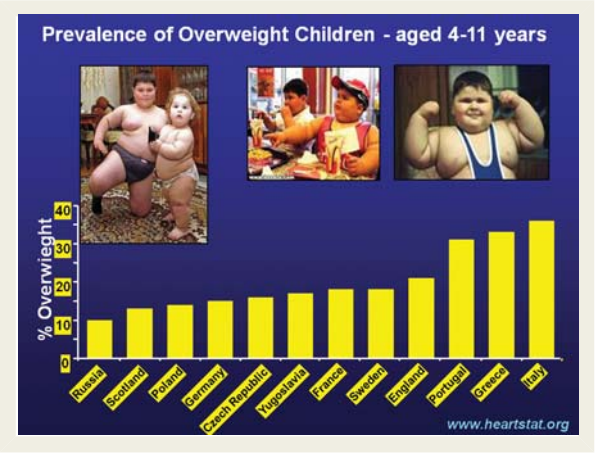
Ultimately, what each Fellow takes away will depend on his or her own motivation, says Dr Schwitter. 'I would assume that in three months they would probably publish one or two case reports. If they want to stay longer of course they would be integrated in newer research projects'.

Jennifer Taylor

The impact of childhood obesity on heart disease

Tackling atherosclerosis early improves the chance of preventing or reversing damage, says Professor John E. Deanfield, MD, FRCP, FACC, Professor of Cardiology, University College London.

'Childhood obesity is the tsunami that could overcome everything we've achieved by better treatment of established cardiovascular disease', says Professor John E. Deanfield, Professor of Cardiology at University College London. 'The worsening risk factor profile in the population is being driven by being fat and the way we live, and as a result, the next generation could have a massive problem of arterial disease'.



His point is backed up by a survey in Beijing, China, during 1984 to 1999, which showed that mortality rates from coronary heart disease increased by 50% in men and 27% in women, despite better treatment of patients with clinical disease.[1] Most of the increase in deaths was attributable to rises in total cholesterol levels, and increases in diabetes and obesity in the population.

Prof Deanfield says: 'The population burden of atherosclerosis is not going to be solved by improved treatment of people with manifest disease. It's got to be solved by prevention – that's the message. And that's why what is happening in children is such a concern for the future generation'.

People across the globe are getting fatter, with the largest increases in obesity in children and young adults. This has occurred in both developed and less developed countries, including those with traditionally healthy diets, such as the Mediterranean countries.

A higher body mass index during childhood has been associated with an increased risk of coronary heart disease in adulthood, which suggests that as children get fatter worldwide, there will be a time bomb of heart disease waiting to explode.[2]

One of the problems is that fat children become fat adults, so that even if the clock was stopped today, the next generation is already in trouble because there are so many fat children today.[3]

As children become mildly, severely, and very obese, it creates the same pattern of risk factors that is called the metabolic syndrome in adults—hypertension, insulin resistance, low HDL cholesterol, and high LDL cholesterol—but it is occurring in 4–20 year olds.

'It's not a huge surprise that if you then look at children's arteries directly, they already show evidence of arterial damage', says Prof. Deanfield. His own research of nearly 500 UK teenagers showed a continuous relationship between fatness and arterial stiffness. 'It isn't that there's a threshold above which it's unsafe and below which it's okay to be fat. There was a continuous relationship – the fatter the teenagers were, the stiffer the arteries'.

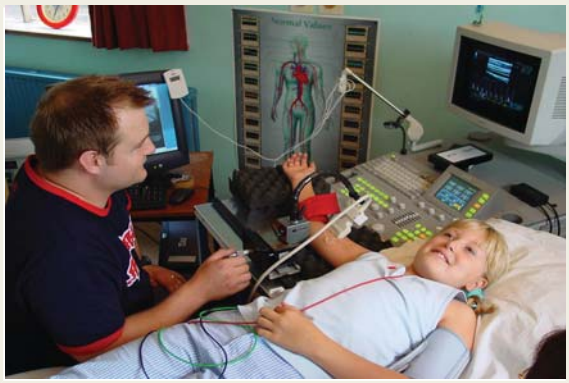
One area that has yet to be understood is whether the significance of the location of fat deposition seen in adults—with visceral rather than subcutaneous fat posing a greater risk for cardiovascular events—holds true for children.

In addition, the pattern of how fat is laid down in children has yet to be discovered—that is, when children get fat is it visceral or subcutaneous, what is the difference between boys and girls, are there differences between ethnic groups and, does it happen before or after puberty?

Prof. Deanfield has just finished a study of more than 1000 school children in London from different ethnic backgrounds before, and after puberty, to see what their fat patterns are and what impact that fat pattern has on their arteries. The results have yet to be published, but they have found a difference between Afro-Caribbeans, Caucasians, and South Asians, even before puberty, in some of the measures of early atherosclerosis.

Prof. Deanfield is also taking part in the Avon Longitudinal Study of Parents and Children (ALSPAC) in Bristol, which is looking in a longitudinal manner, at many aspects of children's health and the impact on future adult disease. More than 14 000 mothers were recruited during pregnancy in 1991 and 1992 and the health of their children has been followed since then.

'This is the biggest prospective study of children's health and its importance for future adult disease in the world', says Prof Deanfield. He became interested in the study about 7 or 8 years ago and with a British Heart Foundation grant, studied around 7000 of the children at the age of 9–11 years. They looked at risk factors, vascular function (including endothelial function and other measures of early vascular damage), and are currently trying to understand what impact factors like obesity have on the arterial wall, even before puberty.



High resolution ultrasound to detect early blood vessel changes clinically, long before the presence of overt arterial disease.

In a follow-up study, they are hoping to take the same 7000 children, who are now 17 years old, and look at how their fatness and fat deposition has changed as they have gone through puberty, whether there are differences between girls and boys and what impact those patterns have on the emergence of arterial damage.

But shouldn't the focus of research efforts be on how to prevent children getting fat in the first place? 'It would be lovely if it was as easy as that', says Prof Deanfield. 'Fatness is a risk factor that people tend to laugh at and dismiss saying if you eat less and exercise more you won't be fat. If it was as easy as that it would be straightforward'.

The upshot, he says, is that there are several things to be done. First, to understand why children get fat, including both the exercise side of the equation—what Prof Deanfield calls Play Stations versus playgrounds—and the eating side, which encompasses research about what makes people feel full.

Secondly, he believes it is important to look for interventions that could uncouple the damaging effects of being fat on the vascular system. 'If we understand the mechanisms we may be able to develop treatments that protect your arteries even in the presence of being fat', explains Prof. Deanfield. Understanding the mechanisms of inflammation would be a good start—what are the signals and how does it link, being fat to damaging the arteries—because new opportunities for treatment could be identified.

Prof. Deanfield believes that arterial damage is reversible, which backs up his mantra that if atherosclerosis is tackled early, there is much more chance of being able to reverse or prevent changes than if the damage is left untouched for 50 or 60 years.

'The approach to atherosclerosis has often been "denial" for many years until patients present to doctors with clinical problems. By this time the underlying pathology – the atherosclerosis – is very well established and pretty much irreversible'.

Autopsy studies and more recently others using intravascular ultrasound have shown that atherosclerosis as a pathology begins in the first and second decades of life—a fact that has been ignored by doctors until recently, says Prof Deanfield.

But isn't some of that just a normal part of ageing? Yes and no is the answer. 'As we all get older – the question becomes, is that normal or is that pathology? Many mechanisms for ageing and disease appear to be shared. Biological ageing can therefore be accelerated by avoidable or modifiable factors. I think ageing is a concept that applies to the young as well'.

His hypothesis is that the rate of evolution of atherosclerosis is affected by factors that are modifiable or avoidable in the young. That being fat, having high cholesterol, smoking and so on, are triggering off a process which is going to lead to premature disease. Populations such as the un-Westernized rural Chinese did not get atherosclerosis, so what is being experienced in the UK and elsewhere is over and above ageing as a healthy process.

In terms of interventions, medication is the last thing that should be used in children, says Prof Deanfield. Doctors have to lead the discussion, but primarily it is a lifestyle, educational and societal battle that needs to be fought if the epidemic of fat children becoming sick adults is to be overcome.

The good news is that small changes, early on, are leveraged to great benefits in later life, what Prof Deanfield calls 'investing in your arteries'. So losing a little weight, for example, will push down cholesterol and blood pressure and improve glucose intolerance. 'Those little changes over 30, 40 or 50 years can produce huge benefits in terms of life expectancy and future risk. So the message is, don't ignore the early bit, because it's easy to deal with it early and much harder to deal with it later'.

Reducing damage is just one side of the equation. Prof. Deanfield believes that people damage and repair their arteries all the time with a number of endogenous vascular repair mechanisms—'Otherwise we'd all end up in the coronary care unit after a few Big Macs'.

His hypothesis is that the evolution of disease could be a balance between injury—due to exposure to risk factors—and the ability of the body to repair the damage. If those mechanisms of injury and repair change throughout childhood, then it may be failure of repair that is at least in part responsible for early changes in the arterial wall. In parallel with his current ALSPAC study, Professor Deanfield hopes to explore whether fatness in children not only leads to vascular injury, but also to a failure in repair.

And the story goes on. 'One of the interesting areas of research is to see whether those repair mechanisms also age,' says Prof Deanfield.

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