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Centre of Excellence: Division of Cardiology, Leuven, Belgium



Pioneering Work in the Use of Stem Cells for Myocardial Infarction, Tissue Plasminogen Activator for Thrombolysis, and Tilt Training for Syncope

Frans Van de Werf, MD, PhD, FESC, FACC, FAHA, professor of cardiology and chair of the Division of Cardiology, Department of Cardiovascular Diseases, Catholic University of Leuven, Leuven, Belgium, talks to Barry Shurlock, MA, PhD.

Frans Van de Werf, MD, PhD, FESC, FACC, FAHA, chairs the Division of Cardiology of the Catholic University of Leuven (K.U.Leuven), Leuven, Belgium, which has a remarkably high visibility index in the cardiology world.

Part of a University That Belongs to the League of European Research Universities

K.U.Leuven belongs to an “Ivy League” called the League of European Research Universities, a select band of 20 institutions. These include the Karolinska Institute, Stockholm, Sweden; the University of Oxford, Oxford, United Kingdom; the University of Cambridge, Cambridge, United Kingdom; and the University of South Paris, Kremlin-Bicêtre, France. The catholic tag of K.U.Leuven (catholic in Dutch is *katholiek*, hence the K in the acronym) dates from its foundation in 1425 by Pope Martin V, and its mission statement refers to “high-quality interdisciplinary research and education with a catholic signature.” However, Professor Van de Werf says, “In practice, we are even more open to other religions and nonreligious people than nonreligious institutions.”

Like so much in this part of Northern Europe, the history of K.U.Leuven involves a number of political upheavals. At

the end of the 18th century (1797), the French closed K.U.Leuven, but then the Dutch reopened it 20 years later. In each of the last two World Wars, the Germans virtually destroyed its library. Then, in 1968, the linguistic tensions at its centre led to its division into 2 parts: the Dutch-speaking K.U.Leuven and the French-speaking Université Catholique de Louvain, Ottignies-Louvain-la-Neuve, Belgium.

Based in an Academic Hospital That Employs 8172 People on an Integrated Campus, Which Contains All Biomedical Research and Teaching Facilities

From the start, K.U.Leuven had a faculty of medicine, with alumni who subsequently included the anatomist Andreas Vesalius and the histologist Theodor Schwann. After the split in 1968, K.U.Leuven’s medics found themselves left with the antiquated St Raphael Hospital, which the institution replaced in 1985 with a brand new academic hospital to the west of the city, in the Gasthuisberg quarter. This hospital now employs more than 8172 people on an integrated campus, which contains all biomedical research and teaching facilities.

The Division of Cardiology at K.U.Leuven forms part of the Department of Cardiovascular Diseases, which has 7

On other pages...

Pioneer in Cardiology: Joep Perk, MD, FESC

Joep Perk, chief of the medical staff at Oskarshamn Hospital, Oskarshamn, Sweden, and professor of health sciences at Kalmar University, Kalmar, Sweden, who established, and has served as a previous chair of, the European Association for Cardiovascular Prevention and Rehabilitation, talks about his career and how it was influenced by an inspirational early work experience in Africa.

Page f71

Mini Spotlight: Frans Van de Werf, MD, PhD, FESC, FACC, FAHA

As Brussels is to European politics, so Professor Frans Van de Werf is to European cardiology

Professor Van de Werf sits on the board of the European Society of Cardiology, serves as editor-in-chief of the *European Heart Journal*, and, together with others, has just written and presented new European Society of Cardiology guidelines for the treatment of ST-elevation acute myocardial infarction. He explains, "Among others, important new recommendations on the choice between mechanical versus pharmacological reperfusion and on new antithrombotic cotherapy are provided." He has won many prizes and awards, but he thinks first of the 2005 Joseph Maisin prize of €100 000, a personal recognition awarded every 5 years to 4 outstanding Belgian biomedical researchers: 2 French speaking and 2 Dutch speaking, 1 for clinical and 1 for fundamental biomedical sciences.

A Career That Had an Early Kickstart

Many PhD theses might seem worthy, but few qualify as noteworthy: at the age of 36, Van de Werf wrote one of the latter, in which he detailed his discovery that the transmural pressure gradient in the heart reverses in early diastole. This reversal, in turn, can lead to a more rapid deceleration of inflow into the failing left ventricle, thereby creating the textbook "gallop rhythm" of the third heart sound, which often provides a clue to left ventricular failure. He recalls, "It was not initially accepted by specialists in the field, including Yellin [Edward L. Yellin, PhD, Albert Einstein College of Medicine, New York, NY], who couldn't believe it really happened! Then it was found by other investigators, and afterwards he apologised to me. A couple of months after the publications, I was very pleased to see editorials on my work in the *Lancet*⁶ and the *British Medical Journal*.⁷"

other research divisions, with hypertension in one division, atherosclerosis and metabolism in another, and imaging and cardiovascular dynamics in a third; 3 other divisions cover cardiac or vascular surgery. The university hospital has these separate interests integrated into one large clinical unit; might one consider the degree of overlap of the research divisions counterproductive? Professor Van de Werf thinks not: "On the contrary, it is one of the strengths of our place. It's also good that we [clinicians] are in close contact with people doing more basic research. Teaching and the hospital are on the same campus, so people bump into one another on a daily basis, making it easier to translate basic findings into clinical projects. And this gives back ideas to the basic researchers—it's a virtuous cycle."

Proud of Its Multidisciplinary Translational Research

The multidisciplinary translational research in which K.U.Leuven takes pride includes a recent study showing that administering stem cells to patients with myocardial infarction reduced the infarct size.¹ The work involved cardiologists, haematologists, radiologists, and nuclear medicine specialists. The study also involved the Flanders Interuniversity Institute for Biotechnology, Ghent, Belgium. At the time, the researchers said, "One of the major scientific merits of this study is that it has investigated—in a rigorously controlled manner—the possible role as well as the limitations of the administration of stem

cells. The findings are thus an important driving force for further targeted clinical and preclinical research" (press release, K.U.Leuven, January 9, 2006).

K.U.Leuven has invested heavily in basic and clinical stem cell research, including its newly established Stem Cell Institute under the direction of Professor Marc Boogaerts, MD, PhD, and haematologist Professor Catherine Verfaillie, MD, PhD, who recently moved to Leuven from the Stem Cell Institute at the University of Minnesota, Minneapolis, Minn.

The University Hospital Has the Resources to Carry Out the Full Range of Cardiovascular Procedures

The university hospital carries out the full range of cardiovascular procedures, including heart transplantations (about 500 to date) and interventions for congenital heart diseases. The coronary care unit has 28 beds, 13 for intensive care and 15 for medium care. Cardiology (together with hypertensive and vascular disease) has 112 beds in 4 wards. An additional 34 beds are dedicated to cardiac surgery.

Professor Van de Werf says that most patients come from the 100 000 people of Leuven itself or from the 300 000 to 400 000 people of the greater densely populated area around the city, whereas "the more difficult cases" come from the 6.5 million people of Flanders. In addition, many of the expatriates of the Brussels community find it easier to travel the 12 miles (20 km) to the university hospital in Leuven than to brave traffic in the capital, Brussels—the heart of the European Union, where 25 000 civil servants of the European Commission turn the machinery of government, where the Council of Ministers meets, and where the European Government enacts parliamentary business for half of its sessions (the others take place in Strasbourg, France).

Five Catheterisation Laboratories and 2 for Peripheral Arterial Imaging and Intervention

K.U.Leuven collects imaging for all specialities in a large unit—nicknamed "The Louvre" after its large glass roof (as in Paris). There, a large crew of specialists commands a fleet of computers: cardiologists working with radiologists, nuclear medicine specialists, radiotherapists, engineers, and medical physicists, analysing echocardiograms, angiograms, and a range of other images to cross-compare and thus maximise their diagnostic and therapeutic potential (eg, for ablations).

Professor Van de Werf comments, "We are just about to acquire an x-ray and magnetic resonance imaging facility, which is a unique kind of catheterisation laboratory, with a magnetic resonance imaging scanner machine next door, so we can move the patient from [fluoroscopy to magnetic resonance] on the same table. Such a facility will allow us to better study the reperfusion process of a myocardial infarction and will be used to perform catheter interventions without fluoroscopy. The centre has 5 catheterisation labs, 3 biplane and 2 single plane, all newly installed and almost finished—the last machine is just going in. In

addition, there are 2 labs for peripheral arterial imaging and intervention. Thus, we have an integrated facility for acute cardiovascular imaging and intervention on the same site, allowing us to tackle everything from, for example, an acute stroke or limb ischaemia to early reperfusion of a myocardial infarction.” Researchers also have access in a separate building to 2 single-plane catheterisation labs for animal work.

Renowned for the Discovery and Development of Tissue Plasminogen Activator and Pioneering Trials

The division is renowned for its pioneering work on thrombolysis. Desiré Collen, MD, PhD, discovered the effect of tissue plasminogen activator (tPA) at K.U.Leuven, and Professor Van de Werf treated the first 5 patients in the world there.² He recalls, “The discovery and development of tPA [in Leuven] was an accident. As far as I recall, Desiré had a Bowes melanoma cell line for the study of antiplasmin. He and his coworkers found in February 1979 that the potent fibrinolytic properties of the culture medium were due to large amounts of tPA. This was the start of the search for the molecular structure and properties of the protein, which was then cloned and produced by recombinant DNA technology at Genentech in California. At the same time, I happened to be working with a dog model—when a copper coil was inserted into a vessel of the dog, it occluded immediately due to thrombus formation. It was thus an ideal model for looking at the dissolution of clots, and Desiré Collen and I started to work together immediately.”

The Leuven Coordinating Centre, which forms an integral part of the division and which Professor Van de Werf directs, carried out international trials to establish the role of tPA and its variants such as single-bolus tenecteplase-tPA in thrombolytic therapy. It forms part of the Virtual Coordinating Centre for Global Collaborative Cardiovascular Research, which includes several major institutions in Europe, Australia, New Zealand, North America, and Latin America (<http://vigour.dcri.duke.edu/map.pdf>).

The list of trials run by the Leuven Coordinating Centre reads like a who’s who of cardiology research in the domain of acute coronary syndromes during the past 20 years, including GISSI (Gruppo Italiano per lo Studio della Sopravvivenza nell’Infarto Miocardico-2) International, GUSTO (Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries), the ASSENT (Assessment of the Safety and Efficacy of New Thrombolytic Regimens) trials, PARAGON (Platelet IIb/IIIa Antagonism for the Reduction of Acute coronary syndrome events in a Global Organization Network), and



Top, Aerial view of the Gasthuisberg campus. Bottom, Division of Cardiology 2007. Sitting, from left to right: Frans Van de Werf, Johan Vanhaecke, Marie-Christine Herregods, Hugo Ector. Standing, from left to right: Wim Droogné, Javier Ganame, Christophe Dubois, Walter Desmet, Tom Rossenbacker; Stefan Janssens, Jens-Uwe Voigt, Werner Budts, Frank Renders, Robert Fagard, Peter Sinnaeve. Missing staff members: Bert Adriaenssens, Kaatje Goedschalckx, Hein Heidbüchel, Dieter Nuyens, Jan Staessen, Els Troost, Johan Van Cleemput, Rik Willems.

COBALT (Continuous infusion versus Double-Bolus administration of ALTEplase). The division also hosts a number of national and international registries, including a register of athletes with an implantable cardioverter-defibrillator or with arrhythmias after intensive sports and a register of patients with myocardial infarctions first admitted to hospitals without catheterisation facilities.

Outlining many other important studies that have taken place in Leuven, Professor Van de Werf says, “These include trials on systolic hypertension, such as the SYST-EUR [Systolic Hypertension in Europe] study,³ on ambulatory blood pressure registration, on home monitoring of heart failure, on new left-ventricle assist devices [Circulate], and on the therapeutic potential of tilt training for the treatment of recurrent neurocardiogenic syncope.”⁴

Professor Van de Werf’s division has taken interest in the possible use of nitric oxide by inhalation to boost the coronary microcirculation after percutaneous coronary intervention. He says, “If one gives it as a nitrate intravenously, there is a significant dose-dependent effect on blood pressure, whereas nitric oxide by inhalation does not



Top, K.U.Leuven collects imaging for all specialities in a large unit nicknamed "The Louvre" after its large glass roof (as in Paris). Bottom, Interior view of the medical imaging centre.

have systemic hypotensive effects and may be an effective treatment after percutaneous coronary intervention for improving the microcirculation. We have done studies with success in animals which have shown greater bioavailability of nitric oxide in the ischaemic heart when given by inhalation,⁵ and we now need to do the trials in human subjects. The problem is a lack of financing, but we are working on it."

Desire for More Independence From Industry and to Engage in More European-Led Clinical Trials

As in most institutions, clinicians have limited time available for research because of the need to earn reimbursement fees for the hospital: Professor Van de Werf estimates that research accounts for about 30% of their time on average. He comments, "We get research money from the government via several channels, but the biggest source of financing and funding is contract research for industry. The European Union provides another source via its Seventh Research Framework Programme projects. Also, the European Society of Cardiology has recently taken the initiative of starting a research foundation, which [in the future] will make money available for specific cardiovascular projects in the countries belonging to the European Society of Cardiology. This may be helpful—we would certainly like to be more independent of the industry."

Professor Van de Werf would also like the Leuven Coordinating Centre to engage in more clinical trials in which the coordination and the data analysis take place

"All the Staff Speak French and English"

Belgium, a country of 10.5 million people, has often had the nickname, "the battlefield of Europe." The residues of conflict linger on in a linguistic battle between the larger Dutch-speaking region of Flanders to the North, which includes Leuven, and the French-speaking region in Wallonia to the South, which also contains a small German-speaking area. Language does not, however, represent a problem within the university hospital, according to Professor Van de Werf, who says, "All the [Dutch-speaking] staff speak French and English to communicate with patients, write referral letters, etc. The Belgium Society of Cardiology is still unified—we've solved the problem at meetings by speaking English. The decision was made 10 years ago, and it's been good for young people, who can practise making presentations in English. Historically, we know that if Dutch is your mother tongue, you have to learn other languages!"

K.U.Leuven Conducts Its Undergraduate Courses in Dutch, but It Conducts Many Postgraduate Courses in English

Professor Van de Werf says, "We have many foreign students as undergraduates, and it's amazing how quickly they learn Dutch. It's probably easier for native speakers of German and English, but even those from countries such as Korea and Romania find that in a couple of months they can learn enough to say, take a history from a patient."

within Europe. He points to the dominance of institutions such as the TIMI study group in Boston, Mass, and the Duke Clinical Research Institute in Durham, NC. He says, "Although we have a close and fruitful collaboration with these groups, sometimes we feel a little bit frustrated, to be honest, as we provide them many data, but most of the credit goes to the United States!"

References

- Janssens S, Dubois C, Bogaert J, Theunissen K, Deroose C, Desmet W, Kalantzi M, Herbots L, Sinnaeve P, Dens J, Maertens J, Rademakers F, Dymarkowski S, Gheysens O, Van Cleemput J, Bormans G, Nuyts J, Belmans A, Mortelmans L, Boogaerts M, Van de Werf F. Autologous bone marrow-derived stem-cell transfer in patients with ST-segment elevation myocardial infarction: double-blind, randomised controlled trial. *Lancet*. 2006;367:113–121.
- Van de Werf F, Ludbrook PA, Bergmann SR, Tiefenbrunn AJ, Fox KA, de Geest H, Verstraete M, Collen D, Sobel BE. Coronary thrombolysis with tissue-type plasminogen activator in patients with evolving myocardial infarction. *N Engl J Med*. 1984;310:609–613.
- Staessen JA, Fagard R, Thijs L, Celis H, Arabidze GG, Birkenhäger WH, Bulpitt CJ, de Leeuw PW, Dollery CT, Fletcher AE, Forette F, Leonetti G, Nachev C, O'Brien ET, Rosenfeld J, Rodicio JL, Tuomilehto J, Zanchetti A. Randomised double-blind comparison of placebo and active treatment for older patients with isolated systolic hypertension. The Systolic Hypertension in Europe (Syst-Eur) Trial Investigators. *Lancet*. 1997;350:757–764.
- Ector H, Reybrouck T, Heidbüchel H, Gewillig M, Van de Werf F. Tilt training: a new treatment for recurrent neurocardiogenic syncope and severe orthostatic intolerance. *Pacing Clin Electrophysiol*. 1998;21:193–196.
- Liu X, Huang Y, Pokreisz P, Vermeersch P, Marsboom G, Swinnen M, Verbeke E, Santos J, Pellens M, Gillijns H, Van de Werf F, Bloch KD, Janssens S. Nitric oxide inhalation improves microvascular flow and decreases infarction size after myocardial ischemia and reperfusion. *J Am Coll Cardiol*. 2007;50:808–817.
- Mechanism of the third heart sound. *Lancet*. 1986;2:1137.
- Timmis AJ. The third heart sound. *Br Med J*. 1987;294:326–327.

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Pioneer in Cardiology: Joep Perk, MD, FESC



A Magical Period in Africa, Missing Out on an Olympic Dream, and a Preventive Approach to Cardiology

Joep Perk, chief of the medical staff at Oskarshamn Hospital, Oskarshamn, Sweden, and professor of health sciences at Kalmar University, Kalmar, Sweden, who established, and has served as a previous chair of, the European Association for Cardiovascular Prevention and Rehabilitation, talks to Mark Nicholls.

For Joep Perk, MD, FESC, a series of principles he learned as he treated patients in the primitive conditions of a small African bush hospital have helped shaped the focus of a career in cardiology. On moving to Sweden, he applied the “prevention is better than cure approach” he had adopted in Lesotho in the mid-1970s to his work in a modern hospital. Now in the later stages of his career, Professor Perk looks back on extensive research in the realms of preventive therapies in cardiology and the satisfaction of being able to spread that philosophy—most significantly in his role in establishing and chairing the European Association for Cardiovascular Prevention and Rehabilitation.

Professor Perk was born in February 1945 in eastern Germany in the final months of World War II. His parents fled west to settle in the Netherlands where Perk grew up and went to school. He carried out his medical studies at the University of Utrecht, Utrecht, the Netherlands, between 1964 and 1971, and did his postgraduate work at the Department of Internal Medicine, Surgery, and Obstetrics, at the regional hospital in Ede, the Netherlands.

An Inspirational Experience in Lesotho

In 1973, Professor Perk left with his wife Christine and 2 young sons for Africa where he took up the post of medical officer in charge of the Quthing District Hospital, Quthing, Lesotho, as part of a development aid project. His role involved carrying out all kinds of surgery, operating between 6 and 8 hours a day. “I was at a small bush hospital, and you had to do everything,” he recalls. “That was anything that came in from the 120 000 people who depended on you, with the nearest hospital 5 hours away.”

Professor Perk explains, “At that time in the Netherlands, it was quite common for young doctors to spend a couple of years developing aid projects. I went to Lesotho to see what I could do and to think about the rest of my life.” And, for him and his family, these exciting and challenging years represent an experience that shaped all of their lives.

“We were living in the middle of nowhere for 3 years, depending on our own knowledge, our enthusiasm, our patience, and our physical condition. But I learned 2 important things: one was, do not let problems go over your head; try to solve things right away. The other was developing a basic trust in what human beings can achieve. I had a fantastic staff of local nurses, and they were incredible in

Sports Training Led to an “Interest in Physical Activity—What You Can Do With Your Body, What You Can Do With Your Heart and Lungs”

In his youth, Professor Perk was active in sport, notably hockey and rowing. A member of the Dutch national rowing squad, he had an opportunity to row for his country at the 1968 Olympics in Mexico, but he suffered a knee injury and had to withdraw from the team, which eventually finished fourth in the final. He says, “When I was studying, I spent 2 to 3 hours every day in training, and that started my interest in physical activity—what you can do with your body, what you can do with your heart and lungs—so a lot of my interest in physical training comes from my engagement in sport in my early years.”

what they did with the limited resources we had there. In the 3 years I worked there, I started a barefoot doctor system and a village health worker system with my nurses, and that has continued and extended to the rest of the country. It was about understanding the power of knowledge, giving people knowledge to change their lives and adapt their lives.”

That approach and a preventive focus have followed Professor Perk through his career. Now in his 60s, he still looks back to the Lesotho experience for inspiration as he trains others in public health and in lifestyle changes to improve their cardiac health. He says, “In Lesotho we worked a lot on preventive health, and it is fun to see that at the end of my career I am back at square one again educating people [about] how to change their lifestyle to prevent [them from] becoming sick. This time, it is from a cardiology perspective, but in effect it is the same basic thing: how to give people knowledge to convince them that with that knowledge they can change their lifestyle.”

“We Could Delay the Progress of Atherosclerosis”

On leaving Africa, Professor Perk settled in Sweden with his family, and he completed his training as a Swedish medical doctor. He then worked as a specialist in internal medicine at Oskarshamn Hospital, Oskarshamn, Sweden, and with cardiology forming an important part of the section, he moved toward it as a specialty. He says, “I saw that there were lots of young heart patients who had become cardiac neurotic; they had a myocardial infarction, and after that they had become chronic heart patients not trusting their chances to survive. That is how I came into the field of



Professor Perk says, "My dream was to have a grand piano looking over the waves."

secondary prevention and cardiac rehabilitation. We were among the first to discover that by training heart patients and giving them the strength to change their lives, we could change things not only mentally but also biologically. We saw that we could delay the progress of atherosclerosis by helping people change their lifestyles." Observing this in the 1980s and publishing their findings, Professor Perk and his team began to apply their basic knowledge of the whole process of atherosclerosis and to convey the importance of those lifestyle changes to patients.

Currently chief of the medical staff at Oskarshamn Hospital and a clinician, Professor Perk now also serves as professor of health sciences at Kalmar University, Kalmar, Sweden, dividing his time between the clinics and going "out in the street preaching the gospel of preventive cardiology."¹ He works closely with general practitioners in 26 health centres in Kalmar County, and he has contributed to the transformation of these primary care centres into healthcare centres. Each centre has a health counsellor to facilitate the early detection of high-risk patients and to counsel them about their lifestyles. "That is a good example of preventive care being put into practice," he says.

"He Believed in Our Message and Inspired Me"

A number of people have influenced Professor Perk's career, notably Nils-Holger Areskog, emeritus professor of clinical physiology from the University of Linköping, Linköping, Sweden. "He has been my mentor over many years, and he believed in our message and inspired me to go on with my work when a lot of people were very sceptical," he says. Professor Perk also admires Lars Ryden, MD, FRCP, FACC, FESC, from the Karolinska Institute, Stockholm, Sweden. "We have done a lot of work together on preventive cardiology, and I am a great admirer of him, his stamina, and his enthusiasm," he adds. And Peter Mathes, MD, professor of cardiology in Munich, Germany, encouraged Professor Perk to join the European Society of Cardiology.

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Much of Professor Perk's research work has involved nonpharmacological methods of prevention, especially physical training and cardiopulmonary rehabilitation. Latterly, that has involved writing new guidelines based on his research, helping the wider population realise that lifestyle changes make a difference in their cardiac health, and encouraging them to make that difference.² Work for which he feels particularly proud includes the transfer of primary care to health care in Sweden and establishing the European Association for Cardiovascular Prevention and Rehabilitation. As chair of the European Association for Cardiovascular Prevention and Rehabilitation Science Committee, he will serve as organiser of EuroPrevent 2009 in Stockholm and 2010 in Prague, Czech Republic. He also belongs as a member to the European Society of Cardiology Science Council and Congress Programme Committee. He has contributed to the European Society of Cardiology textbook of cardiology and edited the textbook of preventive cardiology, and he publishes the bimonthly European Association for Cardiovascular Prevention and Rehabilitation Web site on lifestyle and health.^{3,4} Professor Perk mainly receives funding for his work through his clinic, along with funds from the county health authority in Kalmar and the university.

Professor Perk says, "There are 2 roles I love; one is as a doctor, meeting people and new patients, feeling that you can do something. The other is when I see the knowledge I give people being transferred into action—simple messages being put into clinical care. When I left Lesotho, it was very sad. We had 3 fantastic years there, but my thought also was that I was leaving something behind—knowledge." Away from medicine, Professor Perk enjoys life at home with his wife, gardening, cycling, Alpine walking, and music.

In the next few years, Professor Perk may step down from clinical work, but he will maintain his engagement in public health. He would like to see better ways of measuring quality of life and to see them applied more practically to cardiology, and while recognising the impact of technology in cardiology, he would like to retain a focus on the importance of the preventive and noninvasive approaches to cardiology.

References

- Perk J. High time to join hands between family medicine and cardiology! *Eur Heart J*. 2007;28:2962–2963.
- Fourth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice. European guidelines on cardiovascular disease prevention in clinical practice: executive summary. *Eur Heart J*. 2007;28:2375–2414.
- Perk J, Mathes P, Gohlke H, Monpère C, Hellemans I, McGee H, Sellier P, Saner H, eds. *Cardiovascular Prevention and Rehabilitation*. London, UK: Springer Verlag; 2007.
- European Association for Cardiovascular Prevention and Rehabilitation/European Society of Cardiology Web site. Available at: www.escardio.org/communities/EACPR/news/lifestyle-cvd-literature. Accessed August 11, 2008.

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