Trends and contexts in European cardiology practice for the next 15 years


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In the near future, the practice of cardiology in Europe will be strongly influenced by a complex interplay of epidemiological, social, economical, professional, and technological evolving factors. The present report summarizes the conclusions of an expert conference organized by the European Society of Cardiology to discuss the interactions between these phenomena, in an attempt to foresee the potential scenario in which cardiovascular healthcare and research will develop in the near future, and to anticipate solutions to the identified problems.

KEYWORDS
Clinical services; Epidemiology; Training; Guidelines; Research

Introduction
Cardiovascular diseases (CVD) remain the most important health problem facing developed countries in the 21st century. In spite of the many developments in its prevention, diagnosis, and treatment, there has been a general consensus among healthcare providers that the cardiology services in many countries are heading towards a crisis. This belief has mainly been founded on indicators such as a current decline in the number of cardiologist, increasing healthcare cost, and difficulties encountered during implementation of the available knowledge and strategies. Currently, the amount of information available to support this belief is limited and is mainly based on leading opinions in the field of cardiology either during debates or during informal discussions.

Over the past years, there has been a tendency to contemplate the future of Cardiology as a parallel continuum with the advancement of technology and treatment, to the point that the general population and even many cardiologists may believe that this will provide the ultimate solution to CVD. However, it is possible that the highlighting of new developments by the media obscures real solutions such as full implementation of primary prevention policies and, in general, of evidence-based knowledge.

The European Society of Cardiology (ESC) has as a mission 'to reduce the burden of CVD in Europe' and considered it important to initiate a comprehensive debate among experts on the complex interplay of social changes with scientific and professional factors that may influence the practice cardiology in the near future. A dedicated meeting with the participation of constituent bodies of the ESC (namely National Societies, Working Groups and Associations) was organized by the ESC jointly with the Spanish Society of Cardiology, and held in Madrid in June 2006. Discussions took place around four different areas: (i) CVD in the 21st century, which included an extensive discussion on the epidemiology of CVD, its economics and social changes; (ii) evolving diagnostic and therapeutic approaches; (iii) human resources in cardiology; and (iv) evolving models of basic and clinical research. This article constitutes a consensus report of the discussions and the debate held by the delegates attending the meeting.

Foreseeing CVD in the European society of the 21st century
CVDs cause almost half of all deaths in Europe. In the near future, the epidemiology of CVD across European countries will be influenced by changes in demographics, culture, fiscal matters, and societal factors. The epidemiology of CVD shows that these diseases are a manifestation of many and various conditions, including metabolic and...
inflammatory perturbations. The risk factors are well known, and their fundamental origins are becoming clearer, suggesting that in many cases heart disease, cancer, and diabetes share a common aetiology. There is extensive evidence that CVD could be prevented by lifestyle changes and better use of medicines that are already available. New preventive strategies should be introduced when available. However, cardiologist should be aware that these actions will delay the onset of CVD rather than eliminating the problem.

For at least the next 25 years, CVD will continue to be a major healthcare problem in spite of the introduction of new medical treatments and diagnostic technologies. Demographic trends in the European population will shift the epidemiological pattern of CVD, since the decline of age-adjusted mortality in many European countries conceals an overall increase in the number of persons afflicted with CVD. As a result, CVD will become a central part of the complex pattern of disorders of the elderly.

The cost of CVD to the healthcare systems of the EU will continue to rise in the short and medium term as a result of the increasing costs associated with new developments and with the overall rise in healthcare inflation. The increase in the need for medical care will require cost-saving or cost-effective use of limited resources. Disinvestment away from non-cost-effective interventions and use of savings in cost-effective ones appear mandatory. Improved knowledge on cost-effective modalities is necessary, and should be combined with better implementation of currently available management guidelines. The cardiologist and their associations should take an active position in this field and strive to convince politicians that health contributes to productivity of the society and that health should be considered a positive economic factor. From a general perspective, adequate funding of healthcare should be considered an investment.

Since expenditure will remain a major determinant of access to proper management of CVD, it will also be a potential source of inequity across Europe, particularly after the recent admission to the EU of Eastern European countries with lower gross domestic products. Inequities are even more likely to occur in the access to novel medical modalities, whether diagnostic or therapeutic. Investigation of non-medical factors that influence patient access and that can be influenced locally should be undertaken. Access to both proven and innovative medical technologies might be improved by optimizing funding and reimbursement processes locally. Once again, cardiologists and their organizations have to take increased responsibility in these issues, as well as in priority settings.

At a time of expanded access to information, efforts to bridge the gap between the medical profession and the society should be made. In the immediate future, consumer-driven healthcare will be the rule in a society made up of better informed citizens. Efforts to assess the values of preferences in the population regarding health and healthcare should be encouraged. Access to health quality data and improved knowledge of CVD by healthcare users, patients, and the general public should improve the quality of care and facilitate the implementation of guidelines. The creation of reliable sources of information for the public via the internet would be advantageous as a way to counteract spotlighting of new cures by media and direct consumer advertising campaigns.

### Anticipating the shortage of cardiologists and organizational healthcare changes

A consequence of these epidemiological changes is that an increased demand for resources and manpower is inevitable. In this regard, the availability of trained cardiologists varies considerably across Europe, with an apparent general shortage. To some extent, this reflects a true lack, but other reasons may be the different type of health delivery systems with physicians from other specialties and specially trained nurses being in charge of certain areas of cardiovascular medicine. There is a high demand for improved knowledge in this field that may clarify the situation. This would also provide information on functioning systems to those who have not yet developed novel modalities of patient care such as nurse-lead clinics.

In any case, the solutions to the shortage of cardiologists should be formulated taking into account the social and epidemiological changes that will influence healthcare trends. Cardiology is shifting towards Cardiovascular Medicine with a more general perspective. This will require a greater requirement for general knowledge, as well as changes in the organizational model of healthcare towards process-oriented and holistic patient management. One solution to achieve this end might be the introduction of multi-disciplinary teams integrating cardiac sub-specialties, primary care, non-cardiac specialties, and ancillary services in which the cardiologist will act as a process leader in the different presentations of CVD. In these teams, boundaries between specialties will be softened, and experts in different modalities will collaborate rather than compete. Joint clinical services and common diagnostic and therapeutic pathways will be developed for specific processes: acute coronary syndromes, non-invasive diagnosis, heart failure, etc. The rapidly evolving diagnostic and therapeutic technologies (e.g. non-invasive imaging, invasive diagnostic and treatment, regenerative therapy, etc.) will demand a balanced investment in equipment and knowledge. For logistic reasons, in the early phases of this change the equipment and facilities used in the management of disease processes may not be in the same location; however, it is foreseeable that newer hospitals will be designed to provide this new operative structure.

According to the epidemiological predictions, a large number of clinical cardiologists, responsible for the overall management of cardiovascular patients, will be needed to ensure the demonstrated benefit of specialized care. These clinical cardiologists should not be by default cardiologists; instead, they should have a renewed profile, with a broader training in cardiovascular medicine and related subjects, and in coordinating clinical processes. At a time when most junior cardiologists opt for training in technical sub-specialties, efforts to make this professional option attractive for juniors should be made.

Training schemes should focus on the evolving epidemiological and organizational changes in traditional cardiology. An example of this can be found in the ESC Core Curriculum, aimed to standardize throughout Europe the basic knowledge, skills, and attitudes that all cardiologists should have. The risk of a primary focus on technology rather than on the patient must be acknowledged and counteracted; training programmes should make sure that the holistic patient approach is not lost, but at the same time...
promoting the needed specific skills with focused training programmes including novel educational tools. It is foreseeable, for example, that future non-invasive diagnostic specialists will be trained in several imaging modalities, and that invasive cardiologists will train using simulation models before working with patients. These programs have to be overseen, and a higher demand on examination, audit, and accreditation is recommended.

**Promoting research and translating its results to practice**

Cardiovascular research will typically show a strong interplay between biology and technology. This kind of research will demand working teams integrated by clinician-scientists, clinical investigators, and translational-scientists. However, the number of clinician-scientists is rapidly decreasing, and the conditions for the pursuit of a career in clinical research are fading or at least considered unattractive by young cardiologists. A generalized concern exists regarding this shortage of academic cardiologists and the foreseeable consequences for the quality and amount of independent research in the field of CVDs, which in the predicted scenario will lead to a failure in the translation of knowledge to clinical practice. Actions to correct this tendency must be taken urgently. Training programs including research training in a formalized way and tutorship programs to support individuals with an interest and capabilities in research should be enforced. Rating of scientific chiefs should be made not only on research productivity, but also on mentorship of juniors.

The costs of research in CVDs should be faced in a similar perspective to that outlined above for healthcare costs: research is highly cost-effective because extending healthy lives generates enormous returns to the society. Efforts should be made to integrate the interest of the industry and the general society in cardiovascular research. Public-private partnerships and networking of institutions across Europe may improve significantly the quality of research, with the advantage of a major independence and improved use of the cooperation from the industry. Strong European research institutions free from financial bias should be considered as fundamental.

On the basis of the current evidence, there is an urgent need to improve implementation of clinical practice guidelines at national levels in Europe. Adequate means to create awareness of guidelines among physicians, politicians, and patients is required. The performance of European observational studies for assessing a wide range of long-term outcomes of guidelines implementation should be encouraged.

These studies should assess not only adherence to guidelines, but also whether evidence-based medicine is reproducible in and transferable into clinical practice. The results of these surveys should be used more often to actively guide or stimulate quality improvement, for example, by use as benchmark instrument by individual hospitals.

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**References**