



# The future of continuing medical education: the roles of medical professional societies and the health care industry

Position paper prepared with contributions from the European Society of Cardiology Committees for Advocacy, Education and Industry Relations, Endorsed by the Board of the European Society of Cardiology

## ESC Board\*

Received 21 August 2017; editorial decision 3 January 2018; accepted 16 January 2018; online publish-ahead-of-print 28 February 2018

In recent years, wide ranging biomedical innovation has provided powerful new approaches for prevention, diagnosis and management of diseases. In order to translate such innovation into effective practice, physicians must frequently update their knowledge base and skills through continuing medical education and training. Medical Professional Societies, run as not-for-profit organizations led by peers, are uniquely placed to deliver balanced, disease oriented and patient centred education. The medical industry has a major role in the development of new, improved technology, devices and medication. In fact, the best innovations have been achieved through collaboration with scientists, clinical academics and practicing physicians. Industry has for many years been committed to ensure the optimal and safe application of its products by providing unrestricted support of medical education developed and delivered by international and national learned societies. Recently adopted Codes of Practice for the Pharmaceutical and Device industry were intended to enhance public trust in the relationship between biomedical industry and physicians. Unexpectedly, changes resulting from adoption of the Codes have limited the opportunity for unconditional industry support of balanced medical education in favour of a more direct involvement of industry in informing physicians about their products. We describe the need for continuing medical education in Cardiovascular Medicine in Europe, interaction between the medical profession and medical industry, and propose measures to safeguard the provision of high quality, balanced medical education.

### Keywords

Medical education • Training in cardiovascular medicine • Continuing professional development • Professional societies • Health care industry • Conflict of interest

## The need for continuing medical education

Improved understanding of the biology of health and disease, including molecular and genetic processes, as well as recent innovations in technology, biochemistry, biomedical engineering, and informatics have provided physicians with powerful tools and methods for prevention, diagnosis and management of diseases. This has reduced early mortality

from cardiovascular disease, improved life expectancy, and quality of life, although the number of people living with chronic cardiac and vascular conditions continues to grow.<sup>1</sup> The ongoing development and evaluation of these innovations necessitates continuous information, education, and training of health care professionals to underpin appropriate use of disease classifications, diagnostic tools and new treatments and to ensure that care is delivered sensibly, efficiently, and cost-effectively. The medical industry has a major role in the development

\* Presidential Office, European Society of Cardiology, The European Heart House, 2035 Route des Colles—Les Templiers, 06903 Sophia Antipolis, France.

Tel: +33 4 9294 7600, Fax: +33 4 9294 7608, Email: [escboard@escardio.org](mailto:escboard@escardio.org)

Published on behalf of the European Society of Cardiology. All rights reserved. © The Author(s) 2018. For permissions, please email: [journals.permissions@oup.com](mailto:journals.permissions@oup.com).

of new, improved technology, devices, and medication, often through collaboration with scientists, clinical academics, and practicing physicians. Continued cooperation is warranted to ensure development and introduction into practice of future innovative treatment options.

There is important heterogeneity in culture and lifestyle, economic prosperity and organization, funding and access to health care across Europe and abroad. Disparities in organization, access to training and education of health care professionals, in conjunction with societal factors, contribute to significant differences in morbidity and mortality from cardiovascular disease. It is one of the tasks of the European Society of Cardiology (ESC) to enable exchange about best cardiovascular care between different countries thereby promoting best practice of cardiovascular medicine throughout Europe and beyond. The medical industry supports training and education of physicians and other health care professionals. However, the relationship between health care professionals and the medical industry is complex, a consequence of the dominant global model of private enterprise based innovation, research, and production, and the absence of structural funding of continuing education of physicians in most countries (*Table 1*). This document outlines a blueprint for trustworthy, balanced education in cardiovascular medicine, making use of the opportunities for collaboration with industry, to provide physicians with appropriate and unbiased information.

## The circle of research, education, and evaluation of medical practice

In order to promote its mission, to reduce the burden of cardiovascular disease, the ESC has developed an extensive *educational programme*. European Society of Cardiology-delivered education is firmly based on evidence, summarized in the *clinical practice guidelines*. Guidelines are updated at regular intervals. Evidence underpinning practice guidelines is generated throughout the world in basic, translational, clinical, and epidemiological *research* projects. Furthermore, the ESC has introduced a programme of *registries* [EURObservational Research Programme (EORP)] to describe clinical practice patterns in Europe and beyond. The data collected provide essential feedback about best practices, needs assessments, and feedback on the success of educational programmes and training. This is represented in the 'virtuous circle' of research, education, and medical practice. Moreover, the development of guidelines, assessment of their implementation in the 'real world' and of their impact on outcomes contributes to Health Technology Assessment and provides key references for policy makers.<sup>3</sup>

It should be emphasized that in order to ensure complete independence, the costs of guideline development are paid fully by the ESC, using income from other activities as outlined in its annual reports, while, in the absence of other sources of funding, educational programmes and the registries are supported in part by industry. The ESC has developed a robust and transparent contractual framework and governance structure to enable unbiased planning and execution of these activities in partnership with health care industry. Trust is the guiding principle of this partnership between ESC, its constituent bodies and members, health care industry, the public, and other stakeholders. These structures are continuously developed and updated with input from all stakeholders to ensure reliable and trustworthy activities (guideline development, education programmes, and observational research).

**Table 1** The relationship between the medical profession and industry

- A well-structured, transparent relationship between the medical profession and industry is essential for research and innovation, and medical education.
- An ill-structured relationship between the medical profession and industry risks inappropriate decision making that generates cost, suboptimal treatment choices, and erosion of public trust
- The relationship between health care professionals and industry is necessarily complex; simplistic or absolutist solutions are unlikely to apply

## Requirements for continuing medical education in European countries

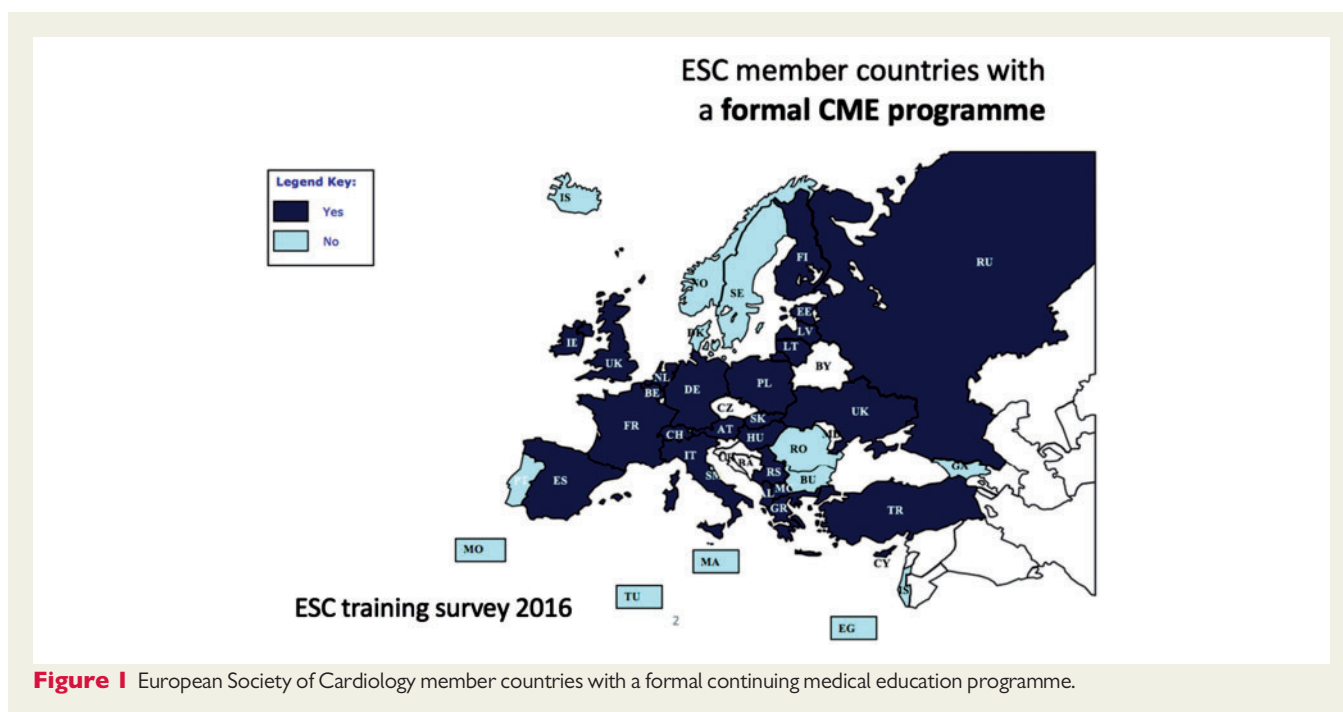
Physicians and other health care professionals have a responsibility to continuously update their knowledge and skills. Increasingly, this has become a statutory obligation, e.g. retention of a specialty degree often requires participation in approved educational activities that provide the participant a defined number of so called 'Continuing Medical Education (CME) credits' (*Figure 1*), as well as some reckoning of numbers and outcomes of interventional procedures to retain the qualification to practice these procedures.

## Costs of continuing medical education

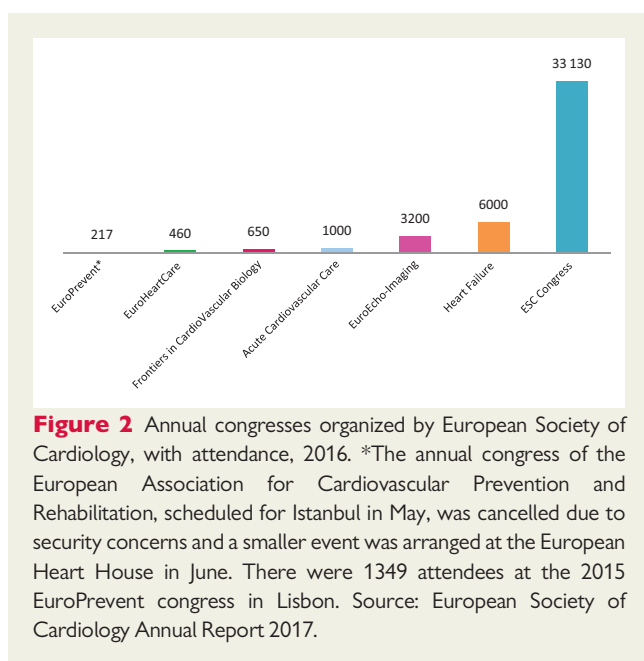
Continuing medical education is currently obtained by attending conferences (local, regional, national, international), online courses, in-person training programmes, or reading and reviewing of scientific papers. Providing continuous medical education to health care professionals is a very costly undertaking, yet financial resources to develop or participate in CME programmes are rarely provided by health care providers or employers. Nevertheless Europeans, including physicians and other health care professionals, have an expectation that education is provided free, in contrast with other countries where costs for education are usually paid by individuals.

In Europe, meetings and conferences organized by professional societies are the preferred form of external CME.<sup>4</sup> To meet this need, the ESC organizes a large *annual congress*, as well as a series of *sub-specialty congresses* (*Figure 2*). Similar large scientific congresses are run by professional societies in the USA and in Asia-Pacific. Most National Cardiac Societies run annual scientific and education meetings. The organization and delivery of such international and national meetings incurs significant costs, covered by a combination of registration fees and from contributions by industry partners, which organize marketing and information activities in conjunction with the congress through exhibitions and satellite symposia (*Table 2*).

*Medical Journals* play an important role in CME and download volume is a reflection of their use by physicians for educational purposes



**Figure 1** European Society of Cardiology member countries with a formal continuing medical education programme.



(Table 3). Subscribers pay the publisher either individually or indirectly through institutional subscriptions (hospitals or universities). Professional organizations often offer subscriptions as part of their membership programmes. The costs of journals are partly recovered from subscriptions, and also by advertisements and sales of reprints, although the latter have become almost redundant with the on-line availability of content. Scientists and clinicians in universities and other institutions provide the content of the journals, usually without reimbursement. They may even have to pay the publisher for extra costs (e.g. colour figures) or to get manuscripts published in 'open

**Table 2** Medical education: costs, funding, and barriers

- Live meeting costs: rental of meeting facilities, organization, preparation (frequently voluntary) of materials by speakers, staff
- Online course costs: recording and broadcasting, dedicated on-line platform, interactivity features (webinars etc), faculty preparation and delivery time (frequently voluntary), hardware, software, staff
- Participants' costs: time from work, registration fees, travel and accommodation.
- Sources of funding: Registration fees; Medical Industry; Grants (research, training or professional development) from Professional Medical Societies, Government, Health care Institutions; Health Care Providers' personal funds; tax relief

access' journals. They also provide content for *textbooks* such as the series of ESC textbooks.

## The health care industry and continuing medical education

It should be appreciated that, notwithstanding the key shared objective of improving patient outcomes, the medical profession and the health care industry differ fundamentally in their fiduciary duties. The beneficiaries in the case of physicians are their patients and to some extent their employers; while the principal beneficiaries of health care companies are their shareholders or their owners. Industry has

**Table 3** European Society of Cardiology journals: impact factor and cumulative number of downloads

ESC journal title	2016 journal impact factor	2016 full text downloads
<i>European Heart Journal</i>	20.212	More than 13.5 million full text downloads
<i>European Journal of Heart Failure</i>	6.968	
<i>European Heart Journal- Cardiovascular Imaging</i>	5.990	
<i>Cardiovascular Research</i>	5.878	
<i>Eurointervention</i> (Europa Organization owned)	5.193	
<i>EP Europace</i>	4.521	
<i>European Journal of Preventive Cardiology</i>	3.606	
<i>European Journal of Cardiovascular Nursing</i>	2.763	
<i>European Heart Journal Supplements</i>	0.896	
<i>European Heart Journal Acute Cardiac Care</i>	No IF yet	
<i>European Heart Journal Quality of Care &amp; Clinical Outcomes</i>	No IF yet	
<i>European Heart Journal Cardiovascular Pharmacotherapy</i>	PubMed listed	
<i>ESC Heart Failure</i>	No IF yet	

Source: European Society of Cardiology Annual Report 2017.

a principal duty to promote use of their products, in effect precluding them from having a direct role in the provision of balanced and unbiased education. Logically and ethically, high quality and unbiased education that guides the best overall management of a patient must also be in the interest of an industry that places patient well-being at the centre of its mission (Table 4).

The phrase 'if the product is free, you are the product' is often used to describe online services and information financed through advertising, but this principle also applies to medical educational programmes. Programmes that are entirely run and funded by industry partners, who have to justify the cost with an impact on revenue ('return on investment'), are at very high risk of taking a biased perspective. Nevertheless, defining educational objectives, aligning the content with independent, evidence-based guidelines, organizing buy-in from different stakeholders and allowing an independent broker to co-ordinate and plan the programme are features that can enable a high quality programme that is indirectly funded by industry. A perceptive audience interested in content that is tailored to their educational needs may want to invest in education, either directly (personal fees) or through their employers. In addition, health care providers, insurance companies or national health care systems have a genuine obligation and interest to invest in unbiased medical education and training. Hospitals or medical practices are, after all, knowledge-based institutions that rely on highly skilled, well-trained workers to deliver high quality and safe care.

**Table 4** Health care industry and continuing medical education

- Involvement with industry in medical education has been permitted on the basis of safeguards being taken
- Fiduciary duty of doctors is to their patients, the duty of industry is to owners/shareholders
- Industry supported or delivered programmes inherently risk favouring their product to comply with its fiduciary duty
- The quality and unbiased nature of medical education should be a concern to physicians, and other stakeholders interested in ensuring safe and effective care (employers/insurance industry/patients)
- Guidance for the interaction between the medical industry and health care professionals include the European Commission's 'List of Guiding Principles Promoting Good Governance in the Pharmaceutical Sector' (Platform on Ethics & Transparency) 2012<sup>5</sup>; followed by codes of conduct from EFPIA,<sup>6,8</sup> Medtech Europe<sup>7</sup> and the BioMed Alliance.<sup>9</sup>
- Effect of new industry codes of conduct has been paradoxical and counterintuitive: discontinuation of direct support of physicians to attend meetings of professional societies or universities, but continued support of physicians to attend company education/training courses and courses run by contracted medical communication and medical education companies.

Support by industry for CME carries the risk of bias and unwanted influence of industry on physicians, potentially influencing choice of pharmaceutical agents or therapeutic devices and treatment patterns. In many countries, this has led to regulation of such support. In 2012, the European Commission published the 'List of Guiding Principles Promoting Good Governance in the Pharmaceutical Sector' (Platform on Ethics & Transparency).<sup>5</sup> This in turn led to the development by the European Federation of Pharmaceutical Industries and Associations (EFPIA), the representative organization for the Pharmaceutical Industry in Europe, and by its medical device equivalent (MedTech Europe), of specific Codes of Conduct regarding industry interaction with health care professionals.<sup>6,7</sup> These codes closely mirror the guiding principles of the European Commission's document. In essence, both codes outline measures to minimize inappropriate interactions with physicians and other health care professionals, provide guidance on the nature and amount of financial support and the venue and nature of meetings for which support may be granted. However, no reference is made to direct provision of medical education by industry in these documents.

A key provision in the MedTech code, implemented since January 2017, has been discontinuation of direct individual support of physicians to attend meetings organized by professional societies or universities. Yet MedTech will support grants to third parties to organize conferences and educational courses. European Federation of Pharmaceutical Industries and Associations has produced a separate Code for Transparency in the relationship between the Pharmaceutical Industry and Health Care Professionals<sup>8</sup> outlining measures to publish details of all finances provided to individual practitioners on their subsidiaries websites at national level. The code

allows for continued support to be provided for physicians to participate in third party educational activities. The Alliance for Biomedical Research in Europe (BioMed Alliance), representing 27 medical professional societies in Europe, including the ESC, published its own Code of Conduct in 2015, outlining the principles for the ethical conduct of doctors in their relationship with the health care industry in the different fields of joint interest, including medical education.<sup>9</sup>

The expected outcome of these codes was to enshrine and formalize a transparent, ethical and productive relationship between the health care industry and physicians that would build public trust that has been at the core of educational programmes developed by ESC.

## Education programmes organised by industry

There is a regulatory obligation to ensure safe use of medicinal products,<sup>10</sup> and EU legislation indicates that risk control measures for manufacturers should include, where appropriate, training for users of medical devices.<sup>11</sup> Such product related training should be distinguished from unbiased education about disease processes, diagnosis and treatment. However, the development of educational, disease oriented programmes aiming at CME by health care industry alone or in partnership with employers has been proposed.<sup>12</sup> The Global Alliance for Medical Education (GAME—www.game-cme.org) was approached for endorsement of such programmes, but its Board decided against. As outlined above, the fundamentally different goals of health care industry and learned societies render such industry-organized programmes biased by nature. Despite the conflicts inherent in direct industry provided education, its growth remains a real prospect. In fact, direct industry provided education exists in a number of forms, run through industry funded institutes, educational foundations, 'Excellence Programmes' and through Medical Education and Communication companies.

## Education programmes organized by medical professional organizations

A very strong argument can be made that medical professional associations are best placed to provide CME. Both at national and international level, these associations have access to unparalleled and diverse expertise, are unbiased by nature and governance, transparent in their goals, respected and representative of their constituent bodies, owned by their members, and comprise a network of members that can ensure dissemination of information and accessibility. In claiming this role, medical professional associations are bound to uphold the highest ethical standards and to verify that presentations are truly unbiased. It should also be appreciated that their annual congresses are much more than just educational events or an exposition of recent scientific progress. They provide a unique opportunity to network and engage at a personal level with colleagues from around the world to exchange views, to learn, to engage in credentialing activities such as examinations as well as to promote continuing

educational activities at national and local levels. The opportunity for young physicians to listen and interact with experienced colleagues has played a central role in encouraging them to actively engage in knowledge acquisition and generation. Thus, congresses provide a unique platform to 'learn from each other'.

## Accreditation of continuing medical education

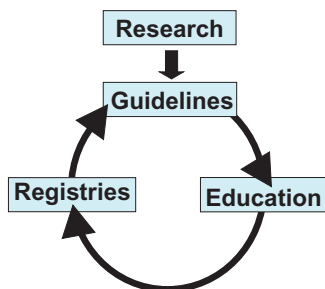
Continuing medical education accreditation is required to provide CME credits that are increasingly necessary for physicians to fulfil their statutory obligations. Thus, accreditation authorities play a pivotal role in recognizing appropriate, unbiased CME programmes. Most national and international CME accreditation authorities have published criteria for accreditation of events.<sup>13–16</sup> European Accreditation Council for Continuing Medical Education (EACCME<sup>®</sup>) recently updated their guidance, which clearly states that 'all funding from sponsors must be provided as an unrestricted educational grant, free of any attempt to influence the programme, individual sessions, subjects for discussion, content or choice of faculty members'.<sup>13</sup> It is an obligation of the organizers of medical education to ensure that governance is in place to guarantee meaningful implementation in practice.

Despite these rules, medical education and communication companies provide a means for industry to organize medical education closely aligned to their agenda, yet one step removed, and so may be eligible for CME accreditation by many authorities that depend on accreditation activity for income. The credibility of CME programmes depends on delivery of unbiased education, requiring a continuous review and independent governance of programmes. The ESC organizes such review through its independent, volunteer-based governance structure and from its constituent bodies and members, and integrates feedback into continuous programme development in a transparent process.

## Collaboration of European Society of Cardiology and industry related to medical education

The collaboration between medical societies and industry in medical education has long been a source of discussion and debate.<sup>17,18</sup> Some have advocated a total prohibition of industry involvement.<sup>19</sup> The most prevalent opinion, shared by ESC, supports a pragmatic approach that maintains a partnership with industry in a clear governance framework that includes rigorous transparency, and strict rules to avoid commercial bias in individual content.<sup>19,20</sup>

The ESC appreciates the support for CME from industry and realizes that, under the current regulations, new modes of support must be explored, including grants to the ESC, designed to support individual participants to attend specific educational programmes and grants to develop educational programmes, registries (EORP) or other specific educational products. The ESC may also apply for long-term support (5 or 6 years) for topic-oriented educational programmes based on ESC guidelines, followed by a registry to assess the extent of adherence to the guidelines, which in turn informs subsequent



**Figure 3** The circle of guidelines, education, and evaluation of medical practice.

updates of these guidelines and leads to improved educational programmes (Figure 3).

To preserve and build an effective continuing medical education programme, that is independent and unbiased, but that recognizes and benefits from a transparent, valid, and clearly defined relationship with medical industry, several steps must be taken:

- First, the health care industry must be convinced that a transparent and respectful collaboration with the medical profession which continues to adhere to the principles of truly unbiased independent medical education is in the best interest of patients, the medical profession and the industry.
- Second, medical professionals attending programmes organized by, or on behalf of industry should keep in mind that the presentations are inherently biased. They must understand that independent CME by their professional organizations is to be preferred, unless specific product related information or device specific training is sought. The ESC will continue to work with the Taskforce on Medical Education of the BioMed Alliance to promote independent CME programmes across all medical specialties in Europe.
- Third, CME accreditation authorities must consistently apply their own rules. Organizers of CME programmes must verify that presentations by scientists and clinicians are unbiased. Acknowledging that abolishing all conflict of interest is neither possible nor, arguably, desirable, a robust and meaningful method of declaring the conflict should be developed. The widespread practice of presenting a slide for a few seconds at the start of a presentation is not a meaningful exercise.
- Fourth, the ESC and its constituents should refrain from endorsing programmes developed and provided by industry.
- Fifth, European and National authorities who demand that physicians and other health care professionals undertake regular CME should be involved in the discussion as to what alternative approaches can be taken to resource this very costly undertaking.
- Sixth, there may be some recourse to the European Commission's Platform on Ethics & Transparency to counter industry's recent proposition to engage directly in medical education as an unintended and undesirable outcome of its work.

It should be understood that despite all reasonable precautions to ensure the independence of an educational event or programme, individual speakers might still be subject to bias due to their relationship with industry. In the end, it is the responsibility of each organizer and faculty member to provide factually correct and reliable

information in whatever programme they participate, whatever the setting, be it organized by or on behalf of industry or a professional organization such as ESC.

## Acknowledgements

The paper was written and approved by the Board of the ESC: Jeroen Bax (President), Barbara Casadei (President-Elect), Ian Graham (Secretary/Treasurer), Fausto Pinto (Past President), Stefan Anker (Vice-President), Lina Badimon (Vice-President), Bela Merkaly (Vice-President), Hector Bueno (Councillor), Sarah Clarke (Councillor), Donna Fitzsimons (Councillor), Christophe Leclerq (Councillor), Cecilia Linde (Councillor), Franz Weidinger (Councillor), Maddalena Lettino (ACCA President), Bogdan Popescu (President EACVI), Diederick Grobbee (President EAPC), Michael Haude (President EAPCI), Gerhard Hindricks (President EHRA), Frank Ruschitzka (President HFA) Stephan Achenbach (Congress Programme Committee), Nigel Clarke (Advisor), Francesco Cosentino (Industry Relations), Gerasimos Filippatos, (Membership), Peter Kearney (Advocacy), Paulus Kirchhof (Education), Steen Dalby Kristensen (Media), Thomas Luscher (Publications), Gunnar Olsson (Advisor), Alec Vahanian (EORP), Stephan Windecker (Practice Guidelines), Jose Zamorano (Global Affairs) and as adhoc writing group member Maarten Simoons (Past-President). This article has been reviewed by the members of the ESC Committees on Advocacy: Peter Kearney (Chair), Rudolf de Boer, Hector Bueno, Robert Byrne, Enrico Gianluca Caiani, Martin Cowie, Alan Fraser, Stefan James, Josef Kautzner, Nikos Maniadakis, Joep Perk, Axel Radlach Pries, Lars Ryden, Panos Vardas, Frans Van de Werf. Education: Paulus Kirchhof (Chair), Stephan Baldus, Ivo van der Bilt, Harran Burri, Kevin Fox, Lino Gonçalves, Julia Grapsa, Stephan von Haehing, Jose Ramon Juantaney, Peter Kearney, Jesper Kjaergaard, Eleni Kletsiou, Anna Kontsevaya, Dipak Kotecha, Ulf Landmesser, Davor Milicic, Barbara Mulder, Agnes Pasquet, Susanna Price, Regina Ribeiras, Rafael Sadaba, Per Anton Simes, Alessandro Sionis, Felix Tanner, Olivier Varenne, Patrick Verhost. Industry Relations: Maarten Simoons (Chair), Giuseppe Boriani, Robert Byrne, Francesco Cosentino, Kenneth Dickstein, Kim Fox, Michael Haude, Thomas Pilgrim, Lars Ryden, Frans Van de Werf, Aoife Delmas. Their important contributions are acknowledged.

## Appendix: Declarations of Interest

**Research Funding:** Jeroen Bax: nothing to be declared. Barbara Casadei: nothing to be declared. Ian Graham: nothing to be declared. Fausto Pinto received departmental or institutional research funding from Boehringer-Ingelheim, Medtronic, Servier, St Jude Medical, GE Healthcare. Stefan Anker received departmental or institutional research funding from Vifor International, Abbott Vascular. Lina Badimon received departmental or institutional research funding from Astrazeneca. Bela Merkely: nothing to be declared. Hector Bueno received personal research funding from BMS, Novartis, Janssen Cilag, Astra Zeneca. Sarah Clarke: nothing to be declared. Donna Fitzsimons: nothing to be declared. Christophe Leclerq: nothing to be declared. Cecilia Linde received departmental or institutional research funding from Novartis, and personal research funding

from Boston Scientific. Franz Weidinger: nothing to be declared. Maddalena Lettino: nothing to be declared. Bogdan Popescu: nothing to be declared. Diederick Grobbee received departmental or institutional research funding from Astra Zeneca, Pfizer. Michael Haude received departmental or institutional research funding from Abbott, Biotronik, Cardiac Dimensions. Gerhard Hindricks received departmental or institutional research funding from Boston Scientific, St Jude medical. Frank Ruschitzka received departmental or institutional research funding from Mars. Stephan Achenbach: nothing to be declared. Nigel Clarke: nothing to be declared. Francesco Cosentino received departmental or institutional research funding from Karolinska Institute, Italian Ministry for University, Research and Education (PRIN grant), European Association for the Study of Diabetes, Swedish Heart & Lung Foundation. Gerasimos Filippatos received departmental or institutional research funding from Medtronic, Vifor International, European Union. Peter Kearney received departmental or institutional research funding from Daiichi Sankyo. Paulus Kirchhof received departmental or institutional research funding from Abbott, Daiichi Sankyo, Sanofi Aventis, British Heart Foundation, BMS/Pfizer Alliance, Leducq Foundation, European Union FP7, European Union H2020, German Centre for Heart Research, UK Medical Research Council. Steen Dalby Kristensen received departmental or institutional research funding by Astra Zeneca. Thomas Luscher received personal research funding by Pfizer, Roche Diagnostics, Biotronik, Bayer Healthcare, St Jude Medical, Servier, Novartis, Mars, Abbott, Boston Scientific, Amgen, Biosensors. Gunnar Olsson: nothing to be declared. Alec Vahanian: nothing to be declared. Stephan Windecker received departmental or institutional research funding from Boston Scientific, St Jude Medical, Terumo Inc, Bracco Pharmaceutical. Jose Zamorano received departmental or institutional research funding from Edwards Lifesciences, Abbott. Maarten Simoons: Nothing to be declared.

**Conflict of Interest:** Jeroen Bax: nothing to be declared. Barbara Casadei: nothing to be declared. Ian Graham received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Pfizer, MSD, Amgen. Fausto Pinto received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Pfizer, Menarini, Boehringer-Ingelheim, Daiichi Sankyo, Biotronik, Servier, Bayer Healthcare, Novartis, Astra Zeneca, Bayer, Medtronic and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. Bayer, Medtronic, Servier. St. Jude Medical, GE Healthcare. Stefan Anker received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from BRAHMS GmbH, Impulse Dynamics, Astra Zeneca, Boehringer-Ingelheim, Servier, Bayer AG, V-Wave, Novartis, Respicardia, Vifor International. Lina Badimon received as direct personal payment speaker fees, Honoraria, Consultancy, Advisory Board fees, Investigator, Committee Member, etc. from Sanofi Aventis, Burson Masteller, Astra Zeneca. Bela Merkaly received as direct personal payment) speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Sanofi Aventis, Medtronic, Abbott, Servier, Biotronik and as payment to institution speaker fees, honoraria, consultancy, advisory

board fees, investigator, committee member, etc. from Abbott, Medtronic, Boston Scientific. Hector Bueno received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Pfizer, Bristol Myers Squibb, Bayer, Abbott, MEDSCAPE-the heart.org, Servier, Novartis, Astra Zeneca, Ferrer Internacional, and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Astra Zeneca. Sarah Clarke: nothing to be declared. Donna Fitzsimons: nothing to be declared. Christophe Leclercq received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Boston Scientific, Medtronic, Sorin Group, St Jude Medical, Biotronik, Bayer Healthcare. Cecilia Linde received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Astra Zeneca and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Medtronic, and as receipt of royalties for intellectual property from Vifor International. Franz Weidinger received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Abbott, Daiichi Sankyo, Amgen, Novartis, Astra Zeneca and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Sanofi Aventis. Maddalena Lettino received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Boehringer-Ingelheim, Aspen, Pfizer, Eli Lilly, Daiichi Sankyo, Bayer Healthcare, Bristol Myers Squibb, Sanofi Aventis, Astra Zeneca. Bogdan Popescu received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from GE Healthcare. Diederick Grobbee received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Pfizer, Ferrer Internacional, and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Pfizer. Michael Haude received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Lilly, Abbott, Volcano, Biotronik, Cardiac Dimensions. Gerhard Hindricks received as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Boston Scientific, St Jude Medical, Biotronik. Frank Ruschitzka received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Amgen, Novartis, Pfizer, BMS, Servier, Sanofi Aventis, Zoll Medical, St. Jude Medical, Fresenius Nutrition, Vifor International, Cardioentis, Heartware and as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Bayer, Novartis, St. Jude Medical. Stephan Achenbach: nothing to be declared. Nigel Clarke: nothing to be declared. Francesco Cosentino received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Abbott, Astra Zeneca, Takeda Pharmaceuticals, Bristol Myers Squibb, Merck Sharp & Dohme, Sigma Tau. Gerasimos Filippatos received as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Bayer, Servier, Corthera, Novartis. Peter Kearney: nothing

to be declared. Paulus Kirchhof received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Boehringer-Ingelheim, Bayer Healthcare, Pfizer Global, Daiichi Sankyo. Steen Dalby Kristensen received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Aspen, Bayer AG, Astra Zeneca. Thomas Luscher received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Medtronic, Oxford University Press-Oxford, Daichi Sankyo, Amgen, Bayer Healthcare, Dacadoo- Zurich, Double Check. Gunnar Olsson received as payment to institution speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Athera Biotechnology AB, Biocrine, Swedish Foundation for Strategic Research, Cereno Scientific AB. Alec Vahanian received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Abbott, Edwards Lifesciences, Valtech. Stephan Windecker: nothing to be declared. Jose Zamorano received as direct personal payment speaker fees, honoraria, consultancy, advisory board fees, investigator, committee member, etc. from Philips, Servier, Pfizer, MSD. Maarten Simoons: Nothing to be declared.

## References

- Global Burden of Disease 2015 Mortality and Causes of Death Collaborators. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet* 2016;**388**:1459–1544.
- Boriani G, Maniadakis N, Auricchio A, Muller-Riemenschneider F, Fattore G, Leyva F, Mantovani L, Siebert M, Willich SN, Vardas P, Kirchhof P. Health technology assessment in interventional electrophysiology and device therapy: a position paper of the European Heart Rhythm Association. *Eur Heart J* 2013;**34**:1869–1874.
- Quekett J; for M3 Global Research. Helping European cardiologists keep up to date. PMLIVE 22 June 2015. [http://www.pmlive.com/pharma\\_thought\\_leadership/helping\\_european\\_cardiologists\\_keep\\_up\\_to\\_date\\_737223](http://www.pmlive.com/pharma_thought_leadership/helping_european_cardiologists_keep_up_to_date_737223) (16 January 2018).
- [https://web-beta.archive.org/web/20130612031413/http://ec.europa.eu/enterprise/sectors/healthcare/files/docs/outcomes\\_et\\_en.pdf](https://web-beta.archive.org/web/20130612031413/http://ec.europa.eu/enterprise/sectors/healthcare/files/docs/outcomes_et_en.pdf); [http://www.eu-patient.eu/global/assets/news/list-guiding-principles\\_nov2012.pdf](http://www.eu-patient.eu/global/assets/news/list-guiding-principles_nov2012.pdf) (16 January 2018).
- EFPIA Board. EFPIA code on the promotion of prescription-only medicines to, and interactions with, healthcare professionals. Consolidated version 2013. [www.efpia.eu](http://www.efpia.eu) (16 January 2018).
- Medtech Europe. Code of ethical business practice. [www.medtecheurope.org](http://www.medtecheurope.org).
- EFPIA Board. EFPIA code on disclosure of transfers of value from pharmaceutical companies to healthcare professionals and healthcare organisations. Consolidated version 2014. [www.efpia.eu](http://www.efpia.eu) (16 January 2018).
- Biomed Alliance. Code for transparency in the relationship between the pharmaceutical industry and health care professionals. [www.biomedeuropa.org](http://www.biomedeuropa.org).
- Regulation (EC) No 726/2004 of the European Parliament and of the Council of 31 March 2004 laying down Community procedures for the authorisation and supervision of medicinal products for human and veterinary use and establishing a European Medicines Agency (Consolidated version: 05/06/2013). [https://ec.europa.eu/health/sites/health/files/eudralex/vol-1/reg\\_2004\\_726/reg\\_2004\\_726\\_en.pdf](https://ec.europa.eu/health/sites/health/files/eudralex/vol-1/reg_2004_726/reg_2004_726_en.pdf) (16 January 2018).
- Regulation (EU) 2017/745 of the European Parliament and of the council of 5 April 2017 on medical devices, amending Directive 2001/83/EC, Regulation (EC) No 178/2002 and Regulation (EC) No 1223/2009 and repealing Council Directives 90/385/EEC and 93/42/EEC. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R0745&from=EN> (16 January 2018).
- Allen T, Donde N, Hofstädter-Thalmann E, Keijsers S, Moy V, Murama J-J, Kellner T. Framework for industry engagement and quality principles for industry provided medical education in Europe. *J Eur Continuing Medl Educ* 2017;**6**:1348876.
- UEMS-EACCME. EACCME criteria for the accreditation of live education events. [www.uems.eu](http://www.uems.eu) (16 January 2018).
- Royal College of Physicians of Ireland. Industry sponsorship and support. 2012. [www.rcpi.ie](http://www.rcpi.ie) (16 January 2018).
- Royal College of Physicians of Ireland. Guide to approval of events for Continuing Professional Development (CPD). [www.rcpi.ie](http://www.rcpi.ie) (16 January 2018).
- Royal College of Physicians. Provide a CPD event. [www.rcplondon.ac.uk](http://www.rcplondon.ac.uk) (16 January 2018).
- Nissen S. Reforming the continuing medical education system. *JAMA* 2015;**313**:813–814.
- Rothman D, McDonald W, Berkowitz C, Chimonas S, DeAngelis C, Hale R, Nissen S, Osborn J, Scully J, Thomson G, Wofsy D. Professional medical associations and their relationships with industry: a proposal for controlling conflict of interest. *JAMA* 2009;**301**:1367–1372.
- Spithoff S. Industry involvement in continuing medical education: time to say no. *Can Fam Phys* 2014;**60**:694–696.
- De Maria A. Continuing education, industry, and physicians. *J Am Coll Cardiol* 2008;**12**:1035–1036.
- ESC Board. Relations between professional medical associations and the healthcare industry, concerning scientific communication and continuing medical education: a Policy Statement from the European Society of Cardiology. *Eur Heart J* 2012;**33**:666–674.