ESC European Society of Cardiology

European Journal of Preventive Cardiology (2024) **31**, 1904–1911
https://doi.org/10.1093/eurjpc/zwae259

POSITION PAPER
Prevention in practice

The future of education in Preventive Cardiology: a statement of the European Association of Preventive Cardiology of the European Society of Cardiology

Konstantinos C. Koskinas [1]*, Matthias Wilhelm [2], Martin Halle [3], Alessandro Biffi[4], Elena Cavarretta [5,6], Constantinos H. Davos[7], Ines Frederix [8], Marwa Hemmat Gaber[9], Dominique Hansen [10], Jennifer L. Jones[11,12], Aneil Malhotra[13,14], and Michael Papadakis [15]

[1]Department of Cardiology, Inselspital, Bern University Hospital, University of Bern, Freiburgstrasse 18, 3010 Bern, Switzerland; [2]Centre for Rehabilitation and Sports Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland; [3]Preventive Sports Medicine and Sports Cardiology, TUM School of Medicine and Health, Technical University of Munich, Munich, Germany; [4]Cardiology Department, Institute of Sports Medicine and Science, Rome, Italy; [5]Department of Medical-Surgical Sciences and Biotechnologies, Sapienza University of Rome, Latina, Italy; [6]Mediterranea Cardiocentro, Naples, Italy; [7]Cardiovascular Research Laboratory, Biomedical Research Foundation, Academy of Athens, Athens, Greece; [8]Department of Cardiology, Antwerp University Hospital, Edegem, Belgium; [9]Cardiology Unit, Department of Clinical and Experimental Internal Medicine, Medical Research Institute, Alexandria University, Alexandria, Egypt; [10]Faculty of Rehabilitation Sciences, Hasselt University, Hasselt, Belgium; [11]College of Medicine, Nursing and Health Sciences, National University of Ireland Galway, Galway, Ireland; [12]Croí Heart and Stroke Centre, National Institute for Prevention and Cardiovascular Health (NIPC), Galway, Ireland; [13]Wythenshawe Hospital and Manchester Royal Infirmary, Manchester, UK; [14]University of Manchester, Manchester, UK; and [15]Cardiovascular Clinical Academic Group, St George's University of London, London, UK

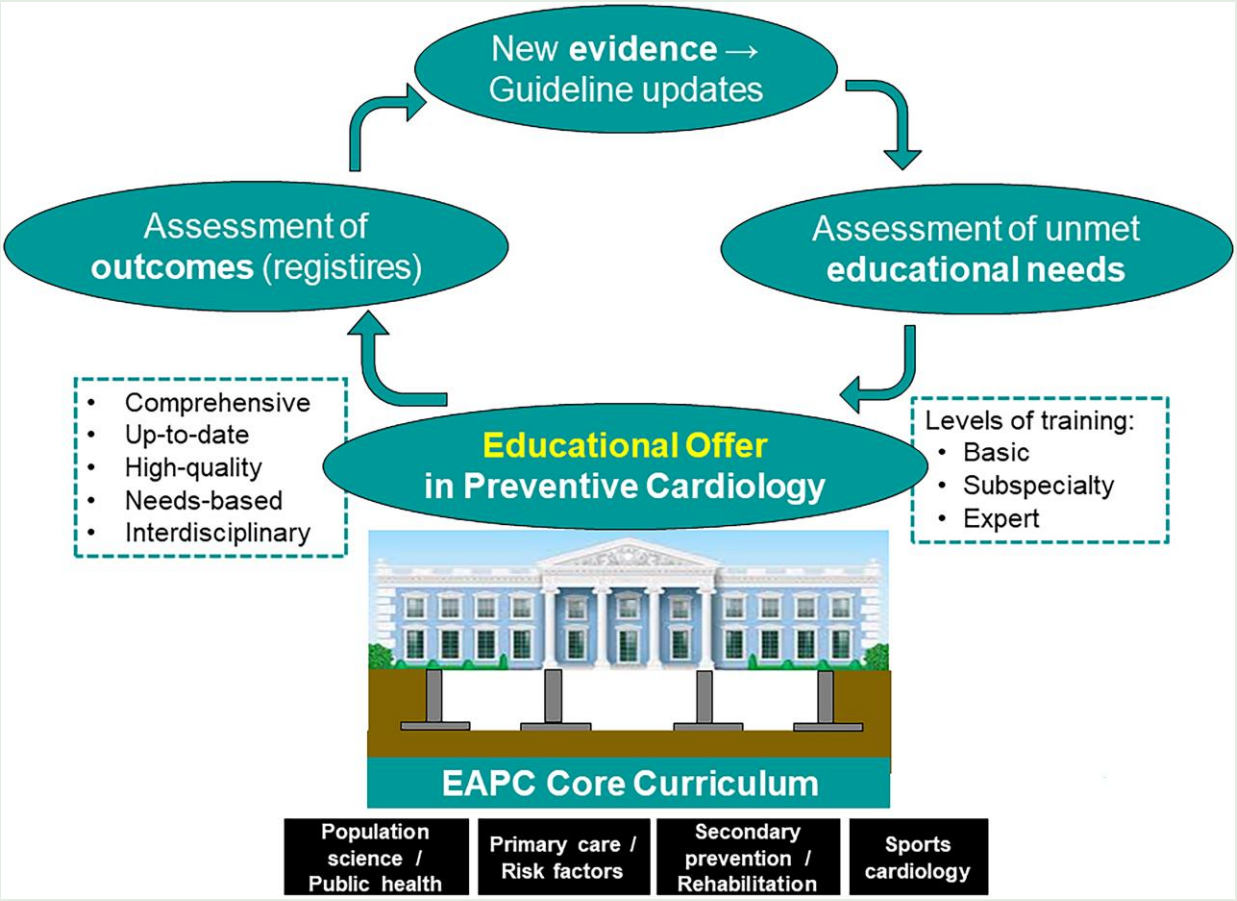
Received 7 November 2022; revised 13 June 2024; accepted 4 August 2024; online publish-ahead-of-print 6 August 2024

See the editorial comment for this article 'Forging education in preventive cardiology for the near future', by A. Abreu, https://doi.org/10.1093/eurjpc/zwae269.

In recent years, major advances in our understanding of risk factors implicated in the development of cardiovascular disease (CVD), in available tools for early detection of CVD, and in effective interventions to prevent subclinical or clinically manifest disease, have led to an increasing appreciation of prevention as a major pillar of cardiovascular (CV) medicine. Preventive Cardiology has evolved into a dynamic sub-speciality focused on the promotion of CV health through all stages of life, and on the management of individuals at risk of developing CVD or experiencing recurrent CV events, through interdisciplinary care in different settings. As the level of knowledge, specialized skills, experience, and committed attitudes related to CV prevention has exceeded core cardiology training, the European Association of Preventive Cardiology (EAPC) has placed major emphasis on continuous education and training of physicians and allied professionals involved in CV prevention, with the aim of setting standards for practice and improving quality of care. The EAPC recognizes the need for a comprehensive educational offer across different levels of training (from core cardiology to sub-speciality to expert training) as well as the need for interdisciplinary approaches that will promote synergies among allied professionals involved in CV prevention. This statement by the EAPC aims to highlight current gaps and unmet needs and to describe the framework to help standardize, structure, and deliver comprehensive, up-to-date, interactive, and high-quality education using a combination of traditional and novel educational tools. The document aims to form the basis for ongoing refinements of the EAPC educational offer, with the ultimate goal of ensuring that new evidence in the field will translate to better CV practice and improved outcomes for our patients.

* Corresponding author. Tel: +41 (0) 31 632 50 00, Email: konstantinos.koskinas@insel.ch

Graphical Abstract



Keywords Education • Preventive Cardiology • Training

Introduction

Preventive Cardiology is a key discipline of cardiology that encompasses all aspects of knowledge related to the prevention of cardiovascular disease (CVD), with the aim of reducing cardiovascular (CV) morbidity and averting fatal CV events. It covers a broad spectrum of CVD prevention, at individual and population levels, through all stages of life, including understanding of the evolving epidemiology of CVD, promotion of CV health, and management of individuals at risk of developing CVD as well as patients with established CVD through interdisciplinary care in different settings. The holistic concept of CV prevention comprises health behaviours (physical activity, exercise, sports, nutrition, weight management, smoking cessation, psychosocial aspects); environmental, genetic, and biological risk factors; underlying morbidities; and pharmacological interventions in the context of the individual's social setting.[1,2] Preventive Cardiology is represented within the European Society of Cardiology (ESC) by the European Association of Preventive Cardiology (EAPC), which is substantially involved in the mission of the ESC to reduce the burden of CVD.[3–5]

The ESC is increasingly investing in education and training of cardiologists in-training and in-practice and has long recognized the need to provide lifelong learning programmes for cardiology professionals, in order to set standards for practice and improve quality of care and CV health for our patients.[6] Of relevance to the evolution of education in the field of CVD prevention, Preventive Cardiology has long been associated with lifestyle interventions only but has evolved in recent years into an expanding, dynamic field because of major advances in diagnosis, risk stratification, and pharmacologic interventions for preventing CVD. As the focus of the cardiology community has started to transition from predominantly treatment to prevention, Preventive Cardiology has gradually and globally evolved into a sub-speciality;[1,3,7–9] indeed, the level of knowledge, specialized skills, experience, and committed attitudes has exceeded core cardiology training and justifies sub-speciality training.[9] In view of the alarmingly high prevalence of CVD (predominantly atherosclerotic CVD) and the progress that has been achieved in recent years in early identification and effective prevention of CVD, several associations and societies worldwide have launched educational activities and roadmaps for CV prevention targeting individual patients, healthcare providers, and policymakers.[10] Overall, education of healthcare providers in the field of Preventive Cardiology has previously received less attention compared with other fields in CV medicine because educational content and material have not been widely available, were insufficiently defined and standardized, and becasue experts in the field have been limited in numbers. In view of this gap in education, the need for a European-wide standardized educational programme for CVD prevention has emerged. Along these lines, an online workshop was held by

the EAPC on 25–26 February 2022 to reflect on the future of education in Preventive Cardiology. Herein, the key outcomes of this workshop are summarized, providing the basis for ongoing amendments and refinements of the EAPC educational offer.

Background of the brainstorming workshop: defining the needs for educational offer in Preventive Cardiology

The EAPC educational resources aim to provide up-to-date, evidence-based, in-person or online programmes in support of continuing medical training in the dynamic field of CV prevention. The educational offer is aligned with the ESC primary vision of promoting best clinical practices and thereby improving CV outcomes for our patients. Along with the *ESC Core Curriculum for the Cardiologist*, last updated in 2020,[11] sub-speciality curricula have been developed by most ESC sub-speciality associations.[12] The recently published *EAPC Core Curriculum for Preventive Cardiology*[9] is a landmark for CV prevention and translates the aims and treatment recommendations of guidelines and other educational material into a training curriculum for future specialists in Preventive Cardiology. This core curriculum will help standardize, structure, deliver, and evaluate the training of cardiologists in Preventive Cardiology across Europe and form the basis for dedicated fellowship programmes and an EAPC sub-speciality certification. While the development of the core curriculum forms the basis for focused and specialized training in CVD prevention, setting up a granulated, standardized, up-to-date educational offer that will embody the aims and principles of the core curriculum and, importantly, reflect the multidisciplinary nature of CV prevention has emerged as the logical next step (*Graphical Abstract*).

In order to build upon the EAPC educational strategy in line with the development of the core curriculum,[9] the EAPC leadership initiated a brainstorming meeting with experts in the field. During the 2022 annual EAPC winter meeting, an online workshop including members of the EAPC Board, the EAPC Education Committee, and experts in the field of population science and public health, primary care and risk factor management, secondary prevention and rehabilitation, and sports cardiology and exercise was held on 25–26 February 2022 to reflect on the future of education in Preventive Cardiology. The objective of the workshop was to reflect on a comprehensive, consolidated, sustainable, and needs-based EAPC educational offer based on the *EAPC Core Curriculum for Preventive Cardiology*,[9] both for cardiologists with different levels of education and for allied health professionals[13] who play an important role in the multidisciplinary Preventive Cardiology team. The aim of the workshop was to further develop and establish a universally attractive and innovative educational programme in Preventive Cardiology provided by the EAPC by adapting to novel ways of learning, raising and establishing quality standards in Preventive Cardiology, enhancing trainer and trainees' engagement, ensuring member recruitment and retainment, and aligning with the ESC educational offer and the new educational environment.

Two additional aspects were relevant when analysing the outcomes of the brainstorming workshop: (i) the launch of the new ESC e-learning platform, the new library of asynchronous and synchronous e-learning courses intended to serve as the *education* hub for guided learning (as compared with the pre-existing ESC 365 that has been serving as the cardiology *knowledge* hub), and (ii) the first certification examination for Preventive Cardiology that was held in May 2023 and is scheduled to be held on an annual basis, raising the need for coupling the EAPC educational offer with the certification process.

The present document summarizes the results of the workshop, and integrates reflections within the EAPC Board and the EAPC Education Committee with respect to the future of education in Preventive Cardiology. This is an introductory document intended to form the basis for a comprehensive strategic plan in the continuous process of refining the EAPC educational offer, including learning modules for different levels of training and integration between education and certification.

Outcomes of the brainstorming workshop

Defining the knowledge and skills

Core curricula are the basis for assessment of knowledge of the cardiologists (in-training and in-practice) and provide the structure of key learning outcomes and organization of training programmes. Different ESC associations have been building on educational offers and running certification examinations based on published sub-speciality curricula. We refer to the EAPC Core Curriculum for a detailed description of entrustable professional activities (EPAs), comprising competencies, knowledge, skills, and attitudes necessary for sub-speciality qualification in Preventive Cardiology.[9] Briefly, the EAPC Core Curriculum describes the necessary competencies in the domains of population science and public health (preventive interventions at the population level, including the epidemiology of CVD and targets for intervention); primary prevention and risk factor management (management of individuals with multifactorial CV risk profiles and non-traditional CV risk factors); secondary prevention and rehabilitation (prevention and rehabilitation programmes for patients with CV, patients with frailty or comorbidities, or patients with cancer); and sports cardiology and exercise (pre-participation evaluation in competitive athletes and management of athletes with suspected or known CVD).[9] For the future EAPC educational offer, the aim is to deliver a standardized educational programme with well-defined modules covering the curriculum knowledge and skill areas, utilizing traditional and novel learning methods as detailed in the following.

Defining the target audience for education

Acknowledging the importance of multidisciplinary and interprofessional approaches for CV prevention, the EAPC educational offer should be addressed not only to cardiology trainees and practicing cardiologists but also be extended to physicians in other medical specialities with a focus on CVD prevention (importantly including general practitioners and primary care physicians), epidemiologists, specialized nurses, and allied health professionals (*Figure 1*). While the EAPC Core Curriculum is primarily addressed to board-certified cardiologists as a sub-speciality training,[9] the brainstorming workshop identified the need for complementary curricula for the continuing professional development of nurses and allied health professions—similar to other ESC sub-specialities[14,15]—as an unmet need to be addressed. With respect to the educational offer, diverse background training and different levels of sub-specialization as well as individual needs of the broad target audience will be taken into account when structuring educational activities, recognizing the multidisciplinary role of prevention.

The structure of the new educational offer

The educational EAPC framework will be embedded within the EAPC/ESC organization's work to create a consistent approach for

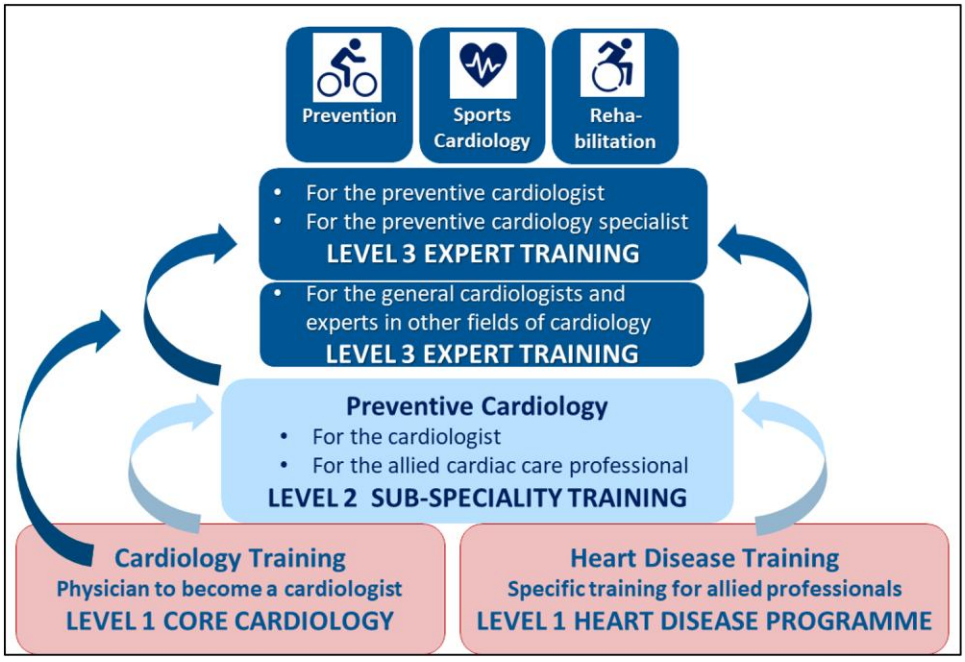


Figure 1 Specialization from general training to more specific education: levelling up from basic cardiology training (lower part) by sub-speciality training (middle part) to expert training level (upper part).

medical doctors, allied health professionals, and others to follow clear expectations in the execution of (sub-)specialized patient care in the future. According to the ESC, it is organized into three levels of education, namely, Level 1—core cardiology training, Level 2—sub-speciality training, and Level 3—expert training, which helps define target audiences, and applies to cardiologists at different levels of training and certification as well as allied healthcare professionals (*Figure 1*).

Level 1: core cardiology training

This core training is based on the ESC Core Curriculum for the cardiologist[11] and encompasses the broad cardiology spectrum required to pass the core cardiology examination and become a certified cardiologist.[11] Basic educational content on Preventive Cardiology is already provided at this level. Topics of heart disease in prevention, diagnostics, and treatment are also of interest to different allied health professionals. Team members may include nurses, physiotherapists, nutritionists, exercise physiologists, psychologists, technicians, radiology assistants, and others. Although they have their own core training educational programme, they have the option to specialize in treating and caring for patients with CVD. During their general or specific training in CVD, the topic of Preventive Cardiology is partially covered.

Level 2: sub-speciality training

This training level is based on the sub-speciality curriculum for Preventive Cardiology as outlined in the EAPC Core Curriculum for Preventive Cardiology.[9] Sub-speciality courses and learning pathways are provided to acquire in-depth knowledge on the broad spectrum of Preventive Cardiology (e.g. epidemiology, public health, primary prevention, risk factor management, rehabilitation, and sports cardiology) to pass the examination for sub-speciality certification.

Level 3: expert training

This training level provides specialists who already have a strong focus on prevention, rehabilitation, and/or sports cardiology or have already been certified as Level 2 preventive cardiologist, as well specialized cardiac care nurses and cardiac allied professionals, with an opportunity to further diversify their careers in becoming experts in the field with an active contribution in Preventive Cardiology education. This level not only focuses on specific high-level expertise in Preventive Cardiology, but also extends this by introducing organizational and communicational skills to lead multidisciplinary teams as well as skills to become a trainer and a teacher, depending on personal aspirations and objectives.

Before entering Level 3 for becoming a Preventive Cardiology expert, Levels 1 and 2 have to be completed. From an educational offer perspective, the higher the level of specialization, the more independent and self-learning (learner-centred) time will be allocated in the training programme (*Figure 2*). Within the education levels, several formats of educational activities may be included; the learner's engagement can be either a short-term commitment, e.g. up to a few hours, or a long-term commitment of several learning hours with in-depth coverage of a topic. A core unit of certified trainers will be integrated into the programme to form the basis of the curriculum and particularly the core of the instructor-centred component. Exchange with certified experts worldwide will guarantee high standards following the CanMEDS (Canadian framework that identifies and describes the required abilities of physicians)[16] and EPA frameworks.[17] The ESC education platform (www.escardio.org/Education) will become the interface between the learner, the instructor, and the scientific association.

Applying novel learning methods for education in Preventive Cardiology

Recent years have seen many advances in education across the ESC, including a growing number of broadly accessible online courses,

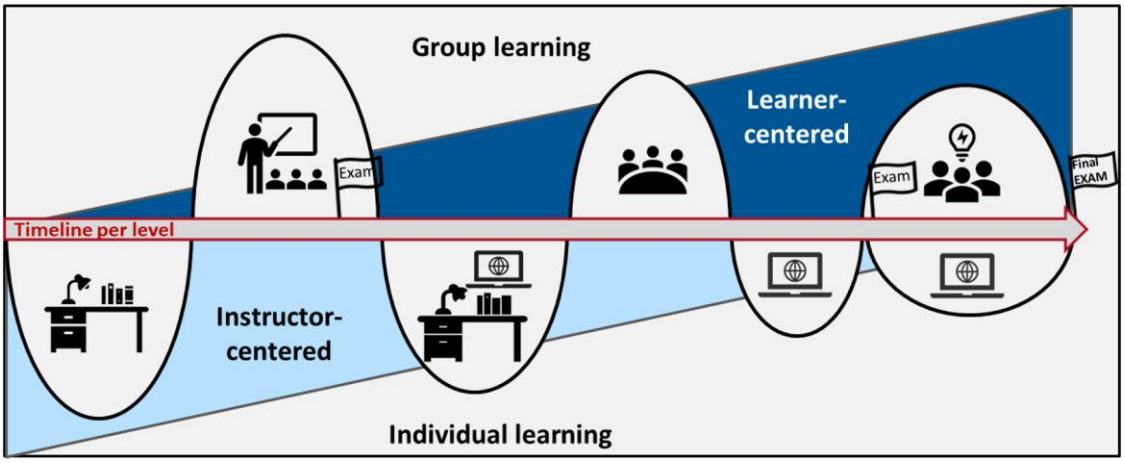


Figure 2 Scheme of blended learning and the 'flipped classroom' concept with alternating 'learner-centred' and 'instructor-centred' intervals of education. Instructor-centred individual learning includes active learning through e-learning, online lectures, and videos as well as self-studying from books and provided literature. Learner-centred group learning comprises passive learning through contextual work, hands-on training, peer-to-peer exchange, interaction in groups, or point-of-care training. Activities are case study groups, discussion groups, buzz groups, debates, role play, simulations, games, or practice applications.

webinars, a Clinical Case Gallery, updates in the ESC textbook and sub-speciality textbooks, certification examinations in various sub-specialities, and more recently the launch of the e-learning platform as the core ESC education ecosystem. Based on the legacy of the COVID-19 and post-pandemic era, a shift towards more remote, online educational activities as efficient training approaches and as a valuable complement to in-person activities has been increasingly recognized. Within the future educational offer for Preventive Cardiology, novel ways of teaching and learning will be included. Blended learning combines synchronous, face-to-face learning experiences with asynchronous online learning experience.[18] In principle, learning methods are categorized into 'instructor-centred' and 'learner-centred' education (*Figure 2*). The former was traditionally favoured by schools and universities but has been successively replaced by modern, learner-centred methods during the past decade. Although both learning methods have their place within different education levels, the instructor-centred method is preferred for pure content conveyance, whereas learner-centred education aims at the interaction between learners with the instructor overseeing and moderating interactive learning. An established way that combines both learning methods is the 'flipped classroom' learning method (*Figure 2*).[19–21] This concept aims to start with interactive, time-intense courses led by specialized instructors when basic knowledge has been acquired during self-studying. The interactive phase is preceded by a knowledge assessment to guarantee a common basic knowledge level. This ensures a reasonably homogeneous group regarding content knowledge before entering the next steps in education, particularly when coming from different educational backgrounds in a multidisciplinary setting (e.g. cardiac nurses, physicians, exercise physiologists, psychologists, or nutritionists). After entering the new step of education, smaller group sessions can be offered. This concept focuses on the individual development of skills at different levels and will continue until the desired competency is achieved. Thereafter, the learner will qualify for certification (*Figure 2*).

Educational offers for different levels

Target audiences for Preventive Cardiology at 'level 1' include cardiologists in training to offer specific training in Preventive Cardiology, which ensures basic knowledge in the field, but could also encourage trainees to choose this sub-speciality later in their career. Beyond cardiologists, general practitioners in training, specialist physicians of different disciplines (e.g. internal medicine, endocrinology, neurology, nephrology, or sports medicine), as well as allied health professionals (e.g. nurses with a background in cardiac disease, exercise physiologists, physiotherapists, dietitians, psychologists, pharmacists, imaging specialists, health coaches, and others) may find parts of Preventive Cardiology education helpful for their career training and practice. It may even be attractive for researchers beyond the core fields of cardiology, who would like to deepen their knowledge of Preventive Cardiology topics, e.g. nutrition and exercise scientists as well as health scientists (*Figures 1* and *3*).

As Preventive Cardiology education at this level is limited to covering and integrating general content and expertise in cardiology core training, the total time for the trainee to be spent at this level is relatively short and depends on individual time preference. Therefore, the concept of a 'flipped classroom' with emphasis on self-training consolidated by instructor-centred teaching (*Figure 2*) will be followed at this level to ensure overall content acquisition for different professions at different expertise levels. In addition, learner-centred intensive education in smaller groups is offered to ensure practical knowledge acquisition and to introduce learners to multidisciplinary teamwork.

Once a physician or an allied health professional is specialized in core cardiology or heart disease, they may add a sub-speciality training in Preventive Cardiology at 'Level 2' to become a preventive cardiologist or a Preventive Cardiology specialist, respectively (*Figures 1* and *3*). At this level, a structured and curriculum-based offer will cover the broad spectrum of Preventive Cardiology from theory to practice and support fellowship programmes and practical courses in the field. The

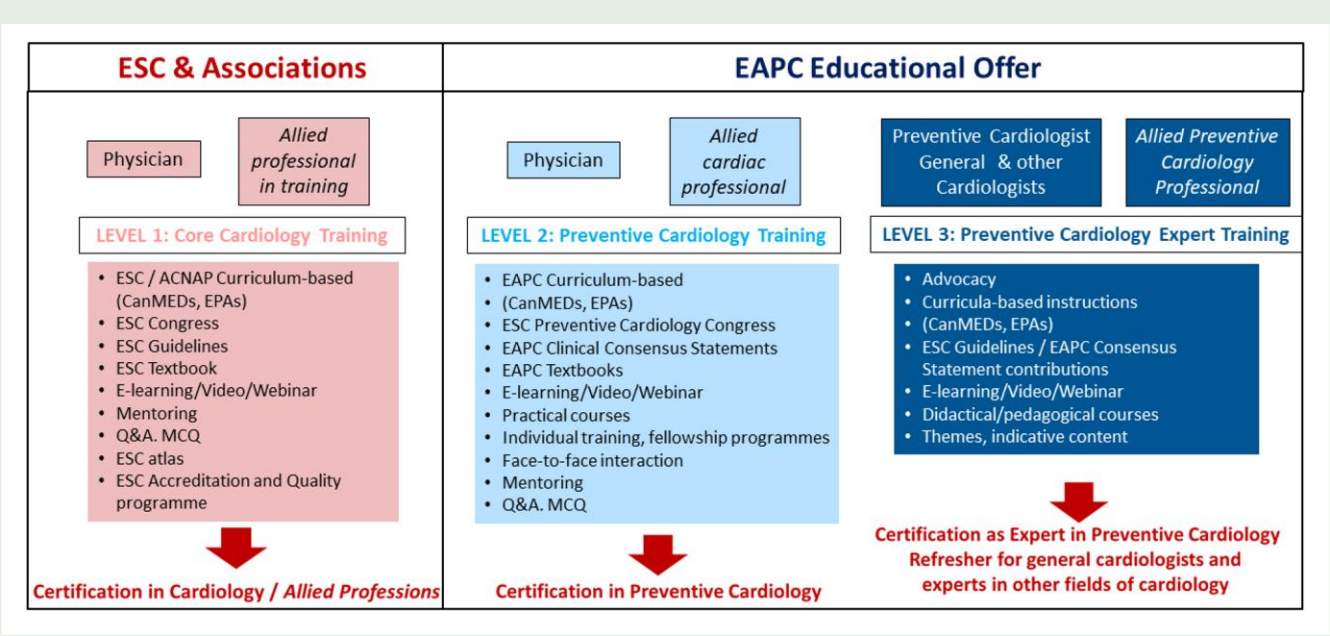


Figure 3 An educational offer, founded by the EAPC, covered the training of the three levels to bring forth experts and trainers in Preventive Cardiology.

'flipped classroom' concept will be maintained, though interphases between learner-centred and instructor-centred units become shorter and learner-centred sessions will become more intense. Online study material and online activities will be offered via the ESC education platform (www.escardio.org/Education) with topic-specific webinars, e-learning, videos, and case reviews as well as fast-to-success activities (e.g. multiple-choice questions). Social media platforms, especially those that are based on this learning concept, will facilitate consistency and peer-to-peer communication as well as networking. The learner-centred Level 2 approach contains predominantly scientific programmes, cyclic events, and standardized incorporated exchange programmes to gain skills and clinical competencies beyond patient care in Preventive Cardiology, provided by the EAPC. The different roles of the healthcare professional as a communicator, a collaborator, and a health advocate, as defined by the Royal College of Physicians and Surgeons of Canada (CanMEDS)[18] come into focus and will be mediated by a multidisciplinary setting with supervisors and training guidelines. The case study groups, instructor- or learner-based, will focus on the management of the clinical aspects of prevention, rehabilitation, and sports cardiology. In addition, the EAPC will offer cyclic events, peer-to-peer networking options, and other scientific programmes via a continuously updated EAPC homepage. Scientific programmes among healthcare professionals will offer the possibility to join projects and to publish scientific work on the backbone of the ESC/EAPC (*Figure 3*). By passing the Level 2 examination and becoming a preventive cardiologist or a Preventive Cardiology specialist, learners will be enabled to advocate Preventive Cardiology, e.g. by improving preventive education during undergraduate medical training, installing preventive multidisciplinary teams, expanding networking activities, and connecting local initiatives with national activities of cardiology societies.

Preventive cardiologists and Preventive Cardiology specialists who have gained practical experience and feel competent to transfer their personal experience and knowledge to less experienced colleagues may enter education Level 3 (*Figure 1*). Therefore, this last level comprises the training to become experts and future instructors. Here, certified preventive cardiologists and Preventive Cardiology specialists will be trainees, who enhance their knowledge in specific sub-fields of Preventive Cardiology such as prevention, rehabilitation, and sports cardiology. In addition, allied health professionals will have the option to become instructors themselves. Thereby, a multidisciplinary approach will be implemented and will involve physicians, scientists, allied health professionals, cardio-oncologist, pharmacists, general practitioners, physiotherapists, exercise physiologists, nutritionists, psychologists, and others. A major strength of this education level is the diversity of this group with colleagues from different backgrounds and specialities who will exchange views and experiences and in that way substantially extend their knowledge. At this level, learner-centred teaching with peer-to-peer exchange and small case-based study groups are favoured (*Figure 2*). Moreover, mediation of communication and leadership skills are emphasized with pedagogical and didactical courses to assure a novel and future-orientated setting in education in Preventive Cardiology.

Educational offer across different healthcare environments

A landmark document published in 2019 introducing a roadmap for CV education across the ESC[6] was based on the output of an ESC Education Conference that had included, among others, National Directors of Training of 43 ESC countries, and thus integrated national descriptions of education and cardiology training. Involving representatives of the National Societies was beyond the scope of the present online brainstorming workshop. However, with respect to standardization of preventive interventions across different countries and in view of differences between healthcare systems, the brainstorming process indicated that a common basis of prevention across healthcare environments should be targeted, focusing on core knowledge and skills

components (i.e. minimum acceptable knowledge for each level) and thus promoting homogenous education and training programmes across countries, while allowing for national societies to be involved in details of implementation.

Key objectives and unmet needs in the European Association of Preventive Cardiology educational offer

The workshop and subsequent reflections within the EAPC Board and the EAPC Education Committee identified the following elements as key goals for the developing EAPC educational offer:

- Targeting of educational material has to be accompanied by clear learning objectives, built around knowledge and skills as outlined in the EAPC Core Curriculum.[9] The educational offer needs to be structured with prerequisites, milestones, and assessment of knowledge and skills at all levels, with learning modules from which an individual could select and compile an individualized learning journey that matches prior training and learning objectives.
- A dual approach is encouraged: utilization of selected existing educational materials complemented by generation of new material as needed to address gaps. A combination of a variety of educational pathways and formats (online courses, webinars, in-person courses, congress sessions to learn and discuss the latest developments in CV prevention, journal articles and online how-to-articles, guidelines, and a new Textbook on Cardiovascular Prevention) will be key to reinforce a tailored, up-to-date, comprehensive educational offer for each level. In particular, the central role of the ESC e-learning platform as a unified educational ecosystem to optimize synergy across online educational pathways is emphasized. It is recognized that, unlike other sub-specialities (e.g. interventional cardiology), there is relatively less dependence on physical training or in-person educational events, emphasizing the central role of remote, online educational activities and digital platforms.
- Reaching out to the EAPC community for feedback on areas of growing interest and perceived unmet needs for education. To this end, gap analyses and needs-assessment online surveys have been launched by the EAPC in Q2 2024, and the results will be utilized to inform the ongoing adaptations of the educational offer. In view of the dynamic nature of the development of the educational offer, continued gap analyses and needs-assessment surveys are foreseen to enable further improvements in the programme and also to assess the impact of the educational activities on clinical practices and on patient outcomes (*Graphical Abstract*).
- Coordination of the ESC and EAPC educational tools to reinforce the circle of new evidence generated by research; recommendations provided by guidelines; and high-quality training and education for ensuring competency-based, optimized CV prevention.
- Advocacy to co-ordinate and harmonize training programmes at a national and European level.
- Fostering the exchange of trainees and mentors, with a particular focus on the key role of Young Communities across countries.
- Incorporating the voice of the patient. The developing educational programme will integrate the need for shared decision-making and highlight the commitment to patient-centred care. Discussion with patients and the leadership of the ESC Patient Forum will be central in this respect.

Conclusions

Preventive Cardiology has a fundamental role in combatting CVDs and thereby in public health. The central and expanding role of Preventive Cardiology in reducing the burden of CVD and improving the prognosis of our patients will continue to evolve and develop in the coming years. The educational offer to establish a three level–based educational programme will support healthcare professionals, researchers, and physicians to become experts in Preventive Cardiology and beyond. Studying Preventive Cardiology through the EAPC learning programme is encouraged and made easily accessible. The ESC with its large number of members (currently around 100 000) will guarantee the promotion and dissemination of this framework and existing alliances, e.g. with clinics and healthcare centres, which will also generate visibility for instructors. The link to the National Societies of Cardiology and General Practice and to other healthcare professional organizations should be established and reinforced to potentiate dissemination and visibility at the national level in different countries. These national societies and healthcare organizations need to be deeply involved with the target of ensuring, as much as possible, the standardization of CV preventive care. Updated curricula, position papers, guidelines, as well as scientific background of the entire spectrum of cardiology and preventive aspects will be made available by an online learning platform. This introductory document summarizes the principles upon which the new educational programme will be based. The building of a detailed, structured roadmap of the new programme for specialist training and continued education for different levels is ongoing, and will incorporate the outcomes of needs-assessment surveys as well as the patient perspective. Thus, continuous optimization of the education framework is ensured to standardize and optimize the knowledge in Preventive Cardiology across Europe and beyond, and will thereby contribute to the mission of the ESC to reduce the burden of CVDs.

Acknowledgements

The authors thank the following February 2022 breakout sessions' participants: M. Antonopoulou (Greece), M. Bäck (Sweden), M. Bahls (Germany), G. Biondi-Zoccai (Italy), S. Castelletti (Italy), F. D'Ascenzi (Italy), P. Dendale (Belgium), S. Gati (UK), A. Gevaert (Belgium), I. Gibson (Ireland), H. Jorstad (The Netherlands), O. Kopylova (Russian Federation), N. Kränkel (Germany), P. Marques-Vidal (Switzerland), Maria Carmen De Pablo Zarzosa (Spain), R. Pedretti (Italy), Z. Petrulioniene (Lithuania), M. Piepoli (Italy), R. Salvador (Austria), M. Sanz de la Garza (Spain), K. Savonen (Finland), V. Maestrini (Italy), M. Siegrist (Germany), and H. Völler (Germany). The authors also thank Claudia Gross, Technical University of Munich, for intellectual contribution to the document and Maxime Cacciutolo Heidel, EAPC Coordinator, for technical assistance in preparing this document.

Conflict of interest: none declared.

References

1. Halle M, Davos CH, Dendale P, Papadakis M, Pfaff C, Krankel N. Future of preventive cardiology: EAPC vision 2020–22. *Eur J Prev Cardiol* 2021;**28**:356–358.
2. Visseren FLJ, Mach F, Smulders YM, Carballo D, Koskinas KC, Bäck M, *et al.* 2021 ESC guidelines on cardiovascular disease prevention in clinical practice. *Eur Heart J* 2021;**42**:3227–3337.
3. Piepoli MF, Abreu A, Albus C, Ambrosetti M, Brotons C, Catapano AL, *et al.* Update on cardiovascular prevention in clinical practice: a position paper of the European Association of Preventive Cardiology of the European Society of Cardiology. *Eur J Prev Cardiol* 2020;**27**:181–205.
4. De Backer G, Perk J, Wood D, Gielen S, Pelliccia A, Grobbee D, *et al.* A short history of the European Association of Preventive Cardiology (EAPC). *Eur J Prev Cardiol* 2022;**29**:1301–1308.

5. Koskinas KC, Dendale P, Halle M, Caselli S, Cornelissen V, Kavousi M, *et al.* Introducing the new task force on cardiovascular risk factors of the European Association of Preventive Cardiology. *Eur J Prev Cardiol* 2022;**29**:1718–1720.
6. Kotecha D, Bax JJ, Carrera C, Casadei B, Merkely B, Anker SD, *et al.* Roadmap for cardiovascular education across the European Society of Cardiology: inspiring better knowledge and skills, now and for the future. *Eur Heart J* 2019;**40**:1728–1738.
7. Shapiro MD, Maron DJ, Morris PB, Kosiborod M, Sandesara PB, Virani SS, *et al.* Preventive cardiology as a subspecialty of cardiovascular medicine: JACC council perspectives. *J Am Coll Cardiol* 2019;**74**:1926–1942.
8. Bairey Merz CN, Alberts MJ, Balady GJ, Ballantyne CM, Berra K, Black HR, *et al.* ACCF/AHA/ACP 2009 competence and training statement: a curriculum on prevention of cardiovascular disease: a report of the American College of Cardiology Foundation/American Heart Association/American College of Physicians Task Force on Competence and Training. *Circulation* 2009;**120**:e100–e126.
9. Wilhelm M, Abreu A, Adami PE, Ambrosetti M, Antonopoulou M, Biffi A, *et al.* EAPC core curriculum for preventive cardiology. *Eur J Prev Cardiol* 2022;**29**:251–274.
10. Laranjo L, Lanas F, Sun MC, Chen DA, Hynes L, Imran TF, *et al.* World Heart Federation roadmap for secondary prevention of cardiovascular disease: 2023 update. *Glob Heart* 2024;**19**:8.
11. Tanner FC, Brooks N, Fox KF, Goncalves L, Kearney P, Michalis L, *et al.* ESC core curriculum for the cardiologist. *Eur Heart J* 2020;**41**:3605–3692.
12. ESC Subspecialty Curricula. https://www.escardio.org/Education/esc-and-subspecialty-core-curricula (14 January 2024).
13. Neubeck L, Ross C, Jones J, Simpson M, Mindham R, Jaarsma T, *et al.* The core curriculum for cardiovascular nurses and allied professionals. *Eur J Cardiovasc Nurs* 2023;**22**:e62–e113.
14. Riley JP, Astin F, Crespo-Leiro MG, Deaton CM, Kienhorst J, Lambrinou E, *et al.* Heart Failure Association of the European Society of Cardiology heart failure nurse curriculum. *Eur J Heart Fail* 2016;**18**:736–743.
15. Hinterbuchner L, Coelho S, Esteves R, Carson S, Kløvgaard L, Gonçalves L, *et al.* A cardiac catheterisation laboratory core curriculum for the continuing professional development of nurses and allied health professions: developed by the Education working group of the Nurses and Allied Professions Committee for the European Association of Percutaneous Cardiovascular Interventions (EAPCI) 2016. *EuroIntervention* 2017;**12**:2028–2030.
16. Frank JR, Danoff D. The CanMEDS initiative: implementing an outcomes-based framework of physician competencies. *Med Teach* 2007;**29**:642–647.
17. Ten Cate O. Nuts and bolts of entrustable professional activities. *J Grad Med Educ* 2013;**5**:157–158.
18. Garrison DR, Kanuka H. Blended learning: uncovering its transformative potential in higher education. *Internet High Educ* 2004;**7**:95–105.
19. Kwon OY. Flipped learning: an alternative pedagogical approach in the untact age. *J Exerc Rehabil* 2021;**17**:222–225.
20. Lau KHV, Greer DM. Using technology adoption theories to maximize the uptake of E-learning in medical education. *Med Sci Educ* 2022;**32**:545–552.
21. Narang A, Velagapudi P, Rajagopalan B, LeBude B, Kithcart AP, Snipelisky D, *et al.* A new educational framework to improve lifelong learning for cardiologists. *J Am Coll Cardiol* 2018;**71**:454–462.