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Editorial

Subspecialties in Cardiology: areas of specific training

Subespecialidades en Cardiología: las áreas de capacitación específica

Ángel Cequier,[a,◇,*] David Calvo,[b,◇] and Belén Cid[c,◇]

[a] Servicio de Cardiología, Hospital Universitario de Bellvitge, Universidad de Barcelona, Instituto de Investigación Biomédica de Bellvitge (IDIBELL), L'Hospitalet de Llobregat, Barcelona, Spain
[b] Servicio de Cardiología, Instituto de Investigación Cardiovascular, Hospital Universitario Clínico San Carlos, Madrid, Spain
[c] Servicio de Cardiología, Hospital Clínico Universitario, Instituto de Investigación Sanitaria de Santiago de Compostela (IDIS), Santiago de Compostela, A Coruña, Spain

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Cardiovascular diseases have become increasingly prevalent in recent decades due to population aging and advances in therapeutic approaches, including new drugs, more refined devices, and less invasive procedures (eg, percutaneous and/or surgical transcatheter interventions). Due to the growth in the patient population and the expansion of therapeutic options, more complex cardiovascular treatments have been developed, requiring appropriate patient selection and the performance of procedures demanding a high level of competence and skill.

Medical staff must be sufficiently skilled to provide optimal medical care. Competent health care delivery requires appropriate training, effective integration of knowledge, the ability to make recommendations, and the acquisition of a wide range of technical skills. The changes over time in educational standards and in training at the various competence levels have undoubtedly become a constant and widespread part of the diagnosis and management of cardiovascular diseases.

CARDIOLOGY SUBSPECIALTIES IN SPAIN

The possibility of following specialist training in cardiology in Spain by an optional period of subspecialization in cardiac catheterization and electrophysiology was first mooted at the end of the 1990s.[1] Two sections of the Spanish Society of Cardiology (SEC)—the Cardiac Catheterization and Interventional Cardiology section (now the Interventional Cardiology Association) and the Electrophysiology and Arrhythmia section (now the Heart Rhythm Association)—published a series of recommendations for the training of cardiologists wishing to receive training in these fields, together with the criteria for the training centers.[2,3] Due to the difficulty of acquiring these competencies within the cardiology specialty program, both sections developed their own programs for the training of these highly specialized competencies. These programs were based on content already in place in the United States and Canada, took 2 years to complete, and began after residency completion. The sections stipulated that these programs were to be run by accredited centers, within a regularly updated program, and with documentation of all of the activity and training performed in the 2-year period. In the last 2 decades, these programs have trained a large number of specialists in interventional cardiology and cardiac electrophysiology in Spain, and both programs are still operational.[4,5] At the end of these training periods, the SEC awards a certificate that, although not officially recognized, is increasingly considered as an additional criterion in calls for public health care system positions requiring cardiologists with training in high-complexity procedures.

Training programs in other health care fields (acute cardiology care, heart failure, and cardiac imaging)[6,7] have also been established for the progressive acquisition of competencies and skills. However, these programs have not been developed in a structured way, with specific contents, and implementation in accredited centers. Currently, cardiologists with relevant experience in these fields and specific skills can obtain certification from the European Society of Cardiology (ESC) in these fields by undergoing a test of their theoretical knowledge and by submitting a logbook recording the activity performed as part of their training.[8]

CARDIOLOGY SUBSPECIALTIES IN EUROPE

The process for applying for accreditation in various cardiology subspecialties in Europe was begun in 2006. In a position paper, the ESC defined a cardiology subspecialty as a field of knowledge with training and acquired skills in specific high-complexity fields.[9] Subspecialties had to be proposed by experts in working groups or in ESC sections, be acquired after specialization, and taught in accredited training centers.

In 2007, Di Mario et al.,[10] with the participation of a panel of experts, published a common training program for the subspecialty of interventional cardiology to permit its endorsement and promotion by the national cardiology societies in Europe.[10] In 2020, the European Association of Percutaneous Cardiovascular Interventions (EAPCI), a branch of the ESC, proposed an update of the study plan for percutaneous cardiovascular interventions to provide a European consensus definition of the level of experience

* Corresponding autor.
E-mail address: acequier@bellvitgehospital.cat (Á. Cequier).
@AngelCequier
◇ The affiliations of the contributing authors are detailed in Appendix.

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and knowledge in this field.[11] The plan promotes standardized education and training programs among countries as the cornerstone of the new EAPCI certification, which is designed to support the recognition of competencies and facilitate the free movement of certified specialists within the European Union.

In 2009, the European Heart Rhythm Association (EHRA) of the ESC created a program to promote the management of rhythm disturbances as a subspecialty of cardiology among European cardiologists.[12] The design of the EHRA program was based on the program already in place in Spain for the training of electrophysiologists. The new program is still considered valid by the ESC and has a training period of 2 years, to be begun postspecialization.[13]

Despite these initiatives, the implementation of programs in these 2 subspecialties has varied highly among European countries. Currently, 8 European countries have structured training programs for both the interventional cardiology and cardiac electrophysiology subspecialties (Germany, Bulgaria, Spain, France, Hungary, the Netherlands, Poland, and Romania). Two countries have cardiac electrophysiology programs alone (Latvia and the Czech Republic) while 3 have interventional cardiology programs alone (Italy, Portugal, and Sweden).

Progress in potential subspecialties in other fields has been more limited. The ESC has produced a series of documents that, by expert consensus, offers accreditation programs in various health care fields requiring particular training and competency acquisition. Documents are available for acute cardiac care,[14] heart failure,[15] different cardiac imaging modalities (echocardiography, cardiac magnetic resonance, cardiac computed tomography, and nuclear medicine),[16] and cardiovascular prevention.[17] The documents specify theoretical contents, training programs, and/or recommendations for high-complexity health care delivery. The contents of the educational material are standardized and, in general, 2-year programs are recommended with a logbook of the procedures performed and a test at the end of the training period to assess theoretical knowledge and obtain accreditation.

AREAS OF SPECIFIC TRAINING AND SUBSPECIALTY REGULATION IN SPAIN

The recent Spanish Royal Decree 589/2022, issued on July 19, 2022, regulates, among other aspects, the criteria and procedure to enable a field of health care practice to be recognized as an area of specific training (AST).[18] Training in an AST, within one or various health sciences specialties, attempts to respond to advances in scientific and technical knowledge requiring adequate training for the acquisition of highly specialized competencies. The aim is to improve the care of patients with highly complex needs. This legislation regulates entry requirements and training within an AST, with adaptation of the residency training system and avoiding a lack of standardization in medical training and health care. Given the interest and potential impact of this legislation on specific fields in cardiology, the following section and table 1 [18] attempt to summarize the most noteworthy aspects of the criteria and the application procedure, the creation of training programs, the requirements for entry to these programs, and the award of AST diplomas.

Application procedure for the creation of an AST diploma

Applications can be initiated by one or more national commissions for specialties developing fields of knowledge or by the Human Resources Commission of the Spanish National Health System. The Spanish Ministry of Health must approve or reject the application within 6 months. If the application is approved, a regulation will be drafted for the creation of an AST and an AST Committee will be formed, within a maximum of 6 months and comprising 6 board members actively working in the area in question. Board members will be specialists with professional experience in the field of the requested AST and who possess a professional curriculum with advanced qualification in the corresponding area. The AST Committee will propose training contents, the length of the program, and assessment instruments.

If the Ministry of Health rejects the AST application, a new application cannot be made within 5 years of the date of the rejection. In addition, if a specific field of knowledge does not meet the criteria for an AST, successful training in a skill or acquisition of a body of knowledge can be recognized by an Accreditation Diploma or Advanced Accreditation Diploma.[19]

Table 1
Criteria for the proposal of a new area of specific training diploma

1. Deepening of the professional competencies of the specialty
1.1. Development of an advanced level of competencies already included in the specialty of cardiology
1.2. Improvements in health care quality and safety, as long as this level of competence cannot be obtained with another specialty or AST. Nonstandardization of health care must be avoided
1.3. Based on the latest advances and knowledge and justified by scientific and health care evidence
2. Identification of content and competencies
2.1. Advanced-level competencies, with a higher level of specialization, complexity, and depth than required in the cardiology training program
2.2. ACE competencies cannot be exclusively based on a technique, procedure, or single disease
2.3. ACE competencies will not be delimited to a functional area, in contrast to Accreditation or Advanced Accreditation Diplomas
3. Justification of the need for an AST
3.1. Prove its need by at least 7 health departments and its approval by most of them
3.2. Potential number of specialists with an AST appropriate for the needs of the population and with a proportional geographical distribution
3.3. The ACE must have long-term financial viability and guarantee professional practice. It must be in line with European Union legislation
4. Implications for the training program of the specialty of cardiology specialty
4.1. The cardiology specialty program must include sufficient basic competence for a subsequent AST program to allow an applicant to reach the advanced level required
4.2. Training in an AST must be specified and differentiated and must not undermine the training quality of cardiology residents
5. Availability of adequate resources to achieve training
5.1. Existence of a group of specialists with the ability to deliver a program and the structure to guarantee AST training
5.2. Demand, interest, and sufficient resources to establish a critical mass of accredited teaching units with adequate training positions
5.3. Training time for an AST between 20% and 40% (1-2 y) of the duration of the specialty of cardiology

AST, area of specific training.
Adapted from Spanish Royal Decree 589/2022 for Cardiology.[18]

Training program

The official training program of each AST will be proposed by the corresponding AST Committee within 6 months after its constitution and will be approved by the Spanish Ministry of Health. The program will establish the qualitative and quantitative training objectives and the competencies that must be progres-

sively acquired by an applicant, with distinct training itineraries based on the applicant's specialty.

AST training will be conducted by the residency system, and teaching units must meet the accreditation requirements of each area approved by the Ministry of Health and proposed by the AST Committee. Accreditation of the teaching units requires a similar process to that already in place for resident training. The time frame for adjudicating applications for accreditation is 6 months. These teaching units must have at least 1 accredited trainer for each AST trainee. The teaching commissions will comprise an assessment committee for each AST that will conduct the final evaluation. Only candidates who have successfully acquired the AST competencies will receive certification.

Entry requirements for training and the award of an AST diploma

To obtain an AST diploma, candidates must meet the following prerequisites: *a)* be a certified specialist in any of the health sciences specialties covered by the AST; *b)* be awarded an AST training place through calls that will be periodically approved by the Spanish Ministry of Health and which will regulate the characteristics of the selection process for each AST. This process will be based on applicants' professional, teaching, and research curriculum, the selection committee, and other aspects deemed necessary to adjudicate the allocation of training places, which refer to accredited positions and funded positions; and *c)* have met the objectives and acquired the competencies specified in the AST training program and passed the final assessment.

An atypical route is being contemplated to allow the award to AST diplomas for specialists who are able to demonstrate they have acquired the requisite competencies and skills while exercising their profession (for 5 of the previous 7 years after the approval of the Royal Decree). Applications are assessed by the corresponding AST Committee. An AST diploma is a prerequisite to allow the use of the title of specialist in an area of specific training. The AST diploma is officially recognized, is valid throughout Spain, and is issued by the Ministry of Health. To guarantee updating of professional competencies in the corresponding field, specialists with an AST diploma must undergo continuous training and periodically gain reaccreditation of their professional competence.

Training fellowships in centers for health care professionals from outside Spain

The Royal Decree for AST[18] regulates a complex situation that traditionally occurs in many Spanish centers concerning training fellowships for the perfection of skills by certified specialists from countries outside of the European Union. Applicants must be specialists currently practicing in countries that have signed agreements for medical exchange programs. Applicants' specialty certifications do not require convalidation but do require approval by the Spanish Ministry of Health, which will only allow the applicant to complete the training fellowship.

These fellowships will be conducted in training centers or units accredited for the training of specialists, who will be considered as trainees. Their activities will be overseen and supervised by the professionals providing those services in the health care unit. Fellowships are authorized for a maximum of 1 year. The managers or directors of any centers offering training fellowships must verify that the applicants are covered by medical malpractice insurance. At the end of the fellowship, the Ministry of Health will issue an accreditation that cannot be used to acquire Spanish specialty certification or its convalidation.

CONCLUSIONS

Advances in the diagnosis and management of cardiovascular diseases have led to the existence of high-complexity health care situations requiring the performance of procedures demanding high levels of competencies and skills. Competent medical practice requires appropriate training, the integration of a range of knowledge, the ability to make recommendations, and a variety of technical skills. The evolution of educational and training standards and of the different competence levels has become a constant and widespread factor in the diagnosis and management of cardiovascular diseases.

The recently published legislation regulating the proposal for AST, as well as entry requirements and training in ASTs or subspecialties may provide a clear response to advances in scientific and technical understanding requiring adequate training in cardiology. This training is necessary for the acquisition of highly specialized competencies and, ultimately, to improve the care of high-complexity patients.

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APPENDIX. AFFILIATED INSTITUTIONS FOR THE DOCUMENT AUTHORS

Ángel Cequier: National Commission of the Specialty of Cardiology (president); D. Calvo: Heart Rhythm Association of the Spanish Society of Cardiology (president); B. Cid: Interventional Cardiology Association of the Spanish Society of Cardiology (president-elect).

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