



COMMENTARY

## 2020 European Society of Cardiology Core Curriculum for the Cardiologist. Is it time for change in the Portuguese cardiology training program?



### Currículo Europeu de Cardiologia – edição de 2020 Chegou a altura de rever o programa de formação em cardiologia português?

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### The concept of the Core Curriculum and development of the 2020 update

The European Society of Cardiology (ESC) Core Curriculum for the Cardiologist, first published in 2006, followed by revisions in 2008 and 2013, provides a training framework outlining the requirements and clinical competencies necessary to become a certified cardiologist in Europe. It aims at a progressive standardization and harmonization of the content and quality of training in cardiology within the European Union (EU) member States and other European countries. Upon completion of the curriculum, the trainee should be able to act independently as a cardiology expert

in the treatment of cardiovascular (CV) patients, keeping in mind that there are subspecialties within cardiology that require further subspecialty training after certification.

Since 2013, the practice of cardiology has changed substantially; in order to reflect modern cardiology. The 2020 update was a joint effort between the ESC and the European Union of Medical Specialists leading for the first time to a single integrated document. This revision was chaired by Professor Felix C. Tanner (University Heart Center, Zurich, Switzerland), who was given the opportunity to assemble a widely representative task force. It included contributors from the ESC Education Committee and liaison officers of the ESC associations, members of the ESC board and representatives of the ESC Working Groups and of national cardiology societies. Additionally, representatives from the Young Cardiology Community and patients themselves were for the first time involved in this revision and provided different

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and valuable perspectives. All members of the task force had the opportunity to an iterative process contribute along an iterative process which employed online Delphi surveys and in-person discussions and meetings and to review the updated document before its publication, which was simultaneous with its presentation at the ESC Congress 2020.<sup>1,2</sup>

## What is new in the 2020 edition – trust in training

Besides the updated definition of the core areas needed for the practice of Cardiology, one of the main changes in this 2020 curriculum is the implementation of Entrustable Professional Activities (EPAs) to describe clinical competencies. This concept has been increasingly used by medical educators throughout the world and the name arises from the fact that trust is a central aspect of learning. During training, trainees progressively acquire knowledge, skills, and attitudes while, at the same time, trainers develop increasing trust in their trainees. This process is often subconscious, but EPAs make it conscious and formalize it. EPAs are defined as units of professional activity or clinical competence that a trainee can be trusted to perform in a given healthcare context, once an appropriate competence level has been demonstrated.

This 2020 revision is based on ESC clinical practice guidelines and covers the ESC topic list. It comprises 62 EPAs organized in 9 chapters (The Cardiologist in the wider context; Imaging; Coronary artery disease; Valvular heart disease; Rhythm disorders; Heart failure; Acute cardiovascular care; Prevention, rehabilitation, and sports; Cardiac patients in other settings). Each EPA presents clear definitions of knowledge, skills and attitudes needed for its completion, as well as assessment tools and expected levels of competence.

In past versions of the Core Curriculum, a fixed number of investigations and techniques was defined and a trainee had to become competent in each one of them. Nevertheless, there is now much evidence confirming the empirical notion that each trainee requires different amounts of practice to achieve expertise. In other words, the number of times a procedure has been performed is not relevant if the trainee is able to perform it independently. In line with the 2013 ESC Core Curriculum, the 2020 update foregoes this concept of set numbers and focuses on the level of entrustment. While previous versions defined three levels of competence, each of the EPAs and each of the investigations and techniques performed in Cardiology now have five entrustment levels, corresponding to the increasing independence reached by the trainee: observing the activity (level 1), activity performed under direct supervision (level 2), activity performed under indirect supervision (level 3), activity performed with distant supervision (level 4), and being able to perform the activity independently and supervise others (level 5).

Furthermore, the 2020 update integrates the various professional roles of the cardiologist in the clinical context (CanMEDs roles) regarded as necessary to be competent both generally as a cardiologist (first chapter) and specifically in each EPA.

Globally, these changes enable more flexibility in the training and assessment of trainees and focus on skills in a clinical context (Table 1).<sup>1,2</sup>

## Training requirements

The document also updates the requirements for trainees, trainers, training programs and institutions. While the main responsibilities lie with the trainee, trainers should, for example, have their role recognized by national authorities and undertake specific training and continuous professional development in educational supervision and assessment. Training institutions should provide a supportive learning environment, not only through adequate clinical experience but also by allowing each trainee time for scheduled, structured learning.<sup>1</sup>

## Cardiology training in Portugal

The Portuguese Cardiology training program was first published in 1997 and was updated in 2011<sup>3</sup>. Currently, the program consists of one year of General Training, followed by one year of Internal Medicine and General Intensive Care and four years of Cardiology (Table 2).

This training aligns with the 2008 version of the ESC Core Curriculum, particularly regarding the minimum numbers for each technique/exam. The 2013 version was the first not including a minimum or optimal number of procedures to be undertaken, while setting level of competences (I, II or III) for each technique. As stated in the document “the number of procedures engaged by trainees is important but is not in itself a robust measure of competence”.<sup>4</sup> Given that the 2020 update further develops this concept, it is fair to say the Portuguese training program should also be updated.

Nonetheless, the sole published data regarding satisfaction of Cardiology trainees in Portugal reported high levels of expectations achieved with the specialty and that most of the trainees would choose the same specialty again. However, one should take into account that this study is from 2015; only 14% of trainees participated in the survey; and Cardiology was the specialty whose trainees most considered the possibility of emigration.<sup>5</sup>

At present, based on the opinion of many Portuguese Cardiology trainees and trainers, the duration and the minimum numbers defined in many of the rotations are not adequate in view of current practice in Cardiology. Overall, and taking the 2020 ESC Core Curriculum into consideration, the duration of some rotations must be reviewed to fully accomplish the proposed EPAs. The evaluation process at the end of the training program is also up for debate. For example, while other specialties in Portugal have their own evaluation grid, the absence of a strict and objective grid in Cardiology leads to a lack of standardization and doubts regarding inequities among training centers and final evaluations.

According to their electoral agenda, the newly appointed board members of the College of Cardiology of the Portuguese Medical Association aim to soon update the training

**Table 1** CanMed roles and levels of independence for each entrustable professional activities and each investigation, from level 1 to level 5: (1) Observe; (2) Direct supervision; (3) Indirect supervision; (4) Distant supervision; and (5) Able to teach (no supervision). Adapted from reference 2, with permission.

1. The cardiologist in the wider context					
CanMed roles	Medical expert, Communicator, Collaborator, Leader, Health advocate, Scholar, Professional				
EPA	Level of independence				
	1	2	3	4	5
<b>2. Imaging</b>					
2.1. Assess a patient using one or multiple imaging modalities					
2.2. Assess a patient using echocardiography					
2.3. Assess a patient using cardiac magnetic resonance					
2.4. Assess a patient using cardiac computed tomography					
2.5. Assess a patient using nuclear techniques					
<b>3. Coronary artery disease</b>					
3.1. Manage a patient with symptoms suggestive of CAD					
3.2. Manage a patient with acute coronary syndrome					
3.3. Manage a patient with chronic coronary syndrome					
3.4. Assess a patient using coronary angiography					
<b>4. Valvular heart disease</b>					
4.1. Manage a patient with aortic regurgitation					
4.2. Manage a patient with aortic stenosis					
4.3. Manage a patient with mitral regurgitation					
4.4. Manage a patient with mitral stenosis					
4.5. Manage a patient with tricuspid regurgitation					
4.6. Manage a patient with tricuspid stenosis					
4.7. Manage a patient with pulmonary regurgitation					
4.8. Manage a patient with pulmonary stenosis					
4.9. Manage a patient with multivalvular disease					
4.10. Manage a patient with a prosthetic valve					
4.11. Manage a patient with endocarditis					
<b>5. Rhythm disorders</b>					
5.1. Manage a patient with palpitations					
5.2. Manage a patient with transient loss of consciousness					
5.3. Manage a patient with atrial fibrillation					
5.4. Manage a patient with atrial flutter					
5.5. Manage a patient with supraventricular tachycardia					
5.6. Manage a patient with ventricular arrhythmia					
5.7. Manage a patient with bradycardia					
5.8. Manage a patient with a cardiac ion channel dysfunction					
5.9. Manage a patient with a pacemaker					
5.10. Manage a patient with an ICD					
5.11. Manage a patient with a CRT device					
<b>6. Heart failure (HF)</b>					
6.1. Manage a patient with symptoms and signs of HF					
6.2. Manage a patient with HF with reduced ejection fraction					
6.3. Manage a patient with HF with preserved ejection fraction					
6.4. Manage a patient with acute HF					
6.5. Manage a patient with cardiomyopathy					
6.6. Manage a patient with pericardial disease					
6.7. Manage a patient with right heart dysfunction					
6.8. Manage a patient with a cardiac tumor					
6.9. Manage cardiac dysfunction in oncology patients					
<b>7. Acute cardiovascular care</b>					
7.1. Manage a patient with hemodynamic instability					
7.2. Manage a patient with survived cardiac arrest					
7.3. Manage a critically ill cardiac patient					
7.4. Manage a patient after a percutaneous cardiovascular procedure					
7.5. Manage a patient after cardiac surgery					
7.6. Manage end-of-life care in a cardiac patient					
<b>8. Prevention, rehabilitation, sports</b>					
8.1. Manage cardiovascular aspects in an athlete (Sports Cardiology)					
8.2. Manage a patient with arterial hypertension					
8.3. Manage a patient with dyslipidemia					
8.4. Manage cardiovascular aspects in a diabetic patient					
8.5. Manage a cardiac patient in primary prevention					
8.6. Manage a cardiac patient in secondary prevention					
8.7. Prescribe a prevention and rehabilitation program for a CV patient					
<b>9. Cardiac patients in other settings</b>					
9.1. Manage a patient with aortic disease					
9.2. Manage a patient with trauma to the aorta or the heart					
9.3. Manage a patient with peripheral artery disease					
9.4. Manage a patient with thromboembolic venous disease					
9.5. Manage a patient with pulmonary thromboembolism					
9.6. Manage a patient with pulmonary hypertension					
9.7. Manage a patient with adult congenital heart disease					
9.8. Manage a pregnant patient with cardiac symptoms or disease					
9.9. Perform a cardiological consultation					
Investigations	Level of independence				
	1	2	3	4	5
ECG					
Ambulatory ECG					
Exercise ECG testing					
Cardiopulmonary exercise testing					
ABP monitoring					
Transthoracic echocardiography					
Trans-esophageal echocardiography					
Stress echocardiography					
Vascular ultrasound					
Coronary CT					
Cardiac CT					
Cardiac MR					
Nuclear imaging					
Right heart catheterization					
Endomyocardial biopsy					
Coronary angiography					
Percutaneous interventions					
Structural interventions					
Cardiac surgery					
Pacemaker programming					
ICD/CRT programming					
Temporary pacemaker implantation					
Permanent pacemaker implantation					
ICD/CRT implantation					
Electrophysiological studies					
Electrophysiological interventions					
Electrical cardioversion					
Pericardiocentesis					

ABP: ambulatory blood pressure; CAD: coronary artery disease; CT: computerized tomography; CV: cardiovascular; ECG: electrocardiogram; HF: heart failure; ICD/CRT: implantable cardioverter defibrillator/cardiac resynchronization therapy devices; MR: magnetic resonance.

**Table 2** Portuguese Cardiology Training Program.

Rotation	Duration	Minimum numbers
General Training	12 months	-
Internal Medicine	8 months	-
General Intensive Care	3 months	-
Clinical Cardiology	11 months	-
Echocardiography	6 months	350 transthoracic echocardiography exams 50 transesophageal echocardiography exams 20 stress echocardiography exams
ECG and Ambulatory Monitoring	3 months	300 stress ECG tests 200 Holter tests 50 ABPM tests
Cardiac Intensive Care	5 months	-
Interventional Cardiology	5 months	300 diagnostic coronary angiographies 100 interventional procedures
Cardiac Pacing and Electrophysiology	4 months	25 temporary pacemaker implantations 50 permanent pacemaker implantations 20 ICD/CRT implantations 50 pacemaker/ICD programming 50 electrophysiological studies
Nuclear Cardiology, Cardiac MR, and Cardiac CT	3 months	50 nuclear scans 20 cardiac MRI exams 20 cardiac CT exams
Congenital Heart Disease	2 months	-
Cardiac Surgery	2 months	-
Optional Rotation	3 months	-

ABPM: ambulatory blood pressure monitoring; CT: computerized tomography; ECG: electrocardiogram; ICD/CRT: implantable cardioverter defibrillator/cardiac resynchronization therapy devices; MR: magnetic resonance.

program and revise the evaluation method, most certainly using the 2020 ESC Core Curriculum framework.

### Conflicts of interest

Felix C. Tanner and Lino Gonçalves are authors of the ESC Core Curriculum 2020 and Kevin Domingues contributed to its development as a Young Cardiology Community Representative.

Maria João Vidigal Ferreira and Miguel Mendes are members of the board of the College of Cardiology of the Portuguese Medical Association.

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