## Update of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance Certification Exam.

Petersen, SE; Almeida, AG; Alpendurada, F; Boubertakh, R; Bucciarelli-Ducci, C; Cosyns, B; Greil, GF; Karamitsos, TD; Lancellotti, P; Stefanidis, AS; Tann, O; Westwood, M; Plein, S; Education Committee of European Association of Cardiovascular Imaging Association (EACVI)

This is a pre-copyedited, author-produced PDF of an article accepted for publication in European Heart Journal - Cardiovascular Imaging following peer review. The version of record is available online at: http://ehjcimaging.oxfordjournals.org/content/15/7/728.long

For additional information about this publication click this link. http://qmro.qmul.ac.uk/xmlui/handle/123456789/9725

Information about this research object was correct at the time of download; we occasionally make corrections to records, please therefore check the published record when citing. For more information contact scholarlycommunications@qmul.ac.uk

### European Heart Journal - Cardiovascular Imaging

# Update of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance Certification Exam --Manuscript Draft--

| Manuscript Number:                               | EHJCI-D-14-00400  |
|--|---|
| Full Title:                                      | Update of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance Certification Exam  |
| Article Type:                                    | Review  |
| Keywords:  | Education; cardiovascular magnetic resonance, exam, syllabus, certification.  |
| Corresponding Author:                            | Steffen E Petersen, M.D.<br>NIHR Cardiovascular Biomedical Research Unit at Barts<br>London, UNITED KINGDOM   |
| Corresponding Author Secondary<br>Information:   |   |
| Corresponding Author's Institution:              | NIHR Cardiovascular Biomedical Research Unit at Barts   |
| Corresponding Author's Secondary<br>Institution: |   |
| First Author:                                    | Steffen E Petersen, M.D.  |
| First Author Secondary Information:              |   |
| Order of Authors:                                | Steffen E Petersen, M.D.  |
|  | Ana G Almeida, MD   |
|  | Francisco Alpendurada, MD   |
|  | Redha Boubertakh, PhD   |
|  | Chiara Bucciarelli-Ducci, MD  |
|  | Bernard Cosyns, MD  |
|  | Gerald F Greil, MD  |
|  | Theodoros D Karamitsos, MD, DPHIL   |
|  | Patrizio Lancellotti, MD  |
|  | Alexandros S Stefanidis, MD   |
|  | Oliver Tann, MD   |
|  | Mark Westwood, MD   |
|  | Sven Plein, MD,PHD  |
| Order of Authors Secondary Information:          |   |
| Abstract:  | An updated version of the European Association of Cardiovascular Imaging (EACVI)<br>Core Syllabus for the European Cardiovascular Magnetic Resonance (CMR)<br>Certification Exam is now available online. The syllabus lists key elements of<br>knowledge in CMR. It represents a framework for the development of training curricula<br>and provides expected knowledge-based learning outcomes to the CMR trainees, in<br>particular those intending to demonstrate CMR knowledge in the European CMR<br>exam, a core requirement in the CMR certification process. |
|  |   |

# Update of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance Certification Exam

Steffen E Petersen<sup>1</sup>, Ana G Almeida<sup>2</sup>, Francisco Alpendurada<sup>3</sup>, Redha Boubertakh<sup>1</sup>, Chiara Bucciarelli-Ducci<sup>4</sup>, Bernard Cosyns<sup>5</sup> (Chair EACVI Education Committee), Gerald F Greil<sup>6</sup>, Theodoros D Karamitsos<sup>7</sup>, Patrizio Lancellotti<sup>8</sup> (EACVI President), Alexandros S Stefanidis<sup>9</sup> (Chair EACVI Certification Committee), Oliver Tann<sup>10</sup>, Mark Westwood<sup>1</sup>, Sven Plein<sup>11</sup> On behalf of the Education Committee of the European Association of Cardiovascular Imaging Association (EACVI)

#### QR code linking to CMR syllabus:



<sup>1</sup>NIHR Cardiovascular Biomedical Research Unit at Barts, William Harvey Research Institute, Queen Mary University of London, London, EC1M 6BQ, United Kingdom

<sup>2</sup>Cardiology Dept, Non-invasive Cardiac Imaging Unit, University Hospital Santa Maria, Faculty of Medicine of Lisbon University, Lisbon, Portugal <sup>3</sup>NIHR Cardiovascular Biomedical Research Unit, Royal Brompton & Harefield NHS Trust and Imperial College

<sup>4</sup>NIHR Bristol Cardiovascular Biomedical Research Unit, Bristol Heart Institute, University of Bristol, Bristol BS2 8HW, United Kingdom

<sup>5</sup>Cardiology Department, CHIREC, UZ Brussel, ICMI (In vivo cellular and molecular imaging) laboratory, Free University of Brussels, Belgium

<sup>6</sup>Division of Imaging Sciences & Biomedical Engineering; The Rayne Institute, King's College London; St. Thomas' Hospital, London SE1 7EH, United Kingdom

<sup>7</sup>1<sup>st</sup> Department of Cardiology, AHEPA University Hospital, Aristotle University of Thessaloniki, 54636, Thessaloniki, Greece

<sup>8</sup>University of Liège, GIGA Cardiovascular Sciences, Departments of Cardiology, Heart Valve Clinic, CHU Sart Tilman, Liège, Belgium

<sup>9</sup>1<sup>st</sup> Department of Cardiology, Echocardiography, General Hospital of Nikea, Piraeus, Greece

<sup>10</sup>Cardiorespiratory Unit, Great Ormond Street Hospital, Great Ormond Street, London, WC1N 3JH

<sup>11</sup>Multidisciplinary Cardiovascular Research Centre & The Division of Cardiovascular and Diabetes Research, Leeds Institute of Genetics, Health and Therapeutics, University of Leeds, Leeds, LS2 9JT, United Kingdom

#### **Corresponding Author:**

Professor S Petersen, NIHR Cardiovascular Biomedical Resarch Unit at Barts, William Harvey Research Institute, Queen Mary University of London, London, EC1M 6BQ, United Kingdom

## Update of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance Certification Exam

Steffen E Petersen<sup>1</sup>, Ana G Almeida<sup>2</sup>, Francisco Alpendurada<sup>3</sup>, Redha Boubertakh<sup>1</sup>, Chiara Bucciarelli-Ducci<sup>4</sup>, Bernard Cosyns<sup>5</sup> (Chair EACVI Education Committee), Gerald F Greil<sup>6</sup>, Theodoros D Karamitsos<sup>7</sup>, Patrizio Lancellotti<sup>8</sup> (EACVI President), Alexandros S Stefanidis<sup>9</sup> (Chair EACVI Certification Committee), Oliver Tann<sup>10</sup>, Mark Westwood<sup>1</sup>, Sven Plein<sup>11</sup> On behalf of the Education Committee of the European Association of Cardiovascular Imaging Association (EACVI)

#### QR code linking to CMR syllabus:



<sup>1</sup>NIHR Cardiovascular Biomedical Research Unit at Barts, William Harvey Research Institute, Queen Mary University of London, London, EC1M 6BQ, United Kingdom

<sup>2</sup>Cardiology Dept, Non-invasive Cardiac Imaging Unit, University Hospital Santa Maria, Faculty of Medicine of Lisbon University, Lisbon, Portugal <sup>3</sup>NIHR Cardiovascular Biomedical Research Unit, Royal Brompton & Harefield NHS Trust and Imperial College

<sup>4</sup>NIHR Bristol Cardiovascular Biomedical Research Unit, Bristol Heart Institute, University of Bristol, Bristol BS2 8HW, United Kingdom

<sup>5</sup>Cardiology Department, CHIREC, UZ Brussel, ICMI (In vivo cellular and molecular imaging) laboratory, Free University of Brussels, Belgium

<sup>6</sup>Division of Imaging Sciences & Biomedical Engineering; The Rayne Institute, King's College London; St. Thomas' Hospital, London SE1 7EH, United Kingdom

<sup>7</sup>1<sup>st</sup> Department of Cardiology, AHEPA University Hospital, Aristotle University of Thessaloniki, 54636, Thessaloniki, Greece

<sup>8</sup>University of Liège, GIGA Cardiovascular Sciences, Departments of Cardiology, Heart Valve Clinic, CHU Sart Tilman, Liège, Belgium

<sup>9</sup>1<sup>st</sup> Department of Cardiology, Echocardiography, General Hospital of Nikea, Piraeus, Greece

<sup>10</sup>Cardiorespiratory Unit, Great Ormond Street Hospital, Great Ormond Street, London, WC1N 3JH

<sup>11</sup>Multidisciplinary Cardiovascular Research Centre & The Division of Cardiovascular and Diabetes Research, Leeds Institute of Genetics, Health and Therapeutics, University of Leeds, Leeds, LS2 9JT, United Kingdom

#### **Corresponding Author:**

Professor S Petersen, NIHR Cardiovascular Biomedical Resarch Unit at Barts, William Harvey Research Institute, Queen Mary University of London, London, EC1M 6BQ, United Kingdom

#### Abstract

An updated version of the European Association of Cardiovascular Imaging (EACVI) Core Syllabus for the European Cardiovascular Magnetic Resonance (CMR) Certification Exam is now available online. The syllabus lists key elements of knowledge in CMR. It represents a framework for the development of training curricula and provides expected knowledge-based learning outcomes to the CMR trainees, in particular those intending to demonstrate CMR knowledge in the European CMR exam, a core requirement in the CMR certification process.

#### Introduction

Cardiovascular magnetic resonance (CMR) has become an established imaging modality, which often provides unique information on a wide range of cardiovascular diseases. The CMR Section of the European Association of Cardiovascular Imaging (EACVI), the former European Society of Cardiology (ESC) Working Group on Cardiovascular Magnetic Resonance, offers a process for certification of individuals in CMR (1). The aim of this process is to set a European standard for competency in the practice of CMR for the benefit of patients undergoing CMR studies. Competency requires knowledge, skills and an appropriate professional attitude. CMR knowledge is tested in the European CMR exam organised by the EACVI Section CMR and is coordinated and supervised by the European CMR Exam Board. The exam tests CMR knowledge, which is only one aspect of the competency requirements for CMR certification; skills and professional attitude are established using other means, such as CMR reporting logbooks and reference letters. To provide exam candidates with learning objectives and an expected knowledge base, a detailed CMR syllabus had been developed by the European CMR Exam Board and made available online in 2011. This CMR syllabus has now been updated and re-structured to align in form and scope with the Echocardiography Core Syllabus of the EACVI (http://www.escardio.org/communities/EACVI/education/Pages/core-syllabusecho.aspx)(2). This new EACVI Core Syllabus for European Cardiovascular Magnetic Resonance Certification Exam is now available online

3

(http://www.escardio.org/communities/EACVI/education/Pages/core-syllabuscmr.aspx).

#### Scope of the CMR Certification Exam Syllabus

The purpose of the CMR Certification Exam syllabus in conjunction with the Echocardiography Core Syllabus and others that may follow is to encourage homogeneous cardiovascular imaging education and structured certification in Europe (1,3-5). It provides a core knowledge summary for cardiology trainees, cardiologists and professionals with an interest in CMR. The syllabus can serve as a guide for developing educational material and educational course content. Trainees may use the CMR syllabus to guide their preparation for knowledge-based assessments (in particular the European CMR Exam). Level 2 and level 3 CMR certified practitioners might identify topics in which they would benefit from Continuous Medical Education (CME). Harmonized imaging education and assessment facilitates the delivery of standardised high quality cardiac imaging which in turn leads to improved diagnosis and management of cardiovascular disease across Europe.

#### Use of the Core Syllabus within the EACVI activities

The role of the EACVI is to provide guidance, to facilitate harmonisation of cardiac imaging practice standards, to define knowledge requirements and to promote education. The EACVI is a world leader in education, providing high-quality educational opportunities through congresses, teaching courses, journals, website, books, recommendations and position papers, slide-sets, and other tangible educational materials. The EACVI CMR Certification Exam Syllabus will be used to standardise the content of these educational opportunities and of the educational activities organised by the EACVI in collaboration with National Societies and National Working Groups. The EACVI values the contribution of National Societies and Working Groups in educational activities. The new EACVI CMR Certification Exam Syllabus will be used to update the ESC Core Syllabus and Core Curriculum in clinical cardiology. Furthermore, the document will represent the foundation of collaboration between the EACVI Education Committee, the EACVI Board

and the ESC Education Committee in awarding adequate Continuous Medical Education (CME) credits to educational activities run throughout Europe.

#### Perspectives

The syllabus will become the reference outline for all teaching materials and courses in CMR throughout Europe. It will represent the foundation of the new European electronic education platform (ESCel). The EACVI will ensure that the syllabus will be kept updated ensuring advances in the field of CMR are incorporated. The CMR Certification Exam Syllabus is aligned with the Echocardiography Core Syllabus of the EACVI (2). It is expected that the other cardiac imaging modalities will follow suit in due course. The aim is to create a complete Cardiovascular Imaging Core Syllabus.

#### Funding

None.

#### References

- Plein S, Schulz-Menger J, Almeida A, Mahrholdt H, Rademakers F, Pennell D, Nagel E, Schwitter J, Lombardi M, on behalf of the Working Group on Cardiovascular Magnetic Resonance of the European Society of Cardiology. Training and accreditation in cardiovascular magnetic resonance in Europe: a position statement of the working group on cardiovascular magnetic resonance of the European Society of Cardiology. *Eur Heart J.* 2011;**32**:793–798.
- Cosyns B, Garbi M, Separovic J, Pasquet A, Lancellotti P, Education Committee of the European Association of Cardiovascular Imaging Association (EACVI). Update of the echocardiography core syllabus of the European Association of Cardiovascular Imaging (EACVI). *European Heart Journal - Cardiovascular Imaging*. Oxford University Press; 2013;14:837–839.
- Lopez-Sendon J, Mills P, Weber H, Michels R, Di Mario C, Filippatos GS, Heras M, Fox K, Merino J, Pennell DJ, Sochor H, Ortoli J, European Board for the Speciality of Cardiology, Szatmari A, Pinto F, Amlie JP, Oto A, Lainscak M, Fox K, Kearney P, Gonçalves L, Huikuri H, Carrera C. Recommendations on sub-speciality accreditation in cardiology: The Coordination Task Force on Sub-speciality Accreditation of the European Board for the Speciality of Cardiology. Eur Heart J. Oxford University Press; 2007. p. 2163–2171.

- Fox KF, Popescu BA, Janiszewski S, Nihoyannopoulos P, Fraser AG, Pinto FJ, European Association of Echocardiography Accreditation Assessment Committee. Report on the European Association of Echocardiography accreditations in echocardiography: December 2003-September 2006. *Eur J Echocardiogr*. Oxford University Press; 2007;8:74–79.
- Popescu BA, Stefanidis A, Nihoyannopoulos P, Fox KF, Ray S, Cardim N, Rigo F, Badano LP, Fraser AG, Pinto F, Zamorano JL, Habib G, Maurer G, Lancellotti P, Document reviewers: Maria Joao Andrade, Erwan Donal, Thor Edvardsen, Albert Varga. Updated standards and processes for accreditation of echocardiographic laboratories from The European Association of Cardiovascular Imaging. *European Heart Journal -Cardiovascular Imaging*. Oxford University Press; 2014;:jeu039.

705 words