European Examination in Core Cardiology (APSC Exit Examination)

Jack WC Tan,1,2,3 Jonathan Yap,1,2 Khung Keong Yeo,1,2 Derek P Chew,4 Alan Yean Yip Fong,5,6 Caitlyn Tan,1 Abdul Shehab,8 Nguyen Ngoc Quang,9 Terrence Chua,1 Clive Lawson,10 Danny Mathysen,1,12 Stephanie Thibaut,13 Wael Al Mahmeed14 and Chris Plummer15

1. Department of Cardiology, National Heart Centre Singapore; 2. Duke-NUS Medical School, Singapore; 3. Department of Cardiology, Sengkang General Hospital, Singapore; 4. Department of Cardiology, Flinders University College of Medicine and Public Health, Adelaide, Australia; 5. Department of Cardiology, Sarawak Heart Centre, Kota Samarahan, Sarawak, Malaysia; 6. Faculty of Medicine and Health Sciences, University Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia; 7. National University of Singapore Yong Loo Lin School of Medicine, Singapore; 8. College of Medicine and Health Sciences, UAE University, Al Ain, United Arab Emirates; 9. Department of Cardiology, Hanoi Medical University, Hanoi, Vietnam; 10. Department of Cardiology, Maidstone and Tunbridge Wells NHS Trust, Maidstone, UK; 11. Department of Ophthalmology, Antwerp University Hospital, Edegem, Belgium; 12. Faculty of Medicine and Health Sciences, University of Antwerp, Wilrijk (Antwerp), Belgium; 13. European Society of Cardiology (ESC), Biot, France; 14. Heart and Vascular Institute, Cleveland Clinic, Abu Dhabi, United Arab Emirates; 15. Department of Cardiology, Freeman Hospital, The Newcastle upon Tyne Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK

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The European Examination in Core Cardiology (EECC), known as the European Examination in General Cardiology prior to 2020, is a joint venture between the European Society of Cardiology (ESC), the Union of European Medical Specialists Cardiology Section and participating national cardiac societies. The EECC is also supported by independent academic oversight.¹

In 2012, the ESC launched the first pilot examination with 80 volunteers from Ireland, the Netherlands, Portugal, Spain and UK; since 2013, there have been annual sittings of the European Examination in General Cardiology/EECC with the participation of the ESC National Cardiac Societies network.

The purpose of the examination is to provide a broad, balanced and up-to-date test of the core knowledge required by cardiology specialty trainees for independent practice.¹

The examination assesses knowledge from current evidence-based guidelines and published research, and has recently been aligned with the ESC Core Curriculum for the Cardiologist, published in 2020.² The examination is intended to complement workplace-based assessments as part of a comprehensive cardiology training programme, as well as to facilitate progressive improvement and harmonisation of cardiology training and clinical practice.¹ Participating cardiac national societies use the EECC in different ways to support the medical education of cardiology trainees in their country. Trainees are advised to take the EECC once they have completed core training, so that unsuccessful candidates may have the opportunity to re-sit the examination before the end of their overall training.¹

The Asian Pacific Society of Cardiology (APSC) is an umbrella organisation representing 22 cardiology societies in the Asia–Pacific region.³ Due to the heterogeneity of the region, the completion of cardiology training and entry into continuous professional development varies across the region. There is no uniform cardiology subspecialty training, and no uniform exit examination to assess the core cardiology knowledge of trainees.
In 2020, the APSC approached the ESC to pilot the EECC, and to determine how the APSC could participate and support the deployment of the examination and its administration in the region for cardiac societies that are part of the APSC but may not be able to join the EECC on their own. Examinees from member countries of the APSC are nominated to take the same EECC examination as their Western counterparts. The examinees are advised to take the examination anytime within 6 months before to 6 months after their own country’s general cardiology exit examination.

In this article we describe the development and administration of the pilot EECC (APSC Exit Examination). The examination results of the APSC examinees over the first 3 years of implementation will be published in a future paper. This analysis is intended to benchmark the knowledge of cardiology trainees as part of the evaluation of the quality of training in the region and to guide future plans for the improvement and harmonisation of cardiology training.

**Methodology**

**Examination Development**

Every year, the writing of the EECC (APSC Exit Examination) starts with question writing meetings in August of the preceding year (August 2019 for the first pilot examination) and the following January (Figure 1). The examination questions are written and edited by groups of cardiologists representing their national cardiology societies and the APSC, all of whom come from all subspecialties within cardiology. The examination questions test knowledge that is mapped to the ESC core curriculum, in line with current guidelines and published clinical studies. The questions cover the following four sections:

- imaging and valvular heart disease;
- rhythm disorders;
- coronary artery disease, acute cardiovascular care, prevention, rehabilitation and sports; and
- heart failure and cardiac patients in other settings.

Each question comprises a short clinical scenario and a single multiple-choice question with five possible answers shown in alphabetical order (Table 1). A board meeting is held in January of the examination year to review the policies and procedures for the examination and, in February, cardiologists select 120 questions across all 62 topics of the core curriculum (30 questions from each examination section). Seventy per cent of the selected questions are text only and 30% contain a still image or short video clip.

After all 120 questions have been chosen, a standard-setting group reviews each question using a modified Angoff method to estimate the probability that a candidate who would just pass the examination will select the correct answer, and these assessments are used to inform the final pass mark. In May, all questions for the final examination are reviewed by the examination board chair and the chair of the standard-setting group to ensure that there are no errors before the examination is held in June.

**Examination Delivery and Pass Mark Determination**

Countries participating in the EECC register in September in the year preceding the examination and need to start registering their candidates in November. The ESC manages all confirmations and instructions to the candidates up to the delivery, in June, of the 3-h online examination with remote proctoring.

After the examination, the performance of each question is reviewed. Questions where <30% or >90% of candidates answered correctly, or those where there was a negative correlation with candidates’ performance in the overall examination are reviewed by representatives of participating national societies. This is to ensure that the answer key was correct, that the question was not misleading and that the question tested an important point of cardiology knowledge. Any question that does not pass this assessment is excluded from the examination (historically, the number of questions excluded has been very low due to the robust quality assurance methods used in question development).

The marks are then given to the independent psychometrician and the EECC board to determine the pass mark. Using the Hofstee method, the...
Table 1: Example Question

A 42-year-old man was admitted to the Emergency Department with a 60-min history of central chest pain. He had no significant past medical history and no abnormal physical signs. His ECG showed 3 mm ST-elevation in V2–V6, I and aVL. He was given analgesia, 300 mg of aspirin and 180 mg of ticagrelor. There were no on-site facilities for PCI, so emergency transfer was arranged to the regional heart attack centre with an expected transfer time of 130 min.

What is the most appropriate additional treatment prior to transfer?
A: Bivalirudin
B: Full-dose fibrinolysis
C: Glycoprotein IIb/IIIa receptor antagonist
D: Glycoprotein IIb/IIIa receptor antagonist plus half-dose fibrinolysis
E: Half-dose fibrinolysis

Correct answer: B: Full-dose fibrinolysis

aVL = augmented vector left; PCI = percutaneous coronary intervention.

Pass mark is expected to fall in the rectangle formed on a graph of pass rate (percentage of candidates passing the examination) against pass mark (the percentage of questions answered correctly for a candidate to pass), bounded by the expected pass rates of 75–95%, and 2SDs around the mean expected pass mark determined by the standard-setting group. The final pass mark is the x-coordinate at the intersection between the diagonal across the rectangle and the plot of the candidates’ performance (Figure 2).

Conclusion

The APSC pilot with the EECC is an opportunity to evaluate the core cardiology knowledge of trainees as part of the evaluation of the quality of training in the Asia–Pacific region, and is a starting point in harmonising the practice of evidence-based clinical cardiology among APSC member countries. The EECC examination is conducted to international standards and established standard-setting methodologies to ensure the validity of results in testing core cardiology knowledge. The methodology described in this article may be used for reference by future examinees, as well as cardiology trainers in the Asia–Pacific region.

References