European Certificate in Medical Genetics and Genomics (ECMGG)*

UEMS† Section of Medical Genetics (UEMS-SMG)

in collaboration with

the Branch of Medical Geneticists of the European Board for Medical Genetics (EBMG-BMG)

& the European Society of Human Genetics (ESHG)

October 2022

The Rules, Description and Protocol of the

ECMGG Examination 2023 (Online)

* *The specialty has different names in different countries, see EU document (EU) 2016/790, January 13 2016, and changes in attachment V, Directive 2005/36/EG. In this document, the specialty may also be referred to as 'Clinical Genetics'.*

† *Union Européenne des Médecins Spécialistes (European Union of Medical Specialists)*

CONTENTS

1. GENERAL BACKGROUND

1.1 The European Certificate in Medical Genetics and Genomics (ECMGG), formerly a Diploma in 2019 (EDMGG), is a joint development of the UEMS Section of Medical Genetics (UEMS-SMG) and the European Board for Medical Genetics (EBMG), Branch of Medical Geneticists (BMG). It is intended to be the main knowledge-based assessment tool for Clinical/Medical Genetics and Genomics training in Europe, with the aim of establishing standards in the specialty to world class levels throughout all European countries.

1.2 The examination is overseen and supervised by the Examination Committee for the ECMGG of the UEMS-SMG and EBMG-BMG, and is also observed by representative(s) of the European Society of Human Genetics (ESHG). The EBMG is the umbrella organization in Europe concerned with professional standards relating to the disciplines that jointly deliver medical genetic services throughout Europe, namely Medical Genetics and Genomics, Genetic Nurse counselling, and Clinical Laboratory Genetics. The examination is also open to observation by central UEMS officials as appropriate.

1.3 The ECMGG 2023 is a two-part examination; it is scheduled for **April 28th, 2023** for the **Multiple-Choice Question (MCQ)** part, and for **June 19th, 2023** for the 2nd part, the **Structured Oral Assessment (SOA)**. The ECMGG is open to candidates worldwide, including trainees and fully trained Medical Geneticists, but for logistic reasons, candidate numbers will be provisionally limited to **60**. Registration for the ECMGG 2023 will open November 1st, 2022 and will close January 31st, 2023 (https://www.uems-ecmgg.org/Apply.html). Candidates *must* be medical graduates to sit the ECMGG, i.e. it is not open to non-medical geneticists.

1.4 No post-nominals are awarded with the ECMGG but the certification is valid for life. It will be valid for practice only in countries where it is ratified and recognized as an official certificate for this purpose.

1.5 The UEMS promotes continuing good medical practice through Continuing Medical Education and Continuing Professional Development (CME/CPD) systems and certification. This is strongly recommended for active practitioners; indeed, in many countries it is mandatory through official bodies at national level, usually conducted by a recurring process of record review and appraisal.

2. WHY TAKE A EUROPEAN EXAMINATION IN MEDICAL GENETICS AND GENOMICS?

2.1 The UEMS is striving to harmonize higher medical training across the nations of Europe in order to raise standards to world-class levels equitably across its member states, and indeed beyond. This, in turn, is aimed at translation into the highest standards of health care service delivery equitably across European nation states.

2.2 In the field of Clinical / Medical / Human Genetics and Genomics, the ECMGG thus represents a significant step towards the raising of standards in this specialty across Europe, with the improvement and equitable provision of services that are currently very varied across Europe. It is anticipated this will contribute to the global mobility of specialists in Clinical / Medical / Human Genetics and Genomics.

2.3 To achieve a 'Pass' in the ECMGG examination is an indication that the candidate has a suitable knowledge base to practice as a Medical Geneticist. However, certification at this level does not in itself equate to having sufficient competences and/or experience to practice Medical Genetics at senior (Consultant) level. Appointment at senior level is subject to formal criteria, established by each nation's official medical regulatory authorities, which may or may not include recognition of the ECMGG.

2.4 Recognition of the ECMGG throughout European nations will be sought by the UEMS and the EBMG, something that has already been achieved for several other medical specialties with respect to equivalent European-wide examinations. The aim is that certification will form a significant part of the candidate's fitness to practice, wherever they seek employment, recognizing that it is primarily the knowledge base that is being assessed. Indeed, it is intended to be a mark of excellence in knowledge.

2.5 Taking and passing the examination should be an indication of commitment to life-long learning, combined with a continuing record of CME. Skills (*or* competences) and attitudes (*or* professionalism), the other essential components and qualities for fully trained practitioners, can only be adequately assessed through continuous clinic-based supervision and evaluation, together with evidence of ability to work collaboratively in teams. The oral part of this examination aims to partially assess some of these skills and attitudes.

3. ELIGIBILITY CRITERIA (ECMGG)

3.1 The examination has been designed to be suitable for trainees in the late stages of their training, i.e. in the year prior to being appointed as a fully trained Medical Geneticist. However, anyone with a *bona fide* medical qualification may take the exam subject to payment of the Admission (examination) Fee. Therefore, individuals are eligible to sit the ECMGG examination if they have a medical qualification (MD, or in some countries MB ChB/BS).

3.2 Proof of eligibility must be provided with the application by attachment of a notarized copy of the candidate's medical qualification (or specialist diploma / certificate in the case of senior doctors). On the day of the examination, only personal documents with photographic identification are required (e.g. passport or national identification card).

3.3 Any individual found to be canvassing Examination Committee members for confidential information relating to any aspect of the examination will be disqualified from sitting the examination, and may forfeit their Admission Fee if this has already been paid.

3.4 Any individual who has received the ECMGG Certificate but was found to have used any unfair means to achieve their result will have their certificate revoked.

4. APPLICATION FOR THE EXAMINATION

4.1 When applying to sit the ECMGG, candidates will declare their consent to taking the examination in the established format and structure, and acknowledge that cancellations are only possible in accordance with the rulings of the cancellation policy.

4.2 An application form must be completed and submitted by **January 31st, 2023**. For logistic reasons the number of candidates for the ECMGG 2023 will provisionally be limited to **60**, and if necessary, priority will be given to candidates from European nations.

4.3 **Important:** Personal details must be correctly submitted, including full name, as the data requested will be used for the certificates. The Admission Fee in Euros and contact details for informing about the result must accompany the application. A notarized (scanned or photographed) copy of the candidate's medical qualification should be sent as early as possible, and no later than February 6th, 2023. Receipt of the medical qualification will be acknowledged and the candidate informed after it has been checked (if the medical qualification is written in a language not known to the review team, the candidate may be asked to provide a notarized translation). The Admission Fee has to be paid by bank transfer (see bank details below), as payment by credit card is not possible. The Admission Fee from all candidates must be received by February 28th, 2023. The date of transfer of the fee to the UEMS Section of Medical Genetics bank account will serve as the application date. Candidates from countries whose currency is not the EURO *must* pay the currency exchange fee in addition to the Admission Fee.

4.4 The bank details are as follows:

Account name:	UEMS /S. CLINICAL GENETICS
Account number:	001-6762413-37
IBAN code:	BE35 0016 7624 1337
BIC code:	GEBABEBB
Bank address:	BNP Paribas Fortis
	Montagne du Parc 3
	1000 Brussels

4.5 In order to comply with Belgian Law, please follow this procedure regarding the title of transfer:

i. Please include the title of transfer:

"EXAM – THE NAME OF EXAMINEE / CANDIDATE – COUNTRY"

ii. Please do not refer to 'payment' or 'invoice'

4.6 For registered candidates who have paid their Admission Fee, more details about the online process and procedure will be sent in the weeks prior to the exam and a briefing with the necessary technical details for each part of the examination will be scheduled.

4.7. For candidates who have paid their Admission Fee and are registered, an invoice will be available upon request.

5. EXAMINATION ADMISSION FEE (EUROs):

5.1 The Admission Fee is given below. It applies for 2023 and will be reviewed annually. Additional fees may apply in the event of irregularities that require further administrative work.

5.2 The Admission Fee includes the fees for both parts of the ECMGG, i.e. the written (MCQ) and the oral (SOA) part. The fee has to be fully paid by all candidates, including those who do not proceed to the oral part.

5.3 In the event of cancellations prior to 28 days preceding the first part of the examination, an application for a subsequent examination will be possible for the same fee. Cancellations less than 28 days prior to the examination (i.e. after **March 31st, 2023**) will not qualify for the same fee at a subsequent sitting (see also para 7.7).

5.4 Examination Admission Fee for 2023: **600 €**

6. THE EXAMINATION STRUCTURE AND CONTENT

6.1 The examination is primarily a knowledge-based assessment, based on the European Training Requirement (ETR) curriculum and syllabus for Clinical/Medical Genetics and Genomics (https://www.uems-ecmgg.org/Moreinfo.html), but also seeks to partially assess skills (competencies) and attitudes (professionalism) relevant for Clinical/Medical Genetics and Genomics in respect of clinical reasoning, problem-solving, communication, and ethics. This is consistent with the roles promoted by UEMS, namely Medical Expert, Communicator, Scholar, Health Advocate, and Professional.

6.2 The examination will consist of two distinct parts: a **Multiple-Choice Questions** (MCQ) part and a **Structured Oral Assessments** (SOA) part. The **MCQ part** will be delivered virtually on **April 28th, 2023**, in partnership with a commercial company (CYIM, France) which will provide online live proctoring via a commercial provider (ProctorU). The **SOA part** of the exam will also take place virtually on **June 19th, 2023**, via CYIM.

6.3 Candidates *must* pass the MCQ part in order to advance to the SOA part of the exam. Literature resources and access to the internet will neither be permitted nor provided for any part of the examination.

6.4 The language of both parts of the examination is *English*.

6.5 **MCQ part: 110 multiple-choice questions; time allowed: 2¾ hours (165 minutes)**

i. 110 individual questions will test knowledge based on the UEMS SMG-Guidelines and the Syllabus in Clinical/Medical Genetics and Genomics (https://www.uems-ecmgg.org/Moreinfo.html). The questions are written, rigorously reviewed, and selected by the Examination Committee. They are then assessed by a panel of independent reviewers before being included in the final version of the examination paper. In this way, *standard setting* of the MCQs will have been undertaken according to the Angoff rank ordering method.

ii. It is intended that candidates take the examination from any private location using a computer with a reliable connection to internet. It is each candidate's responsibility to provide their own computer and identify a location with reliable internet access and

secure connection. For technical reasons it is strongly discouraged to use hospital or institutional internal networks.

iii. During the weeks prior to the MCQ part, the opportunity for technical checks for each candidate and information about the process of the exam will be provided, in cooperation with the commercial provider.

iv. The format of the MCQs is a brief *scenario* (usually *clinical*), with or without *investigations* (*data, test results*), followed by the *question*. Five possible answers are provided, one of which is the *best correct answer*. The answers appear in alphabetical or logical order in all questions.

v. Some answer options are definitely wrong whilst some are correct but not as good as the best correct one.

vi. The candidate should therefore select *one of the five answers* that they consider the *best correct answer*. It will not be possible to select more than one answer. There is no penalty (negative mark) for a wrong answer.

vii. The outcomes of the MCQ part will be subjected to rigorous statistical analysis in parallel with the Angoff analysis undertaken as part of the standard setting process. The results of the MCQ part of the exam will be finally adopted at an Examination Board Meeting within 3 weeks of the sitting.

viii. An anonymised online survey is sent out to candidates within a week of the MCQ part of the exam in order to collect feedback on the process.

ix. Candidates will be notified of the outcome of the MCQ exam within 3 weeks of the sitting. The candidate's percentage achieved, and the percentage required to advance to the SOA part of the exam, will be given with the notification.

x. Here is a sample question, and more sample questions are available at:
hhttps://uems-genetics.org/Exam.html and
https://www.uems-ecmgg.org/Examination.html

#	A newborn boy has Down syndrome.		
	What is the most likely genetic basis of Down syndrome?		
	a.	47,XXY	
	b.	Deletion 7q11.32	
	c.	Pathogenic variant in *CDH7*	
	d.	Trisomy 21	✓
	e.	Unbalanced Robertsonian translocation 14:21	

6.6 **SOA part: 6 stations; 10 minutes per station**

i. Only candidates who pass the MCQ part will advance to the SOA part of the exam.

ii. The SOA scenarios and questions are written, rigorously reviewed, and selected by the Examination Committee. *Standard setting* of the SOA part of the exam will be undertaken according to statistical methods, e.g. the Hofstee method.

iii. The SOA part of the exam will be conducted in *English*. The examiners are all aware that competence in the English language varies between candidates and proficiency in English is not part of the assessment. Allowance will be made for different levels of English and every effort will be made to minimise language difficulties for candidates.

iv. It is each candidate's responsibility to provide their own computer and identify a location with reliable internet access and secure connection (as provided by CYIM). For technical reasons it is strongly discouraged to use hospital or institutional internal networks.

v. The SOA part of the exam consists of 6 OSCE (Objective Structured Clinical Examination)-style stations to be visited by all candidates. At each station, the candidate will be shown a screen describing a clinical case. This will be one page that may contain a clinical scenario, family tree, and/or genetic test results. The candidate will be invited to read the clinical scenario over a period of 2 minutes. They will then be asked a standardized set of questions over 8 minutes. After a brief pause, the candidates will move to the next station.

vi. Each station will have 3 questions testing each of the following 3 domains: (a) Application of Genetic Principles; (b) Clinical Communication and Counselling Skills; and (c) Clinical, Ethical, and Legal Aspects.

vii. Each station will have 2 examiners, who may be external examiners or members of the Examination Committee. In addition, an observer may be present who does not interfere with the examination process.

viii. Each candidate will be asked the standardized set of questions by one examiner while the other examiner takes notes. The two examiners will independently score the candidate on each of the 3 domains, on a 4-point scale: (4) Clear Pass; (3) Borderline Pass; (2) Borderline Fail; and (1) Clear Fail; this generates 6 data points per candidate per station.

The following grid describes the marking system and the domains to be assessed:

Candidate #	**Mark**	**(a)** **Application of Genetic Principles**	**(b)** **Clinical Communication and Counselling Skills**	**(c)** **Clinical, Ethical, and Legal Aspects**
Clear Pass	**4**			
Borderline Pass	**3**			
Borderline Fail	**2**			
Clear Fail	**1**			

ix. The aims of the SOA format are to standardise the oral assessment process and minimize presentation differences between candidates.

x. The outcomes of the SOA part of the exam will be subjected to statistical analysis.

xi. An anonymised online survey is sent out to candidates within a week of the SOA part of the exam to collect feedback on the process.

xi. Candidates will be notified of their result within 3 weeks of the exam sitting.

xii. An example scenario and questions will be available at:

https://uems-genetics.org/Exam.html and
https://www.uems-ecmgg.org/Examination.html

7. EXAMINATION OUTCOME

7.1 In registering for the examination the candidate accepts that the result of the examination is final. A legal debate on the final decision is not possible.

7.2 The pass mark will be calculated with help of an Angoff rank ordering evaluation as a control measurement, and other statistical methods provided by a professional statistician with experience in examination methodology and analysis.

7.3 External, independent assessors may be appointed by the Examination Committee to advise and oversee fairness in the final allocation of marks.

7.4 In order to achieve an overall pass, candidates should achieve a 'Pass' in both parts of the examination.

7.5 Some feedback will be available for unsuccessful candidates. Appealing the final decision is discouraged.

7.6 If a candidate does not achieve the pass mark, they may re-sit the examination at a later date, subject to payment of the corresponding Admission Fee. If a 'Pass' is only achieved in the MCQ paper but not the SOA exam, both parts of the examination will have to be taken in a following sitting.

7.7 If a candidate falls ill for one or both parts of the examination, a medical attestation is expected. In case of a medical attestation, the candidate will be permitted to carry over the payed admission fee to a following sitting of the examination.

7.8 Successful candidates will be issued with a physical (paper) certificate to mark their achievement. Their names and nationality will be added to UEMS-SMG website (subject to permission that will be requested at registration).

8. THE EXAMINATION COMMITTEE (EC)

8.1 The remit of the EC is to design the examination, write, review and select questions, establish a standard setting process and quality control measures, identify independent assessors and examiners, and organize the examination.

8.2 The EC organizes the question-writing examination group, which comprises ≈21 individuals (https://uems-genetics.org/ExaminationGroup.html and https://www.uems-ecmgg.org/Moreinfo.html), many of whom are National Delegates to the UEMS Section of Medical Genetics. Some members have been invited to join because of their acknowledged expertise in examination methodology. At the time of writing, 15 European nations are represented on the group, covering all regions of Europe. The large majority of members are experienced Medical Geneticists, and in addition the committee accommodates high achieving, committed colleagues who have recently completed their training.

8.3 The EC writes MCQs and constructs SOAs for the ECMGG, and edits MCQs submitted voluntarily from other sources.

8.4 All members of the EC have pledged strict confidentiality in relation to question material. Any member of the group found to have divulged information inappropriately, i.e. broken confidentiality, will have their membership terminated with immediate effect.

9. INDEPENDENT ASSESSORS

9.1 Experienced Medical Geneticists, independent of the EC, are recruited to undertake a review of the MCQs in advance of the examination itself, a standard-setting process leading to an Angoff rank ordering evaluation. In 2022 this group comprised 17 individuals, representing 8 European nations.

9.2 These assessors are required to pledge their confidentiality in relation to all examination material.

10. EXAMINERS

10.1 A panel of independent, external examiners will be recruited, principally to participate in the SOA part of the examination. It is intended that each SOA question will have a minimum of one external examiner, although this may not always be possible.

10.2 The minimum criteria for appointment as an external examiner are as follows:

i. Their national specialist organisation is a member of the UEMS-SMG.

ii. Medically qualified as a Medical Geneticist with a minimum of 5 years' clinical experience after specialisation.

In addition, it is desirable that they have previous examination experience.

10.3 Examiners are required to pledge their confidentiality in relation to all examination material.

10.4 Recognizing that a conflict of interest may arise between examiner(s) and candidate(s), prior to the examination, examiners will be shown a list of candidates. In the event of any conflict of interest being expressed, every effort will be made to ensure that a candidate is not actively examined by the examiner with whom there is a real or perceived conflict.

11. ECMGG EXAMINATION BOARD

11.1 Within 3 weeks following the MCQ part of the exam, and after full statistical analysis has been completed, the Chair of the Examination Committee will convene an *Interim* Examination Board Meeting to adopt the results and determine those candidates who are permitted to progress to the Oral part of the exam. The membership of the Examination Board comprises SMG Bureau members and members of the Examination Committee; in addition, members of the Standard-Setting Group will be invited to attend.

11.2 Within 3 weeks following the Oral part of the exam, and after full statistical analysis has been completed, the Chair of the Examination Committee will convene a *Final* Examination Board Meeting to adopt the final results and determine those candidates who have passed, and can thus be awarded the ECMGG Certificate. The membership of the Examination Board comprises SMG Bureau members, members of the Examination Committee, and representatives of the external examiners for the Oral part; in addition, members of the Standard-Setting Group will be invited to attend.