European Certificate in Medical Genetics and Genomics (ECMGG)*

UEMS† Section of Medical Genetics (UEMS-SMG)

in collaboration with

the Branch of Medical Geneticists (BMG)

of the European Board for Medical Genetics (EBMG)

& the European Society of Human Genetics (ESHG)

December 2021

The Rules, Description and Protocol of the ECMGG Examination 2022 (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)*

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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 inaugural examination took place in June 2019 as an in-person exam as a satellite event of the European Human Genetics Conference in Gothenburg, as a Diploma. The following exam, after an adaption period in 2020 due to the COVID pandemic, took place virtually, ie online, over two dates in June and September 2021. The ECMGG 2022 is scheduled for **June 24th, 2022** for the **Multiple Choice Question (MCQ)** paper, and **September 19th, 2022** for the **Structured Oral Assessment (SOA)**. The ECMGG is open to candidates worldwide, including trainee and fully trained Medical Geneticists, but for logistic reasons candidate numbers will be provisionally limited to **50**. Registration for the ECMGG 2022 is open from December 10th, 2021 and will close at the end of March, 2022 (https://www.uems-ecmgg.org/Apply.html). Non-medical graduates are not eligible to sit the ECMGG.

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 which 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 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 which has already been achieved for several other medical specialties. 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, ie 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 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 should 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 identification documents are required (eg, passport).

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 (go to https://www.uems-ecmgg.org) by **March 31st, 2022**. For logistical reasons the number of candidates for the ECMGG 2022 will provisionally be limited to **50**, and if necessary priority will be given to candidates from European nations.

4.3 Personal details must be correctly submitted, including full name, as the data requested will be used for the certificates. The application must be accompanied by the corresponding examination fee **in Euros** and contact details for informing the result. The date of transfer of the fee to the UEMS Section of Medical Genetics bank account will serve as the application date.

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 examination fee, more details about the online process and procedure will be sent about one month prior to the exam.

5. EXAMINATION ADMISSION FEE (EUROs)

5.1 The admission fee is given below. It applies for 2022 and will be reviewed annually. Additional fees may apply in the event of irregularities that require further administrative work.

5.2 The examination fees include the fees for both parts of the ECMGG, ie the written (MCQ) and the oral part. The fees have to be fully paid also by candidates who sit the written examination but 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 (ie, after **May 27st, 2022**) will not qualify for the same fee at a subsequent sitting (if the fee has been increased).

5.4 Examination admission fee for 2022: **600 €**

6. THE EXAMINATION STRUCTURE AND CONTENT

6.1 The examination is primarily a knowledge-based assessment, based on the curriculum and syllabus (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: **Multiple Choice Questions** (MCQs) and **Structured Oral Assessments** (SOA). The **MCQ paper** will be delivered virtually on **June 24th 2022**, 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 take place virtually on **September 19th 2022**.

6.3 Candidates must pass the MCQ paper 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 **MCQs: 110 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 Genetics (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 the examination. 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 the internet. It is each candidate's responsibility to provide their own computer and identify a location with reliable internet access and secure connection.

iii. During the two weeks prior to the MCQ paper the commercial provider will arrange for a trial connection with each candidate and demonstrate the process of the exam.

iv. The format of the MCQs is a brief *scenario* (usually *clinical*), with or without *investigations* (*data*), 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 answers 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* which 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 paper will be subjected to rigorous statistical analysis in parallel with the Angoff analysis undertaken as part of the standard setting process.

viii. Candidates will be notified of the outcome of the MCQ exam within 3 weeks of the sitting.

ix. 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 39-year-old woman delivers a male child who is suspected to have 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: 6 Stations; 10 minutes per station**

i. Only candidates who pass the MCQ paper 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, eg, the Hofstee Method.

iii. The SOA part of the exam will be conducted in *English* and every effort will be made to minimise language difficulties for candidates who lack fluency.

iv. It is each candidate's responsibility to provide their own computer and identify a location with reliable internet access and secure connection.

v. The SOA part of the exam consists of 6 OSCE-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 testing 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 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 1	**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. 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 VENUE AND SCHEDULE

7.1 Both parts of the examination will take place virtually from any private location of each candidate's choice. It is the candidate's responsibility to provide their own computer and identify a location with reliable internet access and secure connection. Trial connections and explanation of the process will be undertaken in the two weeks prior to both the MCQ and SOA sections of the exam.

8. EXAMINATION OUTCOME

8.1 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.

8.2 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.

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

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

8.5 Some feedback will be available for unsuccessful candidates and appealing the final decision is discouraged.

8.6 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.

8.7 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.

8.8 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 which will be requested at registration).

9. THE EXAMINATION COMMITTEE (EC)

9.1 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.

9.2 The EC organizes the question-writing examination group, which comprises ~22 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.

9.3 The EC writes MCQs and constructs SOAs for the ECMGG, as well as refining MCQs submitted voluntarily from other sources.

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

10. INDEPENDENT ASSESSORS

10.1 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 2021 this group comprised 12 individuals representing six European nations.

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

11. EXAMINERS

11.1 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.

11.2 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.

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

11.4 All examiners will be required to abide by the 'Rules of Procedure' for the examination (under development).

11.5 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.