



The College of Anaesthetists of Ireland Membership Examination

The official MCAI guide



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Produced by:

Dr Gareth Morrison, Member of the CAI Examinations Committee

Dr Anne Hennessy, CAI Vice-President and Chair of the Examinations Committee

Ruth Flaherty, CAI Examinations Manager

Introduction

To become a **Member** (MCAI) or **Fellow** (FCAI) of the College of Anaesthetists of Ireland by examination, candidates must pass the Membership and the Fellowship Examinations respectively.

The Examinations are set and supervised by the CAI through a specialist group of Examiners who are Consultant Anaesthetists and experts in their fields. The College is committed to maintaining the **highest possible standards** for its Examinations. In order to maintain this position, the MCAI / FCAI examiners and the Examinations Department **rigorously quality assures all its processes** and actively follows best medical education practice to ensure the pre-eminence of the Membership and Fellowship Examinations.

The CAI overriding concern is to ensure our **assessments endorse**:



College of Anaesthetists of Ireland Examination Department Mission Statement

“The choice of assessment method(s) should be appropriate to the content and purpose of that element of the curriculum”

Methods will be **chosen** on the basis of validity, reliability, feasibility, cost effectiveness, opportunities for feedback, and impact on learning.

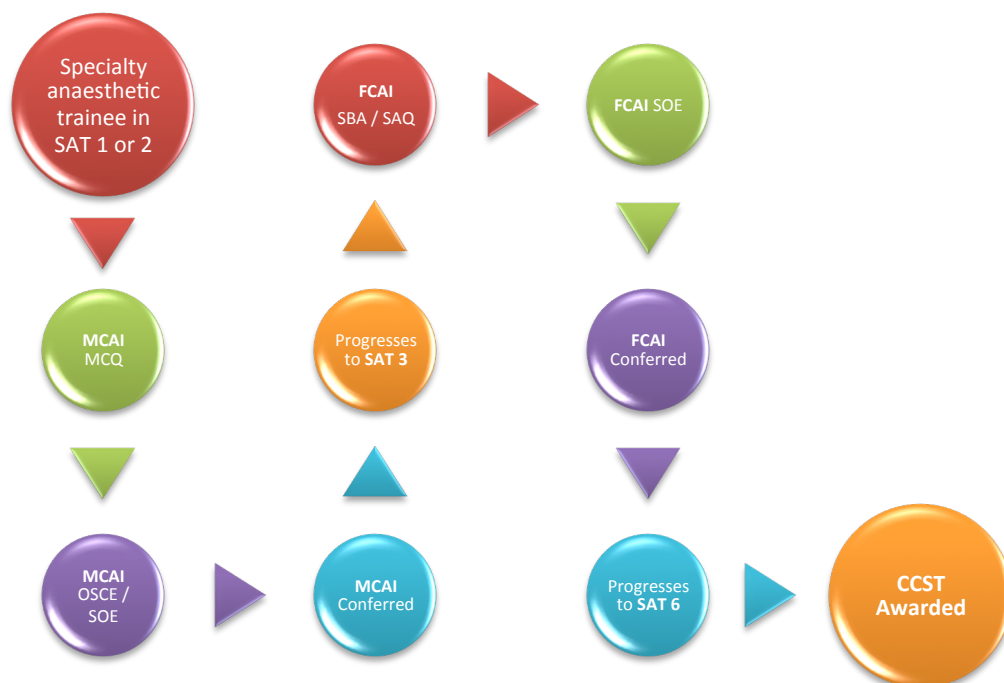
The rationale for the choice of each assessment method is documented and evidence based.

*Over the past two years, the CAI has made **significant changes** to all elements of their examinations, from examiner training, question drafting and review, standard setting, examiner and examinee feedback and quality assurance. These changes have been fully supported by best medical education and assessment practice.*

The Examination Committee feels confident that our **programme of assessment** is valid, fair, acceptable, feasible and effective. It supports examiners to make reliable judgements and is blueprinted to the curriculum, including the generic, shared and specific learning outcomes.

The CAI **assessment processes** are **fully aligned** to the **stated learning outcomes** in the Membership and Fellowship curriculum (Edition 2, 2016):
<https://www.anaesthesia.ie/attachments/article/85/MCAI%20and%20%20FCAI%20Examination%20Syllabus.pdf>

We have **defined levels of performance** at **critical progression points** in our training and assessment programme.



The Membership of the College of Anaesthetists of Ireland (MCAI) Examination

The Membership examination is composed of **three** parts:

1. The written multiple choice examination
2. The structured oral examination
3. The objective structured clinical examination.

The Membership examination is a **national test of knowledge** as laid out in the MCAI examination syllabus agreed with the Irish Medical Council. The examination is embedded within the curriculum outcomes and specialty anaesthetic trainees will not progress to the Fellowship examination or to SAT3 without possession of this qualification.

1. The Membership Written (Multiple Choice) Examination

The Membership written examination consists of **two parts**, completed on the **same day**:

a) 90 MTF (multiple true/false) questions

- 30 MTF questions on physiology / biochemistry
- 30 MTF questions on pharmacology
- 30 MTF question physics / clinical measurement / equipment / statistics.

These are essentially a test of knowledge. Each MTF is composed of five parts, so in total there are 450 questions in the paper. Candidates complete this paper in 180 minutes.

b) 50 SBA (single best answers) questions, completed in 120 minutes.

- 6 questions on anatomy
- 2 questions on statistics
- 14 questions on physiology / biochemistry
- 14 questions on pharmacology
- 14 questions on physics / clinical measurement and equipment.

These are designed to examine the application of the knowledge tested in the MTF section. The paper attracts 50 marks.

The MTF and SBA results are **added together**, giving the **MCQ** result. So in total, the MCQ is out of 500 marks.



To pass the MCQ examination, candidates have to achieve the overall pass mark; therefore poor performance in one component can be **compensated** by a better performance in the other part.

Pass mark determination

For both the MTF and SBA examinations, the cut score is determined by **Angoff referencing**. This is undertaken by a group of examiners who have completed training in this method of standard setting and discuss in detail, the notion of the borderline candidate.

To ensure reliability, the cut score is reduced by $1 \times$ standard error of measurement (SEM).

Blueprint

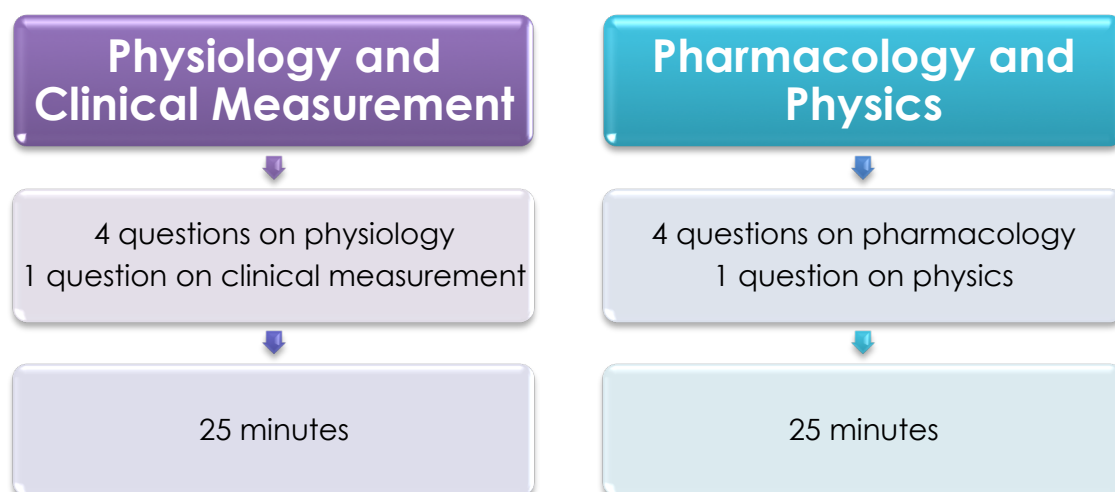
All questions are mapped to a detailed blueprint, with explicit coverage of all the basic sciences, which underpin anaesthetic practice.

The examination is held three times a year (January, June and September) in Dublin, Bahrain, Cairo, Jordan, Oman and Perdana.

2. The Membership Structured Oral Examination

Candidates may only take the Membership structured oral examination (SOE) once they have **been successful** at the **Membership MCQ examination**. The SOE section gives the opportunity for examiners to explore a candidate's **understanding** as well as their **knowledge** of clinical and basic science concepts. **SOEs are also good at linking the curriculum and the more areas sampled, the better the validity of the examination.**

The structured oral examination consists of **two parts**:



Each structured oral examination lasts a total of 25 minutes. In each section candidates are exposed to 5 questions of 5 minutes each, and 2 examiners evaluate their answers independently. Thus a total of **4 examiners** are involved in independent scoring for each candidate. However, there is an **overall agreed score** at the end of the SOE.

Although all questions are **structured**, the face-to-face nature of these examinations allows exploration not only of knowledge, but also of the understanding (application) of that knowledge.

Concept of the Structured Oral Examination

The 10 questions asked in both SOEs, may cover **any aspect** of the MCAI examination syllabus. Each question lasts 5 minutes, and the examiners will move from one topic to another to ensure that adequate time is allocated to allow the candidate to display the necessary **knowledge** and **understanding** in each area.

Physiology and Clinical measurement SOE

The focus of this SOE is to explore MCAI candidate's knowledge of topics specific to **physiology, biochemistry and clinical measurement related to clinical anaesthesia and intensive care medicine**. The physiology SOE has an emphasis on cardiorespiratory physiology. In addition neurophysiology, gastrointestinal, renal and endocrine physiology are examined.

An example of a Physiology and Clinical Measurement SOE Menu:

Question	Example
Physiology	Mechanisms of cerebral autoregulation?
Physiology	Types of hypoxia and the oxygen haemoglobin dissociation curve
Physiology	The sympathetic and parasympathetic nervous systems
Biochemistry	What are the biochemical changes associated with exercise?
Clinical measurement	Principles of measurement: what do you understand by the term calibration?

Pharmacology and Physics SOE

The focus of this SOE is to explore MCAI candidate's knowledge of pharmacology and physics pertinent to the practice of clinical anaesthesia and intensive care medicine. The pharmacology areas examined are general pharmacology, anaesthetic pharmacology and systemic pharmacology (at least one question from each category) and include questions that are relevant to intensive care medicine.

For the pharmacology SOE, the four questions are taken from the four broad areas of the MCAI syllabus:

1. Pharmacokinetics, pharmacodynamics and medicinal chemistry
2. Anaesthetic pharmacology
3. General pharmacology
4. Systemic pharmacology

There will be at least one question from each category.

An example of a Pharmacology and Physics SOE Menu:

Question	Example
Pharmacology	Discuss the uptake and excretion of sevoflurane
Pharmacology	Anti-arrhythmic drug classification
Pharmacology	Antimicrobial chemotherapy and resistance
Pharmacology	Anti-anginal pharmacology
Physics	Electrical circuit components: defibrillation

Marking the SOE

There are **two examiners** at each SOE table. Examiners alternate roles as **questioner** and **observer**. Both questioning and observing examiner **independently grade** each candidate (4, 3, 2, 1) for each question during the SOE. At the end of the SOE, each examiner independently allocates an overall grade to that candidate (4, 3, 2, 1). These overall SOE grades are then discussed between examiners and a final grade for that SOE is **agreed**.

Responses to the questions are assessed using the rating scale below:

Grade	Description
4	Outstanding – worthy of a prize.
3	Pass – the candidate shows satisfactory knowledge and understanding of the topic. A clear pass.
2	Borderline / Marginal fail. The candidate shows incomplete / partial understanding of the topic.
1	Outright fail. The candidate shows very limited knowledge or understanding of the topic.

3. The Membership Objective Structured Clinical Examination (OSCE)

The OSCE tests **applied knowledge** and **skills** in a variety of clinical areas. The style of the station varies e.g., interactive with an actor and/or examiner, completion of an answer sheet. The questions are chosen by the OSCE coordinator group to ensure a range of topics across the examination syllabus is included in each OSCE circuit. The process of an OSCE follows clear guidelines; the questions, instructions to candidates and examiners and the marking schedules are **specific** and **fixed**.

The OSCE comprises **18 stations** in approximately 2 hours (5 minutes per station). There are two pilot stations. These stations do not contribute to the final mark but are used to **ensure validity** of the questions before they are used in examinations. Neither the candidates nor the examiners know which stations are test stations. All of the stations are regarded as active. However the results from the pilot stations do not contribute to the candidate's final mark. There is one rest station. Therefore 15 stations are used to calculate the result of the OSCE.

OSCE Blueprint

The MCAI OSCE circuits follow the format below and are explicitly blueprinted to the MCAI curriculum.

Station	Clinical skills being tested	Number of stations
Resuscitation	Tests knowledge and skills in dealing with peri-arrest or arrest scenarios	1
ECG	ECG interpretation, risk assessment, ability to calibrate	1
Physical signs	Ability to undertake a detailed examination of major body systems	1
Critical incident	Management of common critical incidents	1
Simulation	Ability to interpret clinical monitoring and relate to clinical context	1
Communication	Ability to listen to, understand and explain	2
Technical skills	Practical anaesthetic skills	2
Equipment	Identify, describe and/or perform a basic safety check of the equipment used in routine anaesthetic practice	1
Anatomy	Knowledge of anatomy relevant to anaesthesia / ICM	1
Airway	Airway management including equipment	1
Radiology	Ability to interpret common radiological investigations	1
Data	Ability to interpret test results, and how the results may impact on anaesthetic care	1

Pass mark determination

1. For interactive OSCE stations with an examiner, Borderline Regression (BLR) is used.

Borderline regression is an absolute, examinee-centred standard setting method that is widely used to standard set OSCE exams. To establish **creditable standards**, examiners must use a systematic approach in **gathering expert judgments** about **acceptable levels** of competency. The BLR method is generally considered **robust** and **defensible**.

The vast majority of stations use this method of standard setting.

2. For non-interactive stations e.g. written, Angoff referencing is used.

Looking at each question in turn (and the model answer for the OSCE) and the relevant marks for each part of the question, subject matter experts estimate what proportion of minimally *competent* candidates would get this question correct. The averages of all judges are taken and used to determine the station cut score.

The **overall cut score or pass mark** of the **OSCE is calculated by aggregating the pass marks** for each of the **separate OSCE stations**.

Cut score = Cut score derived from BLR (**X**) + Cut score derived from Angoff (**Y**)

Cut score = **X + Y**

Cut score = (X + Y) + 1 × SEM

Upward adjustments are made using the **Standard Error of Measurement (SEM)**.

Making such an adjustment reduces the probability of passing an incompetent candidate. However there is also a chance of failing an only-just competent candidate. Protecting patients from incompetent doctors would support the argument for making such adjustments.

SOE / OSCE

Candidates complete both examinations on the same day. They are held twice a year (Autumn and Spring) in Dublin, Muscat and Perdana.

A Candidate who is successful in the Membership SOE and OSCE examination who has complied with such provisions as determined by the Council shall be entitled to be **admitted a Member of The College of Anaesthetists of Ireland**, on conferring the Member shall be entitled to use the post-nominal letters **MCAI**.

MCAI Testing Time

The MCAI curriculum is extensive and the CAI has a duty to ensure that candidate's knowledge, skills and behaviours are tested adequately. You can see from the table below, that a MCAI candidate will have a minimum examination time of 458 minutes or 7.6 hours, providing they pass each examination on the first attempt.

Examination	Time (minutes)
MCAI MTF	180
MCAI SBA	120
MCAI SOE 1	25
MCAI SOE 2	25
MCAI OSCE	108
Total testing time	458 minutes (7.6 hours)

Summary of the MCAI Examination



Quality Assurance Assessors

The CAI has a quality assurance (QA) examiner. Their role is:

- To assess the process and conduct of the MCAI/FCAI examinations to ensure there is a uniform and fair standard applied by all examiners, and that there is no unlawful discrimination in relation to any of the protected characteristics described in equality legislation.
- To contribute to the appraisal and performance review of examiners in their role as an examiner.
- To provide feedback on the conduct of the examination to the body setting the examination.
- To develop standard operating procedures for the following aspects of examinations: question writing and review, paper generation and ensuring alignment to blueprint, marking, standard setting of cut score and post examination analysis and psychometric analysis review.
- Generate a QA report following each examination, reviewing the performance statistics and outlining areas of good and perhaps not so good practice. An action plan is also attached for consideration by the Examination's Committee.
- A visiting examiner from the RCoA also annually reviews and provides feedback on our examination processes pertaining to the SOEs and OSCE.

The **Examination Committee** who meet approximately five times per year, also discuss all aspects of QA and will take action to ensure that the CAI follow best practice. The Irish Medical Council also dictate specific standards, which the CAI endeavours to implement and

Question Writers

Examiners selected to contribute to question writing must demonstrate that they are:

- Up to date in their specialty (anaesthesia / pain / ICM / biomedical science).
- A substantive Consultant.
- Understand the level of knowledge, skills and attitudes required of the candidate to pass the exam.
- Able to devote the time required to develop appropriate questions.
- Able to develop questions that minimise bias for candidates from the groups protected by equality legislation.

MCAI / FCAI Examiners will:

- Be on the IMC / GMC Specialist Register.
- Be a Fellow of the CAI in good standing.
- Be in a substantive Consultant post for at least two years, and must demonstrate awareness of the training standard required of the candidates, before becoming an examiner
- Provide evidence (for example, references) to confirm that management and/or clinical colleagues agree to the examiner taking up this role, if appropriate.

- Be able to provide evidence of satisfactory completion of examiner training after selection.

Examiner Training

All newly appointed examiners are required to attend an examiner training day, which covers:

- The structures of the MCAI / FCAI examination
- Their role as an examiner
- Principles of assessment and basic psychometrics
- Standard setting
- Interactive Angoff session
- How to write SBAs / SAQs
- How to ask structured oral examination questions
- Objectively structured clinical examination
- Equality and diversity

Further educational needs are supported with the edition of **examiner guidance manuals** including how to write examination questions, standard-setting procedures and how to understand post examination analysis.

Lead examiner and quality assurance reports emphasize areas of good examination practice and recommendations on how to improve areas falling short of the CAI high standards.

Equality and Diversity in the CAI Examinations

The CAI actively **appoint examiners** from all ethnic backgrounds, and we feel that this diversity **is important** given that we have a large proportion of non-Irish doctors attempting our examinations.

As examiners and those involved in the examination process, it is crucial that they understand key equality legislation and what some of the implications could be in the examination process. This is covered during the examination training day, and our examiner guidance manual covers this in explicit detail.

The **CAI advocates** that a candidate's performance in an examination should never be compromised by any of the nine protected characteristics of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion and belief, sex and sexual orientation. The CAI is considering the requirement of compulsory completion of an e-learning module covering equality and diversity issues in examinations by all its examiners.

Differential attainment in the MCAI / FCAI examinations cannot be attributed to a single identifiable cause, but results from a combination of factors. The CAI reviews performance from all its candidates looking for areas of different attainment by different groups. The Examinations Committee and College Council take the issue of differential attainment very seriously and are committed to delivering the fairest examination possible.

Disability

The CAI has a duty to make a reasonable adjustment where practices place a disabled candidate at a substantial disadvantage. Demonstrating understanding of a candidate's impairment and being supportive of their concerns is an important part of the process of applying reasonable adjustments.

All requests from candidates with a disability must include a written statement of support from the employer's Occupational Health Department (OHD) and/or College Tutor confirming that the candidate's difficulties warrant special examination arrangements. Each request will be considered individually.

Full details are available in the CAI Examination Regulations:

<https://www.anaesthesia.ie/attachments/article/85/Examinations%20Regulations%202018.pdf>

Examination Validity

MCAI

A candidate has a maximum number of **six attempts** at the MCAI MCQ.

Once a candidate has passed the MCAI MCQ the result remains valid for a period of **three years** (six sittings) for OSCE and SOE attempts measured from the published start date of the first OSCE/SOE undertaken. Candidates can only progress to the OSCE/SOE section of the MCAI examination if they have passed the MCQ examination.

A pass in the whole Membership Examination is valid for 10 years for entry to the Final FCAI Examination.

Candidates must pass the MCQ paper before they can apply to sit the OSCE and SOE.

FCAI

Candidates must pass the written section (SBA / SAQ) before they can apply to sit the SOE.

A pass in the written section will be valid for **three years** to the date of the sitting applied for.

Candidates will be allowed **six attempts** at each section.

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