

Guide to Writing Exam Questions for Entry Into Questionbank

The purpose of this document is to identify acceptable formats of questions for the Questionbank database.

All questions are to be based on the MCCQE format, to aid students in preparedness for their MCCQE Part I exam. Any question not structured in accordance with that format will require revision, or rejection from the database.

A. Multiple Choice Questions (MCQs)

All MCQs should be single best answer, made up of a stem (usually a clinical scenario) with a lead-in question, followed by five response options – one correct or best answer, and four distractors.

Unacceptable:

- any question whose answers include “none of the above”, or “all of the above”
- any question whose answers include a combination of choices, i.e. a and b, or c and d
- questions that say something like “All following statements are true, except...” (or the opposite, all are false except...) or “Which of the following is NOT correct?”
- any question that includes the use of the words ‘always’ or ‘never’
- More or less than five choices
- Use of abbreviations/acronyms

Inadvisable

- Questions asking for recall of a single fact e.g. “Which of the following substances is a hormone?”
- Absence of a clinical stem e.g. questions having only a lead-in such as “Which of the following statements is correct?” or “Which of the following statements is true?”

Acceptable/Preferred:

- Medical Council format
- Clinical scenarios / vignettes, where questions pertain to a scenario – in most cases these should be clinically based, and a designation of the clinical context should be given
- The distractors and the correct answer should “look” similar in length and form e.g. if the lead-in asks for the best treatment, include only various treatments among the responses (not diagnoses)
- More than one multiple choice question can be presented following a single clinical stem

Required

- Association of the question with one or more identified learning objectives of the Unit/Rotation
- Brief rationale for the correct and incorrect answers
- Identity of author of the question

For a detailed resource, please refer to the document: [Guidelines for the Development of Multiple-Choice Questions](#), produced by the Medical Council of Canada, Claire Touchie MD.

B. Clinical Decision-Making (CDM) Questions (Key Features Problems)

The Medical Council of Canada Qualifying Examination (MCCQE) Part I will be written by all of our graduates at the end of their fourth year. The exam uses two types of exam questions, MCQ, and CDM questions or key features problems. The key features problems are intended to assess decision making skills rather than recall of factual knowledge. Knowledge will be required, but the focus of the questions is the use of that knowledge in the solving of a problem, e.g. to guide decisions such as what information to seek, what tests to order, or what management path to follow.

It cannot be expected that our Preclerkship students will be able to perform well on patient management problems, but it is highly desirable that they be introduced to this type of clinical decision-making problem as preparation for the MCCQE Part I exam. It is anticipated that toward the end of Preclerkship and within the Clerkship, the nature of CDM questions used should resemble more closely the complexity of the MCC questions of this type.

A key feature is defined as:

1. a critical or essential step(s) in the resolution of a problem,
2. a step(s) in which examinees (in our case, graduating medical students) are most likely to make errors in the resolution of the problem, or
3. a difficult or challenging aspect in the identification and management of the problem in practice.

The use of key features facilitates the development of clinical problems that are more discriminating measures of competence. The definition of a key feature highlights the fact that not all steps in the resolution of a problem are equally important and that testing time is better spent by focusing on evaluating the critical or challenging steps, the key features. The key features represent discriminating features between successful and unsuccessful candidates.

The elements in developing key features problems are:

- What is the problem that is to be assessed? - selection of the problem must be guided by and directly linked to the course objectives.
- What are the critical, essential, or challenging elements in the resolution of this problem? i.e. the key features that should be assessed
- Which method or methods are best suited to measure the key features for this particular problem?

The problems should be relatively short and focus only on a few critical elements of problem resolution (i.e., the key features), permitting more problems to be included on an examination within a fixed period of time. There is some flexibility in the format of these questions in that the response component may take the form of short answer write-in (WI) or an option choice from a short menu (SM) style. There is also flexibility in the number of options offered, the number of allowable responses, and the scoring pattern (e.g. use of “killer” responses).

The clinical presentations of CDM problems should be described in the way in which the problem would be presented by a patient to a physician.

CHECKLIST FOR THE DEVELOPMENT OF KEY FEATURES PROBLEMS

Guidelines for Defining the Clinical Problem (Chief Complaint) and the Clinical Situation

- Select the objective(s) to be examined
- Select gender and age range of the patient; only specify a precise age (e.g., 27) if that case specifically calls for a precise age, otherwise use a range (e.g., 20-29).
- Select a clinical situation(s) best suited to the chosen clinical problem:
 1. Undifferentiated problem or complaint
 2. Single typical or atypical problem
 3. Multiple problem or multisystem involvement
 4. Life-threatening situation
 5. Preventive care and health promotion.

Guidelines for Developing Key Features

- Determine the critical or essential clinical decision-making steps for the resolution of the chosen clinical problem; answer the question, **“What are the critical steps or elements in the resolution of this clinical problem?”**
- Think of various patient presentations pertaining to the chosen clinical problem.
- Decide if the critical steps in resolving the problem require eliciting data, interpreting data, or managing the condition.
- Write specific key features pertaining to the chosen clinical problem.
- The key feature statement should be written in two or three parts:
 - The initial clinical information (i.e., “Given an adult patient presenting with <”);
 - The clinical task (e.g. “< the examination candidate will order investigations including <”); and
 - If necessary, a qualifier(s) may be added (e.g. “order initial investigations”)
- Avoid trying to assess all clinical decision-making steps in the resolution of a clinical problem. Focus only on the more challenging or discriminating essential steps, the difficult steps in practice where clinicians tend to go wrong.
- Discuss and review key features with colleagues and fellow committee members **before** developing a clinical scenario(s) for the key feature(s).

Guidelines for Developing Clinical Case Scenarios

- Case scenario should be based on clinical problem definitions (life span, clinical situation, specified age if applicable, specified gender if applicable) and key feature givens, up to the first key feature.
- Write short clinical scenarios if the key feature(s) is(are) primarily eliciting data; write longer clinical scenarios if key feature(s) is(are) requiring data interpretation or management.
- Use “real patient data” as much as possible; using factitious data can risk introducing inadvertent inconsistencies (i.e., incompatible laboratory values).
- Avoid the use of “medicalese” and technical jargon when writing the clinical scenario; use the words that the patient would actually say or describe the physical findings rather than giving the medical term (e.g., “finger nails and nail beds are normal” instead of “no clubbing.”).

- Use of photos (i.e., skin rashes, radiographs, etc) is encouraged in the clinical decision-making examination format.
- Avoid the use of humor as this can potentially distract examinees.

Guidelines for Writing Questions

- Select the appropriate question format (write-in [WI] format preferred for differential diagnosis and treatment questions; short-menu [SM] format preferred for eliciting history or laboratory investigations).
- Decide on the appropriate instructions to accompany the question (i.e., "Select up to x", "Select only one," or "Select as many as are appropriate")
- In the SM format, there should be 2-3 times the number of choices in the list as there are correct responses; the list of choices may contain correct non-scored responses (i.e., not a key feature element), incorrect distractors, and dangerous options that would automatically give a "0" score if chosen ("killer response").
- Distractors should be plausible; distractors should be developed with the acceptably competent medical student in mind; distractors should include content which is reflective of common misconceptions or errors which are not acceptable.
- Acceptable distractors:
 - are usually homogeneous in content (e.g., all are investigations or all are therapies)
 - may include correct answers that are not integral to the key feature(s) (i.e., neutral non-scoring distractors)
 - do not contain any hints to the correct answer
 - would seem plausible and attractive to the minimally competent medical student or one selecting an inappropriate course of action
 - are similar to the correct answer(s) in construction and length
 - are not mutually exclusive to each other or to information in the clinical scenario.
- In the SM format, the list of choices should appear in alphanumeric ascending order.
- In the WI format, the total number of allowable answers (y) should be limited to the expectation of how many opportunities (y) a medical graduate should have to include the correct response(s) within y number of opportunities.
- Avoid questions which can be answered without reference to the clinical scenario; such questions are likely not measuring clinical decision-making.

Guidelines for Preparing the Scoring Key

- All keyed correct scored responses must directly match the key feature(s).
- Use equal weighting systems if there is more than one correct response. Avoid use of differential weighting, unless one response is significantly more important than others.
- Each question (section) receives a total score of "1"; hence, if more than one correct response within a question, weighted scores should add up to "1".
- If more than one key feature is being assessed by a question, the scoring key should give a score of "1" for each key feature that is scored in the answer key.
- Use of incorrect dangerous responses ("killers") that automatically receive a score of "0" regardless of other responses for that particular question should be used judiciously, as would be plausible in the given clinical situation and selected by weaker candidates.

- Include acceptable synonyms for keyed correct responses in WI questions, to facilitate scoring of such questions.

Note: *The description of CDM questions borrowed significantly from the MCC “**GUIDELINES FOR THE DEVELOPMENT OF KEY FEATURE PROBLEMS & TEST CASES April 2010**”, and the detailed guidelines above are taken almost verbatim from that document. It is a valuable source of information, and has several examples of questions and scoring that offer important insights into construction of CDM questions. This document may be viewed at:*

http://www.med.uottawa.ca/Students/MD/assets/documents/CDM_Guidelines_e.pdf