Writing MOC Assessment Questions

INTRODUCTION

The primary goals of assessment in a CME activity are to ensure the participant has a satisfactory understanding of the material, to promote active learning, and to identify areas in need of further learning. These goals cannot be achieved unless careful thought is given to the creation of assessment questions so they adequately test the most critical concepts, follow the activity learning objectives, evaluate application of knowledge rather than recall of isolated facts, are unambiguous, and do not introduce irrelevant difficulty.

Additionally, many member-boards of the ABMS require an evaluation component that measures the impact of the activity on the physician learners' knowledge, strategies, skills, performance, and/or patient outcomes in order to grant MOC Part II points to an activity. This required assessment is aligned with both ACCME and AMA expectations that the accredited provider evaluates the changes learners achieved as a result of the activity. While a multiple-choice post-activity is only one way to fill this requirement, many activity planners choose this form of evaluation as it is often the most efficient.

This guide will help you write assessment questions that will both fulfill board requirements for MOC Part II and improve learner knowledge that will result in improved patient care.

QUESTION REQUIREMENTS

These requirements of the Center for Continuing Medical Education have been derived from the requirements of the ABMS boards, the AMA, and the ACCME as well as educational research and best practices.

- Questions are due to the CME office two weeks before the activity to ensure enough time to build and test the assessment.
- Please provide one question per talk, session, or presentation. The only exception is Pathology, which requires at least two questions per half hour.
- Participants must achieve a passing score. Typically the passing score is set at 80%.
- Participants can be allowed to take the assessment multiple times to achieve a passing score.
- Participants must receive feedback and/or references for the correct answer to help them understand why a choice is correct or incorrect. A brief narrative or explanation of the correct answer must be provided. References should be provided when appropriate.
- Questions should be multiple choice with a single best answer and 3-5 choices. True/False and Yes/No questions should be avoided (Case & Swanson, 2001, page 14).
- An ideal question can be answered without looking at the choices. Higher order questions that require interpretation, judgment, or problem-solving are better than simple recall of information (Morrison & Free, 2001, p. 20).
- Questions should be stated as a positive (do not use no, not, "all of the following except") (Case & Swanson, 2001, p. 25).
- Do not use absolutes such as "all," "none," "always," "never," "all of the above," or "none of the above." (Brame, 2013, #6).
- Do not include multiple combination choices of answers ("A and B," "B and C," "A and C") (Premadasa, 1993, p. 240).
- If these requirements are not met, revisions will be requested or MOC Part II will not be offered.

EXAMPLE

Below is an example of an excellent assessment question.

The options provided are consistent and avoid patterns that could give away the answer (i.e. short distractors and one lengthy correct answer, plausible distractors and one "All of the above", etc).

Which of the following is most likely?

A. Cancer antigens are mostly over-expressed self-antigens and can be safely targeted by immunotherapy because the low levels expressed on normal tissues may be irrelevant.
B. Most cancers have insufficient cancer-specific antigens because they have too few mutations and most of them encode intracellular proteins making them useless targets.
C. Because every patient's cancer has a different set of cancer-specific mutations, there is little chance the patient will make useful responses to these mutant antigens.
D. Using checkpoint inhibitors for therapy can safely target self-antigens.
E. Most human cancers harbor multiple cancer-specific proteins that are encoded by somatic mutations (nsSNVs) and that may be targeted by autologous CD4+ and or CD8+ T cells of the patient.

Question feedback not only explains the reason behind the correct answer, but also discusses why the distractors are incorrect.

Answer: E.

Correct answer is E because out of 478 patients treated with one of 19 different protocols, the only significant correlation with complete remission was patients' T cell responses to autologous cancer cells. Where analyzed, these T cells recognized mutant tumor-specific antigens encoded by nsSNVs. Most humans have 12 different HLA alleles to choose from as potential molecule presenting any given mutant peptide to their T cell repertoire. This repertoire lacks neonatal tolerance to these neoantigens and may therefore harbor potent CD4+ as well as CD8+ T cells. **Answer A is incorrect** because targeting self-antigens with T cells has killed a number of patients. **Answer B is incorrect** because most human cancers harbor numerous nsSNVs encoding mutant intracellular proteins that may be presented to the patient's T cells by as many as 12 different HLA alleles on the cancer cell surface. **Answer C is incorrect** because clinically effective check point blockade appears to depend on unleashing autologous T cells responses to the patient's own mutant antigens. **Answer D is incorrect** because the most serious side effects of checkpoint blockade are recognition of normal tissues by autoreactive T cells.

The physcian included additional rationale, relevant to his references. References are distinguished from eachother and accessible to a learner who wants to learn more.

Rationale:

Preclinical and clinical studies have shown that the strongest and safest cancer rejection antigens are those encoded by somatic mutations (usually non-synonymous single nucleotide substitutions or nsSNVs) because these antigens are not subject to thymic tolerance and absent from any normal cell or tissue of that patient, i.e., are cancer-specific.

References:

Preclinical reference:. Monach PA, Meredith SC, Siegel CT, Schreiber H. A unique tumor antigen produced by a single amino acid substitution. *Immunity* 2:45-59. 1995.

Clinical reference: 'Final common pathway' of human cancer immunotherapy: targeting random somatic mutations. Tran E, Robbins PF and Rosenberg SA, *Nat Immunol.* 18:255-262. 2017.