The purpose of the ASCRS Question Writing Guidelines is to support faculty and content developers when they are creating multiple-choice questions that accompany ASCRS educational activities. The goal is to provide a resource that will be helpful in the development of well-written questions which accurately measure the learners' application of knowledge gained within the activity.

Multiple-choice questions are efficient because they can be scored rapidly and provide quick feedback to learners. However, they are difficult to construct, requiring time for writing, review, and revision. Writing excellent multiple-choice questions is a craft, and these guidelines are designed to assist in honing that craft.

An important consideration in constructing multiple-choice items is to focus on measuring learning, rather than knowledge recall or test-taking skills of learners.

Multiple-Choice Item Anatomy

There is typically a 60-minute wait when 20 groups are in line at a local restaurant. Group size does not significantly affect the seating rate.

A new group arrives and inquires about the length of the waiting list. The host states there are 50 groups on the list. A movie the group intends to see starts in 130 minutes.

Which of the following should the group decide now so they may still arrive at the theater before the movie starts?

A. Agree to split the group into two parties
B. Skip ordering appetizers once the group is seated
C. Wait even though the group will be cutting it close
D. Select another restaurant close to the theater.

Definitions

Stem
Lead in question
Options
Answer choices
Distractors
Wrong response options
Answer
Right response option
Item
The question as a whole—stem + answer + distractors
Guidelines Overview

Item (The question as a whole)
Each item should assess the application of knowledge, not recall of an isolated fact or point.

Do not make items contingent on one another, such as using the answer to the first item in the stem of subsequent items.

Each item should focus on an important concept - the key point learners should be taking away from the activity.

The item stems should be long and informative; the options should be short and concise.

Stem (The lead-in question)
When writing questions, make sure the questions relate to the content that is being assessed (e.g., the questions evaluate the learner's understanding of the content that was presented).

Keep in mind the knowledge level required to answer the question. A good question is relevant and neither too hard nor too easy for a practitioner in their specialty area.

Ensure the question is completely set up and explained in the stem. The learner should not have to read the options to understand what is being asked.

When writing pre- and post-test questions, do not write the questions specific to the material. For example, asking what percentage of patients meet X criterion as cited within the presentation is too broad for the learner to know. Rather, the question should assess how much the learner knows about the topic before the material is covered.

Avoid trivial, tricky, or overly complex questions.

Options (The answer choices)
For consistency, all items should have four options: one answer and three distractors.

All options should be kept free of clues as to which response is correct.

Options should be mutually exclusive, i.e. they should not overlap in content. There should only be one correct answer.

All distractors should be homogenous, falling in the same category as the answer (e.g., all diagnoses, tests, treatments, prognoses).

All distractors should be plausible; none should stand out as obviously incorrect.

Do not use “All of the above” and/or “None of the above.” These decrease the effectiveness of the question.

Complete stem/ options format
A 50 year old patient with Stevens Johnson Syndrome s/p limbal allograft transplant and PK OU has stable vision of 20/40 OD and 20/400 OS due to recurrent limbal stem cell deficiency. Which is the preferred next step OS?

A. Repeat limbal transplant from living related donor if available
B. Repeat penetrating keratoplasty
C. Observation, recommend no surgery OS as patient has functional vision OD
D. Implant Boston Keratoprosthesis

Tip
Clinical vignettes provide a good basis for questions, as they assess the learner’s application of knowledge.

Do not use True/False questions or “All of the following are true, except.”

Avoid textbook, verbatim phrasing.

Tip
Prior to writing your questions, it is a good idea write down the general content area (such as crosslinking or managing pseudoexfoliation), and then write down the testing point (such as evaluation of a complication). A clear testing point will help you write a question that is free of technical flaws.

Tip
A time-saving tip is to write a few items each day while preparing the material—while it is fresh in your mind. The items will then most likely reflect what you emphasized in your presentation.

Incomplete stem/options format
Intrastralomal corneal rings may be used in conjunction with:

A. Crosslinking
B. PTK
C. Both
D. Neither
In-depth Guidelines

Stems

The stem is the lead-in question or statement. **The stem must pose a clear question, and it should be possible to arrive at the answer without seeing the options.** To determine if the question is clear and focused, cover up the options and if see if learners could pose an answer based solely on the stem. Rewrite the stem if they could not.

**Tips**

- Avoid terms of degree, such as rarely, commonly, frequently, etc.
- Avoid negative questions in the stem

Stems should be simple and plainly written. They should focus on one aspect of a behavior, task, or learning objective. All vignette stems should include pertinent case history information. Refer to drugs by their generic names.

**True/false questions and those which require backwards or negative logic should be avoided,** as they can lead to confusion and imprecision.

True/false questions, including, “Which of the following is true/false,” require the answer be absolutely true or false. However, there may be disagreement amongst a panel of experts about what is true/false.

Negative logic questions, such as, “All of the following, except,” or, “Which of the following is not,” require the learner to switch tracks in thinking, forcing a backwards logic. A learner covering the options for, “Which of the following is the least likely diagnosis?” could imagine a wide range of possible options, but the odds are slim they would be the same as those the writer has chosen.

Questions that ask, “Which of the following drugs is contraindicated for this patient?” and “Which of the following clinical features conveys the worst prognosis?” sound like negative questions, but they are actually subtle expectations that reflect situations in clinical practice.

**Vignettes**

Clinical vignettes provide a good basis for questions, but require specific elements in order to be successful.

For clinical vignettes, include all pertinent patient history data such as age, gender, presenting complaint, medical history, physical findings, diagnostics, initial treatment/surgical plan, and subsequent findings/outcomes.

Suggested stems to accompany vignettes include:

- How would you diagnose this patient?
- What is the most appropriate next step in establishing the diagnosis?
- What is the most appropriate treatment/surgical plan?
- What tests would you order for this patient?

**Options**

The options are the answer choices, both the correct answer and the distractors (wrong response).

The answer is the best or more appropriate of the available responses. The rationale for the correct answer should be kept in mind while composing the options. All the options should be kept free of clues as to which response is correct. In a well-constructed item, each distractor will be selected by some learners. Therefore, all distractors should be plausible; none should stand out as being obviously incorrect.

**Tips**

- Common misconceptions, errors, and faulty reasoning provide a good source of plausible distractors.
- True statements that do not answer the question serve as good distractors

All distractors should be homogeneous—they should fall in the same category as the correct answer (e.g., all diagnoses, tests, treatments, prognoses). All distractors should be both real and logical, which means they should be grammatically consistent, logically compatible, and of the same relative length as the answer.

Distractors should be neither too similar nor too different. Without even looking at the question, if a learner sees the list of answers: triangle, square, circle, apple, they will likely know that “apple” is not the correct answer. However, choices should also not be so similar that learners have trouble finding the differences between them.

“All of the above” and “None of the above” should not be used. They are negative lead-ins and are imprecise answers. They can mislead the learner into selecting them.
Identifying Common Item-Writing Flaws

For consistency, all items should have four options: one answer and three distractors.

The following are examples of typical flaws encountered in the item-writing process. Please familiarize yourself with these examples, so you may avoid them when writing your own questions.

**Unfocused Stem**

A question should be completely set up and explained in the stem. The learner should NOT have to read through the options to ascertain what the question wants to know.

** Poor: Unfocused**

Washington, D.C.:
A. Is home to the third busiest subway
B. Leads the national in the production of kitty litter
C. Consumes more wine than any of the United States, except California
D. Is home to the MLB franchise, Nationals.

The problem with this item is that the learner has no idea what the question is asking until all the options are read. By focusing the stem on what is really being asked, the author can make this item much easier to comprehend.

**Improved: Focused**

Washington, D.C. is the home of which of the following MLB teams?
A. The Wizards
B. The Capitals
C. The Lions
D. The Nationals

By focusing on teams, as opposed to all the broader possibilities about Washington D.C., the learner can identify the answer if they were covering the options.

**Heterogeneous Options**

An unfocused stem may lead to the next most common item writing problem: heterogeneous options. Each question, of course, should have one clearly correct answer. The other incorrect answers should homogeneous, i.e., be somewhat similar in content, category, grammatical structure, and length.

** Poor: Heterogeneous Options**

Which of the following statements about North American weather is true?
A. Thunderstorms only happen in the summer.
B. San Francisco never gets snow.
C. New York gets less rain than Tampa.
D. Boston is windier than Chicago.

The above item has many problems. The stem is not focused and does not explain what is being asked. As a result, the options are not focused either, and the answer can only be found by ticking off the options that are not true. The stem and options are no more focused than the example to the left. In addition, the options use absolutes such as, “only,” and, “never,” which could lead the individual to select or eliminate them based on the phrasing alone.

Many stems phrased as, “Which of the following statements about _____ is true?“ have not been properly focused. Therefore the options cover a range of topics, rather than just one. To improve the question, decide what you really want to ask, and make the options extensions of that question.

**Improved: Homogeneous Options**

Chicago is known as the “Windy City.” However it is not the windiest city in the United States. Which city is?
A. Boston, Massachusetts
B. San Francisco, California
C. Amarillo, Texas
D. Buffalo, New York

By focusing on one aspect of the weather, the item now measures the learner’s knowledge on the subject.

**Tip**

It is important that the options are approximately the same length. Often the item writer will try to clarify the answer more than the distractors, making the answer much longer and stick out from the others. Even a learner who does not know the answer may pick the right one because it looks more important.
Mutually Exclusiveness of Options

Options should be mutually exclusive; that is, they should not overlap in content. There should only be one correct answer.

**Poor: Overlapping Options**

The patient should be instructed to take the medication:

A. At bedtime  
B. Every evening  
C. On an empty stomach  
D. Before meals

There are several areas of potential overlap. Bedtime and evening could be the same time (Options A and B). Similarly, C and D are both possibly true. It is important to ensure that information in an option is not repeated in other options.

**Improved: Mutually Exclusive Options**

The patient should be instructed to take the medication:

A. At bedtime  
B. Every morning  
C. 30 minutes before meals  
D. 30 minutes after meals

With slight revisions the options are now more exclusive, with little overlap, which leads to a better measure of the learners’ understanding of the topic.

**Use of “None of the Above” and “All of the Above”**

These statements should NOT be used, as they reduce the effectiveness of the options. Using “None of the above” opens the realm of possible answers to anything that is not on that page, i.e., any number of possible answers. If the learner feels that some other choice than what is listed could possibly be correct, then they will choose, “None of the above,” even if one of the given choices may be correct. It reduces the question to a process of elimination rather than challenging the learner.

Likewise, with “All of the above,” all learners need to do is decide more than one answer is correct, and they are immediately directed to that option.

**Negative Options**

Item writers should NOT create questions that ask the learners to choose the option that is false or incorrect, instead of asking to choose a single correct answer. Negative items can often be confusing for the learner, as the options can be diverse or unrelated; this confusion can be compounded if the options also contain negative wording. The test is not intended to assess the learner’s ability to perform mental gymnastics to attempt to determine what the question is really asking.

Similarly, questions should not be structured as, “All of the following are true, except,” as the focus of the item should be one correct answer.

**Poor-Negative Phrasing**

Which of the following is an incorrect statement for managing an eye with zonular dialysis?

A. 3-piece IOL should be inserted in the sulcus if the zonules are too weak.
B. In the event of vitreous prolapse through zonular dialysis, vitrectomy should be preferred through pars plana so as to clear the area of zonular dialysis of any vitreous strands allowing recentration of the capsular bag.
C. Cohesive OVD should be used to tamponade the area of zonular dialysis.
D. Triamcinolone should be used to check if vitreous has prolapsed.

The options are long, dense, and have significant variation in length. The structure requires the learner to evaluate each, using a backwards logic to find the incorrect response—ultimately measuring the learner’s endurance rather than knowledge.

**Improved-Positive Phrasing**

In the event of zonular dialysis, which of the following should you perform?

A. Insert a single-piece IOL in the sulcus
B. Use cohesive OVD to tamponade the area of the zonular dialysis
C. Use triamcinolone to check for vitreous prolapse
D. Recenter the capsular bag prior to removal of vitreous strands

The stem has been adjusted to remove the negative, and the options are more homogeneous, ensuring the item assesses the learner’s comprehension of the topic.
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