

nephSAP

Nephrology Self-Assessment Program

Learning Objectives and Questions Writing Guide

Overview

In accordance with the Accreditation Council for Continuing Medical Education (ACCME) guidelines for continuing medical education, the ASN has the following expectations to guide faculty as they develop the educational content of their nephSAP article. nephSAP is first and foremost a learning activity. Therefore, it's important to develop your article content and assessment questions based on learning objectives. The purpose of learning objectives for nephSAP are to provide learners with a clear purpose to focus their learning and to provide you, the author, with a map of what needs to be covered within your article.

You should develop 3-5 learning objectives for your article (no more than 5).

Self-Assessment Questions for nephSAP are for learners to assess their comprehension and application of the article's learning objectives. *Self-Assessment questions should map to your learning objectives* and special attention should be given to ensure *your questions assess the correct level of learning*. You should provide 1-2 questions per learning objective, for a total of at least 6-7 questions.

Authors must provide the following to include with their submission:

- 3–5 learning objectives (no more than 5)
- 6–7 multiple choice questions with answers and explanations
- The answers must include:
 - The location of the correct answer within the text (section heading/subheading)
 - The rationale for the correct answer (why is it correct?)
 - An explanation for each distractor to explain why it is incorrect
 - References to support the rationale for correct/incorrect answers
 - Visit the **nephSAP Author Resources page** (<https://nephsap.org/page/author-instructions/authors>) for a downloadable template

Writing Learning Objectives

Before you start writing your article, you will be provided with the overarching goals, learning objectives, and table of contents for the entire nephSAP issue. You will receive a high-level outline that reflects what the editorial team expects you to cover in your article. Based on this information, the first thing you'll want to do is develop learning objectives for **your** article, as the learning objectives will drive your article content and assessment questions.

Why is a learning objective important?

A learning objective is a concise statement about what the learner will be able to do when they complete the learning activity.

They are important. If you know where you're headed, it's easier to get there. Well-defined learning objectives provide learners with a clear purpose to focus their learning and will direct your choice, as the author, of the content and assessment questions you develop.

Writing a valid learning objective

A valid learning objective completes this sentence, *at the end of this learning activity, you should be able to* (think "what is it I want to teach the learner?"):

A good learning objective is active, specific, and measurable.

- It is **active**—uses an action verb.
- It is **clear**—provides specific direction on what the learner should achieve.
 - What should the learner be able to *do* after the learning activity that they couldn't *do* before completion of the learning activity?
- It is **not ambiguous** — it will not use "fuzzy" hard to measure verbs, such as "learn" and "understand."
 - **Tip:** If you find yourself getting hung up on using fuzzy verbs then ask yourself, "what does it look like if someone understands this information?" "What is it they can *do* now that they couldn't do prior reading my article and answering my assessment questions?"

Strive to develop learning objectives that measure learning at the higher levels of Bloom's taxonomy:

Avoid:	Recall
Better:	Comprehension
Best:	Application, Analysis, Synthesis, or Evaluation

Example Learning Objective:

Identify 100% of patients in your practice whose serum calcium laboratory results are at risk of showing spurious hypocalcemia and/or masked hypercalcemia.

- **Active Verb:** *Identify*
- **Measurable:** *100% of patients in your practice*
- **Specific:** *Whose serum calcium laboratory results are at risk of showing spurious hypocalcemia and /or masked hypercalcemia (i.e., represents a change in physician performance/behavior.)*

Active Verb List

There are several online resources that provide lists of active verbs you can use to express *measurable* learning achievement. These lists are based on the six levels of learning of "Bloom's

Taxonomy.” The higher the level, the more abstract the understanding of the subject matter. Please review at least one of the following resources on active verbs for learning:

- https://meded.hms.harvard.edu/files/hms-med-ed/files/writing_learning_objectives.pdf
- <https://www.bobpikegroup.com/trainer-blog/5-steps-to-writing-clear-and-measurable-learning-objectives>
- <http://www.celt.iastate.edu/teaching/effective-teaching-practices/revise-blooms-taxonomy/>
- <https://tips.uark.edu/using-blooms-taxonomy/>
- <https://und.edu/academics/ttada/writing-learning-objectives.pdf>

Writing Self-Assessment Questions

Your first draft questions should be submitted with first draft of the article, indicating where the correct answers are found within the major content sections. Please base the questions on the article’s learning objectives (e.g., To diagnose monoclonal immunoglobulin deposition disease).

Click [HERE](#) for a helpful video on writing questions from Dr. James Novak, KSAP Director.

Question Style

All questions must be written according to ABIM style guidelines in a **“single-best-answer question”** format with a lead-in question, followed by a series of choices, with **one correct answer** and **three to five distractors** (i.e., incorrect answer options). The item lead-in should be focused, closed, and clear; the learner should be able to answer the item based on the stem and lead-in alone.

Each question must have one unambiguously correct answer, and 3 or 4 incorrect but plausible answers (e.g., A, B, C, D, and possibly E).

- Mutually exclusive answers should be used only for questions with three options (e.g., “increased”, “decreased”, or “stay the same”).
- The distractors “all of the above” and “none of the above” are not to be used in any question.
- Give normal values (including SI units) for laboratory tests that are not in the usual list; use consistent units of measure.
- Abbreviations should be avoided in both the questions and answers.
- Non-FDA approved drugs, devices, or diagnostic tests may not be the subject of questions.
- Questions testing basic science or pathophysiology knowledge are acceptable, but should have some clinical relevance (i.e., diagnostic testing, prognosis, treatment, genetic counseling, etc.).
- 85% or more of questions should contain a brief clinical stem.

- All incorrect answers (distractors) should be plausible but clearly less correct than the correct answer.
- The clinical stem should be reasonably brief, but should contain not only sufficient information to allow a correct answer to be selected, but also enough information to make the distractors plausible.

 **Do not use True/False or negative questions:**

- True/false questions (e.g., "Of the following, which is TRUE")
- Negative questions (e.g., "Each of the following is correct EXCEPT...")
- Imprecise phrases (e.g., "is associated with" or "is useful for"), words that provide cueing (e.g., "may" or "could be"); or vague terms (e.g., "usually" or "frequently")
- Irrelevant material

Negative questions should be reworded in a positively phrased manner.

Question Examples

 **BAD Example: TRUE/FALSE Question**

Which of the following is TRUE of red blood cells (RBCs)?

- A. RBCs have multilobulated nuclei
- B. The shape of an RBC is a biconvex disc
- C. A normal RBC is approximately 7 mm in diameter
- D. RBCs are derived from common lymphoid progenitor cells
- E. Band 3, or anion exchanger 1, in RBC membranes is defective in some forms of hereditary spherocytosis

 **GOOD Example:**

Band 3 protein, or anion exchanger 1 protein, mediates chloride-bicarbonate exchange across the membrane of red blood cells.

Mutations of this protein may cause which of the following diseases?

- A. Sickle cell anemia
- B. Beta thalassemia minor
- C. Paroxysmal nocturnal hemoglobinuria
- D. Refractory anemia with ringed sideroblasts
- E. Hereditary spherocytosis



BAD Example: NEGATIVE Question

Each of the following substances is normally produced by the stomach EXCEPT:

- A. Hydrogen chloride ✓
- B. Calcium carbonate ✗
- C. Intrinsic factor ✓
- D. Pepsinogen ✓
- E. Gastrin ✓



GOOD Example:

The stomach produces which of the following substances?

- F. Gastrin ✓
- G. Glucagon ✗
- H. Vasopressin ✗
- I. Testosterone ✗
- J. Cholecystokinin ✗

Example used with permission from: Novak, JE. [How to Write Good Multiple-Choice Questions](#). Presented as part of MCQ Wednesday at Henry Ford Medical Group; March 9, 2016; Detroit, MI.

Writing the Clinical Stem

The clinical stem is a case description that includes enough information (appropriate history, physical examination, laboratory data, imaging, pathology) to answer the question correctly and to make the distracters plausible, even though they are incorrect.

- The stem should relate to the ability to answer the question correctly and provide information necessary to answer the question.
- Be sure to include age and gender in the stem. A site of care (office, ER, hospital, ICU) is also desirable for question classification purposes. Race, ethnicity, occupation, and/or geographic site may be added if appropriate to the question content.
- The cases are to be intellectually challenging, *test clinical reasoning, judgment, and synthesis* (80% of the questions). Testing simple recall of knowledge from memory should be limited to no more than 20% of the total number of questions. **ALL** the questions should be answerable by someone who has read and understood your article material.

Examples of a “one-best-answer question” are:

- Which of the following is the most likely causal agent?
- If untreated, this patient is at greatest risk for which of the following disorders?
- Which of the following is the most appropriate response by the physician?
- Which of the following is the most appropriate method to facilitate patient informed consent?
- Which of the following is the most appropriate description of the deviation from official procedure?
- Which of the following is the most likely effect on estimates of disease incidence and prevalence?

Examples of questions for a clinical stem question include the following with variations:

- Which ONE of the following is the MOST likely cause of this patient’s?
- Which ONE of the following changes to this patient’s regimen should be made next?
- Which ONE of the following is the MOST appropriate next step in management?
- Which ONE of the following is the MOST appropriate treatment for this patient?
- Which ONE of the following is the MOST likely diagnosis?
- Which ONE of the following is the MOST appropriate test to perform next?

Cognitive Task: Each question poses one and only one task

- | | |
|-------------|-------------------|
| • Testing | • Prevention |
| • Diagnosis | • Natural history |
| • Treatment | • Pathophysiology |
| • Prognosis | • Epidemiology |

Cognitive Ability

- **Recall knowledge:** test recall of memorized knowledge. Use for new information and recent changes in practice.
- **Synthesis:** Tests recall and interpretation – asks for a conclusion. Most useful for diagnostic problems.
- **Judgment:** Tests recall, interpretation, and decision making – asks for an action. Tests important clinical skills. Most useful for assessing clinical decision making (simulating practice).

Writing Answer Options

All answer options must:

- **be homogeneous and plausible**, to avoid cueing to the correct option.
- **be presented in a logical order (e.g., numerical or alphabetical)**, to avoid bias towards certain positions.
- **be stated clearly and concisely**, to avoid cognitive overload in the learner (e.g., you want to assess their attainment of the learning objective not their reading ability).
- **be mutually exclusive**. Alternatives with overlapping content may be considered “trick” test items.
- **avoid using absolutes** such as *always*, *never*, and *all* in the options; also avoid using vague terms such as *usually* and *frequently*.
- **avoid negatively phrased items** (e.g., those with *except* or *not* in the lead-in). If you must use a negative stem, use only short (preferably single word) options.

Incorrect answer options will:

- **be plausible and should not provide clues** to the correct answer. Questions on controversial topics in which you have an opinion, not necessarily backed up by evidence, are acceptable. Such questions will be asking for the MOST CORRECT answer.
- **deal with either diagnosis or therapy (but not both)** and may NOT be in the “All of the following answers are correct, EXCEPT” format.

Writing the Explanation

The explanation should begin **by stating the correct answer**. Include a thoughtful but brief explanation of the correct answer **and then an explanation of why the other options are incorrect**.

Answers and explanations must include:

- the correct answer to each question (A, B, C, D, or E)
- a one or two paragraph explanation that indicates **why the correct answer is correct** and **why each distractor is incorrect**
- appropriate reference citations (1 to 4 per question is desirable, with no more than 5 total references per question).

The question, answer, and explanation document is due with the first draft submission

References

Include relevant references from ASN publications, major journals that are readily obtained from most medical center memberships, or free online reputable peer-reviewed journals. Please use the **AMA Manual of Style formats**.

Reference Examples:

- *Journal article*
Chang SH, Merzkani M, Lentine KL, Wang M, Axelrod DA, Anwar S, et al.: Trends in discard of kidneys from hepatitis C viremic donors in the United States. *Clin J Am Soc Nephrol* 16: 251–261, 2021 10.2215/CJN.10960720
 - *Article of chapter in an edited book*
Doshi MD, Taler SJ: Evaluation of Hypertension in Living Donor Candidates. In: *Living Kidney Donation*, edited by Lentine, KL, Concepcion BP, Lerma EV, Cham, Springer, 2021, pp 1199–139
 - *Website*
Centers for Medicare and Medicaid Services: End Stage Renal Disease (ESRD) Payment Overview, 2010. Available at: <http://www.cms.gov/ESRDPayment>. Accessed April 28, 2010
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Questions?

Contact the nephSAP Editorial Office: nephsap@asn-online.org

Note:

For the Clinical Case Presentation section, ASN referenced “Constructing Written Test Questions For the Basic and Clinical Sciences” (4th Edition) from the National Board of Medical Examiners.

For the Writing the Question section, ASN referenced “Brame, C., (2013) Writing good multiple choice test questions. Retrieved October 11, 2019 & reviewed January 6, 2023 from <https://cft.vanderbilt.edu/guides-sub-pages/writing-good-multiple-choice-test-questions/>