

ABVP
Item Writing Guide
All RVS



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Starting 2020, writing individual exam items no longer counts for Maintenance of Certification (MOC) points. However, you can earn MOC points by being a member of your RVS exam committee. Please ask your RVS Exam Vicechair if their committee needs volunteers.

Introduction

This guide is meant to familiarize you with:

1. How to write an acceptable ABVP Exam Item. These are the materials covered by the Exam Item Workshop or webinar.

You must have attended an Item Writing Workshop at an ABVP Symposium or successfully completed the on-line Item Writing webinar (located at www.ABVP.com >>Form and Documents) to be able to create exam items.

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Concepts and techniques in writing a good examination item

Purpose

The purpose of this section is to familiarize the reader with the overall process of writing an item suitable for inclusion in the examinations developed by the American Board of Veterinary Practitioners (ABVP).

It is not designed to be a comprehensive discussion of item writing, nor examination development. Included in this guide are discussions on:

1. item types
2. item cognitive complexity together with
3. item writing suggestions.

The cornerstone of any examination program is the individual examination item (aka ‘the question’). Each item must be linked to a specifically required area of work or practice. Every five to ten years, ABVP Produces a Job Content Analysis (JCA) which establishes detailed assessments of the conditions, activities, and modalities that a clinical specialist should know. This Job Content Analysis is the basis and justification for the blueprint used for the examination. All items should be linked directly to the blueprint.

Definitions

While unique terminology is introduced throughout this document, a prerequisite comprehension of the following key terms is important to establish uniformity:

Item

the entire question, including the stem and options. In multiple-choice testing it is customary to speak of test “items” rather than questions, since items may be presented in the form of statements rather than questions.

Stem

the statement, question, chart, or graph portion of an item. The stem of the item should clearly present the central problem or idea.

Options

all offered answers to the item, including the distractors (the incorrect answers), and the **key** (the one correct, best answer).

Types of Exam Items

Multiple Choice (MC) Items

All ABVP multiple choice items have three options — one (1) key, and two (2) distractors.

One Best Response type MC

This is the traditional and most prevalent type of multiple-choice item. All items will fit this format, or one of the variations thereof, described in this section. The one best response item type consists of a stem, followed by a series of possible answers or completions, called options.

Stem

Which cranial nerves compose the afferent and efferent limbs of the pupillary light reflex?

Options

1. Optic and Oculomotor nerves
2. Optic and Abducent nerves
3. Trigeminal and Facial nerves

In this type of item, the instructions to examinees emphasize the importance of selecting the “one best response” from among those offered. In answering these items, the examinee is further instructed to look for the best or most appropriate choice and to discard others that may appear plausible, but are less applicable.

The two primary formats of the one best response item type are the Direct Question and the Incomplete Statement, as shown in the following examples.

Direct Question

In the treatment of diabetic ketoacidosis, it is important to monitor for which of the following complications?

- A. hypokalemia and hypophosphatemia
- B. hypercalcemia and hypophosphatemia
- C. hypokalemia and hypercalcemia

Incomplete Statement

The urethral anchoring structures include:

- A. ventral ligament and the bilateral ischiocavernosus/ischiourethralis muscles.
- B. ventral ligament, dorsal ligament, and bilateral retractor penile muscles.
- C. dorsal ligament and the bilateral bulbourethralis muscles.

The most important route of infection of *Toxocara* in kittens is:

- A. transmammary.
- B. transplacental.
- C. fresh feces.

Barring local laws to the contrary, an unvaccinated cat exposed to rabies virus should be quarantined for:

- A. 10 days.
- B. 45 days.
- C. 6 months.

When performing a perineal urethrostomy, the accessory sex gland(s) used as the proximal landmark for the length of the urethral incision is(are) the:

- A. bulbourethral gland.

- B. prostate.
- C. seminal vesicles.

Contrast and Compare

| <i>as Direct Question . . .</i> | <i>as Incomplete Statement . . .</i> |
|--|--|
| <p>When repairing a distal diaphyseal fracture of the humerus, what nerve may be encountered passing through the supracondylar foramen just proximal to the medial epicondyle?</p> <p>A. median nerve B. radial nerve C. caudal cutaneous antebrachial nerve</p> | <p>When repairing a distal diaphyseal fracture of the humerus, the nerve that may be encountered passing through the supracondylar foramen just proximal to the medial epicondyle is the:</p> <p>A. median nerve. B. radial nerve. C. caudal cutaneous antebrachial nerve.</p> |
| <i>as Direct Question . . .</i> | <i>as Incomplete Statement . . .</i> |
| <p>What factors in the classic coagulation cascade are included in the common pathway?</p> <p>A. I, II, V, X B. II, VII, IX, X C. V, VII, IX, XII</p> | <p>In the classic coagulation cascade, the common pathway includes factors:</p> <p>A. II, VII, IX, X B. V, VII, IX, XII C. I, II, V, X</p> |

Use either a Direct Question or an Incomplete Statement as the item stem; whichever seems more appropriate for effective presentation. If neither form of presentation is clearly preferable, simply select the style that you can handle most effectively. Those inexperienced in writing multiple-choice items may find that they produce technically superior items when writing direct questions, rather than using the incomplete statement approach. The direct question may induce the item writer to produce more specific options.

Fill In The Blank (FITB)

A limited number of Fill in the Blank questions, selecting from the options given, are acceptable. Most of these items could be better written as either a direct question or incomplete statement — including the example below. Rarely does this format allow the clearest possible presentation of the stem.

Fill in the Blank Example

The _____ forceps cause the least amount of tissue trauma.

- A. Brown-Adson
- B. Smooth Thumb
- C. Kelly

Complex Multiple Choice

Complex multiple-choice (CMC) items begin with a stem, followed by three or four true-false statements, responses, or completions (called elements), and ending with three lettered options containing various combinations of the elements. The stem may take the form of a direct question or an incomplete statement. When designing the elements, special care must be taken to ensure that each is unequivocally true or false. Probability estimates or judgments, upon which experts might disagree, should — without exception — be excluded.

Stem . . .

Which of the following drugs require a DEA license?

Elements . . .

1. Diazepam
2. Ketamine
3. Acepromazine

Options . . .

- A. 1 and 3 only
- B. 1 and 2 only
- C. 2 and 3 only

With CMC items, examinees are confronted with an all or none situation. They may be able to recognize one element as correct, but will only receive credit when the option that includes all of the correct elements is chosen. To minimize the potential advantage to be gained through guessing, elements should be combined in a logical fashion. It is often desirable to equalize the number of times each element appears in the options, as shown in the previous example. Avoid the temptation to include all elements as an option (c. 1, 2, and 3), as “testwise” examinees can often recognize this as a cue to the correct answer. CMC items should be used sparingly, and in fact, should be limited to one (1) or two (2) per two hundred (200) items.

Clinical Vignette

A direct question or incomplete statement may be preceded by a template of data used to create a clinical scenario called a vignette. Clinical vignettes enhance the validity of the test, keep the test focused on important information, and allow candidates to effectively use memorized data in their thinking and reasoning processes.

Data templates may be of varying length and could include some, or all, of the following: age, gender, history, clinical signs, examination findings, diagnostic study results, initial treatment, subsequent findings, etc.

Sample templates

- A (patient description) has (clinical signs). Which of the following tests would most likely establish the diagnosis?
- A (patient description) with a history of (condition) is taking (medications). Which of the following medications is most likely to cause (clinical sign or abnormal test result)?
- A (patient description) has been eating (type of diet). Which of the following conditions is most likely to occur?

- A (patient description) exhibits signs of (describe). What is the most likely etiology?
- A (patient description) exhibits signs of (describe). Exposure to which of the following toxic agents is the most likely cause?
- A (patient description) develops (clinical signs). The laboratory results are: (list or arrange data in a chart). Which of the following is the most likely cause?

The stem format following the vignette should be either a direct question or an incomplete statement.

For example:

- Which of the following is the most likely explanation for these findings?
- Which of the following is the most likely causative organism?
- Which of the following is the most likely diagnosis?
- Which of the following is the most appropriate next step in establishing the diagnosis?
- Which of the following findings will confirm the diagnosis?
- Which of the following is the most appropriate treatment?
- Which of the following is the most likely adverse effect?
- Which of the following is the next step to prevent an epizootic?
- Which of the following is the most appropriate initial (or next) step in management?
- The most likely cause is a lesion in the:
- Laboratory evaluation is most likely to show:
- The patient is at increased risk for development of:

Clinical Vignette Examples

A 7-year-old cat has been eating a low magnesium, urine acidifying dry diet for the past 5 years. Which of the following conditions is most likely to occur?

- calcium oxalate urolithiasis
- hypokalemic polymyopathy
- nutritional secondary hyperparathyroidism

An 18-year-old cat presents with weight loss and inappetence. You find a creatinine of 4.9 mg/dL (0.8-2.3 mg/dl), PCV of 19% (30-45%), and total protein level of 8.2 g/dL (5.9-8.5 g/dl). The anemia is normocytic and normochromic. Erythropoietin treatment fails to increase the PCV after 12 weeks, but the WBC count rises from 8,372/microliter to 32,425/microliter (5,500-19,500/microliter). The neutrophil count is 31,078/microliter. Which of the following is the most likely explanation for these findings?

- The anemia is associated with inflammatory or infectious disease rather than chronic renal failure.
- The erythropoietin is causing erythroid and myeloid proliferation, but this cat has a maturation defect in the erythroid precursors.
- Anti-erythropoietin antibodies have developed.

A 2-year-old indoor/outdoor cat presents with iritis, anterior uveitis characterized by keratitic precipitates, and exudative chorioretinitis. Treatment with clindamycin resolves the inflammation. Which of the following is the most likely causative organism?

- Toxoplasma gondii*
- Histoplasma capsulatum*

C. *Bartonella henselae*

A cat has a confirmed diagnosis of diabetes mellitus. The cat is ketoacidotic, dehydrated, anorexic, and vomiting. You have initiated intravenous fluid therapy and plan to check a blood glucose every hour for 24 hours. Which type of insulin and route of administration is most likely to normalize blood glucose and reverse the ketoacidosis?

- A. regular insulin given intramuscularly every hour
- B. lente insulin given subcutaneously every 4 hours
- C. ultralente insulin given subcutaneously every 6 hours

Since several items can be written using the same template of data, clinical vignettes are an appropriate format for writing Situational Sets.

Situational Set

Examinees are given a short scenario, or item stem, along with a collection of facts or data. They are then presented with 3 to 5 multiple-choice items regarding recognition and management of the problem. Each item should be able to stand alone in reference to the situation.

Each item in the set, while relating to the scenario, remains independent from the other(s) in terms of determining the correct answer. Do not provide a series of interrelated items that supply or suggest the response to another item within the set. Also, avoid a series of items which build upon one another, requiring a correct response to one in order to determine a correct response to another.

Situational Set Examples

A 14-year-old neutered male cat presents with weight loss, tachycardia, and vomiting after eating. CBC and serum chemistry panel show the following: WBC 18.6 thous/uL (5.5-19.5 thous/uL), HCT 30% (29-45%), BUN 38 mg/dl (15-34 mg/dl), Cr 2.5 mg/dl (0.8-2.3 mg/dl), ALT 325 IU/L (28-76 IU/L), AST 164 IU/L (5-55 IU/L), and T4 6.8 ug/dl (0.7-5.2ug/dl).

- A. Which of the following is the most appropriate initial treatment?
- B. oral methimazole
- C. surgical thyroidectomy
- D. radioactive iodine

Which of the following is the most appropriate diagnostic step?

- A. urine analysis
- B. serum bile acids
- C. free T4

What is the most likely histopathologic abnormality of the thyroid gland?

- A. adenomatous hyperplasia
- B. follicular carcinoma
- C. lymphocytic thyroiditis

Currently our exam software can group situational sets together. But each individual question has the same stem presented.

Item Cognitive Complexity . . .

ABVP uses a three-tiered classification system to identify the level of thinking required to respond to an item. The three levels are recall, application, and evaluation/ analysis. Consider how an examinee would likely think when formulating a response to the item.

Level 1 . . . Recall

Recall items primarily test the recognition or recollection of isolated information. Such items predominantly require an effort of memory. They include the recall of specific facts, generalizations, concepts, principles, processes, procedures, or theories. To simplify, such an item will ordinarily be asking: "What is X?" Example . . .

Examples

Which of the following is an example of a non-nutritive sweetener?

- A. saccharin
- B. fructose
- C. sucrose

Hypotonic fluids are those with an osmolality of less than about:

- A. 200 mOsm/kg.
- B. 300 mOsm/kg.
- C. 400 mOsm/kg.

Level 2 . . . Application

Application items primarily test interpretation or application of limited data. Such items require more than simple recall, and therefore, they should include a problem-solving aspect. Items at this level will ordinarily be asking: "Knowing X to be true, what would you expect to be true about Y?"

Examples

A racing Greyhound dog has a resting heart rate of 90 beats per minute. It is desirable to have the telemetry monitored heart rate increase no more than 30% during exercise. What is the desired maximum heart rate?

- A. 110
- B. 117
- C. 127

In the cat, hypercalcemia in the presence of hyperphosphatemia is most often associated with:

- A. renal failure.
- B. primary hyperparathyroidism.
- C. malignancy.

Level 3 . . . Evaluation/Analysis

Analysis items primarily test the assessment of data, problem solving, or the proper alignment of various elements into a meaningful whole. Items at this level will ordinarily require examinees to make judgments concerning the effectiveness, appropriateness, or best course of action for a given situation. Several steps may be required in the thought process of the examinee. Clinical vignettes are very useful in developing items that require evaluation and analysis.

Example

A 5-year-old 15 kg mixed breed dog has been treated for diabetes mellitus for the past year with 18 units of NPH insulin once daily. She has had increasing PU/PD and density of her cataracts. The glucose curve never dropped below 180 mg/dl, with the nadir at 12 hours. Which of the following is the best course of insulin therapy?

- A. twice daily NPH insulin.
- B. twice daily ultralente insulin.
- C. once daily ultralente insulin.

To write items that assess a particular cognitive level, ask this essential question: “What do I expect the examinee to do in order to select the correct response?” If you expect the examinee to identify or recognize, you will generally be writing recall items. If you want the examinee to classify, explain, or differentiate, you are likely writing application items. If you expect the examinee to formulate, evaluate, or judge, then analysis items should be the result.

In light of the fact that the majority of items on ABVP examinations are required to be application or evaluation, authors are encouraged to write items that demand more than just recall.

Item Writing Suggestions

Suggestions for all parts of the exam item

FOLLOW THE STANDARD RULES OF GRAMMAR.

If the stem of the item is a question, and the options are complete sentences, each option should begin with a capital letter and end with a period. If the options are not complete sentences, they should begin with a lower-case letter and have no terminal punctuation.

When the stem is an incomplete sentence, end with a colon or no punctuation at all. Begin each option with a lower-case letter and end with a period.

AVOID IRRELEVANT SOURCES OF DIFFICULTY.

Just as clues to a correct response may be inadvertently incorporated, it is possible to unintentionally include obstacles. Frequently, mathematical problems are answered incorrectly by examinees who have reasoned correctly but have erred in their computations. To measure the understanding of a calculation process, simple (whole) numbers are recommended. Use suitable professional terminology, but do not use longer, more complicated words when shorter, less complex words will suffice. Overall, the difficulty of the “average item” should be such that it will be answered correctly by 55-75% of the examinees. Item writers typically underestimate the difficulty of the items they produce.

USE AN EFFICIENT FORMAT.

Items should be submitted in the format provided at the end of this guide. The options should be listed on separate lines, aligned one under another, like the examples in this guide. This makes the options easy to read and compare. The use of letters in front of the options is preferable to using numbers, since this avoids possible confusion when numerical options are used in an item.

ELIMINATE IRRELEVANT CLUES.

Irrelevant clues may make the item easier as a whole or may even change the basis upon which the item discriminates. “Test wise” examinees, who normally would not be able to select the correct option, may notice the clue and respond correctly on the basis of it.

Wording similarity, in both the stem and the correct answer, is one of the more obvious clues. Key words in the stem may be unintentionally repeated verbatim in the correct answer, or a synonym may be used, or the words may simply sound or look alike.

The phrasing of the correct answer may give it away. Even the most poorly prepared examinees are able to recognize a familiar phrase or “buzzword.”

When an answer is qualified by modifiers, typically associated with true statements (e.g., sometimes, may, usually), it is more likely to be chosen.

Including absolute terms in the distractors may enable examinees to simply eliminate them because such terms are commonly associated with false statements (e.g., always, never, all, none, only).

Including two options that have the same meaning makes it possible to eliminate both as potential answers. If two options have the same meaning, and only one answer is to be selected, it is fairly obvious that they must be incorrect.

AVOID RARE, EXOTIC, AND TEXTBOOK CASES.

Exceptional cases or examples are indeed just that — exceptional — and should, therefore, be avoided since they do not occur with sufficient frequency to warrant their assessment. Also, these types of cases may be too specific, by region or location, and as such are not applicable on a national basis. Textbook cases also encourage rote memorization instead of comprehension. Examinees may get the item correct even though they lack a solid understanding of the content of their profession.

PROVIDE NORMAL LABORATORY VALUES.

If laboratory values are used in an item, the normal ranges should be given. Our current testing software has these normal values as an attachment that the examinee can refer to.

If the value is one considered to be common knowledge, be sure that equivalent SI (international) units are provided as well, where applicable. Because of marked changes between testing laboratories, try to avoid expecting candidates to know normal blood values. ABVP provides a standardized list of normal for most species to facilitate this process. Please use this standardized list whenever possible.

The Stem

USE CLEAR AND SIMPLE LANGUAGE.

Unlike other reading material, in which extensive content helps to clarify the meaning of a particular phrase, a test item must be explicitly clear without benefit of further context.

Sentence structure should be as simple as possible. Complex sentences should be broken up into two or more separate sentences. Qualifying phrases should be placed near the terms they qualify. The important elements should generally appear early in the statement of the item, with qualifications and explanations following.

PRESENT A SINGLE, CLEARLY FORMULATED PROBLEM.

The task set forth in the item stem should be so clear that it is understood without reading the options. In fact, a good check on the clarity and completeness of a multiple-choice stem is to cover the options and determine whether or not it can be answered. Avoid “undirected” stems which require the examinee to read all options in order to understand what the item is asking. Do NOT write questions of

the form “Which of the following statements about X is correct?” These items are unfocused, and do not perform well statistically.

AVOID THE USE OF NEGATIVE WORDING.

State the stem of the item in positive form. While negative items cause irrelevant difficulty, they can also benefit the “test wise” examinee. Examples of this type of questioning are: “Which of the following is NOT true?” or “Each of the following is true EXCEPT”

USE OF “WHAT” vs. “WHICH” in the STEM.

The word “What” implies an absolute answer, therefore, if the correct answer is a fact, use the word “What.” If the answer requires judgment, or if other answers not listed in the options could be just as good as a possible answer, use the word “Which.” The word “Which” is used to limit the realm of choice to the listed options.

PUT AS MUCH OF THE WORDING AS POSSIBLE INTO THE STEM.

Avoid repeating the same material in each of the options. By moving all common content to the stem, it is possible not only to clarify the problem, but also to reduce the time required to read the options. Simply moving the common words to the stem may not be adequate. Rewording the entire item may be necessary.

AVOID EXCESSIVE “WINDOW DRESSING”.

The item should contain only material relevant to its solution, unless determination of relevancy is part of the problem.

INCLUDE ALL QUALIFICATIONS NEEDED TO SELECT THE RIGHT ANSWER.

State the topic qualifications specifically for each item. Item writers take for granted their own knowledge of a given topic. Do not assume that different individuals share the same understanding of a topic’s qualifications.

Options

SELECT AND FORMULATE THE DISTRACTORS WITH CARE.

The distractors are as important as your statement of the problem in the stem. Incorrectness should not be the sole criterion for a distractor. The difficulty of an item depends largely on the quality of the distractors. The finer the distinctions to be made in selecting the correct answer from the distractors, the more difficult the item.

MAKE CERTAIN THAT THE KEY IS CORRECT AND CLEARLY BEST.

There should be ONLY ONE UNQUESTIONABLY correct answer. The intended answer should be the one that experts would agree is clearly the best. It may also be necessary to include “which of the following” in the stem to allow for equally satisfactory answers, which have not been included in the item.

MAKE THE DISTRACTORS PLAUSIBLE TO THE UNINFORMED OR MISINFORMED.

The distractors in a multiple-choice item should be so appealing to examinees, who lack the knowledge called for by the item, that they select one of the distractors in preference to the correct answer. The art of constructing good multiple-choice items relies heavily on the development of effective distractors. The following are a number of things that can be done to increase the plausibility and attractiveness of distractors.

- Use the common misconceptions of examinees as distractors.
- State the options in the language of the examinee.
- Use good-sounding words (e.g., accurate, important, etc.) in the distractors, as well as in the correct answer.
- Make the distractors like the correct answer in both length and verbiage complexity.
- Use extraneous clues in the distractors, such as stereotypical phrasing, scientific-sounding answers, and verbal associations with the item stem.
- Make the options similar but avoid overly fine discriminations, which are not practically significant.
- Avoid using options which are opposites of one another. Opposites are inconsistent with the idea that each option should be plausible, and examinees can eliminate them with only limited information.

DO NOT USE THE OPTIONS “ALL OF THE ABOVE” OR “NONE OF THE ABOVE.”

The inclusion of “all of the above” as an option makes it possible to answer the item on the basis of partial information, and the chances of guessing the correct answer are increased. Another difficulty with this option is that some examinees, recognizing that the first choice is correct, will select it without reading the remaining options. “None of the above” is a poor option because it could almost always be argued for being a correct answer.

Additionally, the current examination software randomizes all the options making placement of a particular answer within the question impossible.

MAKE THE OPTIONS INDEPENDENT.

Sometimes a subset of two of the options may cover the entire range of possibilities, so that one of them must necessarily be correct. In some instances, an option may include one or more of the other options, so that all of the options in that subset must necessarily be false. By reason of their association, related options help examinees eliminate wrong answers. Furthermore, options should not be mutually exclusive, since an examinee can eliminate one of the distractors on that basis alone.

MAKE ALL OPTIONS GRAMMATICALLY CONSISTENT WITH THE STEM AND PARALLEL IN FORM.

Ordinarily, the correct answer is carefully phrased so that it is grammatically consistent with the stem. Read EACH option with the stem, and ensure that the options are consistent, parallel, and properly stated.

Summary of Item Writing Suggestions

Ask the following questions about each of your items:

General Consideration

- Is the knowledge or skill measured by this item relevant to acceptable certification-level performance?
- Does the item test something important to professional practice?
- Is the item stated clearly enough so that the knowledgeable candidate will be able to see the correct choice without hesitation?
- Are the items presented in the proper format?
- Are normal laboratory values provided?
- Have you avoided irrelevant clues to the correct answer or irrelevant sources of difficulty?

The Stem

- Is the stem easy to read?
- Is the sentence structure simple and direct?
- Have you avoided ambiguous words, fuzzy terms, and over-generalizations?
- If you have used a technical term is it the most generally accepted one?
- Is the stem positively stated?

The Options

- Does each choice follow grammatically and logically from the stem?
- Have you selected distractors that are plausible?
- Are the options independent of each other?
- Are the correct answer and distractors parallel in grammatical structure, terminology, length, and content?
- Have you avoided using professionally acceptable or technical terms in the correct answer that were not used in the distractors?
- Have you avoided repetitive wording in each of the options that could be moved into the stem?
- Is there only one correct (or best) choice?
- Have you avoided using “all of the above” and “none of the above” as choices?
- Have you made sure to list the correct answer option as A?

If you have answered all of these questions “Yes,” then you most likely have written a good item. If you answered any of the questions “No,” revise the question appropriately. Review your items carefully before submission to the ABVP office.

Security

Security is a crucial issue for all item material, both written and reviewed. Do not show the material to, nor discuss it with, anyone who is planning to take the examination. When not working with them, keep the materials in a locked container, in a secure location. Examination Committee members are asked to sign an Agreement of Confidentiality because the integrity of the exam depends on overall security.