



## **Board of Certification, Inc. (BOC) Exam Development Style Guide**

*Last Edited on March 2022*

This document is developed to assist BOC item writers and other stakeholders. It provides guidelines/rules to help standardize the development of the BOC exam.

\*This is an evolving document and will be reviewed on a regular basis for edits and alterations.

### **1. General Guidelines**

- A. In general, test items should be critical, important and frequent and do the following:
- Be easily understood
  - Minimize guessing
  - Avoid testing trivial information
  - Avoid candidate scrolling
  - Assess entry level knowledge, skills and abilities (KSAs)
- B. All items should account for characteristics that could affect comprehension including:
- Age
  - Education level
  - Experiences
  - Language
  - Physical/mental limitations
  - Geographic location
- C. Items should be written for the entry level athletic trainer and pertinent to assessing minimum competence required for an athletic trainer within 2 to 3 years of entry to the profession.
- Focus on content that have permeated entry level practice and can be double referenced
  - Items should not be based on opinions. They should be based on established guidelines (i.e., double referenced).
- D. Every item on a high-stakes exam must be linked to the blueprint to be legally defensible.
- E. All items should be written clearly and concisely (minimize expressive/descriptive verbiage).
- Do not use obscure concepts by making sure items are tied to the blueprint and pertinent to the entry level professional.
  - If including practice setting, age, gender, sport, etc., it should have a direct bearing on the content of the item.
- F. Individual items will only test 1 concept at a time.
- If a stem gives information as to a set of signs and symptoms and asks the candidate to identify the potential condition and what to do next, the item should be rewritten into 2 items since it is trying to test 2 concepts (i.e., identification and treatment).
  - Example: “What is the normal pulse rate of an adult and how would each be measured?” This question would need to be split into 2 separate items. Knowledge of normative values is 1 concept and how to assess each is a separate concept.
- G. All items should be written in the form of a question and end in a question mark (?). No fill in the blank or incomplete sentence items.

- H. Refer to the person first within the item as opposed to the injury/illness.
- Example: “A patient with a sprained ankle...”
- I. All items will be written in third-person.
- Example: “An athletic trainer would...” as opposed to “you would...”
- J. Items should be written in “active voice.”
- Example: “The student played basketball at school today.” vs. “Basketball was played at school today.”
- K. All items should be stated positively and avoid the use of statements such as:
- “All of the following EXCEPT”
  - “Which of the following is NOT true?”
  - Not acceptable example: “All of the following conditions can be safely treated with thermal ultrasound EXCEPT...”
  - Acceptable example: “Which of the following conditions are contraindications for use of thermal ultrasound?”
- L. All distractors should be clearly incorrect but plausible and consistent in content.
- “Clearly incorrect but plausible” could include common misconceptions, common errors, familiar but incorrect phrases with some embedded truth or close but incorrect information.
  - “Consistent in content” refers to all distractors being in the same “family.” If the stem is asking about “muscles” all of the distractors need to be “muscles.”
- M. The item stem should include all information that is relevant and necessary to answer the question. If necessary, bullet points may be added to present the information in a clear and concise manner (i.e. signs and symptoms). Bulleted information should be short and concise (no full sentences).
- N. Construction of items should avoid content where there may be inconsistencies or variations in, accepted / published terminology, local/regional/national/institutional laws, regulations and/or policies and procedures.
- O. Vocabulary should be consistent with the level of entry level professional.
- P. Avoid absurd responses. These are so highly implausible, that no test taker will choose them. The use of absurd responses makes guessing easier by reducing the number of plausible distractors in a test item. This can also be said about “all of the above” responses, “none of the above” responses, “I don’t know” responses and “a and b above” responses.
- Q. Avoid verbatim phrasing from a textbook. This type of questioning leads to rote memory for students and most of the test questions are at the lower cognitive level of recall.
- R. Avoid using trickery, humor or teaching within items. Test-takers must be able to interact with the items without barriers.
- S. Avoid trick questions that lead to incorrect responses.
- Trivial content - Items are considered tricky if the content of the item is unimportant and the trivial point is the focus of the correct response.
  - Stem includes unnecessary window dressing - Items are considered tricky if the item writer provided irrelevant information for determining the correct response.
  - Correct response discrimination - Items are considered tricky if the item is discussed at one level of precision such as the approximate area and then it is tested at a much finer level of discrimination such as decimal areas.
  - Opposite principle - Items are considered tricky if they measure knowledge of content in the opposite from which it was learned.
  - Highly ambiguous - Items are considered tricky if the best candidates had no idea of the correct response and they had to guess.
- T. Referencing exam items:
- All items should have a minimum of 2 references.

- Except for seminal references, references will be no more than 5 years old.
  - i. A “Seminal Reference” is typically older than 5 years but has withstood “the test of time” and continues to be used in most ATPs as per the Program Director Reference Survey.
    1. Example: Netters Anatomy
- References will be generally found to be utilized within a considerable portion of the athletic training field.
- References should be publically available, not confidential or of limited release. Publically available may require some cost (e.g., a text book, library subscription).
- In regard to professional statements, Position Statements will be accepted and used (no “official” or “consensus” statements may be used).
- All references will be cited from their “primary source.”
  - i. Example: NATA Position Statement should be referenced from the Journal of Athletic Training and **not** the NATA website.
- Peer reviewed journal articles can be used as long as they are either position statements or meta-analyses.
- Unacceptable References include material from any other professional organization/institutions such as NCAA; ACSM, AMA etc.

<b>2. Terminology</b>
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- A. Patient vs. Athlete vs. Client:
- An individual receiving athletic training service should be referred to as “patient;” the descriptor “athlete” should only be used when a problem is based on participation in a sport.
  - The term “client” should be used for situations where individuals receive athletic training services, usually preventive in nature, on a fee-for-service basis.

B. If age of the “athlete” or “patient” is a relevant factor in the item, specify the age.

C. Terminology

<b><u>Correct Usage</u></b>	<b><u>Incorrect Usage</u></b>
Athletic Trainer	Certified Athletic Trainer
Physician	Doctor
Athletic training “services”	Athletic training “coverage”
BOC	NATABOC or NATA-BOC
Athletic training facility	Athletic training room
Health Care Provider	Allied Health Care Provider
Orthopedic	Orthopaedic

D. Use “Emergency Cardiac Care (ECC)” as a collective noun. Use “CPR” and “AED” when using an AED or applying CPR.

E. Use “ligamentous testing,” “manual muscle testing” and/or “special testing.”

F. Use “differential diagnosis” and/or “impression.”

G. All items must have a clear choice when using “best” or “most.” “Best” and/or “Most” implies that the correct choice is optimal for the situation when compared to other choices.

H. Refer to medications by their action.

- Example: “Antibiotic” instead of “Azithromycin” (Z-Pack)
- Example: “Non-Steroidal Anti-Inflammatory” (NSAID) instead of “Celebrex”

I. Practice settings will be referred to as the following:

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| <ul style="list-style-type: none"> <li>• Clinic/Hospital</li> <li>• Health/Fitness Industry</li> <li>• Industrial/Corporate</li> <li>• Corporate</li> <li>• Military/Government/Law Enforcement</li> </ul> | <ul style="list-style-type: none"> <li>• Professional Sports/Performing Arts</li> <li>• Sales/Marketing</li> <li>• Secondary School</li> <li>• University/College/Community College</li> <li>• Youth Sports</li> </ul> |
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- J. Cranial nerves will be expressed as both the roman numeral and the formal name:
- “Cranial Nerve V (Trigeminal)”
  - “Cranial Nerve II (Optic)”
- K. When a term has 2 commonly accepted forms, both will be used and displayed as the following:
- i.e., “Peroneal (fibularis) tendons”
  - i.e., “External (lateral) rotation”
  - i.e., “Internal (medial) rotation”
  - i.e., “3.0/3.3 MHz”
- L. Deep Tendon Reflexes will be expressed as:
- 0 = Absent
  - 1+ = Hypoactive
  - 2+ = Normal
  - 3+ = Brisk
  - 4+ = Hyperactive with Clonus
- M. When expressing the pain scale, it will be listed as the following:
- “8 on a 10 point scale”
- N. Standard instructions for items:
- Multiple-Choice: *Choose only one*
  - Multi-Select: *Choose all that apply*
- O. Ultrasound parameters will be expressed as the following:
- Frequency = MHz
  - Power = w/cm<sup>2</sup>
- P. Electrical Modalities
- The use of “Hz” is appropriate when designating the frequency of alternating current (AC) modalities
  - The use of “pps” is appropriate when designating the pulse rate.
  - Duty cycle will be expressed as “10 seconds on/50 seconds off”
- Q. Trademarked, Registered and Copyrighted Names
- Names that hold the marks <sup>TM</sup>, ®, © are not to be used in exam items. The generic version to describe the protected term must be used

<b>3. Abbreviations</b>
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Abbreviations on the list below may be used without spelling out the entire term. All other abbreviations **NOT** on the list below need to be spelled out: i.e., American Red Cross (ARC). This does not apply when an item is specifically testing the knowledge of commonly accepted abbreviations.

AAROM	Active Assistive Range of Motion
ACL	Anterior Cruciate Ligament
ADL	Activities of Daily Living
AED	Automated External Defibrillator
AIDS	Acquired Immune Deficiency Syndrome
AMA	American Medical Association
AROM	Active Range of Motion
BESS	Balance Error Scoring System
BID	Twice a Day
BMI	Body Mass Index
BOC	Board of Certification, Inc.
BP	Blood Pressure
bpm	Beats Per Minute

CAATE	Commission on Accreditation of Athletic Training Education
CDC	Centers for Disease Control and Prevention
COPD	Chronic Obstructive Pulmonary Disease
CPM	Continuous Passive Motion
CPR	Cardiopulmonary Resuscitation
CT Scan	Computed Tomography Scan
DIP	Distal Interphalangeal
DSM IV	Diagnostic and Statistical Manual of Mental Disorders - 4th Ed.
EAP	Emergency Action Plan
ECC	Emergency Cardiac Care
ECG/EKG	Electrocardiogram
EMG	Electromyogram
EMS	Emergency Medical Services
EPA	United States Environmental Protection Agency
FERPA	Family Educational Rights and Privacy Act
FDA	U.S. Federal Drug Administration
HIPAA	Health Insurance Portability and Accountability Act
HIV	Human Immunodeficiency Virus
HMO	Health Maintenance Organization
HOPS	History, Observation, Palpation, Special Tests
HR	Heart Rate
LCL	Lateral Collateral Ligament • need to specify which body part (knee, elbow, etc.)
MCL	Medial Collateral Ligament • need to specify which body part (knee, elbow, etc.)
MCP	Metacarpophalangeal
MMT	Manual Muscle Test
MRI	Magnetic Resonance Imaging
MRSA	Methicillin Resistant Staph Aureus
MTP	Metatarsophalangeal
NATA	National Athletic Trainers' Association
NCAA	National Collegiate Athletic Association
NOCSAE	National Operating Committee on Standards for Athletic Equipment
NSAID	Non-Steroidal Anti-Inflammatory Drugs
OSHA	Occupational Safety and Health Administration
OTC	Over-the-Counter
PCL	Posterior Collateral Ligament
PIP	Proximal Interphalangeal
PNF	Proprioceptive Neuromuscular Facilitation
PPE	Pre Participation Examination
PPO	Preferred Provider Organization
pps	Pulse Per Second
PRN	As Needed
PROM	Passive Range of Motion
QD	Per Day
QID	Four Times a Day
ROM	Range of Motion
RROM	Resistive Range of Motion
SLAP	Superior Labral Tear from Anterior to Posterior
SOAP	Subjective, Objective, Assessment, Plan
STD	Sexually Transmitted Disease • when referring to STD, need to mention STI in parentheses
STI	Sexually Transmitted Infection • when referring to STI, need to mention STD in parentheses
TBI	Traumatic Brain Injury
TENS	Transcutaneous Electrical Nerve Stimulation
TID	Three Times a Day
WGBT	Wet-Bulb Globe Temperature

WNL	Within Normal Limits
X Ray	Radiographs

#### 4. Numbers

- A. Numbers less than 10 will be spelled out.
- Example: 7 = seven
- B. Insert a leading zero if the decimal number is less than one.
- Example: 0.4 meters instead of .4 meters
- C. Age will be displayed as the following:
- Example: 17 year(s) old, Nine year(s) old
- D. Refer to spinal segments with no hyphens or spaces.
- Example: **C4** instead of C 4 or C-4

#### 5. Measurements

- A. All measurements (results and inanimate objects) will be displayed in English Customary Units with the Metric System equivalent in parentheses to one decimal point.
- Example: 160 lbs (72.5 kg)
- B. All temperatures will be displayed in Fahrenheit with the Celsius equivalent in parentheses.
- Example: 98 degrees F (36.7 degrees C)

<b>Length</b>		
U.S. Measurements	Metric System	Conversions
Inch = in	Millimeter = mm	1 in = 2.54 cm
Foot = ft	Millimeters of mercury = mmHg	1 ft = 30.48 cm = 0.305 m
Foot = ft	Centimeter = cm	1 yd = 0.914 m
Yard = yd	Meter = m	1 mi = 1.609 km
	Kilometer = km	

<b>Weight</b>		
U.S. Measurements	Metric System	Conversions
Ounce = oz	Milligram = mg	1 oz = 28349.5 mg
Pound = lb	Centigram = cg	1 oz = 28.350 g
	Gram = g	1 lb = 0.453 kg
	Kilogram = kg	

<b>Volume</b>		
U.S. Measurements	Metric System	Conversions
Teaspoon = tsp	Milliliter = ml	1 tsp = 5 ml
Tablespoon = tbsp	Centiliter = cl	1 c = 236 ml
Cup = c	Liter = l	1 qt = 0.946 l
Pint = pt	Kilo = kl	1 gal = 3.785 l
Quart = qt		
Gallon = gal		

<b>Temperature</b>		
U.S. Measurements	Metric System	Conversions
Fahrenheit = F	Celsius = C	1 degree C = (F-32)/1.8

#### 6. Time

- A. When referring to “after” something, it will be referred to as “post.”

- Example: “post-practice” vs. “after practice” and “post-surgery” or “post-surgical” vs. “after surgery”
- B. When referring to “before” something, it will be referred to as “pre.”
- Example: “pre-practice”
- C. Specific time-of-day will be expressed as:
- 9:00 a.m., 12:00 p.m. (noon), 5:00 p.m., 12:00 a.m. (midnight)

**7. Hyphenation**

- A. A hyphen will be used when grammatically indicated.
- Example: X-ray, patient-centered

**8. Range of Motion (values)**

- A. Must include joint/motions assessed.
- B. Must include a number range.
- Example: 0–60 degrees of elbow flexion

**9. Severity of Injury (grades)**

The following injury severity grading will be utilized for all items:

- A. **Grade I (mild)** = little or no damage to tissue, normally no loss of function.
- B. **Grade II (moderate)** = partial tearing or damage to tissue with some loss of function noted.
- C. **Grade III (severe)** = complete or near complete tear or rupture of tissue with complete loss of function usually noted.

**10. Muscle Testing**

- A. The following manual muscle testing grading scale will be utilized for all items:

Normal	5	Complete ROM against gravity with maximal resistance
Good	4	Complete ROM against gravity with moderate resistance
Fair +	3 +	Complete ROM against gravity with minimal resistance
Fair	3	Complete ROM against gravity with no resistance
Fair -	3 -	Some, but not complete, ROM against gravity
Poor +	2 +	Initiates motion against gravity
Poor	2	Complete ROM with some assistance and gravity eliminated
Poor -	2 -	Initiates motion if gravity is eliminated
Trace	1	Evidence of slight muscular contraction; no joint motion
Zero	0	No muscle contraction palpated

- B. Manual muscle testing will be expressed in this manner:
- The patient tested 3/5 (Fair) upon a manual muscle test of the biceps brachii

**11. Cultural Sensitivity**

- A. Items must be written to be sensitive to differences in gender, ethnicity and religious beliefs of the candidate. We will strive to balance these differences by the inclusion of all gender/ethnic groups within exam items.
- B. When writing a problem for a certification exam, item writers need to be vigilant about producing work that is fair — avoiding bias and stereotyping. Bias and stereotyping in testing are two different concepts.

- **Bias:** No problem should have characteristics that result in differential performance for individuals of the same ability but from different ethnic, gender, cultural or religious groups. Problems also can have characteristics that may cause bias against individuals with disabilities.
- **Stereotyping:** Tests should be free of material that may be offensive, demeaning or emotionally charged. While the presence of such material may not make the problem more difficult for the candidate, it may cause her or him to become “turned off” or emotional and result in lowered performance.

**12. Sports/Activities**

- A. When constructing items, all types of activities need to be represented within the exam. Therefore, we will not lean heavily on any given sport/activity when writing items (i.e., basketball, industrial worker, recreational participant, etc.)

**13. Emergency Cardiac Care (ECC) Items**

- A. Only items that refer to when to utilize CPR/AED or that give information about the status of CPR/AED are applicable to the exam. Items pertaining to the specifics of CPR/AED application (i.e., compression ratio, number of respirations, etc.) are not needed. All candidates have to submit a current ECC card to the BOC in order to become certified upon passing the exam.

**14. Images, Audio and Video Files**

- A. All submitted media must be free of copyrights. This includes releases from models used in the images or from artists who created the images.
- a. If needed, the BOC will handle all copyright issues with files used for exam items.
- B. Specific requirements:

<i>Digital Imagery</i>	<i>Diagrams and Other Non-Photographic Images</i>	<i>Scanned Imagery</i>	<i>Videos</i>	<i>Audio (stand alone)</i>
Original source file should be 1600 x 3200 dpi (largest setting on most digital cameras). If file is too large to submit via I-Dev, please compress and submit via email to the project manager.	Original source file should be 1600 x 3200 dpi. If file is too large to submit via I-Dev, please compress and submit via email to the project manager.	Images should be no less than 256 colors and 1200 dpi.	Files should be in MPEG format with 10,005 Kbit/second streaming video and 44,100 Hz * 320 Kbit/second audio channel.	Files should be non-compressed .wav files.