



Orthopaedic Division

CANADIAN PHYSIOTHERAPY ASSOCIATION

Division d'orthopédie

ASSOCIATION CANADIENNE DE PHYSIOTHÉRAPIE

Information for Candidates

Preparing to Write the

Advanced Level

Multiple-Choice Examination

**Orthopaedic Division of the Canadian Physiotherapy Association
Information for Candidates Preparing to Write the
Advanced Level Multiple Choice Examination**

Introduction

Candidates preparing to write the Advanced Level Multiple Choice Examination will benefit from the following information, which describes the parameters used to select the 100 questions for this examination. Seven sample questions, which are typical of the type of questions selected for the examination, have also been provided for your reference.

A table of specifications that is approved by the Orthopaedic Division of the Canadian Physiotherapy Association guides the selection of questions for the examination. The table of specifications outlines the number of questions selected for the examination according to *question type*, the *cognitive level* at which the question is written, and the *content domain* from which the question is taken:

- *There are two different types of questions on the exam:*
 - Case Based Questions: a scenario followed by three or four questions (CQ)*
 - Independent Questions (IQ)*
- *There are three different cognitive levels at which questions can be written:*
 - Knowledge Comprehension (KC)*
 - Application of Knowledge and Skills (AP)*
 - Critical Thinking (CT)*
- *There are four different content domains from which questions can be taken:*
 - Anatomy, Physiology, Neurophysiology (APNP)*
 - Biomechanics of Joints (BIOM)*
 - Myokinematics and Myokinetics (MYOK)*
 - Pathology (PATH)*

Candidates will be familiar with the four content domains described above, but may benefit from a further description of what is meant by the three different cognitive levels.

- *Knowledge Comprehension (KC)*: *Knowledge Comprehension questions require candidates to recall factual information and understand concepts.*
- *Application of Knowledge and Skills (AP)*: *Application questions require candidates to apply or transfer knowledge and skills to new situations.*
- *Critical Thinking (CT)*: *Critical Thinking questions require candidates to analyze, compare, contrast, evaluate and justify information and ideas. It also requires candidates to understand relationships, structures and patterns.*

The chart below describes the *approximate* number of questions that will be on the examination from each question type, cognitive level, and content domain. In any given year the number of questions selected for the examination could vary within the ranges outlined in the following chart.

Table of Specifications for the 100 MCQs Selected for the Advanced Examination

<i>Question Types</i>	<i>Case Based Questions</i> <i>Independent Questions</i>	30 to 40 60 to 70
<i>Cognitive Levels</i>	<i>Knowledge Comprehension (KC)</i> <i>Application of Knowledge and Skills (AP)</i> <i>Critical Thinking (CT)</i>	20 to 30 50 to 60 15 to 25
<i>Content Domains</i>	<i>Anatomy, Physiology, Neurophysiology (APNP)</i> <i>Biomechanics of Joints (BIOM)</i> <i>Myokinematics and Myokinetics (MYOK)</i> <i>Pathology (PATH)</i>	25 to 35 15 to 25 5 to 15 35 to 45

The information in the previous chart can be broken out in further detail by describing a cross tabulation of a specific cognitive level with a specific content domain for the 100 questions on an examination. The chart below provides an example of this information:

Sample Cross Tabulation of Cognitive Levels and Content Domains

N = 100	<i>APNP</i>	<i>BIOM</i>	<i>MYOK</i>	<i>PATH</i>	N =
<i>KC</i>	8	5	2	10	25
<i>AP</i>	15	11	7	22	55
<i>CT</i>	7	4	3	6	20
N =	30	20	12	38	100

Interpreting the Cross Tabulation Chart:

Examples:

In the third column, BIOM, there are 5 questions from biomechanics that are knowledge comprehension questions (KC), 11 that are application questions (AP), and 4 that are critical thinking questions (CT), for a total of 20 questions from the content domain of biomechanics.

In the fourth row, CT, there are 7 critical thinking questions from anatomy (APNP), 4 from biomechanics (BIOM), 3 from myokinematics (MYOK), and 6 from pathology (PATH) for a total of 20 questions from the cognitive level of critical thinking.

Body Parts, Body Locations, Conditions and Subject Areas

It is also important to note that questions developed for the Advanced Level MCQ Examination take their context from the following body locations, conditions and subjects.

Body Locations	Conditions	Subjects
✓ Cervical spine ✓ Thoracic spine ✓ Lumbar spine ✓ Thoracolumbar ✓ Sacroiliac joint (SIJ) ✓ Head and Neck ✓ TMJ ✓ Shoulder ✓ Elbow and forearm ✓ Wrist and hand ✓ Hip ✓ Knee ✓ Foot and ankle	✓ Headache ✓ Vertebral artery ✓ Dizziness differentiation ✓ Tendinopathy ✓ Osteoarthritis ✓ Myofascial strain ✓ Articular dysfunction ✓ Peripheral neuropathy ✓ UQ dysfunction ✓ LQ dysfunction ✓ CNS disease/dysfunction ✓ Thoracic outlet syndrome ✓ Whiplash associated disorder	✓ Manipulation theory ✓ Exercise prescription ✓ Neurodynamics ✓ Pain science ✓ Injury mechanics ✓ Instability ✓ Red flag questions ✓ Assessment ✓ Education ✓ Research ✓ Effects/efficacy ✓ Treatment planning ✓ General medical knowledge

The 100 questions that are selected each year for the examination are selected from a question bank of approximately 400 questions. Although there is an element of randomness that is used to select the 100 questions for the exam, the parameters outlined in the table of specifications on page 2 must be met. As well, there are processes in place to ensure that no one body part or body location is over represented or under represented according to its relative importance in the curriculum

For example, the distribution of the 100 questions on an exam by body part, body location, condition or subject might be as described in this chart:

Body Part or Location	Distribution Example 1	Distribution Example 2
<i>Cervical spine</i>	<i>11</i>	<i>9</i>
<i>Thoracic spine</i>	<i>8</i>	<i>10</i>
<i>Lumbar spine</i>	<i>10</i>	<i>9</i>
<i>Thoracolumbar</i>	<i>3</i>	<i>4</i>
<i>Sacroiliac joint</i>	<i>3</i>	<i>3</i>
<i>Head and neck</i>	<i>10</i>	<i>9</i>
<i>TMJ</i>	<i>2</i>	<i>3</i>
<i>Shoulder</i>	<i>9</i>	<i>7</i>
<i>Elbow and forearm</i>	<i>4</i>	<i>5</i>
<i>Wrist and hand</i>	<i>6</i>	<i>6</i>
<i>Hip</i>	<i>6</i>	<i>7</i>
<i>Knee</i>	<i>8</i>	<i>8</i>
<i>Foot and ankle</i>	<i>9</i>	<i>8</i>
<i>Manipulation theory</i>	<i>3</i>	<i>3</i>
<i>Exercise prescription</i>	<i>3</i>	<i>2</i>
<i>Neurodynamics</i>	<i>3</i>	<i>4</i>
<i>General knowledge</i>	<i>2</i>	<i>3</i>
<i>Total MCQs =</i>	<i>100</i>	<i>100</i>

Sample Questions:

The seven sample questions that follow will give candidates an indication of the format, level of difficulty, and content of questions that will be on the examination. Below each of the sample questions is an information bar. This bar provides the candidate with an annotation for the question. The annotation provides the correct answer, the content domain from which the question is taken, the cognitive level of the question, and the body part or location. This annotation, of course, will not be present on the examination.

CASE QUESTION SECTION: Questions 1 to 3 refer to a case.

CASE 1

Last week, the quarterback of a football team fell on his outstretched hand. X-rays of the wrist and hand are negative for fractures. Today, he reports difficulty throwing the football greater than 20 yards and that his grip is weaker than usual.

QUESTIONS 1 to 3 that follow refer to CASE 1

1. What are the characteristic osteokinematic movements of the metacarpal bones at the 2nd to 5th carpometacarpal joints during flexion?
 - A. Impure swing about a sagittal axis in a coronal plane, with conjunct folding: external rotation of metacarpal #2 and internal rotation of metacarpals #4 + #5
 - B. Impure swing about a coronal axis in a sagittal plane, with conjunct folding: internal rotation of metacarpal #2 and external rotation of metacarpals #4 + #5
 - C. Impure swing about a coronal axis in a sagittal plane, with conjunct folding: external rotation of metacarpal #2 and internal rotation of metacarpals #4 + #5
 - D. Impure swing about a sagittal axis in a coronal plane with conjunct folding: internal rotation of metacarpal #2 and external rotation of metacarpal #4 + #5

Answer B	BIOMECHANICS	KNOWLEDGE COMPREHENSION	WRIST/HAND
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2. The client's improvement has plateaued despite specific mobilizations and an exercise program. Assessment reveals a non-capsular pattern of motion restriction with a hard end-feel. What should the physiotherapist do?
 - A. Perform a manipulation in the opposite direction of the glide restriction.
 - B. Perform a direct thrust manipulation in the same direction as the restricted articular glide.
 - C. Perform a gapping manipulation technique parallel to the joint surface.
 - D. Initiate an aggressive frictioning program over the affected ligament.

Answer B	ANATOMY PHYSIOLOGY	CRITICAL THINKING	WRIST/HAND
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3. The client now reports lateral forearm muscular tightness and pain with throwing. Upper limb neuromeningeal tension testing is normal. Elbow extension is full. Assessment reveals the ulna is held in abduction at the ulnohumeral joint. There is a hard end-feel of the lateral glide of the ulna at the ulnohumeral joint. The joint is non-irritable and stiff. What is the best way to relieve this lateral forearm muscular tightness and pain?
 - A. Perform a Mill's manipulation.
 - B. Perform an ulnohumeral distraction manipulation.
 - C. Perform a valgus manipulation at the ulnohumeral joint.
 - D. Perform a lateral thrust manipulation of the ulna on the humerus.

Answer D	ANATOMY PHYSIOLOGY	CRITICAL THINKING	WRIST/HAND
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END OF CASE

INDEPENDENT QUESTION SECTION: Questions 4 to 7 do not refer to a case.

4. A 22-year-old male runner presents with heel pain. Neurodynamic testing reproduced the heel pain in the following position: straight leg raise with internal leg rotation, adduction of the hip, dorsiflexion and eversion of the ankle, and extension of the toes. Which nerve would require treatment?

A. Saphenous nerve
B. Peroneal nerve
C. Sural nerve
D. Plantar nerve

Answer D	BIOMECHANICS	APPLICATION OF KNOWLEDGE	NEURODYNAMICS
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5. A 22-year-old male client presents post surgery with a diagnosis of traumatic, unidirectional Bankart surgery (TUBS) lesion. Which of the following is the most common mechanism of injury for TUBS?

A. Abduction and extension of the arm in the coronal plane
B. A fall on the point of the shoulder
C. Forward flexion and external rotation
D. A direct blow to the lateral shoulder

Answer A	PATHOLOGY	APPLICATION OF KNOWLEDGE	SHOULDER
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6. A biomechanical examination of the lumbar spine reveals a loss of intersegmental movement at L4-5 with a very hard abrupt end-feel. Which of the following is associated with a joint fixation?

A. A non-capsular pattern of limitation of physiological movements
B. A capsular pattern of limitation of physiological movements
C. A normal axis of rotation
D. Increased motion on a rotatory stability test

Answer A	PATHOLOGY	KNOWLEDGE COMPREHENSION	LUMBAR SPINE
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7. Which of the following groups of arteries of the vertebro-basilar distribution arises from the basilar artery?
- A. Anterior spinal, internal auditory, pontine, superior cerebellar, posterior cerebellar
 - B. Posterior spinal, anterior inferior cerebellar, pontine, superior cerebellar, posterior cerebellar
 - C. Posterior inferior cerebellar, anterior inferior cerebellar, internal auditory, pontine, superior cerebellar
 - D. Anterior inferior cerebellar, internal auditory, pontine, superior cerebellar, posterior cerebral

Answer D	ANATOMY PHYSIOLOGY	KNOWLEDGE COMPREHENSION	HEAD/NECK
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Setting the Pass Score for the Advanced Level MCQ Examination

The pass mark is determined through a standard-setting process using a modified Angoff method. A panel of content experts rates each question on the examination in terms of the percentage of minimally qualified candidates (those possessing the minimum knowledge and skill necessary to practice safely and effectively) that *should* answer the question correctly. The average of the ratings of the content experts determines the Angoff value for each item, and the sum of the Angoff values across all items on the examination becomes the pass mark (or cut-score) for the examination. As examples, the pass mark set by the panel for the examination in Year A was 69.0% requiring at least 69 questions correct out of 100 questions. In Year B the pass mark set by the panel was 71.2% requiring at least 71 questions correct out of 100 questions.

Prepared for the Orthopaedic Division of the Canadian Physiotherapy Association

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