

# Aeromedical Theory Examination

## Study Guide and Sample Questions

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Emergency Health Services Branch  
Ministry of Health and Long-Term Care



To all users of this publication:

The information contained in this standard has been carefully compiled and is believed to be accurate at date of publication.

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## Document Control

Version Number	Date of Issue	Brief Description of Change
2.3	June 2014	Finalized version
3.0	July 2017	Revised format and edits for consistency with other study guides

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## Overview

The Aeromedical Theory Examination is offered three (3) times per year by the Ontario Ministry of Health and Long-Term Care (MOHLTC). Successful completion of this exam (minimum score 70%) is a required to be eligible for employment as a flight paramedic in Ontario.

The Aeromedical Theory Examination is based upon the knowledge and skills required to provide pre-hospital care and the adaptation of this background to the aeromedical environment. The exam is written on one day and is two and half (2.5) hours in length. The Aeromedical exam is composed of multiple choice questions which pertain to various scenarios based on actual ambulance calls. Also included in the exam is some multiple choice questions which stand alone and are not related to any specific scenario.

No single text provides the range of information necessary for a comprehensive review of the categories and sub-categories covered in the exam. Training facilities may utilize a wide range of resource materials during the educational process.

## Subject Categories

The Aeromedical Theory Examination measures knowledge and skills in the following categories and subcategories:

### Categories

- Anatomy and Physiology
- Communications
- Flight Operations
- Flight Pathophysiology
- Legal / Ethical Issues
- Patient Assessment
- Patient Management

### Subcategories

- Acts & Regulations
- Anaphylaxis

- Barometric Pressure
- Barotrauma
- Behavioural Situation
- Burns
- Cardiovascular System
- Central Nervous System
- Decompression Sickness
- Defibrillation
- Dehydration
- Documentation
- Emergency Procedures
- Endocrine
- Environment
- Equipment
- Flight Safety
- Gas Laws
- Gastrointestinal
- Geriatric
- Gynecology
- History taking
- Hypoxia
- Infectious Diseases
- Intravenous Therapy
- Multi-Systems
- Musculoskeletal System
- Neonatal
- Obstetrics
- Other
- Pediatrics
- Pharmacology
- Policy / Procedure / Protocol
- Primary Survey
- Radio Communications
- Renal
- Respiratory System
- Secondary Survey
- Stresses of Flight

- Survival Training
- Symptom Relief
- Therapeutics
- Toxicology
- Trauma
- Triage
- Verbal Report

## Question Types

Within each category you may be asked several types of questions corresponding to cognitive levels. Cognition level refers to the degree of complexity of thinking required to answer a question or solve a specific problem. The types of questions, in increasing order of difficulty, are:

1. *Factual* questions measure your ability to recall facts pertaining to a specific category of content.
2. *Application* questions require you to apply your knowledge of concepts to a particular patient situation or content area.
3. *Judgement* questions measure your ability to decide the best course of action or most appropriate approach in a provided situation.
4. *Interpretative* questions require you to determine the inferences of a given situation (e.g. patient assessment findings; presenting manifestation or given condition; legal and/or environmental conditions).
5. *Rationale* questions measure your ability to explain the reason for assessment findings; management decisions; patient clinical presentations and safety and legal precautions.
6. *Prioritization* questions measure your ability to sequence assessment based on what is best to perform or expected according to a given protocol. It also measures your ability to select the most appropriate action or measure when managing a situation.

## Scoring Process

The Aeromedical Theory Examination is comprised of questions developed by experts in the Aeromedical field. The exam is subject to rigorous statistical analysis before scores are reported to candidates. This analysis determines whether each question yielded the expected statistical results. If this analysis suggests that particular questions were ambiguous, required knowledge beyond the scope of the exam or were otherwise inappropriate, then the results of these questions are not used in computing the candidates' score.

# Strategies

- All questions on the exam are of equal value; do not waste excessive time pondering an individual question.
- Scores are based upon the number of correctly answered questions; wrong answers do not count against your score. Therefore, to maximize your score, it is better to guess at an answer than not to respond at all.
- Record all your answers on your computer answer sheet. This sheet is the only document that will be scored.
- If you decide to change an answer on your answer sheet, ensure you completely erase the pencil mark you do not wish to be scanned by the computer.
- Do not wait until the last few minutes of the exam to record your answers on your answer sheet; extra time will not be granted for this purpose.
- Check frequently to ensure you are marking your answers in the appropriate row on your answer sheet.
- If you are stuck on a difficult question, eliminate as many answer choices as possible and then select the answer you think is best from the choices remaining.

# Sample Exam Questions

The following is an example of the type and format of questions you will see on the Aeromedical Theory Examination. Following each question is an explanation of the question type and the correct answer.

1. Which of the following law(s) apply to the atmospheric or barometric pressure?
  1. Dalton's Law
  2. Henry's Law
  3. Graham's Law
  4. Starling's Law
  - A. 1 only
  - B. 1 and 4
  - C. 2 and 3
  - D. 2, 3 and 4

*Type: Factual. Category: Flight Pathophysiology. Sub Category: Gas Laws. The correct answer is A.*



Questions 2 and 3 refer to the following scenario:

Your aircraft has been dispatched to transport a neonate team from Elsewhere Airport to Billy Bishop Airport. It is the middle of winter and the temperature at ground level at the pickup airport is minus thirty degrees Celsius (-30°C). The estimated time en route to Toronto is one hour and forty-five minutes.

At the airport, the land ambulance meets you and unloads the incubator with a premature infant whom they tell you is being mechanically ventilated and has numerous medications running in the IVs. The neonate transport team consists of 2 RNs and a RN in training to become a member of the Neonate Transport Team. Two of the RNs are wearing appropriate winter weather clothing, but one RN is wearing only hospital greens and a white lab coat. In the cabin of your aircraft, there are three seats, two stretcher racks, one of which accommodates the incubator.

2. Can you refuse to transport the RN who is not appropriately dressed?
  - A. Yes, because the RN represents a hazard to herself and the other passengers and crew.
  - B. No, because only the pilot in command has the authority to refuse to board passengers.
  - C. No, because the RN is needed to provide patient care and cannot be left behind.
  - D. Yes, because your aircraft has only three seats.

*Type: Application. Category: Flight Operations. Sub Category: Flight Safety. The correct answer is B.*

3. Given the restriction of cabin space, it is acceptable for all three RNs and the incubator to be permitted to board the aircraft?
  - A. No, because there are four adult passengers and only three seats available.
  - B. No, because the combined weight of the transport team and equipment exceeds the aircraft limit.
  - C. Yes, but one RN must be strapped to a stretcher on one of the stretcher racks for take-off and landing.
  - D. Yes, but you must give up your seat and strap yourself to a stretcher on one of the stretcher racks for take-off and landing.

*Type: Judgement. Category: Flight Operations. Sub Category: Flight Safety. The correct answer is A.*

Questions 4 to 7 (inclusive) refer to the following scenario:

You are the aeromedical attendant assigned on a charter airline service. You are to airlift a male patient with pneumonia, several bruised or fractured ribs, and a possible pneumo or hemothorax. The patient is at a small clinic west of Marathon and you are to transport him to Thunder Bay.

The patient, Mr. Major, was assessed by a doctor who was called to an emergency home delivery. The RPN states his O<sub>2</sub> saturation is 88% and he is now only mildly dyspneic. She states that the

doctor wanted him assessed since he should receive IV antibiotics for pneumonia. Mr. Major also needs an X-ray to determine if his rib fracture has caused a pneumothorax.

The RPN tells you that Mr. Major suffered a spontaneous pneumothorax about six months ago. She also tells you that he fell this morning while walking along the shore of Lake Superior and this fall resulted in his rib bruising and subsequent discomfort. There are no X-ray facilities at the clinic.

Before proceeding to the aircraft, you assess Mr. Major's vital signs. You find his pulse to be 98 full and regular, respirations are 30 shallow and regular and his blood pressure is 150/92. He appears pale, slightly diaphoretic and anxious.

4. Select the priority assessment(s) you would perform before accepting this patient for flight.
  1. Auscultating for air entry equality from the bases to apices of his lungs.
  2. Determining his degree of pain with deep inspirations.
  3. Inspecting the peripheral edema in dependent parts.
  4. Checking for deviation of his trachea from its mid-line position.
  5. Observing his jugular veins for distention with each breath.
  6. Determining the symmetry of chest wall movement during each breath.
    - A. 1 and 3
    - B. 2, 3 and 6
    - C. 2, 4 and 5
    - D. 1, 4, 5 and 6

*Type: Prioritization. Category: Patient Assessment. Sub Category: Multi-Systems. The correct answer is D.*

You are concerned about accepting this patient with a suspected unstabilized pneumothorax. You are flying in a pressurized, fixed wing aircraft. The flying time will be 1 hour and 20 minutes to Thunder Bay.

Both you and the nurse realize that he needs more treatment than is available at this clinic.

5. Which of the following is/are accurately related to your concerns about flying Mr. Major?
  1. The higher the altitude, the lower the partial pressure of oxygen which in turn decreases the required pressure gradient for his alveolar/blood diffusion.
  2. The percentage of available oxygen in the air decreases as one ascends in altitude greater than 8000 feet, which will further compromise his alveolar ventilation.
  3. In altitudes above sea level, greater amounts of oxygen are dissolved in the plasma which will make it unavailable for transfer to body cells.
  4. The greater the altitude, the greater the air expansion in the intrapleural space, which will further the collapse of his affected lung.

- A. 1 and 2
- B. 1 and 4
- C. 2 and 3
- D. 3 and 4

*Type: Rationale. Category: Flight Pathophysiology. Sub Category: Gas Laws. The correct answer is B.*

6. The PIC (Pilot in Command) asks if there are any restrictions for the flight. The best instructive response would be:
- A. “No, time is critical, proceed full steam ahead.”
  - B. “Yes, keep the cabin altitude as close to sea level as you can.”
  - C. “No, but increase the cabin altitude as much as you can.”
  - D. “Yes, try to keep us at a cabin altitude of 20 000 feet.”

*Type: Judgement. Category: Flight Pathophysiology. Sub Category: Stresses of Flight. The correct answer is B.*

Mr. Major has been quiet and non-talkative other than telling you that he and his family had been on a camping vacation. He states that his wife and children will break camp and meet him in Thunder Bay, and that he should never have left home with such a terrible chest cold. He said, “I felt lousy for the whole 5 week trip.”

Thirty minutes into the flight, he becomes agitated and restless. He throws his blanket off and winces with pain as he tries to take a deep breath. You hear him swear under his breath. His pulse is now 120, regular, but weaker in volume. His blood pressure is 100 by palpation. His respirations are 34, apical only except for occasional involuntary quick deeper breaths. His diaphoresis and pallor have increased. He is conscious and fully orientated.

7. Which of the following may be the cause and/or reason for these assessment findings?
- 1. A decrease in his blood oxygen saturation and perfusion.
  - 2. His anxiety about this unexpected illness/injury and the disappointment related to the delay of his trip.
  - 3. A decrease in his vital capacity from pleural effusion associated with his lung infection.
  - 4. An increase in the size of the pneumothorax or hemothorax, which decreases his diffusion surface.
- A. 4 only
  - B. 1 and 2
  - C. 1, 3 and 4
  - D. 1, 2, 3, and 4

*Type: Interpretation. Category: Flight Pathophysiology. Sub Category: Respiratory System. The correct answer is D.*



