

DEFINITION

Aerospace Medicine is that area of enhanced competence within medicine concerned with the recognition, investigation, diagnosis, and management of all aspects of medical, surgical, and health and safety issues concerned with flight.

Aerospace Medicine is a specialized body of medical information and knowledge related to human safety and performance in the aviation and space environments. It includes

- knowledge of the psychological, physiological, and pathophysiological effects of these environments on healthy individuals, as well as understanding the effects of such environments on those with existing medical conditions and individuals requiring medical evacuation;
- components of the practice of occupational medicine involving the selection, periodic health evaluation, and special assessment of individuals working in the aviation and space environments;
- components of the practices of occupational and preventive medicine aimed at maintaining the health and fitness of aircrew and space crew, and minimizing or ameliorating the deleterious effects on humans working in these specialized environments, through applied knowledge of the specialized risks; and
- specialized clinical medical skills aimed at providing optimum medical care for crew members in the isolated environment of space operations.

GOALS

Upon completion of training, a diplomate is expected to function effectively as a competent specialist in Aerospace Medicine, capable of an enhanced practice in this area of focused competence (AFC), within the scope of his/her primary discipline. The AFC trainee must acquire a working knowledge of the theoretical basis of the discipline, including its foundations in the sciences and research.

The discipline of Aerospace Medicine also includes responsibility for

- aeromedical assessment of individual fitness to fly;
- health and safety of aircrew members and the flying public;
- provision of medical advice and support to aerospace operations;
- engagement of governments, other physicians, and other health professionals in the promotion of the health and wellness of people who fly; and
- advancement of the discipline of Aerospace Medicine through scholarship.

Note: All markers must be signed off by supervisor prior to adding to portfolio.

Note: All submitted cases or clinical material must be de-identified to preserve patient privacy. This requires the removal of key identifiers, including but not limited to name, birth date, date of consultation, and location (e.g., hospital/clinic, city). In some cases, even without these identifiers, a patient could be identified by other information included in the case or clinical material (e.g., if the patient has a very rare condition, or lives in a remote area with a limited population size). In these instances de-identification may not be sufficient to ensure patient privacy. In such exceptional cases it would be advisable to obtain patient consent for the submission.

Diplomates must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centred care and service to a diverse population. In all aspects of specialist practice, the diplomate must be able to address ethical issues and issues of gender, sexual orientation, age, culture, and ethnicity in a professional manner.

At the completion of training, the AFC trainee must demonstrate evidence of acquisition of the competencies listed in the table below.

In the view of the AFC Program Committee, this candidate has acquired the competencies of the diploma program as prescribed in the <i>Competency Portfolio</i> and is competent to practice as a diplomate.	YES <input type="checkbox"/>	NO <input type="checkbox"/>
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COMMENTS

1. Aeromedical assessment of individual fitness to fly		
Milestones	Standards of Assessment	Documents to be submitted
1.1. Perform an aeromedical assessment of an air crew member	<p>Aeromedical assessment of five (5) aircrew members or candidates. The assessments must demonstrate satisfactory ability to gather appropriate data/information, integrate the function/role of the air crew member and the implication of the disease on that function/role, apply appropriate aviation standards and document the risk assessment and mitigation strategy as well as the final decision in a clear, concise, and logical manner.</p> <p>The assessments must be focused on the fitness for aeromedical certification under published standards and/or assessment of fitness to fly of those individuals who do not meet the standards. The range of outcomes should include: fit, unfit, fit with restrictions. The assessment must include at least one complex case (physical and psychological illness or injury) in at least two different types of flying environments.</p>	<p><i>Submit aeromedical assessments (real or simulated) for five (5) aircrew members or candidates. The range of outcomes should include fit, unfit, and fit with restrictions.</i></p>

<p>1.2. Perform an aeromedical assessment of a passenger</p>	<p>Aeromedical assessment of one (1) real or simulated passenger case scenario. The assessment must demonstrate satisfactory ability to gather appropriate data/information, apply knowledge of the medical condition, flight stresses, and particular flight environment, compare to guidelines and document the risk assessment and mitigation strategy as well as the final decision in a clear, concise, and logical manner.</p> <p>The scenario must document a medical condition or illness, identify the aeromedical issues including a full list of all aeromedical considerations, describe which are pertinent to the case and provide a mitigation strategy. Clinical conditions may include but are not limited to: flight of an individual with bullous lung disease, congestive heart failure, diabetes, pregnancy, or post myocardial infarction (MI).</p>	<p><i>Submit one (1) aeromedical assessment of a passenger based on a simulated or real case scenario</i></p>
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<p>1.3. Perform an aeromedical assessment of a patient for medical evacuation/transport</p>	<p>Aeromedical assessments of two (2) real or simulated patient case scenarios. The assessments must demonstrate satisfactory ability to gather appropriate data/information, apply knowledge of the medical condition, flight stresses, and particular flight environment, compare to guidelines and document the risk assessment and mitigation strategy as well as the final decision, in a clear, concise, and logical manner.</p> <p>The assessments must include a determination of the medical crew and equipment requirements for safe patient transfer.</p> <p>The case scenarios must be related to two different patient clearance circumstances. The range of patient clearance circumstances may include but is not limited to: respiratory, infectious, cardiovascular, obstetrical, musculoskeletal, trauma, psychiatric, or neurological issues.</p>	<p><i>Submit two (2) aeromedical assessments of a patient for transport based on real or simulated case scenarios</i></p>
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<p>1.4. Act as a consultant regarding individual fitness to fly</p>	<p>Consultations provided in three (3) instances when called upon to provide advice regarding individual fitness to fly. The request for consultation may be written, telephone, or otherwise technology-enabled. The documentation must include a brief description of the issue, the assessment of the aeromedical risk along with the risk mitigation strategy and final recommendation.</p>	<p><i>Submit three (3) written documentations of consultative advice provided regarding fitness to fly</i></p>
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2. Health and safety of aircrew members and the flying public		
Milestones	Standards of Assessment	Documents to be submitted
2.1. Develop aeromedical standards and guidelines	<p>Composition of an evidence-based update or critique of an item within aeromedical regulations, standards, policies, or a guideline. The submission must include appropriate references. The submission must demonstrate knowledge of current national and international aeromedical standards. The submission should be a briefing note or report and must effectively communicate the issue to a regulatory authority.</p>	<p><i>Submit an evidence-based update or critique of an item within aeromedical regulations, standards, policies, or guidelines with appropriate references. If the document has multiple authors, provide a description of the candidate's role.</i></p>
2.2. Advocate for the health and safety of patients	<p>Analysis of a particular occupational or environmental risk relevant to patients. The submission must briefly describe the risk, identify the target audience, and propose a risk communication and/or mitigation strategy.</p> <p>The submission should be a briefing note or report of no more than two (2) pages and must effectively communicate the issue to the target audience. Possible topics include but are not limited to: fatigue of long haul pilots, risk of decompression sickness in high altitude skydivers, radiation, hypoxia, cold water immersion survival, water ditching with underwater escape.</p>	<p><i>Submit an analysis, in the form of a briefing note or report of no more than two (2) pages, of an occupational or environmental risk relevant to patients</i></p>

3. Provision of medical advice and support to aerospace operations		
Milestones	Standards of Assessment	Documents to be submitted
3.1. Perform the aeromedical component of an accident investigation	<p>EITHER</p> <p>Participation in an aircraft accident investigation, real or simulated. The investigation must include all of the following as they relate to factors in the accident:</p> <ul style="list-style-type: none"> • Human factors analysis • Injury pattern analysis • Safety systems performance • Individual medical circumstances <p>The supervisor must sign off on the documentation attesting to the PER-AFC candidate's participation and proficiency in the investigation.</p> <p>OR</p> <p>Completion of training in accident investigation. The instruction must include training in:</p> <ul style="list-style-type: none"> • Human factors analysis • Injury pattern analysis • Safety systems performance • Individual medical circumstances <p>Simulated investigation must be part of the training. Acceptable courses include but are not limited to:</p> <ul style="list-style-type: none"> • Canadian Forces Operational Flight Surgeon course 	<p>EITHER</p> <p>(i) Submit evidence of participation in either a simulated or real aircraft investigation, as attested by a supervisor (e.g., chair of the investigative board, investigator in charge, or equivalent)</p> <p>OR</p> <p>(ii) Submit evidence of satisfactory completion of an accident investigation course. For courses other than those listed as acceptable, submit the course syllabus.</p>

	<ul style="list-style-type: none"> • University of Southern California <i>Aircraft Accident Investigation</i> course (United States) • Cranfield University <i>Aircraft Accident Investigation</i> course (United Kingdom) • United States Air Force School of Aerospace Medicine (USAFSAM) <i>Aircraft Mishap Investigation and Prevention - USAF Medical Investigator</i> course 	
<p>3.2. Advise, at a system level, on human performance and maintenance of human performance in the aerospace environment</p>	<p>Analysis of a particular occupational risk, new piece of equipment, or new platform in the aerospace environment. The submission must demonstrate an understanding of the nature of the human performance risk. The submission must include strategies to mitigate that risk that demonstrate an understanding of the industrial hygiene principles of substitution, administration, engineering controls, and use of personal protective equipment.</p> <p>The submission must demonstrate an ability to clearly communicate to a non-specialist in a short, concise format. Possible topics include but are not limited to:</p> <ul style="list-style-type: none"> • introduction of a new oxygen delivery system, i.e., on-board oxygen generation system (OBOGS) • G-protection • on-demand oxygen 	<p><i>Submit an analysis in the form of a briefing note or report, of no more than two (2) pages, on a particular aeromedical occupational risk, or a new piece of equipment, or new platform in the aerospace environment</i></p>

	<p>systems for passengers</p> <ul style="list-style-type: none"> • night vision goggles • underwater escape equipment • cold water/sea survival equipment 	
<p>3.3. Provide medical guidance to optimize mission success</p>	<p>Aeromedical analysis of an aerospace mission. The submission must describe the context of the mission and either identify the aeromedical risks and strategies for risk mitigation or provide an optimization strategy that could include but is not limited to a training program or plans for aeromedical evacuation.</p> <p>The submission should be a briefing note or report of no more than two pages. Examples include but are not limited to:</p> <ul style="list-style-type: none"> • sending flight surgeon to fighter squadron deployment or to Soyuz landing • major air disaster planning • planning a new airline route 	<p>EITHER</p> <p><i>(i) Submit a briefing note or report on the aeromedical risks and strategies of risk mitigation of an aerospace mission</i></p> <p>OR</p> <p><i>(ii) Submit an aerospace mission optimization strategy that could include but is not limited to a training program or aeromedical evacuation</i></p>

4. Engagement of governments, other physicians, and other health professions in the promotion of the health and wellness of people who fly		
Milestones	Standards of Assessment	Documents to be submitted
<p>4.1. Educate physicians, other health professionals, aircrew, members of the public, or government officials about aspects of Aerospace Medicine</p>	<p>Demonstrate an educational intervention related to Aerospace Medicine for at least one of the following audience groups: physicians, other health professionals, aircrew, members of the public, or government officials.</p> <p>The submission must demonstrate a thorough understanding of the topic and the ability to explain aeromedical topics to non-experts.</p> <p>The submission must identify the target audience.</p>	<p><i>Submit documentation of an educational intervention on an Aerospace Medicine topic aimed at non-experts</i></p> <p><i>Acceptable formats include:</i></p> <ul style="list-style-type: none"> • <i>the PowerPoint slide presentation delivered to the target audience</i> <p><i>or</i></p> <ul style="list-style-type: none"> • <i>a newsletter or bulletin created for the target audience</i>
<p>4.2. Contribute to the effective functioning of a committee related to Aerospace Medicine</p>	<p>Active participation on a committee related to Aerospace Medicine. The submission must document the nature and function of the committee, the PER-AFC candidate's role on the committee, and evidence of contribution of expert knowledge to the workings of the committee, which may be in the form of a letter from the chair or minutes from the meeting.</p>	<p><i>Submit evidence of documented active participation on a committee related to Aerospace Medicine</i></p>

5. Advancement of the discipline of Aerospace Medicine through scholarship		
Milestones	Standards of Assessment	<i>Documents to be submitted</i>
5.1. Conduct a scholarly project related to Aerospace Medicine	<p>Completion of a scholarly project relevant to Aerospace Medicine. This may include but is not limited to:</p> <ul style="list-style-type: none"> • a completed manuscript suitable for submission to a peer reviewed journal • a research proposal (including submission of ethics approval) • a learning module or curriculum or other educational innovation • a summary of the literature on a topic suitable for publication or as background to a research proposal or policy document 	<p><i>Submit a completed scholarly project (manuscript, proposal, educational innovation, or literature review)</i></p>

*Drafted – Aerospace Medicine AFC Committee – September 2014
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