

**AMA DIRECTIVE 100-01
MEDICAL STANDARDS FOR CAF AIRCREW**

Document Status:	Current
Document Type:	Directive
Document Number:	AMA 100-01
Original Source:	A-GA-005-000/AG-001 2011-05-09
Authority:	AMA
OPI:	SSO AV MED
Effective Date:	Mar 2012
Last Updated:	April 2019
Current Update:	July 2020

Record of Amendments:

Date yyyy-mm-dd	Amendment
2016-06	<p>Requirement for Chest X-Ray for initial pilot selection removed. Added requirement for Hb A1C for initial aircrew selection.</p> <p>Para 6.3 revised to read occupational transfer vs component transfer</p>
2017-04	<p><u>General</u></p> <p>All Figures significantly revised: reformatted to tables, updated requirements.</p> <p>Fig 2 UAV classification updated from Tiers to current Class system</p> <p>Clarification that Bioscience Officers not employed in Aeromedical Training are non-aircrew and retain an A5 Air Factor. Aviation Physiology Technician MOSID updated.</p> <p>CFP 154 and AMA 100-01 MOSID profile for AMTO 00197-01 clarified and harmonized to 333/33/4</p> <p>Requirements for aircrew eye examination outlined at para 7.2</p> <p><u>Standards Changes – Annex A</u></p> <p>VISION</p> <p>4.2. Updated information regarding refractive eye surgery</p> <p>4.4 Retinal pathology disqualifications revised</p> <p>4.8 Ocular muscle balance standards. Vertical phoria \geq 2PD.</p> <p>Stereopsis para removed</p>

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	<p>4.12 Allowable refractive limits changed.</p> <p>METABOLISM</p> <p>9.5 Familial hyperlipidemia (added)</p> <p>9.6 A history of gout will be reviewed with a risk assessment based on frequency and related metabolic abnormalities including uric acid level. (added)</p>
2018-11-22	<p><u>Introduction</u></p> <p>Para 1.3.b Clarification that the CO/CFEME is the aeromedical authority for untrained aircrew until MOSID-specific training commences</p>
	<p><u>Standards Changes- Annex A</u></p> <p>General</p> <p>1.5. Obstructive sleep apnea added as a disqualifying complication of obesity</p> <p>Eyes</p> <p>4.4 and 4.12</p> <p>Changes introduced to maximum allowable refractive errors and associated retinal pathology. All candidates with myopia > -5.00 diopters (including prior to refractive surgery) continue to require assessment by an ophthalmologist. For myopia > -6.00 diopters, any evidence of lattice or myopic macular pathology is disqualifying. In the absence of any retinal or macular pathology, the following are the new refractive limits</p> <p>Group A aircrew – up to -8.00 diopters myopia or +3.00 diopters hyperopia spherical equivalent including native refraction prior to refractive surgery</p> <p>Group B aircrew- no refractive limits (provided no retinal pathology)</p> <p>Cardiovascular</p> <p>6.10 Valvular Disorders</p> <p>Bicuspid aortic valve is now disqualifying for pilot selection. For other aircrew BAV with no stenosis and moderate or less regurgitation is acceptable</p> <p>Neurological</p> <p>13.13 Migraine headache. Further clarification with respect to the risk assessment of aircrew with migraine</p>
2019-04-01	<p>Annex A</p> <p>Eyes</p> <p>4.4 and 4.12</p> <p>Clarification regarding maximum allowable refractive errors and associated retinal pathology. All candidates with myopia > -6.00 diopters (including prior to refractive surgery) require a specific retinal assessment for retinal pathology. Any retinal pathology requires</p>

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	<p>assessment by an ophthalmologist. For myopia >-6.00 diopters, any evidence of retinal pathology is disqualifying. In the absence of any retinal pathology, the following are the allowable refractive limits</p> <p>Group A aircrew – up to -8.00 diopters myopia or +3.00 diopters hyperopia including native refraction prior to refractive surgery</p> <p>Group B aircrew- no myopic refractive limits (provided no retinal pathology). Maximum hyperopia +5.00 SE</p>
2020-05-21	Para 6.2 revised and Table 5 added to update and clarify the process for re-enrolment of of trained aircrew
	Para 6.6 added to address the employment of civilian aircrew by DND
	Annex A Para 4.12.d Clarification that progressive lenses are acceptable.
	New standard 6.14 added for recurrent unexplained syncope or symptomatic orthostatic intolerance.

References:

- A. DAODs 2015-0, 2015-1, 5002-1
- B. A-GA-005-000/AG-001 Department of National Defence/ CAF Airworthiness Program
- C. A-MD-154-000/FP-000 Medical Standards for the Canadian Forces
- D. [Flight Surgeons Guidelines](#)
- E. CAF H Svcs Gp PD 4000-16 Periodic Health Examination – Aircrew
- F. CAF H Svcs Gp PD 4000-01, Periodic Health Assessment

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1. Introduction

1.1 This document defines the medical standards for Canadian Armed Forces (CAF) aircrew. The *Aeronautics Act* establishes the Minister of National Defence (MND) as the authority for military aviation. The Chief of the Defence Staff (CDS) acts under the direction of the MND on matters relating to the *Aeronautics Act*. The CDS has designated the Commander RCAF as the Airworthiness Authority (AA) for the DND and the CAF. The AA is the management authority for the DND/CAF Airworthiness Programme (references A and B).

1.2 The Medical Advisor to the Commander RCAF (RCAF Surgeon) is designated by the CDS as the Medical Advisor for the purposes of subsection 6.5(1) of the *Aeronautics Act*¹. The RCAF Surgeon is also designated by the AA as the Aerospace Medical Authority (AMA)² (reference B). These aeromedical standards define the requirements for medical certification under the Airworthiness Programme. This directive is complementary to references B and C.

1.3 The AMA is responsible for ensuring that all activities associated with the aerospace medicine capabilities of the DND/CAF are conducted appropriately, safely and by qualified and authorized personnel (reference B). This includes responsibility for medical certification of aircrew. The AMA assigns routine responsibility for medical certification to the following individuals:

- (a) The 1 Canadian Air Division Surgeon (1 CAD Surgeon) is assigned the authority for medical certification of CAF Regular and Reserve Force aircrew; and,
- (b) The Commanding Officer, Canadian Forces Environmental Medicine Establishment (CFEME), is the delegated aeromedical authority for certification of initial aircrew applicants and untrained MOSID-assigned members, until such time as occupation-specific training commences.
- (c) The Aerospace and Undersea Medical Board (AUMB) is a consultative board that provides recommendations on medical certification for complex cases, and changes to the medical standards or policies that affect the health and wellbeing of CAF Aircrew and other selected personnel. AUMB provides aerospace standards advice and recommendations primarily to AMA, CO CFEME, and the 1 CAD Surgeon.

¹ The MND provided a limited direction to the CDS on 12 June 2006 to designate the Medical Advisor for the purposes of subsection 6.5(1) of the *Aeronautics Act*; accordingly, on 17 July 2006 the CDS designated the Medical Adviser to the Chief of Air Staff as the Aerospace Medical Authority.

² The Designation of Aerospace Medical Authority (1150-21 (DAS Coord) 9 Sept 2006) states the AMA is the authoritative leader for Aerospace Medicine for all aerospace medicine capabilities including, but not limited to, the aerospace medical program, air evacuation, search and rescue medical issues, and aeromedical training.

1.4 The medical standards contained in this document will be reviewed on an annual basis. Substantive changes to the medical standards for personnel falling under AMA 100-01 recommended by AMA are reviewed by the Aeromedical Policy and Standards Committee (APSC).

2. Basis for Aeromedical Standards

2.1 The aeromedical standards defined in this document are based on the following principles:

- a. **Flight Safety:** The primary objective of medical standards for aircrew is to preserve flight safety by ensuring that aircrew members meet the *bona fide* occupational requirements (BFORs) for vision, hearing and other physical requirements related to their particular aircrew occupation, and by identifying medical conditions, either symptomatic or asymptomatic, that might compromise flight safety either by acute incapacitation or by subtle performance degradation.
- b. **Maintenance of Operational Effectiveness:** Successful completion of a mission may be critical in military air operations. Some critical missions relate to national security, others are concerned with preservation of human life as in search and rescue or aeromedical evacuation operations. This mission-critical aspect of military air operations differs from most civilian air operations and may necessitate more stringent medical requirements.
- c. **Protection of Crewmember Health:** Certain medical conditions may be aggravated by environmental and occupational exposures imposed by military air operations. Some medical standards for aircrew exist to minimize the risk for future health problems and to prevent injury to CAF aircrew secondary to performing aviation related duties.
- d. **Preservation of Trained Resources:** Candidates selected for CAF aircrew undergo extensive training at Crown expense. The training costs for some aircrew positions are considerable. Medical screening procedures and standards are designed to select individuals who, as a minimum, may be reasonably expected to complete the required period of service without developing an operationally significant medical problem, and who optimally will remain healthy through their CAF career.

2.2 CAF medical selection standards may differ from Transport Canada (TC) licensing standards that are focused on flight safety of the public and aim to minimize the risk of and consequences from a medical issue during only the period of validity of the medical certificate.

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For trained CAF aircrew that develop a medical problem an aeromedical risk assessment (as per Annex B) may be employed rather than strictly applying the standards in this document.

3. Responsibility for Mandatory Reporting of Medical Conditions

3.1 Subsection 6.5(1) of the *Aeronautics Act* (and ref B) provides that a physician or an optometrist shall inform a Medical Advisor designated by the MND if a patient who is a flight crew member or air traffic controller has a medical or optometric condition that is likely to constitute a hazard to aviation safety. All physicians and health care providers who provide health care services to CAF aircrew are required to report without delay to the 1 Cdn Air Division Surgeon (who acts under the delegated authority of the AMA) any newly discovered medical condition that might compromise flight safety.

4. The Canadian Forces Air Factor

4.1 The CAF medical category system includes an Air Factor. The Air Factor designates the medical fitness for flight duties for CAF aircrew, and medical fitness for flight as a passenger for non-aircrew. The Air Factor is the responsibility of the AA. The Air Factor is administered in the CAF medical category system under the oversight of the AMA. Air Factor definitions are in Table 1.

4.2 The Standards in this document apply to the CAF aircrew and related Military Occupational Structure Identification Code (MOSID) occupations involved in the operation or control of military aircraft or in safety critical air-related operations (Group A) or non-safety critical aircrew positions (Group B). Group A and B MOSIDs and the corresponding minimum CAF Medical Profile are in Table 2 (minimum profile information is taken from reference C).

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Table 1. Air Factor Definitions

Air Factor	Definitions
A1	Assigned to Pilots (00183)* medically fit for unrestricted duties.
A2	Assigned to Air Combat Systems Officers (ACSO) (00182), Flight Engineers (00021), Airborne Electronic Sensor Operators (AESOP) (00019) and Mission Specialists medically fit for unrestricted duties in air operations.
A3	Assigned to any CAF aircrew with a medical operational flying or flight controlling restriction. The specific restriction must be defined as part of the A3.
A4	Assigned to Search and Rescue (SAR) Specialists (00101), Aerospace Controllers (AEC) (00184 including Air Traffic, Air Weapons controllers), Aerospace Control Operators (AC Op) (00337 including Air Traffic, Air Weapons), Loadmasters (00170-01), Flight Stewards (00165-01), Flight Attendants, Aeromedical Training Officers (AMTO) (00197-01), Aviation Physiology Technician (00373-01), Flight Surgeons (00196-04), Flight Nurses (00195-01), Flight Medical Technicians (00334-01) who are medically fit for unrestricted duties in air operations.
A5	Assigned to non-aircrew CAF personnel medically fit to fly as passengers in CAF aircraft.
A6	Assigned to CAF personnel unfit to fly in CAF aircraft.
A7	Assigned to CAF aircrew medically unfit to carry out MOSID-specific aircrew duties.
* Military Occupational Structure Identification Code (MOSID) indicated in parentheses	

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Table 2. Group Assignment and Minimum Medical Profile for RCAF Aircrew

AIRCREW	MOSID	GP	V	CV	H	G	O	AIR FACTOR
Pilot	00183	A	2	2	2	2	2	1
ACSO	00182	A	3	2	2	2	2	2
Flight Engineer	00021	A	3	2	2	2	2	2
Loadmaster	00170-01	A	3	2	2	2	2	4
AESOP	00019	A	3	2	2	2	2	2
AEC	00184	A	3	2	2	3	3	4
AC Op ¹	00337	A/B	3	2	2	3	3	4
AMTO ²	00197-01	A	3	3	3	3	3	4
Aviation Physiology Technician	00373-01	A	3	2	3	3	2	4
SAR Specialist	00101	A	2	2	2	2	2	4
Mission Specialist	00005, 008,010,339	A	3	2	2	2	2	2
Class 2 and 3 Unmanned Aircraft Systems (UAS) Operator	---		3	2	2	3	3	UAV
Flight Test Engineer	00185	A	3	2	3	3	3	2
Flight Surgeon	00196-04	B	4	3	3	3	2	4
Flight Nurse	00195-01	B	3	2	2	2	2	4
Flight Med Tech	00334-01	B	3	2	2	2	2	4
Flight Steward	00165-01	B	3	3	3	3	3	4
Flight Attendant	--	B	3	3	3	3	3	4 (WSE)³
AWACS ² - ATIS (Aerospace Telecommunications and Information Systems) Technician	00109	B	3	2	2	2	2	4
UAV Payload Operator	000019	B	3	2	2	3	3	UAV
¹ Only those ACOP who fill a Designated Control Position are Group A; non-DCP ACOP are Group B. ² While employed in Air Operations. Bioscience Officers not employed in Aeromedical Training are non-aircrew and retain A5. ³ While so employed. Revert back to A5 following aircrew tour.								

5. Review and Approval Process

5.1 The medical assessment, review and approval process for both aircrew candidates and previously enrolled and qualified aircrew is a complex process. The following steps shall be followed:

- a. **Aircrew Candidates:** Candidates for CAF aircrew selection undergo medical testing and screening as detailed below. The medical information is reviewed by the Military Medicine Section of CFEME and an appropriate initial Air Factor is assigned. The initial assignment of an Air Factor for candidates for all aircrew positions is conducted at CFEME under the authority of the CO/CFEME (see paragraph 1.2). The Air Factor for CAF personnel undertaking occupational transfer to an aircrew position is also assigned at CFEME. The final approval of the Air Factor rests with the AMA whereas the final approval of other medical factors rests with the Directorate of Medical Policy. Aircrew applicants found not to meet selection standards may request a review of the decision if new medical information becomes available. For civilian applicants, the information should be provided through the Recruiting Centre/CFRG to DMedPol/RMO. For serving members, information should be forwarded through the member's CFHS unit to CFEME. The information will be reviewed by CFEME/MMS and the AUMB, and a recommendation provided to the CO/CFEME and, if required, the AMA for disposition.
- b. **Aircrew:** Aircrew are required to undergo periodic medical assessment as detailed below. The medical information is reviewed by a CAF certified (military or civilian) Flight Surgeon or Basic Aviation Medicine (BAvMed) Healthcare Provider. When the aircrew member's medical condition is in compliance with Medical Standards for CAF Aircrew, the Air Factor is renewed by the Flight Surgeon or BAvMed Healthcare Provider with further review and approval by the Wing Surgeon or Senior Flight Surgeon.

CAF aircrew that develop medical problems are initially assessed by the local Flight Surgeon or BAvMed Healthcare Provider. The local Flight Surgeon has the authority to ground or restrict aircrew for periods up to three months (they may assign a temporary A3 or A7 Air Factor) for minor or temporary medical problems, and to reinstate the appropriate Air Factor for aircrew duties once the issue is resolved. BAvMed providers have the authority to ground or restrict aircrew for periods up to three months for minor or temporary medical problems if the medical condition and management is within their scope of practice, and to reinstate the appropriate Air Factor when indicated.

For medical problems that fall outside medical standards and/or that are anticipated to or do persist for more than three months the Flight Surgeon or BAvMed Healthcare Provider is required to complete a CAF 2033

(Medical Examination Record) or CFHIS equivalent outlining the medical issues and recommended temporary restrictions. The CAF 2033 is forwarded to the 1 CAD Surgeon's office for review. The 1 CAD Surgeon's office reviews the medical information and, on behalf of the AMA, may approve a temporary grounding or flight/controlling restriction for up to one year. CAF 2033 medical assessments that require prolonged aircrew grounding may also be referred to the Military Medicine Section at CFEME for further clinical input. Complex cases may be discussed with the AUMB to determine aeromedical disposition recommendation.

Information on medical management of aircrew can be found at reference D.

6. Medical Assessment Process for Aircrew Selection

6.1 Medical assessment is an integral part of aircrew selection and must be completed and the appropriate Air Factor assigned by CFEME before candidates proceed on aircrew training courses. The following steps shall be followed in order to expedite this process and avoid unnecessary delays.

- a. **Aircrew Selection:** Civilians may apply for Pilot, ACSO, AEC, AC Op, AESOp or SAR Technician selection through a Canadian Forces Recruiting Centre (CFRC). All other CAF aircrew positions are selected from serving CAF members through an occupational transfer process.

All civilian or military candidates for Pilot undergo medical screening at the Military Medical Section of CFEME at DRDC Toronto. This assessment takes place only after an initial medical screening at a CFRC (civilian applicants), or at a Canadian Forces Health Services (CFHS) unit (military members) and after successful completion of aptitude testing at the Canadian Forces Aircrew Selection Center (CFASC).

Civilian candidates for AEC, ACSO and AC Op and AESOp undergo medical assessment at a CFRC with review of the medical documents and assignment of the appropriate Air Factor by the Military Medicine Section at CFEME. Civilian candidates for SAR Tech have an initial enrolment examination at a CFRC and then undergo further assessment at CFEME/ Military Medicine Section for fitness for aircrew and dive duties.

Military personnel applying for all aircrew positions are medically examined at a CFHS unit, with Pilot candidates undergoing further assessment at CFEME.

The medical documents of all other aircrew applicants are reviewed by CFEME Military Medicine Section to have the appropriate Air Factor assigned.

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- b. **Medical Testing Procedures for Aircrew Selection:** The medical testing procedures for aircrew selection are listed in Figure 3 and discussed at reference E. Additional medical testing may be required as clinically indicated.

6.2 Experienced CAF aircrew who re-enrol within two years of release do not require a re-enrolment medical but must undergo an aircrew PHA (type I or type II as appropriate) at their assigned unit with local approval of the Air Factor by a CAF Flight Surgeon. Aircrew re-enrolling more than two years after release require a complete type I aircrew PHA with approval of the Air Factor by a CAF Flight Surgeon up to 5 years, or CFEME if greater than 5 years. Table 5 details the requirements for related testing and approval authority. Aircrew who component transfer from Regular Force to Reserve may transfer back to the Regular Force provided their aircrew medical has been kept current. IAW Ref A DAOD 5002-1, all CAF re-enrollees to the Reg F, P Res, Supp Res and Special Force are required to meet the minimum medical standard for the applicable MOSID.

6.3 Aircrew undertaking occupational transfer to a new aircrew MOSID must have a new MOSID-specific Air Factor assignment by CFEME (even if the Air Factor number does not change). This requires a current aircrew PHA and preliminaries specific to the new MOSID at the unit level, with the file forwarded to CFEME for review.

6.4 Experienced aircrew applicants, either previously in the CAF or in another military, must meet the minimum medical standard for the applicable MOSID, as specified under DAOD 5002-1. In certain circumstances, a waiver of the minimum MOSID medical standard may be granted by CMP or delegated authority.

6.5 Air Factors assigned by CFEME are valid for a period of one year from the date of the aircrew physical examination. For pilot applicants examined at CFEME, the Air Factor is valid for one year from the date of assignment at CFEME. Aircrew applicants must have their Air Factor renewed annually until enrolled and/or MOSID/OSS assigned. This is accomplished by a repeat aircrew PHA (type I or type II) with required investigations followed by review and approval by the appropriate reviewing medical authority (typically CFEME). Periods of validity of medical tests and steps involved for type I and II assessments are detailed in Table 3 and Table 4.

6.6 DND may contract civilian aircrew to fly DND aircraft in a variety of roles including instruction and flight test. Contracted pilots must hold a valid Transport Canada Category 1 medical certificate. The RCAF Surgeon maintains aeromedical oversight of contracted aircrew and the following requirements apply:

- a. **Initial Medical Certification:** Initial medical certification is delegated to CO CFEME. Initial applicants must submit to CFEME their most recent Transport Canada Medical Examination Report (MER), any written communications with Civil Aviation Medicine, as well as laboratory

investigations (CBC, HbA1C, non-fasting lipids), ECG, and aircrew eye examination (DND 2776) with cycloplegic refraction completed within one year of application. CFEME will review the submitted documentation and determine medical fitness to fly DND aircraft. CFEME may request additional information from the applicant's Civil Aviation Medical Examiner or Health Care Provider as required; and

- b. **Continuing Medical Certification:** While contracted by DND, aircrew must submit to a local CAF Flight Surgeon any subsequent MERs, as well as repeated laboratory investigations, ECG, and aircrew vision assessment (DND 2776) in accordance with the periodicity outlined for Group A aircrew in Table 4 below. The local CAF Flight Surgeon will review the submitted documentation and confirm medical fitness to fly DND aircraft (as appropriate) and seek guidance from ASCS as required.

7. Periodic Medical Evaluation of Trained Aircrew

7.1 All CAF aircrew are required to undergo periodic medical evaluation once they are assigned to a MOSID/OSS.

- a. **Group A Aircrew:** Group A aircrew PHAs follow a biennial cycle, with a complete aircrew PHA (Type I) alternating with a more limited aircrew health screening (Type II) on alternate years. The Air Factor is valid for one year from end of the month of the date on which the PHA (either type I or type II) was conducted. After this period, the aircrew will be "grounded" until an aircrew PHA has been completed. The 1 Cdn Air Div Surgeon has delegated authority to each medical clinic's senior Flight Surgeon to extend the validity of the Air Factor by 30 days. This is to be done only after a Flight Surgeon has reviewed the medical file to rule out medical concerns. An extension for extenuating operational circumstances between 30 and 56 days requires approval by the 1 Cdn Air Div Surgeon and shall be requested using the 1 Cdn Air Div Order Vol 1, 1-243, Annex A.
- b. **Group B Aircrew:** Undergo routine periodic medical assessment in accordance with standard Canadian Forces procedures. The Air Factor is valid for the PHA interval defined in reference F.

7.2 The components and required frequency of the complete PHAs and more limited health screenings are listed in Table 4. A full eye examination is required within 12 months for aircrew selection, and periodically thereafter as indicated in Table 4. This may be performed by an ophthalmologist, optometrist, or CF Ophthalmic Technician, and the form DND 2776 Visual Acuity for Aircrew completed. The examination must include and record the results of a thorough clinical ophthalmologic assessment including:

- a. Visual Acuity: near and distance, uncorrected and corrected;

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- b. Refraction: cycloplegic refraction in addition to manifest refraction is required for all aircrew candidates. Manifest refraction only is required thereafter, with a dilated funduscopy.
- c. Ocular muscle balance: both near (1/3m) and distance (6m), with measurement in prism diopters of any horizontal or vertical heterophoria using the alternate cover test or Maddox rod;
- d. Near stereopsis recorded in sec/arc;
- e. Intraocular pressures: Glaucoma suspects (see Annex A para 4.10) must be referred to an ophthalmologist for a full glaucoma assessment. This must include visual acuity, ocular coherence tomography, gonioscopy, dilated optic disc and fundus examination, visual field testing, and optic nerve imaging. Risk factor evaluation, treatment, and follow-up recommendations should be provided;
- f. Dilated funduscopy; and
- g. Visual fields: by confrontation, with formal VF testing if clinically indicated.

Table 3. Investigation Requirements for Initial Aircrew Selection

Investigation	Validity for selection (years)	PILOT	ACSO	SAR ²	GROUP A	GROUP B
Chest X-ray	5			X		
Electrocardiogram	4	X	X	X	X	X
Audiogram	1	X	X	X	X	X
Colour vision testing ¹	1	X	X	X	X	X
Aircrew Eye examination (DND 2776)	1	X	X	X	X	X
Urinalysis – macroscopy and microscopy	1	X	X	X	X	X
Complete blood count	1	X	X	X	X	X
Fasting Lipid profile (TC, TG, LDL, HDL)	1	X	X	X	X	X
Fasting blood glucose	1	X	X	X	X	X
Hemoglobin A1C	1	X	X	X	X	X
Height/Weight/Waist circumference/Blood Pressure	1	X	X	X	X	X
Full History and Physical Examination	1	X	X	X	X	X
Pulmonary function	5	X		X		
Tests Completed at CFEME for Pilot Applicants						
Pulmonary function	5	X				
Corneal topography	5	X				
Echocardiography	5	X				
Retinal Imaging	5	X				
<p>1. Colour vision testing is done in each eye with pseudoisochromatic plates (PIP) under prescribed lighting conditions. Those who fail PIP tests are further assessed with the Farnsworth Panel D15 test. Those who pass the D15 are assessed as colour vision safe for aircrew duties.</p>						
<p>2. SAR: Applicants must meet shallow water diver standards in accordance with CFHS Inst 4000-04 as well as aircrew standards. Required additional screening at clinic level includes: CXR – inspiratory/expiratory views; lung function-spirometry; electrolytes, urea, creatinine, AST, ALT, GGT, ALP</p>						

Table 4. Requirements for Periodic Aircrew Medical Examinations

Assessment	Includes	Period of Validity
Type I Aircrew Periodic Health Examination	DND 2552: PHA patient questionnaire DND 2452: Aircrew/Diver questionnaire Audiogram Visual acuity: distance, intermediate, and near vision Colour vision Height, weight, waist circumference Blood pressure Complete History and Physical by aviation medicine provider (PHA Part 2) Confirmation of valid ophthalmology, cardiovascular risk assessment, and laboratory investigations	1 year; alternating with Type II
Type II Aircrew Periodic Health Examination	DND 2552: PHA patient questionnaire DND 2452: Aircrew/Diver questionnaire Audiogram Visual acuity: distance and near vision Colour vision Height, weight, waist circumference Blood pressure File review by aviation medicine provider: Confirmation of valid ophthalmology, cardiovascular risk assessment, and laboratory investigations	1 year; alternating with Type I
Aircrew Eye Examination	Assessment and completion of DND 2776 by optometrist or ophthalmologist Including: Visual acuity near and distance; manifest refraction; near and distant ocular muscle balance; intraocular pressures; dilated funduscopy; and visual fields by confrontation.	<u>Group A:</u> Up to age 40: 4 years Over 40: 2 years Over 46: 1 year Corrective lenses up to 46: 2 years <u>Group B:</u> With PHE
Aircrew Cardiovascular Risk Assessment	ECG CBC, HbA1C, cholesterol, HDL, LDL, triglycerides (non-fasting) Review of cardiac risk factors: smoking, FHx, Hypertension, DM2, lipid profile Cardiovascular Risk Score (eg FHP)	<u>Group A:</u> Up to age 40: Every 4 years Over 40: 2 years <u>Group B:</u> With PHE

Table 5. Medical Procedures for Re-enrolling Trained Aircrew

Time Since Release	Less than 2 years	2-5yrs	Greater than 5 years
ALL AIRCREW			
Aeromedical Assessment	Type I aircrew PHA by Flight Surgeon or BAvMed Provider at CF H Svcs C (or Type II aircrew PHA if less than 1 year since release PHA)	Type I aircrew PHA by Flight Surgeon or BAvMed Provider at CF H Svcs C	Type 1 aircrew PHA by Aerospace Medicine Consultant at CFEME or other available location
Air Factor Approval	Flight Surgeon	Flight Surgeon	CFEME
Labs (CBC, A1C, non-fasting lipids)	Within 2 years	Within 1 year	
ECG	Within 4 years	Within 2 years	
Aircrew Eye Exam	V1 and <age 46 - within 2 years V2/3 or >age 46 - within 1 year		
PILOTS			
Corneal Topography	Confirmed to be on file Repeat only if clinically indicated		
Retinal Photography			
Pulmonary Function Test			
Echocardiography			

Annex A – Medical Standards

POTENTIAL CAUSES FOR MEDICAL DISQUALIFICATION OF AIRCREW

1. General

1.1 Potential causes for medical disqualification of aircrew are defined as any medical condition that may compromise flight safety, operational effectiveness or crew health or safety through either a risk of incapacitation or a performance decrement.

1.2 All injuries, contusions, fractures, or surgery that could interfere with the performance of duties unless healed and not associated with functional deficit.

1.3 History of sensitivity or demonstrated allergy of sufficient severity so as to interfere with the performance of duties or inability to avoid the allergen.

1.4 Chronic use of any medication may be considered disqualifying. Guidelines for Flight Surgeons Medications in Aircrew identifies concerns.

1.5 Obesity, defined as a Body Mass Index greater than 30 kg/m², complicated by fatty liver, metabolic syndrome, diabetes, musculoskeletal issues, or obstructive sleep apnea.

1.6 Chronic fatigue syndrome sufficient to compromise flight safety or operational effectiveness.

1.7 Collagen or auto-immune diseases such as lupus erythematosus.

1.8 History of malignant neoplasm.

2. Head, Sinuses, Nose, Mouth and Throat

2.1 Deformities (e.g., scars, depressions or exostoses) or chronic muscular contractions or spasms (e.g., torticollis) of the skull/head, face, and neck that interfere with wearing equipment/headgear and or performance of duties.

2.2 Cervical ribs with symptoms or signs of thoracic outlet compression.

2.3 Chronic rhinitis of any cause that may interfere with the performance of duties.

2.4 Chronic sinusitis (sinus infection for more than three months).

2.5 Chronic enlargement of the tonsils, adenoids or redundant soft tissue of the oral pharynx that interferes with speech, swallowing, breathing or is associated with recurrent otitis media.

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- 2.6 Any disorder or defect which affects the clarity of speech to the extent that efficient communication or the performance of duties may be compromised.
- 2.7 Recurrent epistaxis.
- 2.8 Any chronic disorder or defect that interferes with normal ventilation of paranasal sinuses or middle ear.

3. Ears

- 3.1 Any diseases of the ear or mastoid with subjective or objective evidence of residuals that interfere with the auditory or vestibular functions sufficient to interfere with performance of duties.
- 3.2 Tumours or congenital deformation of the external meatus or canal severe enough to interfere with hearing or performance of duties.
- 3.3 Chronic external otitis, otitis media, mastoiditis or mastoid fistula.
- 3.4 History or presence of abnormal labyrinthine function, unless an isolated, remote episode with full recovery (e.g., vestibular neuronitis).
- 3.5 History or presence of Meniere's disease.
- 3.6 Chronic inability to equalize the pressure of the middle ear.
- 3.7 Tinnitus that interferes with hearing or communication.
- 3.8 Hearing standards – CAF unaided pure tone audiometry standards are defined as follows:
- H1: $\leq 30\text{dB}$ in each ear in the 500-8000 Hz range
 - H2: $\leq 30\text{dB}$ in each ear in the 500-3000 Hz range
 - H3: $\leq 50\text{dB}$ in either ear in the 500-3000 Hz range
- 3.9 Aircrew are required to meet the following standards:
- H2 - Pilots, Air Combat Systems Officer, Flight Engineer, AESOP, Loadmaster, AEC, AC OP, SAR specialists, Mission Specialists, UAV operators (Tier 1/2), Flight Nurse, AMT, Flight Med Tech
 - H3 - Flight Surgeon, AMTO, Flight Attendant, Flight Steward, and FTE
- 3.10 History of inner ear fistula.

4. Eyes

- 4.1 Disease of either eye or supporting structure that may interfere with the performance of duties.

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4.2 Cornea:

- a. Chronic or recurrent keratitis;
- b. Vascularization, haze or opacification of the cornea from any cause when it is progressive or interferes with vision;
- c. Corneal dystrophy of any type, including keratoconus of any degree;
- d. Refractive surgical procedures other than PRK (or other excimer laser procedures) or LASIK are disqualifying. Premium wavefront technologies with a femtosecond laser are preferred. Candidates may be considered three months after laser refractive surgery for correction of uncomplicated myopia and astigmatism, or after six months for hyperopic correction. All other CAF vision and medical standards must be met.
- e. History of orthokeratology treatments within the previous six months; and,
- f. History of penetrating or lamellar keratoplasty.

4.3 Inflammation of the uveal tract (iris, ciliary body, choroid) that is acute, chronic or recurrent or its residuals with the exception of uncomplicated post-traumatic iritis.

4.4 Retina and vitreous:

Myopia greater than -6.00 diopters SE including refractive errors prior to surgery requires careful dilated retinal assessment with specific comments about the presence or absence of any underlying retinal pathology including lattice. The presence of any retinal pathology requires assessment by an ophthalmologist or retinal specialist.

- a. Lattice degeneration if associated with high risk features including myopia with spherical equivalent (SE) > minus 6.00 diopters (including native refraction prior to laser refractive surgery), sub-retinal fluid, retinal traction, retinal tears or symptoms (floaters, flashes, etc.);
- b. History or evidence of detachment;
- c. Retinal hole with evidence of fluid or vitreous traction;
- d. Degeneration or dystrophies of the central or peripheral retina;
- e. Pigmentary degenerations;
- f. Retinitis, chorioretinitis, or other inflammatory conditions of the retina, unless single episode which has healed and does not impair central or peripheral vision;
- g. Hemorrhages, exudates, or other retinal vascular disturbances or conditions that potentially impair vision; and;
- h. Opacification or disturbance of the vitreous that could cause a loss of central or peripheral visual acuity.

4.5 Optic nerve:

- a. Presence or history of optic neuritis;
- b. Optic atrophy, primary or secondary;
- c. History of papilledema, pseudopapilledema or papillitis; and,
- d. Congenito-hereditary conditions, including optic nerve drusen that may interfere with central visual acuity or visual field.

4.6 Lens:

- a. Aphakia;

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- b. Opacities of the lens that interfere with vision or are considered progressive are evaluated on a case-by-case basis;
 - c. Lens dislocation, partial or complete; and,
 - d. Intraocular implants or intraocular contact lenses.
- 4.7 Other defects and disorders:
- a. History or presence of malignant tumors of eye or orbit;
 - b. Exophthalmos, anophthalmos or microphthalmos;
 - c. Pathologic nystagmus;
 - d. Diplopia in any field of gaze; and,
 - e. Any organic or congenital disorder of the eye or adnexa not previously specified that threatens to impair visual function.
- 4.8 Ocular muscle balance measured at 30-50cm and at 6m. Near stereopsis measured in sec/arc:
- a. Vertical deviation (hyper / hypophoria) ≥ 2 prism dioptres;
 - b. Horizontal deviation (exo / esophoria) greater than 10 prism dioptres;
 - c. Diplopia or a history of diplopia is disqualifying; and,
 - d. Flight Surgeons, AMT and Aeromedevac personnel may be considered on a case-by-case basis.
- 4.9 Colour vision deficiency. Inability to pass the Farnsworth D15 for all aircrew MOSIDs other than AMTO, Flight Surgeon, Flight Nurse, Flight Steward and Flight Attendant.
- 4.10 Intra-ocular hypertension:
- a. Characteristic glaucomatous changes in the optic nerve;
 - b. Visual field loss characteristic of glaucoma with or without intraocular pressure (IOP) greater than 21mmHg;
 - c. Isolated IOP greater than 28mmHg in either eye (measurements are not adjusted for corneal thickness);
 - d. Glaucoma Suspects identified by any the following must be referred to an ophthalmologist for a full glaucoma assessment and will be considered on a case-by-case basis:
 - (1) An IOP in either eye equal to or greater than 22mmHg;
 - (2) An IOP difference of 4mmHg or greater between eyes;
 - (3) Pigmentary dispersion syndrome;
 - (4) Narrow angles;
 - (5) Suspicious optic nerve cupping;
 - (6) Visual field defects.
- 4.11 Medically required use of a contact lens.
- 4.12 Visual acuity and refractive errors (Spherical Equivalent SE= $\frac{1}{2}$ cylinder + sphere).

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Spherical equivalent (SE) greater than - 6.00 diopters requires a careful retinal assessment to exclude retinal pathology with specific documentation of retinal findings (see para 4.4). Disqualifying criteria include:

- a. Inability to meet the visual acuity standards detailed in Figure A-1;
- b. For Group A aircrew (see Table 2), spherical equivalent greater than - 8.00 diopters or +3.00 diopters including prior to laser refractive surgery;
- c. For Group B aircrew, refractive error greater than -8.00 diopters SE if associated with retinal pathology including lattice or greater than +5.00 diopters SE.
- d. For aircrew requiring near and distance correction, progressive lenses are acceptable

	PILOT AND SAR SELECTION		OTHER AIRCREW EXCEPT FLIGHT SURGEON and AMTO		FLT SURGEON, AMTO MÉDECINS DE L'AIR, OSMA	
	SELECTION DES PILOTES/ SAR		AUTRE PERSONNEL NAVIGANT			
	V2		V3		V4	
	Better Eye	Other	Better Eye	Other	Better Eye	Other
	Meilleur œil	Autre	Meilleur œil	Autre	Meilleur œil	Autre
Uncorrected Distance Non corrigée Vision de loin	6/18 Or 6/12	6/18 6/30	6/60	6/60	N/A S/O	
Corrected Distance Corrigée Vision de loin	Correctable to		Correctable to		Correctable to	
	6/6	6/9	6/6	6/9	6/9	6/60
Near at 30cm Uncorrected Vision de près à 30 cm Non corrigée	N10 OR N8	N10 N12	N/A S/O	N/A S/O	N/A S/O	N/A S/O
Near at 100cm Uncorrected Vision de près à 100 cm Non corrigée	N24 OR N16	N24 N36	N/A S/O	N/A S/O	N/A S/O	N/A S/O
Near Corrected Vision de près Corrigée	(30cm) N5 (100cm)N14	N6 N18	(30cm) N5 (100cm)N14	N6 N18	(30cm) N6 (100cm)N18	N36 N36

Figure A-1. Aircrew Vision Standards

5. Lungs and Chest Wall

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- 5.1 Any condition of the lungs, pleura, mediastinum or chest wall that could interfere with lung function including gas exchange or the wearing of personal equipment.
- 5.2 Pneumothorax:
- a. History of spontaneous pneumothorax or pneumomediastinum unless more than three years have past, pulmonary function tests are normal and bilateral CT scan shows no substrate for recurrence; and,
 - b. History of spontaneous pneumothorax within three years if treated with pleurodesis or pleurectomy may be considered on a case-by-case basis.
- 5.3 Chronic obstructive lung disease with evidence of gas trapping or oxygen desaturation beyond physiological with altitude exposure.
- 5.4 Asthma:
- a. Active asthma is disqualifying for aircrew selection;
 - b. History of asthma is evaluated on a case-by-case basis for aircrew selection; and,
 - c. Asthma which is well controlled with inhaled medications based on pulmonary function evaluation including bronchial provocation testing is evaluated on a case-by-case basis for continuing aircrew duties.
- 5.6 Pulmonary bullae, blebs or cysts, or lung abscess.
- 5.7 Any tumor, benign or malignant, of the trachea, bronchi, lungs, pleura, or mediastinum. History of surgery for benign lesions will be evaluated on a case-by-case basis.
- 5.8 History of pulmonary embolus, except for well-documented amniotic fluid or post-traumatic fat embolus.
- 5.9 Obstructive sleep apnea which is severe and which without regular, nightly use of CPAP results in symptoms of daytime fatigue and sleepiness manifested by reduced sleep latency is disqualifying for aircrew duties. Mild-to-moderate sleep apnea which without CPAP does not result in reduced daytime sleep latency, or fatigue or sleepiness symptoms sufficient to compromise flight safety or operational effectiveness is not disqualifying. CPAP use *per se* is not disqualifying.
- 5.10 Inflammatory or restrictive lung disease e.g., sarcoid that may affect lung function including gas exchange.

6. Cardiovascular

- 6.1 Any chronic or recurrent cardiovascular condition which may jeopardize flight safety or compromise mission effectiveness or which may be aggravated by participation in CAF flight operations.
- 6.2 Hypertrophic or dilated cardiomyopathy.

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- 6.3 Recurrent symptomatic orthostatic intolerance.
- 6.4 Hypertension:
- a. Mean systolic blood pressure greater than 130mmHg and/or diastolic blood pressure greater than 85mmHg confirmed with ambulatory blood pressure monitoring, or serial readings by a health care professional; and,
 - b. Hypertension controlled on acceptable medications may be considered on a case-by-case basis.
- 6.5 Evidence of coronary artery disease including history of angina or myocardial infarction, or demonstrated on coronary angiography or non-invasive perfusion assessment such as nuclear perfusion studies or stress echocardiography. Minor degrees of coronary atherosclerosis without evidence of ischemia will be evaluated based on a risk assessment as detailed in Flight Surgeons Guideline 600-02 Aircrew with Known Coronary Artery Disease.
- 6.6 Pericarditis, myocarditis, endocarditis (active or chronic).
- 6.7 Congenital heart disease:
- a. History or findings of major congenital abnormalities of the heart or great vessels;
 - b. ASD or VSD with no evidence of hemodynamic effects, or with successful surgical repair with no evidence of ongoing hemodynamic effects is evaluated on a case-by-case basis; and,
 - c. PFO is not disqualifying.
- 6.8 Cardiac arrhythmias: Recurrent, persistent or prolonged cardiac rhythm disturbances with hemodynamic symptoms or associated with underlying structural heart disease.
- 6.9 Cardiac conduction defects:
- a. Wolff-Parkinson-White syndrome or a history of arrhythmias associated with other accessory conduction pattern. WPW ECG pattern without symptoms will be considered on a case-by-case basis. History of WPW syndrome that has been successfully ablated is not disqualifying;
 - b. Mobitz type II or third degree heart block;
 - c. Primary prolonged QT syndrome, and,
 - d. Complete left bundle branch block or right bundle branch block if associated with underlying structural or ischemic heart disease.
- 6.10 Valvular disorders:
- a. For pilots, bicuspid aortic valve is disqualifying. For other aircrew, bicuspid aortic valve associated with greater than mild regurgitation is disqualifying

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- b. Mitral valve prolapse if mitral leaflets are thickened or myxomatous with clear prolapse, or >3mm prolapse with moderate or severe mitral regurgitation, or left atrial dimension enlargement
- 6.11 Deep venous thrombosis if recurrent, or associated with pulmonary embolism or chronic venous insufficiency.
- 6.12 Abnormalities of the arteries (peripheral or cerebrovascular), including aneurysms, atherosclerosis, and arteritis, and arteriovenous malformations.
- 6.13 Raynaud's disease or other symptomatic vasospastic disorders.
- 6.14 Recurrent unexplained syncope or symptomatic orthostatic intolerance
- a. Recurrent neutrally-mediated syncope with clear precipitating factors will be assessed on a case-by-case basis

7. Hematology

- 7.1 Hematological or reticuloendothelial disorders that could compromise flight safety, mission effectiveness or the individual's health through participation in operation duties.
- 7.2 Red cell disorders:
- a. Chronic anemias which are not readily correctable and which may cause physiological impairment;
 - b. Hemoglobin SS and SC; and,
 - c. Hemoglobin S trait with a history of complications.
- 7.3 White cell disorders:
- a. Leukemia;
 - b. Hodgkins and non-Hodgkins lymphoma; and,
 - c. Chronic myeloproliferative disorders or myelodysplastic syndromes.
- 7.4 Platelet disorders:
- a. Thrombocytosis or thrombocytopenia requires further evaluation and is considered on a case-by-case basis;
 - b. Idiopathic thrombocytopenic purpura (ITP) unless an isolated episode in childhood with a complete recovery; and,
 - c. History of thrombotic thrombocytopenic purpura (TTP) or haemolytic uremic syndrome.
- 7.5 Hypercoagulable disorders.
- 7.6 Hemophilia.

7.7 Hemochromatosis is disqualifying for enrolment in the Canadian Forces. If diagnosed in trained CAF aircrew, the Air Factor limitations are determined by the frequency requirement of phlebotomies and the presence or complications.

8. Abdomen and Digestive System

8.1 Chronic disease or disorders of the alimentary tract that interfere with performance of duties.

8.2 Inflammatory bowel disease (Crohn's disease or ulcerative colitis).

8.3 Active gastric or duodenal ulcer disease.

8.4 Chronic gastritis or chronic abdominal pain.

8.5 History or gastrointestinal bleeding from any cause except for post-traumatic bleeding, medication induced gastritis, or minor bleeding (such as hemorrhoids or resolved infectious colitis).

8.6 Any chronic, recurrent or major progressive liver, gallbladder, or pancreatic disorder (e.g., pseudocyst). Benign, non-infectious hepatic cysts are not disqualifying.

8.7 History of acute pancreatitis.

9. Endocrine and Metabolic

9.1 Any endocrine disease or disorder that may affect performance of duties.

9.2 Diabetes mellitus.

9.3 Metabolic syndrome (three or more of):

- a. Waist circumference >89cm in women or > 102 cm in men;
- b. Triglycerides >1.70mmol/L;
- c. HDL cholesterol < 1.3 mmol/L (women) or <1.0 mmol/L (men);
- d. Fasting blood glucose (equal to or greater than 5.7 mmol/L); and,
- e. Blood pressure (equal or greater than 130/85 mmHg).

9.4 Hyper or hypothyroidism until chemically and clinically euthyroid.

9.5 Familial hyperlipidemia.

9.6 A history of gout will be reviewed with a risk assessment based on frequency and related metabolic abnormalities including uric acid level.

10. Genitourinary

10.1 Any disorder of the genitourinary system that interferes with the performance of duties.

- 10.2 Nephro/urolithiasis:
- a. History or renal colic requires further evaluation for underlying substrate for recurrence; and,
 - b. Presence or renal calculi in the collecting system (outside the renal parenchyma) requires urologic consultation with a risk assessment for future renal colic.

10.3 Autoimmune parenchymal and vascular renal disorders.

10.4 Acute or chronic nephropathy.

10.5 Polycystic kidney disease.

11. Musculoskeletal Disorders

11.1 Traumatic, inflammatory, degenerative, congenital (or hereditary) and metabolic disorders, or disease of any bone, joint, muscle or supporting structure that interferes with the performance of duties.

11.2 Chronic arthritis with functional disability that interferes with the performance of duties.

11.3 Active infections of bone, joint, muscle or tendon (e.g. osteomyelitis, soft tissue infections and septic arthritis).

11.4 Presence or history of musculoskeletal malignancy.

11.5 Benign tumours or cysts, single or multiple, that interfere with performance of duties or create a fracture potential.

11.6 Joint instability (recurrent subluxations or dislocations), unless surgically corrected.

11.7 History of osteomyelitis with no recurrence will be reviewed on a case-by-case basis.

11.8 Mal-union of fractures that interferes with performance of duties.

11.9 Symptomatic traumatic, degenerative, or congenital disorders of the spine such as herniated nucleus pulposus, spondylolisthesis, spina bifida, ankylosing spondylitis, fractures and dislocations, scoliosis, kyphosis, and lordosis.

11.10 Asymptomatic traumatic, degenerative, or congenital disorders of the spine such as herniated nucleus pulposus, spondylolisthesis, spina bifida, ankylosing spondylitis, fractures and dislocations, scoliosis, kyphosis, and lordosis that could interfere with performance of duties are considered on a case-by-case basis after appropriate specialty consultation.

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11.12 Presence or history of herniated nucleus pulposus, or fractures and dislocations of the spine resulting in persistent neurologic deficit. Cases without persistent neurologic deficit will be considered on a case-by-case basis after appropriate specialty consultation.

11.13 History of recurrent mechanical spinal or sacroiliac pain with disabling episodes of pain, muscle spasm, postural deformities, or persistent or chronic limitation of motion of the spine or pelvis.

11.14 Scoliosis of greater than 20 degrees (for pilot only).

11.15 Functional disorders, scars and deformities, amputation of the fingers or hand that impair dexterity, grip strength, circulation, that are symptomatic, may interfere with performance of duties or preclude the wearing of equipment.

11.16 Disorders of the foot that compromise the wearing of equipment or are associated with chronic pain (such as severe clubfoot, pes planus, pes cavus, hammer toes (hallux valgus), overriding digits, hallux rigidities, and bunions).

11.17 Chronic or recurrent bursitis, tendinitis, and synovitis sufficient to interfere with the performance of duties.

12. Skin

12.1 Any disorder of the skin or nails, acute or chronic that is severe enough to interfere with the performance of duties or the wearing of protective equipment.

12.2 Extensive, deep, or adherent scars that interfere with muscular movements or with the wearing of equipment, or that show a tendency to break down.

12.3 Severe acne, atopic dermatitis, dermatitis factitia, or eczema that interfere with the wearing of equipment.

12.4 Cysts, nevi, or benign tumors of the skin of a size or location that interferes with the wearing of equipment unless surgically corrected.

12.5 Dermatitis herpetiformis.

12.6 Connective tissue diseases and other dermatoses aggravated by sunlight.

12.7 Neurofibromatosis.

12.8 Pilonidal sinus:

- a. History of inflammation or discharging sinus in the preceding two years; and,

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- b. History of pilonidal sinus with excision surgery without postoperative signs or symptoms indicative of residual disease for more than one year is evaluated on a case-by-case basis.
- 12.9 Psoriasis or a verified history of same unless limited to < 1% total body surface area, asymptomatic and not requiring treatment.
- 12.13 Pemphigus vulgaris, bullous pemphigoid, or other primary blistering disorder.
- 12.14 Malignancies of the skin, primary or secondary cutaneous manifestations of systemic malignancies:
- a. Basal cell carcinoma that has been adequately excised is not disqualifying; and,
 - b. Squamous cell carcinoma that has been adequately excised will be evaluated on a case-by-case basis.

13. Neurological

- 13.1 Any neurological disorders that may interfere with the performance of duties:
- a. Primary or secondary malignancies of the nervous system; and,
 - b. Benign tumours or history of benign tumours of the nervous system (including acoustic neuromas) are considered on a case-by-case basis.
- 13.2 Vascular disorders of the nervous system (e.g. Arteriovenous malformation, intracranial aneurysms, cavernous angioma).
- 13.3 History of a cerebrovascular accident (stroke, TIA, subarachnoid hemorrhage).
- 13.4 History of infection of the nervous system within 2 years, or with residual neurologic defects that may compromise performance of duties:
- a. Uncomplicated viral meningitis and other central nervous system infections without residual neurologic sequelae are evaluated on a case-by-case basis; and,
 - b. Encephalitis or history of encephalitis is disqualifying.
- 13.5 Peripheral or central nervous system demyelinating disease (e.g., multiple sclerosis).
- 13.6 Acute inflammatory demyelinating polyneuropathy without neurologic sequelae after 5 years is evaluated on a case-by-case basis.
- 13.7 Congenital or developmental abnormalities of the nervous system that interfere with performance of duties.
- 13.8 Personal history of diseases of hereditary origin such as neurofibromatosis, Huntington's chorea, hepato-lenticular degeneration, acute intermittent porphyria,

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spinocerebellar ataxia, peroneal muscular atrophy, muscular dystrophy, familial periodic paralysis, and congenital lower spastic paraparesis.

13.9 Family history of disorders or diseases of hereditary origin such as the above paragraph will be considered on a case-by-case basis.

13.10 History of seizure disorders, including absence (petit mal):

- a. Febrile convulsions before the age of 5 years or seizure clearly attributable to toxic etiology (e.g. organic solvent poisoning, oxygen toxicity) are not disqualifying; and,
- b. Benign age-related seizures (e.g. Juvenile Myoclonic Epilepsy) are evaluated on a case-by-case basis.

13.11 History of craniotomy or skull defects that interfere with the performance of duties. Craniotomy performed more than 5 years ago with no skull defects is reviewed on a case-by-case basis.

13.12 History of traumatic brain injury associated with any of the following:

- a. Any loss of consciousness or amnesia requires further evaluation;
- b. Intracerebral hemorrhage;
- c. Penetrating injuries or laceration of the brain;
- d. Skull fractures are reviewed on a case-by-case basis;
- e. Imaging evidence of retained intracranial metallic or bony fragments;
- f. Absence of bony substance of skull;
- g. Parenchymal central nervous system injury with persisting neurologic deficits;
- h. Cerebral leptomeningeal cysts, arachnoid cysts, brain abscesses, traumatic CNS infections, or arteriovenous fistula;
- i. Transient cerebrospinal fluid rhinorrhea or otorrhea is reviewed on a case-by-case basis; and,
- j. Any post-traumatic syndrome manifested by changes in personality, deterioration of higher intellectual functions, anxiety, headaches, or disturbances of equilibrium for more than 3 months is disqualifying, and for less than 3 months is evaluated on a case-by-case basis.

13.13 Migraine headache with aura, or any disabling, chronic, or recurrent headache will be reviewed with a risk assessment based on risk factors, including but not limited to: headache triggers, frequency, severity of symptoms and MOSID.

13.14 History of chronic, recurrent headaches during a defined time period without recurrence for 3 years will be reviewed on a case-by-case basis.

13.15 Disorders or injuries of peripheral nerves that interfere with performance of duties.

13.16 Uncomplicated Bell's palsy without sequelae after six months is considered on a case-by-case basis.

13.17 Cervical or lumbar radiculopathy. History of cervical or lumbar radiculopathy is evaluated on a case-by-case basis.

13.18 Movement disorders such as Tourette's syndrome, dystonia and chorea.

13.19 Parkinson's disease and related conditions.

13.20 Essential tremor will be assessed on a case-by-case basis.

13.21 Disorders of neuromuscular transmission (e.g., myasthenia gravis) and myopathies.

14. Mental and Behavioural Disorders

14.1 The diagnosis of a psychiatric disorder should meet the criteria established in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM).

14.2 Any behaviour or mental condition that in the opinion of the AMA makes or is likely to make the individual a hazard to flight safety, crew coordination, or mission execution is disqualifying.

14.3 The following conditions are disqualifying for CAF aircrew:

- a. Delirium, Dementia and Cognitive disorders unless fully reversible with no evidence of residual deficits of cognition, memory, judgement or behaviour, and there is a low likelihood of recurrence;
- b. Schizophrenia and other psychotic disorders;
- c. Bipolar disorder (type I and II);
- d. Depressive disorder:
 - (1) Single Major Depressive Episode:
 - i. Untrained aircrew - suitability for aircrew selection will be considered on a case-by-case basis.
 - ii. Trained aircrew may be considered for a return to flight duties following resolution of an episode of major depressive disorder provided that there is clear confirmation of clinical stability for a minimum of six months. Aircrew may be returned to flight duties on approved antidepressant medications following aeromedical psychiatric review and clinical aeromedical review as per Flight Surgeon Guideline (FSG) 1400-01. Alternatively, antidepressant medication and psychotherapy must be discontinued for at least two months without return of symptoms..
 - (2) Recurrent Major Depressive episodes:
 - i. Untrained Aircrew - disqualified for selection.
 - ii. Trained Aircrew may be considered for a return to flight duties (with a restriction if required) while on an

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- approved anti-depressant medication (see FSG 1400-01) provided they have received aeromedical psychiatric confirmation of a full clinical recovery along with a aeromedical review including AUMB.
- (3) A history of attempted suicide or depression related psychotic features is disqualifying for aircrew duties.
- e. Adjustment disorders may be disqualifying if any of the following conditions are met:
- (1) Active suicidal ideation or a documented attempt;
 - (2) Hospitalization was required;
 - (3) Three or more episodes have occurred; or
 - (4) Adjustment disorder treated with SSRI medications:
 - i. For aircrew candidates, is assessed on a case-by-case basis
 - ii. For experienced aircrew, a return to flight duties may be considered subject to the policies detailed in FSG 1400-01.
- f. Anxiety disorders are disqualifying aside from a history of uncomplicated, mild generalized anxiety or social phobia.
- (1) PTSD will be considered on a case-by-case basis but is generally disqualifying for flight duties;
 - (2) Recurrent panic attacks or panic disorder is disqualifying.
- g. Somatoform disorders;
- h. Dissociative disorders;
- i. A diagnosis of current ADHD or current treatment for ADHD symptoms is disqualifying. Individuals with a history of ADHD will be evaluated on a case-by-case with a risk assessment based on the past diagnosis and recent/current functioning off all medications;
- j. Sleep disorders if associated with unexpected sleep, daytime drowsiness or somnambulence;
- k. Substance Abuse or dependence. (Note: nicotine-related disorders are not necessarily disqualifying):
- (1) History of Alcohol Abuse or Dependence, unless the individual has completed an approved treatment program with total permanent abstinence after the program. For experienced CAF aircrew, a 60 day post-program observation period, ongoing total abstinence and active participation in an after care program for a minimum of 2 years is required for consideration for return to flying duties. Abuse of other substances will be considered on a case by case basis but are normally disqualifying.
- l. Characterological behaviours that show evidence or immaturity, instability, impulsiveness, lack of judgement, or an impaired capacity to adapt to stressful situations.

15. Obstetric and Gynecology

15.1 Any disabling disorder of the genitourinary system or associated anatomical structures that interferes with performance of duties.

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15.2 Pregnancy is disqualifying for selection. For trained aircrew, pregnancy requires grounding unless member requests consideration for continued flight duties. In such cases, restricted flight duties may be considered up to 24 weeks gestation in non-ejection seat aircraft after confirmation of low risk singleton pregnancy. Appropriate flight type, duration and destinations should be determined after individualized occupational reproductive hazard exposure review completed by the Flight Surgeon in consultation with the attending obstetrician and discussed with member. Pregnancy is disqualifying for flight in ejection seat aircraft.

15.3 Controller duties may be authorized throughout pregnancy under Flight Surgeon supervision in consultation with the obstetrician. Considerations for potential employment limitations include shift work, shift length, physical location of duties and ease of access to replacements should unforecasted sudden absences be required of short or long duration.

16. Dental

16.1 Any dental defects that:

- a. Interfere with clear speech sufficient to compromise verbal communication;
- b. Cause changes in the contours of the face which interfere with the wearing of protective equipment; or,
- c. May result in barodontalgia.

17. Infectious Diseases

17.1 Any acute or chronic infectious disease, until appropriately treated with confirmed eradication, which might compromise mission operations, performance of duty, or crew health or safety.

17.2 Tuberculosis:

- a. Active tuberculosis; and,
- b. History of tuberculosis or a confirmed PPD conversion until completion of a CDC approved treatment regimen and an adequate period of follow-up.

17.3 Malaria (unless appropriately treated and cured).

17.4 Acquired Immune Deficiency Syndrome (AIDS). Clinical or laboratory evidence of Human Immunodeficiency Virus (HIV) infection is disqualifying for aircrew selection. In trained aircrew HIV infection is considered on a case-by-case basis.

ANNEX B

AEROMEDICAL RISK ASSESSMENT AND MANAGEMENT

References: A. Risk Management for CAF Operations, B-GJ-005-502/FP-000
B. Department of National Defence/Canadian Forces Airworthiness Programme, A-GA-005-000/AG-001

Introduction

1. Risk assessment and management form a key element in military operations. Reference A describes the overall process of risk management for CAF operations. The Canadian Forces Airworthiness Program (Ref B) includes a Risk Management Process (Section 2) which provides a structured approach to risk ensuring consistent and effective decision making. This Risk Management Process is integrated into the programmes of the Operational Airworthiness Authority and the Technical Airworthiness Authority.
2. The RCAF Surgeon, as the Aerospace Medical Authority (AMA), is the delegated authority for CAF aeromedical issues. The AMA has developed a parallel Risk Management Process for aeromedical issues which is detailed in this Annex.

Aeromedical Risk Management Process

3. Consistent with the established generic approach to Risk Management outlined in Ref B, aeromedical risk management includes the process for assessing and analyzing risk, and modifying the identified risk where possible through risk mitigation.

Risk Assessment

4. Aeromedical risk comprises several aspects. Each of these must be considered when considering the potential aeromedical impact of a particular medical condition
 - a. Risk to flight safety;
 - b. Risk to mission completion;
 - c. Risk for performance compromise and mission effectiveness; and
 - d. Risk to the individual.
5. Similar to the process utilized by the Operational and Technical Airworthiness Authorities, the aeromedical risk assessment process includes the use of a qualitative and quantitative decision-making tool to assist in assessing the level of risk for aircrew with medical problems. The Aeromedical Risk Matrix (ARM) provides an evidence-based best estimate of quantitative risk associated with specific medical issues. The ARM provides the AMA, delegated aeromedical authorities and the Aerospace and Undersea Medical Board (AUMB) an objective tool to assist in aeromedical disposition decisions. The ARM is meant to be integrated into the overall process of aeromedical risk

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evaluation and is not to replace reasoned aeromedical decision making based on experience and sound clinical judgement.

Risk Mitigation

6. For situations in which aeromedical risk is deemed to be high, aircrew are generally grounded, either temporarily, until the condition improves or resolves, or permanently. For some conditions, a period of grounding for observation will allow better definition of long term risk permitting subsequent re-evaluation of risk.

7. For conditions in which the aeromedical risk is moderate, risk may be mitigated by applying specific aeromedical restrictions through the Air Factor. Aircrew with medical conditions engendering moderate aeromedical risk may be assigned an A3 Air Factor, with a specific operational flight restriction designed to mitigate the medical risk.

8. Risk may also be mitigated through the use of specific medications or other medical interventions to reduce the risk of a medical event occurring. In such cases, with an evidence-based review, with the treatment intervention in place the aeromedical risk may be reassessed to a lower level.

Communication

9. The AMA provides oversight for medical certification of aircrew on behalf of the Airworthiness Authority through the Air Factor. Clinical aeromedical risk disposition is communicated to the operational branch through the Air Factor. Designated aircrew are required to maintain medical certification through the process of initial certification and periodic recertification of the Air Factor. Aircrew with nominal medical risk have appropriate MOSID specific Air Factors assigned (A1, A2, A4). Increased aeromedical risk is communicated through assignment of an A3 Air Factor restriction, or an A7 – unfit aircrew duties. In certain cases in aircrew identified as having increased risk, the AMA may request input from the Aeromedical Policy and Standards Committee (APSC).

Aeromedical Risk Matrices

10. A risk matrix is a table that has several categories of likelihood (probability of events) for rows and several categories of consequences of events for columns. Cells are colour coded to reflect risk. The Aeromedical Risk Matrix is a 4x4 table which similarly incorporates likelihood rows and outcome columns arranged with risk increasing to the upper right. Unlike most other risk matrix tables, Aeromedical Risk Matrices include a third dimension, the role of the particular aircrew, reflecting the different outcome on operations of a medical event amongst differing aircrew (e.g. a medical event in a Flight Surgeon is likely to have a different operational outcome than the same medical event in a pilot). The third dimension is incorporated through a series of four ARMs based on four Categories of Aircrew.

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11. Likelihood: Similar to other risk matrices, the Aeromedical Risk Matrix includes an evidence-based assessment of the probability of a medical event occurring related to the medical condition under review. Likelihood of a medical event is derived from a careful evidence-based review of available medical literature, along with best estimates from clinical specialists. If there are multiple potential medical events related to the condition, a best estimate for the probability of each separate event is included in the ARM. For each potential event, probability is categorized as:

- a) Likely – risk for an event greater than 2% per year;
- b) Possible – risk for an event 1-2% per year;
- c) Unlikely – risk for an event 0.5-1% per year; and,
- d) Highly unlikely – risk for an event less than 0.5% per year.

12. Consequences: The consequences of a medical event are divided into four classes, 1-4. For each class of medical event, the probable outcome is based on evaluation of three variables: (1) the impact on mission completion and flight safety, (2) the effect on the operational performance of the individual aircrew, and (3) the requirement for medical attention.

- a) Class 1 events:
 - i. Minimal or no mission impact. No risk to flight safety
 - ii. Low or minimal effect on performance
 - iii. Requires only routine medical follow-up
- b) Class 2 events:
 - i. May result in mission abort or compromised mission effectiveness. No risk to flight safety
 - ii. Moderate effect on performance
 - iii. Requires post-mission medical follow-up
- c) Class 3 events:
 - i. May result in flight safety hazard or compromise. High probability of mission compromise
 - ii. Major effect on performance
 - iii. Requires immediate medical attention
- d) Class 4 events:
 - i. Likely to result in flight safety critical event and mission termination
 - ii. Total incapacitation
 - iii. Requires immediate advanced medical care

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13. A generic risk Aeromedical Risk Matrix showing likelihood rows and consequence columns is shown below:

	Class 1 Medical Event	Class 2 Medical Event	Class 3 Medical Event	Class 4 Medical Event
	Minimal impact on mission	May result in a mission abort or compromised effectiveness	Likely to result in a flight safety hazard or compromise	Likely to result in a flight safety critical event
	May result in a deleterious effect on the health of the individual aircrew but minimal effect on performance	Aircrew able to continue duties with minor to moderate performance compromise.	Major decrement in performance	Total acute incapacitation (may include sudden death)
	Requires routine periodic medical follow-up	Requires medical attention	May require immediate medical attention	Requires immediate advanced medical care
Likely > 2%/yr				
Possible 1-2%/yr				
Unlikely 0.5-1%/yr				
Highly Unlikely <0.5%/yr				

14. Third Dimension is Categories of Aircrew. In order to reflect the differing impact on flight safety and operational effectiveness of a medical event occurring within the spectrum of designated aircrew positions, aircrew have been classified into four categories as follows:

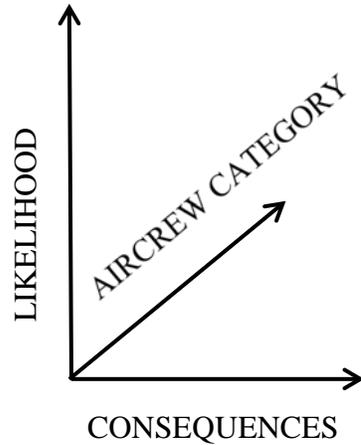
- a) Category 1:
 - i. Pilots – Fighters, Tactical Helicopter, Maritime Rotary Wing, SAR rotary wing, Instructors of pre-wings students
 - ii. SAR Technicians
- b) Category 2
 - i. Pilots – Transport, maritime fixed wing, SAR fixed wing, Instructors of post-wings students
- c) Category 3
 - i. Non-pilot Group A aircrew – Air Combat Systems Operators (ACSO), Flight Engineers (FE) , Airborne Electronic Sensor Operators (AESOp), Mission Specialists (MS), Flight Test Engineers (FTE), Loadmasters (LM), Airborne Environmental Control officers (AEC) , Airborne Control Operators (ACOp) in

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Designated Control Positions (DCP), Aeromedical Training Officers (AMTO) assigned to chamber duties, Aeromed Tech, UAV Tier 1/2 Operators

- d) Category 4
 - i. Group B aircrew – Flight Surgeon, Flight Nurse, Flight Med Tech, Flight Steward, Flight Attendant, AWACS/ATIS, UAV Payload Ops

15. 3-D Aeromedical Risk Matrices. To reflect the differential risk associated with a medical event in each of the Aircrew Categories, a separate Aeromedical Risk Matrix is developed for each Category of aircrew as shown in the tables below. Cells are colour coded to reflect aeromedical risk, with green indicating low aeromedical risk, yellow a moderate aeromedical risk, and red a high aeromedical risk



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Category 1 Aircrew

	Class 1 Medical Event	Class 2 Medical Event	Class 3 Medical Event	Class 4 Medical Event
	Minimal impact on mission	May result in a mission abort or compromised effectiveness	Likely to result in a flight safety hazard or compromise	Likely to result in a flight safety critical event
	May result in a deleterious effect on the health of the individual aircrew but minimal effect on performance	Aircrew able to continue duties with minor to moderate performance compromise.	Major decrement in performance	Total acute incapacitation (may include sudden death)
	Requires routine periodic medical follow-up	Requires medical attention	May require immediate medical attention	Requires immediate advanced medical care
Likely > 2%/yr	Yellow	Red	Red	Red
Possible 1-2%/yr	Yellow	Yellow	Red	Red
Unlikely 0.5-1%/yr	Green	Green	Yellow	Yellow
Highly Unlikely <0.5%/yr	Green	Green	Green	Green

Category 2 Aircrew

Likely > 2%/yr	Yellow	Red	Red	Red
Possible 1-2%/yr	Yellow	Yellow	Yellow	Yellow
Unlikely 0.5-1%/yr	Green	Green	Green	Green
Highly Unlikely <0.5%/yr	Green	Green	Green	Green

Category 3 Aircrew

Likely > 2%/yr	Yellow	Yellow	Red	Red
Possible 1-2%/yr	Green	Yellow	Yellow	Yellow
Unlikely 0.5-1%/yr	Green	Green	Green	Green
Highly Unlikely <0.5%/yr	Green	Green	Green	Green

Category 4 Aircrew

Likely > 2%/yr	Green	Yellow	Red	Red
Possible 1-2%/yr	Green	Green	Yellow	Yellow
Unlikely 0.5-1%/yr	Green	Green	Green	Green
Highly Unlikely <0.5%/yr	Green	Green	Green	Green

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List of Abbreviations

AA	Airworthiness Authority
ACSO	Air Combat Systems Officers
AC Op	Air Weapons and Aerospace Control Operator
AEC	Aerospace Controller (Air Traffic and Air Weapons Controllers)
AESOP	Airborne Electronic Sensor Operators
AMA	Aerospace Medical Authority
AMTO	Aeromedical Training Officers
AUMB	Aerospace and Undersea Medical Board
BAvMed	Basic Aviation Medicine (BAvMed) Healthcare Provider
CDS	Chief of the Defence Staff
CF	Canadian Forces
CFASC	Canadian Forces Aircrew Selection Center
CFEME	Canadian Forces Environmental Medicine Establishment
CFHS	Canadian Forces Health Services
CFRC	Canadian Forces Recruiting Centre
DRDC	Defence Research and Development Canada
MND	Minister of National Defence
MOSID	Military Occupational Structure Identification Code
PHA	Periodic Health Assessment
SAR Tech	Search and Rescue Technician
TC	Transport Canada
UAS	Unmanned Aircraft System