

GUIDELINES FOR FLIGHT SURGEONS

AIRCREW VISUAL REQUIREMENTS

- References: A. CFP 154 - Medical Standards for the Canadian Forces
B. CFAO 34-44 - Medical Examination – Aircrew

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GENERAL

1. This is an update of the Flight Surgeon Guideline concerning examination and visual standards for aircrew from those updated on 30 Oct 98. This revision of the guidelines should be considered the current standard. This guideline represents the concurrent opinion of the full Central Medical Board including 1 CAD Flight Surgeon and the Aeromedical Advisor to the Chief of the Air Staff. Because of concerns regarding operational effectiveness and flight safety, variation from this guideline in unique circumstances should only occur after obtaining appropriate aeromedical advice from Central Medical Board.

INITIAL EYE EXAMINATION

2. A full eye examination including near and distant vision, dilated funduscopy, muscle balance, intraocular pressures and visual fields must be done within the 12 months preceding the initial

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examination for aircrew. This initial eye examination for Pilot (32), ANav (31), AEC (39), FE (091) and SAR (131) must include a cycloplegic refraction by an ophthalmologist.

3. All other aircrew i.e. Loadmaster (911), Airborne Electronic Sensor Operator (081), Aerospace Control Operator (168), Flight Nurse, Flight Attendant, Flight Steward, Flight Med A, AMT, Flight Surgeon, Aeromedical Officer and Technician may be done by an Ophthalmic Technician/Optomtrist.

PERIODIC EYE EXAMINATION

4. A periodic eye examination will be done:

- a. every 4 years after the initial eye examination to age 40 (every 2 years if the member wears glasses);
- b. every 2 years after age 40; and
- c. annually after age 46.

5. The periodic evaluations may be done by a CF ophthalmic technician/optometrist. The periodic eye examinations must include dilated funduscopy in all cases but the requirement for a cycloplegic refraction is at the discretion of the ophthalmologist or ophthalmic technician. When the examination is done by an ophthalmic technician the funduscopy must be checked by a flight surgeon or medical officer.

6. Where visual status changes sufficiently to warrant a V factor change, the member shall be referred to an ophthalmologist for confirmation.

Note: All V factor changes below Classification/Trade Standards will be forwarded to DRDC Toronto (CFEME)/CMB for recommendations regarding limitations. CMB will then forward with recommendations to 1 CAD who will finalize a category assignment and recommendations and inform D Med Policy in Ottawa.

VISUAL ACUITY STANDARDS

Initial Selection:

Note: Most Aircrew candidates must meet not only visual acuity standards but also cycloplegic refractive standards as defined in paragraph (8). Refractive criteria do not apply to those aircrew as defined in para (17).

7. Near vision is determined using “Times Roman” type and is assessed at reading distance 30-35 cm) and at 100 cm. The 100 cm distance is important in the cockpit and for users of CRT displays. When two values are shown, such as N5 and N14, the first value refers to the reading distance and the second to the 100-cm distance.

Pilot	1. Direct Entry - CCEP (Community College Enrollment Program) 2. Helicop Program 3. Former CF Pilots (unrestricted) 4. Search and Rescue	All other Aircrew (except AMTO & Flt Surg)	1. Flt Surg 2. AMTO
<u>Better Eye</u> <u>Other Eye</u> <u>Distance</u> 6 / 6 6 / 9	<u>Better Eye</u> <u>Other Eye</u> <u>Distance</u> 6 / 18 6 / 18 or 6 / 12 6 / 30	<u>Better Eye</u> <u>Other Eye</u> <u>Distance</u> 6 / 120 6 / 120	<u>Better Eye</u> <u>Other Eye</u> <u>Distance</u> N/A N/A
NO CORRECTION ALLOWED	CORRECTABLE TO 6 / 6 6 / 9	CORRECTABLE TO 6 / 6 6 / 9	CORRECTABLE TO 6 / 9 6 / 120
<u>Near</u>	<u>Near</u>	<u>Near</u>	<u>Near</u>
N5 & N6 & N14 N18	N10 & N10 & N24 N24	N/A N/A	N/A N/A
NO CORRECTION ALLOWED	CORRECTABLE TO N5 & N6 & N14 N18	CORRECTABLE TO N5 & N6 & N14 N18	CORRECTABLE TO N6 & N18 N18 N36

Cycloplegic Refraction Limits

8. Initial cycloplegic refraction standards are as follows:

	Pilot	Other Aircrew requiring refractive limits: ANav, AEC, FE
Myopia	Not more than - 0.25 spherical equivalent in either eye	Not more than - 2.00D spherical equivalent in either eye
Hyperopia	Not more than + 2.50 spherical equivalent in either eye	Not more than + 3.50D Spherical equivalent in either eye
Astigmatism	Cylinder power not more than 0.75D in either eye	Cylinder power not more than 1.25D in either eye

9. Spherical equivalent is determined by algebraically adding half the cylinder part of the correction to the spherical part of the correction.

10. SAR Tech must meet minimal standards of V2 but no refractive standards apply.

11. Other Aircrew that must meet minimal standard for V3, but no refractive standards apply Loadmaster (911), AESO (081), AC OP (168), AMT (717), Med A (Aeromedevac) (711), Flight Nurse, Flight Attendant and Flight Steward.

12. Flight Surgeon (55) and AMTO (56) are acceptable as V4. No refractive standards apply.

Ocular Muscle Balance

- 13. Ocular muscle balance should be measured at 6 meters and at 30 - 50 centimeters with the individual wearing the correction required for these distances. Accommodation control targets should be used at both distances with the single cover and alternate cover tests, using prisms if necessary.
- 14. Diplopia, or a history of Diplopia, is disqualifying as is unstable fusion.
- 15. The angle of squint must be less than 2 prism diopters of vertical deviation (hyper/hypohoria) at both 30 - 50 centimeters and 6 meters. Up to 10 diopters of horizontal deviation (exo/esophoria) is acceptable providing there is no history of diplopia. Borderline cases can be assessed at CMB.
- 16. AMT, Flight Surgeons and Aeromedevac personnel may be considered acceptable regardless of the angle of squint provided there is stable fusion and there is no history of diplopia.

VISUAL CATEGORIZATION

- 17. A summary of initial aircrew visual categories are as follows:

V1	V2	V3	V3	V4
Refractive standards apply	Refractive standards do not apply	Refractive standards apply	Refractive standards do not apply	Refractive standards do not apply
Pilot (32)	1. SAR Tech 2. CCEP 3. Helicop Program 4. Former CF Pilots (unrestricted)	1. ANav 2. AEC 3. FE	1. Loadmaster 2. AESO 3. AC OP 4. AMT 5. Med A 6. Flt Nurse 7. Flt Att 7. Flt Stwd	1. Flt Surg 2. AMTO

FLYING RESTRICTIONS/EXPERIENCED AIRCREW

- 18. Pilots with a visual factor of V2 remain A1. An operational flying restriction is not required but V2 pilots must wear corrective lenses while flying. No refractive standards apply. They are however below the standard for initial selection as pilot and appropriate documentation (CF 2033 and CF 2088) is forwarded through DRDC Toronto(CFEME)/CMB to 1 CAD.
- 19. V3 pilots should be categorized A3 with the following restrictions: “Unfit Tactical Helicopter Nap of the Earth and Tactical Fighters (CF - 18) as a solo pilot”. Fit in these roles with or as co-pilot. They are considered fit for solo flight in all other aircraft and operational roles. Refractive standards do not apply. Appropriate documentation is forwarded through DRDC Toronto (CFEME)/CMB for

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category recommendations to 1 CAD. Former CF Pilots who are V3 A3 may be re-enrolled with the appropriate restrictions.

20. All aircrew deteriorating to V4 will be assessed and restricted according to the individual case. Appropriate documentation should be forwarded through DRDC Toronto (CFEME)/CMB for recommendations to 1 CAD.

Contact Lenses

21. The determination of the 'A' factor of those pilots choosing to fly with contact lenses is the same as for a pilot wearing spectacles i.e. according to their unaided vision. Pilots who receive contact lenses because of operational roles (Tactical Fighter, SAR, Tac Hel) IAW Medical Directive 07/91, will have them supplied by the CF. Other pilots must pay for the lenses. When contact lenses are worn by aircrew they must be properly fitted and certified that they were appropriately fitted without problems. (See Medical Directive 07/91)

Note: Toric lenses are now acceptable for aircrew operating high performance aircraft for corrections up to 2 diopters.

Alteration of Corneal Refractive Status

22. Laser surgery (PRK* and LASIK**) has gained wide acceptance in Canada as a means of altering the refractive state of the eye. It is reported that in experienced hands and using state of the art equipment, upwards of 98% of patients will achieve an uncorrected visual acuity of 6/12 (the legal vision requirement for driving), or better. These results, however, while encouraging, offer little solace to the small group of patients who end up with reduced visual acuity and/or chronic visual complications.

* Photorefractive Keratectomy

** Laser-assisted in Situ Keratomileusis

23. The Canadian Forces have long treated refractive surgery as a personal decision on the part of the member. If the member is willing to accept the financial burden and the potential career implications associated with a less than desired outcome, then the Canadian Forces have generally not interfered. Serving aircrew members and aircrew candidates, however, have been restricted from taking advantage of this policy on the grounds that there was insufficient information to predict how the altered cornea would respond to environmental stresses of flight such as acceleration and hypoxia. There was also concern about the flight safety hazards associated with potential complications, such as glare, photophobia, haze and halo effects.

24. In June 1999, a panel of highly qualified specialists from across North America met at DRDC Toronto (formerly DRDC Toronto (CFEME)) to discuss the issue of laser refractive surgery within the context of Canadian Forces air operations. As a result of these deliberations, the following revisions to the Flight Surgeon Guidelines has been implemented:

- a. Laser refractive surgery will continue to be medically disqualifying for either entry into or retention in the Pilot classification. Quality of vision and the response of the altered cornea to ambient flight conditions continue to be a concern. Ongoing research in the United States Navy and the United States Air Force will be monitored closely with the view of revising this directive for pilots in the future.
- b. Laser refractive surgery is considered acceptable for entry into and retention in all non-pilot aircrew classifications providing certain criteria are met. These criteria are:
 - (1) The member must accept financial responsibility for the procedure and any career implications resulting from a less than desired outcome.
 - (2) The member must obtain permission from his or her Commanding Officer for any absences or temporary employment restrictions resulting from the procedure (see below).
 - (3) There must be a mandatory six-month observation period from the time of surgery until return to flight status or entry into training.
 - (4) The Central Medical Board Consultant in ophthalmology at CFEME at DRDC Toronto must assess each member prior to entrance into training or resumption of aircrew duties. Travel for members, to and from CFEME for these assessments, will be treated as medical referrals. The cost's associated with these referrals will be born by the medical section as per Unit SOP's.
 - (5) The member's pre-surgical refractive error must not exceed the spherical equivalent of $-6.00 / +3.50$ diopters and the pre-surgical astigmatism must not exceed ± 3.50 cylinders; and
 - (6) The member's post-surgical refractive correction must not vary more than 0.50 diopters over the six-month observation period.

25. It is recognized that with current surgical techniques, a small number of patients have a loss of Best Corrected Vision (BCV). The current aircrew standards require correction to 6/6 in one eye and 6/9 in the other. If a member's BCV is below these standards after surgery, they would be rendered unfit for flight duties.

26. For purposes of data collection and in order to establish a longitudinal study group, the first 50 non-pilot aircrew members and/or aircrew candidates taking advantage of this revised policy will return to CFEME at 18, 30 and 42 month intervals (post-surgery) for a full ophthalmologic reassessment.

Progressive Lenses and Polarized Lenses

27. Progressive lenses are considered unsuitable for Pilot. Polarized lenses are not allowed for any aircrew.

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Inter-corneal rings and Radial Keratectomy (RK) Surgery

28. Inter-corneal rings and RK Surgery still remain disqualifying for all aircrew MOC's.

SUMMARY

29. Beyond the obvious importance of visual function in air operations such function represents the single-most frequent cause for aircrew candidate unsuitability. It follows that Flight Surgeons must have a thorough knowledge of aircrew visual requirements and should ensure that visual examinations are carried out completely, accurately and at the required interval.

30. Where doubt exists as to the suitability of a candidate or to the implications of visual function in experienced aircrew such cases should be discussed with or referred to Central Medical Board.