

NPA No. 18 /2014
CAAP 19: AEROMEDICAL

Release Date: 16th September 2014

The GCAA has recently conducted a review of (CAAP 19) as a result of Consultative Committee outcome/ E-Medical Reports / best practices/ benchmarking to European standards).

The review has concluded that there is a need for a new publication to be introduced to address certain provisions of Aeromedical examiners designation, facility designation, ATC medical examination and some reinstatement protocols which have been amended. Moreover the introduction of new class of medical certification for the holders of LSA certificate.

The proposed entry into force date of the amendment is 1st November 2014.

Below is a list of the other publications which would be affected upon entry into force of the proposed amendment:

- 1 - CAR Part VIII
- 2 - CAR Part VI

This notice is published to announce to the public this amendment and to entitle all concerned parties to:

1. Review the attached proposed publication; and
2. Submit their comments online through the GCAA website within 1 month from the date of this NPA.

Comments must be submitted through the GCAA Website – E-Publication – Notice of Proposed Amendment, using the Action of “Submit NPA Feedback Request.”

Comments and Responses may be viewed in the Comments Response Document CRD pertaining to this NPA on the GCAA website.



الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

CIVIL AVIATION ADVISORY PUBLICATION

CAAP 19

AEROMEDICAL

**AND POLICY REGARDING GCAA AEROMEDICAL EXAMINER SYSTEM AND AEROMEDICAL
CERTIFICATION**

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2. PURPOSE

This Civil Aviation Advisory Publication (CAAP) provides information regarding Aeromedical Examiner System and the GCAA policy on the Aeromedical certification.

3. STATUS OF THIS CAAP

This is Revision No.04 to CAAP 19 - AEROMEDICAL; it will remain current until withdrawn or superseded. This document involves the adoption of ICAO Annex 1 for flight crew members' medical certificates; the issue of medical certificates by the Aeromedical Examiners (AME), initial and renewal of Aeromedical examiners designation and initial and renewal of Aeromedical centre facilities, as well as Introduction of new class of medical certification of LSA.

4. APPLICABILITY

This guidance and policy material applies to all UAE AMEs, aircraft operators, holders of flight and cabin crew licenses, Air Traffic Controllers, and ATC Students.

5. REFERENCE

U.A.E C.A.R Part II establishes the validity of medical certificates, and describes the requirements for the issuance of medical certificates. It also prescribes the medical certification standards and certification protocols.

PART I - ADMINISTRATIVE ASPECTS

SUBPART A - AEROMEDICAL EXAMINERS (AME)

1. PURPOSE

The purpose of this document is to provide guidelines for the administration of the Aeromedical Examiner System (AME System) including procedures for designating and terminating the designation of aeromedical examiners (AMEs).

2. DELEGATION OF AUTHORITY

Licensing and Aeromedical Department is the organizational element within the General Civil Aviation Authority, responsible for oversight and management of the AME System. The Department develops and establishes regulations, policies, standards, and procedures, governing the AME System. The Head of Aeromedical section is delegated the responsibility and:

- (a) Designates and terminates designation of local physicians as AMEs, Senior AME and approved GCAA specialists.
- (b) Designates and terminates designations of physicians as AMEs who is located in foreign countries.
- (c) Plans, develops, administers, and evaluates medical education programs in support of the AME System.
- (d) Monitors the AME System.
- (e) Provides administrative support for the AME system.

3. AUTHORITIES DELEGATED TO A DESIGNATED AME

3.1 General

An AME is delegated the authority to:

- (a) Accept applications for physical examinations necessary for issuing medical certificates.
- (b) The issuance or denial of the GCAA medical certificates in accordance with UAE CAR Part II Chapter 5, subject to reconsideration by the GCAA Aeromedical section.
- (c) The issuance or denial of a Combined Medical/Student Pilot Certificates subject to reconsideration by the GCAA Aeromedical section.
- (d) Refer a medical certification decision to the GCAA when the AME does not have sufficient information, or is unsure of whether he/she should issue a medical certificate.

3.2 Specific Authorization for Issue, Revalidation and Renewal of Medical Certificates

3.2.1 Initial Issue:

- i. Class I medical certificates shall be issued by an AeMC.
- ii. Class II and cabin crew medical certificates shall be issued by an AeMC or an AME.
- iii. Class III medical certificate shall be issued by an AeMC.

3.2.2 Revalidation and Renewal:

- i. Class I, Class II and cabin crew Medical certificate medical certificates shall be revalidated or renewed by an AeMC or an AME.
- ii. Class III medical certificate shall be revalidated or renewed by an AeMC.

3.2.3 Specific Authorization Delegated to SAME:

- i. The SAME is delegated a task of reinstatement for all classes of Medical certificates, subjected to further review by AMS.
- ii. The endorsement of any limitation on a medical certificate for all medical classes subjected to review by AMS.

4. AME EXAMINATION

4.1 General

The AME examination is an assessment intended to measure the AME's knowledge, skill, and aptitude. It is used by the GCAA to determine if the AME is allowed to practice aviation medicine, or to use a privilege of the GCAA designation.

The GCAA will use a standardized test which is administered and scored in a consistent manner to ensure legal defensibility. It is developed and validated by external professional company specialized in aviation medicine and all the tests are fixed in terms of scope, difficulty and format, and are usually significant in consequences.

The knowledge based assessment consists of best fit question examination to be taken at specific dates determined by Licensing Examination section which may or may not be preceded by refresher regulatory course.

4.2 Applicability

Initially all AMEs are required to give the exam and Permission to defer will be granted only once and ONLY in exceptional circumstances.

4.3 AME Evaluation

A variety of assessment methods will be used in the examination and evaluation process for the designated examiners.

It is obligatory that assessment of the performance of AME in the field settings should be fair, valid, reliable, and in accordance with the principles enunciated in the Licensing Examination procedure. Accordingly, where an AME's performance in a clinical or field setting is to be assessed for eligibility of continuity of their designation, the evaluation must encompass as a minimum:

A formal statement describing the evaluation process, including the criteria to be used in assessing the performance of AME. This statement should be available to all AME before or at the beginning of the clinical or field experience;

- i. a midway performance evaluation with feedback to the AME; the performance record from the E-Medical system (total number of applications done versus your technical or administrative errors)
- ii. Audit observations
- iii. overall communication with the GCAA aeromedical team related to certification issues

- iv. written documentation of the final competency exam assessment; In addition, for such clinical and field experiences, AMS must ensure that:
- v. The AME are fully informed regarding the GCAA publications concerning medical certification evaluation procedures, including the specific assessment procedures to be applied in any particular field or clinical setting.

Assessment of performance shall be conducted based on individual risk based audit form which will capture all of the above elements or components.

It is expected that examinations and other assessments be set up, conducted and marked in a transparently fair manner. They will appropriately reflect our objectives in evaluating the current designated AME.

Upon completion of the risk based performance assessment the AME should receive feedback on their performance in a fashion which is consistent with the evaluation format.

4.4 Learning Resources

- The ICAO medical manual (Document 8984) update was 2012, 3rd Edition – available in GCAA website.
- The GCAA CAR part II, Chapter-5 MEDICAL PROVISIONS FOR LICENSING, updated October 2011, Chapter 1 updated in August 2013
- CAAP 19, updated September 2012
- The Aviation, Space, and Environmental Medicine

5 RESPONSIBILITIES

5.1 AME Roles and Responsibilities

- i. They have a responsibility to ensure that only those applicants who are physically and mentally able to perform safely may exercise the privileges of their licenses.
- ii. To properly discharge the duties associated with these responsibilities, AMEs shall maintain familiarity with general medical knowledge applicable to aviation. They shall have detailed knowledge and understanding of UAE regulations, policies, and procedures and guidance material related to medical certification.
- iii. The AME must be satisfied as to the identity of each applicant for medical certification
- iv. The AME should answer the medical history questions in the medical assessment report, in conjunction with the applicant, and ensure that the applicant understands each such question.
- v. Personally conduct all medical examinations at an established office address, and assume responsibility for the accuracy and completeness of the total report of examination. Nurses may perform limited parts of the examinations (e.g. measurement of visual acuity, hearing (Audiogram), blood pressure, and pulse, and conduct of urinalysis and electrocardiography).
- vi. The AME is responsible to use only the GCAA E-Medical system for the purpose of examination and record, and should send /attach all accompanying reports.

5.2 Roles and Responsibility of Approved Specialist

- i. Possesses an excellent reputation as an expert within an industry, a business process, or a function and got an excellent client relations and client management skills.
- ii. Possesses excellent risk assessment skills; work with the AME or GCAA to avoid or resolve issues

- that might impact the successful completion of the applicant fitness assessment.
- iii. Plans, coordinates, and perform investigations known to resolve or prevent issues that could impact overall aeromedical disposition of applicant.
- iv. Works closely with AME, medical board members or GCAA team members to design and develop management plan to return the applicant to aviation duties on appropriate time scale.
- v. Determine and support the implementation of a GCAA policy, generally by providing the investigation which he does to follow the GCAA protocol;
- vi. Review the results of testing personally and manage the report writing.
- vii. Be accountable for the quality of the service he delivers and personally conduct physical examination in accordance the best practices.
- viii. Investigate the medical case and accordingly treat the medical condition of the applicant.
- ix. Recommend the issuance or denial of the GCAA medical certificates in accordance With the UAE CAR Part II Chapter 5, subject to reconsideration by the GCAA AME and Aeromedical Inspector.
- x. When the Specialist does not have sufficient information, or is unsure of whether he/she should recommend the issue of a medical certificate, he may refer the case to another Specialist in the same field, but final report must be submitted through the approved specialist.
- xi. Upon GCAA request the Approved specialist may be involved in reviewing the medical board as a member of, to review medical assessment for a particular applicant if the medical standards are not met in his particular fields.

5.3 Roles and Responsibilities of Accountable Manager

- i. The AM keeps all the AMEs records.
- ii. Provides training for AMEs on GCAA regulation.
- iii. Keeps track of scheduled reviews with AMEs and the regulator, and when problems arise, looks at the pattern of mistakes and the documentation.
- iv. Review the re-instatement forms personally.
- v. AM need to identify their star performers as well as the few whose performance is unacceptable.
- vi. Supervising all the AMEs medical examinations.
- vii. Releasing the Reinstatements for all applicants.
- viii. Issuing of any variation under the GCAA AMC and inserting or removal of any limitation on medical certificate
- ix. Training for all AMEs in GCAA regulatory matters and remedial AvMed training for those AMEs not meeting GCAA standards.
- x. Focal point for all GCAA communication

6 CODE OF PRACTICE (PROFESSIONAL ETHICS)

The Aeromedical section will adopt a code of professional responsibility relating to aviation medicine practice within the boundaries of the UAE this code of practice will discuss difficult issues, difficult decisions that will often need to be made, and provide a clear account of what behaviour is considered "correct" or "right" in the circumstances. It is a good way to state clearly the AMS's position on important subjects like equality, ethics, contracts, conflict of interest and duty of care. This code of practice applies to all designated examiners by the GCAA including the AME, Senior AME and Specialists.

Failure to follow this guidance will put the designation at risk.

6.1 Confidentiality

The AME is committed to maintaining the highest degree of integrity in all his/her dealings with potential, current and past clients, both in terms of normal commercial confidentiality, and the protection of all personal information received in the course of providing the GCAA examination services concerned. The AME should:

- i. Treat all license holders/Applicants as individuals and respect their dignity.
- ii. Treat license holders/Applicant politely and considerately.
- iii. Respect license holders/Applicants right to confidentiality.
- iv. Act without delay if he/she has good reason to believe that his/her colleague may be putting patients or public health at risk.
- v. Identify the relevant legal and ethical considerations, to help him/her make the aeromedical disposition decisions that respect license holders/Applicant', privacy, autonomy and choices and that also benefit the wider aviation community. If in doubt, he/she should seek the advice of experienced colleagues, or the GCAA AMS as a regulatory body.
- vi. Inform patients about disclosures for regulatory purposes to the GCAA AMS for review and get the patient's express consent for this purpose.
- vii. Understand that confidentiality is an important duty, but it is not absolute. He/she can disclose personal information if:
 - It is required by law
 - It is justified in the public interest

6.2 Ethics

All GCAA services should be done honestly and honourably, and designated peoples are expected to do the same. The AME advice, strategic assistance and the methods imparted through his/her training, take proper account of ethical considerations, together with the protection and enhancement of the moral position of the license holders/Applicants and the AME.

The AME should:

- i. Provide a good standard of practice and care.
- ii. Keep his/her professional knowledge and skills up to date.
- iii. Recognize and work within the limits of his/her competency.
- iv. Work with colleagues in the ways that best serve license holders/Applicant' interests.
- v. Work in partnership with the license holders/Applicant.
- vi. Listen to license holders/Applicants and respond to their concerns about their licensing issues.
- vii. Respect license holders/Applicant rights to reach decisions with health management team about their treatment and care which does not contradict his licensing issue.

6.3 Duty of Care

AME's actions and advice will always conform to relevant law, and all businesses related to civil aviation activities should avoid causing any adverse effect on the human rights of people in the organizations they deal with, the local and wider aviation environments and the safety of society at large. The AME is personally accountable for his/her professional practice and must always be prepared to justify his/her decisions and actions.

6.4 Conflict of Interest

Due to the sensitive nature of our particular aviation regulatory services, designated examiner generally try to avoid any dealings with license holders/Applicant seeking help when they don't meet the GCAA requirements. A possible conflict of interest exists when the AME has a material personal interest, either direct or indirect, in a proposed transaction involving the aviation activity. When the AME has an interest in a transaction being considered by the examinee, the AME should disclose that conflict before the GCAA to take action on the matter.

6.5 Quality assurance

The AME should maintain the quality of what he/she does through constant ongoing review with GCAA staff of all aims, activities, outcomes and the cost-effectiveness of every activity. Regular review meetings and regular progress reports should be maintained.

6.6 Professional conduct

All activities should be conducted professionally and with integrity. The AME should take great care to be completely objective in his/her judgment and any recommendations that he/she give, so that issues are never influenced by anything other than the best and proper interests of aviation community.

6.7 Equality and discrimination

The AME should be fair and objective in his/her advice and actions, and should never be influenced in his/her decisions, actions or recommendations by issues of gender, race, creed, colour, age or personal disability.

7 QUALIFICATIONS AND TRAINING REQUIRED TO DESIGNATED AME, SAME AND SPECIALIST

7.2 Training Courses in Aviation Medicine

- i. Training courses in aviation medicine shall be accepted by the GCAA. The organisation providing the course shall demonstrate that the course syllabus is adequate and that the persons in charge of providing the training have adequate knowledge and experience.
- ii. Except in the case of refresher training, the courses shall be concluded by a written examination on the subjects included in the course content.
- iii. The organisation providing the course shall issue a certificate of completion to applicants when they have obtained a pass in the examination.

7.2.1 Basic and Advanced Training Course for AMEs

The basic training course for AMEs should consist of 60 hours theoretical and practical training, including specific examination techniques. The advanced training course for AMEs should consist of another 60 hours of theoretical and practical training, including specific examination techniques.

i. The syllabus for the basic training course should cover at least the following subjects:

- Introduction to aviation medicine.
- Physics of atmosphere and space.
- Basic aeronautical knowledge.
- Aviation physiology; including demonstration and practical.

- Ophthalmology, including demonstration and practical.
 - Otorhinolaryngology, including demonstration and practical.
 - Cardiology and general medicine; including demonstration and practical.
 - Neurology; including demonstration and practical.
 - Psychiatry in aviation medicine; including demonstration and practical.
 - Psychology.
 - Dentistry.
 - Accidents, escape and survival.
 - Legislation, rules and regulations.
 - Air evacuation, including demonstration and practical.
 - Medication and flying.
 - Pilot working environment.
 - Human factors in aviation, including demonstration and practical.
 - Tropical medicine.
 - Hygiene, including demonstration and practical.
 - Space medicine.
- ii. **Practical training in an AeMC should be under the guidance and supervision of the head of the AeMC.**
- iii. **After the successful completion of the practical training, a report of demonstrated competency should be issued.**

7.3 Qualification and Requirements for AME Designation

7.3.1 Requirements for Initial Designation of AME

Applicants for an AME certificate with the privileges for the initial issue, revalidation and renewal of Class II and Cabin Crew class medical certificates shall:

- i. Be fully qualified and licensed for the practice of medicine and hold a Certificate of Completion of specialist training.
- ii. Have undertaken a GCAA acceptable training course in aviation medicine.
- iii. Demonstrate to the GCAA that they:
 - Have adequate facilities, procedures, documentation and functioning equipment suitable for aero-medical examinations;
 - Have in place the necessary procedures and conditions to ensure medical confidentiality.
 - Have adequate knowledge and skills necessary for examination and assessment for Medical Class II.
- iv. A final interview might be conducted by the Aeromedical Inspector before designation. This may be applicable where the applicant has not held an AME designation before or is not aviation medicine qualified or experienced, or was working in a field of medicine not related to the functioning of the Aeromedical Examiner. Special consideration for designation will be given to those physicians who are pilots, who have been Military Flight Surgeons, who have special training or expertise in Aviation Medicine, or who were previously designated but have relocated to a new

geographical area or an initial application for a Specialist in aviation medicine with vast experience in aviation medicine.

Note 1: Designation of Military Flight Surgeons; can be granted if the military Doctors will be used as a Civilian AMEs, and here the same procedure for designation will follow as for the AMEs.

Note 2: The GCAA will reject any initial application for AME designation if the applicant is over 60 years.

Note 3: On Special occasion the AMS may designate initial applicant with privileges to conduct class 1, 2, and 3 GCAA medical examinations. This will be at discretion of the AMS based on previous experience and qualifications.

7.3.2 Requirements for the extension of privileges of AME designation

- i. Applicants for an AME certificate extending their privileges to the revalidation and renewal of Class I medical certificates shall hold a valid certificate as an AME and have:
- ii. Conducted at least 30 examinations for the issue, revalidation or renewal of Class II medical certificates over a period of no more than 2 years preceding the application;
- iii. Successfully passed an Aeromedical examination at an approved Centre by the GCAA.

7.4 Senior AME Designation

7.4.1 Requirements to be a Senior AME

- i. Diploma in Aviation medicine/or equivalent.
- ii. Three years' experience in aviation medicine.
- iii. Of good performance report within the period of his designation, and
- iv. Participation in GCAA activities and good co-operation with GCAA Aeromedical section.
- v. Excellent ethical conduct.
- vi. Final determination of eligibility will be the function of the GCAA AMS.

Note: Senior AME is title granted by Head of Aeromedical section only and it's based on the AME performances that show a remarkable performance and had contributed to the field of aviation medicine in the UAE and this designation will depend on adequacy of coverage related to the pilot population as well .A final interview might be conducted by the Head Of Aeromedical section before a designation.

7.4.2 Requirements for Specialist designation

- i. The applicant must possess an unrestricted license to practice medicine in the geographical area in which the designation is sought, issued either by Health Authority of the region.
- ii. The applicant must have clinical experience in the speciality field of at least 5 years.
- iii. The applicant must hold a qualification in Aviation or Aerospace Medicine, or if the Specialist is commercial or private pilots himself.
- iv. The applicant must be engaged in the practice of medicine at an established office address.
- v. The applicant's past professional performance and personal conduct shall be suitable for a position of responsibility and trust.
- vi. A final interview might be conducted by the Aeromedical Inspector before a decision can be made in individual cases where the applicant is not aviation medicine qualified or experienced.

7.5 GCAA Requirements for Designation of AeMC Accountable Manager:

- i. Shall be SAME
- ii. Of more than 5 years' experience as Aviation specialist
- iii. Of excellent performance report within GCAA record
- iv. Should be engaged in the aviation medicine work ,i.e. performing more than 200 class I medical in one year
- v. Of good understanding to the local law and regulation of aviation medicine.

8 FACILITIES AND EQUIPMENT REQUIRED

8.1 Requirements for AME Medical Facility

For the conduct of the medical examination, Examiner's shall have adequate facilities for performing the required examinations and possess or agree to obtain the following equipment prior to conducting any GCAA examinations.

- i. The facility shall be approved by the Ministry of health or other Health Authorities wherever applicable.
- ii. Each facility should have at least one GCAA designated AME available to function at it.
- iii. Standard Snellen test and Near Vision Acuity Test N-series Card vision testing.
- iv. Colour Vision Test Apparatus. Ishihara, 24 plate editions.
- v. Standard physician diagnostic instruments and aids including those necessary to perform urinalysis
- vi. Electrocardiographic equipment. All Examiners must have access to digital electro cardio-graphic equipment with electronic transmission capability.
- vii. Audiometric equipment. All Examiners must have access to audiometric equipment or a capability of referring applicants to other medical facilities for audiometric testing
- viii. Laboratory equipment which should be available within the facility includes those for routine aviation medicals namely blood and urine tests. Other required tests to be done in the clinic laboratory by a trained technician or if not available, at another laboratory within a reasonable driving distance from the main facility. For the list of required equipment refer to appendix.
- ix. X-Ray facilities and Drug screening facilities must either be available on premises or within a reasonable driving distance from the main facility.
- x. Pulmonary function test machine (Spirometer) and Peak expiratory flow rate, these machine should be an available within all the facilities.
- xi. A suitable computer, document scanner, modem and software package for communication with GCAA, as the process of e-work will be established for data transfer to the GCAA in the coming year.

Note: The drug screening if not available within the main facility, the specimen can be sent to another one, and the report should be obtained within a reasonable time and with full drug screening protocol.

8.2 Facilities and Equipment Required for the Specialist Facility

- a) The specialist shall have adequate facility for performing the required examinations and possess or agree to obtain such equipment prior to conducting any GCAA examinations;
- b) There should be a provision for chaperones to be made available at the request of those to be examined at the premises.

8.3 Requirements for GCAA Aeromedical Centre AeMC Approval

- i. Availability of SAME designated by the AMS as Accountable manger. Accountable Manager is SAME, high performer, very well qualified, experienced in the field and can easily be identified and define the competency profile important to their success
- ii. Availability of an AME to deputize the Accountable manger on his absence. The number of deputies should match with work demand.
- iii. Presence of internal standardization process and documentation "SOP"- refer to Appendix- I
- iv. Presence of Internal verification process – refer to Appendix – II.
- v. Sufficient number of Admin staff aware about all GCAA procedures.
- vi. Availability of CPD/CME program within the centre – directly related to GCAA activities.
- vii. Presence of sufficient number of good performer AMEs who will be permitted to do Medical class I and /or cabin crew medical Class.
- viii. The Nurses should have a sufficient training on AV MED and documented acceptable competency level in the performed special investigation:
 - ix. CAD test – if applicable
 - x. Visual acuity testing
 - xi. Ishihara 24 plates test
 - xii. Urine dipstick test
 - xiii. Urine drug testing
 - xiv. ECG
 - xv. Audiogram
 - xvi. Spirometry/PEF
 - xvii. Urine Drug screening testing

9 DISTRIBUTION

There shall be a determined need for an AME/SAME/Specialist /AeMC in the area, based on adequacy of coverage related to the pilot population. Other variables, such as rural vs. urban geographic locations and aviation activity levels, shall be considered when assessing the local needs for designation of additional AMEs.

10 TYPE OF DESIGNATION

- i. Once a physician is approved as an AME, SAME, AM, Approved specialist he/she will be granted a 2 year designation.
- ii. Depending on the physician medical back ground and qualification the AME will be categorize as Class II/cabin crew class restricted examiner or as unrestricted examiner for all classes or as Senior AME.
- iii. Depending on the Physician Qualification and field of experience he will be designated as an approved GCAA Specialist.
- iv. The GCAA is constantly evaluating AME's/SAME's and Specialist's performance through reviewing the medical examinations performed by them and with personal audit and also CME pointing system.
- v. The GCAA will hold a full right to downgrade any given designation on bases of not meeting performance requirements or number of medicals conducted per year or any valid justification the Aeromedical section consider it as a risk to flight safety.
- vi. Occasionally the AME can also be suspended based on performance and error rates or any valid justification the Aeromedical section consider it as a risk to flight safety. Please refer to below paragraph no 14 (**Termination or non-renewal of designation**).

11 DOCUMENTATION AND ADMINISTRATIVE PROCEDURE FOR DESIGNATING AME/SAME/SPECIALIST

11.1 Initial Application

- i. Expression of Intent. All applicants for the designation shall apply in writing expressing the intent to practice as an AME/SAME or Approved Specialist. The application shall be made to the Aeromedical section, General Civil Aviation Authority, U.A.E.
- ii. First Correspondence from the GCAA. On receipt of the informal application the Aeromedical Admin assistance will send the required form to the applicant along with list of required equipment within a period of 10 working days.
- iii. Application. The applicant should fill the formal application form and return it to the Licensing Department, supplying all the necessary supporting documents.
- iv. Facility Survey. After reviewing the documents, Provided the candidate is selected for designation the GCAA will inform the candidate and will setup a date and time for the facility survey. Once the facility survey is satisfactorily completed the GCAA shall inform the applicant in writing of the disposal of his or her application and at this stage he shall make any payment required. The Specialist doesn't need to pay for facility approval.
- v. Before finalizing the application the candidate may be required to undertake a competency evaluation exams and/or an interview with the Head of aeromedical section.
- vi. Once selected for designation, the following items should be sent to the physician: Letter of approval from the GCAA, the Designation Card, Facility approval certificate – if applicable, AME stamp, AME code of practice, AME resources, guidance material and supplies. The GCAA Designation cards shall expire 2 years after the date issued. Facility approval shall expire 1 year after the date issued. The Aeromedical Inspector should arrange for training for the designated examiner on the use of E-Medical system.
- vii. Requirements for the Overseas Facility Survey. For the approval of the overseas medical facilities the individual or the organization requesting the approval would be required to make all the necessary arrangements for the GCAA official conducting the audit if feasible or alternative means of Compliance may be accepted to grant this approval.
- viii. Once the AME leave the business or his service is terminated that particular number will be blocked and cannot be used by other AME. Each stamp is intended for the exclusive use of the individual examiner to whom it is issued and must not be used by any other practitioner. In case of lost stamp or Designated Card, the individual is responsible to inform the GCAA immediately.

11.2 Renewal procedure

- i. Thirty days before expiration of designation, the designee shall apply to the Licensing department, forwarding LIF-MED-010 with payment amount of 300 dirham.
- ii. The Aeromedical Inspector shall check the required CME record for all designated examiners applying for renewal, if the record is satisfactory, and the AME performance report during this period of designation is satisfactory, the Aeromedical Inspector recommend the designation renewal.
- iii. Formal interview with the Aeromedical Inspector or exam may be required for some AMEs who meets designation criteria but the performance report is un- satisfactory.
- iv. In case of disqualification for renewal a letter of regret along with the returned cheque will be dispatched to the physician within a period of 10 working days.
- v. Physicians who continue to work as UAE designated AME with expired designation will be subjected to penalties, which may vary from warning letter to permanent suspension.
- vi. Once the designated AME reach the age of 65 years, his designation will not be renewed.

11.3 Procedure for AME/Specialist Re-instatement

Re-instatement of a former AME/Specialist or an AME re-locating from one location to another may be authorized at the discretion of the aeromedical section. However, the applicant must meet the designation requirements.

12 DURATION OF PERMANENT DESIGNATION

Designations of physicians as AMEs are effective for 2 years from the date of initial designation. For continued service as an AME, a new designation shall be made every two years.

Note: Specialist who didn't renew his designation for more than 2 years, his application for re-designation will be considered as initial and all terms and conditions will be applied.

13 OFFICE ADDRESS AND TELEPHONE NUMBERS

All personnel designated by the GCAA will be listed with an office location and telephone number and the designated examiners will be required to promptly advise, in writing, the Licensing Department of any change in office location or telephone numbers. Movement of the location of practice may lead to termination or non-renewal of designation. Continuation of designation at a new location is contingent on need.

14 FEES OF EXAMINATION

The GCAA does not set or recommend fees for general AME examination or specialist consultation.

15 TERMINATION OR NON-RENEWAL OF DESIGNATION

Termination or non-renewal of designation may be based in whole or in part on the following criteria:

- i. No examinations performed after 24 months of initial designation.
- ii. Performance of less than ten examinations per year to maintain proficiency.
- iii. Disregard or failure to demonstrate the knowledge of UAE rules, regulations, GCAA policies, and procedures.
- iv. Careless or incomplete reporting of the results of medical certification examinations.
- v. Failure to comply with the mandatory AME training requirements.
- vi. Movement of the location of practice.
- vii. Unprofessional performance of examinations.
- viii. Loss, restriction, or limitation of a license to practice medicine from Health Authority of the region.
- ix. Any action that compromises public trust or interferes with the AME's ability to carry out the responsibilities of his or her designation.
- x. Any illness or medical condition that may affect the physician's sound professional judgment or ability to schedule or perform examinations.
- xi. Arrest, indictment, or conviction for violation of a law.
- xii. Any other reason the GCAA deems appropriate.

15.1 Return of Material

Upon termination or non-renewal of designation, the AME/Specialist shall return all GCAA material (including identification card) to the GCAA. The GCAA shall take the necessary action if the material is not returned within

a reasonable period of time.

16 CONTINUOUS EDUCATION

16.1 External Credits:

- i. Attendance at national or international scientific meeting, courses ,seminars and workshops.(1 points/hour, max 5 points/day)
- ii. Publication of a paper in a magazine of aerospace medicine journal (5 points, max. 5 points/year)
- iii. Presentation of a paper at a recognized CME activity(5 points, max. 5 points/year)

16.2 Internal Credits:

- i. Small group discussions within the field of Aviation medicine,(0.25 points/hour ,max.5 points/years)
- ii. local medical facility educational activities,(0.25 points/hour ,max.5 points/years)

16.3 Others

- i. Jump seat (1points/one take-off and landing)
- ii. Simulator (1 point/ one take-off and landing)
- iii. Aircraft piloting (1 point/4 hours)
- iv. Any other activities subjected to GCAA approval.

16.4 GCAA Requirement:

- i. During the period of authorization an AME is required to attend a minimum of 20 hours approved refresher training. Scientific meetings, congresses and flight deck experience may be approved by the GCAA for this purpose.
- ii. A CME requirement is as follow: 15 hours must be from external credits, and other 5 hours from reading, internal credits or other activities recognized by GCAA ; Exceptions to this policy shall be based upon an AME's individual circumstances and mutual agreement between the AME and the GCAA.
- iii. The Approved specialist must attend 20 hours approved refresher training, or scientific meeting related directly to his Specialist. ; Plus at least 5 hours related to Aviation medicine.

Note 1: Participation in congress, sessions and courses in another medical specialty other than aviation medicine will not be recognized as GCAA CME required hours.

Note 2: At the time of renewal of AME designation he should show satisfactory completion of CME requirement. This should be reflected in his CV. AME who doesn't participate in any form of CME can lose his status as designated UAE AME.

Note 3: Any extra CME hours, will not be transferred to the following 2 years of designation.

16.5 Procedure for Accreditation Locally Organized CME

16.5.1 Aims and Objectives

- i. To promote a high standard of continuing medical education (CME) in the growing field of aviation medicine within the UAE.
- ii. To promote close co-operation between the approved AMEs within the Emirates
- iii. To actively promote dissemination of information and knowledge between the AMEs in the UAE. As such the CME activities, including those of local hospitals, institutions and international aero-medical conferences will be circulated through the CME unit and will be posted on the website. This may also include changes in the medical practice resulting from research and developments published from major universities, respected journals or regulating bodies from all over the world. AMEs from all the Emirates will be strongly encouraged to attend these CME activities. This includes the promotion of CME in the AeMC.

16.5.2 Requirement for CME Accreditation

a) Content for the conference

CME must be based on a general need related directly to Aviation Medicine for example introduction of new GCAA guidelines, novel therapies and their impact on aviation safety, audit of current practice and guidance for improvements.

b) Instructor

Information about an individual's expertise on medical education as well as the general topic area should be forwarded. All materials presented must utilize information from evidence-based medicine and references must always be stated.

c) Place and time of the Seminar/Workshops

Where and when the activity will occur and how the information will be imparted i.e. lecture, seminar, workshop etc.

d) The objectives for the CME

This must be stated in the application and there should be at least 3 learning objectives which must be:

- Specified
- Clear
- Measurable
- Orientated to the participants

e) Evaluations

For the purposes of the majority of CME events, participants should be evaluated in one or two major domains. These include cognitive (thinking) domains where verbs like – define, compare, discuss, evaluate, compare, describe, assess etc. are appropriate and psychomotor (doing) domains where verbs like display, arrange, perform, write etc. can be used.

f) Ethics

Names and short summaries of all the speakers including their credentials and place of

employment and a signed form noting any conflict of interest must also be forwarded.

g) Feedback

This evaluation can be in my forms, but it must be tied to the learning objectives defined. Some examples of evaluation methods include questionnaires, examinations, and focus groups.

h) Record of Attendance

It is very important that only individuals who actually participate in the education sessions get the credit applied for the time they are involved in the activity.

i) Accredited CME Attendance Certificates

This may be accomplished in one of several ways:

- For one-time events, a certificate of attendance stating accredited number of CME hours may be distributed at the conclusion of the event.
- For ongoing facility/clinic events, a permanent record (either a manual system or spreadsheet application) for each AME must be maintained. In lieu of distributing individual certificates to each participant following ongoing weekly or monthly programs, a summary of events attended could be dispersed on an annual or semiannual basis. The GCAA may issue a certificate of CME on annual basis based on the permanent record. The CME program coordinator will be responsible to track these records.
- If an attendance certificate is issued, it must contain the following information:
 - Event title, date, venue
 - Logo or letterhead of host sponsor (clinic)
 - Statement of Attendance ("This will confirm that Dr.... attended the update on (...subject) held on M/D/Y at (...location)
 - Information on number of accredited hours awarded
 - The CME program coordinator will be responsible to sign the CME certificates

SUBPART B - AEROMEDICAL SECTION (AMS)

The GCAA had appointed Physicians experienced in the practice of aviation medicine that will form part of the GCAA Licensing department, and he/she shall be known as the Aeromedical Inspector.

Medical Confidentiality

The GCAA will ensure that all reports and electronically stored information on medical matters of license holders/applicants are made available to an AMS, in order to be used by the GCAA for completion of a medical assessment. All these document to be accessed by authorized personnel from the GCAA only. The medical information contained in the GCAA files will remain the property of the GCAA, to be released only by Order from a court or written permission from the applicant who request his medical information, on matters related to certification to complete the assessment.

PART II - AEROMEDICAL CERTIFICATION SYSTEM

1. GENERAL

Flight crew, ATC and cabin crew license are issued to applicants who have met the relevant technical and theoretical standards. A valid medical certificate appropriate for the class of license must accompany the license for the applicant legally to exercise the privileges of the license.

2. CLASSES OF MEDICAL ASSESSMENT

Five classes of Medical Assessment shall be established as follows:

(a) Class I Medical Assessment;

Applies to applicants for and holders of:

- Commercial pilot licences aeroplane and helicopter.
- Multi-crew pilot licenses aeroplane
- Airline transport pilot license aeroplane and helicopter

(b) Class II Medical Assessment;

Applies to applicants for and holders of:

- Private pilot licenses aeroplane and helicopter
- Free balloon pilot license
- Student pilot license
- Flight engineer license

(c) Class III Medical Assessments;

Applies to applicants for, and holders of:

- Air traffic controller licenses.

(d) Cabin Crew Medical Assessment:

Applies to applicants for and holders of:

- Cabin crew license

(e) Light sport aircraft (LSA) Medical certificate Assessment:

Applied to applicants for and holders of:

- LSA certificate

3. GCAA MEDICAL CERTIFICATE VALIDITY

3.1. Validity, Revalidation and Renewal of Medical Certificates

- a) Class I medical certificates shall be valid for a period of 12 months.
- b) The period of validity of Class I medical certificates shall be reduced to 6 months for applicant who:
 - i. Are engaged in single-pilot commercial air transport operations carrying passengers and have reached the age of 40.
 - ii. Have reached the age of 60.
- c) Class II medical certificates shall be valid for a period of:
 - i. 60 months until the applicant reaches the age of 40. A medical certificate issued prior to reaching the age of 40 shall cease to be valid after the applicant reaches the age of 42.
 - ii. 24 months between the age of 40 and 50. A medical certificate issued prior to reaching the age of 50 shall cease to be valid after the applicant reaches the age of 51.
 - iii. 12 months after the age of 50.
- d) Class III medical certificate shall be valid for a period of:
 - i. 24 months until the applicant reaches the age of 40. A medical certificate issued prior to reaching the age of 40 shall cease to be valid after the applicant reaches the age of 41; and
 - ii. 12 months after the age of 40.
 - iii. 6 month after the age of 60.
- e) Cabin Crew medical certificate shall be valid for a period of:
 - i. 60 months until the applicant reaches the age of 40. A medical certificate issued prior to reaching the age of 40 shall cease to be valid after the applicant reaches the age of 42.
 - ii. 24 months after the age of 40.
- f) LSA medical certificate shall be valid for a period of:
 - i. 60 months until the applicant reaches the age of 40. A medical certificate issued prior to reaching the age of 40 shall cease to be valid after the applicant reaches the age of 42.
 - ii. 24 months after the age of 40.
- g) The validity period of a medical certificate, including any associated examination or special investigation, shall be:
 - i. Determined by the age of the applicant at the date when the medical examination takes place; and
 - ii. Calculated from the date of the medical examination in the case of initial issue and renewal, and from the expiry date of the previous medical certificate in the case of Revalidation.

3.2. Revalidation

Examinations and/or assessments for the revalidation of a medical certificate may be undertaken up to 45 days prior to the expiry date of the medical certificate.

3.3. Renewal

- If the holder of a medical certificate does not comply with (3.2), a renewal examination and/or assessment shall be required.
- In the case of Class II ,Class III and Class II medical certificates:
- If the medical certificate has expired for more than 2 years, the AeMC or AME shall only conduct the renewal examination after assessment of the aero-medical records of the applicant;
- If the medical certificate has expired for more than 5 years, the examination requirements for initial issue shall apply and the assessment shall be based on the revalidation requirements.
- The holder of a pilot license who has attained the age of 60 years shall not act as a pilot of an aircraft engaged in commercial air transport or private operation unless he meets the GCAA over 60 Medical examination requirements Candidates who at the time of their current medical exam are less than 60 but are going to be 60 years of age before the next medical, the date of their next medical will be calculated as follows;

Example: If a Class I ATPL holder has a renewal aeromedical examination conducted on the 14 August 2011 with a Date of Birth as 05 Nov 1951, the candidate is still not 60 so he does not require to undergo the next medical within the next 6 months, however he will turn 60 on the 05 Nov 2011 and thus the validity of the medical certificate will be reduced from 12 to 06 months. In other words from the date of 05 Nov 2011 the candidate would require to have a medical within 6 months, this would render the date of expiry of the present medical as 14 Feb 2011.

Note 1: The periods of validity listed above may be extended by up to 45 days in accordance with CAR Pat II, chapter 1, paragraph 1.6.

Note 2: When calculated in accordance with 1.6, the period of validity will, for the last month counted ,include the day that has the same calendar number as the date of the medical examination or, if that month has no day with that number, the last day of that month.

Note 3: It is advisable to let the calendar day on which the medical assessment expires remain constant year after year by allowing the expiry date of the current medical assessment to be the beginning of the new validity period under the proviso that the medical examination takes places during the period of validity of the current medical assessment but no more than 45 days before it expires.

The Medical Assessment is valid from the day on which the regulatory medical examination has been carried out. Sometimes the issue of the Medical Assessment has to be postponed until the result of laboratory tests or perhaps a specialist evaluation is known, but this does not change the date for the beginning of the validity period.

Example:

1. *Initial applicant for GCAA Medical class I, goes on 15/7/2014, the calculated expiry date for his next medical will be 15/7/2015*
2. *If he comes for his revalidation on 15/7/2014,the calculated expiry date for next medical will be 15/7/2015*
3. *If he comes for his revalidation on 12/6/2014,the calculated expiry date for his next medical will be on 15/7/2015*
4. *If he comes for his renewal on 20/7 2014, the calculated expiry date for his next medical will be on 20/7/2015*

Note 4: Special investigations (e.g. ECG, Audiogram) 3 months leeway is permitted for the general examination to be synchronized with the special investigations.

Note 5: The period of validity of medical certificate may be reduced when clinically indicated.

3.4. Periodic Test

Chest X-Ray, E.C.G, and Audiometry are performed at different times for the different classes of medicals and for the two different ages group namely, those below 40 years of age, those above 40 years of age and those above 60 years of age. The following schedule is followed.

Class I Medical Assessment

- **Chest X-Ray** Initial assessment, thereafter when clinically indicated.
- **ECG** Initial assessment, thereafter shall be repeated every 5 years until age 30, then 2 yearly until age 40, then annually until age 60 , thereafter every 6 months
- **Audiometry** initial assessment, thereafter every five years up to the age of 40, thereafter every two years.

Class II Medical Assessments

- **Chest X-Ray** Initial assessment, thereafter when clinically
- **ECG**-Initial assessment, at the first medical assessment at the age of 40, and after the age of 40 and at each aeromedical examination thereafter.
- **Audiometry** Initial assessment, thereafter every five years up to the age of 50, thereafter every two years.

Class III Medical Assessments

- **Chest X-Ray** Initial assessment, thereafter when clinically indicated.
- **ECG** -Initial assessment, thereafter to be repeated at four yearly intervals until age of 40, at two yearly intervals thereafter and on clinical indication.
- **Audiometry** - initial assessment, thereafter every four years up to the age of 40, thereafter every two years.

Cabin Crew Medical Assessment

- **Chest X-Ray- Initial** assessment.
- **Audiometry- Initial assessment**, thereafter when clinically indicated.
- **ECG-** to be **done** at assessment once aged 40 and then every 5 years.

LSA Medical Assessment

- **Chest X-Ray- Initial** assessment.
- **Audiometry-** only when clinically indicated.
- **ECG-** to be **done** at assessment once aged 40 and thereafter when clinically indicated.

Note: ECG, Chest X-Rays and Audiograms may be out of phase with the License renewal requirements, in this cases these test can be postponed till the next medical.

3.5. Special Investigations

3.5.1. Electrocardiographs (ECG)

- (a) Routine ECGs are required at specific intervals for class I, class II and class III medical certification.
- (b) All ECGs sent to the GCAA are to be mounted on A4 paper and must contain the following information:
 - Applicant's full name
 - Applicant's License number
 - Report on ECG reading (AME reading , Machine reading alone is not acceptable)
 - All the leads should be marked on the trace and the calibration mark should be clearly visible. The tracing should be performed using standard calibration (10 mm/mV).
 - Where an ECG is known to be abnormal, copies of the previous ECG or reference to it (particularly regarding any changes) would be helpful and should speed GCAA evaluation of the applicant.
 - Any deviation from the normal ECG, should be evaluated carefully by the AME, no judgment is considered valid without cardiologist opinion.
- (c) The AME should examine all ECGs and assess them as normal or abnormal, then provide details of any abnormality detected in the medical report, in case of abnormality the AME should arrange for the cardiologist opinion which may be reporting/reading of the ECG or extensive cardiac review. All such report should be forwarded to the GCAA.
- (d) Detecting disturbances of rhythm and conduction than ischemic heart disease.
- (e) All original issue ECGs performed should be dispatched to the GCAA along with the medical examination form

Note: It is a misconception that a stable "abnormal" recording is necessarily acceptable on the grounds of its stability – a recording demonstrating a pattern of myocardial infarction remains predictive of outcome even if it does not change. Nevertheless, a stable but abnormal recording in follow-up ECGs subsequent to satisfactory investigation may be relatively, although not absolutely, reassuring. A resting ECG is rather better at detecting disturbances of rhythm and conduction than ischemic heart disease.

3.5.2. Audiogram

- The pure-tone audiogram result printout should be enclosed with the medical certificate.
- If the result of the audiogram is not satisfactory, extended otolaryngology Examination should be requested by the AME and done by ENT Specialist using the Form LIF-MED-004 Occasionally the applicant may be asked to pass functional hearing assessment in flight.

3.5.3. Eye Testing

Vision test (visual acuity test and colour vision test) should be performed at every examination and can be conducted by a trained nurse under the supervision of the AME. The AME should enter all the findings.

3.5.4. Colour Vision

All the applicants for all the classes of medical certification have the ability to perceive those colours

necessary for the safe performance of flight duties. It is needed for navigation lights, airport beacons, runway lights, taxiway lights; aircraft position lights, coloured signals and map reading. Also colours used on aeronautical charts, electrical flight information systems in modern aircraft.

3.5.4.1. Common Types of Colour Vision Defects

Type (incidence)	Essential Characteristics
Protanomaly (1%)	Colour matches are different from those made by Normals (anomalous colour matching), reduced sensitivity for red lights.
Extreme Protanomaly (0.2%)	Reduced colour discrimination for red, yellow and green. Reduced sensitivity for red lights.
Protanopia (1%)	Confusion of red, yellow and green. Reduced sensitivity for red lights
Deutanomaly (4.5%)	Colour matches different from those made by normals
Extreme deutanomaly (0.5%)	Reduced colour discrimination for red, yellow and green
Deutenopia (1.5%)	Confusion of red, yellow and green.

3.5.4.2. Causes of Defective Colour Vision:

- Congenital
- Aging
- Eye diseases: retinopathy, opticneuritis CNS disease
- Drugs. (List of drugs, refer APPENDIX 4) Toxic substance poisoning

3.5.4.3. Screening Tests for Colour Vision

- **Frequency-** At initial Medical Certification and thereafter to be carried out every 5 years to age 40, then 2 yearly to age 65.
- **Approved screening test-** Ishihara, 24 plates
- **Approved Advance test for initial class I ,II and III,LSA applicants -** CAD test

3.5.4.4. Screening Test

Plate Testing Procedure

Reliable colour vision testing using the plates requires that a standardized procedure be followed carefully. The main points are;

i. Illumination

The preferred method used is the daylight or artificial daylight source which should give an illumination equivalent to the standard illumination 'C' or 'D' of CIE (Commission International e de l'E clearance).

ii. Position

The plates should be shown at right angles to the visual axis of the applicant at about 75 cm distances.

iii. Exposure Time

Plates are exposed in random sequence and each plate is exposed for a maximum of five seconds.

Screening Test Result

- i. **Normal/Colour Safe Applicant** -The Ishihara test (24 plate version) is to be considered passed if the first 15 plates are identified without error, without uncertainty or hesitation (less than 3 seconds per plate).
- ii. **Colour unsafe, Class I and III cannot be certificated without advanced colour vision testing Indication for Advanced testing**
 - i. Initial Applicants for Class I and III who fail the Ishihara's test, or
 - ii. Renewal/Revalidation Applicants who previously passed screening test and failed the current screening testing, or
 - iii. Holder of Foreign waiver at initial GCAA Medical application, or
 - iv. Current holder of GCAA Medical Class I and III, who had previously granted a waiver based on foreign waiver/or advance colour vision tests not approved by GCAA.

Note: Current GCAA License Holders who had previously passed Anomaloscopy or Lantern testing acceptable to GCAA (Holmes Wright, Beynes, or Spectrolux) are not required to take CAD test.

Result of Advance Colour Vision Testing

- i. **Colour safe:** Applicants who fail the Ishihara's test but pass advanced testing
- ii. **Colour unsafe:** An **applicant** who fails the advance colour perception tests
- iii. Class II/LSA class **applicants** who fail to meet the colour perception standards (i.e. who fail both the Ishihara plate and the CAD test, but who meets all other standards) is eligible for issue of an operationally restricted license (Valid only for day flying only).

***Note:** Cabin crew members should be able to correctly identify 9 of the first 15 plates of the 24-plate edition of Ishihara pseudo isochromatic plates. Alternatively, cabin crew members should demonstrate that they are safe.*

3.5.5. Extended eye examination by Ophthalmologist is required for the following:

- All initial medical checks for class I and III (ATC), thereafter to be repeated when clinically indicated (e.g. LASIK surgery, Eye trauma, Cases of DM, and HTN, Occurrence of eye disease /or if the AME detects or suspects ophthalmic pathology in the applicant for medical certificate etc.).
- At the age of 60, thereafter annually
- The ophthalmologist should use the extended eye examination LIF-MED-001 Form (and the complete form will be forwarded to the GCAA along with the medical application form.

3.5.6. Urine Testing

Urine testing is required at every examination to test for Proteins, Sugar, Blood or any other abnormal

contents. If any abnormal contents are found in the urine the result should be interpreted in the proper perspective (e.g., the finding of blood in the urine of a menstruating female crew). However the test should be repeated after a suitable interval and results noted. If a simple urinary tract infection is diagnosed without any other complications treatment should be instituted. There is no need to delay the candidate's documents waiting for the infection to clear up however a note should be made to the effect that a U.T.I was diagnosed which was non-consequential to the fitness of the candidate and treatment was dispensed. The required testing can be performed in the laboratory however the AME should be satisfied with the authenticity of the results.

Note: Cases of positive urine for ketones in the presence of valid reason such as fasting, high protein diet, and in the presence of normal blood glucose, the result can be acceptable for the issuing medical certificate.

3.5.7. Drug Screening

3.5.7.1. General

Pre-employment drug screening is a GCAA requirement for applicants in all classes, it can be done in the approved facility by a trained individual or at any recognized laboratory, however the AME is responsible to make sure that the required protocol for collection of the specimen and its transport to the laboratory have been followed, and the confidentiality of the applicants has been respected.

The medical certificate should not be issued unless the AME got a negative screening result.

Note: This testing is required of both Persons new to the company and Current employees moving into safety-sensitive positions.

3.5.7.2. List of the Drugs to be Tested

Test for the following drugs or classes of drugs are required:

1. Cannabis (Marijuana) and its metabolites
2. Cocaine and its metabolites
3. Opiates with Morphine and metabolites.
4. Amphetamines
5. Barbiturates
6. Benzodiazepines
7. Methadone
8. Phencyclidine (PCP).

In addition to any Drug testing deemed necessary by the AME on suspicion, or post-accident situations.

3.5.7.3. Procedure for Drug Testing

- i. Prior to conducting any test, the AME should ask the employee to declare the use of any medication he may be taking which could affect the result of the test.
- ii. The testing area identified to carry out the tests will be such so as to protect the dignity of the employee as far as possible, and the collection site should be secure from any water sources, and the water in the toilet bowl should be blue; also there should be no soap, disinfectants, cleaning agents, or other possible adulterants are present;

- iii. A trained tester, or nurse, familiar with the testing procedure will discuss the process of the test and answer any questions the employee may have.
- iv. The urine specimen collected will be provided to the testing laboratory.

3.5.7.4. Procedure of Review of Test Results

- i. Should an AME receive notification of a positive initial/screening result, he/she should notify the applicant involved, that the urine has tested positive, and further confirmation test is needed on the initial urine sample. The AME should not request the applicant to repeat the test unless he got the GCAA permission to do.
- ii. If the confirmation test is positive the AME should deny the certification and send the applicant along with test result to the GCAA approved MRO.
- iii. The Applicants shall be advised to submit medical documentation that may support a legitimate use of the medication and that such information will be reviewed only by the Medical Review Officer to determine whether the individual is illicitly using an otherwise illegal drug.
- iv. As a positive laboratory test result does not automatically identify an employee of job applicant as an illegal drug user; review of results by MRO is mandatory. The Medical Review Officer (MRO) fulfils this function by reviewing the results with the donor and protecting the confidential nature of the donor's medical information. The Medical Review Officer may choose to conduct employee medical interviews, review employee medical history, or review any other, relevant biomedical factors. The Medical Review Officer must review all medical records made available by the tested employee when a confirmed positive test could have resulted from legally prescribed medication. Evidence to justify a positive result may include, but is not limited to:
 - A valid prescription; or
 - Verification from the individual's physician verifying a valid prescription.
- v. If the Medical Review Officer determines there is no justification for the positive result, such result will then be considered a verified positive test result. The Medical Review Officer shall immediately contact the appropriate management official/or the AME upon obtaining a verified positive test result; to recommend or take administrative action.
- vi. The AME/or the company shall inform such applicant that in accordance with GCAA regulations, a confirmed presence of an illegal drug in the applicant's urine precludes the company from hiring the applicant.
- vii. If the applicant, declare the use of any prescribed or over the counter medication on GCAA Medical Application form; which may affect the test result, the test shall be done to confirm the use of the declared medicine at the safe level prescribed. In these cases the AME must request for professional opinion regarding the reason of taking such a medication, and whether the applicant can be off that medicine which is incompatible for flying duties. And at this stage the opinion of MRO shall be requested to confirm the legitimate use of the medication. And if the AME satisfied with these reports, he should defer the case to the GCAA, along with the medical application, MRO report and specialist report for final aeromedical disposition.
- viii. The GCAA may ask the applicant to repeat the urine test in different laboratory, or may ask for more advance test, hair test, if there was suspicion of drug addiction.

3.5.8. Alcohol Screening Tests

Only indicated if the AME at the time of the medical check, observed signs or medical problems which may be related/or induced by alcohol abuse (e.g. person with family history of addiction, cases of cardiac arrhythmia,

insomnia, chronic headache , depression or anxiety, liver disease and cases of uncontrolled hypertension or diabetes).

Note 1: For all the applicants applying for renewal over 60 years, Alcohol Screening should be part of the psychological assessment.

Note 2: Screening should be standardized as much as possible within the GCAA Recognized clinics by using the Laboratory tests.

3.5.8.1. Three of the Most Clinical Laboratory Tests for Detecting and Monitoring Alcohol Use are:

- i. **GGT (gamma-glutamyl transferase):** Is raised in about 80% of heavy drinkers, but is not a completely specific marker for harmful use of alcohol.
- ii. **MCV (mean corpuscular volume):** The MCV is raised above normal values in about 60% of alcohol dependent people and, like GGT, is not a completely specific marker. The value takes several weeks to return to normal during abstinence.
- iii. **CDT (carbohydrate deficient transferrin):** CDT has similar properties to GGT in so far its use as a screening test is concerned. It is more specific to heavy drinking than GGT, but perhaps less sensitive to intermittent “binge” drinking.

Note: All of these tests may also be useful to confirm and monitor abstinence during follow-up of a person who has been previously identified to have a drinking problem. However, the usefulness of GGT, MCV and CDT for this purpose is confined primarily to those cases where it has been demonstrated that the test has been abnormal during periods of drinking. Where it is known that the test has remained normal during a period of heavy drinking, it is clearly unlikely to be useful in the monitoring process (unless subsequent heavier drinking produces an abnormality, where previous “less heavy” drinking has not to do so). In some cases, particularly where a patient presents following successful treatment, test results obtained during a period of heavy drinking may not be available. In such cases, all 3 tests should be conducted at regular intervals usually by the AME in support of the monitoring process.

3.5.9. Pulmonary function tests/Spirometry

- PFT test is required for all initial class I, and class III (ATC) examinations.
- A spirometer measures lung volumes and air flow dynamics and the minimum required measurements are Vital Capacity (VC), Forced Vital Capacity (FVC), Forced Expiratory Volume (in the first second (FEV1) and the Peak Expiratory Flow Rate (PEFR) as well as the FEV1 / FVC ratio. At least three acceptable forced expiratory volume manoeuvres are required and the results should be within 7 per cent of the highest. The values obtained can be compared to predicted values for age, sex, height and ethnic groups.
- The spirometer used should produce a graphical record of either time versus volume or flow versus volume, in the form of a permanent record.
- Significant changes in volumes or flow patterns, particularly changes in the FEV1/FVC ratio should lead to further investigation (and always when less than 70% at initial examination). Where indicated the diagnostic efficiency of these function tests can be heightened by measuring the response of lung function to both severe exercise and the administration of a metered dose of a broncho-dilator. It should be noted that it is the absolute change in FEV1 following a bronchodilator which is important, not the change in FEV1 as a percentage of the vital capacity (FEV1/FVC ratio). An increase in PEFR or FEV1, of 15% or more is very suggestive of an underlying asthmatic tendency. Such findings at the outset of a flying career require further informed

assessment by a pulmonary physician.

Note 1: It should be noted that a tall, fit man could have an actual FEV1/FVC ratio considerably below that predicted and care must be exercised in making judgments on fitness on such ratios.

Note 2: The Peak Flow Meter is not adequate tool for pulmonary function testing, except in patients with asthma for assessing the current severity of disease and the effect of asthma therapy.

3.5.10. Haemoglobin and Haematocrit

Testing the haemoglobin is required for initial examination and when clinically indicated for all the classes of medical applications. Applicants with abnormal haemoglobin (< 10.5 gm/dl) require a haematocrit test. Haematocrit below 32 % requires an unfit assessment and further tests as clinically indicated. Final assessment depends on the diagnosis and response to treatment.

Only a temporary unfit assessment is required if the primary cause can be satisfactorily treated (e.g. iron or Vitamin B 12 deficiency) and the haematocrit has stabilized at greater than 32 %.

3.5.11. Obesity

3.5.11.1. General Evaluation of Obesity at Aero-medical Examination

Assessment of the overweight or obese person should begin with a careful history and physical examination. The physical examination of an obese patient should evaluate the obesity itself, seek evidence of secondary etiologies of weight gain, and assess onset of obesity-related co-morbidities.

- i. Activity level and dietary history should also reviewed,
- ii. History of medication (use is an important aspects of the initial evaluation (corticosteroids, Estrogen, progesterone, testosterone or other anabolic/androgenic steroids).
- iii. Also obesity related family and social history are indicated(family history of obesity related disease
- iv. Alcohol consumption and exercise habits should be discussed.
- v. An Assessment of dietary intake patterns is important, as well as a review of symptom for hypothyroidism and hypercortisolism
- vi. Discussion of the patient's cardiac risk factors is also appropriate.
- vii. Review the pilot's medical record and perform appropriate physical examination.

3.5.11.2. Effects of Obesity on Health

3.5.11.2.1. Mortality

Obesity and overweight are responsible for more than 300,000 deaths per year Obese adults have a 50–100% increased chance of premature death .In the majority of epidemiologic studies, mortality begins to increase with BMIs above 25 kg/m² The increase in mortality generally tends to be modest until a BMI of 30 kg/m² is reached For persons with a BMI of 30 kg/m² or above, mortality rates from all causes, and especially from cardiovascular disease, are generally increased by 50 to 100 percent above that of persons with BMIs in the range of 20 to 25 kg/m² . For subjects with severe obesity (BMIs >40) life expectancy is reduced by 20 years in men and 5 years in women.

3.5.11.2.2. Morbidity

A large number of physical and mental conditions have been associated with obesity. Health consequences can be categorized by the effects of increased fat mass (osteoarthritis, obstructive sleep apnea, social stigmatization) or by the increased number of fat cells (diabetes, cancer, cardiovascular disease, non-alcoholic fatty liver disease). Increases in body fat alter the body's response to insulin leading to insulin resistance and creates a pro-inflammatory state and an increased risk of thrombosis.

Central obesity, characterized by its high waist to hip ratio, is an important risk for metabolic syndrome. Metabolic syndrome is a combination of medical disorders which often includes diabetes mellitus type 2, high blood pressure, high blood cholesterol, and triglyceride levels.

3.5.11.3. Defining the Nature of the Problem (Body Composition Tests)

3.5.11.3.1. The Body Mass Index (BMI)

- Body mass index is defined as the individual's body weight divided by the square of their height. The formulas universally used in medicine produce a unit of measure of kg/m²:

Note: well-trained people with dense muscle mass who have a high BMI score BMI classification will not be enough to define their body composition, so clinical judgment must be used in conjunction the waist circumference, the skin fold thickness or more direct methods of measuring body fat.

3.5.11.3.2. Waist Circumference and Waist Hip Ratio

- Waist circumference is the distance around the natural waist (just above the navel). (the tape must be positioned mid-way between the top of the hip bone and the bottom of the rib cage)
- The absolute waist circumference (>102 cm in men and >88 cm in women) or waist-hip ratio (>0.9 for men and >0.85 for women) are both used as measures of central obesity.
- Waist hip ratio is calculated as follow, measure waist at narrowest part and measure the hip at widest part then divide waist /hip to get the ration

Note: The finding that persons with a normal BMI but a large waist circumference had a higher mortality risk suggests that increased waist circumference should be considered a risk factor for mortality, in addition to BMI.

3.5.11.3.3. Body fat percentage

Body fat percentage is total body fat expressed as a percentage of total body weight. It is generally agreed that men with more than 25% body fat and women with more than 33% body fat are obese.

3.5.11.3.4. Neck Circumference Measurements

- i. Screening for and treating Obstructive Sleep Apnea Syndrome will potentially lead to improved quality of life, reduced cardiovascular mortality and reduced accident rates
- ii. The neck circumference should be measured at a point just below the larynx (Adam's Apple) and perpendicular to the long axis of the neck. The applicant should look straight ahead during measurement, with shoulders down, and the tape will be as close to horizontal as anatomically feasible (the tape line in the front of the neck should be at the same height as the tape line in the back of the neck). Care should be taken so as not to involve the shoulder/neck muscles (trapezius) in the

measurement

- iii. Neck Circumference measured in centimetres should be adjusted for hypertension (+4cm), habitual snoring (+3cm), reported choking or gasping most nights (+3cm) to get prediction of Obstructive Sleep Apnoea.(Refer to protocol of OSA)

3.5.11.4. Aeromedical Disposition

- i. For the GCAA medical certification purpose the definition of obesity include:
 - A body mass index above 30 ,or
 - A waist circumference over 102 cm, female 88cm,or
 - A waist to hip ration of 0.9 male and 0.85 female, or
 - Body fat content above 25% male and 32% female.
- ii. Obese applicant with incapacitation risk of >1%, must be grounded and enter a weight management program which should include dietary advice, an increased exercise regime and regular 3 monthly AME follow and should require an additional battery of tests to exclude the nutritional and metabolic disorders before issuing the medical certificate. The minimum tests required would be Lipid profile (total cholesterol, LDL, triglyceride level and HDL), Fasting Blood Sugar and calculation the overall risk of cardiovascular disease. A target weight reduction of at least 10 % their original weight over one year and all risk factors must be monitored and controlled.
- iii. Obese applicants who are otherwise well and can exercise the privileges of a license safely will be certificated without restriction.
- iv. Obese Individual with OSA should be managed as per the protocol of OSA.
- v. If the a class I candidate with BMI of 35 or more fails to lose weight over 6 months period, or even gain more weight, the GCAA may recommend a simulator assessments with particular attention to his competency in managing emergency situations and evacuation. Multi-pilot (Class I 'OML') or safety pilot (Class II 'OSL') limitation may be required.
- vi. If the high BMI does not reflect obesity (e.g. muscular built), then other measurement to be used as guidelines with the BMI for more accurate assessment, such as body fat percentage.
- vii. Failure to comply with any or all of these points may lead to permanent unfitness.

3.5.12. Cardiovascular Risk Assessment

3.5.12.1. Indication:

- i. Hypertension
- ii. Hyperlipidaemia
- iii. Diabetes
- iv. Smoking
- v. Obesity, and lack of exercise
- vi. Adults 45–74 years without known history of CVD.
- vii. The Metabolic Syndrome (sometimes known as Syndrome X or Reaven's Syndrome¹ — hypertension, hyperlipidaemia, insulin resistance and truncal obesity) carries a significantly increased risk of such event.

3.5.12.2. Method for CVD Risk Assessment

- i. Test required to be performed :Lipid profile ,Check for blood pressure, FBS and CRP
- ii. The AME shall use internationally recognized calculators/charts/or score cards for the estimation of CHD. The preferred calculator for GCAA medical examination is as below, this calculator consider all the risks factors – the modifiable and non-modifiable:
<http://www.patient.co.uk/doctor/Primary-Cardiovascular-Risk-Calculator.htm>

3.5.12.3. Assessing and Management of the Cardiovascular Risks

1. Risk group less than 10% risk

- Issue the medical certificates without limitation
- Address the treatment of dyslipidemia, if necessary and recommended

2. Risk group 10-20%

- Need to address for primary prevention
- Modify risk factors by deciding on start anti lipids treatments or adjust the current treatment.
- After the control of the modifiable risk factors, if the calculated risk remain in the intermediate zone, further cardiac evaluation shall be required.
- If cardiac evaluation ruled out any evidence of Ischemic heart changes, the Medical certificate may be issued with OML restriction, and annual cardiology follow up will be required.

3. Risk group > 20%

or presence of diabetes, left ventricular hypertrophy, Symptomatic Carotid disease (CVA, TIA), or PVD (Aneurysm, Abnormal Test – ABIs):

- The license holder shall be grounded
- Control the modifiable risk factors and treat aggressively to prevent progression
- Cardiac consultation will be required and if cardiac evaluation rule out any evidence of Ischemic heart changes, the Medical certificate may be issued with OML restriction, and annual cardiology follow up.

3.5.13. OSA Screening is usually indicated in:

- History of Excessive Daytime Sleepiness
- History of Snoring
- Witnessed apnoea
- Resistant /uncontrolled Hypertension,
- Uncontrolled Diabetes,
- Metabolic Syndrome
- Obesity ,BMI> 35
- Significant weight gain(10% increase in total body weight)
- A high neck circumference
- Complaints of frequent nocturnal awakenings
- Complaints of difficulty concentrating

- Complaints of problems with memory
- Complaints of daytime sleepiness
- Complaints of fatigue
- Complaints of low mood
- Complaints of erectile dysfunction
- Stop Bang questionnaire score of ≥ 3
- Epworth score ≥ 10

3.5.13.1. Method of Objective screening:

- Physical examination including, vital signs (blood pressure, pulse, respiration); height, weight, and body mass index (BMI); ear, nose, and throat including Mallampati score (ENT); thyroid assessment; cardiovascular; pulmonary assessment, and psychological assessment for presence of mood disorder.
- Neck Circumference corrected for height (as a percentage of predicted neck circumference for height) is a more useful predictor than general obesity or BMI. Neck Circumference measured in centimetres adjusted for hypertension (+4cm), habitual snoring (+3cm), reported choking or gasping most nights (+3cm) is a sensitive predictor of Obstructive Sleep Apnoea. Adjusted Neck Circumference (ANC) greater than 48 and/or ANC 43-48 in the presence of other risk factors is indicative of specialist referral.
- The commonly used Epworth Sleepiness scale (ESS) is a simple validated measure of daytime sleepiness and has been shown to be both a reliable and consistent method of distinguishing those with potential sleep disorders from the normal population. Ideally it should be given to sleeping partners who can more accurately assess snoring and apnoea. ESS of ≥ 10 , considered indicative of pathological sleepiness and specialist referral is required. Refer to Appendix-V.
- The use of STOP – BANG questionnaire which is more sensitive in moderate to severe OSA. Stop Bang questionnaire score of ≥ 3 is an indicative of sleep apnoea which requires further assessment by specialist. Refer to Appendix-VI.
- The gold standard diagnostic test is; nocturnal full polysomnographic attended by technologist diagnostic testing (type 1 Sleep Study).
- When the diagnosis is suspected, the AME must refer the applicant for sleep study to confirm/or exclude the diagnosis of OSA. The initial decision on grounding the applicant prior to the specialist referral solely depends on the AME assessment of the case.
- The GCAA accepts the use of CPAP (Continuous Positive Airway Pressure) as an appropriate treatment for Obstructive Sleep Apnoea. The machine must have the ability for data capture ensure compliance. Other methods of treatment including dental splinting may be acceptable on reports showing adequate control of OSA on sleep study analysis and correct fitting and usage of the splints. Presence of any associated risk factors of Obesity, Hypertension, Thyroid disease, Diabetes Mellitus must be addressed and treated as per GCAA protocols in addition.
- The applicant should have documentary advice to lose at least 5% of the current weight over the following year.
- The minimum grounding period of 2 weeks after starting CPAP treatment will be required before returning the applicant to aviation related safety duties. The pilot will be required to use the CPAP machine at least five hours during sleep, for more than 80% of the time. For dental splints, he will be required to use the splint for each and every sleep period. He may be returned to duty once the compliance with the treatment is established by Specialist review with no subjective symptoms and ESS < 10 . The AME should refer the case to GCAA for Aeromedical section for reinstatement of the applicant.
- The GCAA will issue the medical certificate with OML restriction.

- xi. Follow up recommendations, will include 6 monthly Specialist review and 3 monthly AME review to check for compliance, weight loss and other medical conditions which require periodic review. For those managed with dental splinting, in addition to the specialist review, they would require a Dental assessment every six months to check on compliance and fitting.
- xii. Once granted the restricted medical certificate the applicant will be instructed not to perform aviation safety sensitive job if they experience any problems with the treatment or he suspects his sleepiness/ snoring symptoms returning, or at any time obtains a self-reported ESS of ≥ 10 .
- xiii. The GCAA will not consider removal of the OML restriction, until the time when the applicant's medical condition satisfactory controlled, and all associated risk factors are eliminated or controlled.
- xiv. The applicant will be required to be revaluated by the Specialist in case of documented change in his body weight of 10% value increase or decrease.

3.5.14. Indication for Extended Otorhinolaryngology Examination

When clinically indicated (e.g. hearing deficiency on audiogram, decrease hearing or sudden hearing loss, partial or complete, unilateral or bilateral, Nystagmus, gait ataxia, History of snoring/or sleep apnea, etc.) , to be performed by specialist acceptable for the GCAA Form LIF-MED-004 to be used for this purpose.

PART III - MEDICAL EXAMINATION SYSTEM

1. AME COMPLETION OF GCAA FORMS

All U.A.E Aeromedical examiners must ensure a proper, detailed and comprehensive examination of the Applicant is performed according to the UAE CAR Part II, and the results properly recorded in the official GCAA website (www.gcaa.gov.ae, go to E –services “Aircrew medical”).

2. LEGIBILITY

International Civil Aviation Law and the CARs requires all air crew members and Air traffic controllers to carry a valid medical certificate which contains the class of medical, date of issue, licence number, state of issue and the doctors signature, all of which must be legibly entered.

3. DATE

The date that the assessment is completed and the medical certificate issued should be clearly determined and written. The GCAA format which will best serve the flight crew and cabin crew member and the aeromedical certification program is as follows (day, month, and year).

4. NUMBER

All the applicants are issued medical certificate as the UAE license number contained on page one of his license.

5. OFFICIAL STAMPS

Official GCAA Aeromedical Examiner stamps are being provided to all the GCAA approved AMEs after the designation. All the application received by the GCAA should have the official GCAA stamp for the AME who is doing the exams.

6. MEDICAL CERTIFICATES ISSUED BY THE AME

Once the AME has completed the assessment and has concluded that the applicant is FIT, he/she can issue the medical certificate. The validity of this Medical Certificate is in accordance to CAR part II, Chapter 1 para1.6.

7. FRAUDULENT ENTRIES/DECLARATIONS

Prior to undertaking aeromedical examination, AMEs should be satisfied that the applicant has appropriate identification and should inform the applicant about the possible legal consequences of a deliberate false statement made with the intention of obtaining a medical certificate. Thereafter the AME should complete the applicant statement and examiner certification form and record all relevant historical details obtained from the applicant.

A false declaration on a Medical Report shall be reported to the GCAA.

8. DOCUMENT SUBMISSION

All examination reports should be sent to the GCAA as soon as the examination is complete.

If the AME require more investigation/or specialist opinion for certification assessment, a process which may delay the issuance of medical certificate, the AME may keep the application pending with him/her till he gather all the required document and then forward the application to the GCAA, with justification for the delay in submission.

9. MEDICAL CONFIDENTIALITY OF THE APPLICANTS

1. The AME should personally conduct all the examination for all the medical assessment in a recognized facility/clinic, where confidentiality of the applicant's medical information is respected.
2. When an AME completes an aeromedical assessment, the Medical Report form must be forwarded to the GCAA along with the entire medical.
3. The AME should keep a record of all the GCAA medical done in his clinic for at least a period of 5 years, this medical record should be secured in a specific location, allowing access to authorized person only.

10. MEDICAL CERTIFICATION FOR COMPLICATED MEDICAL CASES

The range of variation between individuals is such that if medical standards are laid down in rigid terms they will inevitably exclude a number of applicants who, though not meeting the standard in all aspects might nevertheless be considered capable of performing duties safely in the aviation environment. Since the Chicago Convention lays on Contracting States the duty to promote efficient and safe aviation as well as to regulate it, provision has been made in Annex I for the exercise of a degree of flexibility in the application of medical standards, thus avoiding the hardship and injustice which might otherwise, occur. It is essential for the maintenance of flight safety that the manner in which flexibility is exercised should be reasonably uniform throughout the Contracting States if international acceptance of licenses is to be maintained.

10.1 The Exercise of Flexibility

The provision of a degree of flexibility must not lead to a situation where its use becomes the rule rather than the exception. Annex I, 1.2.4.8 has been worded to make it clear that flexibility may be exercised only in the exceptional case. Failure to observe this requirement could result in routine approval of individuals not meeting specific medical requirements, such as visual standards, thus creating an abuse of the primary object of flexibility.

When evidence accumulates that "flexibility is being utilized. repeatedly in a particular' respect, then the appropriateness of regulations defining the medical requirements comes into question and the suspicion is raised that the regulations define a requirement ,which is not in keeping with demands of flight safety. However, when decisions to exercise flexibility are backed by an accredited medical conclusion it indicates that these decisions have not been regarded as a routine measure but that they have been taken following close examination and assessment of all the medical facts and their relationship to personal performance. The degree and intensity of investigation lying behind each decision accurately measures compliance with the principles.

10.2 The Terms "Waiver" and "Flexibility"

Annex I, 1.2.4.8, is frequently referred to as the "waiver clause" and the term medical "waiver" in connection with licensing is generally accepted. The use of the term "waiver" is unfortunate because the expression "to waive" is defined as "not to insist upon", "to relinquish voluntarily", "to neglect or disregard". In fact the correct exercise of "flexibility" as described in 1.2.4.8 is quite the opposite of "waiver" because the decision to permit the clause to be used is only reached after subjecting the individual involved to a critical analysis,

possibly involving detailed personal examination together with deliberations by those who formulate the “accredited medical conclusion” and the decision of the Licensing Authority. In some cases, however, the Licensing Authority itself may well have the necessary expertise to make such a conclusion. What Annex 1, 1.2.4.8 sets out to achieve is not the dismissal of a deficiency or discrepancy, but establishment of the fact that allowing a particular individual to exercise the privileges of a license with or without the imposition of certain limitations on his activities will not be incompatible with the requirements of flight safety.

10.3 GCAA Procedures in Applying Flexibility

Aircrew personnel and applicants who do not meet Medical standards prescribed in CAR Part II may be considered for a waiver of standards. Medical certification with special Authorization may be granted on the need of the service, consistent with training, experience, performance, and proven safety of the aircrew personnel.

10.3.1 Pre-requisites Issuance of Medical Certification for Complicated Medical Cases

Medical certificates are based upon risk management and how it is applied to the following criteria:

- i. It cannot jeopardize the flight safety, i.e. risk of sudden incapacitation must not exceed 1 % annual incapacitation risk.
- ii. The disqualifying defect must not pose a risk of sudden incapacitation.
- iii. It must not pose any potential risk for subtle incapacitation that might not be detected by the individual but would affect alertness, special senses, or information processing.
- iv. It must not be subject to aggravation by flying duties.
- v. It must be resolved or stable at the time of the issue (i.e. non-progressive).
- vi. If the possibility of progression or recurrence exists, the first signs or symptoms must be easily detectable and cannot constitute an undue hazard to the individual or to others.
- vii. It cannot require uncommonly available tests, regular invasive procedures, non-routine medications or frequent absences to monitor stability or progression.
- viii. It cannot involve unconventional medical treatments that are outside of standard of care.

10.3.2 Process of the Issue

- i. when the applicant’s ability to meet the medical standards as prescribed in CAR Part II, Chapter 5, has not been clearly demonstrated (complicated cases) , or where there has been a change to the existing physical condition of the candidate, the AME should not issue a medical certificate immediately.
- ii. The AME may:
 - Deny the certification and Refer the case to the GCAA for decision along with the supporting documents, or
 - Recommend to convene Aeromedical Evaluation Medical Board Arrange for extended medical evaluation which may be consultation with specialist and any testing or investigation to prepare the Aeromedical summary (AME) for the applicant. This extended initial examination provides an expedient way to return a grounded aviator to flight status pending official GCAA endorsement and granting of a Medical certificate by Aeromedical Section.
- iii. The AME then will prepare the request to the GCAA Aeromedical section, with the following items:

- Complete E-Medical application form.
 - A detailed history, review of systems, and physical findings associated with the defect must be recorded on the physical exam.
 - All supporting documentation required by the appropriate Aeromedical section of the Licensing Department (i.e. laboratory, radiology, consultant reports...)
 - AME's recommendation
 - applicant's most recent flight Assessment check – if applicable
 - All information required for continuation of previous waivers/deviations – whenever applicable.
- iv. The Aeromedical Inspector will look into the case and will review the Aeromedical examiner summary and associated reports and approve the issue of medical certificates, or, will appoint Aeromedical Evaluation board and will notify the applicant of its intent to convene a medical evaluation board.

10.3.3 Procedure of Aeromedical Evaluation Board

- i. The board consists of members appointed by the Aeromedical Inspector. The board evaluates medical cases, which, due to their complexity or uniqueness, warrant a comprehensive aeromedical evaluation. A Special Board of AME should not be requested merely to challenge a physical standard or disqualification without evidence of special circumstances.
- ii. The Aeromedical Inspector will appoint three AME doctors to act as members of this board. The AME who have been dealing with the case and most involved will should be member of the board.
- iii. The GCAA will authorize the president to consult with other experts in the medical community to conduct a proper evaluation of the applicant's medical qualification.
- iv. The board members should meet and discuss the details of the case and the findings of the literature review with the objective of reaching an agreement on the conclusion and recommendations. It is the responsibility of the treating AME to present all the clinical details and relevant investigations to the board members.
- v. The pilot involved should attend the Board if deemed relevant.
- vi. The President of the board should compile a final report to the GCAA that:
 - Presents the details of the clinical problem and the board recommendations.
 - Outlines any investigations done.
 - Includes all reports from external specialists.
 - Concludes if the members of the board were in agreement with regards to recommendations regarding further investigations, treatment, continued licensing, restrictions in licensing and follow up by the supervising AME. If not in agreements the differences in opinion should be presented in the letter of recommendation. The report should be signed by the president of the board and copy of the president recommendation letter should be forwarded to the member of the board.
 - The report should be accompanied by the Aeromedical board conclusion form electronically which should be signed by all members.
- vii. The Aeromedical Inspector will usually make conclusions based on the Medical Board recommendation report received from the president. In case where there is a disagreement between the Medical board members, the GCAA will hold the final decision and The Aeromedical Inspector will recommend the issue of Medical certification.
- viii. In recommending the issue of medical certificate in this case , the Aeromedical Inspector specifies the class of medical certificate authorized to be issued and may do any or all of the following:

- Limit the validity of the Medical certificate
- Condition the granting of a renewal/revalidation of the medical certificate on the results of Subsequent medical tests, examinations, or evaluations
- State on the medical any operational limitation needed for safety;
- Condition the continued effect of this permission, and any medical class certificate based upon it, on compliance with a statement of functional limitations issued to the person in coordination with the GCAA Licensing Department.

10.3.4 Senior Aeromedical Board

i. General

Occasionally the Aeromedical Inspector will convene a senior board AMEs which will be held by GCAA Aeromedical Committee members. The board consists of a minimum of five members, three of whom must be GCAA committee member. The presiding officer shall be the GCAA Aeromedical Inspector. Sometimes the presence of flight operation personnel will be requested.

ii. Vision

Regulator and stakeholder playing together for aviation medicine leadership in the region to promote the safety decision making related to aviation medicine.

iii. Mission

To preserve the talented and expert people in the field and avoid compromising flight safety.

iv. Objective

The board members support the GCAA in Aeromedical disposition in complicated medical cases by providing detailed technical material and developing and promulgating appropriate, clear and concise aviation safety standards.

v. Role of the members

- Provide assistance for GCAA in final determination of aeromedical disposition on difficult licensing eligibility.
- Final decision in relation to aeromedical disposition.
- Identifying policy, regulatory and management issues that require resolution by GCAA.

vi. GCAA Subject Matter Experts/Board Members

Board members with the appropriate experience and expertise will be selected and appointed by the GCAA to participate in a regular meeting. Such selection and appointment will be based on their knowledge and competence in the relevant subject area, knowledge of applicable legislation, regulations and regulatory issues, ability to think strategically, being results orientated, having good communications skills and good teamwork and team building skills as well as the ability to manage a team of multi-disciplined GCAA and aviation community practitioners.

10.3.4.1 Procedure of Senior Aeromedical Evaluation Board

- i. The Aeromedical Section will establish the senior Aeromedical Board, this committee chaired by GCAA Head of Aeromedical section plus senior AMEs. Other AME may participate in the Committee on need. The chairman and the members must be free of external influence.
- ii. The board evaluates medical cases, which, due to their complexity or uniqueness, warrant a comprehensive aeromedical evaluation.
- iii. The GCAA Aeromedical Inspector is authorized as the president of the board.
- iv. The board members should meet and discuss the details of the case and the findings of the literature review with the objective of reaching an agreement on the conclusion and recommendations.
- v. Once a decision reached by the members the President of the board should compile a final report to Presents the details of the clinical problem and the board recommendations and Concludes if the members of the board were in agreement with regards to recommendations regarding continued licensing, restrictions in licensing and follow up requirements. Should be signed by the president of the board. The final decision on any case or issue will remain the privilege of GCAA.
- vi. Copy of the president recommendation letter should be forwarded to the member of the board.
- vii. Once the GCAA reaches the final decision either to issue or deny the medical certification, a notification letter will be send to the applicant , and conclusion report will be send to the concern AME and the president of the board and the Applicant must receive written notification letter.

10.3.5 Follow up Action

- i. All applicants should follow the GCAA requirement and/or recommendation for the medical certificate to be valid. The applicant must refer to GCAA endorsement letter to determine how frequently the required information must be submitted. The continuation request must include the applicant's periodic medical exam, and all required additional information as specified by GCAA letter and/or the pertinent section of the Licensing Department.
- ii. A person who has been granted a medical certificate based on a special medical flight or practical test need not take the test again during later physical examinations unless the GCAA Aeromedical Inspector determines or has reason to believe that the physical deficiency has or may have degraded to a degree to require another special medical flight test or practical test.
- iii. **Non Compliance**-Any reported case of non-compliance reported by the AME and/or Operator personnel must be reported to the aeromedical section for action.

10.3.6 Withdrawal of Medical Certificate Issued Under Flexibility Clause

The medial certificate granted to a person who does not meet the applicable provisions of CAR, Part II, Chapter 5 may be withdrawn at any time if:

- i. There is adverse change in the holder's medical condition;
- ii. The holder fails to comply with a statement of functional limitations or operational limitations issued as a condition of certification;
- iii. Public safety would be endangered by the holder's exercise of his license privileges;
- iv. The holder fails to provide medical information reasonably needed by the GCAA for certification.

10.3.6.1 Procedure of Withdrawal

If an Authorization is withdrawn under paragraph above the following procedures apply:

- i. The holder of the Authorization will be served a letter of withdrawal, stating the reason for the action;
- ii. By not later than 60 days after the service of the letter of withdrawal, the applicant may request in writing to the GCAA for review of the decision to withdraw. The request for review may be accompanied by supporting medical evidence
- iii. Within 60 days of receipt of a request for review, a written final decision either affirming or reversing the decision to withdraw will be issued; and a medical certificate rendered invalid pursuant to a withdrawal.

10.3.7 Renewal/Revalidation of Medical Certification Issued Under Flexibility Clause

The Applicant must show to the satisfaction of the AME that the duties authorized by the class of medical certificate applied for can be performed without endangering public safety in order to obtain a new medical certificate under CAR Part II, Chapter 5. An Examiner's decision or determination is subject to review by the GCAA Licensing section. Only SAME is permitted to re-issue a medical certificate issued under flexibility clause.

10.3.8 Reciprocal Recognition of Foreign Waiver

The GCAA may accept, on an individual basis, valid aeromedical waivers issued by regulatory authorities. The applicant must have a copy of the waiver issued by the ICAO Contracting State and it must be attested.

11. MEDICAL FITNESS

11.1 General

The holder of a medical certificate shall be mentally and physically fit to exercise safely the privileges of the applicable license. In order to apply for or to exercise the privileges of a license, the applicant or the holder shall hold a medical certificate issued in accordance with the provisions of CAR Part II (Medical) and appropriate to the privileges of the license.

Note: Fees for assessment and/or provision of reports are the license holder's responsibility.

11.2 Temporary Incapacity of Certificate Holder

11.2.1 Class I, II and III:

- (a) Holders of medical certificates shall not exercise the privileges of their licenses, related ratings or authorizations at any time when they are aware of any decrease in their medical fitness which might render them unable to safely exercise those privileges.
- (b) Holders of medical certificates shall not take any prescription or non-prescription medication or drugs, or undergo any other treatment, unless they are completely sure that the medication, drug or treatment will not have any adverse effect on their ability to perform safely their duties. If there is any doubt, advice shall be sought from the AMS, or an AME.
- (c) Holders of medical certificates shall, without undue delay, seek the advice of the AMS, or an AME when becoming aware of:
 - Hospital or clinic admission for more than 12 hours; or
 - Surgical operation or invasive procedure; or

- The regular use of medication or
- The need for regular use of correcting lenses.

(d) Holders of medical certificates who are aware of:

- Any significant personal injury involving incapacity to function as a member of a flight crew
- Any illness involving incapacity to function as a member of a flight crew throughout a period of 20 days or more; or a period of less than 20 days when the illness involving incapacity to function and interfere with the flight safety
- Being pregnant, shall inform the GCAA in writing of such injury or pregnancy, and as soon as the period of 21 days has elapsed in the case of illness. The medical certificate shall be deemed to be suspended upon the occurrence of such injury or the elapse of such period of illness or the confirmation of the pregnancy, and

11.2.2 Cabin Crew Class

- (a) Holders of medical certificates shall not exercise the privileges of their licenses, related ratings or authorizations at any time when they are aware of any decrease in their medical fitness which might render them unable to safely exercise those privileges.
- (b) Holders of medical certificates shall not take any prescription or non-prescription medication or drugs, or undergo any other treatment, unless they are completely sure that the medication, drug or treatment will not have any adverse effect on their ability to perform safely their duties. If there is any doubt, advice shall be sought from the AME.
- (c) Holders of medical certificates shall, without undue delay, seek the advice of the AME when becoming aware of:

- Hospital or clinic admission for more than 12 hours; or
- Surgical operation or invasive procedure; or
- The regular use of medication; or
- The need for regular use of correcting lenses.

(d) Holders of medical certificates who are aware of:

- Any significant personal injury involving incapacity to function as a member of a flight crew; or any illness involving incapacity to function as a member of a flight crew throughout a period of 20 days and more, or even less shall inform the AME of such injury or illness without delay, so the license will automatically be suspended, but depending on the illness or injury the AME may not inform the GCAA about the case if after 20 days the crew can resume flying duties safely. Exception to this case are cases of psychiatry or any medical condition, the AME aware that the applicant needs to use medications for prolonged period or the medical condition may impair/or affect the flying duties.
- In cases when the crew is unfit to fly after 20 days and permanent suspension is recommended by the AME, the GCAA shall be informed to take the final decision.
- If the cabin crew becomes pregnant, GCAA shall be informed in writing. The medical certificate shall be deemed to be suspended upon the confirmation of the pregnancy.

Note: License holders who fail to report the above mentioned conditions may be subjected to heavy penalties so the AME should take every opportunity to emphasize these legal requirements to them.

11.3 Reinstatement Process of Applicant License After Inter-Current Illness, Injury or Pregnancy:

- i. As soon as it is ascertained by the AME that the applicant is medically fit to discharge his duties safely (a process which may need expert advice, series of medical investigations etc.), he should immediately inform the GCAA using the GCAA E-Medical service for reinstatement and send all the supporting documents.
- ii. The Aeromedical section will process the re-instatement request received from the AME within 10 working days, provided all the medical reports submitted are acceptable.
- iii. GCAA AMS will determine the re-instatement decision and any further investigation required. In such cases, the crew/ATC medicals will be kept pending until it is resolved.

11.3.1 Reinstatement Process of Applicant License After Confirmation of Pregnancy

- i. The suspension of the license may be lifted by the GCAA after the first trimester, when the obstetrician - who is aware of all aviation activities-, certifies that an applicant has no significant medical contraindications related to pregnancy, and the AME confirms her as meeting the standards. The reinstatement of the license depends on the duties of the license holders and also on the aircraft type, the type of the operation and nature of cockpit duties. The exercise of the license privileges in such circumstances may involve imposition of operational limitation. The risk of acute incapacitation from premature labour exceeds 1% after 26 weeks gestation, consequently all medical certificates holders are advised not to exercise license privileges after 26 weeks gestation.
- ii. Class I and II and cabin crew medical certificate holders are formally deemed medically unfit to exercise license privileges from 26 weeks gestations until cleared by post-partum assessment by obstetrician.
- iii. Class III medical certificate holders may exercise relevant license privileges until 34 weeks gestation provided that:
 - The Obstetrician supervising the pregnancy certifies that the license holder is fit for duties during this period and
 - Suitable administrative arrangements are made which ensure that sudden incapacitation of an affected license holder due to premature labour will not adversely affect the safety of air navigation.
- iv. Thereafter, Class III medical certificate holders are formally deemed medically unfit to exercise license privileges until cleared by post-partum assessment by the obstetrician.
- v. Following delivery, applicants are required to obtain a clearance from the AME before return to their duties. Depending on the stage of a pregnancy at which the event occurs, such clearance may be required following a miscarriage, still birth or termination of the pregnancy. Following a normal delivery, clearance to resume duties should be appropriate at six weeks post-partum.

11.4 Decrease in Medical Fitness for LSA Pilots and Reinstatement Process

The key functional abilities for flying are for good vision and hearing together with the strength and coordination similar to that needed to drive a car. Medical incapacitation (particularly if unheralded) can pose more of a risk in the air as the pilot cannot 'pull-over' to deal with an acute medical issue. In the air, pilots are also potentially subjected to noise and g-forces, and hypoxia and cold with increasing altitude.

1. Licence holders shall not exercise the privileges of their licence and related ratings or certificates at any time:
 - a) when aware of any decrease in their medical fitness which might render them unable to safely exercise those privileges)
 - b) when taking any prescribed or non-prescribed medication which is likely to interfere with the safe exercise of the privileges of the applicable licence)
 - c) when receiving any medical, surgical or other treatment likely to interfere with flight safety.
2. Licence holders shall, without undue delay, seek fitness advice from the Aeromedical Examiner (AME) who issued their medical certificate when they:
 - a) have undergone a surgical procedure or invasive procedure
 - b) have commenced the regular use of any medication
 - c) have suffered any significant personal injury or illness involving incapacity to function as a pilot for at least 21 days
 - d) are, or have reason to believe, they are pregnant
 - e) have been admitted to a hospital or medical clinic
 - f) first require corrective lenses
3. After illness or injury, the AME may only advise of fitness if a complete recovery has been made with no residual disability, no untoward effects of medication, and no increased incapacitation risk. Cases of doubt should be referred for examination/assessment by a SAME. Medical reports from treating doctors may be required. Medical Flight Tests may be required.
4. The GCAA LSA medical standards can be accessed on the GCAA website. Special consideration should be made of pilots with multiple conditions. The following conditions will normally require assessment by or referral to a SAME:
 - Reduced visual acuity in either eye below 6/9 despite any correction
 - Visual field defect
 - Sedative medication
 - Physical disability
 - Need for hearing aid(s)
 - Diabetes requiring medication
 - Malignant disease
 - Angina/coronary disease
 - Implanted cardiac device
 - Heart failure
 - Cardiac valve replacement
 - Chronic lung disease
 - Pneumothorax
 - Recurrent fainting
 - Organ Transplant
 - Epilepsy
 - Cerebral disorders
 - Alcohol/substance misuse
 - Personality disorders

- Use of antidepressant medication
 - Psychotic disorder
 - Learning difficulties
 - Major surgery
 - Endocrine disorder
 - Sleep disorder
5. AMEs can apply a limitation to wear glasses or maintain existing limitations. The application of other limitations requires referral to a SAME.
 6. Applicants who have one or more limitations applied, or who are assessed as unfit, have a right of appeal to the GCAA.

Note: Fitness Assessment on Applicants for LSA certificate who don't meet GCAA standards will be done on individual basis.

11.5 Limitations to Class 1, Class 2 and LSA Medical Certificates

- (a) AME or SAME may refer the decision on fitness of the applicant to the Aeromedical section in borderline cases or where fitness is in doubt.
- (b) In cases where a fit assessment can only be considered with a limitation, the SAME, AME or the AMS should evaluate the medical condition of the applicant in consultation with flight operations and other experts, if necessary.
- (c) Limitation codes:

	Code	Limitation
1	TML	restriction of the period of validity of the medical certificate
2	VDL	correction for defective distant vision
3	VML	correction for defective distant, intermediate and near vision
4	VNL	correction for defective near vision
5	CCL	correction by means of contact lenses only
6	VCL	valid by day only
7	HAL	valid only when hearing aids are worn
8	APL	valid only with approved prosthesis
9	OCL	valid only as co-pilot
10	OPL	valid only without passengers (PPL and LSA only)
11	SSL	special restriction as specified
12	OAL	restricted to demonstrated aircraft type
13	AHL	valid only with approved hand controls
14	SIC	specific regular medical examination(s) - contact AMS
15	R XO	specialist ophthalmological examinations
16	OML	valid only as or with qualified co-pilot

Limitation Codes

TML Time Limitation

The period of validity of the medical certificate is limited to the duration as shown on the medical certificate.

This period of validity commences on the date of the medical examination. Any period of validity remaining on the previous medical certificate is no longer valid. The pilot should present him/herself for re-examination when advised and should follow any medical recommendations.

VDL Wear Corrective Lenses and Carry a Spare Set of Spectacles

Correction for defective distant vision: whilst exercising the privileges of the licence, the pilot should wear spectacles or contact lenses that correct for defective distant vision as examined and approved by the AME. Contact lenses may not be worn until cleared to do so by the AME. If contact lenses are worn, a spare set of spectacles, approved by the AME, should be carried.

VML Wear Multifocal Spectacles and Carry a Spare Set of Spectacles

Correction for defective distant, intermediate and near vision: whilst exercising the privileges of the licence, the pilot should wear spectacles that correct for defective distant, intermediate and near vision as examined and approved by the AME. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn.

VNL Have Available Corrective Spectacles and Carry a Spare Set of Spectacles

Correction for defective near vision: whilst exercising the privileges of the licence, the pilot should have readily available spectacles that correct for defective near vision as examined and approved by the AME. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn.

VCL Valid by Day Only

The limitation allows private pilots with varying degrees of colour deficiency to exercise the privileges of their licence by daytime only. Applicable to class 2 medical certificates only.

OML Valid Only as or with Qualified Co-Pilot

This applies to crew members who do not meet the medical requirements for single crew operations, but are fit for multi-crew operations. Applicable to class 1 medical certificates only.

OCL Valid Only as Co-Pilot

This limitation is a further extension of the OML limitation and is applied when, for some well-defined medical reason, the pilot is assessed as safe to operate in a co-pilot role but not in command. Applicable to class 1 medical certificates only.

OPL Valid Only Without Passengers

This limitation may be considered when a pilot with a musculoskeletal problem, or some other medical condition, may involve an increased element of risk to flight safety which might be acceptable to the pilot but which is not acceptable for the carriage of passengers. Applicable to class 2 and LSA medical certificates only.

OSL Valid Only with Safety Pilot and in Aircraft with Dual Controls

The safety pilot is qualified as PIC on the class/type of aircraft and rated for the flight conditions. He/she

occupies a control seat, is aware of the type(s) of possible incapacity that the pilot whose medical certificate has been issued with this limitation may suffer and is prepared to take over the aircraft controls during flight. Applicable to class 2 and LSA medical certificates only.

OAL Restricted to Demonstrated Aircraft Type

This limitation may apply to a pilot who has a limb deficiency or some other anatomical problem which had been shown by a medical flight test or flight simulator testing to be acceptable but to require a restriction to a specific type of aircraft.

SIC Specific Regular Medical Examination(S) Contact Licensing Authority

This limitation requires the AME to contact the licensing authority before embarking upon renewal or recertification medical assessment. It is likely to concern a medical history of which the AME should be aware prior to undertaking the assessment.

RXO Specialist Ophthalmological Examinations

Specialist ophthalmological examinations are required for a significant reason. The limitation may be applied by an AME but should only be removed by the AMS.

(a) Entry of limitations

- (1) Limitations 1 to 4 may be imposed by a SAME or AME.
- (2) Limitations 5 to 15 should only be imposed:
 - (i) For class 1 medical certificates by the SAME;
 - (ii) For class 2 medical certificates by the AME or SAME in consultation with the licensing authority;
 - (iii) For LSA medical certificates by an SAME or AME

(b) Removal of limitations

- (1) For class 1 medical certificates, all limitations should only be removed by the AMS.
- (2) For class 2 medical certificates, limitations may be removed by the AMS or by an SAME or AME in consultation with the AMS.
- (3) For LSA medical certificates, limitations may be removed by an SAME or AME.

Note: Any other limitation may be imposed on the holder of a medical certificate if required to ensure flight safety.

12. OVER 60 MEDICAL ASSESSMENTS

12.1 General

The GCAA permits pilots, flying on commercial transport operations, to operate over the age of 60 years, up to the age of 65, without the issuance of waiver, but with the following recommendation:

- (a) As a member of a multi-pilot crew and provided that,

- (b) Such holder is the only pilot in the flight crew who has attained age 60.
- (c) And passes all the extra medical requirements for over 60 applicants.

12.2 Candidates Turning 60 Years of Age

Medical certificate holders who at the time of their current medical exam are less than 60 but are going to be 60 years of age before the next medical, the date of their next medical will be calculated as follows:

Example:

If a Class I ATPL holder has a renewal aeromedical examination conducted on the 14 August 2006 with a Date of Birth as 05 Nov 1946, the candidate is still not 60 so he does not require to undergo the next medical within the next 6 months, however he will turn 60 on the 05 Nov 2006 and thus the validity of the medical certificate will be reduced from 12 to 06 months.

In other words from the date of 05 Nov 2006 the candidate would require to have a medical within 6 months, this would render the date of expiry of the present medical as 05 May 2007.

12.3 Assessment Requirements

12.3.1 Initial Issuance of over 60 Medical Certificate Requirements

In addition to the usual medical assessment required by the class of medical over 40 years, the first medical assessment at age of 60 years shall include:

- i. A psychological evaluation, which may be conducted by either the SAME or consultant psychologist
- ii. Alcohol screening test (Laboratory tests).
- iii. An extended eye examination by an ophthalmologist
- iv. Screening for Diabetes medicine
- v. Lipid profile.
- vi. Cardiac evaluation by stress ECG.
- vii. Haemoglobin

12.3.2 Renewal Requirements

The pilot will undergo, in addition to the usual medical assessment requirements;

(a) Every 6 months;

- 1. An ECG.
- 2. Diabetic screening
- 3. Lipid profile
- 4. Haemoglobin

(b) Every 12 months;

- 1. Ophthalmology consultation.
- 2. Audiogram
- 3. Stress ECG

Note 1: unless otherwise indicated, the stress ECG should be repeated annually.

Note 2: only SAME is permitted to do over 60 medical assessments.

Note 3: No age limit has been determined for the private pilots and Flight Engineers by the regulation, but the medical assessment is the same over 60 year medical requirements.

13. USE OF MEDICATION, PSYCHOACTIVE DRUGS OR OTHER TREATMENTS

13.2 The use of Medication (prescribed or non-prescribed)

- i. Accidents and incidents have occurred as a result of pilots flying while medically unfit and the majority has been associated with what have been considered relatively trivial ailments. Although the symptoms of colds, sore throats, diarrhea and other abdominal upsets may cause little or no problem whilst on the ground they become dangerous in the flying environment by distracting the pilot and degrading performance in the various flying tasks. The in-flight environment may also increase the severity of symptoms which may be minor while on the ground. The effects may be compounded by the side effects of the medication prescribed or bought over the counter for the treatment of such ailments. The following are some widely used medicines which are normally considered incompatible with flying.
- ii. Antibiotics such as the various Penicillin, Tetracycline and others may have short term or delayed side effects which can affect pilot performance. More significantly, however, their use usually indicates that an infection is present and thus the effects of this infection will normally mean that a pilot is not fit to fly.
- iii. Tranquillisers, anti-depressants and sedatives. Inability to react due to the use of this group of medicines has been a contributory cause to fatal aircraft accidents. Again, as with antibiotics, the underlying condition for which these medications have been prescribed will almost certainly mean that a pilot's mental state is not compatible with the flying task.
- iv. Stimulants such as caffeine, amphetamines etc. (often known as "pep" pills) used to maintain wakefulness or suppress appetite are often habit forming. Susceptibility to different stimulants varies from one individual to another, and all may cause dangerous over confidence. Over dosage causes headaches, dizziness and mental disturbance. The use of "pep" pills while flying is not permitted.
- v. Anti-histamines can cause drowsiness. They are widely used in "cold cures" and in treatment of hay fever, asthma and allergic rashes. They may be in tablet form or a constituent of nose drops or sprays. In many cases the condition itself may preclude flying, so that, if treatment is necessary, advice from the AMS, or an AME should be sought so that modern drugs, which do not degrade human performance, can be prescribed.
- vi. Certain drugs used to treat high blood pressure can cause a change in the normal cardiovascular reflexes and impair intellectual performance, both of which can seriously affect flight safety. If the level of blood pressure is such that drug therapy is required the pilot must be temporarily grounded and monitored for any side effects. Any treatment instituted should be discussed with the AMS, or an AME and a simulator assessment or line check may be appropriate before return to flying.
- vii. Following local, general, dental and other anesthetics, a period of time should elapse before return to flying. The period will vary considerably from individual to individual, but a pilot should not fly for at least 12 hours after a local anesthetic and for 48 hours after a general or spinal anesthetic.
- viii. The more potent analgesics may produce a significant decrement in human performance. If such potent analgesics are required, the pain for which they are taken generally indicates a condition

which precludes flying.

- ix. Many preparations are now marketed containing a combination of medicines. It is essential therefore that if there is any new medication or dosage, however slight, the effect should be observed by the pilot on the ground prior to flying. Although the above are the commonest medicines which adversely affect pilot performance, it should be noted that many other forms of medication, although not normally affecting pilot performance, may do so in individuals who are “oversensitive” to a particular preparation. Individuals are therefore advised not to take any medicines before or during flight unless they are completely familiar with their effects on their own bodies. In cases of doubt, pilots should consult an AME, or the AMS.

13.3 Other Treatments

Alternative or complementary medicine, such as acupuncture, homeopathy, hypnotherapy and several other disciplines, is developing and gaining greater credibility. Some such treatments are more acceptable in some States than others. There is a need to ensure that “other treatments”, as well as the underlying condition, are declared and considered by the GCAA, or an AME when assessing fitness.

13.4 Alcohol

- i. Alcohol is a contributory factor in a number of aircraft accidents every year. It is now well established that even small amounts of alcohol in the blood produce a significant and measurable deterioration in the performance of skilled tasks. Research has shown that blood alcohol concentrations of 0.4 Promille are associated with a highly significant increase in errors committed by both experienced and in-experienced pilots even in simple aircraft. This level may be produced after consuming two units of alcohol, e.g. 5cl of whiskey or 0.5L of beer.
- ii. The number of units in an alcoholic drink is given by the volume of the drink in centilitres (cl) multiplied by the strength in % weight/volume (%w/v).

Examples: 50 cl (0.5L) of beer of 5%w/v contains 2.5 units. (5% of 50 = 2.5) 2.5 cl of whiskey of 40%w/v contains 1 unit. (40% of 2.5 = 1)

75 cl (1 bottle) of wine of 12%w/v contains 9 units. (12% of 75 = 9)

- iii. Alcohol is removed from the body at a relatively constant rate (0.15 promille each hour - 0.015%-) regardless of the concentration present. Pilots should not fly for at least 12 hours after taking small amounts of alcohol and proportionally longer if larger amounts are consumed. It should also be remembered that alcohol can have delayed effects on the blood sugar and the inner ear. The effects on the inner ear can be prolonged and increase susceptibility to disorientation and even motion sickness. It is prudent for a pilot to abstain from alcohol at least 24 hours before flying.
- iv. It must be remembered that alcohol's effects can be enhanced or prolonged significantly if it is taken by an individual who is suffering from an illness or who is taking medication.
- v. The GCAA considered a blood alcohol level of 0.2 promille (0.02%) as the upper limit for aircrew on duty as well as an 12 hour abstention period prior to specified reporting time for flight duty.

13.5 Psychotropic Drugs and Substance Abuse

The use of such drugs or substances has a basic effect of detaching the person from reality as well as more complex short and long term effects. These effects are not compatible with the control of an aircraft and individuals using such drugs or substances are not fit to be members of flight crew/or controlling duties.

PART IV - MEDICAL ASSESSMENTS

SUBPART A - CARDIOVASCULAR

1. HYPERTENSION

Hypertension has been described as the most powerful and prevalent of all the coronary vascular risk factors and its impact on health and aeromedical assessment of professional flight crew is profound.

1.1. Definition

Hypertension is defined by the American Heart Association as listed in the table below.

Category	Systolic (mm Hg)	Diastolic (mm Hg)
Normal	<130	<85
High Normal	130-139	85-89
Hypertension		
Stage 1 (mild)	140-159	90-99
Stage 2 (moderate)	160-179	100-109
Stage 3 (severe)	180-209	110-119
Stage 4 (very severe)	>210	>120

1.2. Evaluation of Applicant with Hypertension

Once a Medical Certificate holder is diagnosed as a case of high blood pressure on at-least 3 different occasions minimum 30 minutes apart, or on 24 hour ambulatory BP monitoring he/she should be temporarily unfit or medical certificate issue should be delayed until a note made of absence of any adverse effects of medication.

Note 1: Previously high readings which are then normal on three day follow up /or 24 hour BP monitoring does not relieve the examining AME from re-evaluation if the blood pressure is high during subsequent physical exams.

Note 2: The diagnosis of white coat hypertension" is not acceptable without such evaluation.

1.3. Evaluation Required for Recertification

1. Documentation of good blood pressure control
2. Documentation of an absence of end organ damage
3. initial evaluation should include:
 - i. Fasting Lipid levels- cholesterol, LDL, HDL, Total cholesterol/ HDL ratio, Triglycerides
 - ii. Diabetic screening
 - iii. Urea and electrolytes

- iv. ECG
- v. Echocardiography is of value in determining an increase in the left ventricular muscle mass, which is predictive of outcome independent of the level of hypertension.
- vi. Extended eye examination by Ophthalmologist
- vii. Ambulatory blood pressure monitoring should always be employed in cases of doubt (or for diagnosis of borderline hypertension or suspected white coat hypertension)
- viii. Exclusion of secondary causes including an assessment of the risk of obstructive sleep apnea
- ix. Any pathology detected will require specialist evaluation.

1.4. Subsequent Review Every One Year

- i. Fasting Lipid levels- cholesterol, LDL, HDL, Total cholesterol/ HDL ratio, Triglycerides
- ii. Fasting blood sugar
- iii. Urea and electrolytes
- iv. ECG
- v. documentation of good blood pressure control
- vi. Documentation of an absence of end organ damage

1.5. Aeromedical Consideration

- The diagnosis of uncontrolled hypertension is disqualifying and waiver will not be recommended.
- Unrestricted medical certificate is possible if Adequate control of blood pressure is achieved (BP< 140/90), and there is no evidence of end-organ damage, and there is no significant medication side effects and absence of other cardiovascular risk factors.
- Restricted medical certificate to multi-pilot operations (Class I 'OML') may be required if there is evidence of end-organ damage, and/or there is significant medication side effects and/or presence of other cardiovascular risk factors.

1.6. Acceptable treatments

Most modern antihypertensive agents are acceptable for control of hypertension in all license holders, provided the applicant is established on medication and has exhibited no adverse side effects from the drugs. The angiotensin converting enzyme (ACE) inhibitors (such as Enalapril, Lisinopril, Ramipril, perindopril), angiotensin receptor blockers (ARB) (e.g. losartan, valsartan, candesartan), which block the angiotensin II receptor and have a very low side effect profile and the slow channel calcium-blockers (CCB) (such as amlodipine, Nicardipine) are the products of choice, for use by flight crew subject to careful supervision.

The applicant must not pilot any aircraft or actively control air traffic following the commencement of antihypertensive therapy or of a changed treatment regimen until such time as there are no significant side effects from medication, i.e. within two weeks of the commencement of therapy or change in medication.

2. ISCHEMIC HEART DISEASE

2.1 Angina Pectoris or Other Evidence of Ischaemic Heart Disease

The AME should inform the GCAA of the diagnosis and advise the applicant not to exercise the privileges of his license until cleared to do so by the GCAA.

2.1.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist assessment preferably one with experience of aviation medicine.
- iii. Stress nucleotide scan /or stress echocardiogram, demonstrating a left ventricular ejection fraction $\geq 50\%$ without significant abnormality of wall motion or evidence of reversible ischaemia.
- iv. A symptom–limited exercise ECG to Bruce stage 4, showing no evidence of myocardial ischemia.
- v. A 24-hour ambulatory ECG demonstrates no significant rhythm or conductive disturbance.

Note 1: If the above investigations are abnormal either all or one significant abnormal test result, the cardiologist should use all necessary measures to treat the individual before recommending his fitness.

Note 2: If the investigations are satisfactory, the applicant may be certificated.

Note 3: If the stress ECG, stress Echo or Thallium scan is positive but subsequent angiogram is reported as satisfactory, the applicant may be certificated without restriction for six months.

2.1.2 Subsequent Review Every Six Months:

- i. Routine aviation medical examination by an AME for appropriate intervention against vascular risk factors (high cholesterol, smoking cessation,, and hypertension)
- ii. Annual Cardiologist's assessment for exercise ECG
- iii. Angiography is no longer routinely required after 5 years, but may be required if the applicant becomes symptomatic or has other evidence suggesting ischemic heart disease.

2.2 Myocardial Infraction

Following the infarction, the AME should inform the GCAA of the diagnosis and the applicant should not exercise the privileges of his license until cleared to do so by the GCAA. This will not be considered until at least six months after the last event for all the classes of the medicals.

2.2.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist assessment.
- iii. Stress nucleotide scan /or stress echocardiogram demonstrating a left ventricular ejection fraction $>50\%$ without significant abnormality of wall motion or evidence of reversible ischaemia.
- iv. A symptom – limited exercise ECG to Bruce stage 4, showing no evidence of myocardial ischemia.
- v. 24-hour ambulatory ECG demonstrates no significant rhythm or conductive disturbance.
- vi. Coronary Angiogram from the time of the event. Coronary angiogram obtained around the time of or during the ischaemic event demonstrating no stenosis in any vessel remote from the myocardial infarction $> 30\%$ and no demonstrable functional impairment of the myocardium subtended by any such vessel.

Notes: If the above investigations are satisfactory, the applicant may be certificated for six months with multi-pilot (Class I 'OML') limitation,, and for 12 months with a safety pilot (Class II 'OSL') limitation .Cabin crew class may be returned to flying duties. Class III will be assessed individually.

2.2.2 Subsequent Review Every Six Months:

- i. Routine aviation medical examination by an AME for appropriate intervention against vascular risk factors (high cholesterol, smoking cessation, and hypertension)
- ii. Annual Cardiologist's assessment and follow-up with exercise ECG.

Note: At any time should symptoms, signs or non-invasive tests suggest myocardial ischaemia then a further angiogram or ECG gated Cardiac MRI is required.

2.3 Coronary Artery Bypasses Grafting (CABG) and/or Percutaneous Transluminal Coronary Angioplasty (PTCA)

The AME should inform the GCAA of the diagnosis and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until six months after the surgery.

2.3.1 Investigation Required for Recertification is:

- i. Routine aviation medical examination
- ii. Cardiologist assessment.
- iii. Stress nucleotide scan or stress echocardiogram, demonstrating a left ventricular ejection fraction $\geq 50\%$ without significant abnormality of wall motion or evidence of reversible ischemia.
- iv. A symptom – limited exercise ECG to Bruce stage 4, showing no evidence of myocardial ischemia.
- v. 24-hour ambulatory ECG demonstrating no significant rhythm or conductive disturbance
- vi. Coronary Angiogram from the time of the event .Coronary angiogram obtained around the time of or during the ischemic event demonstrating no stenosis in any vessel remote from the myocardial infarction $> 30\%$ and no demonstrable functional impairment of the myocardium subtended by any such vessel.

If the above investigations are satisfactory, the applicant may be certificated for six months with multi-pilot (Class I 'OML') limitation or, and for 12 months with a safety pilot (Class II 'OSL') limitation. Cabin crew class may be returned to flying duties. Class III medical will be assessed individually.

2.3.2 Subsequent Review Every Six Months:

- i. Routine aviation medical examination by an AME
- ii. Cardiologist's assessment and follow-up with exercise ECG, and appropriate intervention against vascular risk factors (high cholesterol, smoking cessation, and hypertension).

Note: A further angiogram or ECG gated cardiac MRI scan is required five years following the event.

3. VALVULAR HEART DISEASE

3.1 Aortic Valve Disease

3.1.2 Bicuspid Aortic Valve

This is a common congenital abnormality and may be associated with disease of the aortic root.

Risks:

Progression to aortic stenosis or aortic regurgitation or rarely endocarditis and thus will need regular cardiology reviews depending on risk and assessment.

3.1.2.1 Recertification After Diagnosis

- i. Provided no other abnormality (2D Doppler flow rate < [2,0]] m/sec) is present a fit assessment without limitation may be considered for all the classes of medicals.
- ii. If the aortic root is > 4.0cm , a multi-pilot (Class I 'OML') limitations required, for class II require a safety pilot (Class II 'OSL') limitation, for class III and cabin crew classes no limitation is required. Annual review by a cardiologist is required for all the classes of medical.
- iii. An aortic root diameter >4.5 cm is disqualifying for all classes.

3.1.3 Aortic Stenosis

On diagnosis of the condition, the AME should inform the GCAA and advise applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will be considered once investigations have been completed and results assessed as satisfactory to the GCAA.

3.1.3.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment (ECG/Doppler echocardiogram/other investigations as necessary).

3.1.3.2 Aeromedical Disposition

- i. A fit assessment requires an intact left ventricular function and depends mainly on the mean pressure gradient, but other factors such as left ventricular hypertrophy, reduced left ventricular diastolic function, reduced left ventricular ejection fraction, aortic valve calcification, reduced valve area and aortic regurgitation will need to be considered. Applicants with a minor aortic stenosis (mean pressure gradient of up to 20 mm Hg) may be assessed as fit without restriction.
- ii. Applicants with a mild aortic stenosis (mean pressure gradient above 20 and of up to 40 mm Hg) may be assessed as with a multi-pilot (Class I 'OML') limitation and unrestricted class II, III and cabin crew class.
- iii. Applicants with a more severe aortic stenosis (mean pressure gradient of up to 50 mm Hg) may be assessed as with a multi-pilot (Class I 'OML') limitation and (class II OSL) limitation, cabin crew class without restriction. Class III will be assessed individually.
- iv. Applicant with mean pressure gradient above 50 mm Hg cannot be certified for class I, but class II can be certified with OSL limitation.
- v. No significant left ventricular hypertrophy (free wall and septal thickness > 1,1 cm) nor dilatation, (left ventricular diastolic diameter > 5,6 cm in dominant stenosis, > 6,0 cm in dominant regurgitation) should be present for recertification.
- vi. A history of transient ischaemic attack (TIA) is disqualifying from all classes of medical certification.

3.1.3.3 Subsequent Reviews

At annual intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review

- iii. ECG
- iv. Doppler echocardiogram

3.1.4 Aortic Regurgitation

Aortic regurgitation is well tolerated and even moderate regurgitation may be present for very many years. On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

3.1.4.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. ECG
- iv. Doppler echocardiogram
- v. Stress ECG
- vi. Minor regurgitation in the absence of aortic root disease may be compatible with fit assessment for all the classes.
- vii. Co-existent dilatation of the aortic root >4.5 cm is disqualifying.
- viii. Evidence of volume overloading of the left ventricle (left ventricular end diastolic dilatation > 6,0 cm) is disqualifies although minor increase in the left ventricular end diastolic diameter may be acceptable with Class I 'OML' and a Class II 'OSL'. Class III will be assessed individually.

3.1.3.2 Subsequent Reviews at Annual Intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review
- iii. ECG
- iv. Doppler echocardiogram

3.1.5 Aortic Valve Replacement

Following the surgery, the AME should inform the GCAA of the diagnosis and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until six months after the surgery for class I, II, III and cabin crew medicals. Only tissue valve in the aortic position are acceptable for certification.

3.1.5.1 Investigation Required for Recertification is:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Echocardiogram demonstrating a normal functioning replaced valve. Left ventricular size and function should show appropriate improvement compared with preoperative measurements.
- iv. A symptom –limited exercise ECG to Bruce stage 4, Requirement are at least 9 minutes and no significant ECG or blood pressure changes.
- v. If the above investigations are satisfactory, the applicant may be certificated for six months with multi-pilot (Class I 'OML') limitation, for 12 months with a safety pilot (Class II 'OSL') limitation. Cabin crew class may be returned to flying duties. Class III will be assessed individually.

3.1.5.2 Subsequent Review Every Six Months:

- i. Routine aviation medical examination by an AME
- ii. ECG
- iii. Subsequent review every 12 months:
- iv. Routine aviation medical examination by an AME
- v. Cardiologist's assessment and follow-up with Echocardiogram and exercise ECG.

3.2 Mitral Valve Disease

3.2.2 Mitral Valve Prolapse and Regurgitation

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until investigations have been completed and results assessed as satisfactory to the GCAA.

3.2.2.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. 24 hour ECGs
- iv. Doppler echocardiogram
- v. In addition, trans-oesophageal echocardiography *may* be required Stress ECG,

3.2.2.2 Aeromedical Disposition

- i. Minor regurgitation (no evidence of thickened leaflets or flail chordae and left atrial internal diameter less than or equal to 4.0 cm) the absence of symptoms and mitral valve prolapse only may be compatible with a fit assessment for all the classes.
- ii. Moderate regurgitation may be certificated for class I OML, Class II OSL, restricted Class III and Cabin crew class.
- iii. Severe regurgitation is disqualifying-suggested by left ventricular end diastolic dilatation of the heart > 6.0 cm and/or systolic dimension > 4.1 cm or left atrial internal diameter > 4.5cm.

3.2.2.3 Subsequent Reviews at Annual Intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review
- iii. 24 hrs. ambulatory ECG
- iv. Doppler echocardiogram

3.2.3 Rheumatic Mitral Stenosis

- i. Rheumatic mitral stenosis and/or regurgitation, once diagnosed, is disqualifying in view of the risk of abrupt onset of Atrial fibrillation and of cerebral embolism.
- ii. Minor degrees of mitral leaflet tethering without enlargement of the left atrium and normal sinus rhythm may be assessed as fit with a multi-pilot (Class I 'OML') limitation and Class II applicants may be considered for Class II 'OSL', Class III will be assessed individually.
- iii. Following mitral valve replacement, class I and III applicants will be assessed as unfit because of

increased risk of embolism.

Class II and cabin crew class, may be re-certificated with limitation.

4. VENOUS THROMBOSIS

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until investigations have been completed and results assessed as satisfactory to the GCAA. If the diagnosis has been established and treatment with anticoagulants is indicated, this treatment is temporarily disqualifying until the anticoagulation has been discontinued.

4.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment should include all of the following whether first presentation or recurrent DVT:
 - Detailed family history of thromboembolic disease
 - Assessment for Neoplasia
 - PT/PTT
 - Anti-thrombin III
 - Protein S and C
 - Factor V Leiden
- iii. Doppler ultrasound
- iv. Ventilation and perfusion (V/Q) scanning if indicated
- v. Pulmonary angiography (may be required for pulmonary thromboembolism, to ensure that there is no concomitant pulmonary hypertension (>30 mmHg systolic)).

4.2 Aeromedical Disposition

Venous thrombosis or pulmonary embolism are disqualifying whilst anticoagulation is being used as treatment. After 6 months of stable anticoagulation as prophylaxis, a fit assessment with multi-pilot limitation may be considered after review by the GCAA. Anticoagulation should be considered stable if, within the last 6 months, at least 5 INR values are documented, of which at least 4 are within the INR target range. Pulmonary embolus should require full evaluation. Following cessation of anti-coagulation therapy, restricted license for all the classes may be required for the first two years with annual cardiologist assessment. Cabin crew class may be permitted to continue their duties with the use of anti-coagulation treatment.

5. RHYTHM DISTURBANCES

5.1 Atrial Fibrillation

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.1.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment should include the following Blood tests (thyroid function test and alcohol screening)
- iii. Exercise ECG
- iv. 24 hours ECG, the following criteria should be met:
 - if in sinus rhythm, 48 hours of ambulatory ECG on 3 separate occasions separated by an interval of 4 weeks each should demonstrate the absence of atrial fibrillation (having presented as a single attack, or in paroxysmal form) and of significant pauses (>2,5 sec) during the daytime
 - In the presence of established atrial fibrillation, the shortest RR interval shall not exceed 300 ms and the longest 35 sec. The longest pause on recapture of sinus rhythm shall not exceed 2.5 sec. Ventricular arrhythmia should not exceed an aberrant beat count >2% of the total QRS count with no complex forms.
 - Paroxysmal AF, as above plus the longest pause on recapture of sinus rhythm should not exceed 2.5 sec whilst awake.
- v. Echocardiogram shall show no significant atrial chamber enlargement, or significant structural or functional abnormality and LVEF of 50 % or more and the left atrial internal diameter shall not exceed 4.5 cm
- vi. Further tests may be requested if needed according to cardiologist decision.

5.1.2 Aeromedical Disposition

- i. A single attack of atrial fibrillation with a defined cause, an applicant who has satisfactorily completed the above investigations may be as fit with a multi-pilot (Class I 'OML') limitation, and class II may fly with OSL restriction. Cabin crew can fly without restriction. Class III will be assessed individually.
- ii. If suppression of the attacks are incomplete, or if/when atrial fibrillation becomes established, the GCAA decision will be based on an individual assessment of symptoms during an attack, the rate, experience and other relevant data. If reports are acceptable to the GCAA, a fit assessment with a multi-pilot (Class I 'OML') limitation, class II with OSL restriction and cabin crew without restriction may be accepted. Class III will be assessed individually.
- iii. If atrial fibrillation is present, the rate shall be controlled (i.e. resting rate <90 beats/mm, on exercise < 220 beats/mm) and any QRST abnormality should be attributable to medication or heart rate only.
- iv. The management of atrial fibrillation includes the attempt to suppress attacks (i.e. of paroxysmal disturbance of rhythm) or to control the heart rate when the rhythm disturbance is established.

5.1.3 Subsequent Reviews for a Minimum of 2 Years Every Six Months Intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review
- iii. 24 hours ECG monitoring

Note: A single episode of AF, without significant cause for recurrence in 2 years, may obtain unrestricted certification at the discretion of the GCAA provided there are no further symptoms suggestive of atrial fibrillation, or a recorded episode.

5.2 Atrial Flutter

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.2.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment including the following blood tests (thyroid function test, and alcohol screening)
- iii. Exercise ECG
- iv. 24 hours ECG:
- v. Echocardiogram
- vi. Further tests may be requested if needed according to cardiologist.

5.2.2 Aeromedical Disposition

- i. If drug treatment-which is acceptable for flying duties, is required, there must be adequate rate control, without significant side effects, and there should be no underlying structural heart disease. If these conditions are satisfied the applicant may be assessed fit with limitation.
- ii. In an atrial flutter circuit, the successfully ablated applicant may be assessed as fit with limitation, no sooner than 6 months following intervention.

5.2.3 Subsequent Reviews Every Six Months Intervals:

- i. Routine aviation medical examination.
- ii. Cardiologist review.
- iii. 24 hours ECG monitoring.

5.3 Wolff-Parkinson-White (WPW) Syndrome

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.3.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination.
- ii. Cardiologist's assessment to exclude history of arrhythmia (tachycardia or AF).
- iii. Exercise ECG, Bruce protocol and symptom limited, for at least 9 minutes and no sustained arrhythmia.
- iv. Electrophysiological studies must include an isoprenaline/adrenaline infusion sufficient to increase the sinus rate by 25%, and the following criteria shall be met:
 - HV interval < 70 ms
 - No inducible atrio-ventricular re-entry tachycardia
 - An antegrade refractory period of accessory pathway >300 ms (>250 ms with -delta interval

- during atrial fibrillation >300 ms (>250 ms with isoprenaline)
 - Cycle length with 1:1 accessory pathway conduction >300 ms (>250 ms with isoprenaline)
 - No evidence of multiple pathways.
- v. 24 hours ECG without significant rhythm or conduction disturbance
 - vi. Echocardiogram showing a normal heart structure and normal LV and RV function
 - vii. Further tests may be requested if needed according to the cardiologist decision.

5.3.2 Aeromedical Disposition

- i. Certification with limitation may be granted, if satisfactory report is submitted by the cardiologist
- ii. The presence of atrioventricular re-entrant tachycardia or paroxysmal atrial fibrillation in the presence of an accessory pathway is disqualifying.

5.3.3 Subsequent Reviews every six months intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review
- iii. 24 hours ECG monitoring

5.4 Post Radiofrequency Ablation of WPW Syndrome

Following the radiofrequency catheter ablation, the AME should inform the GCAA of the diagnosis and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until six months after the surgery for class I, II, III and cabin crew medicals.

5.4.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination.
- ii. Cardiologist's assessment, without a history of arrhythmia (tachycardia or AF).
- iii. Exercise ECG, Bruce protocol stage 4, symptom limited should be achieved and neither significant abnormality of rhythm or conduction nor evidence of myocardial ischaemia shall be demonstrable. Withdrawal of cardio-active medication prior to the test should be considered.
- iv. 24 hours ECG without evidence of significant rhythm or conduction disturbance
- v. Echocardiogram -no significant selective chamber enlargement or significant structural or functional abnormality and left ventricular ejection fraction of at least 50%.
- vi. Electrophysiological studies-no evidence of accessory pathway, conduction pre or post isoprenaline/adrenaline.
- vii. Further tests may be requested if needed according to cardiologist decision.

5.4.2 Aeromedical Disposition

Certification with OML limitation for class I may be granted, if satisfactory report and tests are submitted by the cardiologist post ablation.

Cabin crew and Class II may gain unrestricted licence. Class III will be assessed individually.

5.4.3 Subsequent Reviews for 2 Years Post Ablation Every Six Months Intervals:

- i. Routine aviation medical examination
- ii. Cardiologist review
- iii. 24 hours ECG

5.4.4 Aeromedical Disposition

If no recurrence of abnormal conduction within 2 years of successful ablation an unrestricted recertification may be permitted.

5.5 Conduction Disturbances

5.5.1 Atrio-Ventricular Block

- First degree atrio-ventricular block is common in fit young men and the PR interval may be > 200 ms in the presence of a bradycardia. In the absence of a bundle branch disturbance the situation is most often benign and no specific requirement is required.
- Second degree Mobitz type I (Wenkebach) atrio ventricular block.
On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.5.1.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG, Bruce protocol and symptom limited
- iv. 24 hours ECG, with no significant rhythm or conduction disturbance
- v. Echocardiogram (normal heart anatomy and normal LV and RV function)
- vi. Electrophysiological studies if carried out should show normal conduction velocities within the normal range.

5.5.1.2 Subsequent Review

Annual ECG:

- If satisfactory report is submitted by the cardiologist, recertification may be granted with restriction.
- The presence of Mobitz Type II, 2:1 and 3:1 atrioventricular block or evidence of distal conducting tissue disease on electrophysiological study is disqualifying.
- Complete congenital atrioventricular block (a rare condition, which may become symptomatic during early adult life) is disqualifying. Restricted certification may be given with the use of pacemaker.

5.5.2 Right bundle branch block (RBBB)

- Incomplete right bundle branch block is seen in 2—3% of routine flight crew electrocardiograms and appears to carry a normal prognosis in asymptomatic subjects. No special requirements are needed.
- Complete right bundle branch block. When isolated, established and unassociated with other

abnormality of the myocardium or coronary circulation, there appears to be no significant risk of development of further degrees of block or of syncope. Recently acquired right bundle branch block usually also has a benign prognosis provided significant coronary artery disease is not present.

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.5.2.1 Investigation Required for Recertification are as Follows;

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG, Bruce protocol and symptom limited
- iv. 24 hours ECG showing no significant rhythm or conduction disturbance
- v. Echocardiogram (normal heart and normal LV and RV function)
- vi. Further tests may be requested (e.g. coronary angiogram) if needed according to cardiologist decision).

5.5.2.2 Aeromedical Disposition

- The co-existent presence of first degree heart block and anterior or posterior hemi-block requires an electrophysiological study.
- If cardiologist reports are satisfactory, the GCAA may issue unrestricted medical certificate for all the classes of medical certificates. Class I applicant over the age of 40 years may be certificated with OML limitation. Class III will be assessed individually.

5.5.2.3 Subsequent Review For Class I, after One Year

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG.

Note: Unrestricted certification can be issued if there is no change in medical condition of the applicant.

5.5.3 Left Bundle Branch Block (LBBB)

On diagnosis of the condition, the AME should inform the GCAA and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until all investigations have been completed and results assessed as satisfactory to the GCAA.

5.5.3.1 Investigation Required for Recertification are:

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG, Bruce protocol and symptom limited
- iv. 24 hours ECG, without significant rhythm or conduction disturbance
- v. Echocardiogram (normal heart and normal LV and RV function)
- vi. Coronary angiogram or ECG gated MRI scan, is required for applicant over the age of 40 years for

- all the classes of medicals.
- vii. EPS, should be performed if the PR interval is >200 ms and possibly if the ECG shows an abnormal axis.

5.5.3.2 Aeromedical Disposition

- If cardiologist reports are satisfactory, class I may be recertified with OML limitation. Class III will be assessed individually.
- Class II under 40, a satisfactory report may give an unrestricted certificate Class II
- Applicants not able fulfil all the above requirements may be considered for Class II 'OSL'.
- Class II applicant over 40 years, after a coronary angiogram, in addition to satisfactory reports obtained may be given unrestricted medical certificate.

5.5.3.3 Subsequent Annual Review for Three Years

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG

5.5.3.4 Subsequent Review after Three Years

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG
- iv. 24 hours ECG
- v. Echocardiogram

Note: If the report is satisfactory, unrestricted class I, II and III will be granted.

5.5.4 Left Anterior and Left Posterior Hemi Block

- Recently acquired left anterior hemi block raises the possibility of myocardial ischemia and requires the protocol applied to left bundle branch to be followed. At a minimum exercise ECG is required. If all the investigations and cardiologist reports are satisfactory, no requirement for further review is required.
- Recently acquired left posterior hemi block requires at least an exercise ECG and review by a cardiologist.

5.6 Cardiomyopathies

5.6.1 Dilated Cardiomyopathy

This form of cardiomyopathy is associated with dilatation of either the right and/or the left ventricle. It is characterized by reduced cardiac output and symptoms of fatigue and breathlessness. In the more severe forms, sudden cardiac death occurs in up to 50% of patients. It may be secondary to a viral illness, myocarditis, and alcohol abuse, congenital or be idiopathic.

Complications:

- Atrial and ventricular rhythm disturbances
- Sudden cardiac death

5.6.1.1 Investigations Required for Recertification are:

- Routine aviation medical examination
- Cardiologist's assessment
- 24 hours ECG without significant rhythm or conduction disturbance
- Echocardiogram -LVEF ≥ 0.50 without significant abnormality of wall motion
- Exercise ECG-symptom limited to Bruce stage VI, showing no significant abnormality or evidence of myocardial ischemia.
- Coronary angiogram to be requested if any doubt about the result of no-invasive investigations.

5.6.1.2 Aeromedical Disposition

- If limited to the right ventricle it may present as arrhythmogenic right ventricular cardiomyopathy with associated risk of sudden cardiac death. It is thus disqualifying.
- Stable impairment of the left ventricle may be considered for a fit assessment.
- Established dilated cardiomyopathy involving the left and/or the right ventricle is disqualifying.
- The small percentage of patients who appear to make a complete or near complete recovery may be considered for recertification with limitation applicable with the class of medical certificates.
- This recertification should be less than six months after recovery has been deemed to be complete- provided that there satisfactory test reports.
- Class II and Cabin crew class may be issued unrestricted certification if the condition is stable and satisfactory reports are documented with follow up over 2 years.

5.6.1.3 Subsequent Review Every Three Months

- Routine aviation medical examination
- Cardiologist's assessment
- Exercise ECG
- 24 hours ECG
- Echocardiogram

5.6.2 Hypertrophic Cardiomyopathy

5.6.2.1 Investigations Required for Recertification are:

- Routine aviation medical examination (including a history of syncope and any family history of sudden cardiac death)
- Cardiologist's assessment
- 24 hours ECG, without significant rhythm or conduction disturbance
- Echocardiogram (LVEF ≥ 0.50 without significant abnormality of wall motion and septal thickness should be less than 2.5 cm)
- Exercise ECG-symptom limited to Bruce stage VI showing no significant abnormality or evidence of myocardial ischemia.
- Further investigations including a coronary angiogram, myocardial perfusion scan, EPS, especially if there is any doubt about the result of non-invasive investigations.

5.6.2.2 Aeromedical Disposition

- Family history of early sudden cardiac death in two family members is disqualifying
- On 24-hours ECG monitoring, sustained or non-sustained ventricular rhythm disturbances is disqualifying.
- The presence of significant increase in the inter-ventricular septum (i.e. >2.5 cm) disqualifies from all forms of certifications
- If the above investigations are satisfactory, the GCAA will recertify Class I with restriction of OML. For Class II and Cabin Crew Class, an unrestricted certification may be granted if they meet the above requirements in full. Class III will be assessed individually.

5.6.2.3 Subsequent Review Every Three Months

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. Exercise ECG
- iv. 24 hours ECG
- v. Echocardiogram

5.7 Implantation of Cardiac Pacemaker

Following the insertion of cardiac pacemaker, the AME should inform the GCAA of the surgery and advise the applicant not to exercise the privileges of his license until cleared to do so by GCAA. This will not be considered until three months after the surgery for class I, II, III and cabin crew medicals.

5.7.1 Investigations Required for Recertification are:

- i. Routine aviation medical examination (history of syncope, family history of sudden cardiac death)
- ii. Cardiologist's assessment
- iii. 24 hours ECG without significant rhythm or conduction disturbance
- iv. Echocardiogram
- v. Exercise ECG-symptom limited to Bruce stage VI showing no significant abnormality or evidence of myocardial ischemia.

Note: If the applicant does not have any other disqualifying conditions, and he is not pacemaker dependent, and if the pacemaker used is bipolar lead system, he may be certificated with Class I restricted license. Class II and Cabin crew Class may be certificated with unrestricted license if they fulfil all the above requirements. Class III will be assessed individually.

5.7.2 Subsequent Investigations

- i. Routine aviation medical examination every six months
- ii. Annual Cardiologist's assessment with pacemaker check and 24 hours ECG.

Note: Anti-tachycardia pacemaker and automatic implantable system defibrillating systems are disqualifying.

SUBPART B - RESPIRATORY SYSTEM

1. ASTHMA

1.1. Certification Protocol

- i. All initial applicants for all the medical classes of medical certificates should be evaluated by Pulmonologist or general physician if there is:
 - PEF < **80% c)** abnormal PFT
 - History of Asthma.
- ii. If the applicant is diagnosed to have mild asthma, which is well controlled, and normal chest examination and no history of acute attack within the preceding 5 years, he may be assessed as fit class I and the license may be restricted should be reviewed and examined as indicated by the Pulmonologist. For renewal of class I, if symptoms are, mild, infrequent, symptoms well controlled on medication, no symptoms in flight, no wheeze on examination, the AME can issue the medical certificate based on his clinical examination.
- iii. Class II and cabin crew class applicant, may be assessed fit if the asthma is mild, well controlled and no acute attack requiring emergency room visits within the preceding 2 years. Renewal for cabin crew and class II, the AME can issue the medical certificate unless otherwise indicated.
- iv. Class III will be assessed individually.
- v. **All the classes of medical examinations, the AME should not renew the medical certificate, if he noticed:**
 - The symptoms worsen/or wheeze on chest examination
 - Increase in frequency of emergency room, hospital, or outpatient visits.
 - The FEV1 is < 70% predicted value.
 - The applicant requires 3 or more medications for stabilization.
 - The applicant is using steroid in dosage equivalent to more than 20mg of prednisone per day.

2. CHRONIC OBSTRUCTIVE AIRWAY DISEASE

2.1. Certification Protocol

- i. All applicants for initial Class I, II, III and Cabin crew class certificates with an established history of COAD requiring continuous medication shall be assessed as unfit.
- ii. Class I, II, III and Cabin crew class certificate holders whose disease is mild, who have only very minor impairment of lung function, are symptomless, require no medication, and have no radiological evidence of bullae, may usually be assessed as fit.

3. PULMONARY TUBERCULOSIS

3.1 Certification Protocol

- i. Initial applicants for or holders of a Class I,II,III and cabin crew class certificates with a history of previous pulmonary tuberculosis may be assessed as fit provided that:

- A recognized course of medication has been completed.
 - Chest radiography shows no significant lung damage.
 - Normal pulmonary function testing is demonstrated.
- ii. Applicants for Class I,II,III and Cabin crew class with active disease or undergoing any treatment shall be assessed as 'temporarily unfit' for at least the early part of their therapy because of the symptoms ,side effects associated with treatment, and the need for close follow up.
 - iii. Following the initial part of the therapy, if the applicant for class I, showed a satisfactory report from his treating physician that he doesn't have any significant side effects of the medication and he doesn't carry any risk of transmission of the disease, he can return to flying/or controlling duties with restricted certificate till he completes the course of treatment. Class III will be assessed individually.
 - iv. Following the initial part of the therapy, if the applicant for class II and cabin crew showed satisfactory report from his treating physician that he doesn't have any significant side effects of the medication and he doesn't carry any risk of transmission of the disease, he can be granted unrestricted license with close follow up with his AME and /treating physician.
 - v. Following completion of therapy, assessment of fitness shall be performed as detailed above.
 - vi. Applicants with substantial lung damage may have bronchiectasis, be susceptible to recurrent episodes of chest infection and therefore require careful evaluation. Applicants with persistent cavities also require careful evaluation, but as these cavities will probably have a bronchial communication, the risk of significant problems is not great. However, large cavities are likely to be associated with considerable degrees of lung damage and applicants will be unlikely to be assessed as fit.
 - vii. If the applicant is taking prophylaxis treatment with Isonizid because of contact with infected person, or because of recent TB skin test conversion, he may continue flying/or controlling duties without compromising flight safety, because the unwanted effects of this medication are quite uncommon and no way cause an acute incapacitation reaction when they do occur. In these cases the AME/or treating physician should follow all patients on prophylaxis clinically, ordering laboratory studies when indicated.

Note: Possible major adverse effects of first –line anti-tuberculosis drugs are as follows:

- *Isoniazid: peripheral neuropathy*
- *Rifampin: GI disturbances, Hepatitis.*
- *Ethambutol: retrobulbar neuritis, blurred vision,scotoma*
- *Pyrazinamide: hepatitis*
- *Streptomycin: ototoxicity with vertigo and hearing loss*

4. SARCOIDOSIS

4.1 Requirement for Initial Certification of Applicant with a History of Sarcoidosis Confined to Hilar Lymphadenopathy

- i. Serial CXR (hilar lymphadenopathy should be re-examined and shown to be non-progressive and no evidence of pulmonary shadowing)
- ii. Gas transfer factor should be stable.
- iii. Pulmonary function tests should be normal
- iv. Cardiology review to include:

- resting and exercise ECG (symptom limited)
- 24-hour ambulatory ECG monitoring- without significant rhythm or conduction disturbances
- Echocardiogram
- Myocardial scintigraphy or perfusion scanning (MRI) may be needed if any cardiac abnormality detected.

4.2 Subsequent Review Every Six Months for Class I and III and Annual Review for Class II and Cabin Crew Class, All for Two Years

- i. Routine aviation medical examination
- ii. Cardiologist's assessment
- iii. 24 hours ECG.
- iv. Exercise ECG

4.3 Subsequent Review Every Twelve Months for Class I and III

If satisfactory follow up for two years with no previous history of systemic involvement, the applicant for class I and III can be given unrestricted license and continue to have annual follow up.

4.4 Aeromedical Disposition

- i. If all the above tests are satisfactory including no cardiac sarcoidosis; no evidence of other organ involvement and no medication is prescribed a class I OML restriction. Class II and Cabin crew class may be given unrestricted licenses. Class III will be assessed individually.
- ii. Cardiac sarcoidosis is disqualifying
- iii. Applicants with a diagnosis of active sarcoidosis shall be assessed as unfit.
- iv. Initial applicants with a history of multi-system sarcoidosis shall be assessed as unfit.
- v. Previous history of systemic involvement (skin, bone, eye, central nervous system and lung parenchyma), the applicant will be given permanent restricted license.

5. SPONTANEOUS OR IDIOPATHIC PNEUMOTHORAX

5.1 Assessment Guidelines for Initial Applicants

Applicants for initial certification with a history of a single spontaneous pneumothorax may be assessed as fit provided that:

- i. One year has elapsed since full recovery after adequate treatment.
- ii. Full respiratory evaluation is normal.
- iii. No bullae are discovered on chest radiography, CT scans, or other medical imaging technique.
- iv. The bullae have been treated by surgery and no smoking status has been confirmed.

5.2 Assessment Guidelines for Renewal of a Medical Certificate:

Certificate holders who develop a spontaneous pneumothorax must be assessed as temporarily unfit until full resolution has occurred. They may be assessed as fit for certification provided that:

- i. Full re-expansion of the lung has taken place.
- ii. A minimum of six weeks has elapsed since the occurrence.

- iii. Full respiratory evaluation is normal.
- iv. No bullae are discovered on chest radiography, CT scan, or other medical imaging technique.
- v. Restricted license for all the classes of medical certificate holders for one year from the original occurrence.

Note 1: Following a second pneumothorax, a fit assessment must be denied in view of the recurrence rate. A fit assessment at renewal may only be considered by the GCAA following satisfactory surgical treatment (thoracotomy, over sewing of apical blebs and parietal pleurectomy) and full convalescence, usually three months. 'Medical' pleurodesis is followed by a high recurrence rate (30%) and is no longer an acceptable form of treatment.

Note 2: Applicant with history of traumatic Pneumothorax can be given unrestricted license -for all the classes of medical- , after review of medical report covering precipitating factors, associated problems, extent of recovery and subsequent lung function.

SUBPART C - METABOLIC, NUTRITIONAL AND ENDOCRINE SYSTEMS

1. DIABETES MELLITUS

1.1. Certification

- Impaired glucose tolerance often represents a pre-diabetic state that may convert to the full condition at a rate of around 4% per year. Cases may need dietary treatment and will require prolonged and detailed follow-up in order to preserve aeromedical fitness in the long run. The AME must inform the license holders about all possible outcome of this condition and must emphasize the importance of the regular follow up and weight loss. A target weight loss of 10% over 1 year is appropriate in most cases.
- Type 2 diabetics fully controlled on diet alone may be fit for unrestricted medical certificates, subject to detailed follow-up at periodic medical examinations or at least annually with acceptable blood investigations.
- Insulin use is disqualifying from all the classes of medical.
- The use of oral hypoglycemic drugs may be acceptable for flying duties with certain limitation with its use as a single agent (e.g. Biguanides, Thiazolidinedione or Alpha-glucosidase inhibitors and Sitagliptin).
- Combination of agents may be considered on a case by case basis, provided there is no evidence of hypoglycaemia.

Anti Diabetic Medications:

Medication	Class I and III	Class II and Cabin crew class
Biguanides	Yes, (without limitation)	Yes, (without limitations)
Alpha-glucosidase Inhibitors	Yes, (without limitation) if used as single therapy	Yes, (without limitations) if used as single therapy
Sulphonylureas	Not acceptable	Yes, with limitations
Pioglitazone	Acceptable if unable to tolerate Metformin on a case by case basis	Yes, when combined with a biguanide or sulphonylurea, with limitations
Repaglinide	Not acceptable	Not acceptable
Sitagliptin	Acceptable if unable to tolerate Metformin /or combination with Metformin on a case by case basis	Acceptable

1.2. Initial Assessment

- At the time of diagnosis of Type 2 Diabetes mellitus, the GCAA requires the following evaluations to be done:
 - Careful examination to exclude common complications of diabetes including neuropathy
 - HbA1c
 - Blood Glucose must be reasonably controlled
 - BMI level, and determine the desired goal (BMI of <25 is the target)
 - Diabetes Mellitus must be treated as high risk for cardiovascular disease and all modifiable risk factors should be managed aggressively.

- Blood tests including HBA1c, renal function, liver function and lipids.
 - A GCAA extended eye examination.
 - ECG at the time of diagnosis
 - An approved cardiologist consultation
 - Urine micro albuminuria
- ii. If single medication is required to control blood glucose level the license holder must be grounded:
- For Class I and Class III , 30 days ground trial to ensure good glycaemic control, minimal side-effects and a falling HbA1c or a HBA1c < 7%. If single medication fails to adequately control blood glucose levels, and addition of other agent is required the license holder must be grounded.
 - For Class II and Cabin crew class: Minimum 30 day ground trial to ensure no hypoglycaemic episodes, no additional other side-effects, good glycaemic control, a falling HBA1c and or HbA1c 7%
 - To provide a complete record of blood glucose monitoring to AME - random daily record for a minimum 30 days ideally via a data card.

1.3. Follow up for Cases of Type 2 Diabetes Mellitus

- Periodic review with an AME and careful examination to exclude common complications of diabetes.
- Blood glucose and HbA1c less than 7.5% undertaken at three monthly to check the control of diabetes.
- Regular BMI and body fat monitoring and a comment on reduction progress.
- Periodic tests including renal function, blood lipids and urinary tests for detecting early renal damage (micro-albuminuria)
- Annual GCAA approved ophthalmologist review.
- CNS and foot examination for evidence of neuropathy; either by neurologist, family physician or AME.
- Approved Cardiology review.

2. THYROID DISORDERS

- i. Initial applicants with an established diagnosis of thyroid dysfunction will have the issue of their medical certificate deferred until acceptable reports have been received.
- ii. A report from an endocrinologist will be required to confirm details of history, investigations, diagnosis and treatment, optimised thyroid function, no side-effects from either the disorder or the treatment and plans for follow-up care.

2.1 Hypothyroidism

Florid hypothyroidism requires a temporarily unfit status. The candidate may be considered for fit assessment if clinically asymptomatic, euthyroid and taking their prescribed approved medication. Annual Endocrinological review is required by the GCAA.

Any changes in management, including medication changes, must be notified to the AME.

2.2 Hyperthyroidism

A hyperthyroid pilot is unfit for flying and must remain so until a stable euthyroid state has been attained. A fit assessment may be considered by the GCAA when the license holder is clinically and biochemically euthyroid. The individual must be annually reviewed (to include TSH, T3, T4 estimation) to guard against recurrence or the development of hypothyroidism. The continued use of anti-thyroid drugs, if well tolerated, is consistent with aeromedical fitness.

Any changes in management will be notified to an AME.

Cases where eye involvement has occurred, an Extended Eye Examination is required before the candidate can be returned to flying to ensure satisfactory eye movements and no diplopia.

2.3 Thyroidectomy

Following thyroid surgery (complete or partial) the Medical certificate holder will be assessed as unfit. A fit assessment can be made following full surgical recovery, and demonstrated stability of thyroid function.

A report from the specialist will be required confirming details of the surgery, recovery and ongoing treatment and confirmation of euthyroid state. Minimum follow up is annual blood test confirming euthyroid status.

2.4 Radioactive Iodine Treatment

The certificate holder will be assessed as unfit until all treatment is complete and a euthyroid state has been achieved. A report from the specialist will be required and should confirm details of treatment and follow-up care including confirmation of euthyroid state. Minimum follow up is for an annual blood thyroid test confirming euthyroid status.

3. OBESITY

3.1 General Evaluation of Obesity at Aero-medical Examination

3.1.1 Assessment of the overweight or obese person should begin with a careful history and physical examination.

3.1.2 History should include:

- History of medication (use is an important aspects of the initial evaluation (corticosteroids, oestrogen, progesterone, testosterone or other anabolic/androgenic steroids).
- Family and social history are indicated (family history of obesity related disease)
- Smoking intake
- Alcohol consumption should be documented
- Activity level
- Dietary history and patterns of eating
- Exercise habits investigated.
- Sleep disturbance, snoring, sleep apnoea should be assessed
- Menstrual disturbances specifically symptoms related to polycystic ovarian syndromes
- Mood disorders
- The physical examination of an obese patient should evaluate the type of obesity- truncal, central etc.

- Waist circumference
- Hip to waist ratio
- Body fat composition
- Neck circumference
- The presence of a thyroid goitre
- Mallampati score
- Clinical assessment for hypothyroidism and hypercortisolism
- Discussion of the patient's cardiac risk factors is also appropriate.
- Review the applicant's previous medical record and performance of appropriate physical examination.

3.2 Defining the Nature of the Problem (Body Composition Tests)

3.2.1 The Body Mass Index (BMI)

Body mass index is defined as the individual's body weight divided by the square of their Height. The formulas universally used in medicine produce a unit of measure of kg/m².

3.2.2 Waist Circumference and Waist Hip Ratio

Waist circumference is the distance around the natural waist (just above the navel).
(The tape must be positioned mid-way between the top of the hip bone and the bottom of the rib cage).

The absolute waist circumference (>102 cm in men and >88 cm in women) or waist-hip ratio (>0.9 for men and >0.85 for women) are both used as measures of central obesity.

Waist hip ratio is calculated as follow, measure waist at narrowest part and measure the hip at widest part then divide waist/hip to get the ration

3.2.3 Body Fat Percentage

Body fat percentage is total body fat expressed as a percentage of total body weight. It is generally agreed that men with more than 25% body fat and women with more than 33% body fat are obese.

3.2.4 Neck Circumference Measurements

Screening for and treating Obstructive Sleep Apnoea Syndrome will potentially lead to improved quality of life, reduced cardiovascular mortality and reduced accident rates.

The neck circumference should be measured at a point just below the larynx (Adam's Apple) and perpendicular to the long axis of the neck. The applicant should look straight ahead during measurement, with shoulders down, and the tape will be as close to horizontal as anatomically feasible (the tape line in the front of the neck should be at the same height as the tape line in the back of the neck). Care should be taken so as not to involve the shoulder/neck muscles (trapezius) in the measurement.

Neck Circumference measured in centimetres should be adjusted for hypertension (+4cm), habitual snoring (+3cm), reported choking or gasping most nights (+3cm) to get prediction of Obstructive Sleep Apnoea. (Refer to protocol of OSA).

3.3 Aeromedical Disposition

- i. For the GCAA medical certification purpose the definition of obesity include:
 - A body mass index above 30, or
 - A waist circumference over 102 cm, female 88cm, or
 - A waist to hip ration of 0.9 male and 0.85 female, or
 - Body fat content above 25% male and 32% female.
- ii. Obese applicant with incapacitation risk of >1%, must be grounded and enter a weight management program which should include dietary advice, an increased exercise regime and regular 3 monthly AME follow and should require an additional battery of tests to exclude the nutritional and metabolic disorders before issuing the medical certificate. The minimum tests required would be Lipid profile (total cholesterol, LDL, triglyceride level and HDL), random blood glucose estimation with HBA1c and calculation the overall risk of cardiovascular disease. A target weight reduction of at least 10 % their original weight over one year and all risk factors must be monitored and controlled.
- iii. Obese applicants who are otherwise well and can exercise the privileges of a license safely will be certificated without restriction.
- iv. Obese Individual with OSA should be managed as per the protocol of OSA.
- v. If the a class I candidate with BMI of 35 or more fails to lose weight over 6 months period, or even gain more weight, the GCAA may recommend further assessments with particular attention to his competency in managing emergency situations and evacuation. Multi-pilot (Class I 'OML') limitation may be required.
- vi. If the high BMI does not reflect obesity (e.g. muscular built), then other measurement to be used as guidelines with the BMI for more accurate assessment, such as body fat percentage.
- vii. Failure to comply with any or all of these points may lead to permanent unfitness.

SUBPART D - RENAL SYSTEM

1. URINE TESTING

1.1. Haematuria

Significant haematuria is defined as:

- Any single episode of visible haematuria.
- Any single episode of symptomatic non visible haematuria (in the absence of a urinary tract infection (UTI) or other transient cause).
- Persistent asymptomatic non visible haematuria (in the absence of UTI or other transient cause). 'Persistent' is defined as: 2 out of 3 dipsticks positive for non-visible haematuria.

1.2. Proteinuria

Trace proteinuria is acceptable except in the presence of trace haematuria. When trace proteinuria and trace haematuria are both present, a repeat test is indicated.

Urine protein: creatinine ratio (PCR) or albumin: creatinine ratio (ACR) is preferred. ACR has the greater sensitivity. Significant Proteinuria is defined as: ACR>30 or PCR>50.

2. CHRONIC RENAL DISEASE

Applicants require regular renal review. In the absence of nephrotic syndrome and its associated thrombotic potential, and in the absence of uncontrolled hypertension, unrestricted certification may be permitted. A creatinine clearance below 20ml/min is unacceptable for medical certification. An albumin level below 35g/l is also disqualifying.

3. POLYCYSTIC RENAL DISEASE

The diagnosis of autosomal dominant polycystic kidney disease requires an OML for class I and class III certificate holders. Berry aneurysms need to be excluded by means of Magnetic Resonance Angiography and cardiac valve disease (including aortic root dilatation) by means of an echocardiogram. Abdominal aortic aneurysm also needs to be excluded.

4. URINARY CALCULI

4.1 Asymptomatic Stone(s)

The existence of calculi may be completely unknown to the applicant and could be accidentally demonstrated during instrumental check-up performed for other reasons. In such cases, the GCAA may consider a fit assessment with a restricted license for all the classes of certification for one year. After this period of documented freedom from symptoms and an urologist review (Radiological investigation, biochemistry, metabolic screen and any other relevant investigation) is satisfactory.

A fit assessment without a limitation may be considered by the GCAA for all the Classes with no evidence of renal calculi otherwise a restricted license would be appropriate. If originally picked up by an ultrasound scan

further ultrasound scans are required for every renewal and it should demonstrate no volume increase of calculi and no movement of calculi from their original position. If not initially found by ultrasound scan the low dose CT scan undertaken at 2 years and 7 years post index case would suffice as screening.

4.2 Residual Stone(s)

A residual stone, or stones, may often be asymptomatic. If in the calyces or collecting system, they remain a hazard and should be cleared before the individual can be assessed as fit to fly. If the stone is parenchymal, then the hazard is minimal and the applicant may be considered fit with restricted medical certificates for Class I.

4.3 Recurrent Renal Colic

Recurrent renal colic when associated with calculi must be investigated. If a comprehensive urological examination indicates a condition susceptible to treatment and subsequent review over an extended period after treatment shows no change in volume or position of stone and no stone in the calyces or collecting system, and no recurrent of symptoms, the individual may be assessed as fit. Urological follow-up with adequate techniques shall be required by the GCAA for every renewal of medical certificate.

Note: Fit assessment of individuals with frequent or recurrent stone formation may be considered at an earlier stage with restricted licenses and regular urologist assessment and follow up.

4.4 Previous History of Urethral Colic More than Years

Applicant with history of documented renal colic more than 7 years ago can be assessed as fit without restriction if the urologist review with appropriate investigations reveals stone free and normal kidneys. If the investigation reveals residual stone the applicant will be assessed as fit with restricted medical certificates and he should have a regular urologist review. If he underwent successful treatment and the applicant remains asymptomatic he may be given unrestricted medical certificates.

5. RENAL TRANSPLANT

Applicants who have undergone a renal transplant are assessed as unfit. Medical certification can be considered 12 months post-transplant. Renal function must be stable and blood pressure must be within normal limits. The use of approved anti-hypertensive drugs is permitted. Any steroid dosage must be below 10mg/day. Levels of anti-rejection drugs must be within therapeutic range to minimise side effects. Cardiovascular risk must be assessed by a cardiologist to include an exercise (stress) ECG. To maintain certification, applicants are required to provide a regular annual renal report. Class I holders require also require an annual cardiology assessment, including an exercise ECG. The Class I certificate will be restricted with OML. Class III medical certificate holder will be assessed on individual basis.

6. ACCEPTABLE TREATMENT AND MEDICATION FOR ERECTILE DYSFUNCTION

Phosphodiesterase Type 5 (PDE5) inhibitors

The main aeromedical concerns are the side effect profile of these drugs which includes colour vision changes in the blue/green and purple spectrum and sudden hearing loss.

Generic name	trade name	Minimum time between dose and flying
Sildenafil	Viagra	12 hrs.
Vardenafil	Levitra	12 hrs.
Tadalafil	Cialis	36 hrs.

SUBPART E - OTORHINOLARYNGOLOGY

1. HEARING TESTS

1.1. Pure Tone Audiometry

The audiogram is a graphical display of the hearing test. The two main components that are graphed are frequency and intensity. These results are displayed for each ear. Properly calibrated audiometers must be used and the calibration must be checked at regular intervals. The results are recorded in a standard audiogram. The standards requiring the horizontal octave (frequency doubling) interval measure is identical with the vertical 20 dB interval. The audiometry and the audiogram should cover at least the six octave bands from 250 to 8 000 Hz. In this frequency band, thresholds should be determined at the following frequencies: 250, 500, 1000, 2000, 3000, 4000 and 8000 Hz.

For aeromedical assessment only the frequencies 500, 1000, 2000 and 3000 Hz are required. The threshold is defined as the lowest intensity at which the tone is heard at least 50% of the times tested. Usually a 5 dB intensity interval is used. Higher intervals are not acceptable. It is important to prevent the examinee from observing the examiner operating the tone button. Screening audiometry at 20 or 30 dB (HL) might secure the fulfilment of the hearing requirements, but would jeopardise the diagnostic opportunities of series of audiometries at the required intervals.

If the pure tone threshold difference between the two ears exceeds 50 dB at a given frequency in an air-conduction test (using a head-set), the sound signal presented to the worst ear will be heard in the best ear. To avoid this effect (resulting in a 'shadow-audiogram'), a 50 dB masking noise must be presented to the contra-lateral ear.

Bone-conduction tests are not required by the requirements. If performed, the examiner must be aware of the sharpened masking demands of this test. The trans-cranial attenuation of a bone-conducted tone is 5—10 dB, making masking (by means of air conducted noise) compulsory to be able to distinguish safely between bone-conduction thresholds of the two ears. The purpose of a bone-conduction test is to establish the nature of a hearing loss. A true conductive hearing loss will present with normal bone-conduction thresholds, whereas a sensory-neural hearing loss will show identical bone- and air-conduction thresholds.

1.1.1. In Interpretation of an Audiogram, the Following Concepts Must be Known:

- **Frequency**

Frequency or pitch is measured in Hertz (Hz). Frequencies range from low-pitch to high-pitch and read from left to right on the audiogram. Each vertical line represents a different frequency.

- **Intensity**

The intensity is measured in decibels (dB). The intensity relates to how loud or soft a sound is. Each horizontal line represents a different intensity level. The softest sounds are at the top of the chart and the loudest sounds at the bottom. Each mark on an individual's hearing test would represent the softest sounds they could hear. The softest intensity tested is typically 0 dB and the loudest is 120 dB.

- **Right Ear - Left Ear**

The right ear is graphed with either a circle or triangle when testing is performed using headphones. The left ear is graphed with an X or a square when headphones are used. These responses would all represent the air conduction results of either the right or left ear.

- Other symbols seen on the audiogram may depict the responses obtained during bone conduction testing. The right ear is graphed with < or [and the left ear with > or]. These responses can help determine whether a hearing loss is sensorineural or conductive.
- If colours are used, red indicates the right ear, blue indicates the left ear.

1.2. The Spoken Voice Tests

It is difficult to standardise these tests because of large variations between examiners and different national traditions. The following may serve as a guideline:

- i. Prevent lip-reading by having the examinee turn his back to the examiner.
- ii. The whispered voice test should be performed by a whispering produced using the expiratory reserve (after completing a normal expiration). A unilateral test can be performed, when occluding the contra-lateral ear.
- iii. The spoken voice test. Use an average conversational voice. Both ears are tested simultaneously unless a sufficient masking noise is presented to the contra-lateral ear.
- iv. Use numerals between 21 and 99. Let the examinee repeat, what he has heard.
- v. Use the threshold distance between the examinee and the examiner to indicate the outcome of the test
- vi. The tests should be performed in a relatively silent room.

2. HEARING AIDS

For initial Class I and Class III applicants, hearing aids are not usually acceptable.

In an applicant who already holds a medical certificate, any type of hearing aid is acceptable for recertification, e.g. bone-anchored or intra-aural. Following insertion of the hearing aid, a functional hearing assessment must be performed and if satisfactory a return to certification is possible. A multi-crew restriction may be required for Class I applicants. Class III eligibility for certification will be assessed individually.

Note: For many pilots increasing the volume of the head set may be preferable and enhance hearing more than wearing hearing aids.

For removable hearing aids, audiometry, if required, should be undertaken both with and without hearing aids.

3. EAR CONDITIONS

A fit assessment can be considered after full recovery from a condition affecting the ear following provision of a satisfactory ENT specialist report.

If there is incomplete recovery from the condition, evidence that the condition has stabilised for an appropriate period of time is required. The audiogram standards must be met or a satisfactory functional hearing assessment is required.

4. PERFORATION

Recertification is possible after a minimum period of six weeks following a single dry perforation of non-infectious origin. An ENT specialist report is required confirming complete healing and the pilot must be pain free. A satisfactory audiogram is required for Class I and Class III recertification.

5. STAPEDECTOMY

To ensure full healing, recertification is only allowed a minimum of three months after surgery, subject to a satisfactory specialist report confirming no complications, the absence of dizziness, spontaneous or positional nystagmus and a satisfactory hearing result.

6. GROMMET INSERTION

This is acceptable for certification at both initial and revalidation/renewal.

7. BENIGN POSITIONAL VERTIGO/LABYRINTHITIS

In view of the recurrence risk of this condition and the sudden incapacitating nature of the symptoms, the earliest a license holder can be considered for recertification is after they have been symptom-free and off any treatment for at least 4 weeks. Class I holders require an OML for a minimum period of 3 months from recertification. The use of any medication to treat vestibular symptoms, e.g. Betahistine is not acceptable for medical certification.

8. MENIERE'S DISEASE

A diagnosis of Meniere's disease untreated or treated is not acceptable for Class I, III or II medical initial or recertification.

9. SPEECH DISCRIMINATION TEST OR FUNCTIONAL HEARING TEST

This test should be based on the following ICAO guidance:

Hearing loss greater than the requirements may be acceptable provided that there is normal hearing performance against a background noise that reproduces or simulates the masking properties of the flight

deck noise in the cockpit upon speech and beacon signals.

It is important that the background noise be representative of the noise in the cockpit of the type of aircraft for which the applicant's licence and ratings are valid. The frequency composition of the background noise is defined only to the extent that the frequency ranges 600 to 4 800 Hz (speech frequency range) is adequately represented. In the speech material for discrimination testing, both aviation-relevant phrases and phonetically balanced words are normally used. Alternatively, a practical hearing test conducted in communication environment representative of the one for which the certificate holder's licence and ratings are valid may be used.

The Functional Hearing Test form should be used; Refer to appendix III.

SUBPART F - MUSCULOSKELETAL SYSTEM

1. GENERAL

The general guidelines of fitness to be adopted when assessing the musculoskeletal system of an applicant include the assessment of:

- i. Any abnormality of the bones, joints, muscles and tendons, congenital or acquired, which is likely to interfere with the safe exercise of the privileges of the applicable license.
- ii. Sufficient height, leg and arm length and muscular strength.
- iii. Satisfactory functional use of the whole musculoskeletal system including all four limbs.
- iv. No significant sequelae from disease, injury or congenital abnormality with or without surgery.

2. BONES, JOINTS, MUSCLES AND TENDONS

A careful inspection should reveal any significant abnormality or deformity of the bony skeleton. X-ray examination, as required, will show the detailed structure and possible signs of disease or trauma.

3. LOWER EXTREMITY

3.1. Ankle and Foot

A good range and painless movement of the ankle and subtalar joints are essential for the safe management and control of aircraft. There are many conditions, e.g. sequelae of trauma or infection that could impair this function. Painful foot or ankle injuries caused by sporting activities are common problems. They may require a temporary or long-term unfit assessment. The assessment of the applicant's fitness to manoeuvre the aircraft will often require a medical flight test, either in a simulator or in the aircraft.

3.2. Knee

The knee joint should be stable and there should be a minimum, painless, range of movement from 0 to 90°.

3.3. Hip

Osteoarthritis or degenerative joint disease is the most common hip disorder affecting older pilots. A minimum painless range of at least 90 degrees of flexion from the extended position in the hip joint is required. Occasionally an applicant will present with signs of congenital hip dislocation or of Perthes disease (slipped upper femoral epiphysis). These cases should be diagnosed and assessed according to the functional abnormality. Any orthopedic surgical operation of the hip area will need post-operational physiotherapy therefore a minimum period of three months of temporary unfitness will be required.

4. UPPER EXTREMITY

4.1 Shoulder

A good range of shoulder movement is essential for operating controls located in overhead panels and side consoles. Traumatic dislocations or fractures of the shoulder or the acromioclavicular joint are common sequelae of traffic accident and contact sports. These injuries are usually easily diagnosed and following proper

conservative or surgical treatment the recovery is complete. Physiotherapy is often required to attain full mobility and to regain full strength. Habitual shoulder dislocation should be treated surgically because a painful dislocation while operating aircraft controls, especially in the overhead panel, could lead to in-flight incapacitation.

4.2 Elbow

The elbow is also prone to injury. A certain amount of restriction at the elbow joint may be acceptable because some impairment can be compensated for by the shoulder movement. Most elbow problems are caused by acute trauma. The restoration of adequate function should be possible with surgery and physiotherapy. Epicondylitis (tennis elbow) is caused by extended repetitive stress in the insertion point of forearm muscles. This can become chronic and should be properly treated from the beginning.

4.3 Hand and Wrist

The assessment of the functional capacity of the hand and fingers should be made with a good knowledge of the complex aircraft control manipulations required for safe flying. There should be no major impairment of the three basic types of functions of the hand:

- To grasp cylindrical objects;
- To pinch by tip, pulp or by lateral pressure;
- To hook.

Complete intact sensibility and good finger and thumb movements on both sides are also essential for operation of computer displays and keyboards. A person with an amputated thumb should also be evaluated by a medical flight test; otherwise a single finger amputation is usually of no concern.

5. SPINE

A careful examination of the entire spine by inspection, palpation and x-ray (only when required) should be included in every assessment examination.

Any deformity should be evaluated to identify the underlying cause, e.g. a congenital malformation, trauma, sequelae of disease or a neoplasm.

In the case of helicopter pilots, extra care must be taken due to the adverse effects of vibration and the postural effects of the flight controls. It may be necessary to X-ray the spine in order to evaluate congenital or acquired abnormalities which may be incompatible with helicopter flying.

5.1 Thoracolumbar Spine

Any deformity of a vertebral body caused by spondylolysis or trauma (fracture) or the deformity of the vertebral column (scoliosis, or spondylolisthesis) may interfere with the muscular balance leading to muscle spasm and pain. A leg length discrepancy or more than 15—20 mm is a common cause for muscular imbalance and secondary scoliosis.

The compression of a nerve root by a prolapse of an inter-vertebral disc may also cause severe sciatic pain.

All cases of backache among aircrew should be carefully evaluated for possible anatomical origin.

5.2 Cervical Spine

The cervical spine is anatomically different from the lumbosacral spine in that it may be subjected to far greater strain as the result of its mobility rather than from weight bearing. Whiplash injury is common in minor traffic accidents, causing painful soft tissue pain.

Degenerative changes at C4-C7 levels are commonly found in people younger than 40 years, care must be taken in considering these as a cause for brachialgia, muscle weakness and impairment of hand functions.

6. INJURIES AND INCAPACITATION

Musculoskeletal injuries are common. They occur most often during leisure or sports activities or in traffic accidents. Muscle spasms due to distension of the muscle fibres cause temporary discomfort and heal rapidly.

A distortion of a major joint will result in temporary unfitness of 2-3 weeks. A ligament trauma may have to be operated upon which will require 4-6 weeks of immobilization. Most fractures of the extremities will require at least six weeks of immobilization. An assessment is warranted after convalescence only if a significant decrease in function is expected.

SUBPART G - AVIATION PSYCHIATRY

1. MAJOR DEPRESSION

1.1. Protocol for Licensing Pilots with Major Depression

- i. Initial diagnosis of a Depressive episode (according to ICD 10/or DSM V criteria) and treatment must be initiated by a GCAA approved Psychiatrist.
- ii. Baseline Clinical Psychologist assessment must be done by GCAA approved Psychologist at diagnosis as a baseline analysis. The Psychometric testing to include Hamilton Score if depressed or Becks Anxiety Inventory for Anxiety. Additional tests at the discretion of the Approved GCAA Psychologist.
- iii. Baseline blood tests to exclude co-morbid Drug and Alcohol misuse including a urine drug screen, full blood count, liver function tests, thyroid function tests and carbohydrate deficient transferrin
- iv. The treatment options include Cognitive Behavioural Therapy (CBT), and or Selective Serotonin Re-uptake Inhibitors (SSRI's). The SSRI's allowed to be used are Citalopram, Escitalopram, Sertraline and Fluoxetine. Other treatment options must be assessed on individual basis.
- v. Initial grounding should be for at least four weeks post commencement of treatment.

This period to:

- Check for potential side effects
 - Improvement in the condition
 - Stability
- vi. The pilot will be reviewed monthly by the treating Psychiatrist and AME with a Hamilton rating score or Becks anxiety inventory
 - vii. Once stable and there is absence of any side effects confirmed by the treating Psychiatrist, the AME will arrange a psychological assessment if deemed necessary and a functional simulator assessment. The simulator assessment will follow a standardized protocol to ensure safe handling of the aircraft in all conditions.
 - viii. On completion of all the simulator assessment to a satisfactory level, a second Psychiatrist evaluation will be arranged.
 - ix. The AME will send the following reports to the GCAA:
 - Initial psychiatrist reports with all details of the case as per LIF-MED-034 form.
 - Initial psychologist assessment including the result of psychometric test.
 - Monthly follow up of the case from the first Psychiatrist and the AME.
 - Second psychometric test result after stability of the condition
 - The second psychiatrist evaluation of the condition after stabilization of the condition.
 - Simulator test result
 - x. The GCAA will evaluate the reports and determine the fitness of the applicant. Class I may be granted medical certificate with OML restriction.
 - xi. After returning to flying duties the pilot must ground himself if he feels a worsening of his condition or cognitive functioning.
 - xii. After returning to flying duties and being treated, the pilot must be evaluated every month by

Senior AME. The review must include Hamilton score if depressed, if the score is above 8, the pilot should be grounded for further assessment and treatment.

- xiii. The SAME must also review the Applicant who returns to flying duties on treatment every month to confirm the stability of his medical condition.
- Any change in his condition must immediately be evaluated by Psychiatrist.
 - Any decline in cognitive function detected on routine flying (by Colleague or Supervisor) or during Simulator check must necessitate immediate grounding and Psychiatric re-evaluation
 - Any suicidal ideation during the course of stability will necessitate grounding and further Psychiatric re-evaluation
 - Evidence of non-compliance with treatment or ignorance of Psychiatric or AME reviews, necessitates immediate grounding.
- xiv. Once CBT treatment has finished, Pilot should be reviewed on monthly basis by SAME and 3 monthly by the Psychiatrist, and if after at least six months there are no further areas of concern, the GCAA will convene a second Aeromedical evaluation board, at the request of the AME, to reassess the Pilot's condition to remove the OML restriction.
- xv. Follow up should continue as directed by the Psychiatrist and AME which may be indefinitely.
- xvi. For Pilots completing SSRIs treatment, a four week ground trial is required to assess any withdrawal symptoms from cessation of treatment. The psychiatrist should liaise with the AME regarding this period determination.
- xvii. Once successful withdrawal has occurred, a report to be sent to the GCAA recommending return to flying with OML off medication. The Pilot will be subjected to monthly SAME or Psychiatric review.
- xviii. After minimum of 6 month flying with satisfactory Psychiatric and SAME reviews, a full report recommending removal of OML restriction to be forwarded to the GCAA for their consideration. Second Psychiatrist evaluation may be required by the GCAA.
- xix. Follow up should continue as directed by the Psychiatrist and AME which may be indefinitely.

1.2. GCAA Protocol to License Depressed Cabin Crew on Treatment

- i. Initial diagnosis of a Depressive episode (according to ICD 10) and treatment must be initiated by a GCAA approved Psychiatrist.
- ii. The treatment options include Cognitive Behavioural Therapy (CBT), and or Selective Serotonin Re-uptake Inhibitors (SSRI's).
 - The SSRI's allowed to be used are Citalopram, Escitalopram, Sertraline and Fluoxetine.
 - Other treatment options must be assessed on individual basis.
- iii. Initial grounding post commencement of treatment to:
 - Check for potential side effects
 - Improvement in the condition
 - Stability
- iv. Once stable and there is absence of any side effects confirmed by the treating Psychiatrist, the medical certificate will be reinstated by the GCAA.
- v. The Cabin crew will be reviewed every 3 months, unless indicated otherwise by treating

psychiatrist.

- vi. After returning to flying duties the Cabin Crew must ground himself if he feels a worsening of his condition.
 - Any change in his condition must immediately be evaluated by Psychiatrist.
 - Any suicidal ideation during the course of stability will necessitate grounding and further Psychiatric re-evaluation.
 - Evidence of non-compliance with treatment or ignorance of Psychiatric or AME reviews, necessitates immediate grounding.
- vii. Once treatment has completed, Cabin crew should be reviewed as directed by the Psychiatrist.

Note: For licensing other GCAA license holders with Major Depression -Every case will be assessed on individual basis but the general guidelines should follow the same principle. Final determination of certification remains the function of the AMS.

1.3. Cognitive Simulator Assessment

- i. Simulator assessment to be done between 3-5 am during Cognitive/ Circadian lows.
- ii. The focus of the evaluation is to assess the pilot's cognitive and decision making skills during periods of high workload to the level of (Company).
- iii. A comparison of the current cognitive skill level for the pilot with his skill level prior to his illness is recommended whenever applicable.
- iv. This simulator should be conducted under 'day' and 'night' conditions to follow the current PPC scenario - which would confirm that the pilot meets the regulatory standards;
- v. In addition the pilot should conduct a Manual Handling Simulator where the pilot would be required to operate the simulator without the use of auto pilot, flight director or auto thrust. This exercise is designed to check a pilot's instrument scan as well as his capacity, airmanship and awareness. The exercise should include rapid role reversals in bank and pitch to test for dizziness;
- vi. The final part of the simulator should be a manually flown single engine ILS, which would check capacity, awareness and alertness.
- vii. The testing should be done by approved flight examiner.

2. SPECIFICATION FOR PSYCHIATRIC REPORT

- Applicant details
- History of presenting complaint
- Current neurovegetative signs and symptoms
- Past psychiatric history
- Substance abuse history
- Family psychiatric history
- Medical History
- Social history
- Career history
- Forensic history
- Mental status examination
- Diagnosis
- Treatment plan

- Follow up requirements
- Prognosis
- Fitness assessment requirement

2.1 Psychiatric Report Specification

Refer to LIC-MED- 034 form.

3. PERSONALITY DISORDERS

Personality disorders are always troublesome and are more likely to cause administrative or operational problems rather than frank medical problems. They imply lasting, deeply ingrained, inflexible behaviour patterns which, if severe enough, impair social interactions or produce symptomatic subjective distress in response to external stressors. In lesser form these are referred to as personality traits which exist for years in the 'odd', non-conforming personality and do not cause severe problems.

A number of specific personality disorders are identified including:

- Anti-social personality disorder (impulsive, aggressive, manipulative),
- Borderline personality disorder (impulsive, self-destructive, unstable),
- Dependent personality disorder (dependent, submissive, clinging);
- Histrionic personality disorder (emotional, dramatic, theatrical);
- Narcissistic personality disorder (boastful, egotistical, superiority complex);
- Obsessive –compulsive personality disorder (perfectionist, rigid, controlling);
- Paranoid personality disorder (suspicious, distrustful);
- Schizoid personality disorder (socially distant, detached), etc.

While personality trait are unique and may enable a person to excel in a particular field, individuals with identifiable personality disorders are likely to have attitudes or perform acts that may be prejudicial to flight safety, such individuals fail to meet the psychiatric medical standards and requirements and will be disqualified from aeromedical certification.

Certification may be considered if a board of psychiatrist and psychologist with experience in aviation medicine- confirm that a Pilot with a personality disorder represents a low risk to aviation safety.

4. ALCOHOL SCREENING TESTS

4.1 Indications

- i. Screening as part of over 60 medical certification.
- ii. A part of the medical evaluation as determined by the AME during the regulatory medical examination (e.g. cases of cardiac arrhythmia, insomnia, chronic headache, depression or anxiety, liver disease and cases of uncontrolled hypertension or diabetes or increased suspicion especially in those with a family history of addiction).
- iii. Referral following an aviation incident or work related issues.
- iv. 3rd party notifications for suspected Drug or Alcohol misuse.

4.2 Screening Tools:

4.2.1 A detailed interview and system review should be conducted with emphasis on the following:

- Alcohol intake – amount /type/how often
- Family history
- Physical dependence – withdrawal symptoms
- Sickness absence record-pattern of frequent, short term leave is often seen with alcohol-use disorder.
- Neurological issues
- Cardiac – arrhythmias/hypertension
- Gastroenterology – Gastritis/GORD
- Injuries- recurrent or unexplained
- Legal and social problems
- Marital disharmony
- Psychological problems

4.2.2 Examination

- Physical dependence – signs of withdrawal (e.g. irritability, restlessness, apprehension ...)
- General appearance- complexion
- Liver damage – spider naevi, hepatomegaly
- Hypertension
- Pancreatitis
- Cardiomegaly, arrhythmias

4.2.3 Questionnaire

AUDIT (Alcohol Use Disorders Identification Test) – score of 8 or more suggests that there could be a problem with alcohol.

It should be correlated with history and clinical examination and blood tests.

4.2.4 Laboratory Testing

- **GGT (gamma-glutamyl transferase):** Is raised in about 80% of heavy drinkers, but is not a completely specific marker for harmful use of alcohol.
- **MCV (mean corpuscular volume):** The MCV is raised above normal values in about 60% of alcohol dependent people and, like GGT, is not a completely specific marker. The value takes 1-3 months to return to normal following abstinence.
- **CDT (carbohydrate deficient transferrin):** CDT has similar properties to GGT in so far its use as a screening test is concerned. It is more specific to heavy drinking than GGT, but perhaps less sensitive to intermittent “binge” drinking. In persons who consume significant quantities of alcohol (> 4 or 5 standard drinks per day for two weeks or more), CDT will increase and is an important marker for alcohol –use disorder. CDT usually increases within one week of the onset of heavy drinking and recovers 1 to 3 weeks after cessation of drinking. Any elevation of CDT requires immediate grounding, a liver ultrasound to assess for biliary disease and a full report from a substance abuse specialist to the GCAA regarding alcohol intake.

4.3 Protocol for Rehabilitation/Treatment/Reinstatement and Follow Up

- i. If an alcohol-use is suspected in a pilot there must be documented evidence to support this.
- ii. The evidence in the history or examination and /or a high AUDIT score and /or laboratory abnormalities that require further investigation, the pilot should be grounded.
- iii. The AME should refer the pilot to substance abuse specialist to determine the diagnosis.
- iv. If the substance abuse specialist assessment confirmed the diagnosis of alcohol use disorder to FAA standards, then it will be required for the pilot to undertake a minimum 28 day in-patient rehabilitation stay under the Minnesota model at a recognized treatment centre.
- v. Aftercare and long-term follow-up. Treatment, even intensive in-patient care, is unlikely to result in recovery unless it is followed by on-going assistance. In the workplace, this must include:
 - Monitoring, preferably by an employee assistance professional or designated peer.
 - Periodic re-evaluation by a substance abuse specialist, it will be determined on an individual basis by the treatment facility and the treating SAME.
 - Support groups. Involvement in a group such as Alcoholics Anonymous (AA) can provide affected individuals with a continuing source of support during their ongoing rehabilitation process. Three support group meetings per week and a log of all meetings attended should be kept for review with SAME.
 - Monthly Senior AME contact
 - Monthly Blood test
 - A minimum of fifteen unannounced breath alcohol testing per year, this may include the non-work related testing
- vi. Reinstatement after successful treatment and rehabilitation
 - The SAME should send all initial reports, investigation result, and substance abuse specialist report along with all documentation of successful follow up program to the GCAA.
 - The GCAA will convene an aeromedical board consisting of one approved GCAA Psychiatrists, an approved Psychologist and two SAME.
 - Simulator assessment should be part of the board evaluation for cognitive functions.
 - The AMS will evaluate all the reports and if in the documentation of appropriate treatment and abstinence is acceptable the AMS will permit the pilot to return to flying duties with restricted license. The OML restriction may be removed after 2 years upon documentation of successful abstinence.
 - The follow up will be indefinitely.
 - If relapse occurs at any time during the follow up program, the pilot will be removed permanently from flying duties.

5. DSH (deliberate self-harm)

It is not unknown, but uncommon, for an individual to use an aircraft as a means of committing suicide and a brief review of assessing an individual 'at risk' is relevant.

There are differences between those who successfully complete the act of suicide and those who survive after overdose or deliberate self-harm.

Those who commit suicide are more often male and the majority suffers from a psychiatric disorder. The act is

carefully planned, precautions taken against discovery, and the method is usually violent. The majority is suffering from a depressive disorder, many have significant social problems and alcoholism is a feature in about 15% of cases. In the younger age groups personality disorders feature largely, often associated with alcohol or drug abuse, and adverse social factors.

Deliberate self-harm is usually an impulsive act, committed in such a way as to invite discovery.

Over dosage with minor tranquillisers, antidepressants and non-opiate analgesics are common. Here again personality disorders with alcohol and drug abuse are prominent features together with social isolation and deprivation, but frank psychiatric illness is uncommon. In assessing potential risk the following factors should be considered:

- a history of direct statement of intent;
- a history of previous self-harm;
- a previous or current depressive disorder, particularly those in the early phase of recovery;
- alcohol dependence, particularly where physical complications or severe social damage exists;
- Drug dependence;
- Social deprivation or loneliness.

At the initial selection interview those with a history of previous suicidal attempts should be very carefully and searchingly evaluated psychiatrically and it would be wise not to allow such individuals to enter a flying career.

Those who develop depressive illnesses should be excluded from flying and fully evaluated on recovery before reinstatement in a flying role. It is particularly important that those with alcohol dependence or abuse are assessed as temporarily unfit following diagnosis. Those individuals with significant personality disorders should be carefully excluded at the initial examination, if at all possible.

SUBPART H - NEUROLOGY

1. MIGRAINE CERTIFICATION GUIDELINES

- i. Applicant with a history of migraine should not be selected for Class I certification; due to the unpredictability and disabling nature of the condition.
- ii. Applicants presented for renewal with migraine, should be neurologically assessed. If no underlying disease is found and the individual remains free of further attacks for a period of 3 to 6 months, a return to flying may be approved with restricted license for class I.
- iii. if the migraine attacks are infrequent and due to a specific precipitant, and avoidance of this precipitants results in no further migraines for a period of more than 2 years.
- iv. Frequent migraine attacks are incompatible with any form of flying.

2. CERTIFICATION FOLLOWING TRAUMATIC BRAIN INJURY

Some element of head injury occurs in over 70% of individuals involved in automobile accidents and in at least 50% of all major trauma excluding burns. An estimated 80 to 90% of persons with head injury have mild trauma. Of those persons discharged with a good recovery from mild to moderate head injuries, about 10% have a continuing need for medical care services as a result of their head injury.

Traumatic Brain Injury (TBI) is a major cause of neurological disability in the license holder population. Closed head injury is the most common, most often related to rapid deceleration of the head (with or without impact). A combination of neurologic, cognitive, behavioural, and psychosocial variables are involved in the outcome of head injury, and the latter two variables are probably the most important. There are two major concerns over fitness for aviation – related duties following head trauma. One is the neuropsychological consequence of trauma in applicants who have not had any clear deficits and the other is the possibilities of Post Traumatic Epilepsy (PTE).

2.1. Consequences of Traumatic Brain Injury

2.1.1. Neuropsychological Consequence

The neuropsychological consequences are secondary to the effects of acceleration/deceleration forces on the skull and brain. Because of the anatomy involved, these forces cause their greatest focal damage to the orbital, frontal and anterior temporal areas of the brain. Associated with the cortical damage there is diffuse white matter damage.

The result of this is dysfunction in a number of functional executive activities of the brain.

These frequently are:

- Slowing of reaction time, impaired memory and deficient ability to perform constantly at a high level over time, particularly in settings of complex activities and choices.
- A high propensity for further mental decline with fatigue.
- Other problems include attention, initiation and proper sequencing of tasks, difficulty in planning and anticipating the future, and difficulty establishing automatic responses to a normal fear.
- The affected individual may not notice or care that the task is being poorly performed.

- Problems are exacerbated by stress, fatigue and pain and the handling of simultaneous emergency tasks is particularly affected.

2.2. Prediction of Neuropsychological Consequence

The most common way to predict the outcome of head injury is the duration of post-traumatic amnesia (PTA). Most individuals who have had a PTA of less than 30 minutes are likely to be fit within three months. Older individuals and/or those who have a history of previous concussion are of greater concern. A person with PTA lasting more than 30 minutes but less than 24 hours will likely be fit from a neuropsychological point of view after a longer time, probably one year.

2.2.1. Post-Concussion Syndrome

Post-concussion syndrome is characterized by a set of nonspecific symptoms including headache, insomnia, irritability, a non-specific dizziness, poor concentration, memory loss and other complaints. Neurological examination and imaging studies are normal. The condition is self-limited, generally resolving in weeks or months. The license holder must be grounded until the time his symptoms subsided.

2.2.2. Neurological Deficit

The major part of recovery from focal deficits such as hemiparesis, aphasia and other deficits takes place within six months of injury, though further recovery occurs at a slower pace over two to three years. Medical records and current neurological functioning will provide information regarding persistent deficit.

2.2.3. Posttraumatic Epilepsy (PTE)

PTE usually refers to late epilepsy, i.e., to seizures that develop several weeks or months after the head injury (1 to 3 months in most cases). Epilepsy is the most common delayed sequel of craniocerebral trauma, with an overall incidence of about 5 % in patients with closed head injuries and 50 % in those who had sustained a compound skull fracture and wound of the brain. The basis is nearly always a contusion or laceration of the cortex. As one might expect, the risk of developing posttraumatic epilepsy is also related to the overall severity of the closed head injury. The risk of seizures after severe head injury was 7 % within 1 year and 11.5 % in 5 years. If the injury was only moderate, the risk fell to 0.7% and 1.6 %, respectively.

After mild injury the incidence of seizures was not significantly greater than in the general population. In general, of those who develop post traumatic seizures, 50% will occur within one year and 70- 80% within two years. Thereafter the incidence is 3 - 5% per year up to ten years.

Once the first post-traumatic week (the period of early PTE) has passed, the risk of subsequent PTE decays exponentially. By two years, the residual risk is less than 20% of that immediately post-injury and at four years it is less than 10% of that initially present.

2.2.3.1. Post Traumatic Epilepsy Markers

- A past history of febrile convulsions in childhood and/or a family history of epilepsy doubles the risk associated with any other markers.
- Early post-traumatic epilepsy that occurs within the first week following injury carries a 25% risk of later epilepsy.
- Demonstrated haemorrhage within the brain substance, particularly the cortical part, is

associated with 25-45% risk of PTE.

- Depressed fractures or presence of blood in the subarachnoid space are not reliable guides to risk of PTE.
- The presence or absence of a post-traumatic amnesic interval of more than 24 hours, focal signs, and early post-traumatic epilepsy will increase the risk of PTE. (Any convulsive activity following the immediate effects of impact, however shortly thereafter these occur, should be considered as "early posttraumatic epilepsy").
- The presence of blood within **the parenchyma**- not in subarachnoid space- is of major concern, since PTE is believed to be an "iron driven" phenomenon.

2.3. Aeromedical Status for Head Injury Based on Clinical and Imaging Studies

2.3.1. Mild Head Injury

This is characterized by:

- Transient loss or alteration of consciousness without any focal neurological deficit and with rapid return to alertness and orientation Post-traumatic amnesia (PTA) occurs when a person is conscious but ongoing events are not recorded in the memory. This can sometimes be very difficult to evaluate as there may be no witnesses or may be poor recall or record keeping. The assumption must always therefore err on the side of caution with regard to defining periods of amnesia or loss of consciousness. For a minor head injury the duration of this lapse must be a clearly documented period of amnesia being less than one hour; and there must be no Post-traumatic syndrome (PTS). PTS comprises a symptom complex including:-Dizziness/ Vertigo; Emotional impairment; Headaches; Neurological signs and or Intellectual/ Cognitive impairments.
- Normal CT scan and MRI i.e. no skull fractures or cerebral bleeding
- Normal neuropsychological testing

2.3.1.1. Aero Medical Disposition

With the above criteria **all satisfied**, the main determinant factor for certification decision will be the PTA duration.

- A clear documented history of PTA lasting 1 hour or less and no LOC, the applicants are generally considered to be fit to fly after four weeks.
- A clear documented history of PTA/LOC lasting 1-12 hours, the applicants may be granted restricted medical certification by one year.
- A clear documented history of PTA/LOC more than 12 hours a restricted certification can be considered at two years.

In all cases, formal confirmation of neurological fitness should precede a return to flying and referral to the GCAA for a final decision is required.

2.3.2. Significant Head Injury

Presence of any of the following:

- PTA/LOC >12 hrs., and

- Focal neurological deficits
- Basal Skull fracture or Depressed fracture (Linear Fracture with intact dura not included)
- Surgical or traumatic penetration of the dura
- Neurological/intellectual impairment
- Any intracranial bleeding (Subdural Hematoma, Epidural Hematoma, Intracranial Haemorrhage, Intraventricular Hemorrhage, Subarachnoid Hemorrhage)
- Abnormal EEG

2.3.2.1. Aero Medical Disposition

In the presence of any of the above findings, the license holder must be assessed unfit.

However, reconsideration of certification decision may be done by the GCAA a 2 years after the index event. In this case a senior Aeromedical Board will be conducted.

The main determinant factor for certification decision will be the:

- Extent and nature of any neurological deficit.
- Risk of post traumatic epilepsy.

2.3.2.1.1. Certification Requirements:

- Two Neurology consultations by Neurologists acceptable to the GCAA supporting recertification
- Comprehensive Neuro-psychological evaluations
- Brain imaging (CT or MRI) at index and no sooner than 2 years afterwards
- Normal Sleep deprivation/Photostimulation EEG.
- Two practical flight tests including one at night during circadian lows
- Senior AME medical board.

Final aeromedical disposition of medical certification and return to duties will be considered individually. Those applicants with a full clinical recovery **may** be considered for a fit assessment after 2 years following the above detailed rigorous assessment.

Presence of Epilepsy; Penetrating skull injuries; Debilitating neurological deficits; Reduced Cognitive functioning and or Brain abscess will be permanently disqualifying from all types of medical certification.

SUBPART I - OPHTHALMOLOGY

1. REFRACTIVE SURGERY

1.1. Radial Keratotomy

In this operation, a limited number of radial incisions are made through the corneal stroma whereby the anterior surface is flattened. The method is used to reduce or eliminate myopia.

Experiences so far show that the myopia is reduced, and to a greater degree, in patients with larger amount of near-sightedness. It is not possible to predict the effect: some patients end up with hyperopia. Although complications due to the incisions are few, infections occur and have caused blindness. From the functional point of view, two problems are most relevant to aircraft personnel.

One is that in some patients the refractive state is not stable and can vary more than 1 dioptré during the day. Another is increased glare sensitivity due to the corneal scars.

Applicants who undergo radial keratotomy and whose eyes have established must thereafter have an ophthalmological assessment every two years for Class I and III and every 5 years for Class II.

Note 1: If the diurnal fluctuation in visual acuity is significant (i.e. loss of more than one Snellen line for Class I and III licence applicants and more than two Snellen lines for Class II licence applicants), even if an applicant's visual acuity is still within the pass standard, this fluctuation constitutes failure to meet the visual requirements of the standards concerned.

Note 2: This procedure is obsolete and should not be used anymore. However there are applicants who received these procedure years ago.

Note 3: Applicant who undergo this procedure, are not permitted to return to flying/or controlling duties while the refraction is still not stable. So extended eye examination is required before recertification, with particular concentration on stability of visual acuity.

Evidence of stability requires:

A variation not exceeding 0.25 dioptré in refraction

A visual acuity changing by not more than one Snellen line

A visual acuity which at least satisfies the minimum standards for the class of license, at three paired serial measurements. Measurement should be in the morning and late in the day and must be delayed for at least three months following surgery.

1.2. Laser-in-situ-Keratomileusis (LASIK)

During the laser in situ keratomileusis (LASIK) a corneal flap is shaved by a microkeratome. The cornea is flapped back and a laser ablation is performed in the stromal bed. After the laser procedure the corneal shave is returned back. The applicant should be aware of the possible adverse side effects of the procedure, and that in some cases it may take up to 6 months for complete recovery. The possible complications of LASIK are more severe than in PRK (PhotoRefractive Keratectomy), and mostly related to the use of the microkeratome. The flap can be dislocated or be lost and it can be loosened long after surgery. An irregular astigmatism can be produced by the microkeratom. Also with this procedure glare and instability of refraction can occur.

1.2.1. Recertification Requirements

Extended Eye Examination by Ophthalmologist and the evaluation should demonstrate:

- Visual acuity
- Field of vision
- Night glare
- Haziness
- Surgical healing of the flap is complete
- Significant dry eye syndrome
- Conjunctival injection/ inflammation
- Diffuse Lamellar Keratitis (DLK)
- Epithelial ingrowths
- Irregular flap (folds, wrinkles, striae)
- Incomplete/partial or complete flap displacement
- Retinal detachment
- Macular haemorrhage
- Decreased quality of vision in low light conditions or a loss of contrast sensitivity
- Visual aberrations such as glare, diplopia, ghosting, or starbursts
- Infection
- Stability of refraction is demonstrated with a diurnal variation of less than 0.75D in each eye.

1.3. Phakic Intraocular Lenses

It has been shown that corneal refractive surgery presents bad results in high refractive errors. To correct high refractive errors, a second artificial lens is implanted in addition to the own lens. There are two possible locations to place the lens: in the anterior or in the posterior chamber of the eye. The procedure works for myopia from -10 to -18 dioptries and for hyperopia of +3 to +10 dioptries. It is also a procedure that is reversible. Lens implantation is a well-known procedure. But it is an intraocular surgery with the possibility of infections, loss of the eye, pupillary block glaucoma, and development of cataract, retinal detachment, corneal edema or opacity with resulting keratoplasty due to loss of endothelial cells. For high hyperopia up to +9 dioptries a clear lens extraction with intraocular lens implantation is performed. This procedure is not reversible and it is combined with the loss of accommodation and therefore not very useful in young patient eyes.

Assessment

A fit assessment may be possible after 3 -12 months, depending on the preoperative refraction, the thickness of the cornea, the experience of the surgeon, the performed procedure and the side effects of the individual case. A fit assessment may be possible, provided that there is no postoperative problems have occurred and especially if the intraocular pressure is not increased.

Note: In case, where the candidate did not inform his/her AME about any surgical procedure mentioned above, the candidate will be classified as holding a disqualified medical certificate and this will be considered a breach of GCAA regulation. The applicant will be subjected to penalty and he may lose his license permanently.

2. MEDICAL MANAGEMENT OF LASER INJURIES GUIDELINES

Laser beams represent a potential threat to mission effectiveness and flight safety because of their ability to damage aircraft sensors and the eye. Laser based systems and devices are proliferating and pose a threat to the eye, both temporarily and permanently, from friendly and hostile sources. The frequency of laser beam exposures is likely to increase.

Medical force protection and prevention in operational units should include training and awareness of the threat by direct flight surgeon (AME) involvement in flying safety and aircrew training programs. For example, awareness that many lasers, e.g. Class 2 and 3A pointers, although very bright, cause no more than momentary dazzle or temporary flash blindness effects may help reduce fear and anxiety associated with these events. On the other hand, more powerful lasers, to include laser pointers rated Class 3B or higher, are potentially dangerous, especially when the source is at close range. Laser beams can be invisible in the form of infrared (IR) and ultraviolet (UV) wavelengths. The risk of permanent ocular injury diminishes at increasing distances from the source. However, laser beam exposures may disrupt operations during critical phases of flight and have psychological effects at distances far beyond those associated with ocular damage. Flight crew should be knowledgeable as to the entire laser beam threat spectrum, including appropriate steps to be taken if exposed.

2.1 Purpose

The purpose of these guidelines is to provide guidelines and instructions for AME dealing with potential laser beam exposure in flight crew and ground personnel. The intent is to provide an evaluation and initial management process to assess and respond to laser beam exposures where ocular adnexal injury may have occurred.

2.1.1 Laser Effects on Visual Performance

Lasers may interfere with vision either temporarily or permanently in one or both eyes. At low energy levels, lasers may produce temporary reduction in visual performance in critical tasks, such as flying aircraft. Also the glare induced by the laser scattering on scratches on the cockpit windscreen which can fog out landing lights and can be a risk to safe control of the craft. At higher energy levels they may produce serious long-term visual loss, even permanent blindness.

Pilots who sustain minimal injuries or even no injury from low energy laser exposures may develop serious psychological problems and become ineffective in the performance of their duties.

2.2 Eye Injuries

Cornea	Retina
Ultraviolet and low energy far-infrared radiation can injure the epithelial layer of the cornea; a condition that is painful and visually handicapping. At lower powers, this injury is primarily due to a photochemical reaction. A latency period of hours may exist between the time of exposure and the development of the corneal pathology. Minimal corneal lesions heal within a few days, but meanwhile they produce a decrement in visual performance.	1. Temporary changes in the ability to see can be produced without permanent damage. 2. Absorbed energy heats the retinal tissue. Heat from lasers causes thermal coagulation of the photoreceptor cells and other retinal structures. The surrounding retina will be threatened by inflammatory processes and edema. These processes result in scotoma (blind spots), varying in size depending on the extent of the retinal damage.

High energy far-infrared radiation is absorbed mainly by the cornea, producing immediate burns at all corneal layers .An infrared laser can produce a burn resulting in immediate visual incapacitation and may lead to permanent cornea scarring. Very high energy can perforate the cornea; this perforation may lead to loss of the eye.	3. Sub retinal hemorrhage /Vitreous Hemorrhage, Extensive or centrally located hemorrhage can produce a significant loss of vision. 4. Retinal detachment – this occurs when the energy of the laser is enough to create a hole in the retina, and its onset will be from days to months after the injury 5. Laser damage to the retinal/choroidal areas may produce brief, severe pain. 6. A major long-term effect of laser retinal injury is the scarring process which may degrade vision weeks or even months after the injury.
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2.3 AME Role

The key to evaluating and managing any laser eye injury or suspected laser beam exposure is immediate involvement of the AME. The AME is responsible for coordinating and determining the appropriate care and action to be taken. The AME should always approach a laser eye injury as a potentially serious ocular injury. An early consultation with an eye specialist is paramount for all suspecting case.

2.4 Evaluation of Suspected Laser Injuries by Eye Specialist

2.4.1 History

A detailed operational and medical history with respect to the nature and characteristics of the laser beam exposure. Important details include characteristics such as intensity, colour, constant or flicker nature of the light source, duration of exposure, location, estimated beam diameter, range, tracking, source, location (airborne or ground), glare, pain, photophobia, and any immediate or delayed symptoms. It is important to note that some laser beams are invisible to the human eye (e.g., UV and IR) and may induce sudden visual symptoms.

The use of personal protective equipment shall be documented if used (including glasses or contact lenses).

Past ocular and family eye histories should be included.

Use of the Laser Beam Incident Questionnaire will aid in both the medical assessment and intelligence aspects of the incident. The Laser Incident Questionnaire is meant to provide medical and laser experts with enough information to aid in initial treatment of exposed personnel. Involved personnel will undergo more extensive interviews by additional medical, operational, and military intelligence personnel.

Once the diagnosis of Laser eye injuries diagnosed, notifications should be made as soon as possible to the AME who shall notify the GCAA as soon as time and circumstances permit.

2.4.2 Physical Examination

- In any suspected laser eye injury, the patient should be re-examined as clinically indicated, ideally in 24 hours, but at least within 72 hours.

- the Eye doctor shall use the GCAA Ophthalmology form (MED- 01)
 - External Examination of the skin around the eyes and its adnexa
 - Near Visual Acuity Test.
 - Distant Visual Acuity Test.
 - Amsler Grid Test.
 - Pupils.
 - Stereopsis.
 - Colour Vision.
 - Slit Lamp.
 - Retinal Examination

Optical Coherence Tomography (OCT). Use of OCT can be very beneficial to aid in the determination of subtle retinal effects from laser beam exposure. OCT allows for examination of the nerve fibre layer, retinal pigment epithelium and choriocapillaris. It has been used to demonstrate and document retinal injuries by lasers when no symptomatic changes have been present. This type of the test should be considered and requested by the AME if a laser beam injury is suspected.

SUBPART J - INFECTIOUS DISEASE

1. INFECTIOUS HEPATITIS

Jaundice, as a result of inflammation of the liver, may be caused by infections or toxic agents. Active infectious hepatitis is incompatible with flying. Fit assessment may be considered by the AME in conjunction with the GCAA after full clinical recovery and normal liver function tests.

Note: Any form of chronic hepatitis (as indicated by serologic markers and/or objective evidence of liver function impairment) will be disqualifying for certification of all medical Classes.

1) Hepatitis B

- i. Acute hepatitis B is disqualifying. Certification may be considered upon full recovery (viral clearance).
- ii. Chronic hepatitis B – Certification may be considered in pilots in the ‘immune tolerant’ or ‘inactive HBV carrier state’.
- iii. Pilots are required to submit a report from a liver specialist, to include:
 - History of infection and Current symptoms;
 - Stability of condition;
 - Liver Function Tests;
 - HBV serology;
 - HBV DNA levels;
 - Alphafoetoprotein (AFP);
 - Report of ultrasound of the liver.
- iv. Requirement for treatment is disqualifying.

2) Hepatitis C

- i. Applicant with HCV-antibody positive and HCV-PCR is considered unfit for certification recertification may be considered for Class I with restricted medical certificate.
- ii. Pilots are required to submit a report from a liver specialist, to include:
 - History of infection;
 - Current symptoms including any CNS effects;
 - Stability of Condition;
 - Liver Function Tests;
 - HCV Serology;
 - HCV RNA and genotype;
 - Report of ultrasound of the liver including biopsy results if available.

Requirement for treatment is disqualifying; certification may be considered.

SUBPART K - ONCOLOGY

1. GENERAL

Malignancy poses a threat to flight safety for a number of reasons including:

- Direct effects of the primary tumour
- Effects of secondary spread
- effects of treatment modalities
- Psychological effect
- Cachexia
- Endocrine or biochemical disturbances.

2. INTRODUCTION

Every applicant who has been treated for malignant disease will need an individual assessment before exercising license privileges, the principles must apply to all categories of license applicants. Recovery from surgery or radiotherapy should be assessed. Current curative or adjuvant chemotherapy is incompatible with certification, and recovery from the effects of such treatments will demand a period of unfit assessment after it has finished. If the pilot has recovered from the primary treatment and, as far as can be assessed with available techniques, there is no residual tumour, then the level of certification will depend on the likelihood of recurrent disease. This guidance material will explore methods that enable the risk to flight safety posed by air crew who have received treatment for malignant disease to be assessed.

In addition to ensuring that treatment has been effective, pre-requisites for certification after treatment for malignant disease include satisfactory haematological parameters and no on- going side effects from therapy.

A history of malignant disease involving the central nervous system is disqualifying for certification

3. PRIMARY TREATMENT FOR MALIGNANT DISEASE

3.1. Surgery

Surgery is the commonest primary treatment for malignant disease, and is frequently the only treatment. A return to flying, from the purely surgical aspect, depends on the extent of the surgical operation, and this can be conveniently broken down into minor, intermediate and

Operation	Example	Minimum time assessed as temporarily unfit
Minor	Excision of mole/lymph node biopsy	1 week
Intermediate	Orchidectomy for testicular tumour	4 weeks
Major	Hemicolectomy for carcinoma of colon	12 weeks

Table 1: Minimum periods of unfitness after surgery

The AMI may consider earlier recertification's if recovery is complete, the applicant is asymptomatic, and there is a minimal risk of complications.

3.2. Radiotherapy

Radiotherapy treatment for malignant disease is usually given as an intensive course. The aim of this may be curative, for example when given to an isolated group of lymph nodes which have proved by biopsy to contain lymphoma; or as adjuvant treatment, for example to the abdominal nodes following orchidectomy for a seminoma of the testis, on the assumption that they may contain metastatic tumours. Since most courses are intensive, there is little time to fly even if the pilot wished to, but many patients undergoing radiotherapy suffer non-specific systemic effects (tiredness, malaise and nausea) which make it inadvisable for any pilot to fly whilst receiving such treatment.

Apart from physical symptoms, there are often psychological effects and worries associated with radiotherapy, which, in common with chemotherapy, may also affect flying ability. Consequently, pilots should be assessed as unfit during any course of radiotherapy.

3.3. Chemotherapy

Pilots should be assessed as unfit during any period of treatment with cytotoxic chemical agents.

These medicines are toxic to normal cells, and in particular to rapidly dividing cells in the bone marrow.

During chemotherapy the patient is routinely tested for normal blood levels of red blood cells and haemoglobin, and this should serve as a reminder both to the pilot and the medical examiner that there are potential risks when entering a hypoxic environment.

An unfit assessment applies both to curative chemotherapy, for example, treatment of disseminated lymphoma, and to adjuvant chemotherapy, for example when given to prevent the possible recurrence of colorectal cancer following surgical excision. The latter treatment may extend over a prolonged period of time, and there may well be a conflict between the medical advice to have the adjuvant treatment and the pilot's desire to regain medical certification to fly.

The only exception to an unfit assessment during adjuvant treatment for malignancy is endocrine therapy. Certain adjuvant hormone and anti-hormone treatments following (for example) breast or prostate cancer treatment may be acceptable if there are no side effects.

3.4. Stem cell transplantation

It is possible to return to flying after stem cell transplantation if there is sustained remission.

4. CERTIFICATION AFTER PRIMARY TREATMENT

4.1 Defining Acceptable Risk

In this discussion the assumption is made that the primary treatment, be it surgery, radiotherapy,

Chemotherapy or a combination of these, has removed all signs of tumour "X" when measured clinically or by investigation. The risk to flight safety is now the possibility that local or metastatic recurrence will cause sudden or insidious incapacitation whilst the pilot is flying.

The same risk of cardiac incapacitation of one per cent per year or less to be acceptable for two-crew

professional operations to be applied to certification after treatment for malignant disease. One difference between cardiology (a topic that is well-suited to the application of objective risk assessment) and oncology is that with the former, once the risk has been defined and certification achieved, the pathological condition is not likely to go away. After treatment of malignancy, however, the prognosis improves with recurrence-free time after the original episode. Thus to consider the full range of certification possibilities, from no certificate to unrestricted Class I, and including Class II certification for private flying, acceptable incapacitation risk levels have to be defined.

In this discussion, the following annual incapacitation risks will be used to define the appropriate certification. It should be noted that the exact levels of acceptable risk for restricted Class II certification (restricted private flying¹) have not been defined. For single-crew professional flying a figure of 0.1 % has been empirically quoted and is a reasonable basis, given that it is an order of magnitude less than the maximal acceptable multi-crew figure and is the approximate cardiovascular risk of men in their 40s. **Table 2.** For the purpose of these calculations, a 5 % annual incapacitation risk has been taken as the upper limit for restricted private flying.

Table 2: Certification possibilities according to acceptable risks of incapacitation

Incapacitation risk per year	Acceptable level of certification	License
Less than 0.1 %	Any	any
Between 0.1 % - 1%	Class I restricted Class II unrestricted	2 crew professional Solo private
greater than 1%	No class I Possible class II restricted	No professional Private with restriction

Thus if an incapacitation rate per year can be derived for “tumour X” at any particular time following its original treatment, then an acceptable level of certification for that pilot, at that time, can be calculated from the table above.

Following “successful” primary treatment, the risk that tumour X will cause an insidious or sudden incapacitation depends on two factors. The first is the actual risk of recurrence, which will depend on the pathological stage of the tumour or its TNM classification². The second is the site of that recurrence, and this will depend on the primary tumour type. These two factors will now be discussed individually, again in relation to a hypothetical tumour X.

4.2 Defining the Risk of Recurrence

The annual recurrence rate of tumour X can be calculated from survival curves. Ideally these should be “recurrence free” survival curves, but those are often not available, and thus simple survival data will need to be used. However, unless it is possible to cure many patients once their tumour has recurred (not a common situation) then the two curves will be very similar in shape.

Figure 1 shows a hypothetical five year survival curve for tumour X, and is used to show the usual representation of this type of data. It includes percentage figures along the curve showing the recurrence rates for each of the five years following treatment.

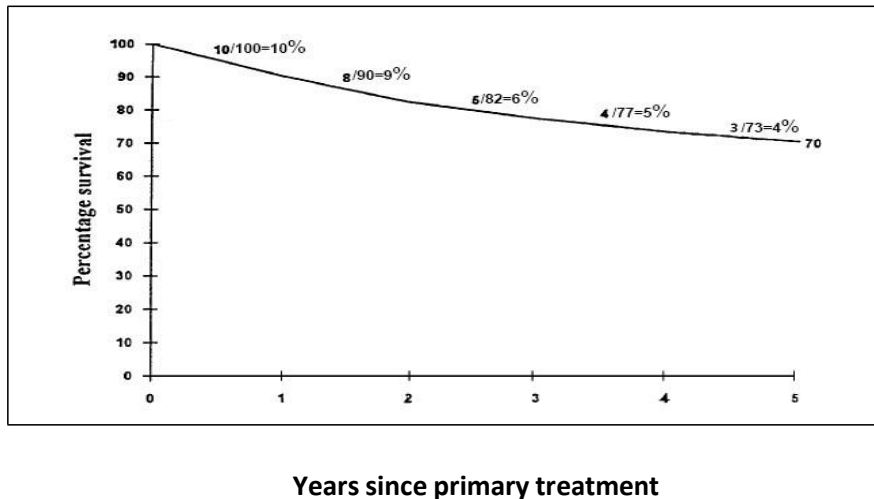


Figure 1: Overall five year survival after primary treatment for tumour X

The graph represents the recurrence rates for all cases of tumour X. These data, however, include a large spectrum of recurrence rates from very low (early stage disease) to very high (late stage disease). To illustrate the effect of different stages on prognosis, it is assumed that tumour X lesions can be divided into three types, or stages, based on the pathological examination of the resected specimen.

Studies have shown that the prognosis following surgical treatment for tumour X is related positively to the stage of the tumour at operation. Thus the previous overall five year survival curve of tumour X can be broken down into three separate curves relating to the three separate stages as shown in **Figure 2**. As would be expected, the more advanced stage tumours (stages 2 and 3) have a worse prognosis than early lesions.

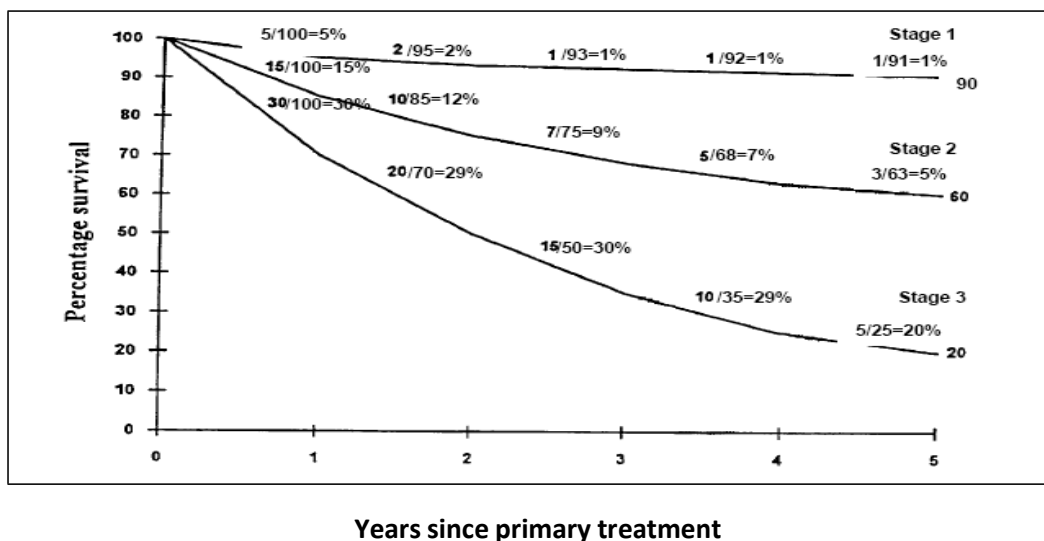


Figure 2: Five year survival for tumour X divided into pathological stages

From the data in Figure 2 it is possible to derive a yearly percentage risk of recurrence for any stage of tumour X. For instance, the risk of a recurrence between two and three years after surgery for a stage 2 tumour is 9%.

4.3 Defining the Site of Recurrence

Each tumor has its own particular sites of recurrence, and these have been recorded in pathology Textbooks since they were first written. Although metastases can occur in any part of the body, the majority are found in lymph nodes, lungs, bones, bone marrow and brain. For any particular tumor the risk of first recurrence at each of these sites can be determined from available data sources. However, these data are often difficult to find in the medical literature. Figures for the incidence of metastases in various organs at post-mortem are more easily obtained, and in some tumors an extrapolation from such data may be necessary to obtain a “first recurrence” incidence.

Table 3 provides an example of the percentage incidence figures of first recurrence at different sites for a hypothetical tumor.

Site	Incidence
Local and lymph nodes	60%
Liver	20%
Lung	5%
Bone	5%
Bone marrow	0%
Brain	10%

Table 3: Incidence of metastasis by site for a hypothetical tumour

4.4 Defining the Risk of a Particular Metastasis Causing Incapacitation

A first recurrence in a regional lymph node carries a very small risk of incapacitation. A brain metastasis, on the other hand, as the first indication of recurrent disease, must be assumed to carry a 100 %potential for sudden incapacitation in the form of a fit or seizure or another neurological event such as paresis, sensory loss or headache. Metastatic disease in bone marrow can cause anaemia and bleeding disorders. Rarely metastases erode major vessels with catastrophic consequences (lungs and liver).

The risk of subtle incapacitation is harder to quantify, but it must be assumed that any recurrence of any tumour will degrade the operational abilities of aircrew to some extent. Thus a table of “incapacitation weighting” can be constructed to give an estimate of the potential for sudden and insidious incapacitation by a recurrence at each metastatic site. This is shown in Table 4.

Site	Incapacitation weighting
Local and lymph nodes	5%
Liver	5%
Lung	5%
Bone	5%
Bone marrow	20%
Brain	100%

Table 4: Incapacitation weighting

4.5 Defining the Total Risk of Incapacitation

Three parameters may be known about tumour X, and these can be used to estimate a “total” risk of incapacitation. They are:

- The recurrence rate per year for any stage of tumour X (as a percentage)
- The frequency of metastatic disease in a particular organ (as a percentage)
- The risk that a metastasis in a particular organ will cause incapacitation (as a percentage).

A formula can now be divided to calculate the total risk of particular metastases causing incapacitation in any year after completion of primary treatment. The example below is for brain metastases.

(Tumour X recurrence rate (%)) X (Incidence of brain metastases (%)) X (Risk of a brain metastases causing incapacitation (%)) = Incapacitation risk for brain metastases in tumour X (%)

Using the figures that we have obtained, numbers can be put to this formula. The tumour recurrence rates per years are from **Figure 2**.

Year 1 / Stage 1: $1/20$ (5%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $1/200$ = 0.5% risk of incapacitation
Year 1 / Stage 2: $3/20$ (15%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $3/200$ = 1.5% risk of incapacitation
Year 1 / Stage 3: $3/10$ (30%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $3/100$ = 3.0% risk of incapacitation.

In the first year, therefore, the average risk of incapacitation due to brain metastases ranges from 0.5 percent to 3.0 per cent, depending on the staging of the tumour. This would allow a range of certification as shown in **Table 5**.

Year 1 - Brain Metastases			
Stage	Incapacitation risk	Professional certification	Private certification
1	0.5%	As or with co-pilot	Unrestricted
2	1.5%	None	Safety pilot
3	3.0%	None	Safety pilot

Table 5: Range of certification possible in first year after completion of treatment

By year 5 the prognosis has improved and the incapacitation risks have decreased. Again the tumour recurrence rates are taken from **Figure 2**.

Year 5 / Stage 1: $1/100$ (1%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $1/1000$ = 0.1% risk of incapacitation
Year 5 / Stage 2: $1/20$ (5%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $1/200$ = 0.5% risk of incapacitation
Year 5 / Stage 3: $1/5$ (20%) $\times$ $1/10$ (10%) $\times$ $1/1$ (100%) = $1/50$ = 2% risk of incapacitation

In the fifth year the risk of incapacitation has now fallen to between 0.1 and 2%. The range of acceptable certification has also increased, as shown in **Table 6**:

Year 5 - Brain Metastases			
Stage	Incapacitation risk	Professional certification	Private certificat
1	0.1%	Unrestricted	Unrestricted
2	0.5%	As or with co-pilot	Unrestricted
3	2 %	None	Safety pilot

Table 6: Range of certification possible in fifth year after completion of treatment

Other types of recurrence are possible (and indeed more likely) than brain metastases, but because of the” incapacitation weighting” given to each anatomical recurrence, brain lesions contribute most to the total risk of incapacitation. The combined risks of several sites of recurrence may need to be taken into account.

4.6 Presenting the Total Risk of Incapacitation

A table can be used to show the type of certification possible depending on time since completion of primary treatment and stage (Table 7):

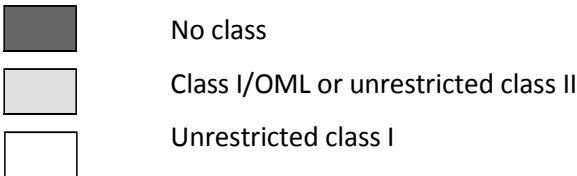
stage	Year since completion of primary treatment				
	1	2	3	4	5
1	0.5% (5%x10%x100%)	0.2% (2%x10%x100%)	0.1% (1%x10%x100%)	0.1% (1%x10%x100%)	0.1% (1%x10%x100%)
2	15%x10%x100%=1.5%	12%x10%x100%=1.2%	9%x10%x100%=0.9%	7%x10%x100%=0.7%	5%x10%x100%=0.5%

Table 7: Certification possibilities according to stage and time since completion of treatment

This can be displayed graphically in a chart as shown in **Figure 3**:

stage	Year since completion of primary treatment				
	1	2	3	4	5
1					
2					

Figure 3: Bar Chart indicating certification possibilities according to stage and time since completion of treatment



4.7 Using Certification Assessment Charts

It must be emphasized that charts are only for guidance. Flight crew with tumours that have a number of additional good prognostic factors may be returned to flying earlier than the “average” example demonstrated by the chart. Conversely, if adverse prognostic factors are present, further delay may be necessary before recertification.

Charts are based on published survival statistics following treatment for a particular type of tumour and may need revision if new therapy is introduced or the results of new studies become available. Studies used to calculate the certification assessment figures may use overall, event free or disease-free survival, and may include subjects unrepresentative of a pilot population (in terms of age, sex, country of residence, lifestyle and other variables) and may include cases where curative treatment has not been attempted. Individual case assessment therefore remains paramount.

Charts are useful for tumours that have a prognosis that improves with time. Some malignancies have a long median survival time of ten years or more but the rate of progression remains relatively constant with time. In such a situation it may be possible to maintain certification for several years provided the license holder remains asymptomatic, is not on active treatment, and is reviewed regularly.

4.8 Tumour Markers

The relapse or active progression of certain tumours may be effectively followed by measuring tumour markers. The most common example in pilots and controllers is adenocarcinoma of the prostate where levels of Prostate Specific Antigen (PSA) can be tracked over a period of time.

Analysis of the tumour marker is very useful in determining the risk of relapse for an individual.

It is inappropriate to use a certification assessment chart where this alternative type of specific risk assessments is possible.

5. WAIVER CONSIDERATION FOR APPLICANT WITH CANCER

Generally Waiver recommendation for applicants with a history of cancer is done on a case- by-case basis. Survivors of childhood leukemia or lymphoma are generally considered cured if their disease-free survival is for more years than their age at diagnosis.

With the exception of basal cell carcinoma, all malignancies require medical board appointment. The board may find the member fit for full duty immediately, as would be expected after excisional biopsy of a low level malignant melanoma, or it may place the member in limited duty status for some period of time.

5.1 General Requirements:

- A member must be on full duty before waiver consideration for flight status.
- An objective assessment by the oncologist of the chances of cure, the risks, likely nature and ease of detection of recurrence, and recommendations for follow-up are included. Of particular interest is an estimate of the 5 year survival rate.
- It will be appropriate to recommend a return to restricted flying status provided there is a minimal risk of incapacitation as a result of recurrence of the malignancy. This decision will include an assessment of survival and recurrence rates, in conjunction with the tendency for recurrences to present catastrophically.

- The necessity for continued follow-up will almost certainly interfere with operational requirements unless the follow-up is at greater than 6-month intervals, or the tests required for follow-up are very simple (e.g. CBC).
- In most cases upgrading to full duty, and hence a waiver to full flight status, can be considered 2 years after completion of therapy provided there is no recurrence. Specific exceptions to this are addressed on the individual data sheets.

APPENDIX I - SOP

Standards Operation Procedure which is detailed, written instructions to achieve uniformity of the performance of a specific function, it is a written process or a way for the AMEs to perform the task of GCAA examination and assessment the same way each time it is completed. It is used to:

- (a) Identify the responsible person for each task.
- (b) Describe actions (i.e. what is to be completed).
- (c) Train staff (new AME, Admin assistance, Nurses) on the processes
- (d) Monitor the clinic and AME performance.

- Benefits of SOP

- (a) It will ensure that all GCAA Aviation medicine activities conducted within the AeMC follows the updated GCAA regulation, Evidence Based Medicine, international best practices in Aviation medicine and the organizational policies; to protect the rights for all license holders attending GCAA examination at this centre.
- (b) Provides autonomy within the clinical site. Improves the quality of the data collected, thereby improving the quality of any research in the field.
- (c) Utilized as a reference and guideline as to how research will be conducted within the clinical site on any particular medical condition before issuing or denying any medical certificate.
- (d) Excellent training source for new AMEs

- Essential Elements of SOP

Header – title, original version date, revision date, effective date, approved by

- Purpose – why one has the policy
- Responsibilities – who the policy pertains to
- Instruction/Procedures – how to accomplish the items of the policy
- References – what the policy is based on
- Appendix – source documents/case report forms

It is essential for any approved AeMC to develop an internal Verification process to ensure the compliance of all AMEs with the approved standards in relation to all GCAA Examination, assessment, diagnosis and management before making any fitness decisions.

This is to ensure that given the same or a similar piece of evidence the AMI and verifiers (in this context Accountable manger) would come to the same conclusions.

- (a) The Accountable Manger is responsible to develop an internal Audit procedure to confirm:
 - 1) Compliance of all AMEs with GCAA regulation, and
 - 2) The AeMC approved SOP.
 - 3) Performance of AVMED Nurses involved in special investigation part of the GCAA examination.
 - 4) Ensure the compliance of personnel involved in GCAA examination with the code of conduct.

- (b) The Accountable manger should monitor each activity within the centre on periodic review and document the audit reports securely within the facility for GCAA review and any other audit may be required for quality reason.
- (c) The Accountable Manager will apply any quality improvement actions required to develop the processes where necessary and detail these in the report provided to the AMS for review and approval.

APPENDIX II - INTERNAL VERIFICATION PROCESS

Internal Verification Process

It is essential for any approved AeMC to develop an internal Verification process to ensure the compliance of all AMEs with the approved standards in relation to all GCAA Examination, assessment, diagnosis and management before making any fitness decisions.

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 - 3) Performance of AVMED Nurses involved in special investigation part of the GCAA examination.
 - 4) Ensure the compliance of personnel involved in GCAA examination with the code of conduct.
- b. The Accountable Manager should monitor each activity within the centre on periodic review and document the audit reports securely within the facility for GCAA review and any other audit may be required for quality reason.
- c. The Accountable Manager will apply any quality improvement actions required to develop the processes where necessary and detail these in the report provided to the AMS for review and approval.
- d. The Nurses should have a sufficient training on AV MED and documented acceptable competency level in the performed special investigation:
 1. CAD test
 2. Visual acuity testing
 3. Ishihara plates test
 4. Urine dipstick test
 5. Urine drug testing
 6. ECG
 7. Audiogram
 8. Spirometry/PEF
- e. Sufficient number of Admin staff aware about all GCAA procedures
- f. Availability of CPD/CME program within the centre – directly related to GCAA activities.
- g. Presence of Code of practice (professional ethics) within the facility.
 1. It is styled as a code of professional responsibility, which will discuss difficult issues, difficult decisions that will often need to be made, and provide a clear account of what behaviour is considered "ethical" or "correct" or "right" in the circumstances.
 2. A code of practice is a good way to state clearly any organisation's position on important subjects like confidentiality, equality, ethics, contracts, conflict of interest and duty of care.
- h. Presence of sufficient number of good performer AMEs who will be permitted to do class I and /or cabin crew medicals.

APPENDIX III - FUNCTIONAL HEARING ASSESSMENT FORM (LIF-MED-011 FORM)

Dear Training Captain/CFI,

The subject named below has recently had an audiogram performed which is below the required standard for unrestricted medical certification. Please complete the following assessment and forward it to Licensing section at the address at the bottom of the page.

Name:		GCAA License Number	
Place of Test:	☐ Aircraft ☐ Simulator		

Can the subject hear adequately in the Aircraft/ Simulator during all phases of flight?	YES	NO	N/A
Dose his/ her hearing loss interfere with the ability to communicate with air Traffic Control and / or other flight crew members during all phases of flight.	YES	NO	N/A
Can he/ she accurately identify non-routine R/T phraseology?	YES	NO	N/A
Can he/ she identify accurately the identification signals of Navigation Beacons?	YES	NO	N/A
In your opinion, does his/ her hearing loss interfere with flight safety.	YES	NO	N/A
Have you any other observations or comments?			
Name:		Dates:	
Position:		Signature:	
GCAA Instructor/Examiner No			

APPENDIX IV - POPULAR DRUGS REPORTED TO AFFECT COLOR VISION

The following table offers just a sample of the popular drugs that have been reported to affect Colour Vision:

1	Analgesics, Anti-Inflammatory Agents:	
	Drug	Side Effects
a.	Ibuprofen (Advil)	Blurred Vision; Decreased Vision; Photosensitivity; Decrease in Colour Vision.
b.	Naproxen (Anaprox, Aleve)	Decreased Vision; Changes in Colour Vision; Photosensitivity, Corneal Opacities.
2	Cardiovascular Drugs	
	Drug	Side Effects
a.	Digitalis Glycosides	Colour Vision Defects, Decreased Vision, Glare Phenomenon, Flickering Vision.
b.	Diuretics (Thiazide-type)	Color Vision Abnormalities, Decreased Vision, Myopia, Retnal Edema.
3	Hormones, Hormone-Related Drugs	
	Drug	Side Effects
a.	Estradiol (general)	Colour Vision Abnormalities, Decreased Vision, Fluctuations of corneal curvature and corneal steepening.
b.	Oral Contraceptives	Colour Vision Abnormalities, Decreased Vision, Retnal vascular disorders.
c.	Tamoxifen (Nolvadex)	Decrease in Colour Vision, Decreased Vision corneal opacities, retinopathy, possible optic neuritis or neuropathy.
4	Other Drugs	
	Drug	Side Effects
a.	Plaquenil	Colour Vision
b.	Chloroquine	Colour Vision
c.	Myambutol	Colour Vision
d.	Barbiturate	Affect the yellow or yellow-green vision
e.	Viagra	Temporary change in blue/green colours
f.	Vitamin A (in a retinol form)in large doses	Affect the yellow or yellow-green vision
h.	Caffeine	In large doses can alter the colour vision temporarily

APPENDIX V - EPWORTH SLEEPINESS SCORE

Epworth Sleepiness Score

Situation	Chance of dozing 0 = no chance of dozing 1 = slight chance of dozing 2 = moderate chance of dozing 3 = high chance of dozing
Sitting and reading	
Watching television	
Sitting inactive in a public place (e.g. a cinema or meeting)	
As passenger in a car for > 1 hour	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to a companion	
Sitting quietly after an alcohol-free lunch	
In a car, while stopped briefly in heavy traffic	
Total Epworth Sleepiness Score	

Johns MW, A new method for measuring daytime sleepiness: the Epworth sleepiness scale.
Sleep, 14(6):540-545.)

APPENDIX VI - STOP BANG

Screening for: OBSTRUCTIVE SLEEP APNEA

Answer the following questions to find out if you are at risk for Obstructive Sleep apnea.

STOP

S	(snore) Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?	YES / NO
T	(tired) Do you often feel tired, fatigued or sleepy during daytime?	YES / NO
O	(obstruction) Has anyone observe you stopping breathing during your sleep?	YES / NO
P	(pressure) Do you have or are you being treated for high blood pressure?	YES / NO

BANG

B	(BMI) Body Mass Index more than 35kg/m ² ?	YES / NO
A	(age) age over 50 years old?	YES / NO
N	(neck) neck circumference greater than 40 cm? *	YES / NO
G	(gender) gender male?	YES / NO

Result:

High risk of OSA – 'yes' to three or more items

Low risk of OSA – 'yes' to less than three items

APPENDIX VII - LASER QUESTIONNAIRE

A - APPLICANT DETAILS

**GCAA LICENSE:
NAME:**

B - MEDICAL INFORMATION:

Following questions are designed to gather information to assist the eye doctors in analysis of laser beam exposure incidents. It should be anticipated that further questions and information will be sought as time allows.

1. DESCRIBE THE LIGHT YOU SAW

- 1.1. What colour(s) was the light(s)?
- 1.2. How bright was it?
- 1.3. How long was it on?
- 1.4. Was it uniform in appearance?
- 1.5. Did the intensity of the light change?
- 1.6. Was it constant or did it pulse or flicker? If so how fast did it pulse or flicker?
- 1.7. How wide (perhaps using finger widths at arm's length) was the beam at origin?
- 1.8. How wide on exposure was the light? Did the light fill your cockpit or compartment?
- 1.9. Was the light emanating directly from a source or was it reflected off a surface?
- 1.10. Were there any other unusual light sources?
- 1.11. Have you seen this light(s) before?

2. DATE AND CIRCUMSTANCES

- 2.1 Date and time (local using a 24-hour clock) that the exposure occurred? Local: DDMMYYYY hh:mm.
- 2.2 How far and in what direction was the light source? Was it airborne or surface based?
- 2.3 What was between the light source and your eyes?
- 2.4 What were the atmospheric conditions: clear, overcast, rainy, foggy, hazy, and sunny?
- 2.5 Was any equipment such as windscreens, visors, NVGs, goggles or sensors affected by the light?

2.6 What evasive manoeuvres did you attempt and did the beam follow you as you tried to move away?

3. EFFECTS

3.1 How long did you look into the light beam?

3.2 Did you look straight into the light beam or off to the side?

3.3 What tasks were you doing when the exposure occurred? Did the light(s) hamper you from doing those tasks?

3.4 Were both eyes exposed? If not, describe the difference between the light exposure (for example, one eye was shielded or closed, or on the side away from the light beam).

3.5 Describe any difference in the effect on either eye.

3.6 Was the light so bright that you had to blink or squint, close your eyes, or look away?

3.7 Was the light painful? Describe the pain. For how long did the pain persist after the light exposure?

3.8 Was vision affected while the light was on? How much of your visual field was affected? What types of things could you see or not see? Did you notice the colour of instruments or targets change? Did the changes to your vision remain constant or vary during the exposure? If the light source was mounted on a platform (e.g.: aircraft, ground vehicle or building), how much of the platform was obscured?

3.9 Did your vision remain affected after the light was extinguished? If so, for how long and how did you estimate the time? What types of things could you see or not see? Did you notice afterimages ("spots before your eyes")? If so describe them.

3.10 Was there any lingering (i.e., hours or days) visual effects? If so, were the effects continuous or intermittent? Did you have problems reading or seeing in low-light conditions? How long until you were able to see normally again?

3.11 Did you notice any reddening, warming, or burns to your skin?

3.12 Describe the condition of your vision before the incident? Do you wear glasses?

3.13 Are you taking any medications?

APPENDIX VIII - MEDICATION GUIDELINES FOR AMES

1 – GENERAL INFORMATION

1. These Guidelines have been developed to assist the AMEs in determining the aeromedically acceptable use of medications for aircrew and ATCs. Each prescribing situation is unique in terms of the illness, the individual, and the drug, and it is difficult to legislate the sensible use of medications in aircrew and ATCs. Determining whether a medication may be used in aircrew on flying duties and/or ATCs on controlling duties and what restrictions may be appropriate should be based on a sound knowledge of aeromedical evaluation of the drug if available, drug actions, side effects, and the operational environment including possible contingency situations.

Note: If in doubt about prescribing a medication for an aircrew, AME should consult the GCAA Aeromedical section, for their decision and approval.

2. When aircrews or ATC are started on a long-term medication, the AME must inform Aeromedical Section even if the medicine is compatible for flying or controlling duties.
3. One of the functions of the AME is to brief their candidates on the appropriate use and precautions in the use of drugs, including over-the-counter (OTC) medications and herbal preparations, which the candidates may not consider as "drugs". These guidelines may be helpful in the preparation of such briefings.
4. Aircrew or ATC may also be prescribed medications from sources other than their AME, e.g. by Dental Officers or Consultants, and they should be briefed in the requirement to consult their AME prior to returning to flying or controlling duties while taking medication prescribed from any source.

2 - DRUGS, DISEASES AND FLIGHT SAFETY

In prescribing any medication for aircrew or ATC, the AME should consider both the nature of the disease process, and the medication. Sometimes, the disease or medical problem itself will preclude flying rather than the potential side-effects of the medication.

When prescribing medications to aircrew/or ATC we are concerned about two possibilities which may impact on FIGHT SAFETY:

1. Acute incapacitation
Is there any possibility that this drug, in this situation, might cause incapacitation; anaphylaxis, acute vertigo, hypotension, arrhythmias, diplopia
2. Performance decrements.
Performance decrements may occur through a direct effect on the CNS, or, by a peripheral side-effect e.g. GI upset, which can be distracting enough to cause a critical lapse of attention. Drugs with obvious CNS side-effects are obvious exclusions, but subtle side-effects from other medications may also cause serious flight safety problems.

So any medication which can affect flight safety, the candidate must be grounded.

3 - DRUG GROUPS - CONSIDERATIONS AND RECOMMENDATIONS

Unfortunately, it is impossible to cover every drug available. And in case of any doubts or concerns regarding a particular prescribed or no prescribed drugs refer to the GCAA Aeromedical section.

4 - DIGESTIVE PATHOLOGY

ANTI-SPASMODIC MEDICATIONS

1. This group of medicine used to treat non-ulcerative colitis dyspepsia, irritable bowel syndrome and diverticular disease.
2. Prescribed Antispasmodic, medicines, such as Lamotil, Bentyl, Levsin, Donnatal, Librax, Cantil and Barbidonna are incompatible to flying/or controlling duties, because of their antimuscurinic effects (atropine like effects), which may cause confusion, reduced power of accommodation, difficulty in micturition and constipation.
3. OTC antispasmodic medicine, such as Buscopan is also incompatible with flying/controlling duties, because of its antimuscurinic effects.
4. Occasional use of these medicine for treatment of self-limited gastroenteritis of traveler's diarrhea require a 48 hours waiting period after the last dose before returning to flying/or controlling duties.
5. Antispasmodic medicine which contains Barbiturate, e.g. Donnatal, may cause positive drug screening test.
6. Other antispasmodic, such as – alverine, mebeverine and peppermint oil are acceptable.

5 - ACID SUPPRESSION THERAPY – PUD, GERD AND DYSPEPSIA

1. Active GI ulcer disease requires grounding. Aircrew or ATC suspected of having active ulcers should undergo endoscopy and treated accordingly .after the completion of the diagnosis and treatment, the aircrew or ATC can return back to flying /or controlling duties depending on the initial assessment of the gastroenterologist at the time of endoscopy, it may be necessary to repeat endoscopy to confirm ulcer healing before returning to flying/or controlling duties.
2. For dyspeptic symptoms without a demonstrable ulcer, for reflux symptoms, and for "maintenance" therapy after ulcer healing, OTC antacids or H2 antagonists (e.g. ranitidine, cimetidine) or proton pump inhibitor (e.g. pantoprazole) may be used by aircrew or ATC provided there are no side effects.
3. For gastro-esophageal reflux (GERD), proton pump inhibitors are most efficacious and may be used for aircrew including pilots.

6 - ANTIDIARRHEAL MEDICINES

1. OTC preparations such as Imodium are allowed if the symptoms are not severe.
2. Antimotility drugs such as codien phosphate, cophenotrope and morphine are not acceptable.

7 - ANTI HAEMORRHOIDS

Soothing preparations containing bismuth subgallate, zinc oxide and haemamelis often mixed with a small dose of corticosteroid may be acceptable in short courses for topical applications.

8 - TREATMENT OF GALLSTONE

Treatment for dissolution of gallstone is not compatible with flying status as it may cause diarrhea and possible cholecystitis.

9 - TREATMENT OF INFLAMMATORY BOWEL DISEASE

1. Local anti-inflammatory drug such as meselazine, a well-tolerated drug may be compatible with flying status.
2. Rectal corticoids may be acceptable
3. Salazosulfapyridine should be avoided because of its frequent adverse effects, but on individual basis, can be permitted if the pilot had a grounding trial period of 4 weeks and showed no significant side effects.

10 - ANTI-MOTION SICKNESS DRUGS

Currently, no anti motion sickness medications are considered safe enough for routine use by flight deck aircrew, FE or ATC.

11 - CARDIOVASCULAR DRUGS

HYPERTENSION

There include a wide variety of medications such as diuretics, beta-adrenergic blocking agents, ACE inhibitors, calcium channel blockers, labetalol, prazosine and minoxidil. Some of these drugs may be compatible with flying duties

THIAZIDES

Thiazide diuretics use in crew member or ATC does not require any flying /or controlling restriction. However, they may produce some serious side-effects like hypokalemia, which may be of concern in the aviation environment. Strict laboratory and clinical monitoring is necessary at periodic interval (every 3 months) and reports are should be forwarded to the GCAA with the applicant's medical application. Combinations of thiazide with spironolactone may also be compatible with flying /or controlling duties.

BETA-BLOCKERS

These drugs may be compatible with flying/or controlling if they are prescribed for a condition having no adverse effect on flying safety. Selective B1 blockers (e.g. Atenolol) are preferred for flying/or controlling personal. Excess bradycardia or orthostatic arterial hypotention would be grounds for a change in treatment.

ACE INHIBITORS

Angiotension-converting enzyme inhibitors as a class have fewer side-effects than most other antihypertensive. The current recommendation is that ACE inhibitors may be compatible with flying/or controlling duties. e.g. Captopril, Enapril, Lisinipril.

ANGIOTENSIN II RECEPTOR ANTAGONISTS:

May be compatible with flying/or controlling duties. E.g. candesartan, Irbesartan, losartan

CALCIUM-CHANNEL BLOCKERS

May be compatible with flying/or controlling duties, if used for hypertension only.

The longer acting products (i.e., amlodipine) are to be preferred to shorter acting ones (i.e. nifedipine). Verapamil and diltiazem may also be considered but not in concert with a beta-blocking agent.

11 - CENTRAL ANTIHYPERTENSIVE DRUGS

Incompatible with flying or controlling duties e.g. clonidine, alphas-methyl-dopa

VASODILATORS

Incompatible with flying/or controlling duties e.g. prazosin, dihydralazine

12 - ANTIARRHYTHMIC DRUGS

Fit assessment of flying/controlling personnel with arrhythmias is only possible by AMS after review procedure. Many of these medications have proarrhythmic effects.

- a) Class I sodium channel blockers (e.g. flecainide) are not compatible
- b) Class II Beta blockers (e.g. bisoprolol), are compatible
- c) Class III potassium channel blockers (e.g. amiodarone, I) are not compatible; Sotalol on individual basis can be accepted for flying duties.
- d) Class IV calcium channel blockers (e.g. verapamil) are compatible e) Digitalis derivatives are compatible

13 - ANTIANGINAL MEDICATIONS

Nitrates or other antinatal substances are incompatible with flying/or controlling g duties when used for treatment or prevention of ischemic symptoms.

14 - ANTICOAGULANTS

This group of medicine (e.g. Heparin and Warfarin) is not compatible with flying and controlling duties. But low doses of anti-platelets drugs (aspirin, dipyridamole) may be acceptable.

15 - RESPIRATORY SYSTEM

ASTHMA

The GCAA may approve the use of certain medications for treatment of mild asthma.

1. Oral steroids or theophyllines derivatives are not permitted. Asthma in general is not compatible with aircrew duties, and candidates with a history of recent asthma should not be selected for aircrew training. Aircrew candidates with a history of wheezing during childhood should be evaluated with an airway challenge test to objectively determine their current degree of airway reactivity.
2. Trained aircrew develop asthmatic symptoms should have a thorough pulmonary review including pulmonary function tests before and after bronchodilator, airway challenge testing, and an exercise test if indicated.
3. If it is determined that the degree of airway reactivity is mild, and can be well controlled with inhaled corticosteroids with minimal requirement for inhaled beta-agonists, pilots can be returned to flying duties and other aircrew and ATCs may return to unrestricted duties. Oral bronchodilators including theophyllines and beta-adrenergics are not permitted. Leukotriene inhibitors have not been investigated from an aeromedical perspective, and at present should not be used in pilot aircrew. Use in non-pilot aircrew may be considered after consultation with GCAA Aeromedical section.
4. The use of short acting beta agonist/or long acting beta agonist should be restricted to eight hours or more prior to flying/or controlling, but may be used in an usual asthmatic attacks flight to allow the safe completion of the flight.

ANTITUSSIVE DRUGS

Antitussive opioids are incompatible as they may induce drowsiness. They are also detected in urine tested for opioid derivatives. (e.g. Aurimel, Bepro, Broncholar, Broncholarforte, Bronchophane, Codaphed, Codilar, Codipront, Codipront Cum exp, Coldex-D, Dextrokuf and Dextrolog. However, non-narcotic Antitussives, and not combined with sedative agents or antihistamines, are not contraindicated for flying.

EXPECTORANTS

Mucolytic agents are well tolerated and are compatible with flying duties. Other expectorant containing opioids are incompatible (e.g. Broncholar, Broncholarforte, Codipront Cum exp, Bronchophane, and Dextrolog.

16 - ANTIHISTAMINES (ANTI ALLERGIC MEDICINES)

1. In general sedating oral antihistaminics are incompatible for flying/or controlling duties. Since many compounds of this type are freely available over-the-counter, the AME should regularly brief aircrew and ATC on the potential hazards of these compounds, including the potential arrhythmogenic potential of pseudoephedrine.
2. Non-sedating oral antihistamine (e.g. Loratadine – Claritin and fexofenadine – Allegra-) are H1 antihistamines which have not been demonstrated to have anticholinergic or CNS effects and so can be acceptable for flying/or controlling duties. The drug should first be used for a non-flying trial period of at least 7 days, and the minimal dosage which effectively controls symptoms determined. Candidate must be seen again before returning to flying/or controlling duties, and the presence of any side-effects as well as the extent of symptomatic control determined. Alcohol must not be taken within a 24 hour period prior to flying while taking an antihistamine.

3. Topical antihistamine can be used by the crew members and the ATCs.

17 - ENDOCRINOLOGY

THYROID

1. HYPERTHYROID:

Patients with hyperthyroidism must be grounded on diagnosis of hyperthyroidism. If thyroid suppression treatment with propylthiouracil or carbimazole is undertaken, crew member must remain grounded until a euthyroid state has been established for at least two months and satisfactory report from the endocrinologist/or general physician is received by the GCAA. If there have been eye signs, an ophthalmologist consultation is required to assess the range of eye movement and exclude diplopia. Anti-thyroid drugs are not disqualifying in the absence of side effects I131 therapy may be preferred therapy. The crew must remain grounded during therapy and until clinically and biochemically euthyroid following treatment. All patients with hyperthyroidism should remain under lifelong follow-up.

2. HYPOTHYROID:

Patients may be returned to flying duties while using thyroid replacement hormones once a state of clinical and biochemical euthyroidism has been established (TSH normal, no symptoms or signs).

18 - METABOLIC DISEASES

ANTI DIABETIC

- a) The use of insulin and Sulfonamides are disqualifying for all the classes of medical.
- b) Hypoglycemic drugs like Biguanides (e.g. Metformin), may be acceptable for flying duties if satisfactory blood sugar controlled achieved.

TREATMENT OF HYPERLIPIDEMIA

1. HMG CoA reductase inhibitor (statin), with preference for hydrophilic molecules such as pravastatine rather than the lipophilic substances such as simvastatin which may induce sleep disorders.
2. Fibric acid derivatives (e.g. gemfibrozil), may be used if there is hypertriglyceremia.
3. Zetia (Ezetimibe), a new class medicine for lowering cholesterol. Can be used with combination with statins.
4. Cholestyramine, after a previous evaluation of gastrointestinal tolerance.

The candidate should be grounded for the first two weeks during the initiation of drug therapy for hyperlipidemia, and require monthly monitoring of lipid and transaminase levels during the first six months of treatment. Medication to be discontinued in the case of gastrointestinal side effects or elevated transaminase concentration (greater than 3 time the normal concentration)

GOUT PROPHYLAXIS

Allopurinol is currently approved for prophylaxis of gout without requirement for an operational restriction. Allopurinol is indicated for prophylaxis after recurrent episodes of gout. Because of the risk of precipitating an episode of gout during initiation of allopurinol therapy (which should generally be done with colchicine coverage), the candidate must be grounded for the first 14 days of allopurinol therapy

19 - NEUROLOGY

ANTI EPILEPTIC MEDICINE AND DRUGS USED FOR PARKINSON DISEASE

All the drugs prescribed for these diseases are disqualifying for the flying duties. The GCAA may permit on exceptional cases the applicants who were using anti epileptics medicine for temporary basses, after satisfactory electroencephalographic evaluation and period of 3 months symptom free and off drugs (e.g. post head injury, or some cases of excised benign tumours without complication).

MIGRAINE TREATMENT

1. In general no anti-migraine is acceptable for flying/or controlling duties.
2. The GCAA may permit the use of certain prophylactic (preventive) migraine headache medication (e.g. beta blocker, calcium channel blocker), the GCAA approval require document that the medication is successful in preventing the occurrence of the attack.
3. The Cabin crew class is allowed to fly with the use of SSRI, as a treatment for migraine, if satisfactory control of the symptom is reported after ground trial.
4. The use of single drug, ergot derivatives for aborting an infrequent attack may be acceptable to GCAA, after a previous test period and full neurological evaluation.

PSYCHIATRY

All drugs used for psychiatric treatment may affect alertness and upper brain functions; therefore they are incompatible with flying /or controlling duties. These drugs include barbiturates, neuroleptic antidepressant, normothymic, anxiolytic and hypnotic drugs.

SEDATIVES/HYPNOTICS

1. In general, this class of drug is not compatible with flying/or controlling duties, but because there may be occasions under operational conditions when it may be useful to prescribe a short-sedatives, the GCAA recommend the drug Temazepam (Restoril) or Zolpidem for that purpose.
2. Other drugs especially those with long-acting active metabolites e.g. diazepam, must not be used.
3. Dietary supplements, such as melatonin and Valerian reported help reduce sleep problems.

TEMAZEPAM/ZOLPIDEM:

Indication: it should be used on temporary basis to assist sleep pattern during transient insomnia due to extraneous factors such as shift works, or jet lag during a limited stopover in long-haul transport operation to facilitate sleeping onset.

Characteristic: This medication has a short half-life, does not accumulate on daily ingestion, rapidly eliminated and does not have a slowly eliminated metabolite and they have rapid onset of action.

Dose: for Temazepam 10-20mg allowed for the crew/and for Zolpidem 10 mg

Side effects: occur with unnecessarily high doses for unnecessarily long period, so adverse effects may imply misuse of the medication by the aircrew. Impaired performance the next day and anterograde amnesia and sedative sequel would be of considerable significance to aircrew.

The GCAA in order to control the use of hypnotics among the crewmembers and prevent its misuse recommends the followings:

1. The AME should not encourage the crew member who is complaining of sleep problems or jet-lag to use medication before trying the non-medical remedies.
2. The AME should recommend the non-medical remedies such as no caffeine, no alcohol, no smoking, and exercise prior to bed-time, silence, darkness, fresh air and lower temperature in bed room, relaxation technique...
3. If the above measures failed, the AME can prescribe the medication, and in this case the drug needs to be ground tested first (by taking it on a day when not schedule to operate the following day) to ensure no adverse side effects are experienced.
4. The dose should be kept to a minimum.
5. The AME should explain to the crewmembers that this drug should not be combined with alcohol and some other medications which can be used by crew member (refer to appendix).
6. The crewmember that is using this tablet should not fly or control the aircraft for at least 12 hours after the ingestion of the tablet.
7. The AME should explain to the crew that any misuse of the drug, i.e. higher dose than the recommended one, or using it within 12 hours of the flight commencement may jeopardize the flight safety as it decrease performance. Also in case of random drug testing, the AME should explain that if the tablet is consumed before 12 hours, the drug level in the urine will not exceed the cut-off level of Temazepam or /Zolpidem specified by the laboratory.
8. If the crewmember needs the drug more frequently than it is recommended, or using higher doses, he/she should be assessed by psychiatrist for possible misuse or abuse.

MELATONIN:

Melatonin is a hormone that is secreted by the pineal gland to regulate the sleep cycle. In the evening the level of the hormone in the bloodstream rise sharply, reducing alertness and inviting sleep, and in the morning it falls back, encouraging waking.

The most noticed benefit of melatonin is in combating circadian rhythm disturbances (e.g. jet lag, shift work and delayed sleep phase syndrome), rather than other causes of insomnias

Note: melatonin supplements do not appear to affect sleep quality, wakefulness after sleep onset, total sleep time or percent of time spent in rapid eye movement (REM) sleep.

Side effects:

Abdominal cramping, fatigue, headache, dizziness and irritability, some user will have a hangover like effect the following day and a small percentage may have vivid nightmares and disturbed sleep. , and so if the crew decided to take this supplement, he should go first for a week period of ground trial before using it

Possible drug interaction with Melatonin:

In all cases the crew shall inform his AME about his use of this supplement, and if the crew decided to take this supplement, he should go first for a week period of ground trial before using it, and especially if the prescriptions of the following drugs are recommended:

1. Antidepressant, melatonin reduces their effect. (High doses of melatonin 1200 mg have been reported to cause depression).
2. Blood pressure medication (melatonin acts as vasoconstrictor)
3. Blood thinning medications, Anticoagulants, increase risk of bleeding
4. Steroid and Immunosuppressant medications (melatonin act as immunosuppressant)
5. Other substances: caffeine, tobacco and alcohol can all diminish level of melatonin in the blood.

VALERIAN

Valerian is an herbal choice for the treatment of mild insomnia, anxiety and muscle pain. It has good tolerability

Valerian extracts cause sedation by increasing the amount of gamma aminobutyric acid (GABA, an inhibitory neurotransmitter)

Because of the sedative CNS effects and interference with judgment which occur with the use of this supplement, the GCAA will not allow any applicant to exercise their flying duties/or controlling duties while they are taking this supplement.

If the applicant; s condition does not require medical intervention, and he prefers to take this supplement rather than anxiolytics or hypnotics, he/she can exercise their flying/or controlling duties, after ground trial, and in these cases the tablet must be taken at least 6 hours before flying.

ANTI-DEPRESSANTS

1. The use of antidepressants is incompatible for all the classes of medical except cabin crew class, where they may be permitted to resume flying duties, depending on the psychiatrist's report.
2. SSRI is the only class of medication allowed to be used in cabin crew wishing to continue their flying with the use of medications, provided successful improvement was achieved with ground trial period.

3. TCA and MAOIs are incompatible with flying duties.
4. The GCAA may consider certification for all classes who were successfully treated with Electroconvulsive Shock therapy.
5. Non-traditional treatment – St. John's Wort, is herbal preparation used for depression. Any person intended to take this supplement should consult his AME about his symptoms, and it should be ground tested first. The AMEs should inquire more deeply into the candidate's psycho-medical history and advise any candidate who is taking this supplement about possible side effects of it, like rising blood pressure, and he should also advise them to avoid alcoholic beverages, foods that contain tyramine and some medications like over the counter cold and flu remedies and its use with antidepressant medications.
6. Non-traditional treatment- tryptophan (5-HTP), it is herbal remedy for depression that is immediate precursor to Melatonin and Serotonin. Serotonin gives a neurochemical balance during times of stress and is essential to regulating mood and other important bodily functions. This herbal supplement has significant antidepressant compared to conventional antidepressant SSRI or TCA, but with fewer side effects. Gastrointestinal symptoms, dry mouth and drowsiness are the most common side effects. The person who decides to take this supplement should consult his AME about his symptoms and his will to use this supplement. The supplement should be ground tested first.
7. If according to the AME assessment the candidate does not need conventional treatment /or psychiatric evaluation the GCAA may permit pilots/or ATC to use non-traditional treatment.

20 - NALGESIC AND ANTI-INFLAMMATORY DRUGS

NSAIDs and ANALGESICS

NSAIDs

1. ASA and the non-steroidal anti-inflammatory drugs (NSAIDs), which inhibit prostaglandin synthesis, all have potentially serious side-effects on both the GI tract and the CNS. CNS effects include sedation, headaches, and decreased vigilance.
2. These substances if prescribed for a short period or at moderate doses may be compatible with flying/or controlling duties if the candidate experience no side effects after 48 hours of use and if the condition that a candidate is using the drug for will not interfere with the safe performance of flying/or controlling duties. Aircrew and ATCs should be briefed on the potential GI side-effects, Hypersensitivity reactions (e.g. acute bronchospasm) and increases in hepatic transaminases progressing and /or frank hepatitis with the use of ASA and NSAIDs.
3. If aircrew and ATC requires NSAIDs for prolonged periods (over two weeks), or if the crew or ATC need high dose of NSAID to control his symptoms, the case should be referred to the GCAA for further decision.

Note: The musculoskeletal disorder under treatment, may itself be disqualifying for flying. That is, a pilot with an arthralgia or tendinitis painful enough to require NSAID group of medication more than likely should at least be temporarily grounded. Even if the discomfort being treated is relatively mild, the tendency for these preparations

to induce unpleasant side-effects would seem to preclude usage by the active pilot/ATC. Nevertheless, careful observations by a qualified physician may identify certain patients who can tolerate these medications without unsafe side-effects, in which case a return to flying/or controlling could be considered. Such cases would not only require careful evaluation but also regular surveillance after being returned to flying status.

ANALGESICS

NARCOTIC AND NON-NARCOTIC

The narcotic analgesics are prohibited from use by an active pilot /ATC simply because of the general depressant effects of the narcotics. It should also be pointed out that any pain severe enough to warrant a narcotic should in itself be disqualifying for flying. The most commonly used narcotic analgesics are: opiod derivatives; morphine derivatives; methadone group; meperidine group.

The non-narcotic analgesics ordinarily do not have direct effects that would preclude flying duties. The question of air safety while using non-narcotic medications for pain should primarily concern the issues of the severity of the pain and the cause of the pain. If the pain is severe enough to be distracting and/or if the condition causing the pain is in itself disqualifying, then flying should be prohibited. Non-narcotic analgesics can be exemplified as follows: salicylates; aniline derivatives (Tylenol, Phenacetin, etc.); paracetamol; pyrazolon derivatives; phenylbutazone; proporyphene.

As is the ease with all drug therapy, the medical examiner must always be aware of drug idiosyncrasy and be certain the pilot/ATC-patient tolerates the drug well before resuming flying /controlling activities during such usage.

Note: certain minor surgical procedures such as dentistry may require local or regional anaesthesia or even general anaesthesia. Any such case should be grounded until the effects of anaesthesia have completely cleared and the possibility of post-treatment complications seems remote. The period will vary considerably from individual to individual, but a pilot/ATC should not fly for at least 12 hours after a local anaesthetic and for 48 hours after a general or spinal anaesthetic.

STEROIDS

- a) Systemic steroids are generally incompatible with flight duties for all the medical classes, because of the complex nature of their action and because the disorders usually requiring such therapy are in themselves disqualifying.
- b) The AGCAA may permit cabin crew class who need to use steroid for short term (2 weeks) and at a low dose to resume their duties, provided clearance from significant side effects after ground trial.
- c) Injection of steroids for non-disqualifying conditions, such as joint or back discomfort which does not limit function, is disqualifying for 24 hours following the injection. The pilot/or ATC may then return to flying duties.
- d) Anabolic steroids (muscle building compounds) have significant side effects and are incompatible for flying.

Note: the GCAA may on individual basis permit the use of "physiological replacement therapy" as, for example, might be indicated for a stable case of adrenal gland insufficiency may be permissible while flying. Clinical

experience would indicate that a “physiological” dose relative to prednisone would be 6-9 mg daily for males and 4-6 mg daily for females. Pilots/ATC on steroid therapy should have regular medical surveillance at intervals of probably no longer than six months. Any pilot/ATC on steroid therapy should be well instructed in the principles of steroid therapy, including the possible effects of intercurrent infections, or sudden interruption of therapy.

21 - TREATMENT OF INFECTIONS

ANTIBIOTIC

1. The GCAA will allow the crew/or ATC to return to flying duties after a minimum grounding period of 4 days, providing the acute infectious illness has resolved and there are no drug side-effects. In few cases when the candidate experience no side effects after using them for 48 hours or he had used the drug previously without suffering any side effects, the GCAA may permit them to return to flying /or controlling duties before 4 days.
2. For long term antibiotics (e.g. a tetracycline for acne), the GCAA recommend a minimum observation period of seven (7) days before returning to flight/or controlling duties.
3. Topical antibiotics do not normally require a grounding period.
4. Anti-malarial drugs used for the treatment of malaria are incompatible with flying or controlling duties.
5. Chemoprophylaxis: long-term antimalarial chemoprophylaxis warranted due to frequent visit to endemic area, in these cases the candidate should be grounded for 24 hours after the first dose of the drug before departure, but grounding is not required for further weekly preventive doses. Chloroquine is approved for the crew or ATC use, but efficacy is low. Mefloquin is not recommended for prophylaxis in aircrew or ATC because of the potential neurocognitive effects. Atovaquone/Proguanil (Malarone), also can be used as prophylaxis with greater efficacy than others.
6. Anti-Tuberculosis treatment: although tuberculosis become relatively uncommon disease in the US and Europe countries, we are within UAE still having documented cases of tuberculosis. All classes of medicals shall be temporarily grounded in the initial phase of the treatment. Once they finish the initial phase, without significant side effects and with no residual symptoms, should be seen by a chest physician to declare that they are not contagious and should also be seen by ophthalmologist and ENT specialist(if the candidate was taking Streptomycin) and do liver function test. If all the reports and examination are satisfactory to the GCAA, pilots can resume their flying duties with an operational multicrew limitation. Cabin crew class once fulfils all the requirement of the GCAA, can resume their flying without restriction.
7. Chemoprophylaxis for tuberculosis, usually is Isoniazide, it can be used by the pilots and cabin crew after ground trial of one week with no side effects.
8. All candidate taking Anti-tuberculosis medications whether for treatment or prophylaxis, should be followed regularly by a physician and liver function test.

ANTIFUNGAL DRUGS

Terbinafine (Lamasil), fluconazole (Diflucan) and other antifungal agents may be used to treat fungal infections of the nails if they undergo proper medical monitoring and do not suffer side effects.

IMMUNIZING AGENTS

Crew members are not permitted to fly for 24 hours after receiving immunization, except no restriction is needed after oral polio, immune globulin, or the third and fourth typhoid doses. Reaction to immunization may be delayed, e.g. 5-10 days after yellow fever. Crew members should be cautioned about the delayed effects and are not permitted to fly when experiencing significant delayed reactions.

TREATMENT AND SUPPRESSION OF HSV

For aircrew with frequently recurring genital herpes, suppression by the administration of oral acyclovir (200 to 400 mg twice daily), oral famciclovir (250 mg twice daily), or oral valacyclovir (500 mg daily) is acceptable for continuing flying duties, after a ground trial of 2 days, to determine there is no side effects. The use of antiviral cream does not necessitate ground trial if the condition is mild.

22 - DERMATOLOGY

HAIR GROWTH STIMULANTS

- **ROGAINE**
Topical minoxidil should not be prescribed for pilots because of the small but documented incidence of systemic reactions including fainting and dizziness. Rogaine may be used by aircrew other than pilot after a 7 day grounding period to ascertain any potential side-effects. It is not supplied by the CF.
- **PROPECIA**
Finasteride is being promoted as another agent to regenerate hair growth and aircrew may approach the Flight Surgeon about its use. Aircrew using this medication should be grounded for 7 days for observation. Pilots are restricted to fly with or as co-pilot while taking finasteride

KERATOLYTIC TREATMENTS

Used for treatment of Acne, Eczema, mild cases of Psoriasis, Warts, Corns, and Seborrheic dermatitis.

Topical keratolytic agents such as Salicylic acid, Coal tar, Sulphur, and Tretinoin (e.g. Retin A), are allowed to be used by the Pilots/cabin crew and ATCs. Systemic Keratolytics

- **ETRETINATE**
which is used to treat severe psoriasis, may cause serious side effects such as serious dryness of the mucous membrane, like conjunctiva, which is resulted in significant dark vision disorders, also blurred or double vision or other changes in vision, yellow eyes or skin, headache (severe or continuing); nausea and vomiting, bone or joint pain, tenderness, or stiffness; pain, tenderness. The GCAA consider the use of this medicine is incompatible with flying/or controlling duties. Cabin crew class may be permitted to fly with this medicine after a 7 day initial period of grounding to establish that there are no significant side-effects, and private pilots can fly with limitation of not valid for night flying.
- **ACCUTANE:**

May be used by aircrew other than pilot without restriction after a 7 day initial period of grounding to establish that there are no significant side-effects. ATCs are not allowed to use this medicine.

23 - OPHTHALMOLOGY

1. Local anti-infection and non cortisonic anti-allergic collyria are compatible with flying or controlling duties.
2. Anti glaucoma drugs containing beta-blockers are compatible with flying duties.
3. Anti glaucoma drugs modifying the diameter of the pupils such as pilocarpine, are incompatible with flying duties.
4. Pilots who wear contact lenses while flying should never use any preparation while wearing the lenses.

24 - MISCELLANEOUS

a) ORAL CONTRACEPTIVES

Oral contraceptives may be used by female aircrew without requiring a restriction. It is advisable to introduce these medications during a period of flying .The same applies when switching from one preparation to another.

b) SMOKING CESSATION AIDS

Transdermal nicotine applicant from all the medical classes may use transdermal nicotine patches as an aid to smoking cessation without requiring an operational flying restriction. The applicant should not fly for the first few days of initiating treatment and must be reviewed by the AME before returning to flying duties and at regular intervals to confirm that there are no significant side-effects.

Zyban (bupoprion, because of potential neurocognitive side-effects, bupropion is incompatible with flying/controlling duties.

Cabin crew class using this medicine can resume their duties with regular follow up with the AME to monitor the side effects and the smoking cessation.

c) ERECTILE DYSFUNCTION

- i. Viagra/Levitra, the popularity of these medications and its availability to the general population, necessitate more attention by the AME, to recognize the potential serious side effects which may affect the flight safety, these side effects include:
 - a. Temporary colour blindness, as seeing bluish tinge or having difficulty distinguishing between green and blue, this is particularly important during Instrumental Meteorological Conditions or night flying.
 - b. light sensitivity (photophobia)
 - c. potentiation of nitrate medication

- d. NAION (non-arteritic ischemic optic neuropathy), though rare but very serious complication which may lead to permanent loss of vision if not treated within the first days. all of the reported cases developed NAION, within a day and a half(36 hours)post ingestion, and all of the cases had at least one arteriosclerotic risk factors for NAION, like hypertension, Diabetes, dyslipidaemia or pre-existing eye disease that all could have increased their risk of developing the problem.
- ii. The pilot /ATC who is using this medicine should declare its use at the time of the medical check, either he is taking it on regular base or as needed.
- iii. Pilots, ATC and other aircrew using Phosphodiesterase Type 5 (PDE5) inhibitors regularly shall consider the minimum time between dose and flying, any occurrence of decrease vision should be immediately reported to the AME.

Generic name	Trade name	Minimum time between dose and flying
Sildenafil	Viagra	12 hrs
Vardenafil	Levitra	12 hrs
Tadalafil	Cialis	36 hrs

d) DIET AIDS/WEIGHT REDUCTION/APPETITE SUPPRESSANTS

Drug Therapy for Obesity

Noradrenergic Agents which affect weight loss through action in the appetite centre. Phenylpropanolamine (Dexatrim), a sympathomimetic drug and a synthetic derivative of ephedrine, is available as an over-the-counter appetite suppressant and decongestant. The use of this medicine is incompatible for the flying/or controlling duties.

Serotonergic Agents. The serotonergic drugs partially inhibit the reuptake of serotonin and release serotonin into the synaptic cleft, thus acting on the hypothalamus to decrease satiety. Fenfluramine and dexfenfluramine (Reduxare not allowed to be used because of case reports of valvular heart disease and primary pulmonary hypertension.

Fluoxetine (Prozac) is a highly selective serotonin reuptake inhibitor (SSRI) that has been studied in the treatment of obesity. Currently, no anti-depressant medications are authorized by the GCAA for pilots or controllers holding medical certificates.

Digestive Inhibitors

Orlistat (Xenical), the first lipase inhibitor labelled by the FDA for treatment of obesity, is a potent and irreversible inhibitor of gastric and pancreatic lipases, preventing the absorption of about 30 percent of dietary fat.

Orlistat is indicated for use in patients with a BMI of at least 30 kg per m² or in patients with hypertension, diabetes or dyslipidaemia who have a BMI of greater than 27 kg per m².

Gastrointestinal side effects occurred in as many as 40 percent of patients includes flatus with discharge, oily spotting and oily stool, faecal urgency, faecal incontinence and abdominal pain. These side effects may compromise flying safety or worsen with increasing altitudes. The medication may also interfere with the

absorption of fat soluble vitamins and supplementation with vitamins A, E and K may be recommended. Prior to flying/controlling on the medication, individuals must demonstrate two weeks of use without significant side effects.

Common Dietary Supplements for Weight Loss

See herbal medication below.

e) CANCER (CHEMOTHERAPY) MEDICATIONS

Flying while on medication is to be avoided because chemotherapeutic agents are often toxic and may adversely affect the candidate's performance. The pharmacopoeia for these drugs is extensive and warns the prescribing physician of a wide array of common side effects including nausea and vomiting, bone marrow depression with possible pancytopenia, CNS dysfunction and damage to major organs among others. So the GCAA requires the candidate to fully complete the treatment regimen before certification is considered. After treatment is completed, the GCAA will review the case and consider approving the candidate to return to his duties. In certain situations, initial hormonal therapy for prostate cancer or immunosuppressive medications for transplants and arthritis, the GCAA may allow continued flying/or controlling duties during treatment, if no side effects and no evidence of residual cancer. In these cases a limitation of operational multi crew will be imposed.

f) OTHER MEDICATIONS SUCH AS VITAMINS, MINERALS AND HERBAL PREPERATIONS

The crew members and ATCs should treat herbal medications as would any other OTC medication. There is a potential for unforeseen consequences when taking such preparations and they should consult an AME for advice before taking such medications and performing aviation – related duties.

VITAMINS, MINERALS AND DIETRY SUPPLEMENTS

In UAE, all medicinal therapeutic products must carry a registration number; this applies only to the products from the pharmacies. All of the Vitamins and minerals registered in the UAE are considered listed therapeutic goods meaning quality and safety factors have been assessed by the MOH, drug control department. In general, pilots, cabin crew and ATCs should not exceed the Recommended Daily Allowances for these products.

HERBAL AGENTS

Little is known about most complementary supplements and herbal preparations in terms of potential side-effects of aeromedical concern, usually are not regulated by the MOH, Drug control department. They are derived from plant parts or oils. One should bear in mind that there are no standards for quality, potency, safety or efficacy in their manufacture. Identical products may differ markedly between manufacturers or batches by the same manufacturer. Additionally, many drugs are derived from the same plants used in the herbal preparations. Therefore, many herbal preparations have the same potential side effects as manufactured drugs. AME should routinely inquire about herbal and supplement use during periodic aircrew medicals. The AME often lacks clinical information sufficient to be able to quantify the aeromedical risk from use of herbal preparations he may have to research information from Internet sources to provide feed-back to aircrew about these concerns.