CIVIL AVIATION ADVISORY PUBLICATION

CAAP 19

AEROMEDICAL

INFORMATION 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This is Revision No.03 to CAAP 19 - AEROMEDICAL, it will remain current until withdrawn or superseded.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 temporary medical certificates by the Aeromedical Examiners (AME).

4. APPLICABILITY

This guidance and policy material applies to all UAE AMEs, aircraft operators, holders of flight and cabin crew licences, Air Traffic Controllers, and ATC Students. This CAAP will also apply to applicants, who graduate from an approved UAE flying school, and to holders of a foreign licence seeking reciprocal recognition.

5. REFERENCE

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

6. REVISION HIGHLIGHTS

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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 Chief of Licensing & Aeromedical is delegated the responsibility and:

(a) Designates and terminates designation of local physicians as AMEs, & designations of military flight surgeons.

(b) Designates and terminates designations of physicians as AMEs who is located in foreign countries.

(c) Plans, develops, administers, and evaluates medical education programmes 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

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 Ch 5, subject to reconsideration by the GCAA Aeromedical Inspector.

(c) The issuance or denial of a Combined Medical/Student Pilot Certificates subject to reconsideration by the GCAA Aeromedical Inspector.

(d) Defer 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, deferral is recommended by GCAA regulations, or if the applicant needs special authorisation/or waiver (when the applicants doesn’t meet the medical standards, but
with risk assessment and mitigation strategy his estimated risk of incapacitation is less than 1%.

3.1 Responsibilities Of AMEs

3.1.1 AME Responsibilities related to the GCAA safety program

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.

3.2 Responsibilities related to medical certification process

i. The AME must be satisfied as to the identity of each applicant for medical certification

ii. 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.

iii. 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, blood pressure, and pulse, and conduct of urinalysis and electrocardiography). The AME is responsible to use only the forms provided by the GCAA for the purpose of examination and record, and should send all the signed applications and accompanying reports to the GCAA within acceptable period, along with the copy of the medical certificate and other required document.

3.3 Qualifications and Training Required for Initial Designation

i. The applicant for designation as an AME with authority to perform examinations for first, second, third-class, and cabin crew medical certificates must be a professionally qualified physician with at least three years of clinical practice out of which one year, should be in a field of medicine related to the functioning of the Aeromedical Examiner

ii. Qualification in Aerospace or Aviation Medicine from an ICAO recognised university or Organisation. All recognised course must follow same syllabus required by ICAO(APPENDIX 1)
iii. Previous experience as an Aeromedical Examiner.

iv. Of a good standing in his or her community and his/her past professional performance and personal conduct shall be suitable for a position of responsibility and trust.

v. The applicant must possess an unrestricted license to practice medicine in the geographical area in which the designation is sought, issued either by the DHA, MOH or HAAD as might be applicable.

vi. The applicant must be engaged in the practice of medicine at an established office address.

vii. A final interview might be conducted by the Aeromedical Inspector before a 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.

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.

4. FACILITIES AND EQUIPMENT REQUIRED

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.

1. 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 Card vision testing.


   v. Standard physician diagnostic instruments and aids including those necessary to perform urinalysis

   vi. Electrocardiographic equipment. All Examiners must have access to digital electrocardiographic 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 equipments which should be available within the facility include 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 (Spirometry) 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.

5. DISTRIBUTION

There shall be a determined need for an AME 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.

6. TYPE OF DESIGNATION

- Once a physician is approved as an AME, he/she will be granted a permanent designation.

- Depending on the physician medical background and qualification the AME will be categorise as class2 /cabin crew restricted examiner or as unrestricted examiner for all classes.

- The GCAA is constantly evaluating AME’s performance through reviewing the medical examinations performed by the AME and with personal audit and also CME pointing system.

- The GCAA will hold a full right to downgrade any given AME designation on bases of not meeting performance requirements or number of medicals conducted per year.
- Occasionally the AME can also be suspended based on performance and error rates

6.1 Senior AME Designation

6.1.1 Requirements to be senior AME

i. Diploma in Aviation medicine/or equivalent

ii. Three years experience in aviation medicine within UAE

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 and loyalty to GCAA

6.2 Senior AME privileges

i. The senior AME will be member of GCAA Aeromedical Committee

ii. May participate in senior AME Board.

iii. Participate in the amendment of GCAA regulation and guidance material.

iv. May be called upon to assist in the investigation of fatal general aviation accidents

v. Involve in the GCAA CME program development and maintenance.

vi. Participate as an Instructor in the courses organised by the GCAA

6.3 Final decision by GCAA

i. 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.

ii. This designation will depend on adequacy of coverage related to the pilot population as well.

iii. A final interview might be conducted by the Head Of Aeromedical Inspector before a designation.

7. DOCUMENTATION AND ADMINISTRATIVE PROCEDURES FOR DESIGNATING AME;

Application procedures for initial designation and subsequent permanent designation:

(a) Expression of Intent. All applicants for the designation of AME shall apply in writing expressing the intent to practice as an AME and requesting to be licensed as a GCAA
designated AME. The application shall be made to the Acting Director of Licensing, General Civil Aviation Authority, U.A.E.

(b) **First Correspondence from the GCAA.** On receipt of the informal application the requisite GCAA AME designation application form MED Form 10 & MED Form -8 will be sent to the candidate along with list of required equipment (APPENDIX 3), within a period of 10 working days.

(c) **Application.** The applicant should fill the formal application form and return it to the Licensing and Aeromedical department, supplying all the necessary supporting documents.

(d) **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.

(e) Once selected for permanent designation, the following items should be sent to the physician: Letter of approval from the GCAA, Aeromedical Examiner Designation Card, Facility approval certificate, AME stamp and the official GCAA forms, AME resources, guidance material and supplies. AME Designation cards shall expire 2 years after the date issued. Facility approval shall expire 1 year after the date issued.

(f) **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 survey.

(g) 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 AME Card, the AME is responsible to inform the GCAA immediately.

**Note 1:** The designee shall be informed that misuse of the Medical Certificate, GCAA MED Form 03 and Civil Aviation Medical Examination Report, GCAA MED Form 02, could have a detrimental effect on air safety. Accordingly security of these forms must be maintained.

**Note 2:** GCAA forms and supplies may be obtained from the Licensing and Aeromedical Department/ or GCAA official website.
7.1 Duration of permanent Designation.

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

7.2 Office Address and Telephone Numbers;

AMEs will be listed with each office location and telephone number. The AME is required to promptly advise, in writing, the Licensing and the Aeromedical 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.

8. FEES OF EXAMINATION

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

9. RENEWAL PROCEDURE

(a) Thirty days before expiration of designation, the AME shall apply to the Licensing and Aeromedical department, forwarding GCAA MED Form -10 with a cheque of 300 Dirham and total numbers of examinations done per Classes of medical and total number of boards done during his designation.

(b) The Aeromedical Inspector shall check the CME record for all the AME applying for renewal, if the record is satisfactory, and the AME performance report during this period of designation is satisfactory, the Aeromedical Inspector recommend his designation renewal.

(c) Formal interview with the Aeromedical Inspector may be necessary for some AMEs who meets designation criteria but the performance report is unsatisfactory.

(d) 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.

(e) Physicians whose completed GCAA MED form -10 for re-designation is not received within 30 days will not be re-designated. The Chief of Licensing and Aeromedical Department shall be notified of those physicians who decline or fail to be re-designated.

(f) 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.

(g) Once the designated AME reach the age of 65 years, his designation will not be renewed.
10. PROCEDURES FOR AME RE-INSTATEMENT
Re-instatement of a former AME or an AME re-locating from one location to another may be authorized at the discretion of the GCAA licensing and aeromedical Department. However, the applicant must meet the designation requirements including currency with AME training requirements and surveillance.

11. TERMINATION OR NON-RENEWAL OF DESIGNATION

The GCAA may terminate or not renew an AME designation

11.1 Basis for Termination or Non-renewal of permanent 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 office maintenance and appearance.

viii. Unprofessional performance of examinations.

ix. Failure to promptly mail reports of medical examinations to the GCAA.

x. Loss, restriction, or limitation of a licence to practice medicine.

xi. Any action that compromises public trust or interferes with the AME’s ability to carry out the responsibilities of his or her designation.

xii. Any illness or medical condition that may affect the physician’s sound professional judgment or ability to schedule or perform examinations.

xiii. Arrest, indictment, or conviction for violation of a law.

xiv. Request by the physician for termination of designation.

xv. Any other reason the GCAA deems appropriate.

11.2 Return of Material

Upon termination or non-renewal of designation, the AME 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.
11.3 **Appeal Process**

The AME can appeal to the GCAA within 15 days of the decision to terminate the designation, whether or not to reverse the previous decision. During all this period the AME would not be eligible to practice.

12. **ENFORCEMENT**

The GCAA may at any time revoke any authorization it has issued in accordance with the requirements of CAR, if it is established that an AME has not met, or no longer meets, these requirements.

13. **SELECTION OF APPROVED SPECIALIST**

In the selection and retention of designated Specialists, the GCAA will designate only professionally qualified and appropriately licensed physicians.

13.1 **Responsibility of Approved Specialist:**

i. Personally conduct physical examination in accordance the best practices.

ii. Investigate the medical case, and if appropriate treat the pilots with problems.

iii. 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.

iv. 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.

v. Upon GCAA request the Approved specialist may be involved in medical review board as a member of, to review medical assessment for a particular applicant if the medical standards is not met in his particular fields

vi. Some Approved Specialist may be involved in giving lectures on medical subjects related to their specialty and provide clinical demonstration on examination techniques at AME seminars.

13.2 **Qualifications and Training.**

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.

13.3 **Facilities and Equipment required**

- 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;
- There should be the provision for chaperones to be made available at the request of those to be examined at the premises.

13.4 **Distribution**

Initially one specialist in each field will be approved in each emirate although further designations may be made dependant on need.

13.5 **Documentation and Administrative Procedures**;

i. Prospective applicants should apply in writing expressing the intent to practice as an approved specialist. The application shall be made to the Director of Licensing and Aeromedical Department, General Civil Aviation Authority, U.A.E. along with the application copy of current CV and aero-medical training certification.

ii. Once the applicant is chosen by the GCAA to be an approved specialist, they will be requested to pay the appropriate fee to licensing Department in order to proceed to final approval.

iii. Once selected for designation, the following items shall be sent to the physician: A letter of approval from the GCAA as a recognised specialist; Designation Card with a unique GCAA reference number and the official GCAA forms and supplies including a GCAA stamp. Designation cards shall expire 2 years after the date issued and will only be re-issued if the specialist is up to date with the CME requirements of a designated aero-medical examiner and demonstrated an appropriate level of competence as a GCAA designated specialist.

13.6 **Office Address and Telephone Numbers**

The Approved Specialist will be listed with each office location and telephone number. The Specialist is required to promptly advise, in writing, the Licensing and the Aeromedical Department of the GCAA of any change in office location or telephone numbers. Movement of the location of practice may lead to termination.

13.7 **Professionalism**

To properly discharge the duties associated with these responsibilities, the Approved Specialist shall maintain familiarity with general medical knowledge applicable to aviation. They shall have detailed knowledge and understanding of UAE regulations, policies, and procedures related to
medical certification. They should also be familiar with the CAR Part II, and this publication. The AME should be thoroughly familiar with instructions as to techniques of examination, medical assessment, and certification of the airman.

13.8 Continuing Education /Refresher Training

As a requirement for continued designation, the Approved specialist must attend 20 hours approved refresher training, or scientific meeting related directly to his Specialist. Plus at least 2.5 hours related to Aviation medicine.

14. CONTINUING EDUCATION /REFRESHER TRAINING

14.1 CME Objectives:

i. To update the knowledge base of GCAA members in the field of Aviation Medicine.

ii. To increase health and safety awareness, attitudes and activities of association members.

iii. to assist AMEs in determining aeromedical disposition decisions, improve clinical care, and advise patients who are traveling as airline passengers or who require air medical transport

iv. enhance flight safety by ensuring wellness of the crew

14.2 Types of CME Activities

(Principal 1 hour = 1 credit point)

14.2.1 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)

14.2.2 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)

14.2.3 Reading Credits: 5 points max. per year.

Self educational reading of aviation medicine-relevant scientific publications from international research literatures, through/magazines or internet base online CME courses and presentation.
14.2.4 **Others**

i. Jump seat (1points/one take off & landing)

ii. Simulator (1 point/one take off & landing)

iii. Aircraft piloting (1 point/4 hours)

iv. Any other activities subjected to GCAA approval.

14.3 **GCAA requirement:**

i. During the period of authorisation 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 follows: 15 hours must be from external credits, and other 5 hours from reading, internal credits or other activities recognised by GCAA; Exceptions to this policy shall be based upon an AME’s individual circumstances and mutual agreement between the AME and the GCAA.

**Note 1:** participation in congress, sessions and courses in another medical speciality other than aviation medicine will not be recognised 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.

14.4 **Strategies utilized to attain the CME objectives are as follows:**

The GCAA highly recommends the attendance at the following conferences:

i. AsMA annual scientific meeting

ii. ICASM annual meeting

iii. International Aviation Medical Examiner (AME) seminar, certified by the FAA as recurrent training for the AME

iv. JAR FCL3 training

v. Association of Aviation Medical Examiners (UK)

vi. **Other suggested CME resources:**


- [www.wham.org.au](http://www.wham.org.au) – workplace and health assessment module
  - [www.joem.org](http://www.joem.org) CME Credits

14.5 procedure for accreditation Locally organized CME

14.5.1 Aims & 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 following institutions:

- Emirates Medical clinics
- Etihad Medical Facility

iv. To accrediting appropriate continuing medical activities for by institutions, conference organizers or AMEs.

v. To invite renowned speakers locally and internationally to run lectures and or workshops with regards to Aviation Medicine.

vi. To help in the organization of conferences, meeting and workshops.

vii. To provide information and consultation services with the ultimate goal of improving overall aviation safety in the UAE.

14.5.2 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 many 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 semi-annual 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 licence 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 authorised 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.

Note: The GCAA may permit the transfer of Medical Information between the AME for the purpose of complete of medical assessment or for the board purposes.
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 licence must accompany the licence for the license holder legally to exercise the privileges of the license.

2. CLASSES OF MEDICAL ASSESSMENT

Three classes of Medical Assessment shall be established as follows;

(a) Class 1 Medical Assessment;
Applies to applicants for and holders of:
- Commercial pilot licences aeroplane and helicopter.
- Multi-crew pilot licences aeroplane
- Airline transport pilot licences aeroplane and helicopter

(b) Class 2 Medical Assessment;
Applies to applicants for and holders of:
- Private pilot licences aeroplane and helicopter
- Free balloon pilot licences
- Student pilot license
- Flight engineer licences

(c) Class 3 Medical Assessments;
Applies to applicants for, and holders of:
- Air traffic controller licences.

(d) Cabin Crew Medical Assessment
Applies to applicants for and holders of
- Cabin Crew Licence.
3. DURATION OF VALIDITY

The Medical assessment issued in accordance with Civil Aviation Regulation- CAR part II, chapter 1, paragraph 1.6 shall be valid from the date of the examination for a period not greater than:

<table>
<thead>
<tr>
<th>Licence Type</th>
<th>Class</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airline Transport Pilot under 40</td>
<td>1</td>
<td>12 months</td>
</tr>
<tr>
<td>Airline Transport Pilot over 40(multi crew)</td>
<td>1</td>
<td>12 months</td>
</tr>
<tr>
<td>Airline Transport Pilot over 40(single crew)</td>
<td>1</td>
<td>06 months</td>
</tr>
<tr>
<td>Commercial Pilot under 40</td>
<td>1</td>
<td>12 months</td>
</tr>
<tr>
<td>Commercial Pilot over 40</td>
<td>1</td>
<td>12 months</td>
</tr>
<tr>
<td>Free balloon pilot licence under 40</td>
<td>2</td>
<td>60 months</td>
</tr>
<tr>
<td>Free balloon pilot licence over 40</td>
<td>2</td>
<td>24 months</td>
</tr>
<tr>
<td>Air Traffic Controller under 40</td>
<td>3</td>
<td>48 months</td>
</tr>
<tr>
<td>Air Traffic Controller over 40</td>
<td>3</td>
<td>24 months</td>
</tr>
<tr>
<td>Flight Engineer</td>
<td>2</td>
<td>12 months</td>
</tr>
<tr>
<td>Cabin Crew under 40</td>
<td>Cabin Crew</td>
<td>60 &quot;</td>
</tr>
<tr>
<td>Cabin Crew over 40</td>
<td>Cabin Crew</td>
<td>24</td>
</tr>
<tr>
<td>Private Pilot under 40</td>
<td>2</td>
<td>60&quot;</td>
</tr>
<tr>
<td>Private Pilot over 40</td>
<td>2</td>
<td>24 &quot;</td>
</tr>
<tr>
<td>Private Pilot over 50</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Student Pilot</td>
<td>2</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

**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 place 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. The GCAA allow license holders to undergo the medical examination for renewal of their Medical
Assessment on a convenient date up to 45 days before their current Medical Assessment expires without changing the dates for the new validity period correspondingly, thus extending the validity period by up to 45 days. This will allow the expiry date of the Medical Assessment to remain the same year after year.

Example:
1. Initial applicant for GCAA Medical class I, goes on 15/7/2011, the calculated expiry date for his next medical will be 15/7/2012
2. If he comes for his renewal on 15/7/2012, the calculated expiry date for next medical will be 15/7/2013
3. If he comes for his renewal on 12/6/2012, the calculated expiry date for his next medical will be on 15/7/2013
4. If he comes for his renewal on 20/7/2012, the calculated expiry date for his next medical will be on 20/7/2013

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

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

Note 6: Once a licence holder turns 40 years of age he/she is required to undergo a medical examination within the revised validity period.

Note 7: Apart from the above licence holders GCAA also requires the ATC trainees to undergo a formal GCAA medical examination to qualify for class III. (The trainees do not possess any licence).

Note 8: Candidates Turning 60 Years of Age—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 9: Lapsed Medical Certificate Validity**

**Class I/III**

i. If a Class I or III licence holder allows his Medical Certificate to expire by more than five years, renewal shall require an *initial aeromedical examination*.

ii. If a licence holder allows his Medical Certificate to expire by more than 90 days but less than five years, renewal shall require the prescribed standard for renewal examination to be performed by any AME at the discretion of the AMS, subject to the records of medical examinations for licence holders being made available to the medical examiners (This information can be obtained from AMS or the former AME using the form MED-06 & MED-07).

iii. If a licence holder allows his certificate to expire by less than 90 days, renewal shall be possible by standard examination as prescribed by any AME.

**Class II**

i. If an Instrument Rating is added to the licence, pure tone audiometry must have been performed within the last 60 months if the licence holder is 39 years of age or younger, and within the last 24 months if the licence holder is 40 years of age or older.

ii. If a licence holder allows his Medical Certificate to expire by more than five years, renewal shall require an *initial aeromedical examination*. Prior to the certificate issue the relevant medical records shall be obtained by the AME (This information can be obtained from AMS or the former AME using the form MED-06 & MED-07).

iii. If a licence holder allows his Medical Certificate to expire by more than one year but less than five years, renewal shall require the prescribed examination to be performed. Prior to the examination the relevant medical records shall be obtained by the AME (This information can be obtained from AMS or the former AME using the form MED-06 & MED-07).

iv. If a licence holder allows his certificate to expire by less than one year, renewal shall require the prescribed examination to be performed by any AME.
4. PERIODIC TESTS

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.

4.1 Class 1 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.

4.2 Class 2 Medical Assessments

- Chest X-Ray  Initial assessment, thereafter when clinically indicated
- 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.

4.3 Class 3 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

4.4 Cabin Crew Medical Assessment

- Chest X-Ray-  Initial assessment.
- Audiometry-  Is not required unless hearing loss suspected, instead a voice test to be conducted
- ECG- to be done at assessment once aged 40 and then every 5 years

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.

5. SPECIAL INVESTIGATIONS

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 ischaemic 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 ischaemic heart disease

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 MED-04.
- Occasionally the applicant may be asked to passed functional hearing assessment in flight simulator, here the CFI uses Form MED-11.
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.

5.4 **Color Vision**

All the applicants for all the classes of medical certification have the ability to perceive those colors necessary for the safe performance of flight duties. It is needed for navigation lights, airport beacons, runway lights, taxiway lights; aircraft position lights, colored signals and map reading. Also colors used on aeronautical charts, electrical flight information systems in modern aircraft.

5.4.1 **Common types of Color Vision Defects**

<table>
<thead>
<tr>
<th>Type (incidence)</th>
<th>Essential Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protanomaly (1%)</td>
<td>Color matches are different from those made by normals (anomalous color matching), reduced sensitivity for red lights</td>
</tr>
<tr>
<td>Extreme Protanomaly (0.2%)</td>
<td>Reduced color discrimination for red, yellow and green. Reduced sensitivity for red lights.</td>
</tr>
<tr>
<td>Protanopia (1%)</td>
<td>Confusion of red, yellow and green. Reduced sensitivity for red lights</td>
</tr>
<tr>
<td>Deuteranomaly (4.5%)</td>
<td>Color matches different from those made by normals</td>
</tr>
<tr>
<td>Extreme deuteranomaly (0.5%)</td>
<td>Reduced color discrimination for red, yellow and green</td>
</tr>
<tr>
<td>Deutenapia (1.5%)</td>
<td>Confusion of red, yellow and green.</td>
</tr>
</tbody>
</table>

5.4.2 **Causes of Defective Color Vision:**

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

5.4.3 **Screening tests for Color 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 applicants - CAD test**

5.4.4 **Screening test**

• **Plate testing procedure**

Reliable color 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 Intrenational e de l’E clairage).

  ii. **Position**

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

  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/color 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 color vision testing**

• **Indication for Advanced testing**

  i. Initial Applicants for Class I and III who fail the Ishihara’s test, or

  ii. Renewal 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 & III, who had previously granted a waiver based on foreign waiver/or advance color 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 color perception tests

iii. Class II 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).

iv. Cabin crew class can be issued class II license restricted to cabin crew duties only. They don’t require having normal colour vision perception; so no extensive testing is required for their certification.

5.5 Extended eye examination by an Ophthalmologist

Will be 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 MED Form 1 (and the complete form will be forwarded to the GCAA along with the medical application form.

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.

5.7 Drug Screening

5.7.1 General

Pre-employment drug screening is a GCAA requirement for applicants in all classes, it can be done in 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

### 5.7.2 List of the drugs to be tested

Test for the following drugs or classes of drugs is 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.

### 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.

### 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) fulfills 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. A valid prescription; or
b. 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.

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 recognised clinics by using the Laboratory tests.

5.8.1 Three of the most clinical laboratory tests for detecting and monitoring alcohol use are:

i. **GGT (gamma-glutamyl trasferase):** 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 dependant 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 transferring):** 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

- 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 & 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.

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.

5.10 **Hemoglobin & Haematocrit**

Testing the hemoglobin is required for initial examination and when clinically indicated for all the classes of medical applications. Applicants with abnormal hemoglobin (< 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 %.

5.11 **Obesity**

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.

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

5.11.2 Effects of obesity on health

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.

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.

### Table - Medical conditions associated with obesity

<table>
<thead>
<tr>
<th>System</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>• ischemic heart disease: angina and myocardial infarction</td>
</tr>
<tr>
<td></td>
<td>• congestive heart failure: 12% attributable to obesity</td>
</tr>
<tr>
<td></td>
<td>• high blood pressure: present in 85% with BMI&gt;25</td>
</tr>
<tr>
<td></td>
<td>• high cholesterol</td>
</tr>
<tr>
<td></td>
<td>• deep vein thrombosis and pulmonary embolism</td>
</tr>
<tr>
<td>Endocrine and reproductive</td>
<td>• diabetes mellitus</td>
</tr>
<tr>
<td></td>
<td>• polycystic ovarian syndrome</td>
</tr>
<tr>
<td></td>
<td>• menstrual disorders</td>
</tr>
<tr>
<td></td>
<td>• infertility</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>• gastroesophageal reflux disease</td>
</tr>
<tr>
<td></td>
<td>• fatty liver disease</td>
</tr>
<tr>
<td></td>
<td>• cholelithiasis (gallstones)</td>
</tr>
<tr>
<td></td>
<td>• hernia</td>
</tr>
<tr>
<td>Respiratory</td>
<td>• obstructive sleep apnea</td>
</tr>
<tr>
<td></td>
<td>• obesity hypoventilation syndrome</td>
</tr>
<tr>
<td></td>
<td>• asthma</td>
</tr>
<tr>
<td></td>
<td>• complications from general</td>
</tr>
</tbody>
</table>
5.11.3 Defining the Nature of the Problem (BodyCompositionTests)

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:

Table- NHLBI (National Heart, Lung and Blood Institute) CLASSIFICATION FOR BMI CLASS

<table>
<thead>
<tr>
<th>NHLBI Classification</th>
<th>BMI</th>
<th>BMI Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td>1</td>
</tr>
</tbody>
</table>
- BMI can also be determined using a BMI chart, which displays BMI as a function of weight (horizontal axis) and height (vertical axis) using contour lines for different values of BMI or colors for different BMI categories, Figure 1.

![BMI Chart](image)

**Figure graph of body mass index is shown above. The dashed lines represent subdivisions within a major class.**

**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.

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.

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.

*Note:* Direct attempts to determine body fat percent are difficult and often expensive. One of the most accurate methods is to weigh a person underwater which is known as hydrostatic weighting. Simpler method for measuring body fat is the skin fold test, in which a pinch of skin is precisely measured to determine the thickness of the subcutaneous fat layer.

**Table: percent body fat**

<table>
<thead>
<tr>
<th></th>
<th>Below normal</th>
<th>Athlete</th>
<th>Healthy nonathlete</th>
<th>Potential risk</th>
<th>Slight risk</th>
<th>Moderate risk</th>
<th>High risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>&lt;12%</td>
<td>5-13%</td>
<td>12-17%</td>
<td>17-20%</td>
<td>20.1-25%</td>
<td>25.1-30%</td>
<td>&gt;30%</td>
</tr>
<tr>
<td>Women</td>
<td>&lt;18%</td>
<td>12-22%</td>
<td>18-22%</td>
<td>22-27%</td>
<td>27.1-32%</td>
<td>32.1-37%</td>
<td>&gt;37%</td>
</tr>
</tbody>
</table>

5.11.3.4 **Neck circumference measurements**

• Screening for and treating Obstructive Sleep Apnea 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 centimeters 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)
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 88 cm, 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 certified 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.

5.12 Cardiovascular risk assessment:

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.
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

5.12.3 Assessing and management of the cardiovascular risks
   i. Risk group less than 10% risk
      • Issue the medical certificates without limitation
      • Address the treatment of dyslipidemia, if necessary and recommended
   ii. 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.
   iii. 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.

5.13 Obstructive Sleep Apnea Screening Guidelines

5.13.1 General

The prevalence of Obstructive Sleep Apnoea Hypopnoea Syndrome (OSA) in men aged 30 to 65 years is around 1 to 4% and in women around 0.5 to 2%. There is objective evidence for a
1.3 to 12 fold increase in accident rates among patients with OSA. There is strong evidence that OSA can cause hypertension and OSA may be the commonest treatable cause of secondary hypertension. It is also associated with Ischaemic Heart Disease (including an increased risk of sudden cardiac death during the night hours), Hyperglycaemia and Cerebrovascular Disease. Screening for and treating Obstructive Sleep Apnoea Syndrome will potentially lead to improved quality of life, reduced cardiovascular mortality and reduced accident rates (both motor vehicle and work related).

5.13.2 Definitions

An Apnoea is defined as an absence of tidal volume for at least 10 seconds whilst a Hypopnoea is defined as a reduction in tidal volume of at least 50% for at least 10 seconds accompanied by at least a 4% decrease in oxygen saturation. Obstructive Sleep Apnoea Syndrome is generally defined as five or more apnoeas-hypopnoeas per hour of sleep (an Apnoea-Hypopnoea Index, AHI, of ≥5) accompanied by either excessive daytime sleepiness or two or more of the following: episodes of choking or gasping during sleep, recurrent awakenings, unrefreshing sleep, daytime fatigue or impaired concentration or memory. The severity of OSA is often reported as the AHI which correlates well with the clinical manifestations: AHI 5-15 = mild; AHI 15-30 = moderate; AHI >30 = severe.

5.13.3 Obstructive Sleep Apnea protocol

15.13.3.1 OSA Screening is indicated in:

i. History of Excessive Daytime Sleepiness

ii. History of Snoring or witnessed Apnoea

iii. Hypertension, Diabetes, Metabolic Syndrome

iv. Obesity or High Neck Circumference

v. Complaints of frequent nocturnal awakenings

vi. Complaints of difficulty concentrating and Complaints of problems with memory

vii. Complaints of daytime sleepiness or fatigue

5.13.3.2 Method of Objective screening:

i. physical examination including vital signs (blood pressure, pulse, respiration); height, weight, and body mass index (BMI); head, eye, ear, nose, and throat (HEENT); thyroid assessment; cardiovascular and pulmonary assessment, and psychological assessment for presence of depression

ii. 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 centimeters 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) > 48 &/or ANC 43-48 in the presence of other risk factors, refer to step 4.

iii. 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. ESC of >10, considered indicative of pathological sleepiness, refer to step 4.

iv. The gold standard diagnostic test is; nocturnal polysomnographic diagnostic testing (NPSG Sleep Study).

v. When the diagnosis declared at GCAA examination, the AME must not issue the medical certificate and must temporarily suspend the license holder.

vi. Start Medical treatment to manage OSA, the GCAA accept the use of CPAP (Continuous Positive Airway Pressure).

vii. Presence of any associated risk factors, as Obesity, Hypertension, Thyroid, Diabetes must be addressed and treated as per GCAA protocol.

viii. The minimum grounding period of 4 weeks after starting CPAP treatment will be required before returning the pilot to flying duties, he may be returned to duty once satisfactory recovery established with the treatment, with no subjective symptoms and ESS < 10. The AME should defer the case to GCAA for Aeromedical certification decision.

ix. The GCAA will issue the medical certificate with OML restriction and follow up recommendation, which should include 6 monthly Pulmonologist review and 3 monthly AME review in case of associated high BMI.

x. Once granted the restricted medical certificate, the pilot will be instructed not to fly if they experience any problems with their treatment, or at any time obtain a self reported ESS of > 10.

xi. The GCAA will not consider removal of the OML restriction, until the time when the pilot’s medical condition satisfactory controlled, and all associated risk factors are eliminated or controlled.
Note: Elevated C-Reactive Protein (independent of obesity which is also a cause of raised CRP) has been shown to correlate with a positive diagnosis of Obstructive Sleep Apnoea and the degree of elevation of the CRP is proportional to the severity of the Obstructive Sleep Apnoea.

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 apnoea, etc), to be performed by specialist acceptable for the GCAA Form MED-04 to be used for this purpose.
PART III - MEDICAL EXAMINATION SYSTEM

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 Civil Aviation Medical Examination MED Form02 /Ophthalmologic Report forms MED Form 1.

1. LEGIBILITY

International Civil Aviation Law and the CARs requires all air crew members 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.

2. 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).

3. NUMBER

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

4. 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.

5. MEDICAL CERTIFICATES ISSUED BY THE AME

Once the AME has completed the assessment and has concluded that the candidate is FIT, he/she can issue the medical certificate using the GCAA Form. The validity of this Medical Certificate is in
accordance to CAR part II, Chapter 1 para1.6. Once the Medical Certificate Card is issued by the GCAA after the secondary review is completed by the Aeromedical Inspector, the former certificate is automatically null and void.

6. FRAUDULENT ENTRIES/DECLARATIONS

Prior to undertaking aeromedical examination, AMEs should be satisfied that the candidate 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 obtain the applicant’s signature and 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.

7. DOCUMENT SUBMISSION

AMEs must ensure the prompt and timely submission of aeromedical reports to the GCAA. All examination reports, including those using an approved electronic format, 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.

8. MEDICAL CONFIDENTIALITY OF THE APPLICANTS

1. The AME should personally conduct all the examination for all the medical assessment in a recognised 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 accompanied by a photocopy of the Medical Certificate issued to the applicant and all the medical reports must be accompanied by the original of the ECG and audiogram, all in a sealed envelope.

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 authorised person only.
4. The medical information contained in the GCAA files will remain the property of the GCAA, to be released only by the permission of the applicant using a GCAA MED form 7 provided for this purpose.

5. Release of information between the AME should be controlled by the GCAA, so in cases where the applicant changes his AME, the New AME can request Former AME officially, using the MEDform 6, to release any confidential medical information related to the applicant license, this is subjected to the applicant’s permission and the GCAA shall be informed.

9. MEDICAL CERTIFICATE CARDS PROCESS

9.1 General

The Medical Certificate cards are made of credit card size PVC plastic and prepared using a specific computer software program. The holders photograph is scanned into the program.

9.2 Contents of Medical Certificate card:

(a) Front Side

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>(The License Number)</td>
</tr>
<tr>
<td>Class</td>
<td>(Medical Class I, II, III)</td>
</tr>
<tr>
<td>Name</td>
<td>Last name first</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
</tr>
<tr>
<td>Date of Birth</td>
<td></td>
</tr>
<tr>
<td>Last Medical</td>
<td>Date of last medical</td>
</tr>
<tr>
<td>Current Medical</td>
<td>Date of current medical</td>
</tr>
<tr>
<td>Expiry</td>
<td>Date of Expiry</td>
</tr>
<tr>
<td>Authority</td>
<td>Authority under which the medical certificate was issued</td>
</tr>
</tbody>
</table>

Note 1. When the License Number is not available (as in the initial medicals) PENDING is inserted.

Note 2. All dates are written in the following order. Day first, then month, then year.

Note 3. The issuing authority always remains that of the Director of Licensing and Aeromedical
(b) Rear Side

- Limitations:
  
  i. All Classes of Medical Certificates included in a professional aircrew license shall be valid for the privileges in accordance with CARs Part II.

  ii. The medical certificate should be securely attached to the license. It can be renewed within 30 days before the expiry date.

  iii. License holders are required to notify the GCAA of any incapacitating injury or illness for a period of 20 consecutive days or more, or the confirmation of pregnancy. Any such event will automatically result in a temporary suspension of the license.

  iv. The following special examinations shall be completed on or before the end of the month as indicated.

     - ECG
     - Audiogram

     - Holder’s Signature
     - Remarks

Note 1: Limitation
Note 2: Remarks: when the medical condition of the applicant required to do some medical investigation on regular basis, it should be reflected on the card.(e.g. annual ophthalmology report..etc)

Note 3: The special investigation must be done periodically in accordance to CAR.

1. Medical Certificates Issued by an AME

Once the AME has completed the assessment and has concluded that the candidate is FIT he/she can issue the medical certificate (MED-from 03)/or Medical card. This medical certificate will be valid as per the validity of class of medical. Once the Medical Certificate card is issued the initial Medical certificate issued by the AME is automatically null and void.

2. Medical Certification with special Authorization

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 standards
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.

9.3 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.

9.4 The Terms “Waiver” & “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 I, 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. For the purpose of this publication the use of the term medical certificate with special authorization to equal the use of waiver.
9.5 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.

9.5.1 Issue Pre-requisites of Medical Certification with special Authorization

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.

9.5.2 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 defer the case to the GCAA for decision along with the supporting documents, or
- Recommend to convene Aeromedical Evaluation 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 Licensing & Aeromedical Section. The AME must use the service -whenever applicable-of locally GCAA recognized or designated specialists.

iii. The AME then will prepare the request to the GCAA Licensing &Aeromedical section, with the following items:
   a) Complete medical application form (LIC form 02)
   b) A detailed history, review of systems, and physical findings associated with the defect must be recorded on the physical exam
   c) All supporting documentation required by the appropriate Aeromedical section of the Licensing Department (i.e. laboratory, radiology, consultant reports...)
   d) AME’s recommended disposition
   e) applicant’s most recent flight Assessment check – if applicable
   f) 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 summary and associated reports and approve the issue or medical certificates, or, will appoint Aeromedical Evaluation board and will notify the applicant of its intent to convene a medical evaluation board

9.5.3 Procedure of Aeromedical Evaluation board
1. 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.
2. 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
3. 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.
4. 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.
5. The pilot involved should attend the Board if deemed relevant.
6. 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.
• Should be signed by the president of the board.
• Copy of the president recommendation letter should be forwarded to the member of the board.

7. 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 board members, the GCAA will hold the final decision and The Aeromedical Inspector will recommend the issue of Medical certification with special authorization to the chief of Licensing and Aeromedical section. In recommending the Authorization, the Aeromedical Inspector specifies the class of medical certificate authorized to be issued and may do any or all of the following:

i. Limit the duration of an Authorization; validity of the Medical certificate

ii. Condition the granting of a renewal of the authorization on the results of subsequent medical tests, examinations, or evaluations;

iii. State on the medical any operational limitation needed for safety;

iv. Condition the continued effect of an Authorization, 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

9.5.4 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 committee will constitute a board which is the final board to review Aeromedical dispositions as requested by AME and the boards. 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

- To provide a formal mechanism for significant most regulatory policy issues requiring resolution are identified during GCAA’s rulemaking activities.
- Development of regulatory projects, advisory material and procedures and providing technical support to the GCAA.
- Provide assistance for GCAA in final determination of aeromedical disposition on difficult licensing eligibility.
- Technical regulatory development research and safety risk analysis
- May be involved in accident and incident investigation
- Discussing the issues encountered in implementation of new requirements and advice on solution.

vi. Role of GCAA Aeromedical Inspectors

- Final decision in relation to aeromedical disposition
- Identifying policy, regulatory and management issues that require resolution by GCAA

vii. 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.

viii. Procedure of Senior Aeromedical Evaluation board

- GCAA Licensing and Aeromedical Section will establish the senior Aeromedical Board, this committee chaired by GCAA Aeromedical Inspector plus senior AME. Other AME may participate in the Committee on need. The chairman and the members must be free of external influence.
- The board evaluates medical cases, which, due to their complexity or uniqueness, warrant a comprehensive aeromedical evaluation.
- The GCAA appoint permanent members from the stakeholders.
- The GCAA Aeromedical Inspector is authorize as the president of the board
- 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.
- 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.
- Copy of the president recommendation letter should be forwarded to the member of the board.
- Once the GCAA reaches the final decision either to issue or deny the medical certification, a notification letter will be send to the candidate, and conclusion report will be send to the concern AME and the president of the board and the Applicant must receive written notification letter.

ix. Follow up Action

- 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.
- A person who has been granted an Authorization 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.

- **Non Compliance**-Any reported case of non compliance reported by the AME and/or Operator personnel must be reported to the licensing and aeromedical section for action.

**x. Withdrawal of medical certificate with special authorization**

- if non compliance is reported then an Authorization granted to a person who does not meet the applicable provisions of CAR, Part II, chapter 5 may be withdrawn at any time if:
  - There is adverse change in the holder's medical condition;
  - The holder fails to comply with a statement of functional limitations or operational limitations issued as a condition of certification;
  - Public safety would be endangered by the holder's exercise of his license privileges;
  - The holder fails to provide medical information reasonably needed by the GCAA for certification.

- If an Authorization is withdrawn under paragraph above the following procedures apply:
  - The holder of the Authorization will be served a letter of withdrawal, stating the reason for the action;
  - By not later than 60 days after the service of the letter of withdrawal, the holder of the Authorization may request, in writing, the GCAA for review of the decision to withdraw. The request for review may be accompanied by supporting medical evidence;
  - 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,

**xi Renewal medical certification authorization**

The AME is permitted to re-issue a medical certificate under the provisions of an Authorization to an applicant who has a medical condition that is disqualifying under CAR Part II, chapter 5.
The Applicant must again 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.

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

11. LICENSE HOLDER RIGHTS AND RESPONSIBILITIES

As the candidates applying for the GCAA medical certificate have certain responsibilities they also have certain rights. Every candidate for medical examination should be aware of all these rights before being subjected to a medical examination or a board. In all clinics designated for Aeromedical examination a copy of this information regarding the rights of the applicants should be present on the patient notice board in clear view. A copy of this information should also be readily available in the files of the AMEs to be presented to the candidates if they ask for this information.

11.1 Pilots Rights Concerning Their Medical Status

(a) You have the right to expect that the AME will examine you to the best of his ability and based on GCAA Regulations and requirements. The AME must be up to date of Medical knowledge and any changes in the regulations and be able to advise you about the best option for you and discuss each procedure in details and discuss the effectiveness of any medications and possible implications on health and flight safety.

(b) You have the right to expect that good management techniques will be implemented within the clinic considering effective use of your time and to avoid your personal discomfort.

(c) The candidates have the right to be examined by any of the GCAA designated Aeromedical examiners at any of the designated clinics.

(d) If a candidate is not satisfied with the decision given by an AME they have the right to apply to the GCAA. The GCAA after careful assessment of their case will give the decision and if found necessary might send the candidate to be examined by another AME. The expenses in such a case will be borne by the candidate.

(e) If a candidate is not satisfied with the test results of one laboratory they have the right to ask the AME to get the same test repeated. The expenses for such repeat testing will be borne by the candidate and the results of both or all tests have to be submitted to the GCAA.

(f) If a candidate is not satisfied regarding their fitness concluded by an AME or the limitations imposed on him during the course of a routine medical or through a board they have the...
right to discuss this with the AME and ask for an explanation. If they are not satisfied they have the right to petition to the GCAA.

(g) The limitations imposed on the Medical Certificate of an individual are to be lifted at the earliest possible time once there is no need for the limitation. Since a limitation can only be removed by the GCAA it is mandatory for the AME to request the GCAA to remove the limitation once it is no more required. If the AME fails to do it and it is noticed by the candidate they have the right to ask the AME to request the GCAA for the removal of the limitation. In case of the AME not complying the candidate has the right to directly apply to the GCAA to look into the matter.

(h) You have the right to expect that treatment records are confidential. Your records are only disclosed as required by law and GCAA. When the clinic releases records to others, it emphasizes that the records are confidential.

(i) You have the right to privacy. The clinic staff and others caring for you will protect your privacy as much as possible.

(j) You have the right to express a complaint concerning your GCAA Medical and receive a response without your care being compromised. Any complaints must be forwarded to the GCAA Customers unit.

11.2 Pilots Responsibilities Concerning Their Medical Status

(a) To treat the AME with courtesy and respect.

(a) To present accurate identifying information.

(c) To inform the Clinic of any changes to name, address, telephone number or e-mail address. It is essential that we are able to contact you in case of an emergency.

(d) To present details of illness or complaint in a direct and straightforward manner including information about your health, including past illnesses, hospital stays, and the use of medicine.

(e) To keep renewal of GCAA Medical Certificate on time.

(f) To comply with the any recommendations for regular follow up and blood tests provided by the AME.

(g) To ask questions when you do not understand questions in GCAA form.

(h) Responsible for recognizing the effect of life-style on his personal health. Pilot health depends not just on the clinic care, but in the long term, on the decisions he make in his daily life.

(i) You must not perform duties on an airplane while under the influence of any drug that may affect flight safety.

(j) You must not consume alcohol less than 12 hours prior to the specified reporting time for flight duty or the commencement of standby; and not to consume alcohol during the flight duty period or whilst on standby.

(k) License holders or student pilots must not exercise the privileges of their licence, rating or authorization at any time when they are aware of any decrease in their medical fitness
which might render them unable to safely exercise those privileges and they must seek the advice of the GCAA or an AME when becoming aware of:-

- Surgical operation or invasive procedure
- All procedures requiring the use of a general or spinal anesthetic (no flying for at least 48 hours)
- All procedures requiring local or regional anesthetic eg. a visit to dentist requiring an injection (no flying for at least 12 hours)
- The regular use of medication
- The need to regularly use correcting lenses
- Hospital or clinic admission for more than 12 hours

12. MEDICAL FITNESS

12.1 General

The holder of a medical certificate shall be mentally and physically fit to exercise safely the privileges of the applicable licence. In order to apply for or to exercise the privileges of a licence, 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 licence.

12.2 Temporary incapacity of certificate holder

12.2.1 Class I, II and III:

(a) Holders of medical certificates shall not exercise the privileges of their licences, related ratings or authorisations 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. Further advice regarding medication is given in AME guidelines (ATTACHMENT).

(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 or
- Any illness involving incapacity to function as a member of a flight crew throughout a period of 20 days or more; or
- 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

12.2.2 Cabin Crew Class

(a) Holders of medical certificates shall not exercise the privileges of their licences, related ratings or authorisations 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 or more, 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: If the Medical condition require grounding for long period, the GCAA may issue a temporary suspension letter.

Note 2: Licence holders who fail to report the above mentioned conditions may be subjected to heavy penalties so the AME should take every opportunity to emphasise these legal requirements to them.

12.3 Reinstatement process of applicant licence after inter-current illness, injury/or pregnancy:
(a) 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 MED-Form 15A- and send all the supporting documents.
(b) The Licensing & Aeromedical Department will process the re-instatement request received from the AME within 72 hours, provided all the medical reports submitted are acceptable.
(c) If the clinic has not receive any intimation from the GCAA within 72 hours, re-instatement request sent by the AME to be treated as fit to fly/or to control, and the candidate can resume his duties.
(d) GCAA AMI 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.

12.4 Reinstatement process of applicant licence after confirmation of pregnancy

The suspension of the licence 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.

Class I &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.

Class III medical certificate holders may exercise relevant license privileges until 34 weeks gestation provided that:
(a) The Obstetrician supervising the pregnancy certifies that the license holder is fit for duties during this period and
(b) 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.

Thereafter, Class III medical certificate holders are formally deemed medically unfit to exercise license privileges until cleared by post-partum assessment by the obstetrician.
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.

12.5 Guidance for ATC & ATC students in regards to medical illness:

The holders of ATCO licenses and student ATCO licenses are required to have a minimum standard of physical & mental fitness while on duty so as to ensure they are fit to provide an ATC service and to minimize any potential risk or likelihood of sudden incapacitation in order not to endanger or compromise the safety of aircraft under their direct control.

- A license holder who is aware of decrease in his physical or mental fitness that may render him unable to safely exercise the privileges of his license must seek immediate medical advice from an AME.
- An ATC who is providing an ATC service while under the influence of psychoactive substances (Alcohol drink and problematic drugs and medicine), may not be aware that his judgment and skill have been degraded to the extent that the service being providing is unsafe or dangerous to aviation safety. This may be the case where psychoactive substances are being abused, or where medicines have been prescribed by a doctor, or none prescribed (over the counter) medicines obtained for minor illness (such as anti-flu medicine).
- In both items 1 & 2 above, the ATCO shall inform the unit management. They in turn will either ask for advice or information from any designated AME concerning the fitness of the affected controllers for his duties or he may wish to send the controller to be assessed physically by an AME.
- If further advice is needed the GCAA AMS may be advised through the AME.
- The controller who is suspected of being under the influence of psychoactive substances while on duties, shall be immediately withdrawn from the operational position and the GCAA advised of what has happened, and his license will be suspended immediately.
- In the event of physical injury, surgical operation or medical illness, the GCAA shall be advised either through the AME, or the ATCO himself. Cases of illness extending to 20 days or more will result in suspension of license. The GCAA AMS shall be informed once the medical condition has been resolved, in order to reinstate the license.

13. OVER 60 MEDICAL ASSESSMENTS

13.1 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
13.2 Candidates Turning 60 Years of Age

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 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.

13.3 Assessment Requirements

13.3.1 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 AME or consultant psychologist/psychiatrist, this should include Alcohol screening test (Laboratory tests).
ii. An extended eye examination by an ophthalmologist
iii. Fasting blood glucose and a glucose tolerance test in cases where the initial test is abnormal
iv. Lipid profile.
v. Cardiac evaluation by stress ECG.
vi. Haemoglobin

All these tests to be prepared by the AME, who will send a final report to the GCAA about the pilot’s condition. The appointment of a medical board depends on the GCAA decision if deemed necessary after the submission of all the reports by the AME to the Aeromedical section.

The significance of psychological assessment for over 60

With increasing age new skills take longer to learn and to retain. Thus an experienced captain may find it difficult and take an increasing time to become competent on new aircraft as compared with his juniors. Anxiety and reactive depressive disorders may result from the fear that senility is responsible. Sympathetic handling and possibly psychological evaluation may prove helpful and may demonstrate that no dementia exists. Further difficulty can arise when the ageing pilot fails to master the handling techniques of a new aircraft. In both cases the pilot will have
tried his best but finds insuperable difficulty learning the new techniques — or may indeed have lost his motivation to fly. The first case will require careful evaluation for renewal of his medical certificate and in the second case renewal of the medical certificate cannot be supported.

13.3.2 Renewal Requirements

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

(a) Every 6 months;
   i. An ECG.
   ii. Fasting blood Glucose
   iii. Lipid profile
   iv. Haemoglobin

(b) Every 12 months;
   i. Ophthalmology consultation.
   ii. Audiogram
   iii. Stress ECG

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

13.4 Private Pilots

No age limit has been determined for the private pilots by the regulation, but the medical assessment is the same over 60 year medical requirements.

13.5 Flight Engineers

No age limit has been determined for the F/E by the regulation, but the medical assessment is same as pilots over 60 years.

Note: The holder of a pilot licence who has attained the age of 65 years shall not act as a pilot of an aircraft engaged in commercial air transport operations.

14. USE OF MEDICATION, PSYCHOACTIVE DRUGS OR OTHER TREATMENTS

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

(a) Accidents and incidents have occurred as a result of pilots flying while medically unfit and the majority have been associated with what have been considered relatively trivial ailments. Although the symptoms of colds, sore throats, diarrhoea 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.

(b) Antibiotics such as the various Penicillins, Tetracyclines 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.

(c) 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.

(d) 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. Overdosage causes headaches, dizziness and mental disturbance. The use of “pep” pills while flying is not permitted.

(e) Anti-histamines can cause drowsiness. They are widely used in “cold cures” and in treatment of hayfever, 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.

(f) 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.

(g) Following local, general, dental and other anaesthetics, 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 anaesthetic and for 48 hours after a general or spinal anaesthetic.

(h) 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.
(i) 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.

14.2 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.

14.3 Alcohol

(a) 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.

(b) 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)

(c) 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.

(d) 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.
(e) 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.

**Note1:** AME guidelines refer to (ATTACHMENT)

### 14.4 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 control duties.
PART IV - MEDICAL ASSESSMENTS

SUBPART A - Cardiovascular

1. TECHNICAL SPECIFICATIONS OF INVESTIGATIVE PROCEDURES REQUIRED IN THESE PROTOCOLS

A. Resting electrocardiography

Resting electrocardiography is required at defined intervals as laid down in the CAR Med. The A 12 lead ECG with the recording system representing at least three leads simultaneously. Minor anomalies are common, requiring comparison with earlier recordings (where available) in at least 10 to 15 per cent of cases. The resting ECG is an insensitive tool for the detection of pre-symptomatic coronary artery disease, although it does identify a small number of people who have suffered a silent myocardial infarction. Sometimes ECG changes are variable, but 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 ischaemic heart disease.

B. Exercise Electrocardiography

1. Exercise Electrocardiography should be carried out to a standard treadmill protocol, in which both the slope and its rate increase every three minutes, Bruce protocol is the preferred one with a 12 leads ECG, with monitoring for at least (6) minutes after cessation of exercise.

2. Applicant to reach at least 85% of predicted heart rate at least nine minutes on the Bruce protocol or equivalent on the bicycle ergometer (maximum predicted heart rate +220 beats per minute minus applicant’s age in years for men, 200 beats per minute minus applicant’s age in years for women)

3. Treadmill exercise is performed but bicycle exercise is acceptable if the applicant is unable to perform on the treadmill.

4. Medication with cardio-active drugs (beta-blocking agents, vaso-dilators) should ideally have been withdrawn 48 hours beforehand, unless the medication is used to treat known ischemic heart disease or a significant arrhythmia. Digoxin should preferably be discontinued 14 days beforehand.

5. All reports of stress tests should include the following details:
   • Duration of exercise (with comment if less than nine minutes)
- Level of perceived exhaustion of the applicant; and
- Any symptoms experienced by the applicant.

6. A positive Stress ECG is defined by 1.0 mm or more of horizontal or down sloping ST segment depression at 0.08 sec after the J point.

7. A positive stress ECG is of adequate diagnostic validity if recorded when an applicant’s exercise capacity, heart rate and blood pressure response reach at least 85% of predicted for age, sex, height and weight and where the ST segment shift is consistent with ischemia.

8. If the applicant is unable to reach nine minutes or equivalent on stress ECG, the reason for cessation should be symptom limitation, any symptoms should be recorded, together with symptoms, if any interpretation by an accredited cardiologist is required and the recording should show no evidence suggestive of myocardial ischemia.

C. Stress Nucleotide (Thallium) Scan:

1. Thallium myocardial perfusion imaging (MPI) has the advantage that is a non-invasive means of predicting the outcome over a limited period (up to 4 years) but suffers from the disadvantage that the radiation dosage is three times that received during coronary angiography.

2. It should be carried out in a recognized and experienced centre and may be used for aeromedical assessment in the coronary syndromes. It may be used in establishing fitness, for example following revascularisation, provided a recent, index coronary angiogram is available.

3. When radionuclide techniques are used to assess left ventricular ejection fraction, it should be >50%.

D. Doppler echocardiography

Two (and now three) dimensional doppler echocardiography is an excellent non-invasive means of demonstrating cardiac chamber diameters, wall thickness and motion. The heart valves can also be assessed. Doppler techniques allow the deduction of pressure drops (i.e. the gradient) across a valve. Left ventricular fractional shortening may be employed to calculate the ejection fraction which is better derived by Simpson’s rule. The cardiac dimensions should be within the normal range. The left ventricular ejection fraction should be > 50% without significant abnormality of wall motion such as dyskinesia, hypokinesia or akinesia.
E. Stress echocardiography

When echocardiographic techniques are used to assess the ejection fraction, it should be >50%. Stress echocardiography is a useful non-invasive technique for the assessment of reversible ischemia. Pharmacological stress such as intravenous dobutamine should be used, rather than exercise. Stress induced wall motion abnormalities demand further investigation.

F. Twenty four hour ambulatory electrocardiographic (Holter) monitoring

Twenty four hour ambulatory electrocardiographic (Holter) monitoring is of use in the detection of atrial and ventricular arrhythmias and conduction abnormalities. It is commonly used in aeromedical assessment to seek episodes, for example, of paroxysmal atrial fibrillation. Other techniques, operated by the subject, i.e. CardioCall / CardioMemo, are applicable to less frequent rhythm disturbance. Complex ventricular rhythm disturbance and paroxysmal atrial ventricular rhythm disturbance is likely to disqualify, or require further evaluation.

G. Coronary angiography

Coronary angiography has long been the gold standard in the assessment of coronary artery disease. It is invasive and therefore has found less favour in the aeromedical assessment of pilots with known coronary disease. Furthermore increasing experience has permitted the use of stress Thallium and exercise ECG as surrogates, always provided there is a recent (i.e. within 6 months) coronary angiogram, to which the findings can be related. There should be no delay > 6 months prior to assessment of fitness. Significant left main stem (> 30% stenosis) or triple vessel coronary artery disease is disqualifying. Single or two vessel involvement may be considered for Class 1 OML provided the coronary angiogram shows< 50% luminal narrowing in any major epicardial vessel (unless subtending an infarction) in the presence of a normal contrast ventriculogram. No more than 30% stenosis is permitted in the proximal left anterior left main coronary artery. Thus luminal obstruction >30% but < 50% elsewhere may be tolerable always provided there is no evidence of myocardial ischaemia on stress thallium exercise ECG. However, more than two stenoses between 30 and 50 % within the vascular tree are not acceptable. The ejection fraction as measured by the contrast ventriculogram should be >50%. Following myocardial infarction it is important to establish, in so far as is possible, that the infarction has been ‘completed’ and that a tight stenosis, which may or may not represent recanalisation of a blocked vessel, is not subtending potentially ischaemic muscle. This is generally best demonstrated by stress Thallium Scan. Following coronary artery surgery (CABG), if coronary angiography is carried out, there shall be no proximal disease in any ungrafted vessel >30% and no demonstrable impairment of the myocardium subtended by any such vessel. There shall be no obstruction in any graft or of its anastomosis >30% unless stress Thallium confirms the absence of stress induced myocardial ischaemia.

H. Magnetic Resonance Imaging & Angiography (MRI & MRA)

Magnetic Resonance Imaging & Angiography (MRI & MRA) is a non-invasive technique increasingly used in the elucidation of abnormalities of the myocardium such as the infiltrative
myopathies and myocarditis. It can also demonstrate localize wall damage in the context of coronary artery disease.

I. Electron-beam Computerized Tomography and Multi-Detector Computed Tomography Coronary Angiography

Electron-Beam Computerized Tomography (EBCT) is a comparatively new radiographic technique which detects calcium in the coronary arteries, the Agatston score correlating with the presence of calcium in the wall of the coronary artery, and, by extrapolation, atheromatous disease. Its value in determining prognosis is under evaluation. It is not required for regulatory purposes but may prove useful once there are more data on its prognostic power. Like exercise ECG, it is likely to have a high negative predictive accuracy in subjects with a low probability of coronary artery disease. If an aircrew member undergoes the investigation for whatever reason, and the result suggests the possibility of coronary artery disease, further investigation is indicated using available techniques.

Electron-beam computerized tomography has a radiation burden about half that of coronary angiography but is being supplanted by Multi-Detector Computed Tomography Coronary Angiography (MDCTCA) in the non-invasive assessment of the coronary arteries. The radiation burden of the latter is the same as thallium MPI and at least twice that of coronary angiography. It has not yet replaced coronary angiography in the pre-intervention assessment of coronary artery disease.

2. 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.

2.1 Definition

Blood pressure is the force in the arteries when the heart beats (systolic) and when the heart is at rest (diastolic), it is measured in millimetre of mercury (mm Hg).

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Systolic (mm Hg)</th>
<th>Diastolic (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;130</td>
<td>&lt;85</td>
</tr>
<tr>
<td>High Normal</td>
<td>130-139</td>
<td>85-89</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1 (mild)</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2 (moderate)</td>
<td>160-179</td>
<td>100-109</td>
</tr>
<tr>
<td>Stage 3 (severe)</td>
<td>180-209</td>
<td>110-119</td>
</tr>
<tr>
<td>Stage 4 (very severe)</td>
<td>&gt;210</td>
<td>&gt;120</td>
</tr>
</tbody>
</table>

**Evaluation of applicant with hypertension**

Once a licence 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.

2.2 **Recertification**

2.2.1 **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. Fasting blood sugar
   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. Fundoscopic examination
   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 apnoea
   ix. Any pathology detected will require specialist evaluation

2.2.2 **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
2.3 **Aeromedical consideration**

- The diagnosis of uncontrolled hypertension is disqualifying and waiver will not be recommended.
- Unrestricted waiver 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 waiver to multi-pilot operations (Class 1 ‘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.

2.4 **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 (Refer to medication guidelines (ATTACHMENT 2).

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.

3. **ISCHEMIC HEART DISEASE**

3.1 **Angina pectoris /or other evidence of Ischaemic Heart Disease:**

Ischaemic heart disease symptoms such as angina, arrhythmia, cardiac failure or other evidence of ischaemic heart disease, require that 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.

3.1.1 **Recertification:**

3.1.1.1 **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 ≥ 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 demonstrate 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 proceed to coronary angiogram.

**Note 2:** If the investigations are negative, the applicant may be recertificated without restriction.

**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.

### 3.1.1.2 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 and

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.

### 3.2 Myocardial infarction

Aviation medical certificate following myocardial infarction

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.

### 3.2.1 Recertification:

#### 3.2.1.1 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

If the above investigations are satisfactory, the applicant may be recertificated for six months with multi-pilot (Class 1 ‘OML’) limitation, and for 12 months with a safety pilot (Class II ‘OSL’) limitation. Cabin crew class may be returned to flying duties. Class 3 will be assessed individually.

3.2.1.2 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 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. If an Angiogram has not been performed then at five years following the event. A myocardial perfusion scan is required.

3.3 Coronary artery bypasses grafting (CABG)

Following the graft, 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.

3.3.1 Recertification

3.3.1.1 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 ≥ 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 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 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
If the above investigations are satisfactory, the applicant may be recertificated for six months with multi-pilot (Class 1 ‘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 3 will be assessed individually.

3.3.1.2 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.

3.4 Percutaneous transluminal coronary angioplasty (PTCA)

Following angioplasty, 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, and III.

3.4.1 Recertification

3.4.1.1 Investigation required for recertification is:

i. Routine aviation medical examination
ii. Cardiology assessment
iii. Stress nucleotide scan/or stress echocardiogram, demonstrating a left ventricular ejection fraction ≥ 50% without significant abnormality of wall motion.
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 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

If the above investigations are satisfactory, the applicant may be recertificated for six months with multi-pilot (Class 1 ‘OML’) limitation, and for 12 months with a safety pilot (Class II ‘OSL’) limitation. Cabin crew class may be returned to flying duties. Class 3 will be assessed individually.

3.4.1.2 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 and follow-up with exercise ECG

**Note 1:** Five yearly coronary angiography should be considered after the index intervention, but may not be necessary, if the exercise ECG stress Thallium shows no change on evaluation. Particular attention should be paid, if multi-lesion coronary angioplasty / stenting in the same vessel or multi-vessel coronary angioplasty / stenting was performed. Graft angioplasty and angioplasty in diabetic subjects has a poor prognosis and is likely to lead to an unfit assessment.

**Note 2:** Evidence of exercise induced myocardial ischemia disqualifies from all classes of certification to fly/or controlling duties.

4. VALVULAR HEART DISEASE

4.1 Aortic valve disease

4.1.1 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.

4.1.1.1 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 1 ‘OML’) limitation is required, for class II require a safety pilot (Class 2 ‘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.

4.1.2 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.

4.1.2.1 Recertification

**4.1.2.1.1 Investigations required for recertification are:**
i. Routine aviation medical examination
ii. Cardiologist’s assessment
iii. ECG
iv. Doppler echocardiogram
v. other investigations as necessary

4.1.2.1.2 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 1 ‘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 3 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) shall disqualify for all classes of certification.

4.1.2.1.3 Subsequent Reviews

At annual intervals:

i. Routine aviation medical examination
ii. Cardiologist review
iii. ECG
iv. Doppler echocardiogram
4.1.3 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.

4.1.3.1 Recertification

4.1.3.1.1 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 1 ‘OML’ and a Class 2 ‘OSL’. Class 3 will be assessed individually.

4.1.3.1.2 Subsequent Reviews
At annual intervals:
   i. Routine aviation medical examination
   ii. Cardiologist review
   iii. ECG
   iv. Doppler echocardiogram

4.1.4 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

4.1.4.1 Recertification

4.1.4.1.1 Investigation required for recertification are:
   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 pre-operative 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 recertificated for six months with multi-pilot (Class 1 ‘OML’) limitation, for 12 months with a safety pilot (Class II ‘OSL’) limitation. Cabin crew class may be returned to flying duties. Class 3 will be assessed individually.

4.1.4.1.2 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.

4.2 Mitral Valve Disease

4.2.1 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.

4.2.1.1 Recertification

4.2.1.1.1 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
vi. Stress ECG,

4.2.1.2 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 >4.5 cm

4.2.1.3 Subsequent Reviews at annual intervals:

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

4.2.2 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 multipilot (Class 1 ‘OML’) limitation and Class II applicants may be considered for Class 2 ‘OSL’, Class 3 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.

5. 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. Cabin crew class may be given waiver to continue their duties with the use of anti-coagulation treatment.

5.1 Recertification

5.1.1 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 & 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))

5.1.2 Aeromedical Disposition

Restricted license for all the classes may be required for the first two years with annual cardiologist assessment. Anticoagulation with warfarin or coumarin like substances is disqualifying.

6. RHYTHM DISTURBANCES

6.1 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

6.1.1 Recertification

6.1.1.1 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
Further tests may be requested if needed according to cardiologist decision

6.1.1.2 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 1 ‘OML’) limitation, and class II may fly with OSL restriction. Cabin crew can fly without restriction. Class 3 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 1 ‘OML’) limitation, class II with OSL restriction and cabin crew without restriction may be accepted. Class 3 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. Permissible medication at present (refer to guidelines)

6.1.1.3 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 a trial fibrillation, or a recorded episode.

6.2 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.
6.2.1 Recertification

6.2.1.1 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

6.2.1.2 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.

6.2.1.3 Subsequent Reviews every six months intervals:
   i. Routine aviation medical examination
   ii. Cardiologist review
   iii. 24 hours ECG monitoring

6.3 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.

6.3.1 Recertification

6.3.2 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 msec with isoprenaline) δ delta-delta interval during atrial fibrillation >300 ms (>250 msec with isoprenaline)
• Cycle length with 1:1 accessory pathway conduction >300 ms (>250 msec 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

6.3.3 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.

6.3.4 Subsequent Reviews every six months intervals:

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

6.4 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.

6.4.1 Recertification

6.4.2 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 no 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
6.4.3 **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 creww and Class 2 may gain unrestricted licence. Class 3 will be assessed individually.

6.4.4 **Subsequent Reviews for 2 years post ablation every six months intervals:**

- Routine aviation medical examination
- Cardiologist review
- 24 hours ECG

6.4.5 **Aeromedical Disposition**

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

6.5 **Conduction disturbances**

6.5.1 **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 II Mobitz Type I (Wenkebach) atrivoventricular 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.

6.5.2 **Recertification**

6.5.3 **Investigations required for recertification are:**

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

6.5.4 **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

6.5.5 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.

6.5.5.1 Recertification

6.5.5.1.1 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)

6.5.5.1.2 Aeromedical Disposition

• The co-existent presence of first degree heart block and anterior or posterior hemiblock 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 3 will be assessed individually.

Subsequent review for class I, after one year

i. Routine aviation medical examination
Cardiologist’s assessment
iii. Exercise ECG

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

6.5.6 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.

6.5.6.1 Recertification

6.5.6.2 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.

6.5.6.3 Aeromedical Disposition

- If cardiologist reports are satisfactory, class I may be recertified with OML limitation. Class 3 will be assessed individually.
- Class II under 40, a satisfactory report may give an unrestricted certificate Class II Applicants not able fulfill all the above requirements may be considered for Class 2 ‘OSL’.
- Class II applicant over 40 years, after a coronary angiogram, in addition to satisfactory reports obtained may be given unrestricted medical certificate.

6.5.6.4 Subsequent annual review for three years

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

6.5.6.5 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.

6.5.7 **Left anterior and left posterior hemiblock**

- Recently acquired left anterior hemi block raises the possibility of myocardial ischaemia 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

6.6 **Cardiomyopathies**

6.6.1 **Dilated Cardiomyopathy**

This form of cardiomyopathy is associated with dilatation of either the right and/or the left ventricle. It is characterised 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, alcohol abuse, congenital or be idiopathic.

Complications:
- Atrial and ventricular rhythm disturbances
- Sudden cardiac death
- Cerebral embolism

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.

6.6.1.2 **Recertification**

6.6.1.2.1 **Investigations required for recertification are**

i. Routine aviation medical examination  
ii. Cardiologist’s assessment  
iii. 24 hours ECG without significant rhythm or conduction disturbance  
iv. Echocardiogram - LVEF ≥ 0.50 without significant abnormality of wall motion  
v. Exercise ECG-symptom limited to Bruce stage VI, showing no significant abnormality or evidence of myocardial ischemia.  
vi. Coronary angiogram to be requested if any doubt about the result of no-invasive investigations
6.6.1.2.2 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 is documented with follow up over 2 years

6.6.1.3 Subsequent review every three months

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

6.6.2 Hypertrophic cardiomyopathy

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.

6.6.2.1 Recertification

6.6.2.1.1 Investigations required for recertification are

i. Routine aviation medical examination (including a history of syncope and any family history of sudden cardiac death)
ii. Cardiologist’s assessment
iii. 24 hours ECG, without significant rhythm or conduction disturbance
iv. Echocardiogram (LVEF ≥ 0.50 without significant abnormality of wall motion and septal thickness should be less than 2.5 cms)
v. Exercise ECG-symptom limited to Bruce stage VI showing no significant abnormality or evidence of myocardial ischemia.
vi. Further investigations including a coronary angiogram, myocardial perfusion scan, EPS, especially if there is any doubt about the result of noninvasive investigations.
6.6.2.1.2 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 interventricular 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 3 will be assessed individually.

6.6.2.1.3 Subsequent review every three months

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

6.7 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

6.7.1 Recertification

6.7.2 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 recertificated with Class I restricted license. Class II and Cabin crew Class may be recertificated with unrestricted license if they fulfil all the above requirements. Class 3 will be assessed individually.

6.7.3 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
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SUBPART B- Respiratory system

1. ASTHMA

1.1 Definition

Disorder characterized by increased responsiveness of the small airways to various allergens and non-specific stimuli resulting in widespread airways inflammation and reflex narrowing of the airways.

It has a wide clinical spectrum varying from a single short-lived episode requiring no medication to that of constant disabling condition.

Its course and severity are unpredictable and sudden incapacitation is an uncommon but potential hazard for all diagnosed asthmatics.

1.2 Aeromedical Significance

Acute asthma attacks may cause partial (or complete) incapacitation in the cockpit (or air traffic control workplace).

Acute asthmatic attacks may be precipitated in flight by the inhalation of fumes such as might occur in engine or electrical fires and from other agents which could act as bronchial irritants.

In severe asthmatics, particularly after recent attacks, actual pulmonary function may be worse than that determined from simple clinical examination. Consequently, hypoxia, as measured by oximetry, may be more obvious at higher altitudes than normal.

A humid environment and high pollen counts that may be encountered during low altitude flight can exaggerate airway responsiveness and predispose to more severe asthma attacks. Air trapping in chronic asthma can present an increased risk of barotraumas in high altitude flight, particularly if sudden decompression should occur.

1.3 Diagnosis

- The most sensitive and objective test is the pulmonary function test using the spirometry (PEF can be used for monitoring of chronic asthma not for initial diagnosis)
- The specialist may need more tests to confirm the diagnosis or further assessment to determine the severity. (e.g. Exercise stress tests and assessment of reversibility of airway obstruction)
- If the spirometry tests are normal but the doctor thinks the applicant may have asthma, additional tests may be done. (e.g. bronchoprovocation test where the applicant inhales a substance (methacholine or histamine) that narrows (constricts) the
airways or the Arterial blood gases (ABGs), which determine the amount of oxygen and carbon dioxide in the bloodstream.

1.4 Factors which may affect the spirometry test

Using medication that expands the lungs' airways within 4 hours of the test
Using sedatives before the test
Not being able to breathe normally because of pain.
Pregnancy, obesity, or an enlarged stomach (after a large meal, for example)
Being able to follow instructions and give some effort to the tests.

1.5 Assessment of reversibility of airway obstruction

When airway obstruction is identified on spirometry, assessing response to inhaled bronchodilators is useful. The threshold for significant response is demonstration of an increase of at least 12% and 0.2 L in FEV1 on a spirogram performed 10-15 minutes after inhalation of a therapeutic dose of a bronchodilating agent. New standards recommend the use of 4 inhalations (100 mcg each, 400 mcg total doses) of albuterol administered through a valved spacer device. When concern about tremor or heart rate exists, lower doses may be used. Response to an anticholinergic drug may be assessed 30 minutes after 4 inhalations (40 mcg each, 160 mcg total dose) of ipratropium bromide. Failure to respond to bronchodilator challenge does not preclude clinical benefit from bronchodilators. A positive response to the bronchodilators may correlate with response to steroid therapy.

1.6 Exercise Testing

Repeating physiologic measurements during or after exercise. Patients with suspected asthma but normal resting exams and spirometry may wheeze during exercise, especially when inhaling cooled air. A decrease in FEV1 of > 15% is considered abnormal, indicating hyperactive airways.

1.7 Measures of Asthma severity

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV1 % of predicted</td>
<td>&gt;80%</td>
<td>60-80%</td>
<td>&lt;60%</td>
</tr>
<tr>
<td>Peak flow variability (PFV)</td>
<td>No PFV variability</td>
<td>PFV &gt; 15%</td>
<td>PFV &gt;30%</td>
</tr>
<tr>
<td>Need for inhaled SABA</td>
<td>Every 8 of more h</td>
<td>Every 4-8h</td>
<td>Every 2-4h</td>
</tr>
<tr>
<td>Probability of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous near fatal episode</td>
<td>0</td>
<td>0</td>
<td>0+</td>
</tr>
<tr>
<td>Recent Admission to hospital</td>
<td>0</td>
<td>0</td>
<td>0+</td>
</tr>
<tr>
<td>Night time symptoms</td>
<td>0 to +</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Limitation of daily activities</td>
<td>0 to +</td>
<td>++</td>
<td>+++</td>
</tr>
</tbody>
</table>

Note: FEV1 = forced expiratory volume in 1 second; PEF = peak expiratory flow
1.8 GCAA certification protocol:

i. All initial applicants for all the medical classes of medical certificates should be evaluated by specialist chest physical 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 & examined as indicated by chest physician.

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.

   Class 3 will be assessed individually.

iv. 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.

v. Renewal for cabin crew and class II, the AME can issue the medical certificate unless otherwise indicated.

vi. 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 FEVI 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 AND ASSESSMENT GUIDELINES

2.1 Definition
Chronic obstructive airways disease is defined by a chronic pulmonary disease with a progredient airway obstruction, which is not totally reversible after applying bronchodilators or glucocorticoids

2.2 Recertification:

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 GCAA 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. A recognised course of medication has been completed.
   b. Chest radiography shows no significant lung damage.
   c. 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 3 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 in b, c 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 antitubeculous drugs are as follows:
Isoniazid: peripheral neuropathy
Rifampin: GI disturbances, Hepatitis.
Ethambutol: retrobulbar neuritis, blured vision, scotoma
Pyrazinamide: hepatitis
Streptomycin: ototoxicity with vertigo and hearing loss

4. SARCOIDOSIS AND ASSESSMENT GUIDELINES

4.1 Definition
A disease of unknown aetiology characterised by granulomatous lesions which can affect multiple organ systems It can cause pulmonary manifestation; skin lesions; uveitis; hepatic cirrhosis; renal calculi; hypersplenism; cardiac arrhythmias and valvular defects.

4.2 Assessment guidelines for initial applicants

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.

4.2.1 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.

4.2.2 Aeromedical Disposition

• 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 3 will be assessed individually.
4.2.3 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

4.2.4 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.

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 maybe 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 od 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, oversewing 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
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SUBPART C - Metabolic, Nutritional and Endocrine systems

1. DIABETES MELLITUS

1.1 Diagnostic criteria

<table>
<thead>
<tr>
<th></th>
<th>Fasting</th>
<th>2 hours post prandial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal &lt;120 mg/100 ml</td>
<td>&lt; 6.1 mmol/l</td>
<td>&lt; 7.8 mmol/l</td>
</tr>
<tr>
<td></td>
<td>&lt; 110 mg/100 ml</td>
<td>&lt; 140 mg/100ml</td>
</tr>
<tr>
<td>Impaired glucose regulation</td>
<td>&gt;6.1 – 6.9 mmol/L or</td>
<td>&gt;7.8 – 11 mmol/L</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>&gt; 7.0 mmol/l</td>
<td>&gt;=11.1 mmol/l</td>
</tr>
<tr>
<td></td>
<td>&gt;120 mg/100ml</td>
<td>&gt;180 mg/100ml</td>
</tr>
</tbody>
</table>

Note: Diagnosis should not rely on one abnormal OGTT result and all borderline tests should be repeated.

1.2 Classification

The accepted modern classification is:

<table>
<thead>
<tr>
<th>Type 1 Insulin Dependent (IDDM)</th>
<th>Genetically associated with T-cell dependent autoimmune disease and HLA factors. Very low or absent endogenous insulin. Liable to keto-acidosis. Onset typically under 30.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latent Autoimmune Diabetes in Adults</td>
<td>LADA is defined as the presence of adult-onset diabetes with circulating islet antibodies but without an initial requirement for insulin therapy. Common features include age under 50, BMI &lt;25, personal or family history of autoimmune disease. The majority of adults with diabetes, who had detectable GADAs (glutamate decarboxylase (GAD) antibody, require insulin treatment within 6 years of diagnosis.</td>
</tr>
<tr>
<td>Type 2 Non-insulin Dependent (NIDDM)</td>
<td>Related to obesity and familial tendency. Endogenous insulin always present and often hyperinsulinaemic with insulin resistance. Rarely if ever ketotic. Onset 40+ There is a non-obese sub-group which have different aetiology and family aggregation.</td>
</tr>
</tbody>
</table>
1.3 Complications
a. Macro-angiopathic vascular damage in the coronary, cerebral and peripheral arteries, which can constitute a major aeromedical risk and it increases with the duration of the condition.
b. Microangiopathy is associated with progressive retinal and renal damage.
c. Neuropathy which is probably related to the long term effects of the metabolic abnormality and can involve motor, sensory and autonomic functions.
d. Cataract which is common in older patients with diabetes.

Note: All complications tend to be found in long term diabetes, especially those which are poorly controlled, but can also appear early in the disease-retinopathy in particular can be an initial finding.

1.4 Management of Diabetes Mellitus

1.4.1 General:
In type 2 diabetes the first step in the management is a low calorie diet, weight reduction, exercise at least 150 minutes weekly and smoking cessation.

1.4.2 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.

- 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.

- Insulin use is disqualifying from all the classes of medical.

- The use of oral hypoglycemic drugs may be acceptable for flying/controlling 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.

1.4.3 Anti diabetic medications:

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

### 1.4.4 Initial assessment

At the time of diagnosis of Diabetes mellitus type 2, the GCAA require the following to be done:

- Careful examination to exclude common complications of diabetes including neuropathy
- **HbA1c must be** < 7%
- **Fasting Blood Glucose must be reasonably controlled**
- BMI level, and determine the desired goal (BMI of <25 is the target)
- Cardiovascular risk assessment. DM must be treated as high risk and all modifiable risk factors should be managed aggressively.
- Blood tests including biochemistry, renal function, liver function and lipids.
- Ophthalmologist evaluation.
- ECG at the time of diagnosis, and cardiologist consultation
- Urine microalbuminuria.
- If single medication is required to control Blood sugar:
  - The license holder must be grounded:
    - For Class I & III: 60 day ground trial to ensure good glycaemic control, no side-effects & HbA1c < 7%
      - For cabin crew & Class II: 30 days ground trial.
  - If single medication failed to control Blood sugar, and addition of other agent is required:
    - The license holder must be grounded:
- For Class I,II,III & Cabin crew: Minimum 30 day ground trial to ensure no hypoglycaemic episodes, no other side-effects, good glycaemic control. HbA1c <7%
- To provide record of blood glucose monitoring to AME - random daily record for 30 days.

1.4.5 **Follow up for cases of Diabetes mellitus type 2**

- Periodic review with AME and careful examination to exclude common complications of diabetes.
- Fasting blood glucose and HBA1c three monthly to check the control of diabetes.
- Regular weight measurements and BMI monitoring.
- Periodic blood tests including biochemistry, renal function, plus fasting blood lipids
- Annual ophthalmologist review.
- CNS and foot examination for evidence of neuropathy; either by neurologist or GP.
- Cardiac consultation if indicated
- Annual urinary tests for detecting early renal damage (microalbuminuria)

2. **THYROID DISORDERS**

2.1 **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 for any class of medical, when they are 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.

**Note:** cases where eye involvement has occurred, Extended Eye Examination is required before the candidate returning to flying/or controlling duties.

2.2 **Hypothyroidism**

Florid hypothyroidism requires a temporarily unfit assessment. The candidate may be considered for fit assessment while euthyroid and taking their prescribed medication. Annual endocrinological review is required by the GCAA.
3. **GOUT**

3.1 Aeromedical assessment for all the classes of medical certificates

a. Asymptomatic hyperuricaemia is not disqualifying.

b. Acute gout and the associated treatment require a temporarily unfit assessment until 24 hours after cessation of treatment.

c. Tophic and chronic gouty arthritis should be assessed individually, depending upon the strength, range of movement, pain and medication used.

d. The possibility of nephrolithiases at any stage must be considered.

4. **DYSLIPAEDEMIA**

Dyslipidemia is elevation of plasma cholesterol, triglycerides (TGs), or both, or a low high density lipoprotein level that contributes to the development of atherosclerosis. Causes may be primary (genetic) or secondary. Diagnosis is by measuring plasma levels of total cholesterol, TGs, and individual lipoproteins. Treatment is dietary changes, exercise, and lipid-lowering drugs.

4.1 Classification
4.2 Recommendations for treating Dyslipidemia (LDL)
1. Determine what is the patient cholesterol levels
2. Does the patient have CAD?
3. Determine the presence of major risk factors

4.3 Major Risk Factors (Exclusive of LDL Cholesterol) That Modify LDL Goals
- Cigarette smoking
- Hypertension (BP ≥140/90 mmHg or on anti-hypertensive medication)
- Low HDL cholesterol (<40 mg/dL)
- Family history of premature CHD
  - CHD in male first degree relative < 55 years
  - CHD in female first degree relative < 65 years
- Age (men ≥ 45 years; women ≥ 55 years)

**Note:** HDL cholesterol ≥60 mg/dL counts as a “negative” risk factor; its presence removes one risk factor from the total count.
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SUBPART D - RENAL SYSTEM

1. CALCULI OF THE RENAL TRACT

1.1 General
Urinary calculi (stones) may be found at all points within the urinary tract. Symptoms are produced by obstruction and associated spasm of the smooth muscles in the tract wall. Calculi vary in size, consistency, composition, shape and texture as do the dimensions of the renal tract. Any movement of the stone(s) is therefore unpredictable in terms of the abruptness of onset and severity of pain. The varying G-forces to which an individual is exposed during flight are particularly likely to dislodge renal calculi, and so any radiopaque lesion of the parenchyma or shadowing lesions in the ultrasound will require urological investigation.

1.2 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 (ultrasound, 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 would suffice as screening.

1.3 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 and III. Class II and Cabin crew Class may be granted unrestricted license by the GCAA.

1.4 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.

1.5 **Previous history of uretric 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.

**Note:** Follow-up is important in all cases of documented renal calculi whether treated or not.
SUBPART E - OTORHINOLARYNGOLOGY

1. INVESTIGATIONS

1.1 Hearing tests

1.1.1 Pure tone audiometry

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 fulfillment 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.

In audiometry, the following notification rules must be regarded:
Air-conduction: right ear: 0; left ear: X.
Masked air-conduction: right ear: • ; left ear: — .
Bone-conduction without masking: right ear: [; left ear:].
Masked bone-conduction: right ear: <; left ear: >.
If colours are used, red indicates the right ear, blue indicates the left ear.

1.1.2 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:

a) Prevent lip-reading by having the examinee turn his back to the examiner.

b) 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.

c) 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.

d) Use numerals between 21 and 99. Let the examinee repeat, what he has heard.

e) Use the threshold distance between the examinee and the examiner to indicate the outcome of the test

f) The tests should be performed in a relatively silent room.

2. SOME COMMON ENCOUNTERED HEARING PROBLEMS

2.1 Noise induced hearing losses

Permanent threshold shifts are characterised by the so-called ‘noise-dip’ maximal, at 4000 or 6000 Hz. If present in initial applicants, the prognosis of the hearing loss should be considered. A noise induced hearing loss is the result of noise exposures influenced by a hereditary predisposition.

The physical examination should, if possible, prevent selection of very noise sensitive individuals for the pilot/or ATC profession or at least such individuals should be warned that the noisy flying environment could harm their hearing to a degree that would cause a loss of licence at a later stage of their career. At any sign of a noise induced hearing loss, the applicant should be questioned carefully about his past noise exposures. If this exposure is negligible, the applicant should be considered very noise sensitive.

If the hearing loss is pronounced, but the hearing (because of the high frequency configuration of noise induced hearing losses) is still within the required limits as per CAR Part II, chapter 5, rejection or a waiver should be considered based on these requirements.

It is important to realise, that sensory-neural hearing losses have been proven super-additive the pre-existence of a sensory-neural hearing loss of any origin makes that particular ear much more sensitive to a noise induced hearing deterioration. In all cases of noise induced hearing
loss in young people, instructions and guidance should be given concerning the use of hearing protectors when exposed to noise of any origin, privately and professionally.

2.2 Unilateral hearing loss and unilateral deafness

In normal life, unilateral deafness is a minor handicap, usually only affecting the directional hearing, once the patient has become accustomed to the condition. Directional hearing is a rather unimportant function during flight. If the etiology of the existing hearing loss does not indicate a higher than normal risk of a hearing deterioration in the normal ear, a fit assessment may be considered, a multi-pilot (CLASS 1 ‘OML’) limitation may be required, provided that an ATC-communication test in aircraft-noise is flawless. This can be determined during functional assessment of hearing loss refer to LIC(MED)Form 25, Class III certificate will not usually granted in this case. Private pilot & cabin crew can exercise the privileges’ of their license.
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:

   a) 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 licence.
   b) Sufficient height, leg and arm length and muscular strength.
   c) Satisfactory functional use of the whole musculoskeletal system including all four limbs.
   d) No significant sequelae from disease, injury or congenital abnormality with or without surgery.

   Note: The use of drugs used for the treatment of musculoskeletal disorders must be assessed in accordance with (ATTACHMENT 2).

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
   a) 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.

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

   c) 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 orthopaedic surgical operation of the hip area will need post-operative physiotherapy therefore a minimum period of three months of temporary unfitness will be required.

4. UPPER EXTREMITY

a) **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.

b) **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.

c) **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

5.1 General
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.

a) 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.

b) 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 immobilisation. Most fractures of the extremities will require at least six weeks of immobilisation. An assessment is warranted
after convalescence only if a significant decrease in function is expected.

**SUBPART G - Aviation Psychiatry**

1. **NEUROTIC, STRESS-RELATED AND SOMATOFORM DISORDERS**

1.1 **Phobic anxiety disorders**

The essential feature of this disorder is marked and persistent fear of clearly, circumscribed objects or situations. Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response.

**Note:** The GCAA may grant aeromedical certification where an applicant's specific phobia is unrelated to the aviation environment or unlikely to affect aviation adversely.

1.2 **Panic Disorder**

The essential feature here is recurrent attacks of severe anxiety (panic) which are not restricted to any particular situation or set of circumstances and are unpredictable. There is often secondary fear of dying, losing control or going mad. The dominant symptoms, as with other anxiety disorders, include palpitations, chest pain, choking sensations, dizziness and feelings of unreality (de-personalisation or de-realisation). Attacks occur suddenly, may be unpredictable and usually build to maximum within 10-15 minutes. The GCAA will not grant aeromedical certification to an individual who suffers non-specific or unpredictable panic attacks.

1.3 **Obsessive compulsive disorders**

The essential feature here is that of recurrent obsessional thoughts or compulsive acts. Obsessional thoughts are ideas, images or impulses that enter the individual’s mind again and again in a stereotyped form. They are almost invariably distressing and the patient often tries unsuccessfully to resist them. They are, however, recognised as his/her own thoughts, even though they are involuntary and often repugnant.

Compulsive acts or rituals are stereotype behaviours which are repeated again and again. They are not inherently enjoyable nor do they result in the completion of inherently useful tasks. Their function is to prevent some objectively unlikely event which he/she fears might involve harm. This behaviour is recognised by the patient as pointless or ineffectual, and repeated attempts may be made to resist.
Anxiety is almost invariably present. If the compulsive acts are resisted the anxiety gets worse.

1.4 Generalised anxiety disorder

The anxiety that is generalised and persistent but not restricted to, or even strongly predominating in any particular environmental circumstances. The symptoms are variable but include complaints of persisting nervousness, trembling, muscular tension, sweating, light headedness, palpitations, dizziness and epigastric discomfort. Fears that the individual or a relative will shortly become ill or have an accident are frequently expressed. The clinical course is chronic and fluctuating.

1.5 Reaction to severe stress and adjustment disorders

1.5.1 Acute stress disorder

That is a transient disorder that develops in an individual without any other apparent mental disorder in response to exceptional physical and mental stress and which usually peaks after 2-5 days and resolve within a month. The GCAA will not usually grant medical certification while the individual is experiencing an acute reaction. Once the condition has resolved, return to flying or control duties is likely.

1.5.2 Post traumatic stress disorder (PTSD)

This arises as delayed or protracted response to a stressful event or situation of a brief or long duration, of an exceptional threatening or catastrophic nature which is likely to cause pervasive distress in almost anyone. The disorders in this section are thought to arise always as a direct consequence of acute severe stress or continued trauma. These disorders can be regarded as maladaptive responses to severe or continued stress, in that they interfere with successful coping mechanisms and therefore lead to problems of social functioning.

Predisposing factors, such as personality traits (e.g. compulsive, asthenic) or previous history of neurotic illness may lower the threshold for the development of the syndrome or aggravate its course but they are neither necessary nor sufficient to explain its occurrence. Typical features include episodes of repeated reliving of the trauma in intrusive memories ("flashbacks"), dreams or nightmares, occurring against the persisting background of a sense of “numbness” and emotional blunting, detachment from other people, unresponsiveness to surroundings, anhedonia and avoidance of activities and situations reminiscent of the trauma. It usually starts with autonomic hyperarousal with hypervigilance and enhanced startle reaction and insomnia.

Anxiety and depression are commonly associated with the above symptoms and signs, and suicidal ideation is not infrequent. The onset follows the trauma with a latency period that may range from a few weeks to months. The course is fluctuating but recovery can be expected in the majority of cases. In a small proportion of cases the condition may follow a chronic course over many years with eventual transition to an enduring personality change.
The use of beta blockade and anti-depressive medications, together with psychotherapy offers considerable hope of alleviation of symptoms.

The importance of this stress reaction in aviators lies not only in the symptomatic disorders described above but the very real potential for the development of loss of confidence in, and a fear of flying. Such a development would almost certainly lead to disqualification from continuing certification in a high proportion of such individuals. The role of the authorised medical examiner is paramount in such situations. The GCAA will not usually grant aeromedical certification to individual who suffers from acute symptoms of PTSD. Certification may be considered once an individual's symptoms are controlled and the applicant is considered to pose no threat to the safety of air navigation or flight safety.

Medical certification of the pilots diagnosed with PTSD depends upon the successful resolution of symptoms and maintenance of symptom remission.

The GCAA highlights the pilot must report any adverse changes in anxiety symptoms. Failure to report a change in status would result in removal of his medical authorisation to fly. The validity must be every 6 months with a specialised psychiatrist reporting the pilot’s mental health status and progress.

1.5.3  **Adjustment disorders**
The manifestations vary and include depressed mood, anxiety or worry in a combination of these a feeling of inability to cope, as well as some degree of disability in the performance of daily routines. GCAA will not usually grant aeromedical certification to individual who suffers from acute symptoms of adjustment disorders.

**1.6 Mixed anxiety and depressive disorder**

Anxiety and depression or neurotic depression should be used when symptoms of anxiety and depression are both present but neither is clearly predominant and neither type of symptom is present to the extent that justifies a diagnosis, if each is considered separately.

**1.7 Somatoform Disorders**

The common features of this group of disorders are the presence of physical symptoms that suggest an underlying physical condition, but are not explained by that medical condition. The symptoms cause clinically significant distress or impairment in social, occupational or other areas of functioning and are not intentional. The individual shows a refusal to discuss the possibility of a psychological cause, even if the symptoms onset and evolution prove a close relationship to unhappy life events or hardships and conflicts.

With this kind of disorders there is behaviour or focusing on catching the attention of the people around; it is common that the individuals have an acute feelings of their incapacity to
persuade the physicians about the somatic nature of their illness and the need of a new investigation. Somatoform disorders include:

### 1.7.1 Somatization disorder

The main features are multiple, recurrent and frequently changing physical symptoms that have persisted many years before the individual’s coming to the psychiatrist. The symptoms can affect each part of the body, nevertheless, the most common sensations are gastrointestinal ones (pain, feeling bloated and full of gas, regurgitation of food, nausea, vomiting) and skin symptoms (unpleasant numbness or tinkling, burning sensations, itching). Sexual and menstrual complaints are also common. The course of the disorder is chronic and fluctuating and is often associated with disruption of social, interpersonal and family behaviour.

### 1.7.2 Hypochondrical disorder

The essential feature is a persistent preoccupation with the possibility of having one or more serious and progressive physical disorders. The individuals show persistent somatic complaints or a persistent preoccupation with their physical appearance.

Normal or common place sensations are often considered by these individuals as abnormal and distressing, and attention is usually focused upon only one or two organs or systems of the body. Marked depression and anxiety are often present and may justify additional diagnosis.

There is persistent refusal to accept medical reassurance that there is no real physical cause for the symptoms in discussion.

### 1.7.3 Somatoform autonomic dysfunction

Symptoms are presented by the individual as if they were due to a physical disorder of a system or organ that is largely or completely under autonomic innervations and control, i.e. the cardiovascular, gastrointestinal, respiratory and urogenital systems. The most common and significant complains are the ones referring to the cardiovascular system (cardiac neurosis or Da Costa’s syndrome or neurocirculatory asthenia), to the respiratory system (hyperventilation, psychogenic cough), to the gastrointestinal system (gastric neurosis, neurotic diarrhoea, irritable bowel syndrome, flatulence) and also to the urogenital system (dysuria and increased frequency of micturition).
The symptoms are usually of two types neither of which indicates a physical disorder of the organ or system concerned. Firstly, there are complaints based upon objective signs of autonomic arousal, such as palpitations, sweating, flushing, tremor and expression of fear and distress about the possibility of a physical disorder. Secondly, there are subjective complaints of a non-specific or changing nature, such as fleeting aches and pains, sensations of burning, heaviness, tightness and feelings of being bloated and distended, which are referred by the individual to a specific organ or system.

1.8 Aeromedical Assessment of Neurosis and Somatoform Disorders

a) The initial applicant

If the applicant has suffered a psychiatric illness of significant severity requiring a period, or periods, of psychotropic medication, or has required admission to a psychiatric hospital or undergone prolonged outpatient care, he should normally be assessed as unfit for both commercial flying and air traffic control duties. (Referral for formal psychiatric assessment may allow a fit assessment for a private pilot and Cabin crew in certain circumstances.)

b) Established flight crew

The established pilot has proved himself to be competent by successfully completing flying training. The decision as to his suitability to maintain a medical certificate may, therefore, be considered more sympathetically than is the case with the initial applicant.

- During the acute phase of any neurotic illness the presence of anxiety or depression is likely to interfere with decision making and the individual must be assessed as temporarily unfit to follow his profession until there has been full recovery.
- The use of psychotropic medication to treat psycho neurotic illness is incompatible with aviation duty and while any form of major or minor psychotropic drug aeromedical fitness is deemed to be suspended. This suspension must remain in force until a suitable period has elapsed following the cessation of medication to ensure that stability is maintained. Cases of cabin crew diagnosed with psycho neurotic illness may be permitted by the GCAA to return to flying duties, when satisfactory control is demonstrated by the use of medication.
- A single episode which clears completely in less than three months should be considered compatible with a return to flying.
- A protracted illness with poor response to treatment or characterised by relapses will normally lead to permanent unfit assessment.

2. MOOD (AFFECTIVE) DISORDERS

2.1 General
These are disorders, in which the fundamental disturbances are a change in effect, or mood, to depression (with or without associated anxiety), or to elation. The mood change is usually accompanied by a change in the overall level of activity. Most other symptoms are either secondary to, or easily understood, in the context of the change in mood and activity. These disorders mostly tend to be recurrent and the onset of individual episodes can often be related to stressful events or situations.

2.2 Manic episodes

2.2.1 Hypomania

A disorder characterised by persistent mild elevation of mood with increased energy and activity and usually marked feelings of well-being and both physical and mental efficiency. Increased sociability, talkativeness, over-familiarity, increased sexual energy and a decreased need for sleep are often present but not to the extent that they lead to severe disruption of work or result in social rejection. Conversely, irritability, conceit and boorish behaviour may take the place of the more usual euphoric sociability. These disturbances of mood and behaviour are not accompanied by hallucinations or delusions.

2.2.2 Mania without psychotic symptoms and Mania with psychotic symptoms

Here, mood is elevated out of keeping with the patient’s circumstances and may vary from carefree, jovial to almost uncontrollable excitement. This elation is accompanied by increased energy, over-activity, pressure of speech and a decreased need for sleep. Attention cannot be sustained and there is often marked distractibility. Self esteem is inflated with grandiose ideas and over confidence. Loss of normal social inhibitions may result in reckless, foolhardy and inappropriate behaviour.

In addition to the clinical picture described, delusions (usually grandiose) or hallucinations (usually voices speaking directly to the patient) may be super-added or the excitement, excessive motor activity and flights of ideas, become so extreme that the subject is incomprehensible or inaccessible to ordinary communication.

Note: The occurrence of even a single attack of a hypomanic or manic illness must be disqualifying for all classes of medical certificates, whether or not the condition has been controlled by medication.

2.2.3 Bipolar affective disorders

This disorder is characterised by two or more episodes in which the patient’s mood and activity levels are significantly disturbed, this disturbance consisting on some occasions of an elevation of mood and increased energy and activity (hypomania or mania) and on others of a
lowering of mood and decreased energy and activity (depression). (i.e.hypomanic, manic, depressed or mixed).

Bipolar Disorder is disqualifying for all the classes of medicals.

2.3 Depressive episodes

2.3.1 Major Depression

In typical mild, moderate or severe depressive episodes the patient suffers from lowering of mood, reduction of energy and decrease in activity. Capacity for enjoyment, interest and concentration is reduced, and marked tiredness after even minimum effort is common. Sleep is usually disturbed and appetite diminished. Self-esteem and self-confidence are almost always reduced and, even in the mild form, some ideas of guilt or worthlessness are often present. The lowered mood varies little from day to day, is irresponsible to circumstances and may be accompanied by so-called ‘somatic’ symptoms, such as loss of interest and pleasurable feelings, waking in the morning several hours before the usual time, depression worst in the morning, marked psychomotor retardation, agitation, loss of appetite, weight loss and loss of libido. Depending upon the number and severity of the symptoms, a depressive episode may be specified as mild, moderate or severe.

Note 1: at last 60 % of individuals who have a single episode of severe depression will experience further episodes.
Note 2: a significant aeromedical concern is the high mortality associated with this condition, as up to 15% of patients with major depression die by suicide.

2.3.2 Recurrent depressive disorder

This disorder is characterized by repeated episodes of depression as described for depressive episode without any history of independent episodes of mood elevation and increased energy (mania).

2.3.3 Cyclothymia

Cyclothymic disorder is symptomatically a mild form of bipolar disorder, characterized by episodes of hypomania and mild depression. A persistent instability of mood involving numerous periods of depression and mild elation, none of which is sufficiently severe or prolonged enough to justify a diagnosis of bipolar
affective disorder or recurrent depressive disorder.

**Note 1**: If the patient has hitherto been free of excessive mood swings and if the depression follows a non-recurring stress, such as death of a close relative etc., the prognosis for freedom from further attacks is good.

2.3.4 **Aeromedical assessment for person with depression episode**

2.3.4.1 **GCAA Protocol to License depressed pilots on treatment**

1. Initial diagnosis of a Depressive episode (according to ICD 10) and treatment must be initiated by a GCAA approved Psychiatrist.

2. The treatment options include Cognitive Behavioural Therapy (CBT), and or Selective Serotonin Re-uptake Inhibitors (SSRI’s).

   2.1 The SSRI’s allowed to be used are Citalopram, Escitalopram, Sertraline and Fluoxetine.

   2.2 Other treatment options must be assessed on individual basis.

3. 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

4. Psychometric testing to be done at diagnosis.

   4.1 Psychometric test, to be used as a method for objective testing of mood. This will be required as a baseline analysis.

   4.2 The Psychometric testing to include but not limited to Neo PIR, MMPI-2, Rorschach Inkblot, POMS, and CISS.

   4.3 The type of the test will depend on the Approved GCAA Psychologist decision.

5. The pilot will be reviewed monthly by the treating Psychiatrist and AME
6. Once stable and there is absence of any side effects confirmed by the treating Psychiatrist, the AME will arrange a further psychometrics assessment to see improvement in objective functioning and will arrange a Simulator assessment.

6.1 The simulator assessment will follow a standardized protocol to ensure safe handling of the aircraft in all conditions.

7. On completion of all the tests to a satisfactory level, an Aeromedical board (consisting of at least 2 GCAA approved Psychiatrists and a Senior AME) will be arranged.

8. On recommendation of the board the GCAA, at its discretion, will allow the Pilot to be returned to flying duties with Class I OML restriction.

9. After returning to flying duties the pilot must ground himself if he feels a worsening of his condition or cognitive functioning

10. After returning to flying duties and being treated, the pilot must be evaluated every month by GCAA Approved Psychiatrist.

11. The AME 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.

12. 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

13. Any suicidal ideation during the course of stability will necessitate grounding and further Psychiatric re-evaluation

14. Evidence of non compliance with treatment or ignorance of Psychiatric or AME reviews, necessitates immediate grounding.

15. Once CBT treatment has finished, Pilot should be reviewed on monthly basis by AME 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.
16. Follow up should continue as directed by the Psychiatrist and AME which may be indefinitely.

17. For Pilots completing SSRIs treatment, a four week ground trial is required to assess any withdrawal symptoms from cessation of treatment.

18. Once successful withdrawal has occurred, a further Aeromedical Evaluation board will be convened to evaluate the applicant. If the board recommendations are satisfactory to the GCAA, the Pilot will be returned to flying duties with a restricted OML License.

18.1 The Pilot will be subjected to monthly AME review

18.2 Psychiatric review will be as recommended by the board.

19. After minimum of 6 month flying with satisfactory Psychiatric and AME reviews, the GCAA will convene a further Aeromedical Board to lift the OML restriction.

Follow up should continue as directed by the Psychiatrist and AME which may be indefinitely

2.3.4.2 GCAA Protocol to License depressed cabin Crew on treatment

1. Initial diagnosis of a Depressive episode (according to ICD 10) and treatment must be initiated by a GCAA approved Psychiatrist.

2. The treatment options include Cognitive Behavioural Therapy (CBT), and or Selective Serotonin Re-uptake Inhibitors (SSRI’s).

2.1 The SSRI’s allowed to be used are Citalopram, Escitalopram, Sertraline and Fluoxetine.

2.2 Other treatment options must be assessed on individual basis.

3. Initial grounding post commencement of treatment to:
   - Check for potential side effects
   - Improvement in the condition
   - Stability

4. Once stable and there is absence of any side effects confirmed by the treating Psychiatrist, the medical certificate will be reinstated by the GCAA.
5. The Cabin crew will be reviewed every 3 months, unless indicated otherwise by treating psychiatrist.

6. 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.

7. Any suicidal ideation during the course of stability will necessitate grounding and further Psychiatric re-evaluation.

8. Evidence of non-compliance with treatment or ignorance of Psychiatric or AME reviews, necessitates immediate grounding.

9. Once treatment has finished, Cabin crew should be reviewed as directed by the Psychiatrist.

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 behavior 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:
1. Antisocial personality disorder (impulsive, aggressive, manipulative),
2. Borderline personality disorder (impulsive, self-destructive, unstable),
3. Dependent personality disorder (dependent, submissive, clinging);
4. Histrionic personality disorder (emotional, dramatic, theatrical);
5. Narcissistic personality disorder (boastful, egotistical, superiority complex);
6. Obsessive – compulsive personality disorder (perfectionist, rigid, controlling);
7. Paranoid personality disorder (suspicious, distrustful);
8. 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 psychiatrists - one with experience in aviation
medicine- confirm that a Pilot, ATC or cabin crew with a personality disorder represents a low risk to aviation safety.

4. OTHER PSYCHIATRIC CONDITIONS WHICH MAY BE THE FOCUS OF CLINICAL ATTENTION

4.1 Suicide ideation or gesture

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 suffer 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) a history of direct statement of intent;
   b) a history of previous self harm;
   c) a previous or current depressive disorder, particularly those in the early phase of recovery;
   d) alcohol dependence, particularly where physical complications or severe social damage exists;
   e) Drug dependence;
   f) 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.
4.2 Fear of Flying

DSM IV identifies as a true simple phobia the overt, unbashed and long-standing fear of flying which usually occurs in people who are not aviators. When an experienced aviator who previously enjoyed flying presents with fear of flying, it may represent a complex mix of more acute causes and symptoms presentations. In such fearful fliers, anxiety about symbolic threats may overlay a rational fear of actual risks. This may represent a reaction to a near or actual accident, or displaced anxiety from a personal crisis. If the flier is not consciously aware of the fear, the focus may be on vague or trivial somatic symptoms, presented in setting of "I’d like to fly, but ___". This attitude presents a stiking clinical contrast to the more usual tendency of flier to under state, if not actually deny signs and symptoms that they believe may disqualify them from medical certification.

Whatever is the cause or precipitating factors for the fear of flying, the GCAA will not medically certificate a Pilot/or Cabin crew who suffer symptomatic fear of flying.

SUBPART H- 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 nearsightedness. 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 dioptre during the day. Another is increased glare sensitivity due to the corneal scars.

Applicants who undergo radial keratomy and whose eyes have stablised 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 dioptre 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 microkeratome. 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 diopters and for hyperopia of +3 to +10 diopters. 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 diopters 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

2.1 General

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.

2.2 Purpose:

The purpose of this 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.

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.

2.3 Eye Injuries:

<table>
<thead>
<tr>
<th>Cornea</th>
<th>Retina</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 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,</td>
<td></td>
</tr>
<tr>
<td>1. Temporary changes in the ability to see can be produced without permanent damage.</td>
<td></td>
</tr>
</tbody>
</table>
| 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
but meanwhile they produce a decrement in visual performance.

2. 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.

### 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.

### 4. Evaluation of suspected Laser injuries by Eye Specialist:

#### 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, color, 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 (Appendix 7) 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.

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.
- Color Vision.
- Slit Lamp.
- Retinal Examination
- 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 fiber 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.
- Funds Fluorescein angiography

References:
1. Prevention and medical management of laser injuries (field manual No.8-50) departments of US Army
2. United states Air force school of aerospace medicine /Laser injury guidebook /2008
SUBPART I - 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 tumor, 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 hematological parameters and no ongoing 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
major surgery. Examples of minimum times assessed as unfit for various types of surgery are shown in Table 1. It is stressed that these are minimum times, and more extensive procedures or any complications with, for example, wound healing will extend these times.

<table>
<thead>
<tr>
<th>Operation</th>
<th>Example</th>
<th>Minimum time assessed as temporarily unfit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor</td>
<td>Excision of mole /lymph node biopsy</td>
<td>1 week</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Orchidectomy for testicular tumor</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Major</td>
<td>Hemicolecotomy for carcinoma of colon</td>
<td>12 weeks</td>
</tr>
</tbody>
</table>

Table 1: Minimum periods of unfitness after surgery

The AMI may consider earlier recertifications 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 tumor “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 1, and including Class 2 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 2 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
<table>
<thead>
<tr>
<th>Incapacitation risk per year</th>
<th>Acceptable level of certification</th>
<th>License</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 0.1 %</td>
<td>Any</td>
<td>Any</td>
</tr>
<tr>
<td>Between 0.1 % - 1%</td>
<td>Class 1 restricted</td>
<td>2 crew professional</td>
</tr>
<tr>
<td></td>
<td>Class 2 unrestricted</td>
<td>Solo private</td>
</tr>
<tr>
<td>greater than 1%</td>
<td>No class 1</td>
<td>No professional</td>
</tr>
<tr>
<td></td>
<td>Possible class 2 restricted</td>
<td>Private with restriction</td>
</tr>
</tbody>
</table>

Thus if an incapacitation rate per year can be derived for `tumor 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 tumor 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 tumor or its TNM classification. The second is the site of that recurrence, and this will depend on the primary tumor type. These two factors will now be discussed individually, again in relation to a hypothetical tumor X.

4.2 Defining the risk of recurrence

The annual recurrence rate of tumor 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 tumor 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 tumor 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.
Years since primary treatment

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

The graph represents the recurrence rates for all cases of tumor 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 tumor 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 tumor X is related positively to the stage of the tumor at operation. Thus the previous overall five year survival curve of tumor 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 tumors (stages 2 and 3) have a worse prognosis than early lesions.
From the data in Figure 2 it is possible to derive a yearly percentage risk of recurrence for any stage of tumor X. For instance, the risk of a recurrence between two and three years after surgery for a stage 2 tumor 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.
<table>
<thead>
<tr>
<th>Site</th>
<th>Incapacitation weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local and lymph nodes</td>
<td>5%</td>
</tr>
<tr>
<td>Liver</td>
<td>5%</td>
</tr>
<tr>
<td>Lung</td>
<td>5%</td>
</tr>
<tr>
<td>Bone</td>
<td>5%</td>
</tr>
<tr>
<td>Bone marrow</td>
<td>20%</td>
</tr>
<tr>
<td>Brain</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 4: Incapacitation weighting

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 anemia 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 tumor 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.

4.5 Defining the total risk of incapacitation

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

- The recurrence rate per year for any stage of tumor 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.

\[(\text{Tumor X recurrence rate (\%)} \times \text{(Incidence of brain metastases (\%)} \times \text{(Risk of a brain metastases causing incapacitation (\%)}) = \text{Incapacitation risk for brain metastases in tumor X (\%)}}\]

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

Year 1 / Stage 1: \(\frac{1}{20} (5\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{1}{200} = 0.5\% \text{ risk of incapacitation}\)

Year 1 / Stage 2: \(\frac{3}{20} (15\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{3}{200} = 1.5\% \text{ risk of incapacitation}\)

Year 1 / Stage 3: \(\frac{3}{10} (30\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{3}{100} = 3.0\% \text{ risk of incapacitation}\)

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 tumor. This would allow a range of certification as shown in **Table 5**.

<table>
<thead>
<tr>
<th>Year 1- brain metastases</th>
<th>Stage</th>
<th>Incapacitation risk</th>
<th>Professional certification</th>
<th>Private certification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0.5%</td>
<td>As or with copilot</td>
<td>Unrestricted</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1.5%</td>
<td>None</td>
<td>Safety pilot</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3.0%</td>
<td>None</td>
<td>Safety pilot</td>
</tr>
</tbody>
</table>

**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 tumor recurrence rates are taken from Figure 2.

Year 5 / Stage 1: \(\frac{1}{100} (1\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{1}{1000} = 0.1\% \text{ risk of incapacitation}\)

Year 5 / Stage 2: \(\frac{1}{20} (5\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{1}{200} = 0.5\% \text{ risk of incapacitation}\)

Year 5 / Stage 3: \(\frac{1}{5} (20\%) \times \frac{1}{10} (10\%) \times 1 (100\%) = \frac{1}{50} = 2\% \text{ risk of incapacitation}\)

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**:

<table>
<thead>
<tr>
<th>Year 5- brain metastases</th>
<th>Stage</th>
<th>Incapacitation risk</th>
<th>Professional certification</th>
<th>Private certification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>0.1%</td>
<td>Unrestricted</td>
<td>Unrestricted</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.5%</td>
<td>As or with co-pilot</td>
<td>Unrestricted</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2 %</td>
<td>None</td>
<td>Safety pilot</td>
</tr>
</tbody>
</table>
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):

<table>
<thead>
<tr>
<th>stage</th>
<th>Year since completion of primary treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0.5% (5%×10%×100%)</td>
</tr>
<tr>
<td>2</td>
<td>15%×10%×100%=1.5%</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>stage</th>
<th>Year since completion of primary treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

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 tumors 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 tumor 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 tumors 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 Tumor Markers

The relapse or active progression of certain tumors may be effectively followed by measuring tumor 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 tumor 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.
SUBPART J- Sexually Transmitted 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.

1.1 Hepatitis B:

Applicants with HbsA+ve, with HbeAg -ve and HbeAb +ve with normal liver enzymes are considered to be fit for initial or renewal medical certification.

Applicants with HbsA+ve, with HbeAg -ve and HbeAb+ve with abnormal liver enzymes, are referred to do HBV-DNA (PCR), and if PCR is positive, they are considered unfit for certification.

Applicants with HbsA+ve, with HbeAg +ve and HbeAb -ve are considered to be unfit for medical certification.

1.2 Hepatitis C

Applicant with HCV-antibody positive and HCV-PCR is considered unfit for certification. Recertification may be considered for Class I, II and III with restricted medical certificate, provided the liver function enzymes is stable. Cabin crew Class may be certificated if the test is positive provided they are not classified as food handlers.
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SUBPART K - NEUROLOGY

1. GENERAL

Pathology of the nervous system may:

(a) reduce of the sensory input from, and appreciation of the external and internal environment

(b) impair assessment, judgment and decision making

(c) affect the motor skills necessary for any license holder... effect of such pathology may be episodic, static or progressive. Neurological assessment should include careful history and physical examination

2. NEUROLOGICAL FITNESS

A satisfactory assessment may be achieved if:

(a) there is no abnormality of history, examination or performance

(b) Any abnormality noted has an acceptable risk of hazards to the safety of the flight operation/control duty concerned. Such abnormality may be a single event, or recurrent, static, or progressive or intermittent but potentially recurrent. The condition may improve but subsequently relapse. Neurological fitness for aviation purposes must therefore be demonstrated at initial examination and predicted to be maintained throughout the defined period of medical certificate validation.

3. HEADACHE

Nearly all applicants have experienced headache. The diagnosis of primary headaches are not discrete and the different types should be considered to be part of continuous spectrum ranging from muscular tension headache at one end to Classical Migraine at the other. Secondary headaches from other conditions eg, cranial Neuralgia, Temporal Arthritis should be considered separately.

When considering primary headaches it is important to assess the history according to:

- Speed of onset: is there warning eg, aura or no warning?
- Period of prodrome: seconds, minutes or hours?
- Frequency: isolated or recurrent, if recurrent how often.
- Neurological symptoms: aura (crippling or just perceived), photophobia, visual changes, paraesthesia, paralysis, dysphasia etc.
- Severity: need for acute and intensive intervention such as parenteral opitc analgesics, degree of incapacitation such as need for bed rest versus ability to continue complex tasks
- Treatment and their effectiveness: how effective prophylaxis if used. Type of acute treatment used eg, Tryptins and the speed of response and any significant side effects
- Precipitating factors: such as diet, oral contraceptive etc and effect of aviodance or withdrawal of such factors.
Note: since objective investigation will most usually negative, a detailed history is essential. The best history is obtained at first presentation.

3.1 Migraine

Is an acute but reversible transient cerebral vascular insufficiency phenomenon and headache is not necessarily the most important component. Two main types of migraine are present, common migraine and classical migraine.

3.1.1 Common Migraine (Migraine without Aura)

Diagnosis depends on:

- Detailed history of headaches
- Usually an absence of significant neurological symptoms

Treatment usually does not include parenteral opiates or specific migraine drugs such as vascular active agents.

3.1.2 Classical Migraine

Is accompanies by any transient focal neurological and/or vascular phenomena that may include:

- Unilateral headache
- Hemiparesthesia, Hemiplegia
- Retinal /occipital phenomena, such as visual disturbance of various degree and scotoma
- Basilar artery phenomena
- Autonomic symptoms of nausea, vomiting etc.

Such migraines have variable periods of remission and rate of onset, and may completely incapacitate the sufferer. There is no universal exclusion of medication. Significant side effect should be explored and tier presence or absence documented.

Adverse factors for aeromedical certification include:

- Sudden significant neurological symptom such as loss of vision, weakness and in coordination with no warning.
- Failure or of prophylactic treatment with frequent attacks.
- Requirement for intensive treatment
- Short prodrome that does not allow effective use of acute treatment before symptom onset
Note: the aviation medicine section considers all cases individually.

3.1.2.1 Aeromedical disposition:

(a) Anyone with a history of migraine should not be selected for Class I and III certification; due to the unpredictability and disabling nature of the condition.

(b) 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 and III.

(c) If the migraine attacks are infrequent and due to a specific precipitant, and avoidance of this precipitant results in no further migraines for a period of more than 2 years.

(d) Class II and cabin crew class holders may be allowed to fly without restriction if their attacks are mild and very infrequent; no more than two attacks per year, cases with controlled Migraine with the use of medication acceptable for flying duties may be certificated, if satisfactory report from the neurologist is submitted to the GCAA.

(e) Frequent migraine attacks are incompatible with any form of flying.

4. TRAUMATIC BRAIN INJURY

4.1 General

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, behavioral, 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)

4.2 Consequences of traumatic Brain Injury

4.3 Neuropsychological consequence
4.3.1 General

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 trigger.
- 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.

4.3.2 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.

4.4 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.

4.5 Focal 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.

4.6 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 postrauamatic 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 percent, 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.

4.6.1 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.

5. AEROMEDICAL STATUS FOR HEAD INJURY BASED ON CLINICAL & IMAGING STUDIES:

5.1 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.

There must also be

- Normal CT scan and MRI i.e no skull fractures or cerebral bleeding
- Normal neuropsychological testing

### 5.1.1 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.

### 5.2 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 Hemorrhage, Intraventricular Hemorrhage, Subarachnoid Hemorrhage)
• Abnormal EEG

5.2.1 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

5.2.2 Requirements for Aeromedical certification decision:

i. Two Neurology consultations by Neurologists acceptable to the GCAA supporting recertification
ii. Extensive Neuro-psychological evaluations
iii. Brain imaging (CT or MRI) at index and no sooner than 2 years afterwards
iv. Normal Sleep deprivation / Photostimulation EEG.
v. Two practical flight tests including one at night during circadian lows
vi. 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.
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APPENDIX 1

TRAINING COURSE SYLLABI FOR AUTHORISED MEDICAL EXAMINERS

Program of lectures, and clinical presentation
Reference material utilised for this training are:
ICAO Annex 1
ICAO Annex 13
ICAO manual of civil aviation medicine
ICAO manual of aircraft accident investigation
A standard text book in aviation medicine.

LECTURE UNITS

1. Introduction to Aviation Medicine

Human factor in aviation system
   History of aviation medicine
   Specific aspects of civil aviation medicine
   international and national regulations; Chicago Convention

2. medical requirement, basic principles in assessment of aviation duties.

   general medical requirements

   Physical and mental requirement for licenses
   visual requirement for licences
   colour perception requirement for license
   Hearing requirement for licenses.
   Aviation Physiology
   operational and environmental conditions
   Barometric pressure, hypoxia, hypobaria, decompression, pressurization.
   Acceleration, basic principle, effects on human beings
Visual disorientation, vestibular disorientation, simulator illusion and noise and vibration.

3. Ophthalmology
   - Anatomy of the eye
   - Clinical examination of the eyes
   - Function testing (visual acuity, colour vision, visual fields etc.)

4. Otorhinolaryngology
   - Anatomy of the systems
   - Clinical examination in ORL
   - Functional hearing tests
   - Equilibrium testing
   - Aero-deafness
   - Barotraumas – ears and sinuses
   - Aeronautical ORL – pathology

5. Cardiology
   - Relation to aviation duties, risk of sudden incapacitation
   - Examination procedures and special investigations.
   - Specific cardiovascular conditions (hypertension, ischemic heart disease, myocardial infarction, arrhythmias, cardiomyopathy, congenital heart defects)

6. Respiratory system
   Requirements and assessment of applicant with respiratory problems, lung infection and post surgical cases.

7. Digestive system
   - Abdominal pain, surgery to any part of gastrointestinal tract and complication of operation
   - Hernia
   - Biliary tract disorders

8. Endocrine diseases
   - Pituitary diseases, thyroid disease, other endocrine diseases and their implication on flight safety.
   - Diabetes Mellitus: diagnosis
   - Anti-diabetic medication
Licensing aspects in aviation
satisfactory control criteria for aviation duties.

9. Neurology
Complete neurological examination
Physical fitness and neurological disorders

10. Psychiatry in Aviation Medicine
Psychiatric exploration
Physical fitness and psychiatric conditions
Drugs and alcohol

11. Psychology
Introduction to psychology in aviation
Behaviour
Personality
Flight motivation and suitability
Group social factors
Workload, ergonomics
Psychological stress, fatigue
Psychomotor functions and age
Fear and refusal of flying

12. General medicine
Urinary system, haematology, etc, and implication on flight safety.

13. Accidents investigation and prevention
Accident statistics
general, recreational aviation
commercial aviation
The human factors aspect, role of medical examiner and determination of the causes.
flight crew fatigue.
14. Legislation, Rules and Regulations

ICAO Standards and Recommended Practices

15. On-duty incapacitation

Sudden, subtle, complete, partial, medical aspects and operational aspects.

16. Passenger health or fitness to fly

- Disabled passengers
- Air ambulance flying
- Patients in respiratory distress
- Patients with cardiovascular disorders
- Psychiatric emergencies

17. Medication and Flying

Hazard of medication and drugs in aviation

18. Tropical medicine

- Endemicity of tropical disease
- Tropical pathology and aviation medicine
- Vaccination of flight crew and passengers
- International health regulations
APPENDIX 2

CHECKLIST OF FORMS AND SUPPLIES

(a) UAE Civil Aviation Regulation Part II, *Medical Provisions for Licensing*.

(b) Civil Aviation Advisory Publication (CAAP 19)-Aeromedical

(c) Directory of GCAA approved facilities for Aviation Medical examinations and of Aeromedical Examiners.

(d) Forms and supplies may be obtained from the Licensing and Aeromedical Section. The use of any locally designed forms or certificates in lieu of those listed below is prohibited.

(e) GCAA Form no.02/03, Civil Aviation Medical Examination Report.

(f) Temporary Medical Certificate form (GCAA form 03/03).

(g) A.M.E. Designation Card.

(h) List of Website addresses of important Aviation Medicine sites.

(i) AME stamp
APPENDIX 3

LIST OF REQUIRED EQUIPMENT
All AMEs shall possess, in current calibration and good working order, all the necessary equipment to conduct an aeromedical assessment, including but not limited to:

(a) **Standard Far Vision Testing**, utilizing standard printed eye charts or electronic vision testing equipment.

(b) **N series test types for near vision testing**

(c) **Colour Vision Test Apparatus**. Ishihara 24 -;

(d) **Standard physician diagnostic instruments and aids**.

(e) **Electrocardiographic equipment** *(Three channels ECG machine-printed on A4 paper-full page with or without interpretation)*

(f) **Audiometric equipment**. All Aviation Medical Examiners must have access to audiometric equipment or a capability of referring applicants to other medical facilities for audiometric testing.

(g) **Pulmonary function test machine (Spirometry) and Peak expiratory flow rate**, these machine should be an available within all the facilities.

A suitable computer, document scanner, modem and software package for communication with GCAA, the process of e-work will be established from next year.
APPENDIX 4

POPULAR DRUGS REPORTED TO AFFECT COLOR VISION

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

<table>
<thead>
<tr>
<th>1</th>
<th>Analgesics, Anti-Inflammatory Agents:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Ibuprofen (Advil)</td>
</tr>
<tr>
<td></td>
<td>Blurred Vision; Decreased Vision; Photosensitivity; Decrease in Color Vision.</td>
</tr>
<tr>
<td>b.</td>
<td>Naproxen (Anaprox, Aleve)</td>
</tr>
<tr>
<td></td>
<td>Decreased Vision; Changes in Color Vision; Photosensitivity, Corneal Opacities.</td>
</tr>
<tr>
<td>2</td>
<td>Cardiovascular Drugs</td>
</tr>
<tr>
<td></td>
<td>Side Effects</td>
</tr>
<tr>
<td>a.</td>
<td>Digitalis Glycosides</td>
</tr>
<tr>
<td></td>
<td>Color Vision Defects, Decreased Vision, Glare Phenomenon, Flickering Vision.</td>
</tr>
<tr>
<td>b.</td>
<td>Diuretics (Thiazide-type)</td>
</tr>
<tr>
<td></td>
<td>Color Vision Abnormalities, Decreased Vision, Myopia, Retnal Edema.</td>
</tr>
<tr>
<td>3</td>
<td>Hormones, Hormone-Related Drugs</td>
</tr>
<tr>
<td></td>
<td>Side Effects</td>
</tr>
<tr>
<td>a.</td>
<td>Estradiol (general)</td>
</tr>
<tr>
<td></td>
<td>Color Vision Abnormalities, Decreased Vision, Fluctuations of corneal curvature and corneal steepening.</td>
</tr>
<tr>
<td>b.</td>
<td>Oral Contraceptives</td>
</tr>
<tr>
<td></td>
<td>Color Vision Abnormalities, Decreased Vision, Retnal vascular disorders.</td>
</tr>
<tr>
<td>c.</td>
<td>Tamoxifen (Nolvadex)</td>
</tr>
<tr>
<td></td>
<td>Decrease in Color Vision, Decreased Vision corneal opacities, retinopathy, possible optic neuritis or neuropathy.</td>
</tr>
<tr>
<td>4</td>
<td>Other Drugs</td>
</tr>
<tr>
<td></td>
<td>Side Effects</td>
</tr>
<tr>
<td>a.</td>
<td>Plaquenil</td>
</tr>
<tr>
<td></td>
<td>Color Vision</td>
</tr>
<tr>
<td>b.</td>
<td>Chloroquine</td>
</tr>
<tr>
<td></td>
<td>Color Vision</td>
</tr>
<tr>
<td>c.</td>
<td>Myambutol</td>
</tr>
<tr>
<td></td>
<td>Color Vision</td>
</tr>
<tr>
<td>d.</td>
<td>Barbiturate</td>
</tr>
<tr>
<td></td>
<td>Affect the yellow or yellow-green vision</td>
</tr>
<tr>
<td>e.</td>
<td>Viagra</td>
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<tr>
<td></td>
<td>Temporary change in blue/green colors</td>
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<tr>
<td>f.</td>
<td>Vitamin A (in a retinol form) in large doses</td>
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<tr>
<td></td>
<td>Affect the yellow or yellow-green vision</td>
</tr>
<tr>
<td>h.</td>
<td>Caffeine</td>
</tr>
<tr>
<td></td>
<td>In large doses can alter the colour vision temporarily</td>
</tr>
</tbody>
</table>
APPENDIX 5

AEROMEDICAL SUMMARY TEMPLATE

Date:
Patient Identification:
Name:
Age:
Current job:
Experience/flying hours
The purpose of this AMS is to request a waiver for_____________ (diagnosis).
Applicant 's Organization's name:_________.
Medical Facility name: __________
AME email point of contact: _________ with phone_____________.
AME’s designation number is: __________.
Previous Waivers and status: Please give the status of all previous waivers and update required
Significant Medical History: Same as History of Present Illness.
Consultant reports: Need dates, consultant diagnosis, prognosis, treatment, and follow-up. Submit original copies of the consultant reports along with the AMS
Physical Examination: Include vital signs, and a targeted physical exam that focuses on the waiver(s) requested.
Lab test: Review lab tests that are pertinent to the evaluation of the disqualifying diagnosis. Either type in the actual results or send copies of the laboratory reports.
Diagnosis:
Aeromedical recommendations: Include appropriate aeromedical justification for each recommendation.
Command endorsement: the AME is aware and concurs with this applicant's diagnosis, prognosis, waiver requirements and waiver recommendation in this Aeromedical Summary. Official GCAA endorsement
AME signature
# APPENDIX 6

## EPWORTH SLEEPINESS SCORE

**Epworth Sleepiness Score**

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

**Total Epworth Sleepiness Score**

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APPENDIX 7
LASER QUESTIONNAIRE

A- APPLICANT DETAILS

DATE OF EXAMINATION (DD/MM/YYYY)

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 color(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 maneuvers 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 color 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?
ATTACHMENT

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.

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:

a. Acute incapacitation

   Is there any possibility that this drug, in this situation, might cause incapacitation; anaphylaxis, acute vertigo, hypotension, arrhythmias, diplopia

b. 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.

**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

**2. 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 antispasmodics, such as –alverine, mebeverine and peppermint oil are acceptable.

**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 is no side effects.

3. For gastro-esophageal reflux (GERD), proton pump inhibitor are most efficacious and may be used for aircrew including pilots.

**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.

**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.

**TREATMENT OF GALLSTONE**

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

**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.

**ANTI-MOTION SICKNESS DRUGS**

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

3. **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, enalapril, lisinopril

**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.

CENTRAL ANTIHYPERTENSIVE DRUGS

Incompatible with flying/or controlling duties

e.g. clonidine, alphamethyldopa

VASODILATORS

Incompatible with flying/or controlling duties

e.g. prazosin, dihydralazine

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

ANTIANGINAL MEDICATIONS

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

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

**4. 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 bets 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 containg opioids are incompatible (e.g. Broncholar, Broncholarforte, Codipront Cum exp, Bronchophane, and Dextrolog.)
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.

5. ENDOCRINOLOGY

THYROID

1. HYPERTHYROID:

Patients with hyperthyroidism must be grounded on diagnosis of hyperthyroidism. If thyroid suppression treatment with propythiouracil 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.

I\(^{131}\) 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 life long 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).
6. 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 trasaminase concentration (greater that 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

6. NEUROLOGY

ANTI EPELIPTIC MEDICINE AND DRUGA 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 tumors 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.

7. **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 stop over in long-haul transport operation to facilitate sleeping onset.

Characteristic: This medication have 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 bedtime, silence, darkness, fresh air and lower temperature in bedroom, 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 who 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 cutoff 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:**

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 hang over 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 it 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 supplements 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

8. 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: opioid 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; propoxyphene.

As is the ease with all drug therapy, the medical examiner must always be aware of drug
idiosyncracy 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.

9. 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 fulfills 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, eg 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.
10. 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 copilot 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, Sulfur, 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 mucus 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.

11. OPTHALMOLOGY

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.

12. 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 transermal 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 (bupropion). 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 color blindness, as seeing bluish tinge or having difficult 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-arterictic 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 hyprtention, Diabetes, dyslipideamia 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, any occurrence of decrease vision should be immediately reported to the AME.

iii. Pilots, ATC and other aircrew using Viagara/Levitra should be grounded for 48 hours after ingestion.

d. DIET AIDS/WEIGHT REDUCTION/APPETITE SUPPRESSANTS

i. Drug Therapy for Obesity

Noradrenergic Agents which affect weight loss through action in the appetite center. 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 (Redux are 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 theGCAA for pilots or controllers holding medical certificates.
**Digestive Inhibitors**

Orlistat (Xenical), the first lipase inhibitor labeled 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 m\(^2\) or in patients with hypertension, diabetes or dyslipidemia who have a BMI of greater than 27 kg per m\(^2\).

Gastrointestinal side effects occurred in as many as 40 percent of patients includes flatus with discharge, oily spotting and oily stool, fecal urgency, fecal 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.

**ii. Common Dietary Supplements for Weight Loss.**

See herbal medication below

**f. 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 require 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 multicrew will be imposed.

**g. OTHER MEDICATIONS SUCH AS VITAMINS, MINERALS AND HERBAL PREPARATIONS**

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 a AME for advice before taking such medications and performing aviation—related duties.
VITAMINS, MINERALS AND DIETARY 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, cabincrew 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.