

SHERMAN T. NAZAIRE, MD, DPCOM, CFP, AME

- Family Medicine Practice
- Occupational Medicine Specialist
- Aviation Medical Examiner: CAAP, CASA and FAA
- To discuss in relation to aeromedical decision making



Disclaimer:

- Not a specialist in Ophthalmological Disease, any expert can free to share their knowledge about the case
- Not the Aviation Medical Examiner who assess the subject pilot



**Civil Aviation Authority
of the Philippines**

**A CASE STUDY
OF
BLIND SIGHT DOWN UNDER**

**SECOND AVIATION MEDICAL
EXAMINER REFRESHER WORKSHOP**

DECEMBER 12-13, 2022



General Data

- Airbus A330 Captain
- 48 years old
- Male
- Holder of Airline Transport Pilot License
- Class 1 Aviation Medical Certificate
- Total of 14,102 Flying Hours



PERTINENT MEDICAL HISTORY

- Impaired Fasting Glucose Tolerance
- Hypercholesterolemia



PATIENT HISTORY

Patient illness started sometime in September 2019 when he suddenly noted “darkening of vision of his right eye when looking down”. He had initial consult to an ophthalmologist. A thorough ophthalmological examination was done and given a primary impression of Non-Arteritic Ischemic Optic Neuropathy



What should the Pilot do?



Please choose the best answer:

- a. Seek consult to the airline company physician for medical advise
- b. Apply for a sick leave and return to flying when he has fitness to fly clearance from his attending ophthalmologist
- c. Suspend flying temporarily and notify CAA
- d. Continue flying and self-monitor of the visual/eye symptoms



ANSWER

- a. Seek consult of the airline company physician for medical advise
- b. Apply for a sick leave and return to flying when he has fitness to fly clearance from his attending ophthalmologist
- c. Suspend flying temporarily and notify CAA**
- d. Continue flying and self-monitor of the visual/eye symptoms



ICAO MANUAL OF CIVIL AVIATION MEDICINE

ANNEX I

Decrease in medical fitness

1.2.6.1 Holders of licences provided for in this Annex shall not exercise the privileges of their licences and related ratings at any time when they are aware of any decrease in their medical fitness which might render them unable to safely and properly exercise these privileges.

1.2.6.1.1 **Recommendation.**— *States should ensure that licence holders are provided with clear guidelines on medical conditions that may be relevant to flight safety and when to seek clarification or guidance from a medical examiner or Licensing Authority.*



PATIENT HISTORY

September 2020, subject pilot reported again to CAA after several check up with his ophthalmologist due to similar symptoms he noted on his left eye.

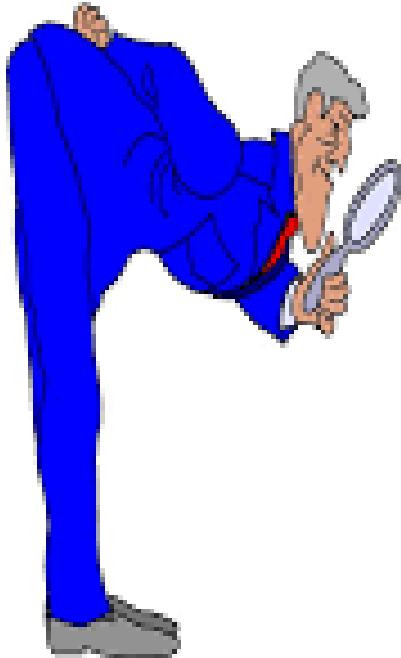
Further examination:

- Blood test (inflammatory markers) were normal.
- Cranial MRI (Magnetic Resonance Imaging) showed swelling of the left optic nerve and resolving right optic nerve swelling.



Despite his condition subject pilot decided to renew his Class 1 Aviation Medical Certificate:

- Review of pertinent medical and physical findings:
 - Grossly Normal Eye Examination
 - VA 20/20 OU with inferior field defect on both eyes
 - Fundoscopy: Pallor on superior portion of the optic disc
 - Perimetry Index: 77%, right eye and 79%, left eye
 - Scotomas: Located in the inferior portion of the visual field



AEROMEDICAL DECISION?



CHOOSE THE BEST ANSWER:

- a. Unfit to fly
- b. Fit to fly daytime only
- c. Fit to fly with no limitations
- d. Do serial monitoring using Perimetry test



CHOOSE THE BEST ANSWER:

a. Unfit to fly

b. Fit to fly for at daytime only

c. Fit to fly with no limitations

d. Do serial monitoring using Perimetry test



ICAO MANUAL OF CIVIL AVIATION MEDICINE

CHAPTER 6

6.3.3 Visual requirements

The medical examination shall be based on the following requirements.

6.3.3.1 The function of the eyes and their adnexa shall be normal. There shall be no active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual function to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.

6.3.3.5 The applicant shall be required to have normal fields of vision.



On July 2021, subject pilot made an appeal on PEL decision for reconsideration on the denial/disqualification invoking the particular provision of the regulations.

ICAO PERSONNEL LICENSING

1.2.4.9 If the medical Standards prescribed in Chapter 6 for a particular licence are not met, the appropriate Medical Assessment shall not be issued or renewed unless the following conditions are fulfilled:

- a) accredited medical conclusion indicates that in special circumstances the applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety;
- b) relevant ability, skill and experience of the applicant and operational conditions have been given due consideration; and
- c) the licence is endorsed with any special limitation or limitations when the safe performance of the licence holder's duties is dependent on compliance with such limitation or limitations.



AEROMEDICAL DECISION?



Please choose answer:

- a. Conduct medical flight test
- b. Seek second opinion from another eye specialist
- c. Deny the appeal
- d. Issue restricted Class 1 Aviation Medical Certificate with limitations



Please choose answer:

- a. Conduct medical flight test**
- b. Seek second opinion from another eye specialist
- c. Deny the appeal
- d. Issue restricted Class 1 Aviation Medical Certificate with limitations

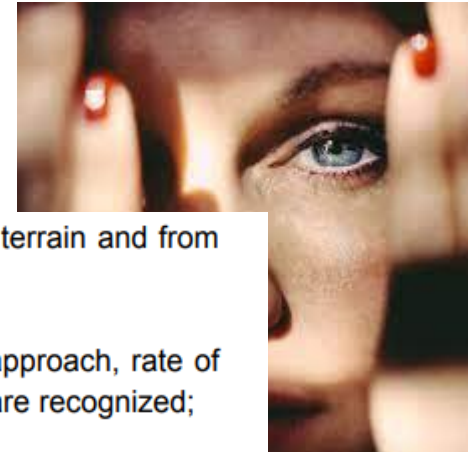


MEDICAL FLIGHT TEST

Visual Deficiencies

2.4.10 Suggested Testing Procedures:

- a) ability to select emergency landing fields from a distance, preferably over unfamiliar terrain and from high altitude;
- b) ability to undertake simulated forced landings in difficult fields. Note the manner of approach, rate of descent, and comparative distance at which obstructions (stumps, boulders, ditches) are recognized;
- c) ability to recognize other aircraft approaching on a collision course (possibly by pre-arrangement), especially aircraft approaching from the far right or far left;
- d) ability to judge distances (compared with the examiner's judgement), such as distance from other aircraft and from the ground, and to recognize landmarks at the limit of the examiner's vision;
- e) manner in which landings are made, including crosswind landings;
- f) ability to read aeronautical maps in flight and to tune the radio on a predetermined station accurately and quickly;
- g) ability to read instrument panels quickly and correctly (including overhead panel, if any).





BASIS OF ISSUANCE

Practical flight test: PASSED

- Restricted Class 1 Aviation Medical Certificate
- Statement of Demonstrated Ability (SODA)
 - Holder shall possess corrective glasses that correct for near vision
 - Valid only when serving as a pilot member of a fully qualified two (2) pilot crew



[Case Reports](#) > [Aerosp Med Hum Perform.](#) 2018 Nov 1;89(11):1005-1007.

doi: 10.3357/AMHP.5177.2018.

Non-Arteritic Anterior Ischemic Optic Neuropathy in Pilots

Alberto G Distefano, Byron L Lam

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Abstract

BACKGROUND: Non-arteritic anterior ischemic optic neuropathy (NAION) is a common cause of optic neuropathy with the exact pathophysiology unknown. Risk factors include advanced age, small optic nerve head, hypertension, diabetes mellitus, and sleep apnea.⁶ High altitude is considered another risk factor, although only few cases have been reported. No cases of NAION have been reported to occur during flight.**CASE REPORT:** A 41-yr-old male pilot presented with vision change while performing high G-force maneuvers in an A10 fighter jet. He developed a paracentral visual field defect superiorly in the left eye. Contrasted MRI was within normal limits. The left optic nerve showed blurred margins while the right was sharp, but cupless. The left eye had similar episodes 16 mo before and 8 mo after, but not during flight.**DISCUSSION:** Our case may be the first reported NAION during flight in an airplane pilot. Our patient was an active U.S. Air Force pilot whose second episode of NAION occurred while performing maneuvers in a fighter jet. The patient is younger than expected for NAION and he did not have any of the commonly associated risk factors. His nonflight episodes suggest he was predisposed to NAION. G-force maneuvers, which restrict blood flow and force blood to the extremities away from the optic nerve head, were the precipitant of his second NAION. With a single case, whether high G maneuvers in general are a risk factor for NAION is unknown.**Distefano AG, Lam BL. Non-arteritic anterior ischemic optic neuropathy in pilots. Aerosp Med Hum Perform.** 2018; 89(11):1005-1007.

Non- Arteritic Ischemic Optic Neuropathy (NAION)

- Loss of, or inadequate blood flow, to the optic nerve which connects the eye to brain
- Typically causes sudden loss of vision in one eye without any pain
- Affects middle aged and elderly individuals
- Visual fields are almost always present
- Etiology is idiopathic
- Functional changes are due to hypoperfusion of the optic nerve head or embolism to the arteries or arterioles supplying the optic nerve head

Non- Arteritic Ischemic Optic Neuropathy (NAION)

- Risk Factors: Hypertension, diabetes, ischemic heart disease, hyperlipidemia, sleep apnea, erectile dysfunction medications, atherosclerosis, history of cataract extraction, elevated intraocular pressure, and optic disc edema.
- No definitive treatment for NAION
- Use of steroids (ex. Prednisone) may resolved optic disc edema but visual field defects remain
- Optic nerve decompression surgery has been found to be ineffective and maybe even harmful.



IMPORTANCE OF NORMAL VISUAL FIELD IN FLYING

Third Edition of the Manual of Civil Aviation Medicine states:

“While good visual acuity is clearly a requirement for safe operations in the aviation environment, an adequate field of vision is also essential. The proper location of oneself in space and the location and assessment of movement of other objects in the surrounding space are necessary for safe operation of aircraft. “A pilot must be aware of other aircraft and objects on the ground while scanning cockpit instruments or looking at charts. The “peripheral flow” of visual information during the landing flare is critical for this maneuver.”

Thank you!

