

Medical Examiners' - Medical Manual

Part 3 - Clinical Aviation Medicine

3.12 Otorhinolaryngology (ENT)

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3.12.1 Introduction

This Chapter provides guidelines to assist Medical Examiners in their assessment of the aeromedical significance of conditions affecting the ears, nose and throat and the upper respiratory system.

The external and middle ear may be affected by functional problems such as Eustachian tube dysfunction leading to inability to equalise pressure in flight, resulting in barotrauma. This may cause pain, acute tympanic membrane perforation and acute vertigo. The integrity of the tympanic membranes may also be affected by trauma or infections which can be acute or chronic. Other conditions of importance are cholesteatoma and otosclerosis. All those conditions may be accompanied by hearing impairment depending on severity.

The inner ear may be affected by damage to the cochlea hair cells from ageing, noise and toxic substances exposure. There may be endolymphatic hydrops, Meniere's disease or sudden hearing loss of uncertain origin. The vestibular system may be affected by labyrinthitis, vestibular neuronitis, otoliths disruption, and Ménière's disease, all resulting in vertigo. Finally the acoustic nerve can be compromised by the presence of a Schwannoma. This list is not exhaustive.

The nose and sinuses are commonly affected by chronic inflammation. Nasal obstruction due to septal deformity, turbinate hypertrophy or congestion from infectious or allergic rhinitis are common. Chronic inflammation can result in nasal polyps and sinus meati obstruction. Barotrauma accompanied by severe pain may happen either during ascent or descent. Chronic nasal obstruction may also result in poor sleep or frank obstructive sleep apnoea.

3.12.2 Examination Techniques

Examination techniques are described in:

GD:	Examination Procedures
The ICAO Medical Manual:	Chapter 12

In addition to examining the hearing performance of an applicant, it should only take a few minutes for the Medical Examiner to ascertain the absence of ear and nasal dysfunction or pathology.

The examination should include nasal passages, using a nasal speculum or an otoscope fitted with a large ear piece, palpation of regional lymph nodes and mouth and throat examination, keeping in mind possible malignancies.

In case of hearing loss, the Rinne and Weber tests, and, if available, tympanometry (impedance audiometry) will assist the ME in deciding what further investigations are appropriate.

3.12.3 Hearing Impairment

3.12.3.1 Considerations

Reliable communications within the cockpit and between crew and Air Traffic Control are essential to flight safety. This is achieved via standard phraseology, adequate working knowledge of English, sufficient hearing and clear speech, as well as reliable communication technology.

Pilots' communications take place in a noisy environment that may affect communication. Headsets are widely used by crews. They have the capability of delivering a sound level chosen by each individual. Some have a separate volume control for each ear and may have active environmental noise reduction (ANR headsets). Many applicants with clinically and socially noticeable hearing loss still have the functional hearing capacity to communicate safely in the aviation environment. However this needs to be demonstrated.

The less sophisticated hearing aids amplify environmental noise, thus compromising speech intelligibility. These aids are not recommended for use in aircraft.

Air traffic controllers (ATC) work in relatively quiet rooms. Interference occurs from over-hearing other controllers speak. ATCs often use headsets when not working alone. These devices can be volume adjusted.

The hearing examination has two components: examination of the hearing function, and examination of the Eustachian tube function, the ear and vestibular apparatus.

The hearing function examination includes: Conversation voice test; to be done at each examination; pure tone audiometry, to be done in accordance with the GD Examination Procedures and as clinically indicated. Clinical examination of the Eustachian tube function, the ear and the vestibular apparatus should be done in accordance with best practice.

The clinical examination of the ear may identify the cause for any hearing impairment. It must be remembered that a hearing acuity that meets the standards may be accompanied by ear disease of aeromedical significance. Thus it is not sufficient for an applicant to have adequate hearing to be considered as meeting the Part 67 ENT standards.

3.12.3.2 information to be provided

- Bone audiometry on the first occasion that a hearing impairment beyond the thresholds outlined in the rules is identified. This is to classify the impairment as either conductive, sensorineural or mixed;
- Impedance audiometry when conductive hearing loss is present. This is to identify middle ear effusion, perforation or Eustachian tube dysfunction;
- Speech discrimination test on the first occasion that a hearing impairment, beyond the thresholds outlined in the rules, is identified in both ears. The test should be repeated when a further impairment is identified i.e. 10 dB or more at one frequency of 5 dBs or more at three frequencies;

- A specialist otolaryngologist report on the first occasion that an asymmetrical hearing loss is identified i.e. asymmetry of 20 dB or more at one frequency or 15 dB at three or more frequencies;
- A specialist otolaryngologist report on the first occasion that middle ear disease is identified by audiometry or by clinical examination;
- An MRI report as may be advised by an ENT specialist;
- An **in-flight or ATC work hearing assessment report** should be provided on form [\(24067-204\)](#) or an ATC workplace assessment as relevant:
 - On the first occasion that the maximum speech discrimination does not reach 90%, in at least one ear;
 - On subsequent occasions if further deterioration is identified or suspected.
 - If the applicant intends using hearing aid during flights or ATC work; or
 - If there has been a report suggesting poor hearing performance.

3.12.3.3 Disposition

Class 1 and 2-IFR

The hearing impairment may be considered as not being of aeromedical significance if the applicant has:

- A normal conversation voice test; and
- A maximum speech discrimination test reaching 90% in at least one ear; and
- No middle ear disease other than otosclerosis as diagnosed by an ENT specialist; and
- No asymmetrical sensori-neural hearing loss, other than noise induced; and
- No intention to use, or is not using, hearing aids during flight.

Class 2- No IFR:

The hearing impairment may be considered as not being of aeromedical significance if the applicant has:

- A normal conversation voice test; and
- No middle ear disease, other than otosclerosis as diagnosed by an ENT specialist; and
- No asymmetrical sensorineural hearing loss, other than noise induced; and
- No intention to use, or is not using, hearing aids during flight; or
- If the applicant intends to use hearing aids, an in-flight hearing assessment report has been obtained and found to be satisfactory.

Class 3:

A Class 3 applicant with hearing impairment may be considered as having a hearing impairment that is not of aeromedical significance if the applicant has:

- A normal conversation voice test; and
- A maximum speech discrimination test reaching 90% in at least one ear; and
- No middle ear disease, other than otosclerosis as diagnosed by an ENT specialist; and
- No asymmetrical sensorineural hearing loss, other than noise induced; and
- No intention to use, or is not using, hearing aids during air traffic control; or
- If the applicant intends to use hearing aids, a functional hearing test has been undertaken and the report found to be satisfactory.

Note: If a condition causing a hearing loss has been diagnosed once by an ENT specialist, there may not be a need for another specialist report if the condition is stable, unless the ME suspects a deterioration to have occurred or the ME suspects another diagnosis.

3.12.4 External Ear Disease

3.12.4.1 Considerations

Exostosis is seen mainly in swimmers and divers. Generally its presence does not preclude flying unless resulting in ear canal blockage or frequent infections. Surgical intervention is occasionally indicated.

Bacterial otitis externa can result in severe pain within hours. This is because the ear canal epithelium is adherent to the underlying firm structure with no room for swelling, resulting in increased tissue pressure. It may be accompanied by systemic symptoms and ear blockage. Candida and other fungal infections can also obstruct the ear canal and be complicated by bacterial infection.

An "apparent" otitis externa can hide a middle ear infection or a cholesteatoma. Resolution of the infection and absence of middle ear disease should be ascertained.

3.12.4.2 Information to be provided

- An ENT specialist report if the condition is recurrent or has not fully resolved.

3.12.4.3 Disposition

These conditions may be considered as not being of aeromedical significance if:

- There is no current infection, no middle ear disease and no history of recurrent infections.

3.12.5 Tympanic Membrane and Middle Ear Disease

3.12.5.1 Considerations

Tympanic Membrane (TM) defects occur as a result of infection or trauma. If small, most defects will heal in a number of weeks. Once the defect has healed the TM may be temporarily or permanently weak. Someone with poor Eustachian function may be prone to re-rupture. Small tympanic membrane defects generally do not result in significant hearing loss. If the defect is central, dry and there is no history of ear infection in recent time, there should be no restriction to flying.

Larger TM defects generally result in hearing loss. They may be accompanied by middle ear pathology, such as chronic infection or disruption of the ossicular chain. These lesions need to be excluded. Applicants should be referred for ENT specialist assessment. Tympanoplasty is often indicated.

The ME should carefully examine the TM for the presence of defects, retraction and atelectasis. The attic and postero-superior quadrant require careful examination to exclude a retraction pocket. Such pockets may hide a cholesteatoma. Defects at the circumference of the TM (marginal perforations) can also result in cholesteatoma. In case of any doubt referral to an ENT specialist should be made.

Examination of the nasal function and the Eustachian tube function is an integral part of the ear examination.

Conductive hearing loss is a sign of ear canal obstruction, TM or middle ear disease. It may be caused by Eustachian dysfunction, middle ear infection or effusion, perforation, cholesteatoma, otosclerosis or small bones disruption. All require ENT specialist examination under the microscope.

3.12.5.2 Information to be provided

- An audiometry assessment report, including bone conduction and tympanometry (expect flat tracing – high volume in case of TM defect) upon the first presentation of an applicant with suspected tympanic membrane or middle ear disease;
- An audiometry assessment report, including bone conduction and tympanometry on subsequent occasions if the condition may have changed or as clinically indicated;
- An ENT specialist assessment report upon the first presentation of an applicant with a suspected tympanic membrane or middle ear disease, other than a small central dry perforation;
- An ENT specialist assessment report if there is active disease or the condition may have progressed;
- An ENT specialist assessment report and all previous ENT specialist reports upon the first presentation if a stapedectomy has ever been performed;

- An ENT specialist assessment report and all previous ENT specialist reports upon the first presentation, and subsequently at regular intervals if a mastoidectomy has ever been performed.
- An ENT specialist assessment report and all ENT specialist reports upon the first presentation if any other relevant ear surgery has ever been performed, unless the surgery was uncomplicated myringotomy or ventilation tubes placement in childhood.

3.12.5.3 Disposition

- An applicant with a central, small, dry tympanic membrane defect may be assessed as having a condition that is not of aeromedical significance;
- An applicant with a central, moderate size, dry tympanic membrane defect may be assessed as having a condition that is not of aeromedical significance if there is no history of infection in recent years, satisfactory hearing and an ENT specialist has advised on absence of middle ear disease;
- An applicant with tympanic membrane retraction or attic retraction pocket may be assessed as having a condition that is not of aeromedical significance only if an ENT specialist has advised on the absence of cholesteatoma and on normal Eustachian tube function – Surveillance by ENT specialist reviews should be considered.

- A Class 1 & 2 applicant with persistent Eustachian tube dysfunction should be assessed as having a condition that is of aeromedical significance;
- An applicant with cholesteatoma should be assessed as having a condition that is of aeromedical significance;
- An applicant who has undergone any form of mastoidectomy should be assessed as having a condition that is of aeromedical significance;
- An applicant who has undergone stapedectomy should be assessed as having a condition that is of aeromedical significance; however;
- An applicant who has undergone stapedectomy more than two years previously, and who has been previously assessed favourably under the flexibility process, may be assessed as having a condition that is no longer of aeromedical significance if that applicant has remained free of any symptoms of vertigo or complications and has satisfactory hearing under those guidelines.

3.12.6 Inner Ear Disease and Vestibulo-Cochlear Nerve

3.12.6.1 Considerations

Cochlear only disease: affect the hearing and the assessment may be undertaken according to the hearing impairment guidelines.

Cochlear and, or Vestibular apparatus disease: Those are conditions that may manifest with vertigo or balance problems. They include Meniere's disease, vestibular or acoustic neuritis, benign positional paroxysmal vertigo (BPPV), vestibular migraines and perilymph fistula. Conditions that affect the vestibular apparatus including alternobaric trauma are all of concern to flight safety.

3.12.6.2 Information to be provided

- An ENT specialist report should be provided on the first occasion that inner ear disease, other than symmetrical sensori-neural hearing loss, is identified;
- Other tests reports as recommended by the ENT specialist;
- Relevant audiometry investigations should also be provided. Refer to the hearing impairment subchapter;
- Upon subsequent applications an ENT specialist reports should be provided for conditions that may progress.

3.12.6.3 Disposition

- An applicant with a history of inner disease affecting the cochlea only, as diagnosed by an ENT specialist, and who has a hearing impairment that is not of aeromedical significance, may be assessed as having a condition that is not of aeromedical significance;
- An applicant with suspected or confirmed Meniere's disease should be assessed as having a condition that is of aeromedical significance;
- An applicant with a suspected or confirmed history of Schwannoma should be assessed as having a condition that is of aeromedical significance;
- An applicant with a history of Benign Positional Paroxysmal Vertigo, as diagnosed by an ENT specialist, should be assessed as having a condition that is of aeromedical significance unless the condition was a single event, has fully resolved and has not recurred for a period of 12 months;
- An applicant with a history of vestibular neuritis, as diagnosed by an ENT specialist, should be assessed as having a condition that is of aeromedical significance unless the condition has fully resolved, and has not recurred for a period of 12 months.
- If there is any doubt about the diagnosis, or if no specialist report is available, those conditions should be assessed as being of aeromedical significance.

3.12.7 Nasal and Sinus Disease

3.12.7.1 Considerations

Nasal Congestion and obstruction occur commonly during an upper respiratory tract infection. During this time flying should not take place unless the condition is very mild and not distracting, free of systemic symptoms, free of any Eustachian tube or nasal dysfunction and no medication is needed or taken.

Chronic congestion or obstruction is not uncommon. It is sometimes ignored by the individual who may not realise that their nasal function could be better. Common causes are chronic rhinitis or sinusitis, septal deformity, inferior turbinates hypertrophy, nasal polyps or a combination thereof. A malignancy can also cause nasal obstruction.

Chronic nasal congestion or obstruction leads to Eustachian tube dysfunction and sinus ventilation problems. This may result in barotrauma, incapacitating pain and possibly vertigo. Another possible consequence of nasal obstruction is obstructed sleep apnoea.

Freedom of nasal passages can be ascertained by examination, using a nasal speculum or an otoscope fitted with a large ear piece. A useful functional test is to ask the applicant to obstruct one nostril and breathe through the other. This should be possible without effort.

3.12.7.2 Information to be provided

- An applicant with nasal congestion or obstruction should provide an ENT specialist report, unless the obstruction is clearly of a temporary nature i.e. due to a common cold, in which case resolution should be ascertained before completing the assessment.

3.12.7.3 Disposition

An applicant with nasal obstruction should be considered as having a condition that is of aeromedical significance unless:

- The condition has been successfully treated; or
- The condition is very mild only, with adequate nasal respiratory function and adequate ventilation of the sinuses and the middle ears, and is not progressive.

3.12.8 Allergic Rhinitis

3.12.8.1 Considerations

This is a very common condition with predominance of seasonal allergic rhinitis. The commonest allergen is grass pollen. Bouts of sneezing, watery eyes and nasal obstruction with their potential complications, including distraction, are of concern to aviation safety. Pollens are few at altitude, and negligible or absent in pressurised cabins because of filtration systems.

From an aeromedical perspective, steroid nasal sprays are preferable for treatment because they do not cause sedation and they act as a preventer. They may however cause nose bleed and the spray should not be directed towards the Little area. They require regular use and take several days to be effective. The use of IM steroids is generally not acceptable and would be a reason to consider the application under the flexibility process.

If oral medication is needed, alone or in addition with nasal steroids (i.e. in the first few days of nasal spray use or if a nasal spray does not sufficiently control the symptoms) the following are acceptable: Loratadine, Desloratadine and Fexofenadine following a ground trial. Other antihistamines must not be used within 48 h prior to flying.

3.12.8.2 Information to be provided

- An applicant with allergic rhinitis should provide copy of the GP notes for the past two years if the ME is uncertain about the allergy severity, its control or the treatment used;
- An ENT specialist report if there is nasal obstruction, or if polyps are present or suspected.

3.12.8.3 Disposition

An applicant with allergic rhinitis may be considered as having a condition that is not of aeromedical significance if:

- The condition is successfully treated; and
- The treatment is acceptable. [See above for recommendations], or
- The condition is very mild, i.e. when suffering from the condition there should be adequate respiratory function, adequate ventilation of the sinuses and the middle ears and no disabling or distracting sneezing or other symptoms.

3.12.9 Sinusitis

3.12.9.1 Considerations

Nasal obstruction and acute sinusitis commonly occur during an upper respiratory tract infection or during an allergic episode. During this time flying should not take place until the condition has resolved. Completion of an antibiotic treatment is permitted if the symptoms have resolved.

The condition may persist and become chronic. It is sometimes ignored by the applicant who may not realise that their nasal function could be better.

3.12.9.2 Information to be provided

- An applicant with chronic or recurrent sinusitis should provide an ENT specialist report.

3.12.9.3 Disposition

An applicant with chronic sinusitis should be considered as having a condition that is of aeromedical significance unless:

- The condition has been successfully treated; and
- If functional sinus surgery has taken place, this procedure has been successful as confirmed by a follow up specialist report; and
- At least three weeks have lapsed since surgery.

3.12.10 Nasal Polyps

3.12.10.1 Considerations

Nasal polyps are most often a consequence of chronic inflammation, whether allergic or infective. Polyps can often be seen at simple clinical examination. They have a typical whitish oedematous appearance, similar to a “peeled grape”. They need to be suspected in someone with poor nasal function and a history of allergic rhinitis or recurrent sinus infections. Systemic steroids are sometime prescribed for nasal polyps. During that time flying should not be permitted. Air Traffic Control should not be permitted unless the Prednisone equivalent dose is 10 mg or less per day and there is no disturbing obstruction.

3.12.10.2 Information to be provided

- An applicant with findings of nasal polyps should provide an ENT specialist report.

3.12.10.3 Disposition

An applicant with nasal polyps should be considered as having a condition that is of aeromedical significance unless:

- The condition has been successfully treated; and
- If polypectomy +/- functional endoscopic sinus surgery (FESS) has taken place, recovery is complete;
- At least three weeks have lapsed since surgery.

3.12.11 Malignancies

3.12.11.1 Considerations

The nature and location of upper respiratory system malignancies are such that wide excision may be difficult. Intranasal and sino-nasal malignancies are prone to local recurrence. Larynx and tongue malignancies may result in significant functional and speech impairment.

3.12.11.2 Information to be provided

- An applicant with a history of ENT malignancy must provide all specialists' reports relating to the history of malignancy; and
- A recent ENT specialist or oncologist report.

3.12.11.3 Disposition

An applicant with a history of ENT malignancy should be considered as having a condition that is of aeromedical significance unless:

- At least five years have lapsed since treatment of the malignancy; and
- The applicant has been discharged from specialists follow-ups in the absence of relapse; and
- The applicant does not suffer from functional impairment, such as speech impairment, or other sequelae that could affect flight safety; and
- The Medical Examiner has given consideration to the cancer history and reasonably considers the condition to be cured.

Note: Most ENT Head and Neck malignancies are Squamous cell carcinomas. Cure is probable in the absence of recurrence 5 years post treatment.

3.12.12 Impaired Speech

3.12.12.1 Considerations

Clarity of speech is important for communications, particularly within a noisy environment. The Medical Examiner must consider two things:

- a) Is the impaired speech the result of a medical condition that is of aeromedical significance?
- b) Is the speech impairment functionally of aeromedical significance?

There are multiple causes for speech impairment. Deafness should be obvious to the Medical Examiner and this may act as the limiting factor in the final decision. The same apply to neurological, neuro-muscular and anatomical disorders, or post-surgery status. Examples of the latter are laryngectomy or partial tongue amputation for malignancy, and vocal cords palsy following thyroidectomy. Other causes include congenital malformation, trauma etc.

3.12.12.2 Information to be provided:

- Copy of all information detailing the cause of the speech impairment.
- An ENT specialist report if insufficient records are obtained.

3.12.12.3 Disposition:

An applicant with speech impairment should be considered as having a condition that is of aeromedical significance unless:

- The Medical examiner is satisfied that the speech impairment is minor and will not interfere with effective aviation communication;
- The speech impairment is not due to deafness;
- The speech impairment is not due to a malignancy;
- The speech impairment condition is not due to any neurological or neuro-muscular condition;
- The speech impairment is not due to any progressive condition;
- The Medical examiner has no aeromedical concern about the speech impairment.

3.12.13 Recurrent Tonsillitis, Tonsillectomy

3.12.13.1 Considerations

A history of recurrent tonsillitis in recent months increases the likelihood of further episodes. The illness can have a rapid onset and may impair or incapacitate an individual within hours. This is of some concern, particularly for the long haul pilot. Tonsillectomy is a treatment option that the ENT surgeons consider based on best clinical practice guidelines that include frequency per unit of time. In NZ, a commonly used rule of thumb for deciding to proceed to tonsillectomy in the clinical setting is ~ seven episodes in one year, five episodes a year for two years and three episodes a year for three years. For pilots, given the vocational consequences, a lower trigger threshold may be appropriate. A history of two episodes of peritonsillar abscess is also an indication for tonsillectomy, without delay.

Once tonsillectomy has been performed, a licence holder should not return to duty until full recovery has occurred. The tonsillar bed should have healed well, with no potential for secondary haemorrhage which can be life threatening. This generally requires a down period of three weeks.

3.12.13.2 Information to be provided

- An applicant with a history of recurrent tonsillitis in the past three years, or any episode of peritonsillar abscess should provide an ENT specialist report, unless tonsillectomy has been undertaken.

3.12.13.3 Disposition

An applicant with a history of recurrent tonsillitis can generally be considered as having a history that is not of aeromedical significance if:

- The episodes are infrequent, and not severe;
- There has been no more than one episode of peritonsillar abscess, unless tonsillectomy has taken place;
- If tonsillectomy has been performed, full recovery has occurred with no residual risk of secondary haemorrhage; and
- At least three weeks have lapsed since surgery.

3.12.14 Sleep Apnoea

This topic is discussed in the Respiratory Chapter of the Medical Manual