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OIA-2026-5711

March 2026

[redacted]

Dear [redacted]

I refer to your emails of 15 and 16 March 2026 requesting, under the Official Information Act 1982 (OIA):

- *Regarding the medical standard in the Royal New Zealand Air Force, for aircrew a Colour Vision Normal score of CPA is required. This can be attained if the Ishihara plates are failed, the Farnsworth D15 is passed, and then the full Colour Vision Assessment at the Auckland School of Optometry is passed.*
- *What tests are undertaken during the full Colour Vision Assessment, is it only a CAD test?*
- *What is the pass mark for the CAD test?*
- *If there are other tests undertaken, is it possible to pass on those if the CAD test is failed?*
- *Please may you also provide the documents containing the pre-entry medical requirements for Officers in the RNZAF under the OIA82.*

During a full colour vision assessment, the School of Optometry will perform the following on behalf of the Royal New Zealand Air Force:

1. Ishihara (24 Plate edition). Note: If the individual fails, the number of errors does not give an indication of the severity of any colour vision defect that might be identified.
2. Lanthony's Album Tritan, to exclude Tritan type.
3. Medmont C 100. This advises which type of defect rather than severity of defect.
4. Farnsworth Dichotomous Test (Panel D 15). A pass indicates that any colour vision defect is unlikely to be severe and that the individual is expected to be safe with electrical wiring codes under good (broad spectrum lamp, office lux levels) lighting conditions.
5. Lanthony's Desaturated D 15 Test. A pass result indicates that any colour vision defect present is likely to be mild in severity.
6. Neitz OT II Anomaloscope (manual testing). Excellent for clinical diagnosis but not effective in establishing colour 'safety' in aviation.
7. Farnsworth Lantern Test. A Pass on this test indicates that the individual can be classified as being safe for the colour code and signal lights used in aviation.
8. Colour Assessment and Diagnosis (CAD) computer-based test system. Considered the gold standard by civil aviation authorities and allied Air Forces, this system was

developed by Prof John Barbur (http://www.city-occupational.co.uk). The examination is undertaken using the using the 'Aviation commercial' testing environment protocol from the UK Civil Aviation Authority (CAA), which is also accepted by the New Zealand CAA.

To be considered 'colour safe' in aviation and receive an unrestricted medical certificate, the thresholds in Standard Normal Units are:

1. Deutan deficiency: less than 6.0 units
2. Protan deficiency: less than 12.0 units
3. Tritan deficiency: a threshold greater than 2.0 units would indicate an acquired cause and would require further investigation

Passing the CAD test is a requirement in order to score a passing grade for the full Colour Vision Assessment.

Enclosed is a copy of the current Aircrew Medical Standards Specifications.

You have the right, under section 28(3) of the OIA, to ask an Ombudsman to review this response to your request. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Yours sincerely

GA Motley
Brigadier
Chief of Staff HQNZDF

Enclosure:
1. Aircrew Medical Standards Specifications

Aircrew Medical Standards Specifications

Contents

Chapter 1: Allergic System and Dietary Restrictions

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important allergy conditions or dietary disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important allergy related conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

Specific problems: Allergic system and dietary restrictions

4.

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**ANAPHYLAXIS**	
	Severe allergic and anaphylactic reactions may be rapid onset and life threatening. The full blown syndrome includes urticaria and/or angioedema with hypotension and bronchospasm. The unpredictable nature of the condition, need for acute care and requirement for medication may have significant implications for the grading of service personnel. In particular, the nature of military catering is such that it is not possible to guarantee an individual's ability to self-police an allergy to food or food additives through labelling or identification of trigger constituents.	
1.1	**Food anaphylaxis**	The most common food allergens are dairy, egg, peanut, tree nut, fish, shellfish/crustaceans, soy, wheat. **Aircrew applicants:** Those with very low threshold who react to traces and all with concurrent asthma are to be excluded. In general applicants with a history of the above will require specialist assessment – Immunologist or GP with special interest in immunological conditions. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Aircrew who have had their requirement for self-administered adrenaline confirmed by a Consultant Allergy Specialist are additionally to be downgraded A3, 'Unfit solo pilot – must fly with a pilot suitably qualified on type' in all but exceptional circumstances. Equivalent grading for other aircrew roles, where practicable.
1.1.1	**Food allergy with past history anaphylaxis**	Must be proven to be tolerating allergen either via history (GP report) or formal food challenge via specialist. **Aircrew applicants:** Assess on case by case basis.

	Food allergy with history of past anaphylaxis without proof of complete resolution or tolerance of trace/small amounts	**Aircrew applicants:** Unfit.
1.1.2	**Current Food allergy symptoms (mild, excluding anaphylaxis)**	Note: Does not exclude future anaphylaxis. Risk. Requires specialist assessment detailing: Indication of threshold for anaphylaxis (e.g. Tolerance of traces or small amounts only). Requirement for carriage of Epipen. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Aircrew who have had their requirement for self-administered adrenaline confirmed by a Consultant Allergy Specialist are additionally to be downgraded A3, 'Unfit solo pilot – must fly with a pilot suitably qualified on type' in all but exceptional circumstances. Equivalent grading for other aircrew roles, where practicable.
1.2	**Latex sensitivity** Three types: • Immediate allergic reactions to latex (type 1 hypersensitivity reaction anaphylaxis) • Irritant dermatitis • Contact allergic dermatitis	**Additional information required:** Wherever an applicant provides a history consistent with or suspicious of latex sensitivity of any type, the applicant will require assessment by an allergist associated with formal testing.
	Past history of type 1 hypersensitivity reaction to natural rubber latex (NRL).	The NZDF cannot guarantee a latex-safe environment in tactical settings. Therefore applicants with a known or proven latex allergy must be excluded from any deployment to a remote area. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Aircrew who have had their requirement for self-administered adrenaline confirmed by a Consultant Allergy Specialist are additionally to be downgraded A3, 'Unfit solo pilot – must fly with a pilot suitably qualified on type' in all but exceptional circumstances. Equivalent grading for other aircrew roles, where practicable.

	Known clinical or occupational history in an applicant related to past exposure to NRL including need for a job change	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	History of irritant dermatitis or allergic contact dermatitis to latex	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Where an applicant has had a single, mild, self-limiting response to a latex product in the past.	Need to determine risk of recurrence and anaphylaxis. **Aircrew applicants:** Assess on case by case basis following specialist advice. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.3	**Medication-induced anaphylaxis**	Where applicant has history of severe acute reaction/anaphylaxis to medication. Risk of anaphylaxis due to inadvertent administration of medication.
	Less severe allergic reaction with a good history of rash/non-life-threatening reaction.	**Additional information required:** Needs to be documented with evidence of relevant skin testing and GP with special interest or allergist/immunologist report. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If poor/vague history or history of possible rash	Report from GP detailing where known: a. time between taking drug and reaction; b. nature of reaction; c. treatment/resolution of the reaction; d. any other drugs at the same time; and e. other underlying conditions. **Aircrew applicants:** Unfit until report provided then assess on case by case basis.
1.3.1	**Aspirin anaphylaxis**	Most common cause of non-IgE-mediated anaphylaxis.

		Aircrew applicants: Unfit.
1.4	Less severe reactions	Minor or moderately large local reactions. Consider Immunologist opinion. **Aircrew applicants:** Assess on case by case basis.
	Severe reactions Or any reaction requiring carriage of Epipen	**Aircrew applicants:** Unfit.
1.5	**Exercise anaphylaxis**	Exercise-induced anaphylaxis typically affects young adults. **Aircrew applicants:** Unfit.
1.6	**Idiopathic anaphylaxis**	In 30–40 per cent of cases of recurrent anaphylaxis no cause is identified. Requires specialist care and access to emergency facilities. **Aircrew applicants:** Unfit.
1.7	**Other drug reactions**	**Aircrew applicants:** Assess on case by case basis.
1.7.1	**Radiocontrast media reactions**	**Aircrew applicants:** Assess on case by case basis.
1.7.2	**Succinylcholine (scoline) sensitivity—low pseudo cholinesterase**	NZDF Recruit standards apply.
1.8	**Food intolerance, including coeliac disease** (proline-glutamic acid sensitised, T-lymphocyte dependent enteropathy)	See also Chapter 6 *Gastrointestinal System*, 2.5.1. *Coeliac disease*
2.	**DESENSITISATION**	
2.1	**Immunotherapy**-effective for the treatment of inhalant allergies and bee or wasp stings. Effective treatment for allergic rhinitis, selected patients with asthma	Requires schedule of injections in specialist centre until maintenance dose is reached (four to six months). Continue maintenance doses, monthly with GP for three to five years.

	and the majority of patients with venom allergy	
	Programme -full and completed	Requires specialist review. May be acceptable following treatment if there is no requirement for medication and no geographic limitations. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Still to complete full program/incomplete program in the past or requires lifelong maintenance treatment	Requires long-term treatment if still undergoing desensitisation. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unfit for 72 hrs after each desensitisation treatment. Aircrew additionally to be downgraded A3, 'Unfit solo pilot – must fly with a pilot suitably qualified on type' in all but exceptional circumstances. Geographic restriction may be required. Equivalent grading for other aircrew roles, where practicable.
3.	**URTICARIAS AND ANGIOEDEMAS**	
3.1	**Physical urticarias** Includes: • dermatographism • pressure/vibratory urticaria • cold urticaria • solar urticaria • heat urticaria • cholinergic urticarial	**NZDF Recruit standards apply.** **See Chapter 3 *Dermatological System*.**
3.2	**Urticaria and angioedema**	**NZDF Recruit standards apply.** **See Chapter 3 *Dermatological System*.**
3.3	**Angioedema (without urticaria)**	**NZDF Recruit standards apply.** **See Chapter 3 *Dermatological System*.**
3.4	**Dermatitis and other allergic skin disorders - *See* Chapter 3 *Dermatological System***	

4	**Idiopathic Environmental Intolerance (IEI)**	
4.1	**Multiple Chemical Sensitivity Syndrome**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.2	**Candidiasis Hypersensitivity Syndrome** Symptoms attributed to infection with *C. Albicans* or toxins thereby produced.	Yeast free diets cannot be accommodated in the NZDF. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.3	**"Sick Building Syndrome"**	Unfit if there is likely to be an ongoing adverse effect on health and performance. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

Chapter 2: Cardiovascular System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important cardiovascular disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important cardiovascular conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Cardiovascular system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**CONGENITAL**	
1.1	**Organic or congenital disease**	Congenital heart disease is generally incompatible with entry to the Service. Presentation at entry often follows surgical correction in childhood, or, if mild, may be detected for the first time. All forms require specialist assessment before entry can be considered.
1.2	**Patent Foramen Ovale (PFO)**	Prevalence studies have shown evidence of PFO in 17 – 27% of individuals; as such, it can be considered a normal variant. PFOs provide a potential right to left shunt for air bubbles if personnel experience decompression illness (DCI). There is a 5-fold increase in the relative risk of DCI for sub-aqua divers with a PFO; however, it is less clear whether there is an increase in relative risk in hypobaric DCI. Aircrew candidates, or serving aircrew, who are discovered to have a PFO as an incidental finding are to be referred to a specialist for cardiac assessment. In the absence of other cardiovascular pathology, they may be awarded / retain a full aircrew medical category but should be cautioned about the risk of DCI in recreational sports diving. They may continue to undergo hypoxia experience through hypobaric chamber exposure. Aircrew who are found to have a PFO during investigation for symptomatic DCI are to be referred to OC AMU for investigation and will be awarded 'unfit solo, must fly with a pilot qualified on type ', 'unfit routine cabin exposure > 18,000 ft' and 'unfit hypobaric chamber exposure'. Hypoxia awareness training will be delivered using reduced oxygen breathing (normobaric hypoxia training) devices at ground level. Aircrew who have had successful trans-catheter closure of a PFO may have these restrictions removed but will be awarded the restriction 'unfit exposure to GZ >2.5G' due to concerns over the shifting of the closure device in the heart septum.
1.3	Atrial Septal **Defect (ASD)**	Untreated cases will almost always be those with small defects of the ostium secundum type and may be considered for licensing providing that investigations and catheter studies show that the left-to-right shunt is small and the pulmonary artery pressure is normal.

		Successful surgically treated cases may include both types of defect, and particularly if treated before age 25, should result in being fit for full flying duties. Applicants who have had surgery after the age of 25 should be assessed on a case by case basis. Defects of the ostium primum type carry a higher risk because of possible late problems with the mitral valve and conduction defects.
1.4	**Ventricular Septal Defects**	**Aircrew applicants:** Very small VSDs without haemodynamic upset may be considered for full flying duties. VSDs repaired before the age of 2 are normally acceptable for full flying duties. VSDs repaired after the age of 2 need to be assessed on a case by case basis.
1.5	**Pulmonary Stenosis**	**Aircrew Applicants:** Mild degrees of pulmonary stenosis appear to carry no significant cardiac risk so long as there is evident stability of the disorder. The results of surgery are also usually excellent and both treated and untreated mild cases may be fit for full aircrew duties.
1.6	**Persistent Ductus Arteriosus (PDA)**	**Aircrew applicants:** Aircrew applicants with an existing PDA are not acceptable for flying training. Individuals who have had successful surgical closure or excision are fit for full flying duties**.**
1.7	**Coarctation of the Aorta**	**Aircrew Applicants:** Untreated applicants are not acceptable for flying training. The outlook for surgically treated cases depends on age at the time of the corrective operation. If the repair was performed in early childhood (before 9), and there is no other congenital abnormality evident, and the blood pressure is normal, the outlook may be sufficiently good to accept for training as non-pilot aircrew. Where the operation was performed after the age of 9, the prognostic doubt increases and such applicants are unfit aircrew training. At least 30% of cases of coarctation have other defects, notably bicuspid aortic valves.
1.8	**Dextrocardia /Situs Inversus**	Maybe fit aircrew duties subject to routine investigations.
2	**RHYTHM DISTURBANCES**	
	Whilst investigations are ongoing all Service aircrew are to be grounded and awarded the limitation ‘unfit for service outside base areas’; other restrictions may be necessary where sudden impairment of consciousness may affect safety (e.g. driving, work in confined space, work at heights).	
2.1	**Sinus Arrhythmia**	Normal variant.

2.2	**Premature Atrial Beats, Premature Junctional Beats and Wandering Pacemaker**	Rarely associated with syncope, but may be associated with atrial arrhythmias with dyspnoea and/or reduced exercise tolerance. Commonly related to excess nicotine, alcohol and caffeine. Small risk of sudden incapacitation. Increased risk of incapacitation if associated with atrial arrhythmias. If no underlying heart disease, no medication and no pacing may be for aircrew.
2.3	**Atrial Arrhythmias, Supra-ventricular tachycardia**	No increased risk of infection but risk of embolus and may require anticoagulation. May require regular specialist review, medication or electrical reversion to control. Aircrew grounded until fully investigated. A history of AF or atrial flutter is incompatible with flying training because of the potential haemodynamic upset.
2.3.1	**Atrial Flutter**	The main concerns are the potential for 1:1 AV conduction (i.e. extreme tachycardia) and the fact that flutter is usually associated with underlying heart disease. Atrial Flutter is disqualifying for all flying duties. A return to restricted flying duties (e.g. 'unfit solo pilot', 'unfit flying in aircraft types exceeding +2.5Gz' and 'unfit service outside base areas') may be possible after successful RF flutter circuit ablation therapy in individuals with otherwise normal hearts.
2.3.2	**Atrial Fibrillation**	As soon as the diagnosis is suspected, aircrew are to be grounded. They should be referred for specialist investigation. The following requirements must be met before considering a return to flying/controlling duties: a. Initial and ongoing symptoms - mild and not incapacitating or distracting. b. Thyroid function tests - normal. c. Echocardiogram - no structural or functional heart disease, no chamber dilatation and left ventricular ejection fraction >50%. d. Exercise ECG - Bruce protocol to maximal effort or symptom limited for > 9 min with no rhythm, conduction or ischaemic changes. e. 24h ECG – SR with no wake-time pauses >2.5s; Sustained AF with no marked variability in rate (RR interval 0.3-3.5s) and <2% ventricular aberrants without complex forms; Paroxysmal AF restricted to sleep-time. f. Other cardiac tests - may include extended ambulatory ECG monitoring, electrophysiology studies and assessment of coronary arteries.

		g. Low thrombo-embolic risk - must not be taking warfarin. h. Taking acceptable drugs. i. Lifestyle review. Aircrew, regardless of the type of AF or treatment, who fulfil the above criteria at 6 months, may be considered for a restricted flying category i.e. unfit solo but fit to fly with pilot suitably qualified on type, unfit aircraft types exceeding +2.5Gz and unfit service outside base areas. AVMO review at will initially be every 6 months with ECG (and 24h ECG as required), for a minimum of 2 years. An unrestricted medical grade may be possible for aircrew who suffer a single episode of AF, have no evidence of structural or ischaemic heart disease and remain in SR without treatment for 2 years, particularly, when precipitating factors have been identified and managed e.g. infection, hyperthyroidism or alcohol. Catheter ablation therapy for AF is associated with approximately a 5% per annum recurrence rate at 2 years and beyond, therefore, aircrew undergoing such treatment will be permanently unfit solo flying. However; if after two years they remain well, in SR and on no medication they may have the limitation of "unfit service outside base areas" removed. The A3 limitation "as or with" will remain.
2.3.3	**Re-Entrant Supraventricular Tachycardia (with or without symptoms)**	Clinical concerns are: a. The presence of an AV accessory pathway facilitates re-entrant tachycardia of sudden and unpredictable onset and which may be associated with high heart rates. b. May be distracting. c. May be associated with reduced cardiac output, haemodynamic symptoms, reduced exercise and G-tolerance.
	Untreated	Re-Entrant Supraventricular Tachycardia is disqualifying for all flying duties. Individuals are to be awarded the limitation 'unfit for service outside base areas'; other restrictions may be necessary where sudden impairment of consciousness may affect safety (e.g. driving, work in confined spaces, work at heights).

	Treated (pathway ablation)	A return to flying duties may be possible if electrophysiological studies, with successful RF ablation therapy if required, indicate that there is no future risk of incapacitating arrhythmia.
2.3.4	**Re-entry pathways (including Wolff-Parkinson-White) with or without symptoms**	The presence of an A-V accessory pathway whose potential for facilitating incapacitating re-entrant tachycardia is unknown without full electrophysiological assessment. WPW is disqualifying for selection to flying duties. However, in a trained aviator and with OC AMU's recommendation, a return to limited duties may be possible if the following criteria are met: a. New finding with no history of tachyarrhythmia. b. Satisfactory evaluation with exercise ECG and 24 hr Holter. Post-electrophysiological study (EPS) and confirmation of benign pathway characteristics an unrestricted flying medical grade may be appropriate (A1G3). Post-successful RF ablation an unrestricted flying medical grade may be appropriate (A1 G3).
2.5	**Ventricular Arrhythmias**	
2.5.1	**Premature Ventricular Beats (Contractions)**	Single ventricular ectopic (VE) beats are common. Frequent VE are arbitrarily defined as 3 or more ectopics per minute. A single VE on a standard ECG recording over 12 seconds may be ignored. If 2 or more VEs occur, a rhythm strip must be obtained. All cases except single VEs as above require full specialist evaluation. Greater frequency (such as bigeminy, trigeminy, multifocality, doublets), are more likely to have an adverse administrative outcome. Individuals are 'unfit service outside base areas' and other restrictions may be necessary where sudden impairment of consciousness may affect safety (e.g. driving, work in confined spaces, work at heights etc).
2.5.2	**Ventricular Tachycardia**	A history of Ventricular Tachyarrhythmia is disqualifying for flying training. Ventricular Tachyarrhythmia is disqualifying for flying duties. A return to limited duties may be possible in a healthy individual with no demonstrable heart disease who has had a non-sustained, asymptomatic and self-limiting salvo of ventricular tachycardia, eg during exercise or G-induced stress.
2.6	**Brugada Syndrome**	
2.6.1		Brugada Syndrome is associated with sudden cardiac death due to polymorphic ventricular tachycardia and ventricular fibrillation. The condition occurs in structurally normal hearts, although there is occasional overlap with arrhythmogenic right ventricular cardiomyopathy (ARVC). The ECG in Brugada

		Syndrome shows changes in the ST segment and T waves; there are 3 Types differentiated by the precise forms of ECG abnormality. Investigation of the syndrome may involve a challenge with ajmaline to assess conversion of Types 2 and 3 to Type 1 which may be indicative of greater risk of death. 20% of patients develop supraventricular arrhythmias and VF. The mean age of cardiac death is 40 years and this usually occurs at night. Patients with spontaneous Type 1 changes and a history of syncope are at higher risk of cardiac arrest. Aircrew Applicants. Recruit candidates with a diagnosis of Brugada Syndrome are to be assessed unfit for service in the RNZAF/RNZN (P8). Serving Aircrew. a. Type 1. Personnel with symptomatic or asymptomatic Type 1 Brugada Syndrome are to be awarded the limitation 'Unfit for service outside Base Areas'. Electrophysiological studies may be indicated to determine the need for an implantable cardiac defibrillator (ICD). Aircrew are to be awarded A4. b. Types 2 and 3. Personnel with Type 2 or Type 3 Brugada Syndrome and a positive ajmaline challenge are to be awarded the limitation 'Unfit for service outside Base Areas'. Personnel with a negative ajmaline challenge may retain an unrestricted medical grade but will require specialist cardiac investigations (likely echocardiography, cardiac MRI and 24 hr ECG monitor to exclude ARVC). Aircrew with Type 2 or Type 3 Brugada Syndrome and a positive ajmaline challenge are to be awarded A4. Aircrew with a negative ajmaline challenge may retain an unrestricted medical grade but will also require investigation to exclude ARVC.
3.	**CONDUCTION DISTURBANCES**	
3.1	**Atrioventricular (AV) Conduction Disturbances**	
3.1.1	**First degree (Möbitz type 1), and second degree, AV block, (Wenckebach's phenomenon)**	First degree AV block, that is PR interval greater than 0.2 seconds, is not uncommon in healthy young aircrew. Provided that the block is reversible by exercise or by the administration of atropine, and the QRS complex is normal, the condition is acceptable for aircrew training. Möbitz type 1 block (Wenckebach patter) is mostly a normal variant and is acceptable at the discretion of a cardiologist with experience in aviation medicine. Specialist evaluation is required in all those individuals with heart block. Personnel with clinically significant heart block are to be assessed as follows:

		a. Pending investigation aircrew are to be grounded and awarded the limitation 'unfit for service outside base areas'; other limitations may also be necessary where sudden impairment of consciousness may affect safety (e.g. driving, work in confined spaces, work at heights). b. The significance of lesser degrees of heart block must be assessed individually.
3.1.2	**Second (Möbitz Type II) or third degree heart block** **Complete Heart Block**	Möbitz type II in which the AV block occurs without prior lengthening of the PR interval is often progressive and can lead to third degree heart block with the consequent haemodynamic consequences. Cardiac pacing is often recommended for Möbitz 2 blocks. Applicants with Möbitz 2 AV block are unfit aircrew training. Serving aircrew with Möbitz 2 AV block are unfit all flying duties. Third degree heart block is always significant and requires specialist evaluation. A diagnosis of third degree heart block renders the applicant unfit aircrew training. A diagnosis of third degree heart block usually renders the aircrew person unfit flying permanently. The use of cardiac pacemakers is unacceptable in the aviation environment.
3.1.3	**Cardiac Pacemakers**	The use of cardiac pacemakers is unacceptable in the aviation environment.
3.2	**Intraventricular Conduction Disturbances**	
3.2.1	**Non-Specific Intraventricular Conduction delays**	Non-Specific Intraventricular Conduction delays are usually considered a normal variant in otherwise healthy subjects, provided the QRS limit is less than 120 milliseconds. If it is more than 120 milliseconds, if cardiac disease has been excluded (cardiomegaly has been excluded by echo, and echo stress test or nuclear stress testing is normal), the aircrew member can be returned to unrestricted flying duties.
3.2.2	**Left Bundle Branch Block**	Left bundle branch block, including exercise-induced LBBB, is associated with coronary heart disease and progressive conduction system disease. It is also associated with hypertension, valvular heart disease, myocarditis and cardiomyopathy. Recruits are to be made permanently unfit aircrew service. Initially, aircrew and controllers are to be made unfit service outside of base areas and unfit flying. They should then be referred to a cardiologist for assessment and follow up: a. Echocardiogram - no structural or functional heart disease, no chamber dilatation and left ventricular ejection fraction >50%. b. Exercise ECG - Bruce protocol to maximal effort or symptom limited for > 9 min with no rhythm or conduction abnormalities (other than LBBB).

		c. 24h ECG – no significant rhythm or conduction abnormalities (other than LBBB). d. Investigation of coronary arteries – if clinically indicated or over age 40 years. e. Electrophysiology studies – may be necessary in those with first-degree heart block. If after initial assessment there is no evidence of underlying heart disease and they are asymptomatic, return to restricted duties may be possible i.e. unfit service outside of base areas and to fit to fly only with pilot suitably qualified on type. If after 3 years there is still no evidence of underlying heart disease, an unrestricted medical grade may be awarded.
3.2.3	**Right Bundle Branch Block**	This may be a normal variant in young people. Incomplete RBBB is a common finding in young adults and does not warrant investigation or restriction of duties. Complete RBBB may be associated with coronary heart disease and progressive conduction system disease; but less frequently than with LBBB. It is also associated with hypertension, congenital heart disease, valvular heart disease, myocarditis, cardiomyopathy, pulmonary embolus and cor pulmonale. Those with isolated RBBB and a normal echocardiogram may be awarded an unrestricted medical grade. Initially, aircrew are to be made unfit service outside of base areas and unfit flying. They should then be referred to a specialist for assessment. The following requirements must be met before considering a return to flying duties: a. Asymptomatic. b. Echocardiogram - no structural or functional heart disease, no chamber dilatation and left ventricular ejection fraction >50%. c. Exercise ECG - Bruce protocol to maximal effort or symptom limited for > 9 min with no rhythm or conduction abnormalities (other than RBBB). d. 24h ECG – no significant rhythm or conduction abnormalities (other than RBBB). e. Investigation of coronary arteries – if clinically indicated. Aircrew and aircraft controllers under age 40 years, fulfilling the criteria above, may be awarded an unrestricted medical grade. They will require specialist review every 5 years, to include resting, exercise and ambulatory ECGs.

		Aircrew over age 40 years, fulfilling the criteria above, may be permitted to return to restricted duties i.e. unfit service outside of base areas and to fit to fly only with pilot suitably qualified on type. They are to be reviewed by a specialist after 1 year with resting, exercise and ambulatory ECGs after which an unrestricted medical grade may be possible. They will require specialist review every 5 years, to include resting, exercise and ambulatory ECGs.
3.2.4	**Sinus Bradycardia**	Sinus bradycardia is common in athletes and regular exercisers. Rates of 30-40 bpm may be seen during rest or sleep. Marked bradycardia in older, less fit persons may be due to conduction system disease or to drugs. 'Pauses' of 2.5 seconds or more between beats are often pathological and should be investigated. 'Wandering pacemaker' and various forms of junctional rhythm are quite common and usually innocent in young people.
4.	**CARDIOMYOPATHY**	
4.1	**Hypertrophic Cardiomyopathy**	Requires regular specialist review. Reduced exercise capacity. Risk of arrhythmias or sudden death.
4.2	**Dilated Cardiomyopathy**	Requires regular specialist review. Reduced exercise capacity. Risk of arrhythmias or sudden death. In dilated, hypertrophic and restrictive (including sarcoid) cardiomyopathy there is a risk of progressive haemodynamic deterioration, emboli and sudden death, even in patients who have previously been asymptomatic. Confirmed cardiomyopathy is rarely compatible with flying duties. Individuals are to be managed on a case by case basis in consultation with OC AMU and with an approved aviation aware cardiologist.
5.	**VALVULAR HEART DISEASE/DISORDERS**	
5.1	**Murmurs**	All murmurs must be explained. However very few are likely to be pathological. All murmurs require further investigation with echocardiography.
5.1.1	**Physiological murmurs**	No restriction for aircrew.
5.2	**Valvular Heart Disease/ Disorder**	Recruits with valvular heart disease of any aetiology will normally be considered unfit for aircrew service in the NZDF (P8). Aircrew with suspected valve disease are to be referred to a specialist cardiologist with aviation experience. Personnel with valve defects may require antibiotic prophylaxis against infective endocarditis prior to dental or surgical procedures.
5.2.1	**Mitral Valve Prolapse**	Aircrew. Individuals with marked MVP are to be awarded A3 ('unfit solo flying'), 'unfit sustained accelerations exceeding +2.5Gz' and 'unfit pressure breathing'). Some cases of minor degree, with normal ECG and no symptoms may retain a full flying medical grade. Severe MVP, or MVP with complications, is a cause for permanent grounding (A4).

5.2.2	**Mitral Regurgitation (MR)**	Trace or mild MR is a common finding on routine echocardiography and Doppler studies and in the presence of a structurally normal heart is considered to be a physiologically normal variant. MR does not appear to be aggravated by long duration +Gz. So pilots are fit for unrestricted flying. Aircrew applicant with trace MR and a normal heart are fit for aircrew training. Serving aircrew with trace MR and a normal heart are fit for full flying duties. Serving aircrew with more than trace MR should undergo annual assessment with echocardiography and Doppler studies. Provided they remain asymptomatic, are in sinus rhythm, the left atrium is not enlarged and left ventricular function is normal they may continue to fly with a restriction, 'unfit high performance aircraft'.
5.2.3	**Mitral Stenosis (MS)**	Mitral stenosis tends to be a progressive disease and enlargement of the left atrium leads to atrial fibrillation. Aircrew applicants with MS are unfit pilot training. Serving aircrew who are asymptomatic, have mild stenosis, are in sinus rhythm, have normal left atrium dimensions and normal left ventricular function may continue to fly with a restriction "unfit high performance aircraft". They will require annual echocardiography and Doppler.
5.2.4	**Aortic Valve Disease** **(Bicuspid Aortic Valve (BAV) and Aortic Stenosis (AS))**	Aircrew. Individuals with progressive AR (minimal haemodynamic effect) and very minor degrees of Aortic Stenosis (AS) are to be awarded A3 "unfit solo pilot-fit as or with co-pilot qualified on type' 'unfit sustained accelerations exceeding +2.5Gz' and 'unfit pressure breathing'. Haemodynamically significant AR and significant AS are causes for permanent grounding (A4). Some cases of mild AR may retain a full flying medical grade. Bicuspid aortic valve (BAV) is found in 2% of the population. As complications such as aortic stenosis or regurgitation can occur and as dissection of the aorta occur in up to one third of individuals with BAV over a lifetime, the diagnosis of a bicuspid aortic valve is a bar to flying training. Aircrew who are found to have a BAV are to be monitored bi-annually with echocardiography. Aortic stenosis or regurgitation found in serving aircrew should be closely monitored (annually) to identify progression of the stenosis and any haemodynamic deterioration. If the condition deteriorates further to a point where there is a significant haemodynamic effect, the aircrew member will need to be permanently grounded.

5.2.5	**Aortic regurgitation (AR)**	The diagnosis and severity of AR is best assessed with echocardiograph and Doppler studies. AR is unlikely to cause acute incapacitation, so does lend itself to a monitoring situation. Trace AR with normal valve morphology is unlikely to progress and should be acceptable for aircrew training. Where there is thickening or calcification of the valves there is more risk of deterioration in function. Aircrew applicants with trace AR and normal aortic valves are fit for aircrew training. Trace AR in association with an abnormal aortic valve is not acceptable for aircrew training. Serving aircrew with trace AR are fit for full flying duties. Aircrew with moderate AR should be restricted "unfit high performance aircraft'. Aircrew with severe AR but normal left ventricle dimensions should be 'unfit high performance aircraft' and 'unfit solo pilot - fit as or with co-pilot qualified on type'. Aircrew with increasing left ventricular dimensions and/or haemodynamic inefficiency are to be grounded.
5.2.6	**Pulmonary Valve Disorders**	The diagnosis and severity of AR is best assessed with echocardiograph and Doppler studies. AR is unlikely to cause acute incapacitation, so does lend itself to a monitoring situation. Trace AR with normal valve morphology is unlikely to progress and should be acceptable for aircrew training. Where there is thickening or calcification of the valves there is more risk of deterioration in function. Aircrew applicants with trace AR and normal aortic valves are fit for aircrew training. Trace AR in association with an abnormal aortic valve is not acceptable for aircrew training. Serving aircrew with trace AR are fit for full flying duties. Aircrew with moderate AR should be restricted "unfit high performance aircraft'. Aircrew with severe AR but normal left ventricle dimensions should be 'unfit high performance aircraft' and 'unfit solo pilot - fit as or with co-pilot qualified on type'. Aircrew with increasing left ventricular dimensions and/or haemodynamic inefficiency are to be grounded.
5.2.7	**Artificial Valves**	Aircrew applicants who have a history of valve replacement are unfit flying training. Personnel with mechanical artificial valves require lifelong anticoagulant treatment; they are permanently unfit for aircrew duties (A4), are 'unfit for service outside base areas' and often require other limitations.

		A tissue graft (heterograft), not requiring anticoagulation, is most unlikely to be compatible with return to flying duties. Homografts (from human cadavers) looks more promising. Conservative valve surgery requires individual assessment. Surgical repair of mitral valves or tricuspid valves (not replacement) sometimes produces an outcome that allows the aircrew member to return to flying in a limited capacity 'unfit solo pilot-fit as or with co-pilot qualified on type and 'unfit high performance aircraft'.
6.	**ISCHAEMIC HEART DISEASE**	
6.1	**Myocardial infarction, coronary insufficiency coronary disease, angina pectoris, cardiac failure**	Coronary Artery Disease (CAD) may be an incidental finding without symptoms or may present with clinical manifestations secondary to ischaemic heart disease (IHD). Clinical presentations may include angina, myocardial infarction, heart failure, arrhythmia and sudden death. CAD is unpredictable and may be catastrophic. CAD may result in spontaneous onset of IHD symptoms such as chest pain, dyspnoea or palpitations that may lead to incapacitation and distraction. Cardiac Risk Assessment (CRA). CRAs are to be undertaken to using NZGG model assess fitness for single, dual pilot and other aircrew operations according to a periodic schedule (see DHR 11, Part 2, Chapter 5 *Aircrew Medical Examinations*, *Aircrew Medical Examinations: Periodic Table*). At recruitment if over age 35. Trained aircrew at 36, then then 2 yearly (include lipids, HbA1c) from age 40. Annual from 60. If clinically indicated. A CRA over 5% over 5 years for single pilot (including T6 instructor) operations or 10% over 5 years for dual pilot operations will require further cardiology assessment/ investigation to assess risk, (such as through Stress (exercise) Echocardiography/ECG testing or other suitable means). **Recruit**: Recruits with any history of ischaemic heart disease are considered unfit for aircrew service in the NZDF (P8). **Aircrew**: Coronary artery disease (CAD) stenosis of ≥50% or IHD is normally a bar to flying duties due to the potential of unheralded angina, infarction and arrhythmia. The aviation environment e.g. hypoxia, hyperventilation and high Gz, may precipitate such events through increased myocardial oxygen consumption. On suspicion of the diagnosis of CAD, aircrew must be immediately grounded. In exceptional circumstances aircrew may be considered for a return to restricted flying duties after 6 – 9 months, if, on review by a cardiologist with Av Med training, they fulfil all the criteria below: Aircrew fulfilling these criteria

		may be awarded A3 ('unfit solo pilot, must fly with a pilot suitably qualified on type' / 'unfit solo (aircrew category will be specified in Med Docs); 'unfit sustained accelerations exceeding +2.5 Gz'; 'unfit pressure breathing'; 'unfit flight above FL 400') in addition to the limitations specified for ground crew. Stenosis at other levels/other minor arteries will require specific consideration and evaluation by a cardiologist and case by case follow up. To maintain this flying category, aircrew must be reviewed, unless otherwise specified by the attending cardiologist, as follows: a. Three monthly review with a cardiologist for the first 18 months post event, then at 2 years and annually thereafter. b. Resting ECG at each review, and exercise ECG, 24 hour ECG and echocardiogram annually. c. Myocardial perfusion scan (MPS (myocardial perfusion scintigraphy) or pCMR (perfusion cardiac MRI) at 3 years then on alternate years. Alternative assessment such as stress echocardiography, DSE (dobutamine stress echocardiography) or CT angiography may be considered acceptable in individual cases, but where there is any doubt regarding the patency of coronary vessels, traditional angiography will likely be required. d. Angiography at 3 years to assess anatomical progression of disease may be required. e. This should be determined following assessment by a cardiologist with Aviation Medicine training. f. If the aircrew patient develops any symptoms, or if abnormalities in any test or measurement are observed, the patient is to be immediately grounded pending review.
7.	**INFECTIVE**	
7.1	**Endocarditis**	Residual scarring produces high risk of relapse or recurrence. Risks include cardiac failure, arrhythmias, unremitting fevers, thromboembolism, strokes, cerebral abscesses, meningitis, acute nephritis or nephrotic syndrome, and sudden death. Grounded until full clinical recovery. Restrictions dependent on risk of recurrence, residual cardiac function and risk of incapacitation.
7.2	**Myocarditis**	Myocarditis is not uncommon but is frequently asymptomatic and probably often missed. Abnormal ECGs are common during acute infection and other illnesses, and may represent transient myocarditis. All individuals require specialist management. Complete recovery may occur even after severe illness, but a chronic or downhill course, possibly needing transplantation, may occur.

		Risk of sudden death or incapacitation. Risk of late development of cardiac failure. Aircrew are to be grounded until full recovery is confirmed.
7.3	**Pericarditis**	25 per cent risk of recurrence when associated with post-viral, idiopathic, rheumatoid and uraemic causes. Late complications include pericardial fibrosis and calcification. Grounded until full recovery. Restrictions dependent on risk of recurrence, residual cardiac function and risk of incapacitation.
7.4	**Rheumatic fever (RF)**	Need for prolonged penicillin prophylaxis (at least 10 years). Risks of pericarditis (including coronary arteritis) and arthritis. Lifelong acute sensitivity to Group A Streptococcus infections—common in the military environment. If structural valve disease is present, increased risk of heart failure and bacterial endocarditis. Restrictions dependent on risk of recurrence, residual cardiac function and risk of incapacitation.
8.	**VASCULAR**	
8.1	**Deep venous thrombosis (DVT),** **Thrombophilia**	Venous thrombo-embolic disease is a common and dangerous condition. Venous thrombosis causes pain and swelling in the affected limb and may give rise to pulmonary emboli causing chest pain, shortness of breath, hypoxia, and cardiac arrhythmias and may be fatal. Recruits with a history of thrombo-embolism are normally considered unfit for service in the RNZAF (P8). A single uncomplicated deep vein thrombosis (DVT), particularly with a defining cause and with a full recovery may be acceptable but should be assessed by a specialist. Aircrew are to be grounded (A4) whilst taking anticoagulants. Resumption of unrestricted flying duties should be possible after completion of treatment for a single uncomplicated DVT. Recurrent DVT is rarely compatible with a return to flying duties. A single pulmonary embolism (PE) may be compatible with eventual award of A3 ('unfit solo pilot'). Recurrent PE is to be assessed A4. Significant residual limb damage (oedema, pain, ulceration) may prevent flying.

		There is no generally agreed definition of thrombophilia but the term is used to describe patients who are at significantly increased long-term risk of venous thrombo-embolism (VTE) deep venous thrombosis or pulmonary embolism). Individuals will be assessed on a case by case basis. However, an individual who is assessed as having a propensity to or a high/significant risk of developing VTE is likely to be found unfit for flying duties. Aircrew in whom a diagnosis of thrombo-embolic disease is made are to be dealt with on a case-by-case basis. Details of their haematological status are to be obtained from their haematology consultant and their flying category is then to be decided after discussion with AvMO and OC AMU. **Aircrew applicant:** May be fit for entry when fully recovered. **Serving aircrew:** May require temporary grounding depending on severity.
8.2	**Thrombophlebitis**	General physician or haematologist assessment. Investigations to exclude other risk factors at the discretion of the assessing specialist.
8.3	**Major vascular disease**	Peripheral artery disease (PAD) causing claudication or rest pain almost always indicates extensive arterial disease. Specialist investigation is always required. Occasionally a completely correctable cause is found (e.g. popliteal cyst). Where investigations have demonstrated normal coronary and cerebral vasculature in aircrew, a return to flying may be possible. Personnel are to be awarded the limitation 'unfit for service outside base areas'.
8.4	**Other vascular Disease: Aneurysm, etc**	Restrictions dependent on risk of recurrence, residual cardiovascular function and risk of incapacitation.
8.5	**Raynaud's phenomenon**	Cold exposure results in a triphasic colour response: blanching of the fingers, followed by cyanosis, then redness. Usually a benign disorder. Must exclude underlying disease, e.g. scleroderma, systemic lupus, SLE and all other mixed connective tissue disease. Must exclude all secondary causes. **Aircrew applicant:** Any history of Raynaud's Phenomenon renders an individual unfit for aircrew selection.
8.6	**Hypertension**	Aircrew applicants with consistently elevated BP should be rejected and referred back to their general practitioner for investigation and possible treatment. Once investigation is complete, the candidate may re-apply for consideration as aircrew. Uncontrolled hypertension is incompatible with flying or aircraft control duties. Furthermore, aircrew are to be grounded when drug treatment is initiated or substantially altered). Complications of hypertension generally preclude flying. Anti-hypertensives. Before a return to flying duties can be considered, hypertensive individuals must be normotensive on stable treatment, normally

		for at least 2 weeks. Any change in treatment, either in dosage or of the drugs used, must result in withdrawal from flying duties (usually 2 weeks) and a further period of monitoring. The following points apply to specific groups of anti-hypertensives: a. Angiotensin Converting Enzyme Inhibitors and Angiotensin II Receptor Blockers: Angiotensin converting enzyme inhibitors (ACEis) and angiotensin II receptor blockers (ARBs) are widely used in the treatment of hypertension. They commonly (1-10%) cause orthostatic hypotension, hyperkalaemia and a decline in renal function; however, these effects are easily identified, often transient and usually resolve on dose reduction or stopping treatment. Cough is very common (>10%) and angioedema uncommon (<1%); both occurring less with ARBs than with ACEis. Previous concerns of impaired G-tolerance with ACEis have not been substantiated in US or UK trials. Following appropriate investigations, treatment in aircrew may be started by an AvMO or Civilian GP. To ensure adequate blood pressure control and absence of adverse effects, aircrew are to be initially grounded, normally for a minimum 2 weeks to ensure suitable control has been achieved. CRA and specialist referral may be required. A return to unrestricted duties is usually possible when stabilised on treatment, but aircrew are to be graded G3. The combined use of ACE is and ARBs significantly increases the risks of serious adverse effects. Aircrew are likely to remain unfit solo flying, for at least 3-6 months after which a return to unrestricted duties may be possible. The drugs listed below are considered acceptable for aircrew. Other ACEis and ARBs will be considered on a case-by-case basis: I. Acceptable ACE inhibitors: Lisinopril, Ramipril, Enalapril, Perindopril, Cilazapril, Quinapril, Fosinopril. II. Acceptable ARBs: Losartan, Valsartan, Candesartan, Eprosartan, Irbesartan, Olmesartan. b. Calcium Channel Blockers. Amlodipine and Nifedipine are preferred for use in aircrew as unrestricted flying duties may be permitted in those treated with these drugs. In order to return to unrestricted flying, the maximum acceptable doses are 10mg daily of Amlodipine or 20mg twice daily of sustained release Nifedipine, with no clinical evidence of side effects. Other drugs in this group are compatible with limited flying duties. Aircrew taking Calcium channel blockers other than Amlodipine or Nifedipine as detailed above are not permitted to fly in aircraft where they will be exposed to accelerations outside the range -1 to +2.5 Gz. c. Thiazides and Other Diuretics. Thiazides are compatible with full flying duties, subject to a grading of a G3 medical marker. d. Beta-blockers. Atenolol, alone or with diuretics, is compatible with limited flying duties. Aircrew are not permitted to fly in aircraft where they will be exposed to accelerations outside the range -1 to +2.5 Gz. The effects of this group of drugs on psychomotor function are such that pilots are not

		permitted to fly solo. Medical grade will be no higher than A3G3Z1. Detailed limitations will be determined by the AvMO. Other Beta-blockers to be assessed on a case by case basis and require full ground trial. e. Alpha 1-blockers. Although alpha 1-blockers may be permitted for benign prostatic hypertrophy the availability of alternative medication with a lower risk of postural hypotension means that these drugs are not currently approved for use in hypertension in those on flying duties.
8.8	**Hypotension**	Restrictions dependent on risk of recurrence, treatment, residual cardiac function and risk of incapacitation.
8.9	**Varicose veins**	
8.91	**Asymptomatic/ uncomplicated** **Significant— extensive networks of varicose veins affecting upper or lower leg (in either limb) but asymptomatic**	Fitness to fly dependent on symptoms and function. Likely to remain fit.
8.92	**Symptomatic and uncomplicated With evidence of perforating veins, or incompetence**	Fitness to fly dependent on symptoms and function. Likely to remain fit.
8.93	**Symptomatic, complicated and chronic—including ulceration, skin changes and phlebitis or previous failure of surgical treatment**	Fitness to fly dependent on symptoms and function. May be fit for local flying but unlikely to deploy overseas for operational flying.
8.94	**Varicose veins, treated**	Return to flying following full functional recovery.
9.	**METABOLIC**	
9.1	**Hyperlipidaemia**	Hyperlipidaemia is a potent risk factor for ischaemic heart disease (IHD) and, if familial, often requires prolonged treatment and follow-up. Secondary causes of hyperlipidaemia should be considered and treated as appropriate. Severe hyperlipidaemia may be incompatible with solo pilot duties (A3) and grounding (A4) may be required if there is evidence of coronary disease. The opinion of a cardiology specialist should be sought for aircrew with associated cardiovascular risk factors. A satisfactory response to treatment and demonstrated absence of end-organ damage is compatible with an unrestricted (G3) medical grade.

9.2	**Lipid Lowering Therapy**	Non-drug measures are preferred; however, resins such as Cholestyramine are suitable if well-tolerated. Fibrates and statins may be used under specialist direction. Fibrates have not been cleared for use by pilots in solo flight, but where prolonged safe use has been demonstrated in an individual exception may be made on the recommendation of the concerned consultant physician and with the agreement of OC AMU. Of the statins Pravastatin and Atorvastatin are approved for use by pilots in solo flight subject to specialist assessment and continuing surveillance; approval is subject to the agreement of OC AMU. Treatment with these 2 drugs may be started by an AvMO pending review by a cardiology specialist if required. Aircrew with safety critical roles are to be grounded for 2 weeks to assess clinical response. Other statins to be assessed on a case by case basis and subject to a trial on the ground.
9.3	**Homocystinuria**	Autosomal recessive inborn error of metabolism. Resembles Marfan's syndrome. Risk of major systemic disease including advanced bone age and formation of thromboemboli. **Unfit aircrew.**
10	**CONNECTIVE TISSUE**	
10.1	**Marfan's Syndrome (if proven)**	Skeletal and connective tissue weakness with increased risk of severe injury/illness. **Unfit aircrew.**
	Partially expressed, even if asymptomatic	**Additional information required:** To be confirmed by a specialist.
10.2	**Other connective tissue disorders:** **Ehlers-Danlos Syndrome** **Osteogenesis Imperfecta**	Skeletal and connective tissue weakness with increased risk of severe injury/illness. **Unfit aircrew.**
11	**SURGICAL**	
	Previous cardiac surgery (except for congenital heart conditions noted above)	Most conditions are not compatible with extreme exertion or isolation from medical care. Additional information required. Full cardiology assessment. Assessment must address original condition, operation, functional result, and prognosis.

		Depending on the surgical procedure and outcome, the applicant may require prophylactic antibiotics for future surgical or dental procedures. Cardiological opinion must be sought to identify any surveillance and prophylactic antibiotic requirements. All such cases are to be reviewed by the OC AMU.
12	**OTHER CARDIOVASCULAR CONDITIONS**	
12.1	**Recurrent unexplained syncope -including neurocardiac syncope of central vasovagal pathogenesis**	Often cardiogenic, caused by ventricular tachycardias, cardiomyopathies, valvular disease, congenital heart disease, other arrhythmias. Possibly neurogenic. Requires access to medical care, regular specialist review. May include reduced exercise capacity. Unfit aircrew training.
12.2	**Simple vasovagal episodes**	Syncope due to vasovagal episodes are common in young people. Fit if serious causes are excluded.
12.3	**Cardiomegaly of any aetiology with the exception of proven Athletic Heart Syndrome**	Any evidence of cardiac enlargement requires cardiological opinion to determine diagnosis. Usually cardiomegaly will be associated with some form of cardiomyopathy (e.g. hypertrophic cardiomyopathy).
12.4	**Athletic Heart Syndrome**	Frequently ECG findings point to a young aircrew applicant having an enlarged heart and the question arises as to whether this is physiological secondary to athletic activities or pathological. This often prompts referral for echocardiography. Often on further assessment by echocardiography dilatation and enlargement of one or more of the chambers of the heart is noted. Two main aetiologies of Left Ventricular Hypertrophy (LVH) are easily excluded (aortic stenosis and hypertension). Cardiologist opinion is required for cases where pathology is suspected. Ceasing all exercise usually reduces the left ventricular wall dimensions to normal in the 'athletic heart', whereas this is not the case in a diseased heart.

Chapter 3: Dermatological System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important skin disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important skin conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Dermatological system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**FUNCTIONAL**	
1.1	**Anhidrosis**	Requires careful regulation of environmental heat and humidity, exercise and fluid intake. Not suitable for exertion in the tropics. Risk of heat exhaustion/stroke at relatively low levels of exertion. **Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity.
1.2	**Hyperhidrosis—severe generalised or hand**	Requires careful regulation of environmental heat and humidity, exercise and fluid intake: not suitable for exertion in the tropics. Risk of dehydration, cramps, fatigue and electrolyte disturbance. **Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity.
2.	**INFECTIVE**	
2.1	**Acne**	Acne lesions may interfere with the ability to wear aircrew life support equipment, webbing, shoulder harnesses and various items of survival equipment. Candidates must be able to wear a respirator and webbing. Restrictions apply to the use of retinoid medication.
2.1.1	**Mild acne**	Eruptions: face/chest/back not requiring oral medication. **Aircrew applicant:** May be fit. **Serving aircrew:** Unlikely to have impact on flying duties.
2.1.2	**Moderate—severe acne**	Aggravation with heat / sweating on face and wearing backpacks and other equipment.

		Aggravation in water/oily, humid atmosphere. **Aircrew applicant:** Fitness determined on severity and need for ongoing treatment. Any applicant with active lesions or undergoing a course of treatment for acne with oral retinoids will be temporarily unfit for entry until there are no active lesions and medication has ceased. Treatment must have ceased for at least 6 weeks with no lasting adverse effects. All potential pilots/observers require ophthalmic assessment of night vision, contrast sensitivity and colour vision at the time of PERSEL. **Serving aircrew:** May require temporary grounding depending on severity. Oral retinoids are not to be prescribed to aircrew without discussion with OC AMU. Topical retinoids acceptable subject to following: a. Isotretinoin, Tretinion and Adapalene only. b. 1 week grounding after commencing. c. Return to flying following acceptable AvMO review.
2.1.3	**Cystic acne**	Requires specialist treatment with appropriate medication; e.g. Roaccutane. Additional information required. **Aircrew applicant:** Dermatologist report required. Difficulty with proper seal on face masks. Aggravation with aircraft pressurisation, extremes of temperature, oily atmosphere and protective suits. Suitability for flight screening for pilot applicants on treatment with retinoid medication such as Roaccutane is to be discussed with OC AMU. **Serving aircrew:** May require temporary grounding depending on severity.
2.2	**Recurrent boils/carbuncles**	As for chronic skin disease. **Aircrew applicant:** Unfit – Review if fully treated and no further boils/carbuncles for six months. **Serving aircrew:** May require temporary grounding depending on severity.
2.3	**Hidradenitis suppurativa**	Risk of recurrent inflammation and infection; resistant to treatment. **Aircrew applicant:** Unfit.

		Serving aircrew: May require temporary grounding depending on severity, particularly if medication is required.
2.4	**Tinea—active**	Requires treatment with topical or oral antifungal medication and evidence of complete resolution. **Aircrew applicant:** Maybe fit once treatment completed. **Serving aircrew:** Unlikely to have impact on flying duties.
2.5	**Warts (not genital)**	If few, in non-exposed and non-weight bearing areas. **Aircrew applicant:** Fit once treatment completed. **Serving aircrew:** Unlikely to have impact on flying duties.
2.6	**Other warts**	Including plantar warts. Requires treatment and evidence of complete resolution. **Aircrew applicant:** Fit once treatment completed. **Serving aircrew:** Unlikely to have impact on flying duties.
2.7	**Cutaneous Leishmaniasis**.	Cutaneous Leishmaniasis may be acquired following service in the tropics. Cases usually present weeks to months later as chronic superficial skin ulceration, unresponsive to conventional antimicrobial therapy. If untreated or misdiagnosed, the condition may result in extensive tissue damage and scarring. Untreated South American forms may relapse after many years as mucocutaneous leishmaniasis, causing destruction of the facial area. Diagnosis involves skin biopsy, and specialised culture of skin specimens for Leishmania parasites. **Aircrew applicant:** May be fit if disease free for 12 months and subject to specialist dermatology report. **Serving aircrew:** All suspected cases are to be grounded and referred to specialist dermatology for assessment.
3.	**INFLAMMATORY/ALLERGIC**	
3.1	**Contact dermatitis**	Mild to moderate primary irritant types. **Aircrew applicant:** Requires specialist assessment. Maybe fit once treatment completed if mild and precipitant avoidable NZDF environment. Unfit if sensitive to substances which are used in the military (e.g. fuels, solvents).

		Serving aircrew: Requires dermatology assessment. May require temporary grounding depending on severity.
3.2	**Allergic contact dermatitis**	**Confirmed** by skin patch testing, to any industrial or occupational allergen likely to be regularly encountered in military service. **Aircrew applicant:** Requires specialist assessment. Maybe fit once treatment completed if mild and precipitant avoidable NZDF environment. Unfit if sensitive to substances which are used in the military (e.g. fuels, solvents). Unfit if severe and requires topical and/or oral steroids continuously or more than two times per year. Less severe Intermittent topical steroids, for less than a week, 1-2 times per year only. **Serving aircrew:** Requires dermatology assessment. May require temporary grounding depending on severity.
3.2.1	**Mask Dermatitis**.	**Aircrew** may develop mask dermatitis after prolonged wearing of oxygen masks. This may result from sensitivity to the agents used in cleaning them or from irritation of an underlying skin condition (e.g. seborrhoea). Consideration should be given to changing the cleaning products used, limiting the wearing time, and treatment of underlying conditions. Resistant cases should be referred locally for consultant dermatology opinion.
3.3	**Latex sensitivities**	Known sensitivities to latex products. **Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity.
3.4	**Atopic dermatitis and Eczema**	The main problem in service conditions is widespread eczema or dermatitis affecting the hands and feet. Candidates with a past history of eczema (defined as eczema which has affected the flexures, or eczema occurring under the age of five) are likely to develop hand / foot dermatitis in service conditions, especially if working with oils, greases, detergents etc. It is therefore important that candidates suffering from or having had atopic eczema are excluded for occupations where hand dermatitis is likely. **Aircrew applicant:** Unfit. Candidates with severe active atopic eczema that has been present in the previous 3 years are unfit for aircrew training. Severe eczema includes those who have required specialist referral, systemic steroids, immunosuppression or strong topical steroids, have suffered from superinfections, and severe eczema affecting hands and face.

		Less severe infrequent episodes managed by emollients and mild to moderate topical steroids may be suitable. **Serving aircrew:** May require temporary grounding depending on severity. Extensive skin disease is not compatible with operational military service; limited skin disease may be acceptable.
3.5	**Evidence of skin rashes or reactions suggestive of allergic condition**	Depends on cause, severity and whether regular medication and specialist review required. Specialist review either immunologist or dermatologist. **Aircrew applicant:** Review on a case by case basis. **Serving aircrew:** May require temporary grounding depending on severity.
3.6	**Repeated attacks of urticaria**	Or other skin rashes of an allergic nature, particularly when associated with hay fever, asthma or other types of allergic illnesses *See also* Allergy/Dietary. **Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity.
3.7	**Chronic photosensitivity disorder**	**Requires** extreme protection from ultraviolet light and is therefore unsuitable for military life. **Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity.
3.8	**Chronic/ persistent eczema**	**Aircrew applicant:** Unfit. **Serving aircrew:** May require temporary grounding depending on severity. Extensive skin disease is not compatible with operational military service; limited skin disease may be acceptable.
3.9	**Chronic palmoplantar dermatosis**	As for chronic skin disease. **Aircrew applicant: U**nfit. **Serving aircrew:** May require temporary grounding depending on severity. Extensive skin disease is not compatible with operational military service; limited skin disease may be acceptable.
3.10	**Psoriasis**	Mild psoriasis does not usually interfere with service life. There is a risk of moderate to severe exacerbation when individuals are put under emotional or physical stress. May be worsened by military conditions. **Aircrew applicant:** Maybe fit if limited to very mild small patches on extensor surfaces of arms and legs, requiring no medication.

		Unfit if chronic, requiring medication, regular topical treatment including strong steroid creams. Unfit if associated with any joint or other systemic complications such as psoriatic arthropathy, iritis and bowel disorders. **Serving aircrew:** Unlikely to have impact on flying duties if mild. May require temporary grounding and/or restrictions depending on severity and if associated with any systemic complications such as psoriatic arthropathy and bowel disorders. ***Aircrew***. Oral retinoids are not to be given to aircrew.
4.	**SCARRING**	
4.1	**Scars causing functional impairment or disability**	**Disfigurement** is not a reason unless it interferes with functionality, such as wearing of protective equipment. Causes interference with mobility, agility and/or fine movements; difficulty wearing protective clothing and apparatus. **Aircrew applicant:** Fit unless there are safety implication with use of aircrew life support equipment. **Serving aircrew:** Unlikely to have impact on flying duties unless affecting ability to safely use aircrew life support equipment.
4.2	**Keloid**	Active (tender, red) keloid formation. **Aircrew applicant:** Fit unless there are safety implications with use of aircrew life support equipment. Unfit if active, infected or affecting limb function and use of aircrew life support equipment. **Serving aircrew:** Unlikely to have impact on flying duties unless affecting ability to safely use aircrew life support equipment.
5.	**GENERAL**	
5.1	**Body Piercing**	All body piercings**.** **Aircrew applicant:** Fit unless there are safety implications with use of aircrew life support equipment. Dental assessment required to exclude trauma or infection to teeth or other structures. **Serving aircrew:** Not to be worn when involved in flying duties – See AVOs.
5.2	**Chronic skin disease:**	Severe ongoing skin disease, localised or generalised, leading to functional impairment or disability. Requires regular specialist review and medication. Impairs operational deployability. Risk of super-added infection. May be associated with other medical conditions.

		Aircrew applicant: Unfit. **Serving aircrew:** May require temporary grounding depending on severity. Extensive skin disease is not compatible with operational military service; limited skin disease may be acceptable.
5.3	**Pigmented Skin Lesions.**	See malignancy section**.** **Aircrew applicant:** Unfit until cleared by dermatologist. Unfit if confirmed to have been malignant. OC AMU waiver maybe applicable if confirmed cure**.** **Serving aircrew:** All pigmented lesions that may be malignant are to be referred to the appropriate specialist for excision. May require temporary grounding depending on histology**.**
5.4	**Wearing of Beards**	A recommendation for aircrew personnel to wear a beard permanently on medical grounds can only be made following discussion with OC AMU. Such cases are to be re-referred for review every 2 years. In the case of aircrew, the beard must not affect the protective neck seal function of the CBRN aircrew respirator. It should not affect the function of the oxygen mask assembly. **Aircrew applicant:** Unfit if beard required on medical grounds **Serving aircrew:** Fit for continued flying duties if they can achieve a satisfactory respirator seal and who could, in wartime, tolerate the need to shave. Those whose medical condition precludes any shaving at all. AvMOs are to ensure that these personnel are graded P3 A3 – G3 Unfit non-aircrew respirators. Bearded aircrew are not to use Vaseline/petroleum jelly, hair wax/gel to effect a respirator seal or when using oxygen mask assembly.

Chapter 4: Ear, Nose and Throat System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important ENT conditions or disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important ENT conditions relating to aviation in the NZDF.

3. The nose and throat are the first lines of defence for screening of foreign bodies such as infection and allergens. Recurrent upper respiratory tract infections may cause significant morbidity and time off work. Resultant impairment of hearing from such infections may impair job performance, particularly in combat situations where communication is paramount. In some situations masks are an essential item of personal protection equipment (PPE), e.g. oxygen masks for aircrew and divers, self-breathing apparatus for firefighters and chemical, biological, radiation and nuclear protection for all personnel. The requirement to travel in aircraft is essential for military personnel. Careful assessment of the ears, nose and throat (ENT) is mandatory for some occupations due to the environmental hazards of altitude or depth and the physiological challenges of those hazards.

4. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

5. Specific problems: Ear, nose and throat system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**EARS**	
1.1	**Radical mastoidectomy with intact tympanic membrane**	May be acceptable, provided that the ear is healthy, the tympanic membrane and posterior canal wall are intact and there is no defect in the hearing, otherwise unfit. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Following cortical mastoid operation and a mastoid tympanoplasty	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.2	**Otitis Externa (OE)**	
	Severe and recurrent (i.e. recurring so frequently that the ears must be kept dry at all times).	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require deployment restrictions.

	Single episode or occasional with complete recovery	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Will require short term grounding until recovered.
	Multiple episodes in a 12 month period	**Aircrew applicants:** Unfit, unless the cause of the episodes has been identified, is self-limiting and treatment has been successful with no recurrence. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Will require short term grounding until recovered.
	Recurrent e.g. 'swimmer's ear' (OE due to water exposure)	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term restrictions.
1.3	**Otitis media** Acute	**Aircrew applicants:** Usually associated with upper respiratory tract infection. **Fit if one off and after f**ull recovery. **Serving aircrew:** Unfit flying until full resolution off medication.
	Recurrent/chronic	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term restrictions/grounding. Consider assessment with hypobaric chamber (clinical profile).
1.3.1	Cholesteatoma	Chronic suppurative otitis media with cholesteatoma invariably requires surgical treatment. Whether surgery is radical or conservative there are problems in predicting long term fitness for military service. The high incidence of recurrent or residual disease in conservative (canal wall up) procedures indicates a high risk of further radical surgery becoming necessary. All types of procedure for cholesteatoma commit individuals to long-term follow-up in an ENT clinic. **Aircrew applicants:** Unfit **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Aircrew duties will rarely be possible. Eustachian tube function is almost always impaired. In highly favourable cases where the mastoid cavity remains quiescent a return to restricted flying duties may be possible following ENT and OC AMU review. Aircrew will remain unfit HUET/dunker and wet dinghy training.
1.4	**Presence of grommets**	Candidates for aircrew selection are unfit if they have a grommet in-situ or are unable to demonstrate patency of their eustachian tubes. **Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. May continue to fly but require restrictions.
1.5	**Hearing loss** A Hearing standard is to be applied following audiogram and Applicants must meet the appropriate HS for aircrew without the use of hearing aid (or cochlear implant)	Members must respond rapidly to orders given against a high level of background noise and/or confusion. Job requires use of high tech communications devices. Impaired hearing may cause delays in response time and a requirement for repetition. Mission completion and safety may be compromised. Risk of further hearing loss due to hazardous noise exposure in NZDF Operations. **Aircrew applicants:** H1 standards required. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require restrictions and more frequent audiometry. To wear hearing protection when exposed to loud noise (TWHPWETLN). Moderate hearing loss in the absence of other symptoms such as tinnitus and vertigo, can usually be compensated for by amplification of sound in headsets. Where continued safe operation is identified as a problem by flying supervisors, it will be necessary to ground the affected aircrew member.
1.5.1	**Acoustic Neuroma (vestibular schwannoma)**	**Aircrew applicants:** Candidates with a history of acoustic neuroma who fail to achieve the required auditory standard are considered unfit. ENT report required. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Normally a history of acoustic neuroma is incompatible with aircrew duties.
1.6	**Meniere's disease** Triad of vertigo, hearing loss and tinnitus may be due to Meniere's disease	**Aircrew applicants:** Unfit. **Serving aircrew:** The diagnosis of Ménière's disease is normally incompatible with aircrew duties due to the unpredictable course of the disease and associated safety implications.
1.7	**Vertigo**	Minor or moderately large local reactions. Consider Immunologist opinion **Aircrew applicants:** Assess on case by case basis.
	Recurrent or chronic	**Aircrew applicants:** Unfit.
	Single episode	**Additional information required:** ENT review. 12 months must have elapsed after a single, significant episode.

		Aircrew applicants: Assess on case by case basis if NO underlying pathology, no increased risk of recurrence. Unfit if presence of underlying pathology and the need for ongoing treatment.
1.8	**Tinnitus**	Established, permanent and severe or compromising function. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until fully symptom free or stable and not interfering with function.
	If the cause is reversible e.g. drug toxicity, acoustic trauma or head trauma	**Additional information required:** ENT assessment must confirm the cause. A minimum of 12 months must have elapsed since cessation of symptoms. Recovery must be complete with no indication of recurrence. Normal audiometry. **Aircrew applicants:** Assess on case by case basis – other factors may be more relevant i.e. severity of head injury. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until fully symptom free or stable and not interfering with function – other factors may be more relevant i.e. severity of head injury.
1.9	**Otosclerosis with or without stapedectomy**	Risk of further hearing loss with unforeseen noise exposure. Risk of fistula formation with minimal pressure changes with subsequent extreme debility. Requires regular ENT reviews and eventual surgery. **Aircrew applicants:** Unfit **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until symptom free or stable and not interfering with function. May require deployment restrictions.
1.10	**Perforations of the tympanic membranes**	
	Healed (spontaneous) and hearing within required limits	**Aircrew applicants:** Assess on case by case basis. ENT review and report required. Temp unfit 3 months. **Serving aircrew:** Following perforation of the TM, aircrew are to be grounded until it has healed. If tympanoplasty is required, the individual should remain grounded (A4) until normal drum mobility is demonstrated at ENT review.

	Unhealed 6 weeks post perforation	**Aircrew applicants:** Unfit.
	History of surgical correction	ENT report at least 12 months post-surgery to confirm success (including clearance to swim and fly) and hearing within required limits. **Aircrew applicants:** Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until cleared by specialist. Consider hypobaric chamber assessment (clinical profile).
1.11	Any other chronic ear disease or surgical procedures of the ear including conditions of the external canal, tympanic membrane, middle ear, inner ear, eustachian tubes or mastoid	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until cleared by specialist. Consider hypobaric chamber assessment (clinical profile).
2.	**NOSE**	
2.1	**Allergic Rhinitis (Hay fever)**	New generation oral antihistamines are effective and have been shown to have minimal effects on performance. These antihistamines should only be used in aircrew if topical preparations have proved ineffective or intolerable. The approved antihistamines for aircrew use are Loratadine, Desloratadine and Fexofenadine.
	Chronic and/or severe and applicants with perennial rhinitis	Risk of exacerbation in military operations: dust, smoke, heat, poor ventilation, high pollen count. May not be able to wear a mask. Requires long-term medication or ENT surgery. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term restrictions.
	Following completion of desensitisation	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Mild/occasional, Minor hay fever symptoms or a simple stuffy nose	Not requiring regular medication or well controlled on intermittent OTC medication. If in doubt, obtain specialist opinion. **Aircrew applicants:** Assess on case by case basis. GP report required. May be fit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

		See policy on Medication and Aircrew – antihistamines.
2.2	**Nasal obstruction**—due to deviated septum, hypertrophic rhinitis, polyps, or other causes, or associated with history of chronic sinusitis or acute Upper Respiratory Tract Infections	Requires regular ENT review and possible surgery. **Aircrew applicants:** ENT report required. Unfit until treated. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Consider hypobaric chamber assessment (clinical profile).
	Non-surgical management - severe seasonal allergic rhinitis (hay fever) requiring regular Medication /topical nasal spray	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Consider hypobaric chamber assessment (clinical profile). May require long term restrictions.
	If surgery required	May be suitable a minimum of 6 months after surgery, subject to a favourable ENT assessment. Unfit if persisting nasal obstruction. **Aircrew applicants:** Temp unfit. Accept if symptom free and capable of effective Valsalva. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Consider hypobaric chamber assessment (clinical profile).
2.3	**Sinusitis** Chronic or frequently recurring. The definition of chronic sinusitis is any of the following occurring for two to four weeks at a time, three to four times per year: • severe headache • toothache • fever • malaise • chronic nasal congestion • discoloured nasal discharge	Serving aircrew who develop recurrent sinus barotrauma may be successfully managed with nasal steroids but surgical treatment involving endoscopic sinus may be required. Most aircrew return to unrestricted flying duties following such treatment. A trial of a decompression chamber run simulating ascent and descent, found in the type of aircraft used, is recommended before returning to duty. **Aircrew applicants:** Unfit. Exceptionally, candidates will be accepted following sinus surgery subject to satisfactory assessment by a RNZAF approved ENT surgeon. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term restrictions.
	More than one episode, even if	**Aircrew applicants:** Unfit.

	occasional episode of mild sinusitis resolving with short-term treatment	**Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Consider hypobaric chamber assessment (clinical profile). May require long term restrictions.
2.4	**Epistaxis**	Recurrent (approx. more than 1 episode per week over 3 months or more). **Aircrew applicants:** Unfit. **Serving aircrew:** Temp unfit until fully treated.
		Successfully treated (no recurrence in 6 months). **Aircrew applicants:** ENT report required. **Serving aircrew:** Temp unfit until fully treated then 1 week stand down.
2.5	**Anosmia**	Anosmia means an absence of a sense of smell. It can be temporary or permanent and the former is very common. Anosmia may be a primary condition, but this is rare; secondary anosmia is more usual. Conditions giving rise to anosmia are usually those of the nose or sinuses (colds, hay fever, vasomotor rhinitis, sinusitis etc) but can include neurological conditions. **Aircrew applicants:** ENT report required. **Serving aircrew:** If permanent anosmia is suspected, referral for a specialist ENT opinion is essential to exclude any underlying cause. If confirmed, uncomplicated permanent anosmia will result in the award of a G3 medical marker.
3.	**THROAT**	
3.1	**Laryngeal disease** causing dysphonia e.g. chronic laryngitis, vocal nodules, laryngeal papillomatosis	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Tonsillitis**—severe and/or recurrent (five or more episodes in the last year)	Maybe acceptable if no recurrences for 12 months. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Following tonsillectomy	**Aircrew applicants:** Acceptable at six weeks after surgery if: a. the operation was successful; b. recovery was uncomplicated by haemorrhage or infection; c. returned to full physical activity; and d. function. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Fit to fly subject to ENT/SMO AvMed review.

3.3	**Obstructive sleep apnoea/Hypopnea Syndrome (OSAHS)**	Risk of daytime drowsiness, poor concentration, rapid fatigue; cardiovascular and respiratory complications; sudden death. It has been associated with an increased risk of road traffic accidents. Requires Continuous Positive Airways Pressure machine which cannot normally be supported at sea, in the field or any operational environment. Often associated with other problems such as obesity. **Aircrew applicants:** Unfit. **Serving aircrew:** On confirmation of a diagnosis of OSAHS, serving personnel are to be downgraded Z4 and G3/4 (dependent upon trade), 'Unfit service outside base areas'; 'Unfit to undertake service driving'; 'Unfit handling live arms'. Aircrew are to be made A4. Other limitations may be required depending on the nature of the work undertaken. **Return to flying** duties will be dependent on the success of treatment as assessed by lab based sleep studies. Those showing a satisfactory response to behavioural modification or oral appliances may return to flying A3, 'Unfit solo pilot - must fly with a pilot suitably qualified on type' and Z4, 'Unfit service outside base areas'. If the improvement is maintained at one year, an unrestricted medical category may be appropriate. Those responding to surgery may return to unrestricted flying once lab-based sleep studies have shown a satisfactory response. Those requiring CPAP are to be made A3, 'Unfit solo pilot - must fly with a pilot suitably qualified on type' (or equivalent for other aircrew as practicable) and Z4, 'Unfit service outside base areas'. After one year, if lab-based sleep studies show a satisfactory response the A3 limitation may be removed.
3.4	**Cleft lip/plate**	Successful surgical correction with good result and clear effective speech/communication. **Aircrew applicants:** To be assessed on a case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

Chapter 5: Endocrine and Metabolic Systems

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important endocrine conditions or metabolic disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important endocrine conditions or metabolic conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

Specific problems: Endocrine and metabolic systems

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**CONGENITAL / DEVELOPMENT**	
1.1	**Feminisation of males/virilisation of females**	May require ongoing medication. May have severe psychological sequelae. Therefore generally not compatible with military life. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.	**WEIGHT DISORDERS**	
2.1	**Acceptable weight range: Body mass index (BMI) 18 – 33**	See anthropometry policy: Health Standard: MS-ENV-AIR-007: Aircrew Anthropometry. **Aircrew applicants:** All applicants are required to pass the pre-enlistment fitness assessment (PFA) and undergo anthropometric assessment subject to aircrew role. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Anthropometric standards apply for specific aircraft roles.
2.2	**Over acceptable weight range: BMI >33.0 but < 36**	Correlation with poor aerobic fitness and risk of stress injury. Further information may be obtained from GP on the applicant's body habitus (paying attention to muscle bulk and fat distribution). In addition the applicant must provide a detailed account of his/her current sporting/exercise interests including intensity levels. **Aircrew applicants:** Temp unfit weight loss to BMI 32.9 or lower has been maintained for six months and there are no complications from obesity (or as required for role).

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. May require restrictions depending on aircrew role and aircraft type, with reduced grading duration i.e. R 3- 6.
	Weight over 125 Kg or BMI 36 or more	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Will require short term grounding until acceptable weight achieved.
2.3	**Under acceptable weight range: BMI less than 18**	**Aircrew applicants:** Acceptable if there are no other health problems and satisfy anthropometric standards for aircrew role. All applicants are separately required to pass the pre-enlistment fitness assessment (PFA). **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Anthropometric standards apply for specific aircraft roles.
	If due to an eating disorder	See Chapter 12 *Mental Health System*
2.3.1	If due to developmental abnormality, or due to immaturity	Assess on merits. **Aircrew applicants:** May require deferral i.e. temp unfit. But acceptable if there are no other health problems and satisfy anthropometric standards for aircrew role. All applicants are separately required to pass the pre-enlistment fitness assessment (PFA). **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Anthropometric standards apply for specific aircraft roles.
3.	**ADRENAL**	
3.1	**Cushing's disease and Addison's disease**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Adrenal tumour** with hypersecretion and subclinical Cushing's disease	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.	**REPRODUCTIVE**	
4.1	**Male**	**See Chapter 7 *Genitourinary System*.**
4.2	**Female**	**See Chapter 8 *Gynaecological System*.**
5.	**PANCREAS**	
5.1	**Diabetes mellitus (DM)** including type I, type II,	Disabilities and complications resulting from DM and its treatment fall into three time-frames which have different implications for operational effectiveness and employability:

	insulinopathies, maturity onset diabetes of young people and endocrinopathies with associated diabetes. DM should be distinguished from impaired fasting glucose (IFG) and impaired glucose tolerance (IGT).	a. *Sudden Incapacitation*. Hypoglycaemia is an inherent risk of insulin and many other antidiabetic drugs. This risk can only be reduced, not eliminated. b. *Medium-term Illness*. Infections, metabolic derangements and fluid imbalance may cause incapacitation over several hours to a few days. c. *Long-term Complications*. Cardiovascular, renal, neurological and ophthalmic complications are a function of the duration and adequacy of control of the disease. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Regardless of previous treatment, whenever a new antidiabetic medication is started, individuals are to be made 'Unfit service outside base areas' and 'Unfit flying duties' (as applicable), for a minimum of 3 months; additional limitations may be necessary depending on occupation. Relaxation of these restrictions will only be considered when there is evidence of adequate glycaemic control, absence of side effects of treatment and acceptable cardiovascular risk. Where two or more classes of antidiabetic medications are used, the most restrictive drug will usually determine the disposition. The glucagon-like peptide-1 analogues are administered by subcutaneous injection and may be impractical in some situations e.g. operational flying.
5.2	**Pre-diabetes (HbA1c in pre-diabetic range)** or treated with diet alone, with impaired glucose tolerance	Recruits with a history of IFG, IGT or DM are permanently unfit service. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.3	**Glycosuria**— positive history of glycosuria	Additional information required: Requires specialist assessment to exclude underlying serious condition (diabetes or renal tubular defects). **Aircrew applicants:** Temp unfit 6 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Management of Aircrew: Aircrew and controllers with suspected IFG, IGT or DM: a. **Investigation:** Whilst investigations are ongoing, aircrew and controllers are unfit service outside base areas and unfit flying/controlling. Those with IFG or IGT can expect to be awarded an unrestricted medical grade. Those with DM will only be considered for an unrestricted medical grade after a period of 6 months.

		b. **Treatment with Diet, Exercise and Weight Loss:** Aircrew who respond to lifestyle changes may be awarded an unrestricted medical grade, with G3 marker. c. **Treatment with Antidiabetic Drugs:** I. Alpha-glucosidase inhibitors (acarbose), biguanides (metformin) and thiazolidinediones (pioglitazone) are compatible with unrestricted flying duties; with the exception of when metformin and pioglitazone are used together in which case only a return to restricted duties is possible i.e. 'Unfit solo pilot – must fly with a pilot suitably qualified on type' / 'Fit to control only when another controller is on duty and in close proximity'. II. Aircrew and controllers taking glucagon-like peptide-1 analogues (exenatide and liraglutide) and dipeptidyl peptidase IV inhibitors (saxagliptin, sitagliptin, and vildagliptin) are permanently 'Unfit service outside of base areas' and 'Unfit solo pilot – must fly with a pilot suitably qualified on type' / 'Fit to control only when another controller is on duty and in close proximity'. III. Insulin, sulphonylureas and meglitinides are incompatible with aircrew or controller duties.
6.	**PARATHYROID**	
6.1	**Hyper-parathyroidism**	Risk of hypercalcaemia, osteoporosis and/or calcium stone formation. Requires regular monitoring.
6.1.1	**Primary or secondary hyper-parathyroidism**	Requires regular specialist review and blood tests. May develop neurobehavioural symptoms incompatible with Service life. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until symptom free or stable and not interfering with function. May require deployment restrictions and unfit solo role.
6.1.2	**Hyper-parathyroidism due to parathyroid adenoma**	**Aircrew applicants:** Temp Unfit 2 years. May be suitable if the all following apply: a. no recurrence of tumour; b. normal calcium levels; c. no evidence of osteoporosis; and d. no requirement for regular medication

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until symptom free or stable and not interfering with function. May require deployment restrictions and unfit solo role.
6.2	**Hypo-parathyroidism (any cause)**	Risk of hypocalcaemia, hypokalaemia, hypomagnesaemia and/or osteoporosis. Most cases require long-term vitamin D and calcium supplements. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Unfit flying until symptom free or stable and not interfering with function. May require deployment restrictions and unfit solo role.
7.	**PITUITARY**	
7.1	**Acromegaly**	Requires regular medication; regular specialist review and blood tests; hospitalisation and specialist care following infections, accidents and injuries. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.
7.2	**Pituitary tumour**	Risk of sequelae: headaches, visual field defects, and hypopituitarism. Requires regular specialist review. May require neurosurgery or multiple hormone replacement. **Aircrew applicants:** Unfit. **Serving aircrew:** Likely to be A4 permanently.
8.	**THYROID**	
		All aircrew and controllers with new onset of thyroid disease are to be made 'unfit' for flying or controlling duties and are to be referred for specialist opinion. Once treatment is stabilised and the clinical state is euthyroid, a return to limited flying/controlling duties can be considered. The approach to further upgrading should be cautious and should only be undertaken with the close involvement of a service approved physician. A return to unrestricted flying/controlling duties may be authorised after a period of specialist surveillance.
8.1	**Goitre**	Any history of goitre requires: a. A favourable surgical opinion which excludes any pathological cause such as Hashimoto's thyroiditis.

		b. Normal thyroid function tests. c. Normal thyroid scan. d. Negative for thyroid antibodies.
	Simple, non-toxic diffuse or non-toxic nodular	Frequently noted at puberty or during pregnancy. They are small with no complications and the patient is euthyroid. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Following surgical or medical ablation requiring thyroxine supplementation	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Other goitres	May be considered after successful completion of treatment and: a. no complication; b. no increased risk of carcinoma; c. no requirement for medication; and d. no requirement for regular surveillance. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case-by-case basis.
8.2	**Hyperthyroidism**	Individuals being treated with either Carbimazole or Propylthiouracil are to be awarded 'Unfit for service outside base areas'. Additionally they are to be made Z5 'Fit to serve in the NZ only' for at least 6 months whilst treatment is titrated and stabilised. If symptomatic and biochemical stabilisation for six months is achieved then individuals may be Z4. The same grading is to apply to those who are placed on 'block and replace' therapy. The approach to further upgrading should be cautious and should only be undertaken with the close involvement of a service approved physician. Many patients will go into a period of remission and medical treatment can be stopped. However approximately 50% of this group will experience a relapse of thyrotoxicosis within 1 year of ceasing treatment. As such, when individuals cease drug treatment they are also to be downgraded Z5 'Fit to serve in the NZ only' for a period of at least 1 year. A history of treatment with radioactive iodine is compatible with an unrestricted medical category after specialist assessment. There is a high rate of development of hypothyroidism after this treatment, in which case individuals should be treated as for that condition. Surgery is now rarely used to treat thyrotoxicosis but is also compatible with an unrestricted (G3).

8.2.1	**Subclinical hyperthyroidism**	Depends on need for ongoing treatment, presence of symptoms and a need for monitoring. Endocrine opinion required. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
8.3	**Graves' syndrome**	Require regular medication, regular specialist review and blood tests. Risk of hypothyroidism following treatment or in course of disease; risk of thyroid storm, infiltrative ophthalmopathy, atrial fibrillation and heart failure. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed as above.
8.4	**Toxic multinodular goitre/toxic adenoma (Plummer's disease)**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A3/4 permanently.
8.5	**Thyroid Stimulating Hormone (TSH)—producing pituitary tumour**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A4 permanently.
8.6	**Malignancies of the thyroid**	**Aircrew applicants:** Unfit **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A4 permanently.
8.7	**Hypothyroidism**	Thyroxine levels vary with activity. Risk of reduced cognitive function and physical fitness with intercurrent disease or interruption to drug replacement therapy. Increased incidence of other auto-immune disorders. **Aircrew applicants:** Unfit **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.
	Mild subclinical hypothyroid dysfunction (elevated serum TSH without symptoms)	Review recommended every 6 to 12 months. In patients with microsomal (thyroid peroxidase) antibodies the conversion rate from subclinical to overt hypothyroidism is at least 5% a year. Can be associated with depression. **Aircrew applicants:** Unfit **Serving aircrew:** Sub-clinical hypothyroidism (raised TSH with normal T_3/T_4) requires specialist referral for investigation and follow-up. Provided the assessment is satisfactory an unrestricted grade may be possible (G3). Long-term

		replacement therapy with Thyroxine is potentially also compatible with an unrestricted G3 grade.
8.8	**Specific conditions associated with hypothyroidism: autoimmune thyroiditis, post-therapeutic radioactive iodine treatment, goitrous hypothyroidism, post-thyroidectomy**	Requires regular specialist review and blood tests. Requires regular medication with significant functional consequences if supply interrupted. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.
8.9	**Hypothalamic-pituitary axis failure**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A4 permanently.
8.10	**Subacute thyroiditis (De Quervain's)**	Often self-limiting but may recur or progress to hypothyroidism. **Aircrew applicants:** Temp unfit 2 years (after resolution). May be acceptable if: a. thyroid function has returned to normal; and b. no recurrence of symptoms, and appropriate specialist opinion. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.
9.	**METABOLIC**	
9.1	**Gout**	Gout is often associated with renal and cardiovascular disease, diabetes and lipid disturbance. Requires regulation of diet and fluid intake. Often requires regular medication. Risk of recurrent acute joint pain and swelling, loss of function; chronic joint deformities; renal dysfunction. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
9.2	**Haemo-chromatosis** **Homozygous and Heterozygous**	See Chapter 9 *Haematological System*
9.3	**Wilson's disease** (inherited copper	Requires regular specialist review; lifelong treatment with chelating agents.

	toxicosis). Family history or personal history.	Risk of acute psychosis, acute haemolytic anaemia, chronic hepatitis, renal failure and slow neurological degeneration. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A4 permanently.
9.4	**Peripheral neuropathy from any metabolic cause**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A3/A4 permanently.
10.	**ALLERGY / ANAPHYLAXIS** *see* Chapter 1 ***Allergic System and Dietary Restrictions***	
11.	**Reserved**	
12.	**ADVERSE DRUG INTERACTIONS**	
12.1	**Malignant hyperthermia (MH)**	High risk of muscle hypermetabolism triggered by inhalational anaesthetics or by succinylcholine. Also increased risk of heat injury and exercise-induced rhabdomyolysis. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A3/A4 permanently.
	Family history of MH	Requires muscle biopsy and/or genetic assay to exclude condition in candidate. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. Likely to be A3/A4 permanently.
13.	**OTHERS**	
13.1	**Any history of chronic or acute endocrine conditions**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.

Chapter 6: Gastrointestinal System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important gastrointestinal conditions and disorders.

2. This sections is not exhaustive, but details policy on the assessment and treatment of common and important gastrointestinal conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Gastrointestinal system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**STOMACH/DUODENUM/OESOPHAGUS**	
1.1	**Gastro-oesophageal reflux disease**	Will require specialist assessment to distinguish between mild and serious cases.
	Mild intermittent disease— (occasional mild episodes which may be related to Dietary indiscretion)	The candidate will be required to provide information on the frequency, severity, duration of symptoms and on the requirement for medication both prescribed and OTC. If any doubt exists on the history as given by the applicant referral to a gastroenterologist is to be sought. **Aircrew applicants:** Assess on case by case basis. Fit if not requiring treatment with H2 antagonists or proton pump inhibitors. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Mild to moderate disease (symptoms experienced on most days)	Responded to four-to-eight week course of proton pump inhibitors. No symptoms for six months following cessation of medication. **Aircrew applicants:** Assess on case by case basis. Fit if normal endoscopy and accompanying gastroenterologist report and If no medication required long-term. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Severe—if requiring long term dietary changes and medication, or multiple recurrent episodes	Risk of development of Barrett's metaplasia (Pre-malignant condition). Also problems associated with special diets, pharmaceutical resupply, especially during deployments. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.

1.2	**Non-ulcer dyspepsia** Types: functional type, irritable upper digestive tract (similar to Irritable Bowel Syndrome (IBS) of lower GIT tract) Ulcer-like dyspepsia Dysmotility-like dyspepsia Unspecified dyspepsia Reflux-like dyspepsia	These may be worsened or exacerbated by military conditions. Increased risk of multiple medical presentations, investigations and potential medication. All require specialist assessment to distinguish between mild and serious cases.
	Occasional attacks of symptoms not causing any significant absence from school or work and not requiring treatment by H2 antagonists or proton pump inhibitors	**Aircrew applicants:** Temp Unfit - Off medication and symptom free for six months. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If ongoing treatment is required or has been required for more than six months within the previous 2 years	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
1.3	**Peptic ulcer**	
	Peptic ulcer caused by H. pylori	If proven cure of H. pylori and no requirement for ongoing medication may be acceptable for entry. **Aircrew applicants:** Temp Unfit - Off medication and symptom free for 12 months. **Serving aircrew:** Aircrew are to be grounded following initial endoscopic diagnosis. After completion of a course of ulcer healing therapy, together with H pylori eradication treatment where appropriate, endoscopic follow up to 2-3 months should take place. Evidence of both complete ulcer healing and H pylori eradication permits upgrading to in uncomplicated cases.
	Peptic ulcer caused by short-term use of NSAID (for less than one month)	Peptic ulcer resulting from NSAID may not be serious, however, likely to be recurrent and will limit treatment options for musculoskeletal problems during training and service. Requires satisfactory specialist report confirming low risk of recurrence.

		Aircrew applicants: Temp Unfit - Off medication and symptom free for 12 months. **Serving aircrew:** Aircrew are to be grounded following initial endoscopic diagnosis. After completion of a course of ulcer healing therapy, together endoscopic follow up to 2-3 months should take place. Evidence of complete ulcer healing permits upgrading in uncomplicated cases.
	Acid hypersecretion (Zollinger-Ellison etc)	Requires long-term specialist review and medication. Increased mortality. **Aircrew applicants:** Unfit. **Serving aircrew:** Aircrew are to be grounded following initial endoscopic diagnosis. Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
	Perforated peptic ulcer	Disqualifying for all applicants. Risk of gastric barotrauma. **Aircrew applicants:** Unfit. **Serving aircrew:** Aircrew are to be grounded following diagnosis. Will require role and deployment restrictions. Individuals are to be made 'unfit for service outside base areas', for 6 month before considering a return to an unrestricted category (subject to satisfactory endoscopic review).
1.4	**Gastritis**	Risk of recurrent pain, nausea and vomiting; bleeding; perforation +/- peritonitis; post-healing obstruction; recurrent ulceration and malignancy. **Additional information required:** All require specialist assessment to distinguish between mild and serious Cases.
	Chronic or recurrent gastritis	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
	Haemorrhagic erosive usually related to alcohol or NSAID	Concerns relate to risks of above plus underlying cause. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
	Non-erosive chronic gastritis associated with H.	**Aircrew applicants:** Temp Unfit - Off medication and symptom free for six months.

	pylori	**Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.5	**Hiatus hernia**	Hiatus hernia is common in reflux disease. Hiatus hernia increases the likelihood that reflux will occur but the presence of a hiatus hernia does not necessarily mean that reflux disease is present. Severe disease may cause disabling dyspepsia, oesophageal erosion and haemorrhage. Need for regular meals, and regular medication. Often unable to sleep flat. May require surgery.
	Mild intermittent symptoms	**Aircrew applicants:** Temp Unfit - Off medication and symptom free for six months. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Moderate to severe Symptoms and Post-surgery	Severe reflux disease poorly responding to medical treatment is an indication for surgery. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
1.6	**Gastric stapling or similar surgery**	Indicates serious underlying eating disorder / morbid obesity. Requirement for dietary restrictions. Risk of malabsorption, adhesions and abdominal pain; early degenerative arthritis. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.	**SMALL AND LARGE BOWEL**	
2.1	**Abdominal adhesions**	May lead to Recurrent acute abdominal pain, bowel obstruction, strangulation, perforation and haemorrhage requiring urgent surgical intervention. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.2	**Chronic diarrhoea for more than one month** Due to infection (e.g. giardiasis or secondary lactose intolerance)	Acceptable after full recovery. **Aircrew applicants:** Temp Unfit - Off medication and symptom free for six months. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Unknown cause	**Aircrew applicants:** Temp Unfit – Assess on case by case basis. Off medication and symptom free for six months.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
2.3	**Frequent bowel actions**— more than four per day.	**Additional information required:** Full investigation including exclusion of: a. laxative abuse; b. malabsorption with weight loss, muscle wasting and anaemia; c. inflammatory with fever, pain, weight loss and bleeding; or d. other infective causes such as Human Immunodeficiency Virus, cryptosporidiosis, Yersinia and non-typhoidal salmonella.
	Treatable with no requirement for ongoing medications	Symptoms resolved. **Aircrew applicants:** Temp Unfit – Assess on case by case basis. Off medication and symptom free for six months. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Untreatable or requirement for ongoing medication	Assess on merits. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.4	**Chronic constipation**	Applicants who require strict dietary restrictions, medication or over the counter laxatives on an ongoing basis. Supply of these preparations may not be available on operational deployment. Symptoms of severe constipation can be incapacitating and could be confused with acute abdomen. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.5	**Malabsorption syndromes** result from impaired absorption of nutrients from the small bowel.	Many diseases or their consequences can cause malabsorption. The commonest causes of malabsorption are included(but not limited to): a. Carbohydrate intolerance; b. Coeliac disease; c. Tropical Sprue;

		d. Whipple's disease; e. Intestinal Lymphangiectasia; f. Short bowel syndrome. In general any condition which leads to malabsorption including the consequences of surgery. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.5.1	**Coeliac disease**	Obligatory dietary restrictions and inability to take some medications. Risk of abdominal pain, diarrhoea and malabsorption. Risk of dermatitis herpetiformis, insulin-dependent diabetes, splenic atrophy, osteoporosis, malignancy, alopecia, impaired fertility and neurological disease. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term role and deployment restrictions (A3/4), in order to ensure that they can be guaranteed access to suitable diets at all times.
2.6	**Crohn's disease**	Crohn's disease can affect any part of the gastrointestinal tract. Inflammation is often focal and transmural. Considerations are as for coeliac disease plus: a. Malabsorption; b. bowel obstruction; c. abscess and fistula formation; d. perianal fissure or fistula; e. malignancy; or f. multiple extra-intestinal complications requiring specialist care. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with unrestricted or deployed flying duties.
		Management of Aircrew: Initially aircrew are to be grounded and awarded the limitation Z5, NZ only.

		Provided they are in full clinical remission with no objective evidence of active disease, complications or drug side effects, a return to restricted duties may be possible ('Unfit solo pilot – must fly with a pilot suitably qualified on type', 'Fit to control only when another controller is on duty and in close proximity' and 'Unfit for service outside base areas'). Specialist advice is required and each case is to be considered on its merits.
2.7	**Diverticular disease**	Risk of recurrent abdominal pain, pericolic abscess formation; fistula; perforation +/- peritonitis; bowel obstruction and bleeding.
	Uncomplicated and asymptomatic	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Bleeding and other severe symptoms	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
2.8	**Ulcerative colitis and ulcerative proctitis**	Ulcerative colitis is a mucosal disease that is confined to the colon. Risk of acute abdominal pain requiring hospital and specialist care. Risk of anorexia, vomiting, weight loss; diarrhoea +/- blood; perforation +/- peritonitis. Increased incidence of carcinoma of colon. Multiple extra-intestinal complications requiring specialist care. Requires dietary modification and medication. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with unrestricted flying duties.
		Management of Aircrew: Initially aircrew are to be grounded and awarded the limitation Z5 NZ only. Individuals with distal disease (inflammation confined to the rectum or sigmoid colon) may be considered for a return to limited flying duties, provided they are in full clinical remission with no objective evidence of active disease and no complications or drug side effects. These individuals are to be awarded the limitations 'Unfit solo pilot – must fly with a pilot suitably qualified on type' 'Unfit for service outside base areas' but may be 'Fit detachments outside of base areas for up to 30 days' – or equivalent for other aircrew roles where practicable. More extensive disease is associated with a higher incidence of complications and relapses, and will require permanent restrictions. Extensive or total colitis will rarely be considered compatible with continued flying duties.

		Individuals in whom the initial inflammatory disease was restricted to the rectum, and who suffer no relapses over a 2-year period of observation, may be considered for upgrading to G3 without restrictions provided there is no evidence of active disease (biopsy proven) and they remain on maintenance treatment only.
2.9	**Irritable bowel Syndrome (IBS)**	Affects about 15 per cent of the population of Western countries. Recurrent abdominal pain and alteration of bowel function may disrupt Service life, therefore, will depend on severity and ability to self-manage even on deployment. Multiple medical presentations, investigations and potential medication. Consider psychological issues.
	If severe or complicated, requiring regular medication	Possible need for dietary manipulation not readily available in military. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
	If symptoms minor and easily self-managed	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.10	**Colonic polyps**	Colonic polyps are increasingly being found in younger people especially in those with a family history of colon cancer. **Additional information required:** History of any polyps of the colon and rectum requires assessment by a gastroenterologist or surgeon to determine the risk of recurrence or malignancy and need for surveillance.
2.10.1	**Hereditary (familial) polyposis**	A patient with hereditary polyposis will require either a total colectomy and ileorectal anastomosis, or a restorative proctocolectomy. These patients need regular review as they can develop tumours elsewhere in the gastrointestinal tract. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term role and deployment restrictions.
2.11	**Lactose intolerance**	Malabsorption of dietary lactose in the small intestine results in gastrointestinal symptoms such as abdominal pain, bloating, passage of loose, watery stools, and excessive flatus. Many individuals adjust their intake of milk or dairy product to suit personal preference and this should not be confused with proven lactose intolerance.

	Minor symptoms with ingestion of milk or milk product	Where doubt exists the candidate is to have lactose tolerance testing to confirm diagnosis. If diagnosis confirmed suitability for entry should be determined on the results of testing and severity of symptoms. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Major symptoms (significant diarrhoea, bloating, pain with minor ingestion)	Unable to tolerate milk products even in other foods such as breads, cereals, confectionary. Need for special diet may not be met on deployment. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term role and deployment restrictions.
2.12	**Miscellaneous colitides** Such as: • Collagenous colitis; • Microscopic lymphocytic colitis; • Ischaemic colitis; • Clostridium difficile colitis; and • Non-steroidal anti-inflammatory drugs induced colitis	Risk of recurrent abdominal pain, diarrhoea +/- blood. Specialist assessment to distinguish between severe and transient cases. If severe, complicated, requiring chronic medications. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term role and deployment restrictions.
3.	**GALL BLADDER**	
3.1	**Cholecystitis**	High risk of recurrence unless gall bladder is removed (See Serial 3). **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Cholelithiasis**	Risk of biliary colic, cholecystitis, pancreatitis, other complications.
	Asymptomatic	Stones found incidentally with no attributable symptoms. Risk of symptomatic disease is one per cent per year. **Aircrew applicants:** Unfit pilot.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
	Symptomatic	High rate of recurrence (70 per cent over two years). **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.3	**Cholecystec-tomy**	**Additional information required:** If all the following are met: a. More than six months post-op (irrespective of surgical approach). b. No complications. c. No recurrence or new symptoms. d. No diarrhoea. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.	**LIVER**	
4.1	**Chronic liver disease**	Complications often severe and progressive. Includes portal hypertension, renal failure, electrolyte abnormalities, jaundice. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
4.1.1	**Chronic Hepatitis**	A diagnosis of chronic hepatitis is incompatible with continued flying duties until the situation has been fully assessed and stabilised. In those requiring no therapy, or who are well controlled on small doses of steroids (not greater than Prednisone 10 mgs per day) restricted flying in a multi-crew environment may be considered. Specialist advice would be required. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties or overseas deployments.
4.2	**Hepatic fibrosis**	Risk of pain, bleeding, general debility. Requires access to medical care.

		Aircrew applicants: Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
4.3	**Hepatic cirrhosis**	Risk of pain, bleeding, general debility. Requires access to medical care. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
4.4	**Gilbert's syndrome** Mild unconjugated Hyperbili-rubinaemia with normal liver function tests	Found incidentally. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.5	**Fatty liver** Most commonly associated with alcoholism, obesity, diabetes, and pregnancy, however, other causes have been identified. There is a poor correlation between the diagnosis of fatty liver and abnormal findings on commonly used biochemical tests for liver disease	Diagnosis is usually confirmed from ultrasound/computed tomography/liver biopsy. **Additional information required:** The history or diagnosis must be confirmed with appropriate Investigations. **Aircrew applicants:** Temp Unfit – Assess on case by case basis. Off medication and symptom free 12 months with no sign of progression. Unfit if associated with hepatomegaly, other pathology (inflammation or necrosis), alcoholism, diabetes or morbid obesity. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require long term role and deployment restrictions, depending on comorbidities
5.	**PANCREAS**	
5.1	**Pancreatitis**	Most episodes of acute pancreatitis are associated with gallstones (particularly bile duct stones) or with prolonged alcohol abuse. Pancreatitis may also be induced by drugs.
	Single episode	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require long term restrictions.
	More than one episode	**Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
5.1.1	**Acute alcohol related pancreatitis**	Problems of alcohol use (binge drinking or dependence). Risk of recurrent episodes requiring specialist assessment. Risk of developing chronic pancreatitis. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
5.1.2	**Acute pancreatitis secondary to biliary tract disease**	Risk of recurrent acute abdominal pain requiring hospitalisation and specialist care; renal failure, pseudocyst, abscess, peritonitis, fistula and haemorrhage; and development of chronic pancreatitis. Significant mortality rate. **Aircrew applicants:** Temp unfit 1 year. Assess on case by case basis after successful cholecystectomy. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.1.3	**Acute traumatic pancreatitis**	Suitability depends on: a. original injuries; b. extent of pancreatic damage; c. residual function; and d. risk of sequelae. **Aircrew applicants:** Temp unfit 12 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.1.4	**Acute pancreatitis — other causes**	**Aircrew applicants:** Temp unfit 12 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.1.5	**Chronic / Recurrent pancreatitis**	Risk of recurrent acute abdominal pain; pseudocyst formation and ascites; exocrine insufficiency (malabsorption and severe weight loss); endocrine insufficiency (diabetes); bile duct obstruction with jaundice; and malignancy Ca of the pancreas in less than five per cent of cases. Requires access to medical care.

		Aircrew applicants: Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Unlikely to be compatible with flying duties.
6	**RECTUM AND ANUS**	
6.1	**Anal fistula, anal fissure, anal stricture or haemorrhoids**	**Additional information required:** Requires treatment and medical report. **Aircrew applicants:** Temp unfit 12 months – assess on case by case basis, if treatment successful and no associated serious diagnosis; e.g. colitis or Crohn's disease. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.	**GROIN AND GENERAL ABDOMEN**	
7.1	**Abdominal mass**	Enlarged liver or spleen usually equates to a serious condition. **Additional information required:** Requires full investigation for cause; decision will be based on diagnosis. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. A4 pending investigations and diagnosis.
7.2	**Hernia (inguinal, femoral, epigastric or incisional/wound hernia)**	Risk of progression and complications from raised intra-abdominal pressure (bending, lifting, push-ups, G-forces).
	Unrepaired	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. A4 pending investigations and diagnosis.
	Repaired	If all the following criteria are met: a. More than six months post-op (three months if surgery was laparoscopic). b. No complications. c. No recurrence. d. Fitness has returned to normal.

		Otherwise unfit. **Aircrew applicants:** Temp unfit 3-6 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Fitness to return to flying duties based on specialist advice and full recovery. Graded return to full duties.
7.3	**Hernia (umbilical)**	Risk of progression and complications from raised intra-abdominal pressure (bending, lifting, push-ups, G-forces).
	Unrepaired	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review. A4 pending investigations and diagnosis, unless minor.
	Repaired	If all the following criteria are met: a. More than six months post-op (three months if surgery was laparoscopic). b. No complications. c. No recurrence. d. Fitness has returned to normal. Otherwise unfit. **Aircrew applicants:** Temp unfit 3-6 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Fitness to return to flying duties based on specialist advice and full recovery. Graded return to full duties.
8	**OTHER**	
8.1	**Food intolerance or allergy**	See Chapter 1 *Allergic System and Dietary Restrictions*.
8.2	**Peutz-Jeghers syndrome — indicated by pigmentation of the skin and mucous membranes** Associated with hamartomatous polyps of stomach, small intestine and colon (the latter	Risk of abdominal pain, small bowel obstruction and haemorrhage. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.

	has a three per cent incidence of developing cancer of the colon)	
8.3	**Amoebiasis**	Any past history of amoebic dysentery. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. A4 pending investigations and diagnosis.

Chapter 7: Genitourinary System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important genitourinary conditions and disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important genitourinary conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Genitourinary system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**CONGENITAL/DEVELOPMENTAL**	
1.1	**Congenital urinary obstruction with or without hydronephrosis**	Generally due to ureteropelvic junction obstruction, vesicoureteric reflux or posterior urethral valves. Common complications include recurrent urinary tract infection (UTI), hydronephrosis and renal scarring. If uncorrected or recurrent after surgery, further risks include acute obstruction, calculi, malignancy and renal failure.
	Current	High risk of retrograde infection and hydronephrosis. Long-term risk of malignancy and renal failure. **Aircrew applicants: U**nfit. **Serving aircrew:** Specialist review required. Serving aircrew are to be assessed on a case by case basis. Likely to require long term aircrew role and deployment restrictions.
	Following corrective surgery or resolution	Further information is required, renal physician or urologist reports as appropriate and reports from time of treatment may suffice. Acceptable if **all** the following are met: a. Surgery is performed involved less than three procedures and was more than five years ago. b. No evidence of ongoing obstruction or reflux. c. No recent or recurrent UTIs (no more than 2 in previous year for females, and nil for males). d. Renal function within normal limits and no hydronephrosis. e. No requirement for ongoing specialist review.

		Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.2	Congenital kidney disease (Includes polycystic kidney disease, medullary sponge kidney, non-cystic renal dysplasia, renal hypoplasia)	Risks include acute and chronic renal failure; and renal malignancy. Requires regular monitoring and access to medical care. Those with a positive family history of autosomal dominant polycystic kidney disease (ADPKD) must undergo screening renal imaging before being considered for Service. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Management of Aircrew: Aircrew are to be grounded and temporarily downgraded unfit service outside base areas and referred to a nephrologist. An unrestricted grade may be awarded if all the following criteria are met: a. Asymptomatic. b. Normotensive. c. No haematuria or proteinuria quantified as PCR <23mg/mmol. d. Normal haemoglobin. e. Satisfactory renal function with eGFR>90ml/min. f. Satisfactory renal ultrasound scan with no evidence of stones, malignancy or complex cysts. g. No evidence of cerebral aneurysms on cranial magnetic resonance angiogram (MRA) or CT scan. h. Normal cardiac echocardiogram. i. Normal abdominal aorta Doppler scan.
1.3	**Undescended testes (cryptorchidism)**	There is an increased relative risk of testicular malignancy and torsion, which is mitigated by early surgery (pre-pubertal). Risk of reduced testosterone production, infertility and risk of malignancy. **Additional information required:** Current specialist report addressing the following:

		a. Presence or absence of an underlying condition. b. Ease of testicular self-examination (includes whether testes can be located and whether they are both present). c. Risk of malignancy. d. Requirement for hormonal therapy.
	Unrepaired, whether testis is palpable or not	Risk for malignancy is elevated (albeit low in absolute terms.) Surgery is indicated for surveillance purposes. **Aircrew applicants:** Unfit. **Serving aircrew:** A4, Z5 until treatment completed.
	Orchidopexy	**Aircrew applicants:** Acceptable if at least 12 months since satisfactory surgery with no requirement for further intervention/follow up. **Serving aircrew:** Fit following full recovery and specialist review.
	Orchidectomy (unilateral or bilateral)	See 5.2 below.
	Evidence of hypogonadism; or requirement for hormone therapy	See 4.2 below.
1.4	**Enuresis** (night time incontinence after age 5)	Significant problem in places where hygiene and laundry facilities are limited. Additional information required for all candidates with enuresis after the age of 12 years: Urologist report. Acceptable if the following apply: a. No episodes for at least three years. b. No underlying condition (may require a renal physician report if reduced renal function, proteinuria or hypertension). c. No underlying psychological issues. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

1.5	**Hypospadias or Epispadias** (Abnormal position of urinary meatus)	Surgical repair not permanently reliable; elevated risk of urethral stricture or meatal stenosis. Requires regular specialist review.
	Minor	If all the following are met: a. Original meatus was on glans or penile shaft. b. No operation or only a single operation required (a single two-stage repair is acceptable), at least two years ago. c. Meatus is on glans. d. No stricture, spraying, reduction in flow or incontinence. e. No requirement for follow-up. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Moderate/Severe	If any the following are present: a. Original meatus was on scrotum or perineum (hypospadias) or abdominal wall (epispadias). b. Required two or more procedures. c. Meatus not on glans. d. Any stricture, spraying, reduction in flow or incontinence. e. Any associated disorder of genitourinary development. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.6	**Phimosis** (congenital or acquired inability to retract the foreskin completely)	A non- or partially-retractable prepuce has an increased risk of skin irritation, infections, STDs and malignancy. A partially-retractable prepuce also has an increased risk of paraphimosis (*see* Serial 1.7 below). Visual inspection and description of prepuce or referral is required. **Additional information required:** In all cases where the foreskin is not fully retractable, refer for urologist's opinion. Treatment may be medical or surgical. **Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
	Medical treatment (steroid cream and manual stretching)	If the following apply: a. Treatment completed three or more months ago. b. Foreskin now fully retractable. c. No recent infection or irritation. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Surgical treatment (circumcision)	If the following apply: a. Surgery was three or more months ago. b. Fully healed, no complications. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Untreated / relapsed	Persistent high risk of infection, irritation, paraphimosis and malignancy. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions i.e. Z4/5.
1.7	**Paraphimosis** (prepuce is trapped behind glans, causing constriction)	A history of paraphimosis requires assessment for possible underlying cause, likelihood of recurrence and residual damage.
	Subsequently circumcised	If the following apply: a. Surgery was three or more months ago. b. Fully healed, no complications. **Aircrew applicants:** Assess on case by case basis.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
	Surgical or medical treatment other than circumcision	Requires assessment by urologist to determine cause and risk of recurrence, and to assess any sequelae. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.8	**Solitary kidney**	Found in 0.1 per cent of the population, usually silent. Acceptable if structurally normal on ultrasound scan including no calculi (compensatory hypertrophy expected) functionally normal (i.e. MSU clear of blood, normal eGFR, normal urine PCR). **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Aircrew with a single kidney may continue to fly with no restrictions providing that the remaining kidney is normal and has not been subjected to renal calculi.
1.9	**Renal transplant**	Renal transplantation is part of the continuing care of patients with chronic renal failure. Facilities do not exist in the NZDF for care of these patients who require long term surveillance and treatment. **Aircrew applicants:** Unfit. **Serving aircrew:** Aircrew with a renal transplant are initially unfit military flying duties. On a case by case basis, transplant >5 years, with no complications and normal function for 5 years (potentially after 3) may be assessed for a return to flying. They will require ongoing reviews (2-4 per year) by their specialist.
1.10	**Request to Act as a Transplant Donor**	Requests may be made from serving personnel to act as transplant donors for close relatives. This is an executive rather than a medical matter and should be actioned in the first instance by a general application. The MO should ensure that the prospective donor has been adequately counselled. Following donation, the donor should be assessed as a patient with a single kidney and may continue to serve with a normal grading. Aircrew will be fit full, unrestricted flying duties.
2.	**FUNCTIONAL**	
2.1	**Incontinence of urine** **(males or females)**	Ongoing bladder instability. Unacceptable in communal/close living quarters in the field, at sea and on deployment. **Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.2	**Chronic genitourinary pain (includes interstitial cystitis, painful bladder syndrome, vulvodynia, prostatodynia and chronic non-bacterial prostatitis)**	Includes anyone with symptoms or treatment for chronic genitourinary pain in the last two years. Symptoms may include urethral, perineal and back pain, urgency, frequency and dyspareunia without infection. Significant adverse impact on function and capabilities when deployed. High risk of incontinence if access to toilet facilities is limited. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
2.3	**Urethral stricture**	Almost always a permanent problem. Risk of recurrent lower abdominal pain due to acute urinary retention; hypertrophy of the bladder detrusor muscle with trabeculation and diverticulae formation resulting in incomplete bladder emptying; resultant urinary stasis causing further recurrent UTI; and ultimately progressive loss of kidney function. Requires regular specialist review and treatment. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.	**INFECTIVE**	
3.1	**Balanitis and/or posthitis**	Need to exclude phimosis (*see* Serial 1.6 above) and diabetes (*see* Chapter 5 *Endocrine and Metabolic Systems*). Single episode, resolved, no risk factors for recurrence may be acceptable. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		History of recurrent balanitis/posthitis. **Additional information required:** Report from Urologist. May be acceptable if definitive treatment and no persisting risk factors for recurrence. **Aircrew applicants: U**nfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
3.2	**Epididymitis**	Likely to be recurrent and limit physical activities.
	Simple	Single episode, responded rapidly to antibiotics, no relapse. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Relapsing, recurrent or chronic	Persistent pain and disability. Long-term antibiotics often required. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
3.3	**Urinary tract infection**	Urethritis and cystitis are very common in females, but uncommon in males. Complications include acute or recurrent pyelonephritis, renal or perinephric abscess, chronic renal failure, and acute or chronic prostatitis. Pyelonephritis in either sex should be investigated for evidence of obstruction or reflux. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Aircrew with urinary infections are to be grounded and referred for investigation and treatment as required.
3.3.1	**Urethritis or cystitis**	Common in females, uncommon in males. A letter from the treating doctor should be requested to confirm details.
	Infrequent, uncomplicated (no more than 2 episodes per annum)	Acceptable if the following are met: a. Each episode was easily treated with single course of antibiotics. b. No indication of any underlying abnormality or reservoir of infection (urologic investigations are not mandated). c. No spread of infection to prostate or upper urinary tract. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

	Males with two or more episodes in the last ten years	May be associated with a urinary tract abnormality or prostatitis. Increased risk of recurrence and long-term complications. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Specialist referral required.
	Females with three or more episodes in the last year, or more than five in last five years	May be associated with an underlying condition. Increased risk of recurrence and long-term complications. **Aircrew applicants:** Unfit. **Serving aircrew: S**erving aircrew are to be assessed on a case by case basis. Specialist referral required.
3.3.2	**Pyelonephritis or renal abscess**	**Additional information required:** Urological investigation and urologist report required. For childhood infections secondary to congenital obstruction see relevant serial. Acceptable if the following are met: a. Single episode. b. No underlying abnormality. c. Renal function is normal. d. Recurrence not anticipated. Otherwise unfit **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.4	**Sexually Transmitted Infections**	**Aircrew applicants:** See NZDF Recruit standards. **Serving Aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
4.	**ENDOCRINE AND METABOLIC**	
4.1	**Nephrolithiasis (renal calculus), Renal Stone Disease (RSD) or renal colic** (includes	Often associated with an underlying metabolic disorder or structural abnormality. High symptomatic recurrence rate, even when asymptomatic. Must avoid dehydration and maintain urine output of more than 2 litres per day; may

	asymptomatic nephrolithiasis)	require dietary advice and/or medication. Long-term risk of renal failure may be increased. Any history (even single episode) of confirmed nephrolithiasis is disqualifying. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Management of Aircrew: Aircrew who have an occurrence of renal colic or are diagnosed with renal stone disease are to be awarded Z5 NZ only 'Unfit for service outside base areas'. Aircrew are to be grounded until stone free. Aircrew with recurrent RSD, or with residual stones not amenable to treatment, are to be referred to a specialist in Renal Medicine. If residual stones are considered unlikely to become symptomatic a return to restricted flying [A3, 'Unfit solo pilot - must fly with a pilot suitably qualified on type' or equivalent for other aircrew roles should be possible. *Renal Colic or incidental finding or RSD* - A4, refer local ED or urology. First stone and clinically and radiologically free can upgrade to G3 after 6 weeks. Metabolic screen (non-fasting bloods (Hb, Na, K, Cl, Cr, Urea, Ca, PO4, AlkPhos, Uric Acid, Bicarb, parathyroid hormone), 3 x EMU (pH, dipsticks), MSU, cysteine check), 3 x 24 hr urine (vol, Ca, Oxalate, Uric Acid, Citrate, Cr, sodium, phosphate) at 3 months post diagnosis: a. If normal – local follow up Imaging (USS/X-rays (renal AXR)) at 1 and 2 years post diagnosis then 2 yearly. b. If abnormal metabolic screen refer renal medicine for treatment options. *2 or more stones, recurrent or residual stones* – remain A4. Refer renal medicine and urology for treatment options. Prophylactic treatment to prevent further stone formation may be indicated. Treatment with citrate supplements or allopurinol is compatible with full ground or flying duties and requires only a G3 category. The use of thiazide diuretics is acceptable for full ground and flying duties, but for aircrew, a four week period of assessment for side effects should be carried out. Nephrolithiasis dietitian advice also advisable.
4.2	**Hypogonadism (male)**	See also any related serials including: Orchidectomy or endocrine/developmental conditions in Chapter 5 *Endocrine and Metabolic Systems*. **Additional information required:** Report from treating specialist summarising cause, treatment, current medication and follow-up requirements, and any risks to future health.

		Aircrew applicants: Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Hypogonadism (female)	See primary conditions in Chapter 8 *Gynaecological System* or Chapter 5 *Endocrine and Metabolic Systems*, as relevant. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.	**SURGICAL**	
5.1	**Nephrectomy**	**Additional information required:** Specialist (Renal Physician and urologist) report addressing reason for nephrectomy, health of remaining kidney, requirement for follow-up and any relevant future risks.
	Performed for renal trauma or organ donation	Normal renal function (MSU, eGFR and urine PCR) and BP. No abnormality in remaining kidney and no expectation that renal function will deteriorate in next ten years otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.2	**Orchidectomy for non-malignant indications** If indication for orchiectomy was malignancy, refer to Chapter 11 *Malignancy*.	*See also* the following, as appropriate: Cryptorchidism, Hypogonadism (male), Testicular cancer, Gender dysphoria. **Additional information required:** a. LH/FHS/testosterone levels. b. Reason for surgery. c. Ongoing treatment or surveillance requirements. d. Likely future health risks **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Unilateral	Acceptable if the following are met:

		a. At least 6 months since surgery. b. No hormonal abnormality. c. No evidence or increased risk of malignancy. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Bilateral	**Additional information required:** Report from treating specialist or head of multidisciplinary team addressing the underlying issue, treatment, current medication and follow-up requirements including consequences if delayed or missed), and any future health risks (CVS, bone, hormonal, malignancy, psychosocial etc). **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
6.	**MASSES, INCLUDING MALIGNANCY.** ***See also*** Chapter 11 ***Malignancy***	
6.1	**Hydrocoele**	Size and symptoms do not necessarily correlate so both must be independently considered. May be associated with other intra-scrotal pathology. Scrotal ultrasound is useful to assess volume and any associated masses.
	Small	Acceptable if all the following are met: a. Size <50 ml. b. Never symptomatic with pain. c. No history of trauma. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Moderate	Size 50–80 ml OR Size <50 ml with symptoms/trauma. **Additional information required:** Urology assessment. **Aircrew applicants:** Temp unfit. Specialist review.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
	Large	Size >80 ml. Increased risk of pain and complications. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
	Repaired	**Additional information required:** Surgical assessment. Acceptable if all the following are met: a. Surgery was >6 months ago. b. No pain, recurrence or complications. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
6.2	**Varicocoele**	There is no clinical classification grading system based on size, therefore the MO must use clinical judgment. May be aggravated by physical activity and limit effort. **Aircrew applicants:** Temp unfit 12 months – assess on case by case basis, if treatment successful and no associated serious diagnosis; e.g. colitis or Crohn's disease. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	All other varicocoeles, whether asymptomatic or not.	Refer for US scan to exclude significant pathology. Moderate to large will require repair prior to enlistment. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

	Repaired Varicocoele	Six months must have elapsed following surgery. **Additional information required:** Surgical assessment. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
6.3	**Renal mass**	Requires full investigation for cause; decision will be based on diagnosis. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Malignancy. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Non-malignant but requires regular specialist reviews and/or medication. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
6.4	**Malignant Tumour of kidney, ureter, bladder**	All require long-term follow-up with risk of recurrence. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.	**NEPHRITIS/NEPHROPATHY**	
7.1	**Interstitial or Tubular Nephritis**	Risk of relapse, pain, nephrotic syndrome, chronic kidney disease. May require prolonged antibiotic or steroid treatment. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

	Acute Interstitial Nephritis (Note: may be asymptomatic)	**Additional information required:** Renal Physician report. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		May be suitable if all the following criteria are met: a. Treatment ceased > 12 months ago. b. Normal serum creatinine, urea and Electrolytes. c. Normal urine PCR and eGFR OR normal 24-hour urine result for creatinine clearance and proteinuria. d. No abnormality on urine microscopy (hyaline casts acceptable). e. Normal blood pressure. f. Risk of relapse or recurrence is considered low. **Note: if secondary to medication must ensure no further exposure to provocative agent (e.g. OTC NSAIDs and PPIs etc).** **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.1.2	**Chronic Nephritis (any cause)**	Requires regular monitoring and access to specialist care. Some risk of progression to renal failure. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.2	**Glomerulo-nephritis or nephropathy**	Inflammatory response involving renal tissue. Elevated risk of progressive renal disease; elevated risk of renal damage from dehydration, some medications and/or intercurrent illness. For secondary nephropathy there are also the risks associated with the underlying condition. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.2.1	**Thin Basement**	**Additional information required:**

	Membrane Nephropathy	Renal Physician report. May be suitable for entry if all the following are met: a. Normal blood pressure. b. Normal serum creatinine and eGFR. c. Minimal haematuria and proteinuria (less than twice the upper limit of normal) - no episodes or documented above this level PCR. d. No casts or crystals in urine (hyaline casts are acceptable). e. No underlying anatomical abnormality or pathology. f. Minimal surveillance required (no more than once a year). **Aircrew applicants:** Temp unfit 3-6 months – assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.2.2	**IgA Nephropathy**	There is a risk of progression to end-stage renal disease, even when symptoms and signs are minimal at time of diagnosis. However, a good prognostic group is no proteinuria and normal BP and normal renal function. If applicable, 5-10 years post-diagnosis, the next 20 years (NZDF employment time) they are unlikely to develop significant issues. **Aircrew applicants:** Normally unfit. Assess on case by case basis. CMO waiver required. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist review.
		Management of Aircrew: *Acute Glomerulonephritis*. Aircrew are to be referred for specialist management and are to be temporarily downgraded Z5 NZ only, 'Unfit for service outside base areas'. Return of normal renal function and the disappearance of casts and protein from the urine (PCR <23mg/mmol) will allow return to normal grading. Return to unrestricted flying is permitted on recovery. *Chronic Glomerulonephritis*. Will require the limitation, 'Unfit for service outside base areas'. Providing that renal function is normal and no adverse features are present such as proteinuria > 2g per day, hypertension or declining renal function - unrestricted flying is permitted. The development of hypertension, proteinuria > 2g/day or reduction in renal function may require restriction of aircraft type or aircrew role. Progressive deterioration in function will lead to a permanent P8.

		The commonest form of chronic glomerulonephritis is IgA nephropathy. This is a fairly benign condition and is associated with the development of chronic renal failure in only about 13-15% of cases. Isolated microscopic haematuria alone carries an excellent prognosis, but hypertension, persistent proteinuria (> 2g per day), or raised creatinine at presentation are indicators of poor outcome. Initial presentation with nephrotic syndrome also bodes ill. The majority of cases of chronic glomerulonephritis may therefore be expected to do well. Nephrotic syndrome may be due to a variety of causes, but the commonest are minimal change (steroid responsive) disease and membranous glomerulonephritis. Steroid responsive disease has a tendency to relapse and 'Unfit for service outside base areas', should be applied for at least two years after cessation of all treatment. Return to flying must be assessed by a renal physician specialist. For return to unrestricted flying, the serum albumin must be normal and urine PCR must be < 100mg/mmol. Providing there is no underlying disease as a cause, idiopathic membranous glomerulonephritis will have a roughly 25% chance of complete clinical resolution, 35-40% of staying the same and 35-40% of deterioration. Close surveillance is important in order to determine the natural history. Grading will depend ultimately on which path is followed by the disease.
7.2.3	**All other causes**	Elevated risk of progression to end-stage renal disease. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Requires specialist renal physician review.
8.1	**Proteinuria and/or haematuria**	**Additional information required:** Asymptomatic proteinuria or haematuria is the commonest presentation of glomerulonephritis. Where diagnosis has been made, refer to relevant serial. **Where no diagnosis has been made, and proteinuria or haematuria has been confirmed, applicants are to obtain referral to a renal physician for assessment.** **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. All aircrew with confirmed haematuria should be referred for urgent investigation. The presence of macroscopic haematuria should lead to temporary grounding until full investigation is complete.
8.1.1	**Persistent proteinuria and/or haematuria where investigation does not provide a definitive**	May be suitable for entry if **all** the following are met: a. Normal blood pressure. b. Normal haemoglobin.

	diagnosis, including where renal biopsy is not clinically indicated, and likely source of haematuria is glomerular in origin.	c. Normal PCR. d. Minimal haematuria and proteinuria (less than twice the upper limit of normal)—no episodes or documented above this level. e. Normal creatinine/albumin ratio on 24-hour urine. f. No casts or crystals in urine (hyaline casts are acceptable). g. No underlying anatomical abnormality or pathology. h. Minimal surveillance required (no more than once a year). i. Specialist renal physician report to support good prognosis. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
8.2	**Glycosuria**	Transient mild glycosuria may occur in concentrated urine. Persistent glycosuria must be fully investigated. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
8.2.1	**Impaired glucose tolerance**	See Chapter 5 *Endocring and Metabolic Systems*
8.2.2	**Renal tubular acidosis**	Various causes, associated with electrolyte and acid-base abnormalities. Increased risk of renal calculi, heart illness and adverse consequences of dehydration. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
8.2.3	**Benign renal glycosuria**	May be acceptable if all the following criteria are met (Specialist report required): a. No underlying disease. b. Normal plasma glucose tolerance. c. Normal electrolytes and acid-base balance. d. No polyuria. Otherwise unfit.

8.3	**Pyuria**	*See* Serial for UTI.
9.	**OTHERS**	
9.1	**History of any other chronic or acute genitourinary condition not included in this chapter**	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

Chapter 8: Gynaecological System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important gynaecological conditions or disorders (including pregnancy).

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important gynaecological conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Gynaecological system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**BREAST**	
		Any history of, or clinically suspected abnormality of the breast requires specialist assessment, to exclude serious underlying condition.
1.1	**Minor conditions**	**Aircrew applicant:** Subject to GP report, acceptable if no further treatment is required. **Serving aircrew:** May require temporary grounding pending specialist confirmation and then fit to fly if no further treatment is required.
1.2	**Breast Tumour**	
	Benign	**Aircrew applicant:** Acceptable subject to specialist confirmation and if no further treatment is required. **Serving aircrew:** May require temporary grounding pending specialist confirmation and then fit to fly if no further treatment is required.
	Malignant	Refer to Chapter 11 *Malignancy*.
1.3	**Bleeding from the nipple**	
	Benign	**Aircrew applicant:** Acceptable subject to specialist confirmation that the condition is not clinically significant and no further treatment required. **Serving aircrew:** May require temporary grounding pending specialist confirmation and then fit to fly if no further treatment is required.
	Malignant	Refer to Chapter 11 *Malignancy*.
1.4	**Excised benign fibroadenoma**	**Aircrew applicant:** Acceptable if confirmed by specialist report and sighted histopathology.

		Serving aircrew: May require temporary grounding pending specialist confirmation and then fit to fly if no further treatment is required.
1.5	**Mastalgia associated with hormonal causes, exercise or activity**	**Aircrew applicant:** Unfit aircrew if they are unable to perform military duties such as; carrying loads, physical activity, wear aircrew life support equipment or wear personnel protection equipment; e.g. body armour, and other military critical skills. If doubt exists, surgical opinion may be helpful otherwise not required. **Serving aircrew:** May require temporary grounding pending specialist opinion and then fit to fly if no further treatment is required.
	Post-surgery	**Aircrew applicant:** Acceptable subject to specialist confirmation that there are no complications and no further treatment is required. **Serving aircrew:** Will require temporary grounding pending specialist opinion and then fit to fly once fully recovered.
1.6	**Breast implant**	Risk of rupture increases with advancing age of implant. **Aircrew applicant:** Additional information required: Report from reconstructive surgeon on individual risks including acceptable risk assessment. Decision: Case by case basis. If report confirms non-tender and asymptomatic, with no associated risks. Unfit if symptomatic, chronic inflammation, leakage or any other complications. **Serving aircrew:** Will require temporary grounding pending specialist opinion and then fit to fly once fully recovered. Fitness for hypobaric chamber training on case by case basis, after 3 month stand down.
2.	**CERVIX**	
2.1	**Cervical conditions**	**Aircrew applicant:** Refer to Recruit medical standards. **Serving aircrew:** Cervical procedures: Following Cervical smear there should be a 24 hour temporary grounding for aircrew. Minimum of 72 hours stand down from flying for colposcopic surgical procedures. Refer to Chapter 11 *Malignancy* for significant conditions.
3.	**MENSTRUAL**	
3.1	**Dysmenorrhoea**	Abnormal menstruation and symptoms associated with pre-menstrual syndrome should be reported to the AvMO. If the condition is considered significant, the aircrew should be grounded until the menstrual period ceases and/or treatment has proved successful. If the problem persists or recurs, the MO is to refer the individual for consultant opinion

		If the gynaecological/obstetric history identifies the need for a pelvic examination or further clinical information, the candidate is to be assessed as temporarily unfit by the Medical Board pending a report from a military or local civilian, consultant gynaecologist. Depends on severity of symptoms but specialist assessment may be required to exclude serious condition.
	Mild	**Aircrew applicant:** Acceptable if symptoms are manageable with no absence from school or work. **Serving aircrew:** May require temporary grounding pending resolution of symptoms.
	Moderate	**Aircrew applicant:** Acceptable if symptoms controlled with over the counter medication or oral contraceptive pill (OCP). **Serving aircrew:** May require temporary grounding pending resolution of symptoms.
	Severe	**Aircrew applicant:** Causing absence from work or school. If there is an underlying medical condition manage as for the condition. Must demonstrate 6 months with satisfactory control. **Serving aircrew:** May require temporary grounding pending specialist confirmation of there being no serious underlying disorder and then fit to fly if no further treatment is required or symptoms are well managed. If significant absence from work or flying is required then a medical grading review should be undertaken.
3.2	**Polycystic Ovary Syndrome (PCOS).**	**Aircrew applicant:** Acceptable if symptoms are manageable with no absence from school or work. Normal weight, normal glucose metabolism, normal lipids, no medication on OCP only. Unfit if PCOS with abnormal glucose metabolism, or raised lipids, or requiring treatment with metformin. **Serving aircrew:** May require temporary grounding pending investigation, management and resolution of symptoms.
3.3	**Amenorrhoea**	**Aircrew applicant:** Depends on the underlying cause. See recruit standards. **Serving aircrew:** May require temporary grounding pending specialist confirmation of there being no serious underlying disorder and then fit to fly if no further treatment is required or symptoms are well managed.
4.	**INFECTIVE**	
4.1	**Pelvic Inflammatory**	

	Disease	
	One attack only	**Aircrew applicant:** If resolution of infection and sequelae excluded then may be suitable subject to medical report. **Serving aircrew:** Will require temporary grounding pending investigation, management and resolution of symptoms.
	Chronic or recurrent	**Aircrew applicant:** Unfit. **Serving aircrew:** May require long term restrictions or permanent grounding. To manage on a case by case basis.
4.2	**Recurrent Genital Herpes Simplex Virus infection**	See Chapter 7 *Genitourinary System*.
5.	**INFLAMMATORY**	
5.1	**Endometriosis**	Risk of recurrent abdominal pain, menorrhagia, functional incapacity, Peritonitis.
	Mild. If treated and asymptomatic off medication (other than COC) for 24 months	**Aircrew applicant:** Maybe fit. Additional information required: Gynaecologist report. **Serving aircrew:** May require long term restrictions. To manage on a case by case basis.
	Treatment required persisting symptoms or multiple endometrial sites on laparoscopy	**Aircrew applicant:** Unfit. **Serving aircrew:** May require long term restrictions or grounding. To manage on a case by case basis.
6.	**MALIGNANCY**	
6.1	**Malignancy of genital tract**	As for malignant disease, *see* Chapter 11 *Malignancy* (except cervical CIN, *see* serial 2.1 above).
7.	**BENIGN TUMOURS**	
7.1	**Fibroids**	**Aircrew applicant:** Maybe fit. Additional information required: Gynaecologist report. **Serving aircrew:** May require long term restrictions or grounding. To manage on a case by case basis.
8.	**OBSTETRICS**	
8.1	**Pregnancy**	**Aircrew applicant:** A candidate for Service who is found to be pregnant is to be assessed temporarily unfit for service until 3 months after delivery of a viable child. If, however, the child is stillborn, or later dies, the assessment may be reviewed after 3 – 6 months, provided that there are no outstanding problems. A pregnancy which terminates with the loss of the foetus before the 12th week

		may be disregarded in terms of employability provided that a period of 4 weeks has elapsed and there are no complications. **Serving aircrew:** Serving personnel are to be medically downgraded to A4 G4 Z5 R12, 'Unfit service outside base areas' (plus other limitations as required), as soon as the pregnancy is notified. Ground personnel who fly as crew members (for example, Aeromedical (AE) personnel) are to be grounded and awarded, 'Fit limited range of duties in trade or branch (type will be specified in Med Docs). Following return to work after delivery, women are to be assessed and upgraded as considered appropriate. Pregnant aircrew, are to be grounded and downgraded as soon as pregnancy is notified. In addition, pregnant aircrew are not to undertake: 1. Decompression training. 2. Wet EBS/HEEDS/STASS training. 3. Dunker training. 4. Training in a dynamic motion flight simulator with a moderate to high risk of rapid and/or un-expected movement or restricted access (as determined by individual aircraft platform risk assessment). Following return to work after delivery, aircrew are to be assessed and upgraded as considered appropriate. In exceptional circumstances and on a case by case basis and subject to suitable risk assessment by an AvMO, women may undertake limited aircrew duties on non ejection seat fixed wing aircraft for the second trimester. Other restrictions will apply (as above) In practice most women will remain unfit flying through the duration of pregnancy.
8.2	**Abortion / miscarriage**	**Aircrew applicant:** Additional information required: Gynaecologist report. Will need to check for psychological sequelae. Assess on a case by case basis but may be fit after 3-6 months. **Serving aircrew:** Will require grounding. Earliest return is 1 month after uncomplicated early pregnancy loss. To manage on a case by case basis.
8.3	**Breast feeding**	**Aircrew applicant:** A candidate who continues to breastfeed after 3 months will normally be considered unfit aircrew training. **Serving aircrew:** Following return to work after delivery, aircrew who are still breastfeeding will be considered on a case by case basis. They will normally be considered unfit for hypobaric training and operational flying duties.

8.4	**Passenger Flying**	Serving personnel with a singleton pregnancy may fly as passengers in RNZF transport aircraft (not rotary wing) in the following circumstances: a. Up to 28 weeks of pregnancy, provided there are no complications with the pregnancy and the expected date of delivery has been confirmed by ultrasound. Passenger advised to carry a medical certificate. b. Between 28 and 36 weeks of pregnancy, provided they produce a doctor's letter certifying the pregnancy is normal and including the expected date of delivery. c. If multiple pregnancy then only before 32 weeks of pregnancy, and if uncomplicated provided they produce a Lead Maternity Provider / doctor's letter certifying the pregnancy is otherwise normal and including the expected date of delivery.
9.	**SURGERY**	
9.1	**Hysterectomy**	**Aircrew applicant:** Maybe fit. Additional information required: Gynaecologist report**.** Specialist report and surgical notes are required. If oophorectomy was performed then criteria at 10.1 must be considered as well. If all the following criteria are met: a. >12 months post-surgery (irrespective of surgical approach). b. No ongoing complications. c. Has resumed physical activities at level commensurate with training and duty requirement. d. Only on approved medication. Otherwise unfit. **Serving aircrew: W**ill require temporary grounding until fully recovered from surgery. Manage on case by case basis.
10	**OTHER**	
10.1	**Peri- or post-menopausal applicants**	The assessment of peri- or post-menopausal applicants needs to take into consideration the time period since commencement of menopausal symptoms or completion of menopause and the possibility of osteoporosis having developed during the intervening period. If there are any concerns about the possibility of osteoporosis in an applicant, bone density studies are required. **Aircrew applicant:** Maybe fit. Manage on a case by case basis.

		Serving aircrew: May require temporary grounding until fully menopausal symptoms have fully resolved or effective management achieved. Manage on case by case basis.
10.2	**Contraception**	Oral contraception *per se* is not a bar to flying duties. However, it is important to establish the reasons for which it is taken as 'the pill' may be taken for therapeutic purposes as well as for contraception. If taken for therapeutic reasons, the MO is to ensure that the woman is fit to fly and seek consultant opinion if in doubt.
10.3	**Infertility**	Cases of infertility are to be treated in accordance with local NZDF health policy. Individuals who have symptomless infertility are not to be awarded a lowered aircrew medical category.

Chapter 9: Haematological System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important haematology conditions and disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important haematology conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Haematological system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**ANAEMIAS**	
1.1	**Anaemia of any chronic disease or disorder**	Requires regular medication and specialist care for underlying disease or disorder. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require long term restriction for role and deployability.
1.2	**Haemolytic anaemia (including hereditary spherocytosis)**	Requires regular medication and specialist care for underlying disease or disorder. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require long term restriction for role and deployability.
1.3	**Pernicious anaemia**	Increased risk of other auto-immune disorders particularly Hashimoto's thyroiditis, Addison's disease and vitiligo; or multicentric gastric neuroendocrine tumours (some malignant). Requires lifelong drug replacement therapy and regular specialist review. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require long term restriction for role and deployability.
1.4	**Iron-deficiency anaemia** With no underlying medical cause	May be acceptable six months following completion of iron supplementation. Requires confirmatory haematology. Normal laboratory range for haemoglobin and iron studies.

		Otherwise unfit. **Aircrew applicants:** Assess on case by case basis once recovered. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If ongoing or with an underlying medical cause	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require long term restriction for role and deployability.
1.5	**Blood Donation**	Following a blood donation aircrew will normally be removed from flying duties for 72 hours.
1.6	**Bone Marrow Donation**	Bone marrow and stem cell donation is altruistic behaviour that is to be encouraged. MOs may be approached for advice by personnel considering registration as potential bone marrow donors, through a scheme administered by the NZ Blood Transfusion Service in association with other agencies. Personnel wishing to donate bone marrow are to gain approval through their chain of command. Personnel will be referred to a MO for counselling on the medical aspects. It is important that MOs confine their advice strictly to the medical aspects. Following a donation aircrew will normally be removed from flying duties for a minimum of 72 hours but longer periods maybe required depending on procedure undertaken, upon the volume of bone marrow donated, and recovery (the degree of post-operative discomfort and the presence of any post-operative complications). Fitness for flying is to be confirmed by an AvMO.
1.7	**Stem Cell Harvesting**	The need for bone marrow donation has been replaced in some situations by the ability to harvest stem cells from peripheral blood. Peripheral stem cell harvesting involves the use of cytokines and anti-coagulants, which have implications for flying / controlling duties. The potential requirement for central venous access and reported side effects experienced by patients undergoing this procedure requires aircrew to be made unfit flying/controlling duties from the start of pre-treatment until a minimum of 7 days after harvest. Personnel are to be reviewed by an AvMO before returning to flying or controlling duty.
1.8	**All Other Organ/Tissue Donations**.	All other cases where Service personnel wish to donate organs or tissue are to be managed in accordance with the following general principles: a. The member concerned must inform their line manager that they wish to undertake this activity and that, as a result, they may require downgrading. The CO must be happy to support the person voluntarily becoming of limited military use. The timing of donation should not interfere with any planned military Operations.

		b. The member volunteering should be fully informed of all the associated risks. Detailed consent to undergo the procedure(s) will be undertaken by the harvesting clinician. A uniformed MO should undertake a 'check of understanding' to ensure that the member comprehends the general nature and magnitude of any associated medical risks. Where the member is unable to demonstrate understanding, the donation will not be medically supported. c. Where necessary the member will be downgraded in order to accommodate any physical limitations or risks generated by medication (e.g. clomiphene for egg donation) or by the procedure itself (e.g. laparotomy for kidney or liver donation). Where necessary a senior MO can be approached to provide advice on the specifics of any downgrading to be applied. The member volunteering are likely to be Z5 NZ only for a period of time as a result of the donation procedure.
2.	**HAEMOGLOBINOPATHIES**	
		Homozygous and double heterozygous conditions are incompatible with flying duties. Sickle cell trait is not a bar to flying duties, and screening is not to be carried out routinely. Other haemoglobinopathy traits are most unlikely to cause any significant clinical or haematological abnormality and personnel with such traits are likely to be fit for all duties including flying.
2.1	**Haemoglobin A2, F**	Normal variants, with minimal clinical effect; beneficial in beta-thalassaemia. Not considered a haemoglobinopathy. **Aircrew applicants:** Assess on case by case basis once recovered. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.2	**Benign haemoglobin-pathies:** **D, E, O-Arab**	**Additional information required:** Generally benign in isolation, may have a mild microcytic anaemia. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		No other haemoglobinopathy. Normal haemoglobin level (within laboratory provided reference ranges for gender). No iron deficiency or overload. No splenomegaly. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
2.3	**Thalassaemias**	Mainly found in people from malarious regions (Asia, Asia Minor).
2.3.1	**Thalassaemia major (homozygous: alpha, beta)**	Severe anaemia needing lifelong transfusions; osteoporosis; splenomegaly, thrombophilia. Not compatible with military life. Following stem cell transplantation. **Aircrew applicants:** Unfit.
2.3.2	**Thalassaemia minor/trait (heterozygous: alpha, beta)**	**Additional information required:** Heterozygous form produces mild or no anaemia but marked microcytosis on blood film. Requires specialist assessment. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.4	**Haemoglobin S**	Mainly found in people from malarious regions (Africa, Asia Minor).
2.4.1	**Sickle cell disease (homozygous)**	Severe anaemia, vascular occlusion, not compatible with military life. **Aircrew applicants:** Unfit.
2.4.2	**Sickle cell trait (heterozygous)**	Sickle cell trait is not a bar to flying duties and screening of aircrew should not be carried out routinely. Fitness for hypoxia training assessed on a case by case basis. **Aircrew applicants:** Assess on case by case basis. Screening for Hb S is only to be conducted when clinically indicated. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.5	**All other haemoglobin-pathies**	Including but not limited to combined haemoglobinopathies, Hb C, Hb Constant Spring, Hb Kenya, Hb Lepore, Hb M. All have altered oxygen-carrying capacity, reduced RBC flexibility and shorter RBC lifespan. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.	**HAEMORRHAGIC DISORDERS**	
3.1	**Haemophilia** Haemophilia A is Factor VIII deficiency.	**Aircrew applicants:** Unfit.

	Haemophilia B is Factor IX deficiency.	
3.2	**Deficiency of Factors II, V, X, XI, XIII**	Bleeding dyscrasia: very severe in operational setting, requires lifelong medical surveillance and specific treatment. **Aircrew applicants:** Unfit.
3.3	**Von Willebrand's disease**	Risk of spontaneous bleeding or bleeding after trauma which may cause exsanguination. Requires lifelong medical surveillance and specific treatment. **Aircrew applicants:** Unfit.
3.4	**Purpura or ecchymoses, excessive epistaxis**	Suggestive of underlying haematological disorder. **Additional information required:** Full haematological investigation. **Decision:** Maybe suitable with no haematological or associated medical problem. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.5	**Immune Thrombo-cytopenia**	**(Formerly, idiopathic or thrombotic thrombocytopenic purpura)**
3.5.1	Diagnosed at age 10 years or younger	If all the following criteria are met: Fully recovered within 6 months of diagnosis. 5. Normal platelet count. 6. Spleen present and functional. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Diagnosed after the age of 10 years	**Additional information required:** Specialist haematological review is required to assess risk of relapse

		If all the following criteria are met: 7. Remission was achieved spontaneously or with first-line treatment (steroids, IVIG). 8. Treatment ceased more than 3 years ago. 9. No underlying condition or sequelae of treatment. 10. Normal full blood examination/count, in particular platelet count. 11. Spleen present and functional. 12. Risk of relapse is considered low. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. **Management of Aircrew:** Symptomatic individuals must be Z5 NZ only, 'Unfit for service outside base areas' as a minimum, other limitations being awarded as clinical condition dictates. Asymptomatic individuals the grading will depend on their stable platelet count as follows; 13. 100-150x10^9/l – G3, 'Medical marker (no functional limitation) unrestricted. 6 monthly FBC checks. 14. 75-100x109/l - Initially Z5 NZ only 'Unfit for service outside base areas' but may be upgraded to G3 after no less than 6 months if platelet count remains stable. 15. Less than 75x109/l – Z5 NZ only, 'Unfit for service outside base areas'. A3, 'Unfit solo pilot - must fly with a pilot suitably qualified on type' 'Unfit solo (aircrew category to be specified in Med Docs)' where platelet count is 75-100x10^9/l., and A4 where platelet count is less than 75x10_9/l.
4.	**HYPERCOAGULABLE STATES**	
4.1	**Inherited hypercoagulable states**	Recurrent progressive thromboembolism in both venous and arterial systems may occur in the following conditions: 16. Antithrombin III deficiency.

		17. Deficiencies of Protein S (deficiency of Protein C is asymptomatic). 18. Fibrinolytic system deficiencies. 19. Dysfibrinogenaemia. 20. Resistance to Activated Protein C. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions.
4.1.1	**Von Leiden factor, Other conditions**	Known carrier, with family history, but with no episodes of thromboembolism. Congenital deficiency of coagulation inhibitors and activated protein C resistance are associated with an increased risk of thromboembolism who require intermittent or lifelong anticoagulation and are usually rejected at entry. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.2	**Warfarin or other Anticoagulant treatment**	Requires access to pharmacy; regular blood tests; access to doctor for change of medication based on blood test; regular specialist review. Risk of haemorrhage even with minor injury. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
5.	**MALIGNANCY** *See* Chapter 11 *Malignancy*	
6.	**SPLEEN**	
6.1	**Splenectomy or functional asplenia**	High risk of bacterial sepsis requiring urgent hospital treatment. Reduced response to bacterial immunisations; immunisation not available for many bacteria. Risk of overwhelming malaria: unable to serve in malarious or potentially malarious areas. Risk of other parasitic infections. **Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. May require role and deployment restrictions. Requires full immunisation cover and may require ongoing prophylactic medication. **Management of Aircrew:** In the absence of complicating factors, serving personnel who have undergone splenectomy are to be graded Z5 NZ only in the first instance. If they are otherwise fit in all respects with no evidence of recurrent disease, and/or abdominal sequelae, they can be considered for grading to no higher than Z4 Metropolitan areas only. Individuals should be encouraged to take long term antibacterial chemoprophylaxis and receive appropriate vaccinations. They are to be awarded the limitation 'Unfit to deploy, travel to or reside in malarious areas' and unscheduled stop-overs must be covered by appropriate malarial prophylaxis and advice. Those troubled by inter-current illness should remain Z5 NZ only. Personnel are to be assessed as permanently unfit for any duties involving dog handling. All personnel who have had a splenectomy or have reduced splenic function should have specialist advice on the requirement for prophylactic penicillin V or erythromycin for life. They should be vaccinated against Haemophilus influenzae, Meningococcus C (with Men C vaccine) and pneumococcus. Vaccination against meningococcus A, C and W135 is recommended only if travelling to endemic areas (sub-Saharan Africa, India and Nepal). Either Meningococcal A&C vaccine or quadrivalent A, C, Y and W135 vaccine is to be used in accordance with current advice for the area to be visited.
7.	**IRON OVERLOAD**	
7.1	**Haemochromatosis and other iron overload states**	Haemochromatosis is an autosomal recessive disorder. Most useful diagnostic tests for iron overload are serum iron, serum transferrin saturation and serum ferritin concentration.
7.2	**Heterozygote with normal iron stores and liver function tests.** Most C282Y heterozygotes (one mutation only) express minor or no abnormalities of iron metabolism but a few develop progressive iron overload and overt disease	**Additional information required:** Require a general practitioner (GP) assessment including the following: Gene assay (not required to be repeated if applicant can produce evidence of previous gene assay) and iron studies indicating normal iron stores and liver function tests in the normal range. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.3	**Homozygotes C282Y**	**Additional information required:** If normal iron stores and normal liver function tests, applicants are to be referred to haematologist or gastroenterologist for risk assessment on the likelihood of developing haemochromatosis. **Aircrew applicants:** Assess on case by case basis.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
7.4	**Haemochroma-tosis — family history in a first degree relative**	**Additional information required:** Require a GP assessment including the following: Gene assay (there is no requirement for the GP assessment and gene assay to be repeated if the applicant can produce previous reports). Current iron studies indicating normal iron stores and liver function tests in the normal range required. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Heterozygote/ homozygote for C282Y and other genotypes with iron overload	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
7.5	**Any other condition causing iron overload**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
8.	**OTHER**	
8.1	**G6PD deficiency**	Prevents use of Primaquine for malaria eradication. If an applicant produces copies of G6PD screening, the result is to be recorded in his/her medical records. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

Chapter 10: Infective States

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important infective states or disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important infections relating to aviation in the NZDF.

3. 3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Infective states

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**BACTERIAL**	
1.1	**Syphilis**	If not treated, can result in many complications including constitutional symptoms of fever and lymphadenopathy, dermatological, neurological. **Decision:** Maybe fit if cured with no complications.
	Treated	**Additional information required:** Assessment by a specialist in infectious diseases with confirmatory blood test, and a neuropsychiatric assessment if appropriate. **Aircrew applicants:** Assess on case by case basis once recovered. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If not treated, ongoing disease or treated but with persistent complications	**Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
1.2	**Tuberculosis**	*See* Chapter 15 *Respiratory System*
2.	**PARASITIC**	
2.1	**Chronic parasitic infection, including relapsing malaria**	Requires regular medication and specialist care. Unable to serve in malarious areas. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
2.1.1	**Malaria—single episode**	Treated (including where necessary with eradication therapy for Vivax) with no recurrence or complications.

		Aircrew applicants: Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.	**VIRAL**	
3.1	**Hepatitis A Virus (HAV)**	**Aircrew applicants:** Unfit.
	HAV in acute state	HAV is a self-limiting disease followed by full recovery and is acceptable once symptoms have ceased and enzymes .returned to normal. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Hepatitis B Virus (HBV)**	Causes a wide spectrum of liver disease and the virus infects everybody fluid (except stool).
	Confirmed hepatitis B surface antigen (HBsAg) positive	**Additional information required:** Must be assessed by haematologist or appropriate specialist, including appropriate serology/LFTS etc.
	Acute infection	**Decision:** Maybe suitable with no haematological or associated medical problem. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
	Persistence of HBsAg positivity chronic active infection	Persistent HBsAg has been associated with: a. Polyarteritis Nodosa; b. other collagen vascular diseases; c. membranous glomerulonephritis; and d. enzymes fluctuate or presence of HBe antigen. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	HBV carrier state	Enzymes not elevated for 12 month period post infection.

		Favourable specialist report and enrolled in hepatitis foundation for annual surveillance. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Reversion to HBsAg negative	Must be 12 months following seroconversion, WITH SPECIALIST REPORT confirming complete recovery and no evidence of any ongoing disease/complications. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2.1	**Management of Aircrew:** A diagnosis of chronic hepatitis is incompatible with continued flying duties until the situation has been fully assessed and stabilised. In those requiring no therapy, or who are well controlled on small doses of steroids (not greater than Prednisone 10 mgs per day) restricted flying in a multi-crew environment may be considered. Specialist advice would be required. Patients with acute hepatitis B are to be temporarily downgraded until there is clinical evidence of full recovery. Carriers of hepatitis B are to be referred to a Consultant Physician to determine their individual prognosis and management, and their infectivity to others. 'Low risk carriers' (HBsAg-positive, HBeAg-negative) will normally pose minimal hazard to others. 'High risk carriers' (HBsAg-positive, HBeAg-positive) will require counselling regarding sexual contacts and advice regarding procedures or incidents likely to involve blood-to-blood contact (e.g. dentistry, medical procedures and contact sports likely to involve blood spills such as boxing). The grading should reflect these considerations.	
3.3	**Hepatitis C Virus (HCV) Anti –HCV positive confirms past or current infection)**	Causes a wide spectrum of liver disease and is an infectious risk to others— therefore, not deployable. Additional information required: Consultation with infectious disease specialist or a gastroenterologist, preferably with an interest in hepatitis. May be considered for enlistment if complete recovery (no viral load on PCR testing for at least 12 months), normal LFTs and no ongoing complications. **Aircrew applicants:** Assess on case by case basis. Likely to be unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.4	**Hepatitis D Virus (HDV) Acute state**	Infection with HDV can occur simultaneously with HBV infection or as a super-infection in a chronic carrier of HBV.
	Fully recovered for 24 months	**Additional information required:** Consultation with infectious disease specialist or a gastroenterologist, preferably with an interest in hepatitis.

		Decision: Seroconversion must be associated with complete recovery and no evidence of any ongoing disease or complications. Otherwise unfit. **Aircrew applicants:** Assess on case by case basis. Likely to be unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If associated with HBV	Fulminant hepatitis is more likely to occur with superinfection, so that combined HBV and HDV infections have a worse prognosis than HBV or HDV alone. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.5	**Hepatitis E Virus (HEV) Acute stage**	Spread by faecal-oral contact. HEV is a self-limiting disease followed by full recovery and is acceptable after an interval of 24 months. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.6	**Hepatitis G**	Requires specialist care. May cause acute liver injury and chronic liver disease. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.7	**Human immune-deficiency virus infection**	Progressive immunological disorder. Requires highly specialised management and medication. Infectious risk to others, and therefore, not deployable. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.7.1	**Management of Aircrew:**	

	Individuals found to be HIV positive are to be temporarily graded Z5 NZ Only and withdrawn from flying or controlling duties for investigations and initiation of treatment under the supervision of a specialist. All individuals will be required to attend for regular follow up and most will be started on Highly Active Antiretroviral Therapy (HAART). Individuals should be unfit flying or controlling whilst initiating, modifying or discontinuing treatment for a period of at least 2 months. Once an individual's CD4 count is in the normal range and the viral load is maintained consistently below 50 copies per ml for 6 months they should be graded by a formal medical board. Aircrew and Controllers are to be assessed on a case-by-case basis. Individuals are not to be graded higher than Z4 Metropolitan areas only including the requirement for a pre-deployment health assessment. The medical board should also consider the side-effects of any medication and the requirement for regular monitoring. It is expected that HIV positive individuals will be restricted to 'Unfit solo pilot – must fly with a pilot qualified on type' or equivalent for other aircrew e.g. 'Fit to control only when another qualified controller is on duty and in close proximity'. The development of subtle neurocognitive symptoms leading to poor performance of complex tasks should be considered by the medical board and a baseline screening of neurocognitive function should be performed before the return to flying or controlling duties. Ongoing functional assessments in the form of routine flight/controlling proficiency tests should be sufficient to detect individuals whose performance has deteriorated; for whom further neurocognitive function should be considered. Additional screening for psychological and cardiovascular conditions may be required as appropriate.	
4.	**GENERAL**	
4.1	**Chronic fatigue syndrome (CFS), post-viral fatigue**	Problems with: a. CFS and post-viral fatigue. b. Fatigue and debility with post-exertional malaise. c. Mild cognitive dysfunction and impaired concentration. d. Sleep disorders. e. Arthralgias. f. Recurrent fever, myalgia, headache and pharyngitis. g. Multiple medical presentations.
	Full recovery with no symptoms for 3 or more years	**Additional information required:** May be acceptable if specialist reports confirm diagnosis and symptomatic status; and no increased risk of relapse. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

4.2	**Unexplained lethargy**	**Decision:** Requires full investigation for underlying cause. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.3	**Generalised Lymphadeno-pathy**	Depends on cause. May be due to serious underlying disorder not compatible with military service. **Decision:** Cause must be established. May be acceptable after recovery self-limiting (e.g. Epstein Barr Virus or cytomegalovirus) with full recovery and no ongoing complications. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.4	**Immune deficiency**	Increased risk of infection. Not compatible with military service. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require role and deployment restrictions.
4.5	**Dengue**	Previous Dengue need not exclude enlistment. However, the risk of Dengue haemorrhagic fever is significantly increased in those who have had Dengue fever. **Careful consideration should be given re deploying such personnel into endemic areas. Patient record should be annotated accordingly.** **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

Chapter 11: Malignancy

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with malignancy disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important conditions relating to aviation in the NZDF.

3. 3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU. Further guidance available in Ernsting's Aviation and Space Medicine, Chapter 28.

4. Specific problems: Malignancy

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**ACTIVE MALIGNANT CONDITIONS**	
1.1	**All current malignant conditions**	Require regular medical review and investigations to assess the risk of recurrence. Periodic review at tertiary specialist clinics which may also be required to provide treatment. Morbidity associated with interval chemotherapy and radiotherapy modalities. Possibility of surgical intervention. Unresponsiveness requiring palliative care measures. Overall prognosis both short- and long-term. The main clinical concerns are to ensure that Service patients continue to receive all appropriate investigations and follow-up necessary for their condition, and that their condition does not adversely affect their trade duties or operational role. There will generally be a period of restricted medical employment following successful treatment for a malignant condition during which clinical surveillance may be relatively frequent. Aircrew are to be managed in the same manner as other serving personnel. However, **Bleomycin** use leads to a permanent risk of increased sensitivity to oxygen, resulting in a fibrotic lung reaction. It is imperative that aircrew receive clinically appropriate care and this drug will still be used when indicated. Nevertheless, such aircrew will then be restricted from flying in aircraft when oxygen is used routinely. In addition, flying limitations are to be considered if there is any possibility of incapacitation. The advice of OC AMU is to be sought in all cases. **Aircrew applicants:** Aircrew applicants with current malignant conditions are unfit. The determination on suitability for aircrew training at a later date is to be determined in conjunction with OC AMU and made on a case by case basis.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis. On suspicion of a serious malignant disorder, pending investigation or when confirmed, all aircrew are to be grounded and made temporality unfit flying until after full recovery and once a prognosis and treatment plan has been confirmed. The restrictions must depend on the particular condition, the likelihood of recurrence, the potential for sudden deterioration and the frequency of specialist review required. Each case is to be judged on its own merits. All cases are to be medically boarded with advice from OC AMU. *Treatment Phase.* In the majority of cases during investigation and treatment, the patient is to be graded A4 G4 Z5, 'Unfit service outside base areas'. The rationale for this is to allow the patient to attend a NZ oncology centre. The limitation ' G4 Metropolitan areas only not exceeding 30 days' may be awarded in appropriate cases.
2.	**MALIGNANT CONDITION NOW IN REMISSION**	
	Frequent Surveillance Phase.	Once treatment has been completed and the patient is in remission a medical category is to be awarded which reflects the patient's condition, the likelihood of recurrence, frequency of specialist reviews, residual disability and trade duties. Whilst specialist review remains more frequently than every 6 months (i.e. more than twice a year) the patient may be awarded an grading of Z5 NZ only. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Infrequent Surveillance Phase.	When specialist reviews are every 6 months or less frequent and the patient remains free of recurrence upgrading to Z2/Z4 category may be possible. Normally this could be possible at 2 - 3 years from the end of treatment, however, in exceptional circumstances an earlier upgrade might be possible. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Additional Information	Occasionally, malignant conditions are diagnosed fortuitously at a very early stage when they are very small or localised, often during investigation for a minor non-malignant condition. Such 'coincidental' malignancies often have an extremely good prognosis and many of these patients could regain a full employment standard at an early stage. **Aircrew applicants:** Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.1	**Cervical cancer**	*See* Carcinoma in situ'.

		Aircrew applicants: Unfit. **Serving aircrew:** Serving aircrew can be considered are to be assessed on a case by case basis.
	Treatment completed	The prognosis for patients with cervical cancer is markedly affected by the extent of disease at the time of diagnosis. **Additional information required:** An appropriate specialist or oncologist report. **Aircrew applicants:** May be acceptable if: a. Stage 1. b. More than five years post-treatment. c. With no recurrence. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.2	**Testicular cancer** Two broad categories— seminoma and non-seminoma	Good prognosis depends on stage, absence of tumour markers, abdominal computed tomography scan free of masses and normal respiratory function tests. **Additional information required:** An appropriate specialist or oncologist report. **Aircrew applicants:** May be acceptable if: a. Stage I or II. b. More than five years since diagnosis. c. Normal tests as above. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Tumours with good International Germ Cell Cancer Collaborative Group (IGCCCG) prognosis are likely to return to unrestricted flying sooner. Those with infrequent follow up can potentially return to unrestricted flying after 2 years A3 as/with qualified co-pilot on type (or as applicable for aircrew role).
		Bilateral orchidectomy: **Aircrew applicants:** Unfit.

		Serving aircrew: Serving aircrew are to be assessed on a case by case basis.
2.3	**Leukaemia**	
	Adult leukaemia chronic and acute	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Childhood acute lymphocytic leukaemia with no recurrence	**Additional information required:** An appropriate specialist or oncologist report. **Aircrew applicants:** Acceptable only if: a. Condition responded rapidly to treatment. b. Treatment did not include cyclophosphamide. c. Treatment concluded more than five years ago. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.4	**Non-Hodgkin's lymphoma**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.5	**Hodgkin's disease**	Diagnosis and treatment in last five years. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
		Treatment with radiation therapy and/or chemotherapy and disease free off treatment for five years. Note: risk of toxicity related to treatment. Pulmonary and cardiac toxicity. Peripheral neuropathy. Second malignancies related to chemotherapy. **Aircrew applicants:** Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

2.6	**All other malignant conditions in remission**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
2.7	**Chemotherapy treatment**	Any applicant who has had a condition which necessitated the use of any therapeutic chemotherapy agent requires specialist assessment to determine if the condition is cured, and there are no residual side effects from drug treatment. **Aircrew applicants:** Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Applicants or aircrew who have been treated with Bleomycin are unfit due to the risk of respiratory failure with hyperbaric oxygen. Cardiology review will be required.
3.	**SKIN CANCER**	
		Service personnel must work outdoors at times for prolonged periods. Although sunscreens are provided, ultraviolet (UV) exposure generally, is greater than expected in most civilian employments. NZDF duty of care precludes it from exposing personnel to excessive UV and causing further skin cancers.
3.1	**Squamous Cell Carcinoma (SCC)**	SCC have definite metastatic potential and these patients should be re-examined every three months for the first several years and then followed indefinitely at six-monthly intervals. **Aircrew applicants:** Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Basal Cell Carcinoma (BCC)** Under treatment and within 6 months	BCC risk is related to sun exposure as a child and adolescent as well as cumulative UV exposure. Once one BCC has occurred there is a high risk of further BCCs. The three-year cumulative risk is estimated between 33 and 77 per cent. Risk is dependent on number of BCCs. Those with truncal BCCs appear to be at increased risk of developing further lesions. Also increased risk of developing other skin cancers such as SCCs and melanoma. Favourable outcome depends on prompt identification and excision/treatment. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	BCCs completely excised	Requires dermatologist report to confirm healing and no further lesions.

		Aircrew applicants: Case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.3	**Malignant Melanoma**	Prolonged operational exposure to sunlight in a tropical or sub-tropical environment may increase the risk of a second primary melanoma in a susceptible individual. Any history of malignant melanoma: **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. After recovery, anything other than T1 < or = to 1 mm and complete excision will require restrictions for a minimum of 8 years. Long term grounding most likely with nodal involvement.
4.	**MALIGNANT TUMOURS OF BONE AND SOFT TISSUE**	
4.1	**Any malignant tumour of bone and soft tissue** These include but are not limited to: • Osteosarcoma and variants • Chondro-sarcoma • Ewing's sarcoma • Fibrosarcoma • Malignant fibrous histiocytoma • Kaposi's sarcoma • Leiomyosarcoma • Multiple myeloma • Reticulum-cell sarcoma (non-Hodgkin's lymphoma); • Liposarcoma	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.2	**Metastatic bone disease**	**Aircrew applicants:** Unfit. **Serving aircrew:** Unfit.
4.3	**Synovial tumours of the knee**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

4.3.1	**Pigmented villonodular synovitis**	Whilst not malignant the only effective treatment is synovectomy. The recurrence rate is high unless excision is complete. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.3.2	**Synovial sarcoma or**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.33	**Other tumours of bone associated with primary or secondary tumours**	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.	**COLORECTAL CANCER**	
5.1		**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Number of years since completing treatment: a. Duke's A T1-2 – May be A1 on completion of treatment and full recovery and after 6/12 A3 as/with qualified co-pilot on type. b. Duke's B T3-4 – May be A1 on completion of treatment and full recovery and after 4 years A3 as/with qualified co-pilot on type **c.** Duke's C – May be A3 as/with qualified co-pilot on type on completion of treatment and full recovery.
6.	**BREAST CANCER**	
6.1		The most significant indicators of prognosis are tumour grade, stage as indicated by histological lymph node involvement, and tumour size. The Nottingham Prognostic Index (NPI) uses these factors to predict outcome on an individual basis. Scores are grouped as excellent. Good, moderate and poor. The requirement for long term medication may require additional restrictions depending on potential for medication related side effects. **Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. After recovery, anything other than Good or Excellent prognosis will require restrictions for a minimum of 10 years.

		Grounding (A4) for minimum 5 years for poor prognoses.

Chapter 12: Mental Health System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important mental health disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important mental health conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Mental health system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**MENTAL HEALTH**	
		Disturbances of mental state may be associated with an unacceptable impairment of judgement in the execution of safety critical tasks. All aircrew who develop significant disturbances of their mental state are to be awarded a temporary medical grade of A4 G4/5 Z4/5, with the limitations 'Unfit aircraft controlling duties', 'Unfit service outside base areas' and 'Unfit handling live arms' In cases which have been discussed with OC AMU, it may be possible to recommend temporary restrictions to the type of flying (for example, 'Unfit operational flying'. Aircrew should normally be assessed by an aviation aware psychiatrist. With the exception of Temazepam, authorised for hypnotic use during operational, exercise and route flying, aircrew are not fit for flying duties whilst taking any psychotropic medication, unless specifically cleared by OC AMU at medical board.
1.	**ANXIETY DISORDERS**	
	Anxiety Disorders	Anxiety disorders include generalised anxiety, specific phobias, agoraphobia, social phobia and panic disorder. Some anxiety problems associated with stressful circumstances may be more appropriately classified as adjustment disorder. Symptoms and signs can include palpitations, tremor, shortness of breath, chest pain, dizziness, fatigue, weakness, headaches and paraesthesia. In panic disorder there is a risk of sudden incapacitation. Serving aircrew that develop an anxiety disorder are to be managed on a case by case basis. Aircrew would normally be fit to return to flying in a limited capacity.
1.1	**Panic Disorder**	Any history or presence of panic disorder renders aircrew applicant unfit for aircrew.
1.2	**Agoraphobia**	Any history or presence of agoraphobia renders aircrew applicant unfit for aircrew.

1.3	**Specific Phobia**	Any history or presence of specific phobia may render applicant unfit for aircrew. To be assessed on individual basis.
1.3.1	**Flying Phobia**	Aircrew presenting with flying phobia require assessment by psychiatrists or psychologists with experience of treating this problem. Liaison with OC AMU is required. Flying phobia is a heterogeneous disorder and may be the presenting symptom of a number of conditions. Although not uncommon in the general population, flying phobia is rare in trained aircrew. During management, temporary restrictions to the type of flying, (for example, 'unfit operational flying', may be more appropriate than grounding. The final medical category will be dependent upon the underlying diagnosis, extent of recovery and the assessed risk of recurrence. See section 5.9.2 Loss of Confidence in Flying below.
1.4	**Social Phobia**	Any history or presence of social phobia renders aircrew applicant unfit for aircrew.
1.5	**Obsessive-Compulsive disorder (OCD)**	Any history or presence of OCD renders applicant unfit for aircrew. **Serving aircrew:** When a diagnosis of a serious OCD is made in a serving aircrew member it necessitates permanent grounding.
1.6	**Post-Traumatic Stress Disorder (PTSD)**	**Aircrew Applicants:** Any history or presence of PTSD renders aircrew applicant unfit for aircrew. **Serving aircrew:** Serving Aircrew who develop an acute stress reaction are to be treated by the principles of Proximity, Immediacy and expectancy (PIE) and are to be returned to flying status as soon as the acute reaction has subsided. Aircrew who develop PTSD are to be managed on a case by case basis. They need to be assessed and monitored very carefully to ensure that symptoms do not constitute a flight safety hazard. Once considered fit to return to limited flying, pilots with PTSD are to be graded A3, as or with Co-pilot qualified on type until the symptoms have subsided. A period of 6 months free of symptoms and off all medications is to be observed before restoration of a full A1 category is considered. See Chapter 12 *Mental Health System*, Section 6 *Post-Aviation Mishap or Incident*.
1.7	**Acute Stress Disorder (ASD)**	Any history or presence of ASD renders aircrew applicant unfit for aircrew. **Serving aircrew:** See Chapter 12 *Mental Health System*, Section 6 *Post-Aviation Mishap or Incident*.

1.8	**Generalised anxiety disorder (GAD)**	Any history or presence of GAD renders aircrew applicant unfit for aircrew.
1.9	**Substance Induced anxiety disorder**	Any history or presence of substance induced anxiety disorder renders aircrew applicant unfit for aircrew.
2.	**DEPRESSION**	
2.1	**Depression**	In general terms mild and self-limiting conditions are more likely to be compatible with future aviation related service. More severe and prolonged illness is likely to be recurrent in nature and thus affect an individual's ability to provide regular and consistent military service.
2.1.1	**Aircrew Applicants**	A single episode of low mood reported to the GP that requires no counselling or medication is acceptable for enlistment provided this has completely resolved and the applicant has been well for 1 year since recovery. A single episode of depression, that requires a short course of counselling (6 sessions) or a short course of antidepressant medication (less than 6 months) may be acceptable for review 2 years after the medications have been weaned and ceased. Favourable criteria would be where there is an identifiable exacerbating factor and this has now been removed. A single episode of depression that requires more prolonged counselling or antidepressant medication (in excess of 6 months) prior to weaning may be acceptable for review 3 years (depending on severity) after the medications have been weaned and ceased. Assessed on a case by case basis. More than 1 episode of depression requiring treatment is a bar to aircrew enlistment. Depression with an episode of significant attempt at self harm is a cause for rejection. Where first line antidepressants have been tried and failed this could indicate severe depression and careful consideration should be given to suitability for enlistment.
2.1.2	**Depression in aircrew**	Aircrew in a safety critical role require careful management. Expectations need to be addressed from the outset as long term restrictions may apply and these will have a significant impact on short term operational fitness and potentially on medium to long term career aspirations. Disturbances of mental state may be associated with an unacceptable impairment of judgement in the execution of safety critical tasks. Even mild cases may be associated with significant loss of concentration, inattention, indecisiveness, fatigue, insomnia and loss of motivation. An individual with an affective disorder (depressive illness or manic disorder) is at risk of self-harm or harm to others.

		Non controlling aircrew are subject to the same policy as pilots and observers; however there may be an opportunity for flexibility based on a case by case basis, their role and in consultation with OC AMU.
2.1.3	**Diagnosis**	Based on clinical assessment by DSM V criteria.
2.1.4	**Management**	**Referral.** All pilots/Observers with significant depression should be assessed by a Psychiatrist. **Treatment.** The following forms of treatment are accepted: a. Cognitive Behavioural Therapy (CBT). b. SSRIs: only Citalopram, Sertraline or Escitalopram **Grading:** Awarded a temporary A4 G4 Z5 until such time that symptoms have resolved. Minimum of 4 weeks. **Reviews:** All should be assessed by regular depression scoring with a validated depression scale, such as Hamilton Depression Scale, Hospital Anxiety and Depression scale, Beck Depression Inventory, Patient Health Questionnaire or Kessler. **Medication:** With the exception of Temazepam, authorised for hypnotic use during operational, exercises and route flying under specific direction, aircrew are not fit for flying duties whilst taking any psychotropic medication (including medication for treatment of non mental health disorders) other than those listed in para 2.1.4 above.

2.1.5	**Return to flying**	**Conditions**: a. All should have an occupational performance report from their line manager to confirm suitability to return to flying. b. Once assessments are clinically satisfactory and either treatment is complete without recurrence or they remain on maintenance SSRI therapy. c. When Pilots/Observers have had a satisfactory simulator check and/or check flight with a QFI/QHI. Other aircrew to have cat checks as appropriate. d. All should remain under medical supervision with at least monthly clinical reviews. **Grading**: a. **On medication.** No higher than A3 (unfit solo), G4 (unfit operational areas), Z4. b. **Change of dose or medication.** Unfit flying 1 month A4. c. **Cessation of medication**. Unfit flying 1 month A4. If remain well then 3-6 months no higher than A3 (unfit solo), G4 (unfit operational areas), Z4. d. **CBT only**. No higher than A3 (unfit solo), G4 (unfit operational areas), Z4. e. **Full flying with no restrictions.** When off all medication/CBT and well for 3-6 months after cessation of medication/CBT. Will have G3 marker for 12 months.
2.1.6	**Return to Operational Duties**	PMO JOHG policy directs that NZDF personnel diagnosed with a depressive illness or an anxiety disorder (including PTSD & Adjustment disorder) must be graded 445 (unfit to deploy) upon diagnosis. Aviation grading to be awarded in line with para 2.1.5 above. Normally personnel *not* commenced on medication, must be symptom free for a period of a minimum of 6 months before re-grading to a deployable status. Before personnel can be upgraded after commencing a medication, they must: a. remain symptom free for a period of 6 months following cessation of the medication; or b. be symptom free for a period of 12 months while remaining on a stable dose of the prescribed medication. Personnel remaining dependent on medications must be graded 432 (unfit operational deployment, dependent on medication).

		Operational deployment of these pers would depend on command application for a waiver and the pers individual risk assessed against the specific risk of the mission.
2.2	**Depression—if diagnosis vague, not substantiated or possibly incorrect**	**Additional information required:** Will be assessed on case by case basis in line with standards above.
2.3	**Dysthymic disorder**	People with dysthymia frequently have a superimposed major depressive disorder, and these patients are less likely to have a complete recovery. **Aircrew applicants:** Unfit aircrew enlistment.
2.4	**Bipolar Disorder**	**Any history or presence of bipolar disorder renders applicant unfit for aircrew.** **Serving Aircrew:** Aircrew who develop bipolar disorder are unfit flying. Medications used to treat bipolar disease are incompatible with flying.
2.5	**Cyclothymic disorder**	Cyclothymic Disorder is a chronic bipolar disorder, hence unfit aircrew entry.
2.6	**Mood disorder due to general medical condition**	Depends on underlying medical condition, management and whether in remission. See above in relation depression and below in reaction to adjustment reaction.
2.7	**Substance Induced Mood disorder**	**Any** history or presence of substance induced mood disorder renders applicant unfit for aircrew.
2.8	**Adjustment Reaction**	**Aircrew applicants:** Aircrew applicants with a short-lived adjustment reaction can be considered for aircrew training after being symptom free for 1 year, provided no medication has been required and satisfactory supporting medical and occupational reports are obtained. See above. **Serving aircrew:** Serving aircrew can be considered for a return to flying 6 months following recovery from a short-lived adjustment reaction. A 6 month period of A3, as or with co-pilot may be considered for pilots. Variance may be considered on discussion with OC AMU.
3	**PSYCHOSES**	
3.1	**Psychotic illness and delusional disorders**	This section includes: schizophrenia, schizoaffective, schizophreniform disorders. **Aircrew Applicants:** Any history or presence of psychotic illness renders applicant unfit for aircrew. **Serving Aircrew:** Serving aircrew who develop schizophrenia are unfit flying.
3.2	**Acute/Brief Psychotic Episode**	**Aircrew Applicants:** Aircrew applicants with a history of a psychotic illness or depression are not fit for aircrew training.

		Serving aircrew: Non pilot serving aircrew who develop a one off, short-lived episode with an obvious non recurring precipitant may be considered for a return to flying once they have been off all medications and remain symptom free for a period of 1 year, subject to specialist advice and favourable reports. Flying restrictions may apply on initial return to flying. Pilots who develop a one off, short-lived episode with an obvious non recurring precipitant may be considered for a return to flying once they have been off all medications and remain symptom free for a period of 1 year. A permanent grading of A3, as or with co-pilot qualified on type would be the maximum grading awarded.
3.3	**Psychotic disorder due to general medical condition**	**Aircrew Applicants:** Aircrew applicants with a history of a Psychotic disorder due to general medical condition are not fit for aircrew training.
3.4	**Substance induced psychotic disorder**	**Aircrew Applicants:** Aircrew applicants with a history of a Substance induced psychotic disorder are not fit for aircrew training.
4	**SUBSTANCE ABUSE**	
4.1	**Drug or alcohol dependency or non-medical use of drugs** (including neurotropic or psychotropic drug use)	Lack of concentration, self-discipline and drive are not compatible **with** military or aircrew training. Risk of injury to self and others; and risk of abusing medical system and pharmaceuticals available. Regular medical review required and may need hospitalisation and psychiatric treatment Alcoholism is a difficult condition to define, however, when alcohol interferes and degrades an individual 's, health, interpersonal relationships, efficiency at work, timekeeping, financial situation or social conduct, he/she has a problem with his/her alcohol intake. Alcohol abuse has a multifactorial aetiology and these factors can take much time and effort and support. In addition, aircrew who have been treated for alcohol abuse problems may relapse, therefore long term follow up and support is required. As alcohol abuse is an obvious flight safety hazard it has to be treated seriously and aggressively.
4.1.1	**History of dependency**	**Aircrew Applicant:** Any candidate with a history of drug or alcohol dependency is permanently unfit aircrew training. **Serving Aircrew:** The confirmed diagnosis of alcohol abuse by MO will require an immediate grounding while the degree of abuse is assessed. A medical category of A4G5Z5 R3 is appropriate. Persistent harmful use of alcohol is to be managed as below. **Management:** Liaison with OC AMU required. Specialist assessment is required by an approved alcohol and addiction disorders counsellor (clinical psychologist or psychiatrist). To include bloods: MCV, LFT(GGT), blood alcohol, and %CDT (for alcohol misuse) and hair analysis for cannabis, amphetamines, methamphetamines, cocaine, opiates and BDZs (for substance misuse) and alcohol questionnaire (e.g. Severity of Alcohol Dependence Questionnaire, The Alcohol Problems Questionnaire and Alcohol Use Disorders Identification Test (AUDIT).

		Within confines of medical confidentiality, Squadron Commanders must be made aware of the individual's problem and the treatment being offered, so that they are in a position to monitor progress and support the therapy. Once diagnosis of alcohol dependency or persistent harmful use of alcohol is made, grade to A4G5Z5. Commence treatment and document abstinence. Depending on the individual case and at the discretion of OC AMU, treatment and review may include in-patient treatment of some weeks followed by periodic specialist review, and blood/hair testing and buddy reports at each review. An alcohol education programme should be embarked upon and strict goals defined which need to be achieved before flying status is reinstated. The underlying predisposing factors should be explored and rectified if possible. Aircrew may also seek support from HIMS (website www.HIMS.co.nz) Minimum of 3 monthly Av MO review. If the individual refuses treatment or problems persist beyond the second review a permanent medical category of A4 G3 Z4/5 is to be awarded. **Return to Flying:** Aircrew should not return to flying duties until they can demonstrate that they have the ability to control their drinking, and that their physical state, including liver function tests, have returned to normal. In all cases a satisfactory report from their Line Manager or SQN CO is required. A fit assessment may be considered by OC AMU after a period of 18 months - 2 years documented sobriety or freedom from substance misuse. A fit assessment may be considered earlier (at 6-12 months) subject to satisfactory reports, in the case of persistent harmful drinking without dependency. A3 G4 Z5 - A multi-pilot (AWQCPOT/Class 1 OML) or With Safety Crew (WSC) limitation may be appropriate, NZ only, TRUMS (AvMO). **Monitoring:** Follow up may be required indefinitely in severe cases. If relapse occurs, a further period of grounding is required, pending further assessment/treatment. More than one episode or a single relapse is likely to be permanently disqualifying for military flying duties. A return to flying duties should be gradual. An A3 category, "unfit solo pilot" is appropriate with limitation to local flights within New Zealand initially. This can be relaxed at a later date when stability has been demonstrated. A full flying category may only be regained after a 3-year period free of alcohol problems (12-18 months may be possible for persistent harmful use and only if truly non-dependent).
4.1.2	**Any current medical problems such as cirrhosis**	**Aircrew Applicant:** Permanently unfit aircrew training.

	or depression	**Serving Aircrew:** Likely to be permanently unfit flying. Assess on case by case basis.
4.1.3	**Hazardous levels of alcohol use (as per ALAC criteria)**	**Aircrew Applicant:** Likely to be permanently unfit aircrew training. Consider Alcohol and Drug report to assess level, risk and any recommendations for treatment. **Serving Aircrew:** Aircrew will require immediate grounding while the degree of abuse or persistent harmful use of alcohol is assessed. With or without apparent clinical dependency or associated medical problems an Alcohol & Drug report is to be obtained to assess level, risk and any recommendations for treatment. See above – Alcohol dependency section.
4.1.4	**Currently on drug or alcohol rehabilitation treatment or programme**	**Aircrew Applicant:** Permanently unfit aircrew training.
4.1.5	**Completed drug rehabilitation treatment or programme**	**Aircrew Applicant:** Permanently unfit aircrew training.
4.1.6	**Previous failed drug rehabilitation programme**	**Aircrew Applicant:** Permanently unfit aircrew training.
4.1.7	**Conviction or offence related to driving under influence of alcohol or drugs (DUI)**	**Aircrew Applicant:** Likely to be permanently unfit flying. Assess on case by case basis. **Serving Aircrew:** Specialist assessment is required; by an approved alcohol and addiction disorders counsellor (clinical psychologist or psychiatrist). If no alcohol related medical disorder is confirmed or a diagnosis is uncertain (e.g. first drink driving conviction) fitness to fly may be maintained after discussion with OC AMU. NB One Drink Driving Conviction is associated with 10% risk of alcohol dependency.
4.1.8	**3rd Party Notification of alcohol misuse**	**Serving aircrew:** A 3rd party notification must be investigated – discussion with the individual / MO / GP and CO may help to verify. OC AMU to be informed. Aircrew should be reviewed by specialist if reasonable suspicion or allegation substantiated.
5	**OTHERS**	
5.1	**Self Harm and Suicide attempts**	**Aircrew Applicants:** An applicant with a single self/harm attempt, with no other psychological/psychiatric illness and an obvious precipitant may be considered no sooner than 3 years post event. Applicants with a history of more than one event are not fit for aircrew training **Serving aircrew:** Serving aircrew may be considered for a return to flying once the precipitating factor has been removed, there is no residual psychiatric / psychological problems and at least one year post incident. Pilots are to be graded A3, Fit as or with co-pilot qualified on type for a period of two years.

5.2	**Postpartum depression** as defined by DSM V	**Aircrew applicant:** Can be applied to any of the above disorders. Requires careful assessment. Likely to require minimum of 3 year deferral for aircrew enlistment. **Serving aircrew:** Manage on case by case basis, but in principle to be managed in line with guidance in section 2.1 above.
5.3	**Learning Disorders**	The term learning disorder is a non-specific term for numerous disorders of cognition in various combinations and levels of severity. Learning disorders may be associated with underlying abnormalities in cognitive function including deficits in attention, memory, linguistic and numeric processes. **Aircrew applicant:** Unfit aircrew selection.
5.4	**Attention deficit Spectrum Disorders**	There may be doubt over validity of original historic diagnosis. Careful assessment is required where doubt exists. Aircrew training is likely to be unsuitable.
5.4.1	**Attention deficit hyperactivity disorder (ADHD) and Attention deficit disorder (ADD) and disruptive behaviour disorders**	Inability to concentrate , carry out orders precisely and without question Risk of injury to self or others if exacerbation Occurs. Regular specialist review. Regular medication required. **Aircrew applicant:** Unfit aircrew selection.
5.4.2	**Previous history with no medication or symptoms for at least 2 years**	**Aircrew applicant:** If mild or disputed diagnosis then requires report from treating psychiatrist or paediatrician and recommendation from a clinical psychologist (a neuropsychological assessment must be sought from a specialist who deals with this disorder). Educational and employer reports required. An additional stand down period may be required. Assess on case by case basis.
5.4.3	**Normal functioning but dependent on continual medication**	**Aircrew applicant:** Unfit aircrew selection.
5.4.4	**Any history of oppositional defiant disorder or conduct disorder**	Any history of ADHD or ADD with disruptive behaviour disorders. **Aircrew applicant:** Generally unfit aircrew selection.
5.5	**Eating Disorders**	**Aircrew applicants:** Aircrew applicants with a history of a significant eating disorder are unfit for aircrew training. **Serving aircrew:** Serving aircrew who are diagnosed with an eating disorder will be managed on a case by case basis, initially being grounded for appropriate assessment and management.
5.6	**Sleepwalking**	**Aircrew applicants:** Commencing after or continuing beyond the age of 14 years – unfit aircrew selection.

5.7	**Trans-gender Dysphoria or reassignment**	**Aircrew applicants:** An applicant undergoing or contemplating gender reassignment. Does not meet NZDF medical enlistment criteria due to required level of ongoing medical support (including regular medication). **Serving aircrew:** Aircrew Individuals who present with Gender Dysphoria are to be awarded a medical category of A4 G3 Z4/5 with the limitations 'unfit flying', 'unfit handling live arms' 'unfit for service outside base areas'. The individual is to be referred for specialist support in accordance with Defence Health protocols. Liaison with OC AMU is required. The individual's subsequent medical category is to be managed flexibly in accordance with the developing clinical situation. Individuals who successfully complete the Sex Reassignment Surgery and are able to function on a day-to-day basis in the opposite sex role are to be awarded a medical category of G3 with no limitation, unless clinical condition or medication being taken may affect flight safety. Fitness for flying to be assessed in consultation with OC AMU.
5.8	**Personality Disorders**	**Aircrew applicants:** Aircrew applicants with a diagnosed personality disorder are unfit aircrew training. **Serving aircrew:** The diagnosis of a serious personality disorder is in a serving aircrew member necessitates permanent grounding.
5.9	**Stress**	MOs should be well aware that Service flying is a demanding and exacting occupation and inseparable from this is the fact that high levels of dedication and professionalism are demanded. This inevitably generates stresses, which, if added to the ever present stresses of day to day life, can become excessive. Some aircrew neither recognise stress within themselves nor understand how to cope with it. At annual aircrew medical the MO must always be on the alert for stress induced physical illness. In addition he should be alert to the indicators of unacceptable methods of coping with stress such as alcohol and drug abuse. If excessive stress or abnormal coping methods are suspected, the MO should sympathetically enquire into the aircrew member's potential stressors and advise on other methods of coping with stress. This may require referral to an appropriately trained psychologist.
5.9.1	**Deterioration in Flying Performance**	**Occasionally** MOs may be called upon to provide an opinion regarding medical or psychological factors which could have caused a reduction in an individual's flying performance. A full medical examination is mandatory to exclude physical causes and in addition, the aircrew member should be referred to OC AMU for his/her opinion and recommendation on the provision of a psychological opinion. Many correctable causes for deterioration in performance can be identified and thereby avoid the loss of an experienced aircrew member. An occupational report from the individual's Line Manager or OC, is required.

5.9.2	**Loss of Confidence in Flying**	Aircrew who have lost their confidence in flying may either self refer to the MO, or be referred by their Squadron Commanding Officer. Often aircrew will not openly approach the MO advising that they have an issue of loss of confidence in flying but may present regularly with medical conditions that necessitate their temporary removal from flying. The MO need to be alert to the fact that the underlying cause for this pattern of behaviour may be a loss of confidence in flying. An occupational report from the individual's Line Manager or OC, is required. The MO is to ensure that sufficient time is allocated to explore, in a sympathetic manner, all possible avenues to establish any physical, psychological, or social aetiological factors which could have precipitated the loss of confidence. The MO has many ways of collecting and collating medical, professional and personal information the aircrew member which may be of value in formulating a diagnosis, treatment and support of his problem. In addition, the MO has many supporting agencies to call upon to support the aircrew member during this difficult time. These agencies include the Padre, Aviation Psychologist, Civilian Psychologist, Psychiatrist and other medical specialists. Following the medical evaluation which would normally include evaluation by OC AMU, a medical recommendation is to be made as to the disposal of the aircrew member which could be either: a. Fit to return to flying b. Excused flying duties for a given period, and c. Excused flying duties permanently. The aircrew member's medical grade is to be adjusted accordingly. The opinion is to be conveyed in writing to the aircrew member's Squadron Commanding Officer for their further action. Discussion and close liaison with the Squadron Commanding Officer throughout the period of the medical assessment is vital and in the best interests of the aircrew member concerned. However, as always this requires the aircrew member's consent.
6	**POST AVIATION MISHAP OR INCIDENT**	
6.1	**Psychological Impact of Aviation Mishaps or Incidents**	MOs are to be alert to the possible psychological sequelae for those involved in any incident. The MO is to take a psychological history from anyone who has been involved in an aircraft accident, whether an ejectee or not, prior to his return to duty. MOs should note that personnel from the emergency services and crash recovery teams are also at risk of developing difficulties and may require medical assistance and advice. Social pressures may prevent individuals admitting to stress related problems; in particular, peer group pressure amongst aircrew is a powerful influence affecting the way they appear to respond following an accident. Consequently, it is preferable for the MO, who should maintain a high index of suspicion, to be known to the individual. The use of the 'Impact of Event Scale' allows some degree of quantification of post-incident psychiatric morbidity and its inclusion in the medical record is also of

		medico-legal benefit. A score of 15 or more should prompt referral for psychiatric evaluation. When there is any doubt about the individual's response to the accident, the MO is to discuss the case with a consultant in psychiatry, who has experience in managing aviators and / or military personnel. MOs are to take every opportunity to educate aircrew and the unit executive about the implications of stress related conditions, their normality, and the importance of handling them correctly. In particular, the executive and supervisors should be made aware of their role in the management of personnel following an accident. Prolonged follow-up of those involved in an aircraft accident may be necessary, particularly from a psychological standpoint. In the first instance this follow-up is the responsibility of the MO who may seek further specialist advice if this is clinically indicated. Following clearance by the appropriate specialists, all individuals are to be seen by their unit MO for an assessment of their fitness to return to work or flying. The MO is to satisfy him or herself that the individual is fully fit for all aspects of their job. Any doubts about fitness should be discussed with OC AMU and appropriate specialists. For the first year following return to work, individuals are to be reviewed at least six monthly to confirm continuing fitness. Thereafter, if review is necessary, aircrew can be monitored at their periodic medical examination. To prevent loss of surveillance on posting, the losing MO is to notify the gaining MO of individuals who have been involved in a significant aircraft mishap or accident.
7	**PSYCHOACTIVE MEDICATION**	
7.1	**Use of antidepressant medication for smoking cessation**	**Nortriptyline** and Bupropion can be used for smoking cessation. Wherever possible, clinicians are encouraged to manage smoking cessation using NRT and lower level support services which do not interfere significantly with employability. The initiation of smoking cessation should ideally be undertaken when aircrew are in a stable environment where support is available. Furthermore this would usefully be at a time away from flying duties, ideally over a minimum of 3 months.
7.1.1	**Use of Bupropion**	**Bupropion (Zyban)**. The drug Bupropion is of proven effectiveness but has significant side effects, which include grand mal seizures, impaired concentration, anxiety, depression and agitation. It is not recommended as a first line treatment in the NZDF due to its occupational implications and its adverse effects profile. Due to the psycho-active nature of Bupropion and its side-effects, the use of the drug precludes any flying duties.

		In view of the significant occupational implications when taking Bupropion, Service personnel using the drug are unfit to deploy operationally and are to be awarded a temporary medical category A4 G4 Z4, 'unfit for service outside base areas' and 'unfit handling live arms'. Aircrew are to be advised to consider deferring treatment with Bupropion until they are on a non-flying tour. Although there is no standard requirement to amend the Z category, it should be noted that malaria prophylaxis is not to be taken with Bupropion. Where aircrew have received a course of treatment with Bupropion they may be upgraded and returned to flying duties no earlier than 2 weeks after ceasing the treatment. Return to flying is subject to a satisfactory medical examination conducted by an Av MO. If neurological or neuropsychiatric side-effects have been experienced whilst taking Bupropion, return to flying is dependent on the results of a medical assessment undertaken by an Av MO and following discussion with OC AMU. Return to flying after suffering a grand mal seizure, as a result of taking Bupropion, is at the discretion of the OC AMU who is to seek the opinion of a Consultant in Neurology.
7.1.2	**Use of Varenicline (Champix)**	Varenicline's side-effects include suicidal ideation and behaviours. Varenicline is not to be prescribed to aircrew at any juncture, whether currently engaged in flying / aircraft controlling duties or not In the event that this medication has been incorrectly prescribed it must be immediately tapered and withdrawn. A further 3 month period of grounding/non-controlling duties is required once the medication has been stopped and all aircrew should be reviewed by an Av MO and following discussion with OC AMU before resuming normal duties.
7.1.3	**Use of Nortriptyline (and other antidepressant medication) for smoking cessation or neuropathic pain**	**Due** to the requirement for increasing daily divided doses over the course of treatment with a psychoactive substance with known side effects, especially sedation, aircrew are to be grounded whilst receiving nortriptyline for smoking cessation. Use of nortriptyline, even in low doses for neuropathic pain, is not compatible with safety critical flying duties.
7.2	**Medication to enhance performance (Fatigue Risk management)**	The RNZAF utilises a tiered hierarchical approach to the management of fatigue and enhancement of performance on flying operations. The foundation starts with the setting of appropriate rostering and planning of work/rest/sleep cycles. Management controls provide the next level of oversight. Individual management though implementation of personalised plans, developed and supported by AMU or DHMC trained staff, can be augmented by the controlled use of sleep aids and stimulants. Only a limited number of medications are approved and these must be carefully managed and overseen by an AvMO. Refer to stand alone policy covering Temazepam, Zopiclone and Caffeine.

Chapter 13: Musculoskeletal System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important musculoskeletal disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important musculoskeletal conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

Specific problems: Musculoskeletal system

a. Orthopaedics

b. Rheumatology

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**GENERAL ORTHOPAEDICS**	
1.1	**Osteomyelitis**	
	Acute	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Will require temporary grounding until full resolution.
	Chronic	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** May require permanent grounding.
1.2	**Tuberculosis—spinal**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** May require permanent grounding.
1.3	**Osteoarthritis, including post-traumatic**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restriction from ejection seat aircraft**.**
1.4	**Chronic inflammatory joint and soft tissue disorders e.g. list conditions**	Unrestricted flying may be possible when there is no disability provided that maintenance therapy is compatible with aircrew duties. Particular attention is directed at assessment of the cervical spine and it may be necessary to avoid ejection seat aircraft. Successful management requires prompt diagnosis and early treatment with disease modifying drugs.

		Aircrew applicant: General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions in ejection seat, RW aircraft and NVG operations. Unrestricted flying/solo controlling is occasionally possible in mild 'undifferentiated' disease after assessment by a consultant in Rheumatology and OC AMU.
		Treatment: Hazardous duty, including flying / solo controlling should be suspended for 7 days following first exposure to each NSAID prescribed. Dehydration should be avoided whilst taking NSAIDs because the renal response to dehydration/hypovolaemia is impaired. Disease modifying anti-rheumatic drugs: (DMARDs) include Sulphasalazine, Methotrexate, Leflunomide, Cyclosporin, Azathioprine and Gold. All of these drugs have potentially serious side effects and therefore require regular monitoring and downgrading to 'Unfit for service outside base areas'. For most drugs this will apply throughout the period of treatment. In the case of Sulphasalazine, routine monitoring may be stopped after 12 months and if disease control is satisfactory then less restrictive geographical category might be considered, after consultation with a consultant in Rheumatology. None of the drugs require permanent withdrawal from flying duties but because of the risk of early toxic side effects and slow onset of action, flying duties should be suspended for the first 2 months and only reinstated following confirmation of fitness to fly by OC AMU. Hydroxychloroquine is less toxic (if less effective) and requires 28 days cessation of flying unfit solo controlling and the limitation 'unfit for service outside base areas'. Aircrew taking Hydroxychloroquine are to have annual ophthalmic screening whilst on treatment. Steroids prescribed in low dose (10 mgs or less daily) as maintenance therapy may be compatible with a limited flying category ('Unfit solo pilot - must fly with a pilot suitably qualified on type') or close proximity controlling ('Fit to control only when another controller is on duty and in close proximity') on the recommendation of a consultant in Rheumatology and following OC AMU advice. Higher doses are incompatible with hazardous duties (including aircrew duties / solo controlling) because of the many adverse effects, particularly neuro-psychiatric, and blunting of the normal stress response. Anti-TNF therapy may be considered as single or combined (with other DMARDS) therapy for patients intolerant of or with unsatisfactory response to standard DMARDS. Patients started on anti-TNF therapy should be temporarily downgraded NZ only with the potential to be upgraded (Z4 or base areas only) after 12 months, subject to satisfactory Rheumatology and AvMed opinions. Monitoring of patients on DMARDS and anti-TNF therapy should be in accordance with published best practice guidelines.
1.4.1	**Reactive Arthritis**	Reactive arthritis: Unrestricted flying / solo controlling is possible in most cases following resolution of the initial episode. Extra-articular lesions such as inflammatory eye disease are of particular importance and should prompt

		immediate specialist referral as appropriate. HLA-B27 positive patients are at a greater risk of developing spondylitis which is usually mild but may be significant enough to affect the flying category**.**
1.4.2	**SLE**	An unlimited flying/solo controlling category may be possible if the disease is mild and restricted to the skin (with no photosensitivity) and the musculoskeletal system. Moderate to severe disease, especially when there is major internal involvement is incompatible with a flying category and may have implications for solo controlling.

1.5	**Juvenile chronic arthritis**	**Aircrew applicant:** General recruit entry standards apply – unfit.
1.6	**Gout**	Refer to Chapter 5 *Endocrine and Metabolic Systems*. **Aircrew applicant:** General recruit entry standards apply – unfit. In exceptions waivers maybe applied for lateral recruits. **Serving aircrew:** Managed on a case by case basis depending on function. Normally aircrew are to be grounded for the first 4 weeks of anti-hyperuricaemic treatment. Unrestricted flying / controlling is permitted after appropriate treatment has been instituted and symptoms have settled.
1.7	**Ankylosing spondylitis**	**Serving aircrew:** If there is significant axial or peripheral stiffness an in-cockpit functional assessment will be required. Functional assessment will need to be repeated at intervals to ensure disease progression does not compromise the aircrew member's fitness to operate the aircraft safely. **Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. An unrestricted flying category can be retained where there is good spinal mobility. Persistent symptoms (especially whilst flying) may require a specific aircraft type limitation. Irreversible loss of cervical mobility, spinal osteoporosis or spondylitic cervical x-ray changes are incompatible with ejection seat aircraft and may be render the aircrew member unfit to fly aircraft with parachute escape systems**.**
1.8	**Marfan's syndrome—** **associated with scoliosis,** **spondylolisthesis, slipped** **epiphysis and other** **systems' disorders**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions.
1.9	**Ehlers-Danlos** **Syndrome skin laxity, joint hypermobility, vascular fragility**	**Aircrew applicant:** General recruit entry standards apply – unfit.
1.10	**Osteogenesis imperfecta**	**Aircrew applicant:** General recruit entry standards apply – unfit.
1.11	**General laxity, indicating** **a hypermobility syndrome**	**Aircrew applicant:** General recruit entry standards apply – unfit.
1.12	**Muscle wasting**	**Aircrew applicant:** General recruit entry standards apply – unfit.

1.13	**Muscular dystrophy**	**Aircrew applicant:** General recruit entry standards apply – unfit.
1.14	**Peripheral neuropathy from trauma/injury**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions.
1.15	**Chronic pain. Includes: Neuropathic pain, Complex Regional pain syndrome, Psychogenic pain syndromes and all other presentations involving chronic pain**	Refer Chapter 14 *Neurological System*. **Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions.
1.16	**Spinal cord lesions**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** May require permanent grounding.
1.17	**Spina bifida**	**Aircrew applicant:** General recruit entry standards apply – likely to be unfit pilot and Rotary Wing aircraft. If asymptomatic with no functional impairment, no more than one vertebra involved, no dimpling of the skin, no history of surgical repair, and no additional risk likely as a consequence of military training then maybe fit for other aircrew roles.
1.18	**Tumours of bone**	Refer to Chapter 11 *Malignancy*.
1.18.1	**Malignancy of bone**	Refer to Chapter 11 *Malignancy*.
1.18.2.1	**Osteoid osteoma**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions.
1.18.2.2	**Simple bone cyst**	
1.18.2.3	**Other non-malignant tumours of soft tissue and bone**	
1.19	**Raynaud's Disease / Phenomena**	**Aircrew applicant:** General recruit entry standards apply – likely to be unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent restrictions.

		Primary Raynaud's phenomenon is compatible with an unrestricted category provided that symptoms are well controlled. A requirement to avoid cold conditions may limit deployability. Secondary Raynaud's phenomenon is often associated with severe underlying disease and limitations almost always apply, dependent upon the severity of the vasospasm and the underlying disorder.
2.	**INJURIES TO A BONE OR JOINT**	
2.1	**Amputations**	
2.1.1	**Amputation of major limb**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on residual function. May require permanent restrictions**.**
2.2	**Joint replacement— any joint**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on residual function. May require permanent restrictions.
2.3	**Joint instability, dislocations and subluxations**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on residual function. May require permanent grounding or restrictions.
2.3.1	**Minor dislocations, e.g. fingers or toes**	**Aircrew applicant:** General recruit entry standards apply – fit if full resolution and no increased risk of recurrence. **Serving aircrew:** Will require temporary grounding until full functional recovery.
2.3.2	**Dislocations or subluxations of major joints including:** • **hip** • **knee** • **ankle** • **foot** • **wrist** • **elbow**	**See below for individual sections.** **Aircrew applicant:** General recruit entry standards apply – likely to be unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit / Sim assessment / check flight required to confirm full function**.**
3.	**FUNCTIONAL ASSESSMENT, SYMPTOMS AND SIGNS**	
3.1	Back **pain or neck pain**	Any history of back pain or neck pain, specialist report required. High risk of deterioration or loss of function under Service conditions. Aircrew candidates with a single episode of low back pain, defined for these purposes, as a pain lasting no longer than 6 weeks, within the last 5 years may

		be acceptable provided that the candidate has remained symptom free for at least one year. **Aircrew applicant:** General recruit entry standards apply – fit if single episode with full recovery. **Serving aircrew:** Will require temporary grounding until full functional recovery. Follow aircrew neck and back pain prevention / rehabilitation program. Functional cockpit/Sim assessment/check flight required to confirm full function.
	The aetiology of neck pain may vary between FW (high performance) and rotary, front and rear aircrew. Persistent and/or distracting symptoms necessitate grounding. Head-borne mass, ergonomics, aircrew behaviour patterns and high +Gz manoeuvres may have a role in the development of neck pain and mitigation of the effect of these should be sought. As a preventative strategy, aircrew should be encouraged to participate in the Aircrew Conditioning Programme which is designed to enhance aircrew performance through reducing fatigue and strain injuries. It involves specialist instruction in exercises to engender a culture of career-long neck and upper quadrant maintenance, to maintain a neutral cervical spine position under load, and to reduce compensation strategies during loading. FW (high performance) and rotary aircrew presenting with neck pain should be managed according to a personalised rehabilitation programme. Asymptomatic radiologically identified cervical spondylosis is compatible with unrestricted flying. However, limitation of cervical movement may affect lookout and a cockpit check is recommended.	
3.2	**Sciatica—true (nerve root pressure)**	Specialist assessment (neuro or spinal) and magnetic resonance imaging (MRI). **Aircrew applicant:** General recruit entry standards apply – may be fit if single episode with full recovery for non pilot and non-Rotary Wing roles. Chronic or recurrent will be unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit / Sim assessment / check flight required to confirm full function.
3.3	**Chronic back pain syndrome**	Candidates with a history of recurrent low back pain or with a history of sciatica or any spinal surgery are considered unfit for aircrew. **Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft.
4.	**CONDITIONS OF THE HEAD AND NECK**	
4.1	**Mandibular or skull fixators in situ**	**Aircrew applicant:** General recruit entry standards apply – consider on case by case basis. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft.

4.2	**Cervical disc prolapse**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. Functional cockpit / Sim assessment / check flight required to confirm full function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft.
4.3	**Cervical spondylosis - Osteoarthritis of cervical spine causing neck pain**	**Aircrew applicant:** General recruit entry standards apply –unfit. **Serving aircrew:** Managed on a case by case basis depending on function. May require permanent grounding or restrictions in ejection seat and Rotary Wing aircraft and NVG operations.
5.	**CONDITIONS OF THE SPINE**	
5.1	**Spinal deformities**	**Aircrew applicant:** General recruit entry standards apply – likely to be unfit. Orthopaedic surgeon opinion with radiology to confirm diagnosis.
5.2	**Scoliosis**	
5.3	**Thoracic kyphosis**	
5.3.1	**Postural kyphosis**	
5.3.2	**Structural kyphosis**	
5.3.3	**Congenital kyphosis**	
5.3.4	**Adolescent kyphosis (Scheuermann's disease)**	
5.4	**Lumbar lordosis**	**Aircrew applicant:** General recruit entry standards apply.
5.5	**Spondylolis-thesis**	Mild backache associated with spondylolysis and non-progressive spondylolisthesis may benefit from an individually moulded lumbar support. If symptoms persist aircrew should be grounded and assessed by a consultant orthopaedic surgeon. Asymptomatic Grade 1 spondylolisthesis is compatible with flying ejection seat aircraft. Aircrew with persistent neck pain and neurological features should be grounded pending resolution of their symptoms. Aircrew with recurrent symptoms are unfit ejection seat aircraft and may require protection from high Gz manoeuvres, wearing aircrew helmets and NVG flying depending on the frequency and
5.6	**Retrolisthesis**	
5.7	**Spondylosis**	
5.8	**Prolapse (herniation, rupture or protrusion) of intervertebral disc**	

	with or without nerve root compression	severity of their symptoms. Asymptomatic cervical spondylosis identified radiologically is compatible with unrestricted flying.
5.9	**Bulging of intervertebral disc**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft. Aircrew may require permanent limitations or restrictions for NVG use.
5.10	**Neural stenosis. Spinal or root canal narrowing due to degenerative disease or any other cause**	
5.11	**Spinal surgery**— any history	If **single** level spinal fusion is required, aircrew are to be grounded for 6 months, following which a return to unrestricted flying (including ejection seat aircraft) is be possible following careful assessment. The results of multi-level fusions or a second fusions are not as good and ejection seat and RW clearance is not normally permitted. **Aircrew applicant:** General recruit entry standards apply – unfit. Manage on a case by case basis for lateral recruits. **Serving aircrew:** Managed on a case by case basis depending on symptoms and function. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent grounding or restrictions in ejection seat and Rotary Wing aircraft and NVG operations.
5.12	**Harrington rods or similar fixation devices**	**Aircrew applicant** General recruit entry standards apply – unfit
6.	**INJURIES AND CONDITIONS OF THE PELVIS**	
6.1	**Congenital dislocation of the hip**	**Aircrew applicant:** General recruit entry standards apply – unfit.
6.2	**Perthes' disease**	**Aircrew applicant:** General recruit entry standards apply – unfit.
6.3	**Slipped femoral or capital epiphysis of the hip**	**Aircrew applicant:** General recruit entry standards apply.
6.4	**Traumatic dislocation of the hip**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft.

6.5	**Surgery to the hip or pelvis**	Resurfacing of the hip joint or large-headed, non-cemented THR. Aircrew who have had these procedures may be fit to return to full flying duties, including ejection seat aircraft and Rotary Wing, no sooner than 6 months post surgery if they have experienced no fractures or pain, have returned to full physical activity and have completed a satisfactory cockpit check including emergency egress. Traditional THR with a cemented cup or stem is incompatible with flying ejection seat aircraft due to the risk of dislocation from windblast on ejection and fracture of the cement mantle on landing. Aircrew who have had a THR with a ceramic head or ceramic cup are to be treated similarly to the traditional THR group. Aircrew may be able to return to other aircraft types post traditional THR, or ceramic cup/head THR, if they have passed a full cockpit check including emergency egress drills and functional assessment. Aircrew with revision of THR are unfit ejection seat aircraft. Those who have had a revision of resurfacing to THR should be considered on a case by case basis. **Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Managed on a case by case basis depending on function. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent grounding or restriction from ejection seat and Rotary Wing aircraft.
7.	**INJURIES AND CONDITIONS OF THE LOWER EXTREMITIES**	
7.1	**Feet and ankles**	
7.1.1	**Pes Cavus**	**Aircrew applicant:** General recruit entry standards apply**.**
7.1.2	**Pes Planus**	**Aircrew applicant:** General recruit entry standards apply**.**
7.1.3	**Claw foot and Talipes**	**Aircrew applicant:** General recruit entry standards apply.
7.1.4	**Hallux Rigidus**	**Aircrew applicant:** General recruit entry standards apply.
7.1.5	**Hallux Valgus**	**Aircrew applicant:** General recruit entry standards apply.
7.1.6	**Ingrown toe nails**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery.
7.1.7	**Complete or partial loss of toes other than great toe**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function.
7.1.8	**Complete or partial loss of great toe**	**Aircrew applicant:** General recruit entry standards apply – unfit.

		Serving aircrew: Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function.
7.1.9	**Hammer toes or other deformities of the toes**	**Aircrew applicant:** General recruit entry standards apply.
7.1.10	**Orthotics**	**Aircrew applicant: G**eneral recruit entry standards apply.
7.1.11	**Plantar Fasciitis**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery.
7.1.12	**Heel spur syndrome or any other calcaneal bone or soft tissue lesion causing pain**	**Aircrew applicant:** General recruit entry standards apply – likely to be unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. May require permanent restrictions**.**
7.1.13	**Achilles Tendonitis**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function.
7.1.14	**Ruptured Achilles Tendon**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function**.**
7.1.15	**Neuroma**	**Aircrew applicant:** General recruit entry standards apply – likely to be unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. May require permanent restrictions**.**
7.1.16	**Ankle instability due to sprains**	**Aircrew applicant:** General recruit entry standards apply – unfit if recurrent. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.1.17	**Reconstructive surgery to the ankle**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery.

		Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.2	**Knees**	
7.2.1	**Anterior knee pain** **General causes of anterior knee pain**	Aircrew **applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.2.2	**Osteochondritis dissecans**	**Aircrew applicant:** General recruit entry standards apply - unfit.
7.2.3	**Pulling osteochondritis (traction apophysitis)** **Osgood-Schlatter's Disease — (Apophysitis of the tibial tuberosity), and Sever's Disease (apophysitis of the calcaneal apophysis)**	Requires specialist assessment and X-ray if symptoms within previous 12 months. **Aircrew applicant:** General recruit entry standards apply.
7.2.4	**Crushing osteochondritis Such as: Freiberg's disease of the metatarsal** **Köhler's disease of the navicular** **Keinböck's disease of the carpal lunate** **Panner's disease of the capitulum**	Requires specialist assessment and X-ray. **Aircrew applicant:** General recruit entry standards apply.
7.2.5	**Dislocation of the patella**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions. Aircrew should be grounded if the knee is unstable or prone to locking pending specialist investigation and treatment**.**
7.2.6	**Meniscal surgery**	
7.2.7	**Anterior Cruciate**	**Aircrew applicant:** General recruit entry standards apply – unfit.

	Ligament (ACL) tear — untreated	**Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.2.8	**Posterior Cruciate Ligament (PCL) tear — untreated**	Aircrew should be grounded if the knee is unstable or prone to locking pending specialist investigation and treatment. Knee Replacement Surgery. Knee replacement is incompatible with flying ejection seat aircraft due to the risk of dislocation but aircrew may return to other aircraft types, including helicopters, if they pass a full cockpit check including emergency egress drills and functional assessment. **Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.2.9	**Reconstructive surgery to the knee (including arthroscopic repair of ACL or PCL)**	
7.2.10	**Combined injuries of the knee involving some or all key structures of the knee including cruciate ligaments, collateral ligaments menisci and cartilage**	
7.3	**Lower Limb Conditions General**	Other joint replacement surgery. Fitness to fly after other joint replacements may be considered if the results of surgery are excellent and subject to assessment by a Service orthopaedic surgeon and OC AMU.
7.3.1	**Shin pain other than a proven stress fracture.**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions.
7.3.2	**Compartment syndrome**	
7.3.3	**Stress fractures**	
7.3.4	**Leg length inequality**	**Aircrew applicant:** General recruit entry standards apply.
8.	**CONDITIONS OF THE UPPER EXTREMITIES**	
8.1	**Wrist**	
8.1.1	**Carpal Tunnel Syndrome**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions if recurrent.
8.2	**Hands**	

8.2.1	**Dupuytren's contractures**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional assessment. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions if recurrent.
8.2.2	**Contractures associated with trauma**	
8.2.3	**Complete or partial loss of fingers**	
8.2.4	**Deformities of fingers including Mallett Finger, Swan-Neck Deformity, Boutonniere deformity and erosive osteoarthritis**	
8.2.5	**Scarring of the fingers**	
8.2.6	**Absent thumb including absent distal phalanx**	
8.3	**Shoulder**	
8.3.1	**Rotator Cuff Syndrome**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions if recurrent.
8.3.2	**Impingement syndrome/ supraspinatus tendonitis**	
8.3.3	**Rupture or tear of the rotator cuff**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. May require permanent restrictions if recurrent.
8.3.4	**Calcific tendonitis**	
8.3.5	**Biceps tendonitis**	
8.3.6	**Adhesive capsulitis (frozen shoulder)**	
8.3.7	**Shoulder instability and dislocation (includes recurrent subluxations & possible dislocations)**	**Aircrew applicant:** General recruit entry standards apply – unfit. **Serving aircrew: Will require temporary grounding until full functional recovery.** Functional cockpit/Sim assessment/check flight required to confirm full function. Likely to require permanent grounding/restrictions if recurrent**.**
8.7.7.1	**Shoulder instability without reconstruction**	
8.3.7.2	**Anterior dislocation or subluxation of the shoulder—single or**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery.

	recurrent	Functional cockpit/Sim assessment/check flight required to confirm full function. Likely to require permanent grounding/restrictions if recurrent.
8.3.7.3	**Shoulder dislocation including subluxation— doubtful cases**	
8.3.7.4	**Acromio-clavicular joint dislocation**	
8.4	**Elbow**	
8.4.1	**Exercise-induced upper limb pain (e.g. medial or lateral epicondylitis) within last 12 months**	**Aircrew applicant:** General recruit entry standards apply. **Serving aircrew:** Will require temporary grounding until full functional recovery. Functional cockpit/Sim assessment/check flight required to confirm full function. Likely to require permanent grounding/restrictions if recurrent.
8.4.2	**Olecranon bursitis**	
9.	**Fractures**	**Aircrew should be grounded** following fracture of any bone until the fracture has united with restoration of a normal, pain-free, range of movement. **If** there is significant deformity or loss of function, the aircrew member should be assessed by an orthopaedic surgeon and have a cockpit assessment by an AvMO before returning to flying duties. Individual aircrew with retained lower limb internal fixation devices, may be allowed to return to flying ejection seat aircraft, following assessment by an approved Orthopaedic Specialist, and approval from OC AMU. At present retained back internal fixation devices remain incompatible with flying ejection seat aircraft**.**

Chapter 14: Neurological System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important neurological disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of common and important neurological conditions relating to aviation in the NZDF.

3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Neurological system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**FUNCTIONAL**	
1.1	**Motion sickness**	See Appendix 1 to this chapter.
1.2	**Seizure disorder**	If the operator of any aircraft or aircraft system suffers a seizure; individual or collective safety will be at risk.
1.2.1	**Single Epileptic Seizure / Solitary Fit**	An unprovoked, spontaneous, non-febrile epileptic seizure is associated with an overall risk of recurrence of 50%, the risk being highest over the subsequent eighteen months. A provoked seizure is one that occurs at the time of trauma or other insult, such as metabolic disturbance **Aircrew applicant:** Those with a single seizure provoked or unprovoked less than 10 years prior to entry are to be considered unfit for all aircrew training. Those who have had a single provoked seizure more than 10 years before entry, and who have not been on treatment during this interval, maybe considered for non pilot aircrew roles on a case by case basis provided there is no evidence of persisting predisposition to epilepsy. In such cases, referral to the appropriate specialist is essential. **Serving aircrew:** Aircrew are unfit flying duties for 10 years, after a single seizure. All aircrew must be referred OC AMU for medical boarding. If there is no recurrence and no treatment, during that time, and specialist in Neurology considers there is no persisting increased risk of seizures, the individual may be upgraded; however, pilots will only be permitted to return to an A3 flying category ('unfit solo pilot – must fly with a pilot suitably qualified on type' and 'unfit rotary wing flying'). Anti-epileptic drugs are incompatible with fitness for aircrew.
1.3	**Epilepsy**	Seizures of any kind in the aviation environment are an unacceptable safety risk. Risk of seizures can increase under deployed conditions, and may be due to missed or lost medication, poor drug absorption due to gastrointestinal illness,

		shift work, prolonged working hours, inadequate rest, dehydration, exposure to noxious gases, stress in combat situation and sleep deprivation. Requires regular specialist review and medication; may require evacuation. **Aircrew applicant:** Candidates diagnosed as having epilepsy or who have had one unprovoked seizure after the age of 5 are considered unfit for aircrew training (other than as stated below). **Serving aircrew:** The diagnosis of epilepsy is a bar to flying. Aircrew are assessed to be permanently unfit flying duties. All aircrew must be referred to the appropriate specialist and subsequently to OC AMU for medical grading. Anti-epileptic drugs are incompatible with fitness for aircrew.
1.3.2	**History of benign rolandic epilepsy (benign epilepsy of childhood with centrotemporal spikes)**	Benign rolandic epilepsy usually stops at puberty. **Aircrew applicant:** Candidates with a confirmed diagnosis of typical rolandic epilepsy of childhood, who have been seizure-free for 5 years (without treatment), may be fit for aircrew training. **Additional information required:** Neurologist report, electroencephalogram (EEG) with no epileptic features, normal 24 hour sleep deprived EEG, normal cerebral imaging.
1.3.3	**History of juvenile absence syndrome (petit mal),**	These seizures have a median age of onset between ages 4 and 10 and normally remit before puberty with no cognitive sequelae. **Aircrew applicant:** Candidates who have had petit mal epilepsy as a child are unfit aircrew training.
1.3.4	**Febrile convulsions**	Uncomplicated of childhood. Usually benign. **Aircrew applicant:** Aircrew applicants who have had a well documented febrile convulsion before the age of 6 years can be considered on a case by case basis.
1.3.5	**All other seizure history**	Any seizure or seizure treatment within the last five years is incompatible with service. **Aircrew applicant:** Candidates who have had more than one seizure after the age of 5 are considered unfit for aircrew training.
1.4	**Narcolepsy**	Symptoms include: a. Hypersomnia. b. Cataplexy. c. Sleep paralysis. d. Hypnagogic phenomena.

		Aircrew applicant: Incompatible with performance of duties. Requires medication (stimulant) which may be difficult to obtain on deployment and which has unacceptable side effects. **Serving Aircrew:** The diagnosis of narcolepsy is a bar to flying.
2.	**INFECTIVE**	
2.1	**Neurosyphilis (active and/or symptomatic)**	Associated with intellectual change, spasticity and loss of balance. **Aircrew applicant:** Unfit. **Serving Aircrew:** The diagnosis of neurosyphilis is a bar to flying.
3.	**HEADACHES**	
3.1	**Headaches (including migraine, cluster and tension)**	Severity of headache and functional impact are better indicators of future incapacity in a military environment than clarity around diagnosis. Frequency is also relevant although less predictive than severity. Migraine is a common disorder and indicates that an individual has a constitutional predisposition to recurrent attacks which are often unpredictable. Migraine can cause a safety hazard in aircrew or Aircraft controllers and cases in these branches/trades must be referred to the appropriate specialist. Because migraine is often associated with neurological disturbance such as visual scotoma, flashing lights, tunnel vision, paraesthesia and weakness, the condition presents a flight safety hazard. In addition, these neurological disturbances are usually unheralded and may precede the headache. Specialist assessment often does not add to the accuracy of the diagnosis of migraine, however, referral may be useful in cases where the symptoms could be due to other neurological illnesses. Single migraine like events are difficult to categorise but should be treated with suspicion if they have a strong migrainous element. **Aircrew applicant:** Candidates with a clear history of migraine and cluster headaches are unfit for aircrew and Aircraft controller. When doubt exists, advice should be sought from OC AMU. Consideration can be given to candidates with mild forms of the disease or absence of migraine within preceding two years who are applying for non pilot/observer aircrew stations which present less of an immediate flight safety risk. **Serving aircrew:** A pilot who suffers even a single attack of migraine is to be referred to the appropriate specialist for assessment, and is to be grounded until cleared. Following assessment, a pilot will normally be unfit solo, but provided the attacks are infrequent and mild, may be allowed to continue flying as or with a co-pilot who is suitably qualified on aircraft type. If there is a definite precipitant for the attacks of migraine, avoidance of which has prevented recurrence for at least 2 years, the restriction on flying fitness may be removed by OC AMU. Other members of aircrew may be allowed to continue flying, with or without specific restrictions, depending on role, but frequent severe attacks will cause temporary or permanent unfitness for all aircrew duties. Aircrew and Aircraft

		controllers must be temporarily removed from all flying/controlling duties pending assessment by the appropriate specialist. In general where there is a duplication of personnel for the role or to perform vital tasks it makes continuation of flying more acceptable.
3.2	**Mild Headaches**	**If all the following apply:** a. Does not require more than simple analgesia (paracetamol or NSAIDs with OTC codeine doses). b. No significant functional impairment. c. No relevant underlying condition. **Aircrew applicant:** More than 3 headaches per year averaged over the last 3 years. Requires assessment, which must address diagnosis, severity, functional impact and prognosis. May be considered fit subject to GP reports/specialist assessment as required approval of confirming authority. **Serving aircrew:** Requires assessment, which must address diagnosis, severity, functional impact and prognosis. Consider stress, social and welfare factors. May require temporary grounding for assessment.
4.	**TRAUMA**	
4.1	**Head Injury / Traumatic Brain Injury (TBI)**	A severe head injury often causes permanent damage to the brain, and is associated with an increased risk of cognitive, psychiatric and neurological disorders. Traumatic brain injury (TBI) is a major cause of epilepsy accounting for 20% of symptomatic epilepsy. The development of seizures in the military population has significant implications both clinically and for advising the executive on occupational factors and consequences of sudden incapacitation. Mild and moderate TBI also have potential to produce a reduction in performance; this is especially relevant to the aircrew population. See Appendix 2 to this chapter for guidance on the full assessment of Head Injury and TBI for aviators.
4.1.1	**Minor head injury**	Any neuro-psychological / mTBI symptoms. No loss of consciousness (LOC). No PTA. No neurological deficit. No skull fracture. See Appendix 2 to this chapter.
4.1.2	**Mild head injury**	LOC < 30 minutes.

		PTA < 30 minutes. No neurological deficit. No skull fracture. See Appendix 2 to this chapter.
4.1.3	**Moderate head injury**	LOC 30 mins to <24 hours. PTA 30 mins to <24 hours. No neurological deficit. Skull fracture. See Appendix 2 to this chapter.
4.1.4	**Major / Severe head injury**	LOC > 24 hours. PTA > 24 hours. Focal neurological deficits (non-permanent). Brain contusion. Intracranial haemorrhage. Depressed Skull fracture. See Appendix 2 to this chapter.
4.2	**Disturbance of consciousness e.g. 'concussion' / mTBI**	See Appendix 2 to this chapter.
4.3	**Boxing**	Taking part in boxing has potential flight safety implications for aircrew due to the potential impact on information processing and target acquisition. Aircrew that have participated in a boxing bout are unfit flying for 48 hours after the completion of the bout – whether there is loss of consciousness, any other symptoms or not. Before returning to flying duties they must also be seen by a Military Aviation Medical Officer who is to assess for history of head injury and undertake basic ophthalmic, neurological and ORL examination and testing to determine fitness for return to flying.

		If there is any suspicion that the individual has suffered from a head injury then the AvMO is to follow the HI policy as detailed above. Should aircrew taking part in boxing suffer any definable head injury or neuropsychological symptoms, their return to flying must be based on the criteria above.
5.	**DEMYELINATION**	
5.1	**Progressive neurological disorder**	An episode of acute disseminated encephalomyelitis is usually a monophasic illness, and provided the individual recovers sufficiently, the prognosis is good. However in the acute stage it can be difficult to distinguish from a progressive demyelinating disease such as multiple sclerosis which is likely to relapse and/or progress to more severe disability. Affects coordination, balance and the senses, especially vision. **Aircrew Applicant:** A past history of optic neuritis or other neurological syndrome associated with a high risk of development of multiple sclerosis is to be referred to the specialist in Neurology and OC AMU. An applicant with a diagnosis of multiple sclerosis is to be assessed unfit for aircrew training. **Serving Aircrew:** All cases of presumed or definite demyelination/multiple sclerosis are to be referred to the appropriate specialist and OC AMU for advice on treatment and a medical grading recommendation. All aircrew are to be grounded until investigations complete and an assessment of prognosis and likely progression is made. In certain circumstances aircrew may return to flying duties with restrictions. Pilots are permanently unfit solo flying.
5.2	**Poly-Neuropathy**	Acute inflammatory demyelinating polyneuropathy (Guillain-Barre Syndrome) is a potentially life threatening disease, and suspected cases must be referred urgently to the nearest neurology centre for treatment. Sub-acute/chronic polyneuropathy can be physically disabling and often requires sophisticated neurological assessment and long term treatment. Cases should be referred to the appropriate specialist. **Aircrew applicant:** The presence of a polyneuropathy with functional deficit renders the person permanently unfit for aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
6.	**SURGERY**	
6.1	**Ventriculoperi-toneal shunt**	Increased risk of illness, injury or medical complications. Spontaneous or post-traumatic blockage of the shunt and de novo or post-traumatic infection requires emergency specialist access. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis subject to primary diagnosis and specialist advice. Likely to remain permanently unfit solo and unfit ejection seat aircraft.

6.1.1	**Hydrocephalus**	Candidates for Service with a history of hydrocephalus with or without a drainage valve in situ are to be assessed unfit for aircrew training. Any other history of hydrocephalus will require assessment by specialist in neurology with aviation experience and OC AMU. **Aircrew applicant:** Unfit aircrew training.
6.2	**Craniotomy**	Increased risk of post-surgical seizure. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** Not normally returned to flying. To be assessed on a case by case basis (after 5 years) taking functional deficit into account.
6.3	**Other neurosurgical procedures**	Depends on procedure. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** Based on neurosurgical assessment as to the risk of further complications/residual underlying pathology.
7.	**OTHER/GENERAL**	
7.1	**Abnormality of cranial or other nerves**	Affects senses, muscle function, sensation, balance and coordination. **Aircrew Candidate:** Acceptable only if there is no functional disability, with little residual disturbance If residual functional disability will be unfit. **Serving Aircrew:** In the acute phase, aircrew are to be assessed temporarily unfit for flying duties pending recovery.
7.1.1	**Facial Palsy**	Bell's palsy - May affect a person's ability to effectively communicate or safely use aircrew life support equipment. **Aircrew Candidate:** Past history may be fit for aircrew training on a case by case basis and subject to specialist reports. **Serving Aircrew:** In the acute phase, aircrew are to be assessed temporarily unfit for flying duties pending recovery. Mild residual palsy maybe acceptable on the advice of an ORL consultant and subject to being able to safely utilize all aircrew life support equipment and communicate clearly. Pilots will be unfit solo for minimum of 6 months following recovery.
7.2	**Abnormality of cranial vasculature, including stroke, intracranial aneurysm, and**	See Appendix 2 to this chapter. **Aircrew applicant:** Permanently unfit aircrew training. **Serving Aircrew:** Not normally returned to flying.

	arteriovenous malformation	
7.2.1	**CVA / TIA**	The occurrence of a cerebrovascular accident is frequently symptomatic of associated disorders (for example, hypertension, cardiac disease, arteriosclerosis, intracranial structural vascular disease) and causes significant morbidity. It is also often associated with a high risk of recurrence and a poor prognosis. **Aircrew Applicant:** Permanently unfit aircrew training. **Serving Aircrew:** Except in specific circumstances where the individual risk of recurrence is low, TIAs and thrombo-embolic strokes require aircrew to be permanently grounded. In all cases referral to a consultant physician or the appropriate specialist is required for investigation/treatment and medical grading recommendation.
7.2.2	**Intracranial Haemorrhage**	Spontaneous intracranial haemorrhage is usually due to hypertension, arteriosclerosis, a structural vascular abnormality (i.e. an aneurysm or arteriovenous malformation), or a coagulation defect. In the acute stage it may be life threatening, and if the underlying cause is not treated successfully the risk of recurrence is often high. **Aircrew Applicant:** Permanently unfit aircrew training. **Serving Aircrew:** Fitness to return to flying duties depends on cause, recovery and removal of risk of recurrence or development of complications. All cases should be referred to the appropriate specialist prior to the award of an appropriate medical grade.
7.3	**Syncope—frequent**	A full history should be taken including note of any prodromal symptoms, length of unconsciousness, degree of amnesia and any confusion on recovery. Candidates with symptoms suggestive of cardiovascular or neurological aetiology must be fully investigated. The results of any cardiological or neurological investigations must be normal before acceptance can be considered. Causes may be difficult to distinguish from epilepsy, especially if there has been a secondary hypoxic convulsion. Examples of factors that may indicate epilepsy as a likely diagnosis are: amnesia for >5 minutes, associated injury, tongue biting, having remained conscious but with confused behaviour and a post attack headache. Infrequent recurrent episodes may have triggers, such as venepuncture. Consequences of loss of consciousness in the aviation environment can be serious, even life threatening. **Aircrew applicant:** Candidates with a single syncopal episode, with a definitive provoking factor, i.e. a simple faint maybe fit for aircrew training. Those who have had recurrent faints are unfit aircrew training.

		Candidates with no definitive provoking factors, who have a normal cardiac and neurological examination with a normal ECG, may be fit for aircrew training provided that 2 years have lapsed since the episode and the risk of recurrence is considered low. **Serving aircrew:** A single definite syncopal episode, even when complicated by a secondary hypoxic convulsion, is compatible with an early return to unrestricted duties (A1). A careful assessment is to be carried out and fitness to return to flying made in consultation with OC AMU. Temporary grounding is required until investigations completed. Infrequent recurrent episodes with definite triggers unrelated to the flying task and well-recognised build up of warning symptoms is also compatible with an early return to unrestricted duties (A1). Temporary grounding is required until investigations completed. Individuals in whom there is any doubt, are 'unfit for service outside base areas', 'unfit handling live arms' and 'unfit flying/controlling' for usually up to twelve months. If there has been no recurrence after that time, and with OC AMU recommendation, the individual may be upgraded (A1). **If unexplained - Additional information required:** Neurology and/or cardiology opinion to exclude pathology. Temporary grounding is required until investigations completed.
7.4	**Chronic pain and pain syndromes are divided into two broad groups: somatogenic and psychogenic**	Chronic pain can develop after injury to any level of the nervous system, peripheral or central. A variety of specific syndromes have been identified. Their pathogenesis is obscure and their incidence and prevalence are unknown. Collectively these conditions present a very poor risk for rigorous military training. Treatment is invariably multi-disciplinary, intensive, costly and with an unpredictable outcome. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.4.1	**Somatogenic pain—**	Is broken into the broad divisions of neuropathic pain and reflex sympathetic dystrophy. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.4.1.1	**Neuropathic pain.**	Neuropathic pain may involve predominantly peripheral processes (peripheral syndromes include neuroma formation and nerve compression—for example radiculopathy from discogenic disease). **Aircrew applicant:** Unfit aircrew training.

		Serving Aircrew: To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.4.1.2	**Reflex sympathetic dystrophy**	(Includes Complex Regional Pain Syndrome and Causalgia). **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.4.1.2.1	**Complex regional pain syndrome**	A chronic state induced by soft tissue, bone or nerve injury in which pain is associated with autonomic changes e.g. sweating or vasomotor abnormalities, and or trophic changes (eg skin or bone atrophy, hair loss, joint contractures). **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.4.2	**Psychogenic pain.**	Chronic pain with insufficient or no organic explanation is a common problem. Typical syndromes include, chronic headache, continued low back pain, atypical facial pain, and abdominal or pelvic pain of unknown cause. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.5	**Peripheral neuropathy from any neurological injury or disorder**	May result from any damage affecting the nervous system distal to the CNS. It affects movement or sensation Affects movement, strength, dexterity and sensation. Unlikely to be compatible with military duties unless the cause has been identified and successfully treated with no residual neuropathy or other symptoms, and the treatment is not ongoing. If the cause is treated, and the condition has resolved (for example poor diet now corrected), then could be considered for entry with appropriate specialist reports. **Aircrew applicant:** A candidate with a current and unresolved peripheral neuropathy is unfit aircrew training. Past history, with full resolution, may be fit for aircrew training on a case by case basis and subject to specialist reports. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.
7.6	**Cranial neuralgia**	Includes trigeminal neuralgia and glossopharyngeal neuralgia Often resistant to treatment. Following surgery or other treatment **Aircrew applicant:** Must be drug-free and symptomatic for at least 36 months. If criteria above not met, they will be permanently unfit aircrew training. **Serving Aircrew:** To be assessed on a case by case basis taking functional deficit into account. Restrictions likely to apply with unfit solo flying for pilots.

7.7	**Cerebral tumours**	The effect a tumour may have on a person's fitness will depend on many factors such as whether it is malignant or benign, intracranial (supratentorial or infratentorial) or spinal. Advice on individual cases is to be sought from the appropriate specialist or a consultant oncologist. **Aircrew applicant:** Unfit aircrew training. **Serving Aircrew:** Not normally returned to flying. To be assessed on a case by case basis (after 5 years) taking functional deficit into account.

Appendix 1 to Chapter 14: Motion Sickness in Aircrew

1. The term 'motion sickness' (MS), also known as kinetosis, is a generic term that describes a set of symptoms under conditions of motion. These include, but are not limited to, most forms of transport (air, sea, car, camel, train or space) but also following training in simulators (virtual motion sickness, VMS) or virtual reality games.

Physiopathology

2. The most accepted theory is that it is a normal psychophysiological response, a neural mismatch or sensory conflict between the visual, vestibular and proprioceptive systems - by healthy individuals - when exposed to (real or apparent) provocative motion stimuli to which they have not adapted. In addition, anticipatory arousal (and a degree of anxiety) caused by previous motion discomfort may inhibit adaptation to the stimulus.

3. Air sickness - motion sickness in flight - commonly affects ab initio aircrew students in training; this generally subsides as habituation to the environment, i.e. **adaptation**, develops. Trained personnel may also be affected, particularly following protracted periods away from flying or under adverse kinetogenic stimuli like during certain hostile operational flying environments for those susceptible to airsickness, e.g. rear crew during Airborne Surveillance or Search & Rescue. Other potential triggers include deployment on ships for those who need to develop their 'sea legs' or exposure to unpleasant stimuli such as smells, sights, confined space, heat or tight fitting masks.

Symptoms

4. Nausea is the hallmark symptom, often preceded by stomach awareness, malaise, drowsiness and irritability. Other symptoms may include sensation of light headiness, fatigue, hyperventilation, salivation, belching, pallor, breaking out in a cold sweat and/or headache. The magnitude of arousal is determined in great measure by the individual's personality and past experiences.

5. There are several diagnostic criteria for MS (e.g. Graybiel's Original Pensacola or Kennedy's Expanded Criteria), but any correlation between severe, or enduring, symptoms and flight will require a full medical history.

6. An easy and simple classification of the severity is by the Motion Sickness Rating:

Rating	Symptoms
0	No symptoms
1	Symptoms excluding nausea (awareness)
2	Mild nausea (mild distraction)
3	Moderate nausea (significant distraction)
4	Moderate-to-severe nausea (wants to stop)
5	Vomiting (cannot continue)

7. This Annex aims to provide the Aviation Medical Officer (AvMO) with guidance on the management of aircrew, and student aircrew, suffering from motion sickness as well as making decisions on airsickness prophylaxis. Discussions involving Senior AvMOs or OC AMU must start as early as possible to ensure success.

GENERAL MANAGEMENT

I – Adaptation

8. The most effective and ideal method of remedial measure, at least in the long term, is natural adaptation to the provoking motion. With continuous repeated exposure, symptoms subside, usually within days. The number of exposures required for adaptation varies between individuals but a slow, gradual, gentle, intermittent increase will help.

9. It is important to note that magnitude and/or direction of motion will influence the effect: multiple and off-axis are worse than single-axis motions; low-frequency motions vs high-frequency; rotary is worse than linear motion, and vertical motions are worse than horizontal ones. A sudden banking and 'pulling G' is 'ideal' for causing motion sickness.

II – Prevention strategies

10. Prevention is much easier than treatment once symptoms of motion sickness have been experienced. *Ab initio* students should receive a briefing on general preventive strategies by an AVMO early in their career, preferably immediately before the start of the flying phase.

11. Certain pre- and in-flight strategies may facilitate minimising air sickness, which will aid the student develop adaptation sooner.

- <u>Pre-flight actions:</u>
  - Being well rested (a good night sleep).
  - Not flying if unwell (URTI, on medication).

- Maintaining good hydration, but in small frequent sips rather than gulps; limiting alcohol and caffeinated drinks, especially in those suffering from MS.
- Consuming food in small frequent amounts to prevent stomach distention, especially dry and solid like BRAT (banana, rice, apple, toast), crackers; avoiding heavy and fatty/spicy food.
- Emptying bowels and bladder prior to flying.
- Wearing of firm but not excessively tight flight clothing or ALSE (helmet, mask).
- Avoiding known nausea generating stimuli, e.g. certain odours (fuel, tobacco…)

- In-flight actions:
  - Limiting head movement, especially during tight banking or pitching.
  - Looking out at the horizon, especially during turbulence, and not reading inside.
  - Chewing gum, flavoured lozenges (not advisable in demanding situations like aerobatics, or for those wearing masks). See 'Complementary therapies' below.
  - Application of cold air to the face (judicious use of the emergency oxygen).
  - Removal of mask and wiping of sweat (as required). Some individuals find wearing a tight rubber mask uncomfortable.
  - Taking control of the aircraft.

III – Treatment

12. Directed towards controlling nausea, decreasing conflicting sensory input and speeding the process of adaptation, the management of airsickness includes medication, behavioural therapies and 'complimentary therapies, run concurrently or sequentially as indicated.

Medication

13. To benefit, drugs must be taken prophylactically. However, due to their undesirable secondary effects (drowsiness, dry mouth, depression …), no anti-motion sickness medication is considered safe enough for ongoing routine use by aircrew.

14. Aircrew students flying under the supervision of a qualified flight instructor (QFI) could benefit, especially when taken as an adjunct to a desensitisation programme (see below).

15. The list of pharmacological approaches for MS in general is at Table 1. Not all are available in New Zealand but are listed for completeness should they be prescribed by allied Air Force AvMOs overseas. Drug combinations with stimulants, which have the advantage of reducing side-effects, are also listed although not available in New Zealand at all.

- Anticholinergics. Hyoscine (scopolamine) hydrobromide is considered the most effective drug for the prevention of motion sickness. It competitively blocks the action of acetylcholine on muscarinic receptors, which in motion sickness appears to be by blocking transmission to the higher brain and the vomiting centres.

Transdermal hyoscine patches provide prolonged activity but need to be applied several hours before travelling (or flying, in this case). Regrettably, they come with multiple side-effects, contraindications and cautions thus restrictions and are not first choice for personnel on flying duties.

- H1-antagonist. First generation antihistamines, although slightly less effective against motion sickness are generally better tolerated than hyoscine. For aircrew, the preferred are the less sedating ones like Cinnarizine (not available in NZ), Cyclizine or Meclozine. Promethazine would be indicated, perhaps for passengers, only if a sedative effect was desired.

- Despite their recognised anti-emetic properties, 5-HT3 receptor antagonists like Ondansetron, Domperidone, Metoclopramide and Phenothiazines (an exception is the antihistamine phenothiazine promethazine but this causes heavier sedation) are not considered effective in preventing motion sickness.

Anticholinergics	• Scopolamine (Hyoscine) Hydrobromide - Patches – available in NZ - Tablets* (Kwells, Travacalm HO)
H_1 antihistamines	• Cyclizine (Nausicalm ®) • Meclozine (Sea-Legs ®, Travel Ease ®, Travel Relief ®) • Cinnarizine (Stugeron ®)* ---------- • Promethazine hydrochloride (Phenergan ®) or P theoclate* • Chlorpheniramine (Piriton)* • Dimenhydrinate (Travacalm ®)*
Combinations*	• Hyoscine hydrobromide + Dimenhydrinate + Caffeine [TravaCalm Original ®] • Promethazine + D-amphetamine • Scopolamine + D-amphetamine • Scopolamine + Ephedrine • Chlorpheniramine + Ephedrine

Table 1: List of pharmacological approaches for motion sickness (* not available in NZ)

Behavioural therapies: cognitive behavioural therapy (CBT), biofeedback, relaxation techniques, mindfulness.

16. The aim is to teach individuals to reduce or overcome the physical manifestations of motion sickness by controlled breathing and visualisation techniques, which may alleviate the psychological reinforcement and associated anxiety of MS.

17. Biofeedback does not have strong clinical evidence supporting its use in treating MS and does not always transfer successfully from the controlled laboratory to the operational flight environment. These techniques may be used by aircrew as an adjunct to other management options but are not recommended as primary or sole management option.

Complementary therapies

18. They have variable support from peer-reviewed literature or research. Nonetheless, even if they were considered placebo, there have been anecdotal successes. Aircrew may try them as an adjunct to the other listed options, rather than primary or sole management option.

19. AvMOs must cautiously consider requests for complementary therapies, record them in their notes and follow up the individuals carefully as some natural remedies (see below) may be considered innocuous but any other medicinal product, especially combinations, should be rejected if there are doubts of the efficacy or potential undesired effects.

20. Complementary therapies for MS prophylaxis include:
- acupuncture;
- acupressure wrist bands (TravaCalm Travel Band®, Seabands®, Relief ® bands);
- natural, herbal remedies or tablets/lozenges (e.g. ginger, peppermint, lemon, fennel…);
- vitamin B6 supplements; high-dose vitamin C;
- magnet therapy.

IV - Motion Sickness Desensitisation (MSD)

21. Some Air Forces run a flight desensitisation programme, usually preceded by a ground phase. The idea is that the individual will habituate to regular graded increments, over time, of unfamiliar and provocative motions. To reduce any degree of anxiety, this must take place away from the training environment.

- **Ground desensitisation**. Aiming to desensitize by a graduated repetitive exposure in a calm environment, it uses motion simulators or the Barany chair to expose the student to nauseagenic stimuli, e.g. cross-coupled Coriolis stimulation, 2–3 times a day for several weeks. This phase is manpower demanding, thus not available in New Zealand. Students in the past have been referred to the Royal Australian Air Force Institute of Aviation Medicine (RAAF IAM), at a cost.

- **In-flight desensitisation**. This is the final, or the only practical, component of the MSD programme. It involves exposing the individual to the motion stimuli in all three axes, which cannot be adequately performed in ground-based simulators; it is conducted to reaffirm the acquired motion adaptation from the ground phase (if available). To reduce anxiety and stress, it must not be conducted during a training exercise, although the sortie may end on general handling by the individual to stimulate enjoyment of flight. NZAP 9202 Annex A establishes guidance and description of the standard five sortie desensitisation profiles.

SPECIFIC MANAGEMENT OF MOTION SICKNESS

AIRCREW TRAINEES

22. All cases of motion sickness in students under training, independently of aircrew branch, must be handled expeditiously if they are to derive maximum benefit from flying instruction. Prolonged periods of untreated sickness will lead to unproductive flying hours, not only through curtailment of exercises but also through lack of assimilation, the effects of medication, anxiety or even disillusion.

23. The Base AvMO must be involved sooner rather than later by the QFI, the training unit, or the trainee themselves, when either of the following occurs:

- there is a second episode of motion sickness after flying training commences, or
- the motion sickness is severe (Motion Sickness Rating 3, 4 or 5), enough to hinder the progress of flight training.

24. **Medical Assessment**. The AvMO is to medically assess the student, paying attention to previous history of motion sickness, vertigo, head injury, ENT disorders, stress/anxiety factors and specifically to the individual's attitude, motivation or desire to continue flying ('flying phobia').

25. Assistance by a psychologist may be indicated; otherwise, other specialist involvement is not warranted unless there is a clear evidence of pathology.

26. **Behavioural adaptation advice**. If possible, early intervention for mindfulness, relaxation techniques and CBT is recommended, as a trainee experiencing symptoms is likely to be apprehensive about future flight training sessions, which itself may further increase the likelihood of motion sickness occurring, developing an insurmountable cycle.

27. **Medication**. With the aim of returning the trainee to the airborne environment as soon as possible, authorised medication (with a suggested regimen, Table 2) may be offered by an AvMO for the control of motion sickness symptoms.

28. Due to the potential of significant adverse effects, the student must be advised and a daytime ground trial (ideally in the same afternoon, or the following morning) arranged to assess symptoms. Depending on the findings, individuals suffering from:

a. mild symptoms, e.g. mild blurred vision, mild drowsiness, dry mouth … may be deemed acceptable, to facilitate early return to the airborne environment.

b. significant side effects, e.g. sedation, allergic reaction, or symptoms considered more than mild, should then undergo a second ground trial of alternative medication.

29. Only after a successful ground trial can the medication be prescribed for flying. It is imperative that the student and their QFI understand that the following conditions apply:

- The student may only conduct dual flying, under the direct supervision of a QFI.
- It will be for a maximum of 8 sorties while the trainee continues on the flying training syllabus.
- The student will not be allowed to fly solo until 5 flights after the medication has stopped.

Medication	**Adult prescription**
Cyclizine hydrochloride 50 mg tablets	50 mg PO 1 - 2 hours prior to sortie
Meclozine hydrochloride 12.5 – 25 mg tablets	25-50 mg PO OD (on night or 1 hour before sortie) Repeated every 24 hrs if necessary.
Scopolamine (Hyoscine) Hydrobromide 1.5 mg transdermal patch	Apply 1 patch to hairless area behind ear at least 5 hours before sortie. Replace if necessary (siting replacement patch behind the other ear) after 72 hours. **Note**: by doing this, adaptation to the drug may take place thus reducing side-effects.

Table 2 – Approved medication for the prevention of air sickness in aircrew students

30. Students on medication trials - ground or for flight training - will be downgraded and awarded the following medical grading:

A3 – 'Must fly with a pilot qualified on type'
G3 – 'Must remain under medical supervision'

31. After each sortie, the trainee must record items like medications taken, the type and timing of all food and drink consumed, sleep patterns, the quality of sleep and any apparent effect of these factors on the symptoms of motion sickness. Also, on discussion with the QFI, records regarding the type of flight undertaken, the time of onset and severity of nausea as well as the duration after the flying profile is stabilised.

32. The student will regularly liaise and report outcomes to the AvMO, who will in turn record them in their medical notes. Both, student and AvMO, will determine the utility of continuing the medication for the maximum eight sorties, or whether medication can be terminated earlier due to favourable progression in motion sickness symptoms. Continued monitoring allows the trainee to return to the normal flying syllabus as soon as it is practicably possible.

33. **Desensitisation**. Flight desensitisation iaw NZAP 9202 may commence at any stage, especially if drug therapy seems unlikely to be successful or to be failing. Once completed, immediate return to the flying syllabus-including dynamic flight exposure (motion-provocative) is then required within 48 hours to maintain adaptation. Failure to do so may result in loss of adaptation and relapse of motion sickness.

Failure to overcome motion sickness

34. Adaptation to motion sickness may decline rapidly if trainees do not continue/return to the flying environment immediately following each phase of motion sickness management. To mitigate this loss, it is recommended to fly a minimum of two sorties per week.

35. Trainees who suffer a relapse following adaptation are to be managed from the beginning, as above. They may be provided further medication, to maximum of another eight sorties, irrespective of the number of sorties flown on medication previously.

36. Should all of the above fail, but the instructor cadre felt that the candidate was worth investing financial support on, the CO will have to communicate with OC AMU to engage the RAAF Institute of Aviation Medicine for their support.

37. Trainees who fail their course because of motion sickness, resulting in a permanent discharge from flight training, will have an MD906 raised by their AvMO (after consultation with OC AMU) and awarded a permanent A4 factor.

TRAINED AIRCREW

38. **Trained pilot aircrew**. It is rare for trained pilots to experience significant MS symptoms on a routine basis. On occasions, mild symptoms during simulator training, on a return to flying following a protracted period away or flying in rough weather, are not uncommon and do not necessarily require intervention. The use of motion sickness medication by trained pilots whilst on actual flying duties is not permitted. In cases of doubt, OC AMU must be consulted.

39. **Trained non-pilot aircrew**. Aircrew in certain non-pilot roles (e.g. air warfare crew, airborne electronic analysts, flight engineers) may suffer mild recurrent motion sickness symptoms well into their careers, mostly dependent on the type, frequency and profile of sorties being flown.

40. Although the use of motion sickness medication on a regular basis by non-pilot aircrew is generally considered incompatible with flying duties, such cases have to be considered on a case by case basis with consultation between the aircrew member, the treating AvMO, the flying supervisor and OC AMU. Medication from Table 2 may be prescribed after ground trials (as above) have taken place.

SIMULATOR SICKNESS

41. Aircrew may experience an 'unsettled' feeling during training on (fixed or motion-base) simulators, or after a 'sortie', even if they do not experience motion sickness in actual flying. This tends to happen with their first training sessions, potentially exacerbated by the lack of cockpit cooling or the frequent use of the 'Pause' function. Symptoms tend to be mild and experience has shown that adaption tends to happen sooner than later.

42. Should sickness occur, the sortie must be abbreviated or even stopped. As with air sickness, once a student becomes physically sick, it may become very difficult to counter the psychological effects on subsequent sessions. Simulator staff should limit the use of triggers (the 'Pause' function) and tailor the visual database by creating or modifying both the imagery and the 3D models.

43. In the rare case of significant symptoms, the base AvMO must be consulted who may authorise motion sickness medication (Table 2) as treatment. The following rules apply:

- alcohol must not be consumed between 24 hours before and 12 hours after taking the medication;
- a ground trial must ensue to confirm success and exclude significant undesirable effects.
- Notwithstanding local unit SOPs regarding temporary grounding following simulator training, an initial minimum TMUFF for airborne flying duties applies after each use of medication: 12 hours after each use of Hyoscine; 24 hours, if antihistamines were used.

44. In any case, aircrew must be assessed as free from any medication effects - as well as any symptoms of simulator sickness - by an AvMO prior to returning to flying duties.

MOTION SICKNESS WHILE SHIPBORNE

45. Aircrew with infrequent or insufficient exposure to the maritime environment may lack adaptation to the motion of the ship and experience sea sickness.

46. The AvMO will have to assess each case individually, considering the sedation produced by anti-motion-sickness medication but also that mild symptoms of seasickness will often improve when airborne. Those significantly affected by the sea state may be treated with motion sickness medication to assist develop their 'sea legs' and return to flying duties.

47. The following guidelines apply:

a. Alcohol must not be consumed 24 hours prior and until 12 hours following use of medication for motion sickness.

b. They must observe a temporarily medically unfit for flying (TMUFF) period for airborne flying duties of:

i. no less than 12 hours after each use of medication at Table 2

ii. no less than 24 hours after each use of medication containing Promethazine theoclate

c. The individual must be assessed as free from any medication effects and any significant symptoms of seasickness by an AvMO before returning to flying duties.

48. In the case that there is no AvMO on board, the ship's medical officer or health worker must contact the squadron's AvMO or on call duty AvMO for consultation.

NON-AIRCREW / PASSENGERS

49. On occasions, non-aircrew personnel (e.g. photographers) may be required to fly as part of their normal duties. These personnel, as well as passengers, are not typically exposed to the flying environment on a continuous basis and may suffer from motion sickness.

50. Health practitioners should advise them on strategies and behavioural techniques which may help reduce symptoms. The prescription of medication may be appropriate in these cases, following a suitable period of ground trial, depending on the exact nature of duties performed by the individual and the degree of adverse effects experienced.

51. Motion desensitisation is not typically recommended for non-aircrew personnel, due to lack of regular flying on a continuing basis after conduct of the MSD programme

52. Any of the above medication may be used but for passengers or personnel exclusively with no duties, the following regimens may apply:

Cyclizine hydrochloride 50 mg tablets	Ṫ x 1, 1-2 hours prior to departure 10 tablets. Max Ṫ TDS
Promethazine hydrochloride 25 mg tablets.	Ṫ x 1 at bedtime the night before travel; repeat after 6-8 hours the following morning if necessary Or, 1-2 hours prior to departure. A second dose may be given 8–12 hours later if necessary. Additional doses may be given on arising in the morning and before the evening meal for the duration of the journey.

Table 3. Medication for passengers

General military references:

1. ADF DHM Vol 3 Part 14 Edition 1 AL44 Ch. 19 Motion Sickness in Aircrew
2. RCAF FSG 1900-01 Medications and Aircrew
3. RAF AP1269A latest edition
4. AFIC INFO PUB ASM 6009. The Management of Motion Sickness in Aircrew
5. DAR 67 (NZ) Aircrew Medical Standards

General civilian references

6. Motion Sickness: Manifestations and Prevention. G.P. Kumar et al. Defence Life Science Journal, Vol. 5, No. 3, July 2020, pp. 230-237, DOI: 10.14429/dlsj.5.14822
7. The Neurophysiology and Treatment of Motion Sickness. A Koch et al. Naval Institute of Maritime Medicine, Kiel https://pmc.ncbi.nlm.nih.gov/articles/PMC6241144/

RNZAF Sickness and training:

8. NZAP 9211 / NZAP 9214 (IH−Pilot) Instructor Handbook For NH90 (TNZA)
9. NZAP 9202, Chapter 1, Section 6 *Motion Sickness in Trainees* and Annex A

NZ Formulary

10. New Zealand Formulary

Appendix 2 to Chapter 14: Management of Traumatic Brain Injury in Aircrew and UAV Operators

1. Head injuries are common but vary considerably in cause, extent and severity. Minor, low energy blows to the head may result in only a superficial injury, for example a simple laceration of the scalp. Such injuries are unlikely to be a concern beyond the healing of any wound, with no neurological effects. However, more significant injuries may result in skull fracture, loss of consciousness, amnesia and brain injury. These will have serious effects on aviation fitness and may require permanent grounding or unfit controlling / RPAS operation. Between these extremes lies a range of injury that may or may not have implications for flight safety.

2. 'Head injury' is a non-specific term that encompasses all clinically evident external injuries above the neck, from bruising to severe facial injury. Such injuries may or may not be associated with Traumatic Brain Injury (TBI). This appendix deals with TBI, because it is the alteration in function associated with even mild TBI that is of concern to flight safety.

Definitions

3. TBI has been defined as 'an alteration in brain function manifest as confusion, altered level of consciousness, seizure, coma or focal neurological deficit resulting from blunt or penetrating force to the head'[1].

4. Mild TBI (mTBI) is synonymous with concussion. In mild TBI, subtle behavioural and neuropsychological changes may be the only symptoms.

Principles

5. The aim of assessing post-TBI patients is to determine the future risk of serious complications and the appropriate occupational disposal, including any appropriate limitation to flying or controlling status. The intent is to preserve flight safety without unnecessarily limiting the individual patient.

Considerations

6. **Extent of any functional neurological sequelae**. Any neurological sequelae will potentially affect the ability to function in an aviation environment. The functional effects of any such sequel must be carefully assessed - with specialist neurological review - before returning aircrew to flying duty (or unmanned systems operators to their duties). Permanent sequelae are likely to lead to permanent disqualification from flying.

[1] Bruns J & Hauser WA. "The Epidemiology of Traumatic Brain Injury: A Review." *Epilepsia* 44 Suppl. 10,(2003) : 2-10.

7. **Risk of Post-Traumatic Seizure (PTS)**. TBI has long been known to cause epilepsy and, in general, the risk of developing epilepsy following TBI is proportional to the severity of the original injury. However, this is difficult to determine because not all TBI patients develop epilepsy, and in those who do, onset may be delayed for many months or years. Features of TBI that indicate the degree of risk of future PTS include:

Loss of consciousness	Skull fracture
Post-Traumatic Amnesia	Intra-cranial haemorrhage
Cerebral contusion	Intra-cerebral haemorrhage
Focal neurological dysfunction	History of early epileptic seizure (within 7 days of injury)

   The presence, degree or absence of these features allow classification of the risk of a PTS for individual patients, which then informs the correct occupational course of action with respect to grounding and subsequent return to duty, if that becomes possible.

8. **Presence of any neuropsychological effects**. Even without an obvious head injury, mTBI can produce a range of symptoms. These normally manifest immediately after the event before resolving within minutes to hours, although in some patients they persist for longer periods. Mild TBI can have an effect on general psychological performance and a pilot's ability to operate an aircraft; it is therefore a potential flight safety hazard.

9. To make a diagnosis of concussion/mTBI all three of the following criteria must be met[2]:

   a. A history of related head injury or involvement in a blast.

   b. Glasgow Coma Scale (GCS) no lower than 13 at thirty minutes post-injury.

   c. One or more of the following:

      i. **Alteration of consciousness (AOC) or mental state**. This may present as a variety of transient physical, cognitive or emotional symptoms, as tabulated below.

[2] For a diagnosis of concussion/mTBI, symptoms must be specifically related to a precipitating event and must not be due to drugs, alcohol, medications or other illness or injury, psychological trauma or language difficulties.

ii. **Loss of consciousness (LOC)**. For no more than 30 minutes duration post-injury.

iii. **Post-traumatic amnesia (PTA)**. For no more than 24 hours duration post-injury.

iv. **Transient neurological abnormalities**. Examples include focal signs or seizures.

Table 1. A comprehensive list of symptoms and signs potentially associated with mTBI (concussion) * Common symptoms

Physical	**Cognitive**	**Behavioural & Emotional**
Feeling / looking dazed*	Confusion*	Problems controlling emotions
Headaches	Disorientation*	Agitation
Dizziness	Difficulty concentrating*	Irritability
Balance disorders	Slowed mental processing	Anxiety
Nausea and/or vomiting	Problems with memory	Aggression
Fatigue	Degraded judgement	Depression
Sleep disturbance		Impulsiveness
Blurred vision		
Sensitivity to light/noise		
Hearing difficulties		
Numbness and tingling		

10. Up to 50% of mTBI sufferers may experience such symptoms, but they normally resolve within a few weeks. Unless they are severe - or continue for more than 3 weeks - no action is required, although aircrew will be unfit to fly during this time. Where diagnostic confusion exists, appropriate specialist clinical input should be sought.

11. **Aviation Risk Factors**. Whilst the healing of injuries such as skull fractures and the assessment of any continuing neurological deficit will be part of the general management of the case, the assessment of any PTS risk and neuropsychological effects will require additional consideration.

Injury Classification

12. The table at the end of this appendix outlines the classification of seizure risk following mTBI (in aircrew), grouping the cases from minor to severe categories by risk, with the features that determine the category for each case.

N.B. Above the minor group, the presence of any single feature in a higher group will move the patient up to that group, even if all of the other features indicate a lower severity.

13. **Boxing**. Participating in boxing has conceivable flight safety implications for aircrew due to the potential impact on information processing and target acquisition. Consequently, aircrew who have participated in a boxing bout are unfit flying for 48 hours after the completion of the bout – whether there is loss of consciousness, any other symptoms or not. Should aircrew partaking in boxing suffer any definable head injury or neuropsychological symptoms, their return to flying must be based on the criteria in this policy.

Medical Management and Risk Assessment

14. **History**. It is essential that sufficient detail of the injury and its effects are obtained to allow classification. If available, statements from witnesses should be obtained in order to augment the patient's history of events. Cases admitted to hospital should have adequate detail but, if it is absent, medical officers should obtain the necessary information. Discussion with the line managers may be indicated to capture subtle changes in personality and performance (see Occupational Reports below).

15. **Initial Flying Restriction**. Any aircrew suffering from a mTBI must be removed from flying duties immediately pending further assessment. In the cases that are 'Mild', or worse, this should be by formal grounding period. OC AMU should be informed.

16. **Neuropsychiatric Assessment**. The non-specific effects of mTBI will only need formal assessment if symptoms persist for over 3 weeks. However, this assessment should not be delayed until immediately prior to a return to flying. Patients need to be monitored in the early weeks and, if assessment is required, they should be referred for a neurological consultation.

17. Investigations.

    a. **Radiology**. Any CT or MRI investigation should be reported by a neuro-radiologist because such a specialist might be able to exclude some apparent pathology, or detect some lesions that might not be apparent to other radiologists.

    b. **EEG**. The value of the EEG test in predicting PTS has not been proven, so this should not be conducted unless there is a clinical indication, or unless requested by DCA Neurology.

18. **Occupational Reports**.

    a. **Occupational Performance.** As above, it may be indicated to formally seek the views of line managers. A written report must be provided by the individual's line manager prior to review for return to flying following mild and moderate cases, to ensure that any behavioural changes that have occurred are evident to the medical officer.

    b. **Flying Assessment**. Pilots grounded for more than 6 months will require a formal refresher course, so their performance will be formally assessed before returning to flying. However, minor cases might not need a refresher so a simulator review and/or QFI/QHI check ride should be considered.

    c. **Remote pilots and unmanned systems operators.** Many of the symptoms and signs at Table 1 are prejudicial to flight safety for these branch and trades, and so should be positively excluded by all means possible.

Return to Flying Duty

19. **Minor to Severe Categories**. Aircrew may return to flying duties, or commence training, no sooner than the time periods from the injury indicated in the table below. A minimum level of assessment is required prior to upgrading or the award of a flying medical category; this is shown in the table, but further tests should be conducted when a clinical indication exists.

20. **Head Injury without TBI**. As stated, this policy is concerned with the effects that mTBI might have on flight safety. There will be a group of patients, nevertheless, that suffer a head injury without evidence of TBI; these may be returned to flying in a shorter time period than the minor group. Thus, in the absence of any findings, symptoms or signs and at the discretion of the managing AvMO, the individual may be returned to flying at less than 7 days. Any suggestion of TBI places the individual into the minor category and they will require the mandatory minimum period of grounding of 7 days - or until their symptoms have resolved - and they have undergone any testing that is indicated.

21. **Criteria for return to flying at less than 7 days**. 'Minor' cases that were alert and orientated from the moment of injury; that have had no alteration or loss of consciousness; that have suffered no PTA and no neurological abnormality (even transient); that have had no symptoms consistent with concussion/mTBI following the injury and that remain asymptomatic, may be returned to flying at less than 7 days post injury at the AvMO's discretion. They must satisfy themselves that the history demonstrating the absence of symptoms or signs is reliable.

22. This policy was developed by the RAF following review of the latest evidence on determination of PTS risk and also the likely hazard if a flight crew member had a seizure in the air. The latter review demonstrated that shorter periods of grounding with the pilot returning to flying in an A3 category (with an 'as or with co-pilot' limitation) are not acceptable for any form of high performance aircraft (i.e. Tucano

T6C) or rotary wing flying, due to the potential hazard presented by incapacitation in the air[3]. The presence of an additional pilot would be unlikely to prevent an accident in this type of military flying. Consequently, although this policy introduces long periods of grounding, the individual would be expected to return to flying with an unrestricted medical grading.

23. By exception, the crew of multi-engine, multi-pilot, large cockpit, fixed wing platforms may be returned in an A3 limited medical grading. In such cases, following a full assessment by a consultant neurologists, an appropriate minimum grounding period may be agreed with OC AMU.

UAV Operations

24. In general, the research and evidence based applies equally to the occupational disposal of unmanned air systems operators.

25. UAV/RPAS operators are sub-divided into Class I – III by NATO. In New Zealand, we are currently operating small systems that weigh less than 2kgs. Although mTBI is relevant to all operators, the flight safety risk increases from Class I to Class III operations. Assessment will take into account the classification, environment (airspace) and operational demands.

[3] The chance of another pilot recovering the aircraft if the subject pilot has a seizure during FJ or RW flight is believed to be remote due to the high speed and tandem cockpit design in the former and small cockpit and low-level flight configuration in the latter.

THE CLASSIFICATION AND ASSESSMENT OF AIRCREW AND POTENTIAL AIRCREW POST-HEAD INJURY

Series	Classification	Definition	Aircrew Medical Grading		Clearance Requirement: Concussive/mTBI symptoms must have resolved
			Trained aircrew	Recruit	
1	Minor	• Any neuro-psychological/mTBI symptoms[4] • No loss of consciousness (LOC) • No PTA • No neurological deficit • No skull fracture	Grounded for 7 days For any return prior to 7 days, see paragraphs 16-17.	Grounded for 28 days	Occupational assessments, e.g. simulator performance, QFI/QHI check ride Medical clearance: AvMO to assess before return to fly
2	Mild	• LOC < 30 minutes • PTA < 30 minutes • No neurological deficit • No skull fracture	A4 for 6 months	A4 for 12 months	Occupational assessments, e.g. simulator performance, QFI/QHI check ride Medical clearance: AvMOs to assess before return to fly
3	Moderate	• LOC > 30 minutes <24 hours • PTA > 30 minutes <24 hours	A4 for 6 months	A4 for 3 years	Full report by neurology consultant

[4] See paragraph 7.

		• No neurological deficit • Skull fracture			Occupational assessments, e.g. simulator performance, QFI/QHI check ride OC AMU to be consulted prior to upgrading
4	Severe	• LOC > 24 hours • PTA > 24 hours • Focal neurological deficits (non-permanent) • Brain contusion • Intracranial haemorrhage • Depressed skull	Permanently unfit aircrew*	Permanently unfit aircrew	* In exceptional cases, a return to flying may be considered not before 3 years post-injury. A in-depth neurological and flying assessments would be required.
5	Very severe	• Penetrating Injury • Permanent neurological deficits	Permanently unfit aircrew		

Chapter 15: Respiratory System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important respiratory disorders. It is not exhaustive, but details policy on the assessment and treatment of common and important respiratory conditions relating to aviation in the NZDF.

2. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

3. Specific problems: Respiratory system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**CONGENITAL**	
1.1	**Cystic Fibrosis**	Requires intensive and daily chest physiotherapy. Decreased exercise tolerance. Regular specialist review. Increased risk of respiratory infections in military environment. Unfit aircrew selection.
2.	**FUNCTIONAL**	
2.1	**Pneumothorax**	
2.1.1	**Spontaneous Pneumothorax**	Over 90% of patients presenting with spontaneous pneumothorax are under 40 years of age and 75% are under 25. Tension pneumothorax develops in 5%. Recurrence rates without definitive treatment are 30% after a first occurrence, 50% following a second and 80% after a third. **Clinical concerns**: Acute pneumothorax may cause acute chest pain and shortness of breath. Symptoms are aggravated in flight, worsening as ambient pressure falls. Tension pneumothorax is potentially life threatening. **Limitations**: A history of pneumothorax, whether treated or not, is a bar to selection for flying duties. All serving aircrew who have had a single spontaneous pneumothorax require specific assessment regarding definitive treatment and should be referred to a specialist for full assessment before returning to flying duties. Because of the risk of recurrence following pleurodesis the treatment of choice is pleurectomy. Aircrew should be fit to return to flying duties with a G3 medical marker 3 months after successful pleurectomy, if required. Alternative management may be to ground the patient for a minimum of 12 months to allow the incidence of recurrence to reduce to an acceptable level and to exclude exacerbating factors such as pleural blebs with a CT scan.

2.1.2	**Traumatic Pneumothorax**	Trauma to the chest wall can cause a leak into the pleural space which may be due to penetration of the chest wall, fractured rib(s) or blunt trauma to the lung tissue. The risk of recurrence after initial treatment is minimal in the absence of underlying lung pathology. Aircrew should be fit to return to flying duties 3 months after treatment and on complete recovery from the incident.
2.2	**Deformities of the Chest**	
2.2.1	**Pectus Excavatum or Carinatum**	Specialist opinion unless minor. Investigate lung function with chest X-ray and respiratory function tests. Significant deformity will require echocardiography and exercise ECG. Exclude Marfan's syndrome or other conditions as indicated.
2.2.2	**Bullae**	**Unfit aircrew recruitment.** **Serving aircrew**: Require respiratory physician assessment. If the risk of spontaneous pneumothorax is high, manage as spontaneous pneumothorax Serving aircrew with bullae associated with underlying COAD or emphysema are unfit flying duties. Surgical resection of a single bulla in a younger aircrew member should be considered before flying category is reinstated.
2.2.3	**Pleural Effusion**	Pleural effusions associated with pathology incompatible with military service. Respiratory physician assessment and referral to OC AMU.
3	**INFECTIVE**	
3.1	**Tuberculosis (TB)**	TB is a debilitating respiratory infection which is difficult to eradicate and poses a public health hazard. Apical cavities may be seen on chest radiographs.
3.1.1	**Active or Latent TB**	Any history of primary or treated TB normally unfit aircrew selection. Aircrew with pulmonary TB are to be referred in for respiratory physician assessment. They will be restricted to NZ for a period of 12-18 months. Whilst taking anti-tuberculous therapy they will be grounded but following treatment, if chest radiography and clinical examination are satisfactory, they may be graded A3, 'unfit solo pilot - must fly with pilot suitably qualified on type'. Twelve months after completing chemotherapy, provided there is no evidence of recurrence, they are to be medically boarded by OC AMU or other designated authority where they will normally be awarded an aircrew medical category of A1/2 G2/3 Z1.
3.2	**Bronchiectasis**	Patients with bronchiectasis are at increased risk of developing chest infections and should be given a medical category not above Z3, 'unfit for service outside base areas'.
3.3	**Bronchitis, Pneumonia and Pleurisy**	Frequent childhood bronchitis suggests bronchial lability and a pre-disposition to asthma. Careful assessment will be required. Isolated attacks of pneumonia with full recovery are of no long term consequence. However, if the chest X-ray is abnormal, specialist referral is indicated. A history of pleurisy with an effusion is suggestive of TB. If less than 2 years prior to entry, this will entail temporary rejection. If more than 2 years

		prior to entry, the individual may be acceptable for air and ground duties subject to specialist assessment and normal chest radiography.
4	**INFLAMMATORY**	
4.1	**Asthma**	Asthma is a disease characterised by wide variations, in short periods of time, in the resistance to airflow within the intra-pulmonary airways. In general, individuals who have symptoms of asthma up to the age of 18 have a 30-50% chance of recurrence in adult life. Individuals who have symptoms past the age of 18 will be considered asthmatic "for life". These statistics have led the RAF to continue to reject all aircrew candidates who have a history of childhood asthma. Because of the high incidence of asthma in the New Zealand population, and the small number of candidates who possess the required aircrew aptitudes, the RNZAF has taken a slightly more relaxed stance on the recruiting of aircrew with a history of asthma. The problems associated with asthma in military aviation are as follows: a. Aircrew may be tempted to fly whilst unfit due to bronchospasm, which increases susceptibility to hypoxia. b. Mild dyspnoea may be distracting. c. A sudden onset severe attack may jeopardise flight safety. d. Squadron operations may be severely disrupted because of an aircrew member's recurrent illness denying the squadron of a critical asset. e. In-flight irritants may exacerbate bronchospasm (dust, smoke, and fumes in the cockpit). f. Increase the individual's risk in the survival/ escape and evasion situation (especially if prophylactic medications are lost or destroyed). g. Could increase the risk to individual during hypobaric training, especially during rapid decompression. h. Positive pressure breathing, breathing cold or dry air, and +Gz exposure can stimulate bronchospasm in individuals with hyper reactive airways.
4.1.1	**Asthma:** **Aircrew Applicants**	Aircrew applicants who have symptoms of asthma in the preceding 5 years or after the age of 18 should be rejected. Applicants who have a history of severe asthma or "brittle" asthma demonstrated by either frequent attacks, several hospital admissions or, regular oral steroids or oral/IV steroids during an attack should be rejected. Applicants who require prophylactic medication (ICS/LABA or Leukotriene antagonists) to remain asymptomatic should be rejected. Referral to a respiratory physician for evaluation and investigation is essential in all aircrew applicants with a history of asthma. The respiratory physician's assessment is to include a bronchial provocation test (BPT; e.g. hypertonic saline challenge test). To be accepted, aircrew applicants should:

		a. be free of asthma for at least 5 years; b. have no symptoms past age 18; c. have a negative bronchial challenge test and not require any prophylactic or relieving medications; and d. have no associated food allergy.
4.1.2	**Management of Asthma in serving Aircrew**	Serving aircrew who develop asthma should be assessed by a respiratory physician and this should include a BPT. Aircrew (including pilots) may continue to fly while taking prophylactic ICS conditional on the following: a. Aircrew require three monthly follow up by an Av MO to assess and monitor their response to medication. b. In addition, aircrew are to monitor their daily peak flows (PF) to establish their own PF norms and to determine and familiarise themselves with the pattern of their disease. c. Minimum PF limits are to be set by the Av MO, below which aircrew are to commence bronchodilator medication, remove themselves from flying and seek medical advice. d. At 3 monthly assessment the Av MO is to: i. take a careful history to identify any symptoms of asthma; ii. review the aircrew members PF diary; iii. perform a physical examination of the respiratory system; iv. review spirometry; and v. develop/update an asthma plan specific for the aircrew member using the Asthma Society guidelines. Serving aircrew who require a course of bronchodilator medication for acute attack are to be made unfit flying for at least 24 hours after the medication has ceased. Aircrew (specified roles) who suffer from exercise induced asthma and who take bronchodilator medication prophylactically before exercise need wait only 8 hours before flying. Aircrew who suffer from asthma are to carry inhaled bronchodilator medication when flying for use in an emergency. This is to be specifically identified on their aircrew medical category. Treatment with oral methylxanthines, Long Acting Beta agonists and Leukotriene receptor antagonists, is incompatible with flying duties.

4.1.3	**Boarding of Aircrew Who Develop Asthma**	Serving aircrew who develop asthma should be downgraded to A3, G3, Z1 R3, TRUMS, with the following limitations: a. Unfit high performance aircraft; b. Unfit solo pilot - Must fly as co-pilot or with co-pilot qualified on type (waiver can be given for aircrew during FIC and posting to PTS); c. Must use Inhaled corticosteroids prophylactically; d. To carry medication; e. Must monitor peak flows and commence bronchodilator therapy and cease flying if PF falls below …. (from Asthma Plan); and f. Z2 climatic limitation may be required if the asthma is triggered by exposure to cold air.
4.1.4	**Training Limitations**	Respiratory irritants. In addition to the limitations above, the following limitations apply to training: a. Respiratory Irritants. Care must be exercised in assessing fitness of individuals for exposure to respiratory irritants in training for example CS gas and training smokes. There is no absolute contraindication; however, personnel with an adverse previous exposure history or poor asthma control should not be exposed. b. Rapid decompression. Asthmatics may be deemed fit provided their chest x-ray is normal, there is no measurable hyper-responsiveness, and there is no excessive diurnal variability. c. Strenuous Physical Exertion. Individuals with asthma may be unfit strenuous physical exertion. d. HUET short term compressed air supply (STASS) – Dry training only. No Wet training. Note: hypobaric hypoxia training is acceptable provided the aircrew member is asymptomatic at the time of the training.
4.1.5	**Exercise Induced Asthma**	Non Pilot aircrew (FLTSTWD, AWS and AO branches only). Applicants with a history of exercise induced asthma and normal FEV1 at rest and normal BPT, for the above specific non pilot aircrew roles, who use prophylactic bronchodilator for well defined, mild exercise induced asthma, and who have a good exercise tolerance, even without medication may be accepted in certain circumstances (following careful assessment and approval from OC AMU).
4.2	**Chronic Obstructive**	**Aircrew applicants:** A diagnosis of COAD (either chronic bronchitis or emphysema) is a bar to selection.

	Airways Disease (COAD)	**Serving Aircrew:** As COAD and emphysema are variable in severity, each case must be assessed individually. Sudden incapacitation is unlikely in mild cases. However as the disease progresses, operational efficiency may be markedly reduced. Mild cases with radiological (CT) evidence of the absence of bullae may be allowed unrestricted flying. Aircrew with bullae are unfit flying. Aircrew with impaired lung function should be made "unfit solo pilot - Must fly as co-pilot or with co-pilot qualified on type". More severe cases should be downgraded to A4, "unfit flying as aircrew, permanent".
5.	**OTHER**	
5.1	**Sarcoidosis**	Sarcoidosis is a systemic, multi-organ granulomatous disease. The most common presentation is asymptomatic bilateral hilar lymphadenopathy on routine CXR. Eight percent of cases with such nodes disappear within two years and can be labelled as having had acute/subacute sarcoidosis. If the disease is present for longer it is termed chronic. The main concern in aviation is that 13 - 20% of patients dying from sarcoidosis have cardiac involvement and arrhythmias, and a high proportion of these patients died from sudden onset, unheralded arrhythmias. Pulmonary involvement causes restrictive airways disease. It may be associated with uveitis and nervous system involvement. **Aircrew applicants:** Aircrew applicants with a history of sarcoidosis should be rejected. **Serving Aircrew:** The following should be grounded: a. suspected sarcoidosis; b. those with acute symptomatic disease; c. those with chronic disease especially if they have uveitis, bone or skin sarcoidosis; d. those with persistent widespread pulmonary shadowing or with abnormal gas transfer; e. those with evidence of cardiac sarcoid. Following confirmation of the diagnosis aircrew are to be downgraded A4 whilst treatment continues.

		When off treatment, provided that there is no evidence of continuing disease activity and no cardiac involvement, patients are to be referred to OC AMU for award of an appropriate medical category. At that stage a pilot would be 'unfit solo - must fly with pilot suitably qualified on type'. A normal flying category will depend on a further year of satisfactory observation. Cardiac involvement requires permanent grounding. Aircrew with asymptomatic bilateral hilar lymphadenopathy, require a full non-invasive cardiovascular work-up by a cardiologist to exclude cardiac involvement. The following limitations may be considered whilst lymphadenopathy only is present: a. Unfit solo pilot - must fly as co-pilot or with co-pilot qualified on type; and b. Unfit high performance aircraft. Non pilot aircrew will be assessed on a case by case basis using the information above as guidance.
5.2	**Lung Cancer**	**Aircrew Applicants:** Aircrew applicants with a history of cancer of the lung are to be rejected. **Serving Aircrew**: Each case should be assessed on its own merits. As sudden incapacitation due to intra-cerebral metastasis is a possibility it is vital that cerebral metastases are excluded utilising an MRI scan. In the past a blanket period of five years of grounding was compulsory to reduce the risk of sudden/subtle incapacitation. However, in some low risk cases it may be possible with regular MRI follow up for aircrew to be returned to flying: a. as or with co-pilot trained on type; and b. metropolitan areas only.
5.3	**Smoking Cessation**	Smoking remains the largest single preventable cause of death and disability in the NZ.
5.3.1	**Use of Bupropion**	**Bupropion (Zyban).** The drug Bupropion is of proven effectiveness but has significant side effects, which include grand mal seizures, impaired concentration, anxiety, depression and agitation. It is not recommended as a first line treatment in the NZDF due to its occupational implications and its adverse effects profile. Due to the psycho-active nature of Bupropion and its side-effects, the use of the drug precludes any flying duties. In view of the significant occupational implications when taking Bupropion, Service personnel using the drug are unfit to deploy operationally and are to be awarded a temporary medical category A4 G4 Z4, 'unfit for service outside base areas' and 'unfit handling live arms'.

		Aircrew are to be advised to consider deferring treatment with Bupropion until they are on a non-flying tour. Although there is no standard requirement to amend the Z category, it should be noted that malaria prophylaxis is not to be taken with Bupropion. Where aircrew have received a course of treatment with Bupropion they may be upgraded and returned to flying duties no earlier than 2 weeks after ceasing the treatment. Return to flying is subject to a satisfactory medical examination conducted by an Av MO. If neurological or neuropsychiatric side-effects have been experienced whilst taking Bupropion, return to flying is dependent on the results of a medical assessment undertaken by an Av MO and following discussion with OC AMU. Return to flying after suffering a grand mal seizure, as a result of taking Bupropion, is at the discretion of the OC AMU who is to seek the opinion of a Consultant in Neurology.
5.3.2	**Use of Varenicline (Champix)**	Varenicline's side-effects include suicidal ideation and behaviours. Varenicline is not to be prescribed to aircrew at any juncture, whether currently engaged in flying/aircraft controlling duties or not. In the event that this medication has been incorrectly prescribed it must be immediately tapered and withdrawn. A further 3 month period of grounding / non-controlling duties is required once the medication has been stopped and all aircrew should be reviewed by an Av MO and following discussion with OC AMU before resuming normal duties.
5.3.3	**Use of Nortriptyline (and other antidepressant medication) for smoking cessation**	Due to the requirement for increasing daily divided doses over the course of treatment with a psychoactive substance with known side effects, especially sedation, aircrew are to be grounded whilst receiving nortriptyline for smoking cessation.
5.4	**Screening Chest Radiography (CXR)**	A CXR is not a mandatory component of the medical assessment of recruits. It remains an important investigation for the screening of groups selected on clinical and other grounds. Indications may include: a. Persons with a history and clinical profile suggestive of cardio-respiratory disease or abnormality. b. Those with a first or second generation family history of pulmonary tuberculosis. c. First generation immigrants, especially if recruited from large high risk inner city areas. Potential aircrew CXR is only required if clinically indicated, such as for past history of respiratory disease.

5.5	**Conditions not listed in this chapter**	**Address with OC AMU. Additional information required** Full clinical history, specialist reports, respiratory function tests and investigations must be provided for consideration.

Chapter 16: Speech, Oral and Dental Systems

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with important speech, oral or dental disorders.

2. This section is not exhaustive, but details policy on the assessment and treatment of speech, oral or dental disorders relating to aviation in the NZDF.

3. 3. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

4. Specific problems: Speech, oral and dental systems

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**CONGENITAL/DEVELOPMENTAL**	
1.1	**Deformities of the mouth, jaw, throat or nose**	If interferes with breathing or prevents effective use of face masks or breathing apparatus. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
		If no interference with breathing or use of face mask. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
1.2	**Severe craniofacial anomaly**	If interferes with breathing or prevents effective use of face masks or breathing apparatus. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
		If no interference with breathing or use of face mask. **Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
1.3	**Speech defect which precludes effective communication**	Will require speech pathology assessment.
		Inability to effectively communicate including the inability to pass on orders or messages under military conditions.

		Aircrew applicants: Unfit. **Serving aircrew:** Unfit flying duties.
2.	**FUNCTIONAL**	
2.1	**Dental abnormalities** such as: Gross malocclusion, hypermobility of teeth or jaws unsuitable for fitting of satisfactory prostheses. TMJ dysfunction – assess on case by case basis	Applicants are required to provide reports from an oral surgeon, orthodontist or their own dentist addressing the extent of treatment required and any potential long-term problems. Requires military dental officer assessment. **Aircrew applicants:** Unfit until resolved. **Serving aircrew:** Unfit flying duties until resolved.
2.2	**TMJ dysfunction**	Will be significant if symptomatic or a potential source of distraction. **Aircrew applicants:** Unfit until resolved. **Serving aircrew:** Assess on case by case basis.
3.	**INFECTIVE/INFLAMMATORY**	
3.1	**Acute inflammatory conditions of the oral cavity**	To be treated and checked for any serious underlying medical condition before reassessment. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
3.2	**Dental caries - extensive**	Likely to result in pain or injury while deployed. Increased risk of becoming a liability on deployment. **Decision:** Requires assessment for risk of long-term problems after treatment through extensive restorations or caries, or unacceptable oral hygiene. **Aircrew applicants:** Assess on case by case basis. Likely to be unfit until resolved. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	Treatment completed and no	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

	risk of long-term problems	
	If risk of long-term problems through extensive restorations or caries, or unacceptable oral hygiene	May be unacceptable. Applicants are required to provide reports from oral surgeon, orthodontist or their own dentist. Assessment by a military dental officer is required. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.	**ORTHODONTIC APPLIANCES**	
4.1	Need for extensive or complex orthodontic or orthognathic treatment	**Decision:** Applicants are required to provide reports from oral surgeon, orthodontist or their own dentist. The report is to address whether there is a need for extensive or complex orthodontic and/or orthognathic treatment and make a recommendation on dental fitness to serve in the NZDF. The Defence Force Recruiting Medical Officer may seek the advice of a Senior NZDF Dentist if specialist dental treatment is required. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.2	**Active orthodontic appliances (bands/ braces)**	**Decision:** An applicant wearing orthodontic appliances requires a report from applicant's treating specialist outlining the reasons for treatment and current treatment plan. **Aircrew applicants:** Assess on case by case basis. Likely to be unfit until treatment is completed. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require restriction on role and deployability.
4.3	**Passive (plates)**	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.4	**Dentures, caps, crowns, bridges**	Acceptable if jaw is fully functional and asymptomatic. **Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.

4.5	**Reserved**	
4.6	**Wisdom teeth: Impacted**	May result in pain, infection, ongoing care. Assessment by a military dental officer required. **Aircrew applicants:** Assess on case by case basis. Likely unfit until resolved. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis. Likely to require role and deployment restrictions.
	If painful or infected requires treatment by a dentist.	**Aircrew applicants:** Unfit. **Serving aircrew:** Unfit flying duties.
	If treatment completed and no infection or inflammation.	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
4.7	**Orthodontic retainers**	
	Orthodontic treatment complete	**Aircrew applicants:** Assess on case by case basis. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
	If obvious dentofacial anomaly	**Aircrew applicants:** Unfit. **Serving aircrew:** Serving aircrew are to be assessed on a case by case basis.
5.	**Annual Aircrew Medical Examination:** The annual aircrew medical examination is designed to establish medical and dental fitness to fly at the time of the examination. The examining Medical Officer will establish the current dental category of aircrew personnel at their annual medical examination from the Medical Summary or as provided by the member. The patient may subsequently be referred by the Medical Officer to the Dental Centre for further investigation/treatment if the dental Cat at the time of annual medical indicates: a. The recall date for periodic dental inspection (PDI) having expired. b. Outstanding treatment which may affect fitness to fly. **Dental Fitness to Fly:** If at any stage aircrew are judged to be unfit to fly as a result of specific dental pathology or a failure by the individual to maintain a current dental Cat, the MO is to be consulted and the situation is to be discussed with the executive. If necessary, medical downgrading procedures are to be initiated. As soon as dental fitness to fly is re-established medical staff are to be informed and appropriate administrative action taken.	

Chapter 17: Visual System

1. This section gives details on the assessment and management of aircrew recruits and serving aircrew personnel with common and important visual disorders. It is not exhaustive, but details policy on the assessment and treatment of common and important eye conditions relating to aviation in the NZDF.

2. Requests for specific advice concerning the employment of aircrew should be directed to OC AMU.

3. Specific problems: Visual system

SERIAL	CONDITION	CONSIDERATION AND DISPOSAL
1.	**LIDS/CONJUNCTIVA/SCLERA**	
1.1	**Abnormalities of the lids interfering with normal function**	Most conditions should be correctable and benign. **Aircrew applicant:** May be fit for entry when fully recovered. **Serving aircrew:** May require temporary grounding depending on severity.
1.2	**Complete or extensive lid deformity**	**Aircrew applicant:** Unfit aircrew training. **Serving aircrew:** Will require temporary grounding and return to flying status will depend on severity; assess on case by case basis.
1.3	**Blepharitis**	**Aircrew applicant:** May be fit for entry when fully recovered. Unfit if more than mild degree and more than three acute episodes per year. **Serving aircrew:** May require temporary grounding depending on severity.
1.4	**Dacrocystitis**	**Aircrew applicant:** Unfit aircrew training. **Serving aircrew:** Will require temporary grounding and return to flying status will depend on severity; assess on case by case basis.
1.5	**Infective or allergic conditions of eyelids or conjunctivae—recurrent**	Most conditions should be correctable and benign. **Aircrew applicant:** May be fit for entry when fully recovered. Unfit if recurrent with frequent and troublesome symptoms. **Serving aircrew:** May require temporary grounding depending on severity.
1.6	**Scleritis—recurrent**	**Aircrew applicant:** Unfit aircrew training. **Serving aircrew:** Will require temporary grounding and return to flying status will depend on severity and assessment for possible underlying autoimmune / other associated conditions; assess on case by case basis. May require geographical limitation.
1.7	**Growths or tumours of the eyelid**	**Aircrew applicant:** May be fit for entry when fully recovered, depending on aetiology / histology. Unfit if residual, multiple or recurrent.

		Serving aircrew: May require temporary grounding and return to flying status will depend on severity; assess on case by case basis.
2.	**CORNEA**	
2.1	**Corneal scarring**	**Aircrew applicant:** Unfit if causes loss of visual acuity (VA) and glare problems. Vascularisation or opacification of the cornea from any cause that is progressive or reduces vision below entry visual standards will render candidate permanently unfit. **Serving aircrew:** Will require temporary grounding for full ophthalmic assessment and return to flying status will depend on severity; assess on case by case basis. May require AWQCPOT limitation.
2.2.1	**Keratitis**	**Aircrew applicants:** Past single episode may be suitable. Assess on case by case basis. If more than one episode the likelihood of further attacks is unpredictable therefore not suitable for enlistment and aircrew training **Serving aircrew:** Continued flight status will be dependent on visual performance, the frequency and severity of attacks and the requirement for treatment and follow up. May require AWQCPOT and geographical limitation.
2.3	**Dendritic Ulcer and Herpes Simplex Keratitis (HSK)**	HSK is usually a one-off uncomplicated condition with no residual effect. Following the initial infection 20-25% of people may however develop met-herpetic disease and become prone to recurrent corneal disease with the risk of visual loss. **Aircrew applicants:** Because HSK can be recurrent and can affect vision, more than one attack is a bar to aircrew training. Applicants with a single attack where there are no residual effects and vision has returned to normal may be considered fit. Dendritic ulcer Must have full recovery, no scarring and no recurrence. More than 1 episode – unfit. **Serving aircrew:** Aircrew are to be grounded during the attack and be off treatment before returning to flying duties. Any persistent loss of VA in aircrew should be referred to specialist in Ophthalmology for assessment in consultation with OC AMU. Because of the potential for recurrence, a limitation may have to be placed on overseas deployment to ensure that immediate ophthalmic assessment is available in the event of an attack.
2.4	**Keratoconus**	Keratoconus is normally a bilateral condition of young adults causing blurred vision and corneal scarring. **Aircrew applicants:** A history of Keratoconus is a bar to aircrew training. **Serving aircrew:** Hard contact lenses are not normally permitted for aircrew use. Continuation of flying for serving aircrew will be in a case by case basis. Aircrew requiring a corneal graft will then fall under the provisions of guidelines for return to flying after receiving a corneal graft.

2.5	**Other abnormalities of the conjunctivae**	Assess on case by case basis. Recurrent condition will render aircrew candidates unfit.
2.6	**Pterygium**	**Aircrew applicants:** Unfit until treated. Recurrent growths will be a bar to entry. **Serving aircrew:** Early referral and management advised. If interfering with visual acuity will necessitate temporary grounding until fully treated and recovery made.
2.7	**Corneal Grafts**	**See section 8.2.**
2.8	**Corneal refractive surgery**	**See section 8.3.**
3	**LENS**	
3.1	**Aphakia**	**Aircrew applicant:** Unfit aircrew. **Serving aircrew:** Requires full assessment by ophthalmologist. Return to flying assessed on case by case basis in consultation with OC AMU.
3.2	**Dislocation of Lens**	**Aircrew applicant:** Unfit aircrew. **Serving aircrew:** Requires grounding and full assessment by ophthalmologist. Return to flying assessed on case by case basis in consultation with OC AMU.
3.3	**Cataracts / Lens opacities**	Cataracts produce a number of symptoms, the most common being gradual painless loss of vision, glare (particularly from car headlights), and double vision. Treatment is surgical with cataract extraction and intraocular lens implant when cataract symptoms become visually significant. **Aircrew applicants:** Aircrew applicants with a history of cataract are unfit for aircrew training. Applicants who have had a successful lens replacement with intra ocular lenses and meet the entry criteria maybe considered for aircrew training subject to specialist review. Current lens opacities render applicant unfit for training. **Serving aircrew:** Aircrew who develop cataracts or lens opacities are to be assessed by a specialist in ophthalmology. Subsequent fitness to fly to be made in consultation with OC AMU. Successful cataract surgery need not be a bar to a return to flying duties. Any cataract surgery in aircrew should be performed by a specialist with knowledge of aviation ophthalmology. Aircrew who undergo cataract surgery are to be subject to regular review throughout their flying careers. Multifocal IOLs or monovision correction using IOLs is unacceptable.
4	**IRIS/UVEA/CHOROID**	
4.1	**Glaucoma and Raised Intraocular pressure**	**Aircrew applicants:** Aircrew applicants with a history of ocular hypertension or glaucoma are not fit for aircrew training.

		Serving aircrew: Those with ocular hypertension require regular screening including visual field (VF) assessment by either an ophthalmologist or optometrist. Aircrew are fit unrestricted flying where the VF is deemed adequate but significant unilateral field loss in experienced aircrew would confer a monocular or uniocular grading. All aircrew are to be assessed by a specialist in ophthalmology and discussed with OC AMU. Adrenaline and pilocarpine drops (pupil-affecting) are incompatible with flying duties. If surgery is indicated (trabeculectomy), the individual is to be downgraded, Z5 'NZ only', until either fully recovered or stable and preferably off topical treatment. Thereafter, a G3 category is appropriate, provided that the VF is satisfactory.
4.2	**Uveitis, Anterior–iritis / irido-cyclitis**	Anterior uveitis causes pain, photophobia, loss of VA and posterior synechiae, it is characteristically recurrent. **Aircrew applicants:** Uveitis (or a past history of) anterior, intermediate or posterior (syn: iritis, pars-planitis, vitreitis, choroiditis) will usually be a bar to entry. **Serving aircrew:** Continued flight status will be dependent on visual performance, the frequency and severity of attacks and the requirement for steroid drops. Long-term treatment of anterior uveitis with topical steroids is not compatible with flying duties unless under regular review by the specialist in ophthalmology and after discussion with OC AMU. A geographical/deployment limitation will normally have to be imposed to ensure appropriate ophthalmological assessment is immediately available e.g. Z4 Metropolitan areas only. In addition a limitation of "as or with co-pilot qualified on type' is appropriate. If there is a period of 3 years free of attacks consideration can be given to returning to full flight status.
4.2.1	**Choroiditis**	**Aircrew applicants:** Aircrew applicants with a history of choroiditis are unfit flying training. **Serving aircrew:** Continued flight status will be dependent on visual performance. A geographical/deployment limitation will normally have to be imposed to ensure appropriate ophthalmological assessment is immediately available. In addition a limitation of "as or with co-pilot qualified on type' is appropriate.
5	**NEURO/NEUROMUSCULAR/FUNCTIONAL**	
5.1	**Diplopia**	**Aircrew applicant:** Unfit aircrew. **Serving aircrew:** Requires full assessment by ophthalmologist. Return to flying assessed on case by case basis in consultation with OC AMU.
5.2	**Myopia**	**See Appendix 1 *Visual Standards*.**

5.3	**Nystagmus**	**Aircrew applicant:** Unfit aircrew. **Serving aircrew:** Requires full assessment by ophthalmologist. Return to flying assessed on case by case basis in consultation with OC AMU.
5.4	**Amblyopia and Stabismus**	**Aircrew applicant:** The individual should be assessed by an ophthalmologist. Unlikely to meet visual standards for aircrew trades.
5.4.1	**Duane Syndrome**	**Aircrew applicant:** The individual should be assessed by an ophthalmologist. Unfit aircrew training.
5.4.2	**Strabismus, squint**	**Aircrew applicant:** An aircrew applicant with a past history of strabismus that has been corrected by patching or surgery will be considered on the basis of their residual function. The individual should be assessed by an ophthalmologist to ensure that the likelihood of regression is small and that all visual standards are met. Aircrew applicants with a frank squint will be outside the limits for eso/exophoria and are unfit flying training. **Serving aircrew:** Serving aircrew who develop a squint are to be referred for ophthalmological assessment. They are considered fit to return to flying duties when they meet the entry standard for eso/exophoria.
5.5	**Prism correction of spectacles**	**See Appendix 1 *Visual Standards*.**
5.6	**Loss of pupillary reflex**	**Aircrew applicant:** The individual should be assessed by an ophthalmologist. Unfit aircrew training. **Serving aircrew:** Requires full assessment by ophthalmologist. Return to flying assessed on case by case basis in consultation with OC AMU.
5.7	**Monocular and Uniocular vision (any cause)**	Personnel with defective vision in one eye have varying degrees of reduced depth perception and restricted fields of vision. Monocular and uniocular personnel are significantly increased risk of visual incapacitation following other ocular injuries and are therefore also deemed unfit to work with lasers. For the purposes of this publication, specific definitions are listed below: a. Uniocular. When one eye is normal and the other eye is either absent or is blind. b. Blind eye. An eye possessing a best attainable corrected Snellen visual acuity (VA) of 6/60 or worse. c. Monocular. When an individual has two seeing eyes, one eye with normal vision but the other eye possessing a best corrected VA between 6/60 and 6/24. **Aircrew applicants:** Permanently unfit for flying training.
5.7.1	**Uniocular vision**	**Serving aircrew:** In favourable cases aircrew may be permitted to return to flying duties after successful rehabilitation with an A3 grading, 'unfit solo pilot

		- must fly with a pilot suitably qualified on type' subject to recommendation from OC AMU.
5.7.2	**Monocular vision**	**Serving aircrew:** Pilots are likely to be graded A3, 'unfit solo pilot - must fly with a pilot suitably qualified on type' subject to recommendation from OC AMU. Trained Pilots that become monocular may return to limited flying 1 year after the loss of the eye. Prior to returning to flight status the pilot should undergo assessment by a QFI. Monocularity is incompatible with NVG use. Other aircrew members may be allowed to return to a full flying category.
5.8	**Visual field defects**	**Aircrew applicants:** Aircrew applicants with visual field defects are unfit for aircrew training. **Serving Aircrew:** Following ophthalmological assessment serving aircrew who develop a field defect that has no aeromedical significance may return to flying with a grading of A3 'as or with co-pilot qualified on type'.
5.9	**Migraine**	Migraine is incompatible with solo flying and solo aircraft controlling duties and assessment by a neurologist is mandatory. **See Chapter 14 *Neurological System***
5.10	**Optic neuritis**	Optic neuritis causes loss of vision and is incompatible with flying in the acute phase. After the neurologist/ophthalmologist has confirmed full recovery and after underlying demyelinating disease has been excluded by the neurologist; it may be possible to return the patient to flying duties. **See Chapter 14 *Neurological System***
6	**DEGENERATIVE**	
6.1	**Retrobulbar neuritis**	**Aircrew applicants:** Aircrew applicants with a history of retrobulbar neuritis are unfit flying training. **Serving aircrew:** Retrobulbar neuritis is incompatible with flying in the acute phase. After the neurologist/ophthalmologist has confirmed full recovery and after underlying demyelinating disease has been excluded by the neurologist; it may be possible to return the patient to flying duties. **See Chapter 14 *Neurological System***
6.2	**Retinopathies**	**Aircrew applicants:** Aircrew applicants with a history of retinopathy are unfit flying training. **Serving aircrew:** Grounding required for the acute phase. Continuation of flight status will be decided on a case by case basis following specialist ophthalmic assessment and visual function.

7	**TRAUMA**	
7.1	**Intra-ocular foreign body**	**Aircrew applicants:** Ophthalmologist review required. May consider if vision stable (and meets standards) with no anticipated sequelae or need for specialist review more than once a year. **Serving aircrew:** Continuation of flight status will be decided on a case by case basis depending on visual function and whether the condition is unilateral or bilateral.
7.2	**Retinal detachment**	**Aircrew applicants:** Aircrew applicants with a history of retinal detachment are unfit aircrew training **Serving aircrew:** Following surgery continuation of flight status will be decided on a case by case basis depending on visual function and visual field. In an experienced aircrew member where only one eye is affected the issue can be treated as if the member was monocular or uniocular.
8	**SURGERY**	
8.1	**Intra-ocular lens implant, includes cataract surgery** **(for phakic intra-ocular lens (PIOL) refer 8.3.4)**	**Policy in development**. **See section 3.3**
8.2	**Corneal grafts**	**Aircrew applicants:** Aircrew applicants who have received a corneal graft are considered unfit for aircrew training. **Serving aircrew:** A return to flying Serving aircrew who have received a corneal graft will be assessed on a case by case basis. The aviator with a corneal graft is likely to be assessed A3, 'unfit solo pilot - must fly with a pilot suitably qualified on type' or 'unfit solo (aircrew category to be specified)'. A return to unrestricted flying could only be achieved in exceptionally favourable cases when the required visual standards are achieved and there is an absence of significant visual symptoms.
8.3	**Refractive surgery**	Depends on type – **Appendix 2.**
8.3.1	**Photo refractive surgery**	**See Appendix 2.**
8.3.3	**All other surgical methods**	**Corneal reshaping surgery:** Corneal reshaping is not a form of refractive surgery, but it has been offered as an alternative to refractive surgery. Orthokeratology (Ortho –K) and corneal refractive therapy (CRT) are procedures using special gas permeable contact lenses to reshape the cornea as a temporary reduction of myopia. Ortho-k and CRT procedures are unacceptable for aircrew. Other Refractive Procedures: Other procedures such as Intrastromal Corneal Ring Segments (ICRS), thermal keratotomy and incisional astigmatic keratotomy are also unacceptable for aircrew.

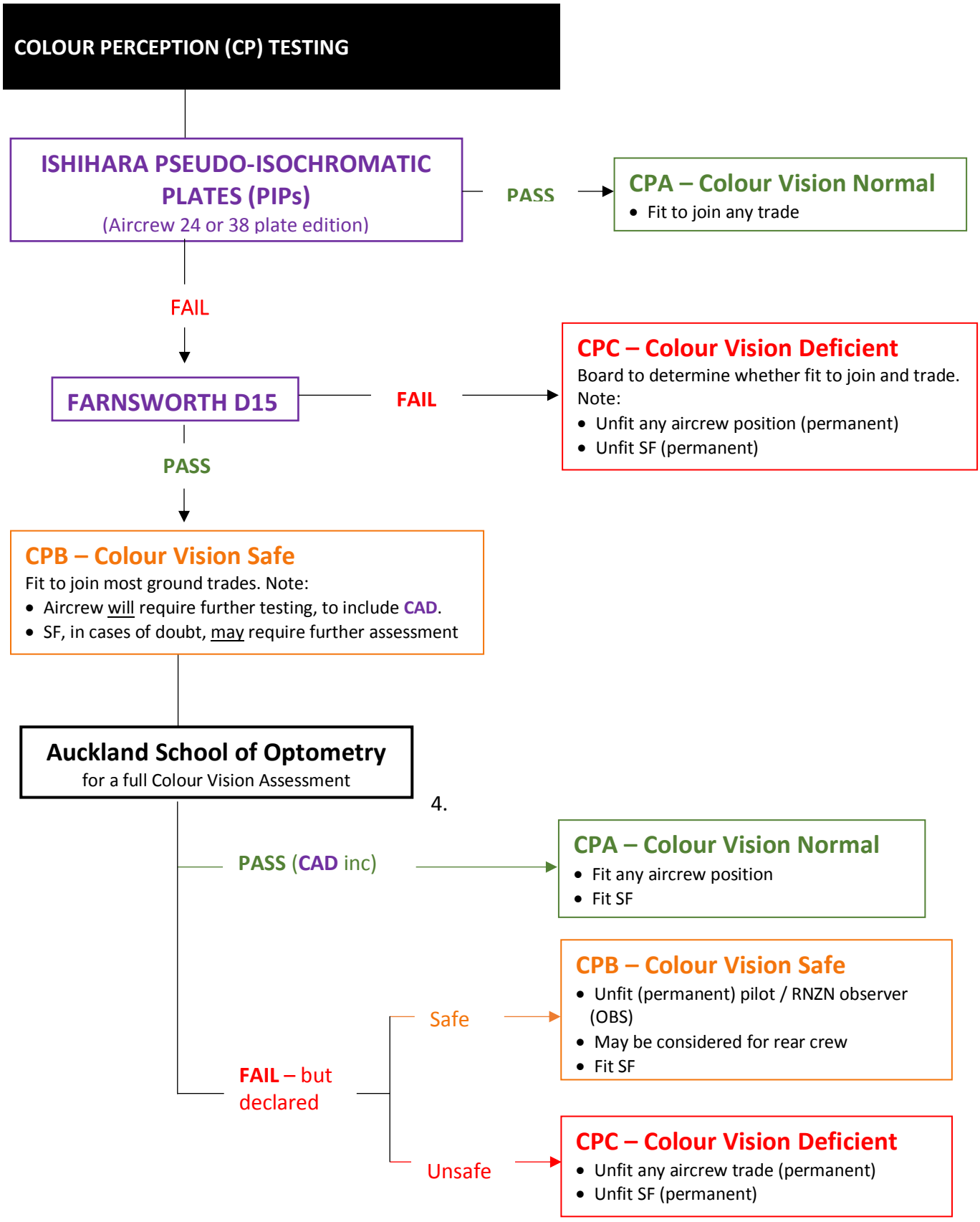
8.3.4	**PIOL implant (Phakic intraocular lens implant to correct myopia without removal of the eye's natural lens)**	**Policy in development. See section 3.3**
8.3.5	**Conductive keratoplasty (CK) & laser thermal keratoplasty**	**Policy in development.**
9	**OTHER**	
9.1	**Exophthalmos**	Requires ophthalmology opinion. Assess on case by case basis with OC AMU. **Aircrew applicants:** If not the result of a pathological process and vision is stable and meets the entry visual standards. **Serving aircrew:** Following ophthalmological assessment serving aircrew who develop exophthalmos may return to flying if it is not the result of a pathological process and vision is stable and meets the visual standards. If it is the result of an underlying medical problem then management is to be on a case by case basis with appropriate limitations.
9.2	**Other chronic or recurrent eye conditions**	**Aircrew applicant:** Specialist opinion required for prognosis and suitability for aircrew training. Important to refer to ophthalmologist with aviation experience and/or aware of aviation and military conditions. If vision or visual function threatened then unfit aircrew training. **Serving aircrew:** Continuation of flight status will be decided on a case by case basis depending on visual function and whether the condition is unilateral or bilateral.
9.3	**Orthokeratology**	**Presently** not approved for aircrew.
9.4	**Correction of reduced visual acuity**	See Appendix 1 and Appendix 3.
9.4.1	**Soft contact lenses (SCL)**	See Appendix 1 and Appendix 3.
9.4.2	**Corrective flying spectacles (CFS)**	See Appendix 1 and Appendix 3. CFS are to be checked at the periodic aircrew medical by the AvMO.
9.4.3	**Sunglasses**	Only sunglasses issued by RNZAF for the purpose of flying are to be worn by aircrew when flying. This is to ensure that they meet the required standard robustness and function.
9.5	**Night blindness**	Requires ophthalmology opinion. Assess on case by case basis with OC AMU. **Aircrew applicants:** Aircrew applicants with true night blindness are unfit for aircrew training. **Serving aircrew:** Following ophthalmological assessment serving aircrew who develop night blindness may return to flying on a case by case basis with

		appropriate limitations; with a grading of A3 ‘as or with co-pilot qualified on type’ and daytime restriction.

Appendix 1 to Chapter 17: Aviation Visual Standards at Selection (Aircrew Applicants)

	Minimum Visual Acuity[1]				Reference Range[2]		Muscle balance (Maddox Rod / Maddox Wing) at 6 metres	Convergence	Accommodation (with correction, by age)	CP[3]	Stereopsis
	Uncorr	Corr	Near[4]	Inter[7]	Sph	Cyl					
PILOT / OBS (RNZN)	6/24	6/6	N5	N14	-1.50 to +1.75 D	+/-0.75 D	Dist: Eso 6d to Exo 8d, ≤ 1d Vert Near: Eso 6d to Exo 16d, ≤ 1d Vert	≤ 10cm	17–20 ≤ 11 cm 21–25 ≤13 cm 26–30 ≤ 14 cm 31–35 ≤ 16 cm 36–40 ≤ 18.5 cm 40–45 ≤ 27 cm	A	≤ 40 secs of arc
HLM	6/24	6/6	-	-	-1.50 to +1.75 D	+/-0.75 D	As above	≤ 10cm	As above	A	≤ 40 secs of arc
ALM	6/24	6/7.5	-	-	-2.00 to +3.00 D	-0.75 to +1.25 D	As above	≤ 10cm	As above	A	≤ 40 secs of arc
AWO / AWS	6/36	6/7.5	-	-	-6.00 to +6.00 D	+/-2.00 D	-	≤ 10cm	-	A	-
FSTWD	6/60	6/7.5	-	-	-6.00 to +6.00 D	+/-2.00 D	-	≤ 10cm	-	B	-

[1] Each eye separately and bilaterally. Candidates who do not meet the minimum are to be awarded an A2 grading and the TWCLACASP (To Wear Corrective Lenses (approved) and to Carry a Spare Pair) restriction.
[2] Must be within the reference range in order to meet minimum corrected vision for trade or better.
[3] Colour Perception (CP). See next page flowchart for CP assessment.
[4] Each eye separately, between 30–50 cm, with spectacles if applicable.
[5] Each eye separately at 100 cm, with spectacles if applicable.
Trades: OBS (RNZN): Navy Observer; HLM: Helicopter Loadmaster; ALM: Air Loadmaster, AWO/AWS: Air Warfare Officer/Specialist; FSTWD: Flight Steward



Appendix 2 to Chapter 17:
Visual Correction for Aircrew: Corneal Refractive Surgery

1. Corneal Refractive Surgery (CRS) keeps advancing with newer techniques since its inception in the 1980s. There are a number of popular methods; although we do not advocate for individuals to undergo CRS, the following are acceptable for aircrew:

   a. Photorefractive Keratectomy (PRK) involves the reshaping of the anterior corneal surface by photoablation using an ultraviolet excimer laser. The corneal epithelium is removed prior to treatment and grows back over the treated zone within 4-6 days.

   b. Laser Epithelial Keratomileusis (LASEK) is a modification of PRK where a thin flap of corneal epithelium is created. The underlying corneal stroma is ablated in the same way as PRK but the flap of epithelium is replaced and acts as a bandage lens. The visual outcome is very similar to PRK but pain and haze are reduced.

   c. Laser In-Situ Keratomileusis (LASIK) involves the cutting of an actual flap of corneal stromal tissue and ablating the underlying stromal bed, before replacing the flap. Disruption of the epithelial layer is kept to a minimum and this avoids the aggressive healing response that leads to the formation of haze. Pain is also minimised and visual recovery occurs within 1-2 days. For those with low levels of myopia, outcomes in terms of visual performance for all of these techniques are very similar.

   d. Wavefront Guided (WFG), or custom LASIK, is just a more refined or accurate form of LASIK.

   e. Small Incision Lenticule Extraction (SMILE) procedure is presently under review.

   f. Other forms of refractive surgery are currently not acceptable

2. A. Aircrew Applicants

3. Aircrew are normally recruited at an age before ocular maturity when CRS may not provide long-term refractive stability. For this reason, CRS is <u>not recommended</u> below the age of 21. However, aircrew recruits may be accepted subject to the following criteria:

   a. CRS by PRK, LASEK and LASIK only. Aircrew applicants who have had any other refractive surgical correction are unfit for enlistment.

   b. A minimum of 6 months has elapsed since surgery.

4. They are to provide a letter from a photorefractive surgeon detailing:

a. Their pre-surgery refraction, at least one interim refraction and current refraction. The current refraction is to include an assessment of contrast sensitivity. Subject's refraction to have been stable for at least 6 months.

b. Recorded pre-operative ametropia, which must not exceed –7.00 to +3.00 dioptres in any meridian

c. Any ongoing postsurgical problems, e.g. oedema / inflammation / haze of the cornea and/or requirement for ongoing steroid drops.

d. Any reported deterioration in contrast sensitivity, night vision or increase in glare.

5. Individuals will be considered fit provided they meet the entry visual standards for their particular trade and have no significant adverse visual effects.

6. In case of doubt as to whether the applicant meets the entry visual standards, OC AMU may request an independent assessment from an ophthalmologist specialist in CRS.

7. Unlike some nations who perform corneal topography on all aircrew candidates to identify applicants who may have undergone CRS, NZDF will rely on an applicant's honesty to declare any previous photorefractive surgery. This is because corneal topography does not always demonstrate the evidence of CRS.

8. B. Serving Aircrew

9. Prior to treatment, personnel should be counselled on the possible complications or side effects of the procedure and on a potential loss of flying status as a result.

10. The cost of all surgery, follow-up and any additional treatment for complications, is to be borne by the individual.

11. The surgery is non-essential and could adversely impact on short to medium term availability for flying duties; aircrew are to be advised to defer treatment until they are on a non-flying tour. The individual is to obtain their line manager's approval before proceeding with surgery.

12. Aircrew who have undergone CRS are to be downgraded temporarily A4 'unfit flying duties' for a minimum of 3 (normally 6) months. Provided there has been a full recovery of visual standards (confirmed by the approved base CAA optometrist) and no complications, individuals may be re-graded A1 from the ophthalmic point of view. In cases of doubt, an assessment by a RNZAF preferred ophthalmic surgeon provider may be required.

13. Prior to the surgery the following conditions should be met:

a. A full ophthalmic examination.

b. Measurement of refractive error.

c. The individual's pre-surgical refractions must meet the following criteria:

i. Myopia < -7 Dioptres

ii. Hyperopia < +3 Dioptres

iii. Astigmatism < 2.5 Dioptres

iv. Anisometropia <2.5 Dioptres

d. The most recent refraction must have been performed within the preceding 6 months. Measurement of the best spectacle corrected Snellen VA, with and without the 'Brightness Acuity Tester' glare source.

e. Contrast sensitivity testing in photopic and mesopic conditions using the Pelli-Robson chart.

f. Contrast acuity assessment to assess functional visual performance under both photopic and mesopic levels of ambient illumination.

g. Pupillometry in mesopic and scotopic conditions.

Return to Duties

14. A return to flying duties is not permitted before 3 months. Serving aircrew who undergo any of the non-approved techniques will not be fit for flying duties.

15. Post-operative assessment. Performed before the individual is permitted to return to flying duties, usually at 1, 3 and 6 months (or as specified by their surgeon), they are to include a repeat of the pre-operative tests. A satisfactory outcome with stable refraction is required before returning to flying duties, normally 3-6 months postoperatively.

16. Conditions for fitness to fly. Once confirmed by an RNZAF AvMO Medical Officer, who will have considered the following criteria:

a. Two postoperative refractions have been performed at least two weeks apart with less than 0.5D difference between two measurements in the same eye.

b. All topical ophthalmic preparations, with the exception of artificial tears, have ceased.

c. There is an absence of unwanted symptoms or postoperative side effects including, but not limited to:

i. decrease in best corrected visual acuity,

ii. corneal haze, reduced contrast sensitivity, pain, blurred vision,

iii. degradation of night vision or colour vision, or significant dry eyes

17. Serving aircrew who appear to have had unapproved CRS (e.g. if aircrew are noted to have a marked improvement in uncorrected VA) are to be declared ‘unfit flying duties’ pending an assessment of visual standards.

Appendix 3 to Chapter 17: Visual Correction for Aircrew

a. This Appendix provides guidance and direction on the use of corrective lenses for aircrew. Appendix 1 provides details on visual standards for aircrew

b. All aircrew are to have VA 6/6 (uncorrected or corrected) in each eye or better when flying (unless indicated on Appendix 1).

c. Aircrew whose VA drops below 6/6 on Titmus testing is to be referred to an optometrist for assessment and prescription of corrective lenses (CL) in the form of either corrective flying spectacles (CFS) or soft contact lenses (SCL).

d. Once prescribed these have to be worn in flight and a spare pair of glasses carried for emergency use.

e. The requirement for the use of correction is to be reflected in an A2 grading with the limitation 'To Wear Corrective Lenses (approved) and to carry a Spare Pair' (TWCLACASP). SCL require additional caveat – 'Approved SCL'.

f. Corrective lenses (CFS and SCL) are to conform to specified standards – see below.

g. CFS are to be checked at the periodic aircrew medical by the AvMO.

h. Pilots, Observers and HLM holding an A2 category are to have annual optometry assessments.

i. Other personnel holding an A2 category are to have optometry assessments, as indicated by their optometrist or AvMO.

Contact Lenses

j. Although contact lenses do have drawbacks, contact lens technology has progressed to the point where the wearing of contact lenses is acceptable for aircrew, including pilots. As a result, SCLs and cleaning solutions are authorised for all aircrew at Defence expense.

18. Type of Contact Lenses.

a. Hard lenses, including gas permeable lenses, are unsuitable for military aircrew use because of the risk of their being dislodged from the eye and the potential risk of a foreign body being trapped under the lens. In addition, if the aircrew member has to subsequently revert to spectacles because of a problem with their contact lenses, spectacle blur can occur and remain for several hours following hard lens use.

b. High water content soft lenses are considered suitable. Deposable contact lenses are also acceptable provided they provide appropriate correction. The use of disposable contact lenses also reduces the problems of providing hygienic lens care under field

conditions. The majority of soft contact lenses have a high water content and are suitable for daily wear only.

c. Soft contact lenses or disposable lenses are suitable for RNZAF operational conditions.

d. There are circumstances in which SCL have a clear operational advantage over CFS as they do not interfere with other equipment. However they may rarely cause complications and the loss of a lens in flight is a potential hazard.

e. Aircrew wishing to wear SCL for flying duties are to be informed of the following:

   a. SCL being used for flying duties must be approved, periodically replaceable.
   b. SCL are incompatible with CBRN operations.
   c. SCL are not to be worn when wearing aircrew CBRN respirators (e.g. AR5).
   d. SCL are to be replaced by new SCL no less frequently than the intended life of the lens.
   e. They are to be worn as daily wear lenses and are not to be worn during sleep.
   f. Whenever an individual is wearing SCL whilst on duty, they are to carry a pair of clear CFS matching their current SCL prescription.
   g. There is risk of ophthalmic complications and temporary loss of operational effectiveness and temporary loss of operational effectiveness arising from the use of SCL by aircrew. These complications are generally related to misuse and irregular cleaning of SCL.
   h. If either eye becomes red or painful the individual is to cease wearing SCL immediately and report to a Service MO within 24 hours. (If not impossible, they are to attend a primary care medical practitioner, an ophthalmic practitioner or a hospital emergency department within the same period). If flight is necessary within that period the individual is to wear CFS. Following such an incident, SCL are not to be worn until approval has been obtained from an AvMO following advice from an ophthalmologist or optometrist.

Authorising SCL use

f. Aircrew who wish to use SCL whilst flying are to be referred to an approved ophthalmologist or optometrist for assessment. The ophthalmologist or optometrist is to confirm whether the individual is a suitable candidate for wearing SCL in flight.

g. Before approval to wear SCL in flight is given to the individual the AvMO is to ensure that:

   a. The individual undertakes to comply with the lens type, cleaning solution and follow-up requirements

   b. The individual has at least one month's satisfactory experience of daily use of the approved lens type and cleaning solutions, but not while actively flying

Limitations

r. Aircrew requiring the use of SCL are to be awarded a medical category of A2. The following limitation is be used:

   a. TWCLACASP (Approved SCL)

      i. Must wear approved visual corrective lenses when flying, authorised to wear contact lenses.

      ii. Must carry approved corrective flying spectacles (spare pair) when flying.

s. Authority to wear SCL in flight is not given until such action has been completed.

Follow up

t. Aircrew approved to fly wearing SCL are to be examined by an ophthalmologist or optometrist at 3 monthly intervals from first use in flight. After 6 months of satisfactory use of SCL in flight this interval may be extended to 6 months at the discretion of the ophthalmologist or optometrist.

Corrective Flying Spectacles

u. At present the RNZAF does not issue specialized issue flying corrective spectacles.

v. The following standards are to be followed for the procurement of CFS for aircrew:

   a. The spectacle frame should be thin and light, preferably of metal, in order to reduce obstruction of the field of vision and should completely surround the lens.

   b. Nylon thread or rimless type spectacles may be a flight hazard because of lenses falling out and are not authorised.

   c. Side pieces/arms should be thin/flat to avoid breaking the seal of the ear bun or headsets or protective flying helmets.

   d. Lenses should be a synthetic material e.g. CR 39, to reduce risk of shattering with impact such as a bird strike. For technical reasons, only low powered polycarbonate lenses can be prescribed for aircrew because of prismatic dispersion of light at higher refractive powers.

   e. Lenses may be single vision or multifocal, however, continuous or variable focus lenses are not authorised owing to distortion produced in the periphery.

   f. Tinted lenses, either plane or corrective, can be used but should be good optical quality. Polarising type tinted lenses are not authorised, as are gradient density lenses which may impede depth perception.

g. Photochromatic lenses are not authorised as, although they darken rapidly they may recover their transmittance too slowly for aircrew use.

h. Only sunglasses issued by RNZAF for the purpose of flying are to be worn by aircrew when flying. This is to ensure that they meet the required standard robustness and function.

w. CFS are to be checked at the periodic aircrew medical by the AvMO.