

# Aeromedical Policy Letters and Aeromedical Technical Bulletins



**Revision Date: May 2015**  
This revision supersedes all previous revisions.

# **Updated:**

## **Purpose, Authority, and Points of Contact**

**1. Authority.** The Director, US Army Aeromedical Activity (USAAMA) on behalf of the Aerospace Medicine Consultant (AMC) to the OTSG, is authorized to issue aeromedical technical bulletins and policy letters to provide flight surgeons guidance in regards to examinations and procedures to determine the fitness for flying duties, and the interim aeromedical disposition of disqualifying conditions, IAW AR 40-501, para 6-5 b.

**2. Implementation.** Policy letters and technical bulletins remain in effect from the date of publication until rescinded or superseded by the Director, USAAMA, or a higher authority.

**3. Purpose.**

- a. Policy letters recommend Army-wide standardization of aeromedical evaluation, treatment, and disposition for a variety of common clinical problems. They provide continuity of aeromedical care for aeromedical providers and aircrew members world-wide and ensure the optimum quality of care. They ensure the safe return of countless aircrew members to flying duties once effective treatment has been achieved.
- b. Technical bulletins recommend Army-wide standardization of aeromedical testing and administration. They ensure consistency in the completion of administrative requirements and the proper use of testing equipment and testing procedures throughout the Army's medical system.
- c. Policy letters and technical bulletins, while not regulations or orders, are a statement of policy by the Director, USAAMA, as derived from the recommendation of the Aeromedical Consultant Advisory Panel's (ACAP) review of data from the Aeromedical Epidemiology Data Register, consultation with numerous specialists, and review of medical literature. The policy letters also recommend medical evaluations which are required to make a final recommendation for flying duties, thus avoiding the delays resulting from incomplete aeromedical summaries.
- d. The policy letters, unless otherwise noted, apply to all military and DAC aircrew, ATC and UAS operators. They apply to any contractor who completes an Army flight physical.
- e. Policy letters and technical bulletins are designed to be updated as the standards of aeromedical care and knowledge change.

**4. Points of Contact.** Please report any content or policy issues to:

U.S. Army Aeromedical Activity (USAAMA)  
334-255-0749/0750/0751/0760      DSN 558-0749/0750/0751/0760  
[usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil](mailto:usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil)

**5. The latest revision of this document may be downloaded at:**

- a. AERO - <https://vso.rucker.amedd.army.mil> (Must be on the NIPNET)
- b. Lyster Army Health Clinic's homepage - <http://www.rucker.amedd.army.mil/tools/links.html> (May access from any computer)

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## INTRODUCTION

## **New Since Last Release**

This revision supersedes the previous revision of the Aeromedical Policy Letters and Technical Bulletins dated 31 March 2008.

The following items have been updated:

- Corneal Refractive Surgery Worksheet

The following Aeromedical Policy Letters have been updated or added:

- Hematuria
- Shoulder Dislocations
- Knees

The following have been deleted from the Aeromedical Policy Letters and moved to the Aeromedical Technical Bulletins:

- The Waiver Process
- Aeromedical Summary Guide to Completion for Mail or Fax
- Aeromedical Summary Template
- Temporary Clearance Pending Approval of Waiver

The following Aeromedical Technical Bulletins have been updated or added:

- All

The following have been deleted:

- FDME periodicity memorandum
- 365 day limit for incentive pay memorandum
- Class 3 aircrew members
- Operational Aeromedical Administration

## **External Links**

1. Army Links:
  - a. US Army School of Aviation Medicine (USASAM): <http://www.cs.amedd.army.mil/usasam/>
  - b. US Army Publishing Directorate (USAPD): <http://www.apd.army.mil/>
  - c. Flight Surgeon Quick Reference Guide
    - 1) AERO (must be on the NIPRNET): <https://vso.rucker.amedd.army.mil>
    - 2) Lyster Army Health Clinic's homepage (may access from any computer):  
<http://www.rucker.amedd.army.mil/tools/links.html>
2. Other Links:
  - a. US Navy Aeromedical Waiver Guide:  
<http://www.med.navy.mil/sites/nmotc/nami/arwg/Pages/AeromedicalReferenceandWaiverGuide.aspx>
  - b. US Air Force Waiver Guide (see USAFSAM Documents section on homepage):  
<http://www.wpafb.af.mil/afrl/711hpw/usafsam.asp>
  - c. DoD Forms Management Program: <http://www.dtic.mil/whs/directives/forms/index.htm>

## **365 Day Limit for Incentive Pay**

Any aircrew member medically grounded for greater than 365 days will have an AMS submitted for suspension. An AMS requesting reinstatement to flight status (waiver) can be submitted if the individual's medical condition resolves, the medical condition is not otherwise permanently grounding, and the individual can be safely returned to flight duties. See AR 40-501 and AR 600-105 for further information.

## **Aeromedical Consultants Advisory Panel**

Purpose: The Aeromedical Consultants Advisory Panel (ACAP) has been created to: (1) Review the aeromedical evaluation of selected aviation personnel. (See below); (2) Review unusual medical problems in aviation personnel; (3) Determine the effects of a medical condition upon an aircrew member's safety in flight, continuity of service, deployability, and medical supportability; (4) Make recommendations on the aeromedical disposition of disqualified aviators through the waiver authorities; (5) Make recommendations to existing medical standards to the Surgeon General; and (6) Develop and review APJs and ATBs in coordination with the Director, USAAMA.

Authority: AR 40-501.

Cases Reviewed: The ACAP will review the following cases of medically disqualified aviation personnel: (1) Those evaluated locally by the Aeromedical Consultation Service; (2) Those with conditions for which no current aeromedical policy exists, and for whom an initial or modified waiver is requested; (3) Those General Officers found to be medically disqualified; and (4) Those cases which are felt to be precedent setting, controversial, or which require highly individualized consideration.

Membership: The membership of the ACAP will consist of board-certified or residency-trained Aeromedical Specialists; experienced Army aviators, and other aviation or medical personnel as requested by the Director, USAAMA.



## CARDIOVASCULAR WAIVERS

## ABNORMAL CARDIAC FUNCTION TESTING

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Each of the cardiovascular function tests (e.g., AGXT, 24-hour Holter monitor, echocardiography, EBCT, myocardial perfusion imaging) when either abnormal or borderline is indicative of possible underlying cardiac disease. Cardiac disease is still the #1 killer of both men and women in the US; thus, screening and evaluating aviation personnel serves an important step in maintaining aeromedical health. No one has been disqualified from aviation service due to ultimately normal outcomes. While cost may be an issue, it shall not be a reason to forego further testing and is the ultimate responsibility of the patient. The hallmark for any reduction in health risk rests with maintaining a healthy lifestyle: reducing modifiable cardiovascular risk factors, maintaining a healthy diet, participating in regular exercise, and maintaining a healthy weight. The risk of sudden incapacitation in flight remains undefined until such time as an appropriate cardiovascular evaluation is completed.

**WAIVERS (For all classes, Rated and Non-Rated, to include Civilian ATC's):** In the absence of cardiac disease (i.e. spurious or false positive test), full flight status is to be expected and the information is filed Information Only. The presence of hemodynamically significant coronary artery disease may lead to restrictions in flight status on a case-by-case review basis (see Coronary Artery Disease APL). Waivers for dysrhythmias and valvular heart disease are discussed on the pages for the respective dysrhythmias and valvular conditions. Aircrew members who are required to undergo further testing but refuse for any reason are normally terminated from aviation duties until such testing is completed. Such appeals may be reviewed at a mini-ACAP or ACAP level. Civilian ATCs are normally not required to undergo such routine cardiovascular screening evaluation; however select individuals may be required to complete such assessments as stated in the OPM standards, Section F(3).

G Code	Condition
G349	Abnormal GXT G985    Abnormal Holter G992    Abnormal ECHO
G973	Abnormal Thallium Scan
G924	Abnormal EBCT

**INFORMATION REQUIRED:** Summaries of the final reports from the ECGs, Holter monitor, AGXT, EBCT, echocardiogram and cardiac catheterization are required in the AMS. Copies of these reports as well as the actual tracings, echo or catheterization films may be requested for review by USAAMA in coordination with the Aerospace Cardiology Consultants. In certain cases, direct consultation will be arranged with the Army Aeromedical Cardiology Consultant.

**FOLLOW-UP:** Normally none is required if testing is normal. For specific waiver abnormalities, see the individual conditions as listed in APLs.

**TREATMENT:** N/A.

**DISCUSSION:** In the U.S. Army cardiovascular screening program, 11% of over 40,000 males over the age of 40 had an abnormal EKG. Further investigation of such patients by AGXT would produce both false positives and false negatives. 80% of patients with severe CAD will be detected by AGXT alone. However, two-thirds with a positive AGXT will have a normal angiography. Radioisotope (e.g., thallium, sestamibi) perfusion studies add specificity and are required in aircrew members with abnormal AGXT testing. Abnormal exercise perfusion studies are to be used to identify the patients who require cardiac catheterization to define the extent of the underlying disease. (See Cardiovascular Screening Program APL).

# ANOMALOUS CORONARY ARTERY

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** Anomalous coronary artery is condition where either the take-off of the coronary artery from the aorta, or the course of the artery as it transverses the heart is aberrant. Because there is a risk of compression of a coronary artery coursing between the pulmonary artery and the aorta (e.g. left main coronary artery arising from the right coronary cusp) there is the risk of transient ischemia and increased risk for sudden death.

## WAIVERS (For all classes, Rated and Non-Rated, to include Civilian ATC's):

The most common anomalous coronary artery is a separate ostium to the left anterior descending coronary artery and the left circumflex coronary artery. This condition is benign, and no further evaluation is required and the information is filed as Information Only.

Anomalous left main coronary artery arising from the right coronary cusp is associated with increased risk of sudden cardiac death, and is considered disqualifying with no waiver or exception to policy recommended.

The finding of alternative variants (e.g., anomalous right coronary artery arising from the left coronary cusp, circumflex arising from the proximal right coronary artery, etc.) may be considered for waiver on a case-by-case basis after completion of full cardiology evaluation.

## INFORMATION REQUIRED:

- Complete cardiology consultation is required including the following:
  - AGXT
  - 24-hour Holter Monitor
  - Echocardiogram with Doppler flow study
  - Reports of cardiac catheterization
- Consultation with the designated Aeromedical Cardiologist may be recommended by USAAMA.

**FOLLOW-UP:** For those receiving a waiver, clinical re-evaluation and AGXT and 24-hour Holter monitor are required annually. For those with separate ostium, no further follow-up is required.

**TREATMENT:** For those with anomalous left main coronary artery arising from the right coronary cusp, treatment is surgical re-implantation of the aberrant portion to the aorta. For separate ostia, no treatment is required. For alternative variants, a decision must be made as to whether or not there is inducible reduction of blood supply with stress. If this is felt to be causative, surgical re-implantation must be considered. Surgical correction is disqualifying.

**DISCUSSION:** In the Department of Defense, anomalous coronary arteries were one of the most common causes of sudden death in 18 to 35 year olds from 1977 to 2002. All deaths were seen in those with anomalous left main coronary arteries. With more sensitive imaging modalities being utilized (e.g., EBCT, MRI, etc.) one can expect to identify disease processes not previously seen in the absence of symptoms. Although anatomic screening is useful final determination is a function of physiologic significance and requires a combination of modalities. Because the natural history is variable, a case-by-case determination will be made of those cases without demonstrable high risk.

# AORTIC REGURGITATION / INSUFFICIENCY

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Aortic Regurgitation is usually asymptomatic for decades because of the compensation of the left ventricle for volume overload produced by aortic regurgitation. Severe aortic insufficiency does not occur until after the 4th decade. If symptoms are occurring, they are usually exercise related and secondary to left ventricular failure, i.e. exertional dyspnea. Later manifestations include orthopnea and paroxysmal nocturnal dyspnea. Exercise intolerance due to left ventricular dysfunction, syncope, and angina are rare in the absence of associated CAD. Reports of valvular degeneration by repeated exposure to high Gz may be of concern in high performance helicopters. Thus, the presence of aortic regurgitation (beyond trace) is of great concern, even in young, otherwise healthy, asymptomatic applicants and aviators.

## WAIVERS:

### Initial Class 1A/1W Applicants:

Normally no exception to policy is recommended, but may be reviewed on a case-by-case basis.

### Initial Class 2, 3, and 4 (Military/Civilian) Applicants:

Will be considered on a case-by-case basis.

### Rated and Non-rated Aviation Personnel (All Classes):

Mild cases of aortic regurgitation may be considered for a waiver. Any structural abnormality associate with aortic regurgitation may be considered for a waiver on a case-by-case basis for rated aircrew members provided the aircrew member is symptom free and a full cardiac work-up is otherwise negative or demonstrates only minimal cardiac enlargement. Specific aircraft restrictions are possible. ATC's will be reviewed on a case-by-case basis.

## INFORMATION REQUIRED:

Complete cardiology evaluation is required to include AGXT, 24-hour Holter Monitor, and echocardiogram with Doppler flow study. Any medication used must be compatible with aviation duties.

Consultation with the designated Aeromedical Cardiology Consultant may be recommended by USAAMA. Local evaluations may require submission of complete tracings and a duplicate echocardiogram for review.

## FOLLOW-UP:

- Submission of annual cardiology evaluation to include report of echocardiogram with Doppler flow study.

**TREATMENT:** SBE antibiotic prophylaxis is required for all dental procedures as well as any other potentially septic exposure. Treatment of any underlying hypertension should be closely adhered to and avoidance of weight training recommended since these both may hasten the onset of symptoms. Medication must be compatible with aviation duties.

**DISCUSSION:** The most common causes of this valvular disorder are congenital valvular abnormalities (bicuspid valve), abnormalities in the proximal aorta secondary to Marfans-type syndrome, and degenerative changes secondary to bacterial endocarditis. Certain systemic inflammatory conditions (i.e. Rheumatoid, Ankylosing Spondylitis) may cause structural degenerative changes of the aortic valve. Studies amongst healthy aircrew at both NAMI and AMCS have detected a limited degree of aortic insufficiency (AI) in a number of patients without detectable valvular pathology.

On echocardiogram, these “physiological” AI cases typically have a very small AI jet that does not extend out of the left ventricular outflow tract (LVOT). The high-pitched early diastolic murmur of aortic regurgitation is often clinically silent and probably insignificant.

Moderate AI is heard best with the diaphragm of the stethoscope with the patient sitting upright, leaning forward and deeply expiring. The murmur is loudest along the left sterna border. Other physical findings include signs secondary to hyperdynamic peripheral circulation.

Valvular replacement is considered permanently disqualifying from aviation duties. In most, valve replacement is mechanical and requires chronic anticoagulant therapy. Civilian ATCs may be considered for waiver on a case-by-case basis.

# AORTIC STENOSIS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Aircrew members with aortic stenosis (AS) generally remain asymptomatic for many years. When symptoms develop they often start with angina, syncope, or left ventricular failure. The onset of any of these symptoms heralds the start of increased risk of sudden death. Syncope has been reported in up to 20% of cases of aortic stenosis; it may even occur with mild AS. Sudden death occurs in 15-30% of all cases, with 3-5% occurring in symptom-free patients. Left ventricular failure may predispose individuals to dysrhythmias or syncope, and increased risk of sudden death. When the diagnosis of aortic stenosis is made, the patient must be followed closely to continuously assess valvular and left ventricular function.

## WAIVERS:

### Initial Class 1A/1W Applicants:

Normally no exception to policy is recommended, but may be reviewed on a case-by-case basis

### Initial Classes 2, 3 and 4 (Military/Civilian):

Very mild AS (gradients below 20mm Hg) may be considered acceptable for all aviation related duties and filed as

Information Only. Bicuspid aortic valves with no other associated findings may also be considered qualified and filed as Information Only. More extensive conditions will be reviewed on a case-by-case basis.

### Rated and Non-rated Aviation Personnel (All Classes):

Mild AS, as above. Moderate AS may be considered for waiver provided complete cardiology evaluation is negative. AS with syncope, or other symptom complex are concerning for continued duties and considered less favorable for waiver action. Surgery is also considered disqualifying with normally no waiver recommended, with select cases reviewed on a case-by-case basis.

## INFORMATION REQUIRED:

- Complete cardiology consultation is required including the following:
  - AGXT
  - 24-hour Holter Monitor
  - Echocardiogram with Doppler flow study
  - Cardiac catheterization may be required.
- Consultation with the designated Aeromedical Cardiologist may be recommended by USAAMA.

**FOLLOW-UP:** Annual cardiology evaluation to include echocardiogram with Doppler flow study.

**TREATMENT:** SBE antibiotic prophylaxis is recommended for all dental procedures as well as any other potentially septic exposure. SBE antibiotic prophylaxis is recommended for both bicuspid aortic valve and aortic stenosis. Neither aortic valvuloplasty nor aortic valve replacement have been considered for favorable waiver action in active duty aviators.

**DISCUSSION:** AS in individuals less than 30 years of age is almost always the result of a congenitally abnormal valve. When found in elderly patients (over 60 years of age), AS is usually secondary to the CAD and the calcific changes in a morphologically normal valve. AS due to rheumatic heart disease is usually accompanied by mitral stenosis or regurgitation. Bicuspid aortic valves become stenotic two-thirds to three-fourths of the time. The percentage of bicuspid aortic valves that become stenotic increases with age.

# ASYSTOLE

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Asystole is defined as abnormal when accompanied by symptoms and/or the pause lasts greater than 3 seconds. Symptoms may be indistinguishable from other forms of cardiac arrest.

**WAIVERS (For all rated and non-rated classes):** Waiver for history of asystole is not normally granted since it is usually associated with myocardial infarction or other serious conditions. In the rare event that it is induced by reversible precipitating factors, e.g., hyperkalemia or electrical shock, with no associated neurologic or cardiac damage, a waiver may be considered with a complete evaluation from a local cardiologist with aeromedical review. Flight surgeons shall contact USAAMA to help with review and coordination of evaluations.

G Code	Condition
G-064	Ventricular escape beat
G-065	Asystole

## INFORMATION REQUIRED:

- Complete aeromedical summary with cardiology consultation to include the following:
  - 24-hour Holter monitor
  - Electrophysiologic assessment, to include CSNRT, WCL, AVN ERP, if pertinent
  - Echocardiogram
  - AGXT
- Immediate DNIF is required until consultation with USAAMA.
- Submit any results of local cardiology testing for review, as requested from USAAMA for Aviation Medicine Cardiology Consultation.

**FOLLOW-UP:** N/A.

**TREATMENT:** N/A

**DISCUSSION:** As one might expect, a review of the AEDR reveals no previously granted waivers for history of asystole. Associated cardiac arrest and myocardial infarction is the primary cause of termination from aviation duties. Survivors of asystole require cardiovascular as well as neurologic clearance as well as any other organ systems that may have been potentially affected from the underlying cause.

# atrial flutter

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Atrial flutter (AF) is relatively uncommon in adults and may be associated with underlying organic heart disease. Symptoms may range from none (particularly in younger individuals) to dizziness, syncope, or angina pectoris. There is a significantly increased incidence of embolic phenomena in sustained atrial flutter.

**WAIVERS (For all rated and non-rated classes):** Waivers for non-recurrent AF or atrial fibrillation (AFIB)/AF spectrum are possible when precipitating factors are clearly documented and correctable, and the complete cardiology evaluation is normal. Alternatively, waiver may be applied for 6 months after radiofrequency ablation, with a normal post-ablation evaluation (AF unable to be provoked). Recurrent AF or AF/AFIB is not considered favorably for waiver although such review will be done on a case-by-case basis. Applicants will rarely be considered for an exception to policy.

G Code	Condition
G-027	Atrial Flutter

## INFORMATION REQUIRED:

- Complete cardiology evaluation is required. This includes:
  - AGXT
  - Echocardiogram
  - Three 24-hour Holter monitors at 2-month intervals.
  - The grounded aircrew member must be observed for at least 6 months off antiarrhythmic therapy or after ablation, for evidence of recurrence.
  - Document any history of precipitating causes, e.g., alcohol intoxication, hyperthyroidism, hypothermia, etc.
- Abnormalities in any of these studies may require further work-up and aeromedical assessment.
- Any medication used to control underlying rhythm or abnormalities found.

**FOLLOW-UP:** In the absence of recurrence, a repeat work-up is required every three years. This work-up includes a 24- hour Holter monitor and AGXT.

**TREATMENT:** The treatment of choice for atrial flutter is an electrophysiology procedure and radiofrequency ablation. Maintenance drug therapy to control AV conduction or long term anticoagulant therapy is disqualifying. A history of cardioversion or short-term use of medication(s) is not necessarily disqualifying, but the continuation of medications or inability to wean off antiarrhythmic therapy makes waiver very unlikely.

**DISCUSSION:** In the usual variety of AF, the typical saw-tooth pattern of flutter waves is usually best seen in the inferior leads. An atrial rate of 250-350 and varying degrees of AV conduction is the most common presentation; 2:1 conduction is the usual AV conduction ratio. Radiofrequency ablation has a success rate in excess of 98% for 'cure' of isthmus dependent atrial flutter. Because AF is a function of the structure of the heart, recurrence in the absence of ablation is common, and the American Heart Association recommends consideration for ablation as a first line therapy with first presentation.

## ATRIAL FIBRILLATION

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** About 20 times more common than atrial flutter, atrial fibrillation (AFIB) may be the result of any underlying cardiac disease but is occasionally seen in the absence of any apparent cardiac disease. The most common cause of AFIB is undertreated or unrecognized hypertension. It may be precipitated by alcohol, caffeine, tobacco, hyperthyroidism, hypoxia, hypothermia, etc. While atrial fibrillation is frequently asymptomatic, especially in younger individuals, its presence in association with rapid ventricular response may be responsible for palpitations. Angina may occur in those individuals with CAD. Dizziness or syncope and even focal neurological symptoms may occur in those with underlying cerebrovascular disease or cerebral embolism. Atrial fibrillation has also been associated with increased embolic events.

**WAIVERS (For all rated and non-rated classes, to include ALL Applicants):** A single episode of atrial fibrillation with clearly documented precipitating factors ("holiday heart") is waiverable, following a 6-month period of observation to ensure the absence of recurrence as well as the elimination of underlying organic sources. For earlier consideration for return to flight, the flight surgeon should contact USAAMA. Alternatively, waiver may be applied for 6 months after radiofrequency ablation, with a normal post-ablation evaluation (AFIB unable to be provoked), although such review will be done on a case- by-case basis. Waivers are not recommended in recurrent cases or in cases with underlying significant CAD. Initial applicants with a history of AFIB will not be considered for an exception to policy.

G Code	Condition
G-026	Atrial fibrillation

### INFORMATION REQUIRED:

- Local evaluation should include a cardiology consultation with the following:
  - AGXT
  - Echocardiogram
  - Three 24-hour Holter monitors taken at 2-month intervals.
  - Thyroid function testing
- A 6-month observation period off antiarrhythmic or rate-controlling medications is required to ensure the absence of recurrence.
- A detailed history to document a precipitating event is essential to support waiver action.

**FOLLOW-UP:** In the continued absence of recurrence, a repeat cardiac evaluation is required every three years. This evaluation should include AGXT and a 24-hour Holter monitor. If AFIB is associated with any underlying disease, these requirements may be modified.

**TREATMENT:** A past history of electrical or chemical cardioversion is not necessarily disqualifying. Any maintenance medication (to include anticoagulant) is considered disqualifying. All underlying precipitating causes should be eliminated including smoking, caffeine, alcohol, etc.

**DISCUSSION:** The baseline rhythm of AFIB is characterized by chaotic atrial activity (P waves not discernible) at a rate of 350-700 times per minute. AFIB is most commonly accompanied by ventricular rates of 60-180 beats per minute. Ventricular rates are easily influenced by the presence of digoxin, beta-blockers, high vagal tone, or intrinsic AV nodal disease. There is a 17-fold increase in risk of AFIB in patients where the AFIB is associated with mitral valve disease compared to a 5-fold increase in risk in patients where the fibrillation arises from all other causes. Cardioversion is usually successful in restoring rhythm in flutter, but there is a relatively high relapse rate in fibrillation. Patients with idiopathic, paroxysmal atrial fibrillation have no increased mortality compared to normal. Radiofrequency ablation

(pulmonary vein ablation) has a success rate of up to 70% for control of AFIB, but should not be considered curative. The American Heart Association recommends consideration for ablation as a first line therapy for special populations, including military personnel.

## ATRIAL PREMATURE CONTRACTIONS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** Atrial premature contractions (APC) are common findings in normal individuals. APCs may be associated with underlying pathological conditions such as atrial enlargement, hypoxia, congestive heart disease, or cardiac ischemia or infarction. Some drugs, e.g., alcohol, tobacco, and caffeine may also be responsible for causing a significant increase in APC frequency. Symptoms are most often none or limited to mild palpitations. For those with more than 3 consecutive APCs, see section on Supraventricular Tachycardia.

**WAIVERS (For all Rated and Non-rated aviators, to include ALL applicants):** Waivers are common for those aircrew members with APCs occurring with a frequency of greater than 10 of any 50 beats, or 10% of any one hour of monitoring, or 1% of 24 hours of monitoring provided that a complete cardiology evaluation is normal and there are no symptoms. Those aircrew members with symptoms (lightheadedness, syncope, etc.) or those found to have underlying cardiac disease will be considered for waiver on a case-by-case basis. For those individuals without symptoms and APCs occurring less than or equal to 10 of any 50 beats, 10% of one hour of monitoring, and 1% of 24 hours of monitoring require no waiver and are filed as "Information only". Initial applicants will be reviewed on a case-by-case basis.

G Code	Condition
G-006	Sinus node ECHO beat
G-023	Atrial premature beat
G-031	Atrial ECHO beat
G-032	Paired atrial premature beats
G-035	Atrial parasystole
G-043	Junctional premature beat
G-045	Junctional parasystole
G-046	Paired junctional premature beats
G-083	Supraventricular premature beat

### INFORMATION REQUIRED:

- A 24-hour Holter and thyroid function testing is required for all individuals with a single APC or multiple isolated APCs found on routine ECG or GXT tracings, if no previous evaluation exists.
  - No further evaluation is required for those individuals without symptoms and whose APCs' frequency of occurrence is less than or equal to 10 of any 50 beats, 10% of any one hour of monitoring, and 1% of 24 hours of monitoring.
- If greater than 10 of any 50 beats, or 10% of any one hour of monitoring, or 1% of 24 hours of monitoring, or if the individual is symptomatic, perform the following:
  - AGXT
  - Echocardiogram
  - If these tests are normal, no further work-up required.
- If these tests are abnormal or the individual is symptomatic, further cardiovascular work-up may be required.
- Contact USAAMA to review the case and assist with additional evaluation. Individual shall remain DNIF until evaluation is complete.

**FOLLOW-UP:** Only required if associated with underlying cardiovascular disorders

**TREATMENT:** Significant decrease in frequency of APCs is achieved through restricting the aircrew member's ingestion of caffeine-containing beverages and cessation of nicotine (smoking and smokeless tobacco or replacement therapy). Medication is rarely used and should be assessed appropriately with aeromedical concerns.

**DISCUSSION:** None.

## atrial septal defect (ASD)

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** Most patients with ASD are asymptomatic. Those that do develop symptoms usually do so by the 3<sup>rd</sup> or 4<sup>th</sup> decade. These symptoms include exercise intolerance, chronic fatigue, and orthopnea secondary to the development of pulmonary hypertension. Significant pulmonary hypertension rarely occurs before age 20 but may happen at earlier ages in those individuals living in higher altitudes. Supraventricular dysrhythmias (e.g., atrial fibrillation, atrial tachycardia) are common in patients with ASD and may persist even after successful repair of the ASD. While at one time it was postulated that ASD predisposes an individual to decompression sickness (DCS), clinical studies conducted by NAMI have not supported this theory. The role of previously undiscovered ASD in the etiology of CNS DCS is still controversial. Many times an ASD is diagnosed as part of the work-up for stroke or TIA, or, more recently and still under study, with migraine variants.

### WAIVERS:

**Initial applicants (all classes):** Exception to policy or waiver for initial aviation candidates is probable if surgically corrected in childhood and without any sequelae from cardiologic assessment below.

**Rated and Non-rated (all classes):** Waivers are usually granted provided complete cardiology work-up is normal and without sequelae, or post-operatively with normal recovery and post-operative cardiologic assessment. If discovered due to another condition (stroke or TIA), that condition must also be aeromedically resolved and compatible with return to flight.

### INFORMATION REQUIRED:

- Cardiology consultation including the following:
  - AGXT
  - 24-hour Holter monitor
  - Echocardiogram
- If repaired in adulthood, post-operative cardiology assessment after a minimum of 3-months recovery
- Copies of all tracings and films may be requested for review.

**FOLLOW-UP:** Repeat cardiology evaluation every three years including: 24-hour Holter monitor and echocardiogram with Doppler flow study. For cases involving childhood repair, there are no annual waiver requirements unless specified.

**TREATMENT:** Waiver is possible after surgical or nonsurgical closure of ASD. The requirement for permanent pacing is disqualifying. SBE antibiotic prophylaxis is not indicated for uncomplicated ASD.

**DISCUSSION:** ASD is the one of most common form of congenital heart disease in adults. Autopsy series document a patent foramen oval in about 30% of cases in the 20-30 year age group. The incidence decreases as age advances. Up to 25% of ostium primum ASD patients have at least one other congenital abnormality of the heart. In patients who have had ostium secundum ASD treated, 58% will have an abnormal stress test with a smaller increase in cardiac output than normal when performing intense, upright exercise. Dysrhythmias follow surgical repair in 3 to 15% of cases, more than half of which have atrial fibrillation or flutter. Untreated secundum ASD is associated with pulmonary hypertension (22%), mitral stenosis (4%), atrial flutter or fibrillation (8%); and with patients experiencing dyspnea (83%), fatigue (27%), palpitations (37%), and chest pain (6%).

# ATRIOVENTRICULAR CONDUCTION DISTURBANCES

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** Bradycardia, often associated with some of the below conduction disturbances, can result in a decreased tolerance to G-forces, syncope, or sudden death. Beyond G-forces concerns, the more severe AV blocks have aeromedical concerns that warrant consideration for continuation in flight status. See Bradydysrhythmias

**WAIVERS (For all classes, Rated and Non-Rated, to include All Applicants):** Short PR interval (PR interval less than 120 msec in all 12 leads, asymptomatic, and without a delta-wave), first degree AV block (PR interval prolonged > 220 msec in all leads), and asymptomatic Mobitz Type I second degree AV block ("Wenckebach" - where AV conduction is progressively more delayed with each beat until there is a blocked beat after which the cycle starts again) have traditionally been considered for information only, no waiver required, providing complete cardiology evaluation reveals no underlying disease.

Mobitz Type II, second degree AV block and third degree AV block (complete heart block) are considered disqualifying and normally not waivable. Since 2-to-1 AV block may be either Wenckebach or Mobitz Type II, complete cardiology evaluation for differentiation is required prior to further review. Consideration will be made on a case-by-case basis with Aeromedical Cardiology review.

G-Code	ICD9 Code	Condition
G-029		Short PR interval (to include Lown-Ganong-Levine syndrome)
G-100	426.11	First degree AV block
G-104	426.12	Mobitz type I second degree AV block (Wenckebach)
G-105	426.13	Mobitz type II second degree AV block
G-108	426	Complete heart block (third degree block)

## INFORMATION REQUIRED:

- For short PR interval, include a complete history directed toward symptoms of tachydysrhythmias, i.e., palpitations, lightheadedness, or syncope: if present, a work-up IAW Pre-excitation syndrome is required; if absent, no further information is required (service member is considered FFD). This is coded as Information Only.
- For 1st degree heart block, local evaluation shall proceed with a rhythm strip performed during exercise increasing the heart rate over 80-100 bpm or more to measure the PR interval. If the PR interval shortens to  $\leq$  220 msec, no further evaluation is required (coded as Information Only). If the PR interval remains prolonged despite increased heart rate, a complete cardiology consultation including treadmill testing, echocardiogram, and 24-hour Holter monitor is required.
- Mobitz I (Wenckebach) block also requires a rhythm strip performed during exercise. If the block is reversed, no further work-up is required (coded as Information Only). If, however, the block is refractory to exercise, a complete cardiology evaluation with AGXT, echocardiogram, and 24-hour Holter is required. If all testing is normal, no further evaluation is needed and the aviator may remain on flight status (coded as Information Only). If abnormal, all will need to be reviewed prior to continuation on flight status.
- Mobitz Type II, 2:1 AV Block, and 3rd degree Heart Block, requires a complete cardiology consultation including treadmill testing, echocardiogram, and 24-hour Holter monitor. Tracings and films may be requested for review. Complete heart block must clearly be

differentiated from AV dissociation due to a marked sinus bradycardia with an accelerated junctional escape rhythm; the latter may be a normal variant.

**FOLLOW-UP:** For conditions coded as Information Only, none is required, provided patient remains asymptomatic and initial work-up was normal. For conditions receiving waiver, specific follow-up will be annotated.

**TREATMENT:** Artificial Cardiac Pacemakers are not compatible with continued flying status.

**DISCUSSION:** Many cases of first degree and Mobitz type I second degree heart block are related to increased vagal tone. Exercise reduces vagal tone and often reverses the block. Recent evidence, however, suggests that in patients with Mobitz type I block refractory to exercise or atropine, syncope is common and the prognosis is similar to that for patients with Mobitz type II block. Syncope (the classic Adams-Stokes attack caused by transient asystole or ventricular fibrillation) occurs without warning. When the rhythm disturbance is short-lived, some patients experience "near-syncope" or a feeling of dizziness often misdiagnosed as vasovagal syncope.

## AXIS ABNORMALITY

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** In the younger population group, significant axis deviation can occur as a normal variant but is occasionally found in other conduction abnormalities. In the older population group, newly discovered significant axis deviation may be an early sign of underlying cardiovascular disease, such as LVH or myocardial disease.

**WAIVERS** (For all classes, Rated and Non-Rated, applicants included): If subsequent evaluation reveals no underlying cardiac disease, then this is coded as Information Only. If the evaluation reveals an underlying abnormality, waiver action is based upon the nature of that abnormality.

G Code	Condition
G-505	Left axis deviation of the P wave. The P-axis is less than -45 degrees (-45 to -180).
G-506	Right axis deviation of the P wave. The P-axis is greater than +120 degrees.
G-735+	Left axis deviation of the QRS complex. The QRS-axis is less than -45 degrees (-46 to -180).
G-736+	Right axis deviation of the QRS complex. The QRS-axis is greater than +120 degrees unless the finding is clinically consistent with a persistent juvenile pattern in young aircrew.

### INFORMATION REQUIRED:

- Compare the tracing to any previous axis abnormality and report consistency or change.
- If the axis abnormality has been acquired since the last examination and/or has never been evaluated previously, then perform an AGXT and an echocardiogram. If right axis deviation is found to be clinically consistent with a persistent juvenile pattern in a young aircrew member, however, only an echocardiogram needs to be completed.
- All tracings and films should be submitted together with the aeromedical summary.

**FOLLOW-UP:** None required for benign deviations.

**TREATMENT:** N/A

**DISCUSSION:** In normal adults, the axis is almost parallel to the anatomical base of the heart to its apex in the direction of Lead II. The axis is more vertical in thin individuals and more horizontal in heavy individuals. Abnormal axis deviations are more commonly associated with fascicular blocks (left anterior hemiblock and/or left posterior hemiblock) and with bundle branch blocks. If ECG is evident for concern of bundle branch block without a frankly deviated axis, work-up should proceed IAW the Intraventricular Conduction Abnormalities APL.

# CARDIOMYOPATHY

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Cardiomyopathy is disease of the heart muscle. The heart loses its ability to pump effectively and in some instances, leads to dysrhythmias. Cardiomyopathy may be attributed to congenital heart disease, valvular heart disease, hypertension, myocarditis, metabolic causes (e.g. alcohol, hyperthyroid), ischemic heart disease, or most commonly idiopathic. The 3 types of cardiomyopathy are dilated, hypertrophic, and restrictive. Dilated cardiomyopathy has an enlarged left ventricle with a decreased functionality that may lead to congestive heart failure. Hypertrophic cardiomyopathy (HCM) results from a thickened septal wall, which may obstruct flow from the left ventricle. Symptoms may present with shortness of breath with exertion, dizziness, syncope, and/or chest pain as well as present with sudden cardiac death from fatal dysrhythmia. Restrictive cardiomyopathy results from rigidity within the ventricle wall for filling and is usually associated with an underlying systemic disease process. Symptoms include shortness of breath, dyspnea on exertion, fatigue, peripheral edema, hypotension, and syncope.

**WAIVERS (For all classes, Rated and Non-rated, including ALL applicants):** Waiver may be considered in only the very mildest of cases with minimal hemodynamic and echocardiographic abnormalities and after the exclusion of underlying pathology. Cardiomyopathy must have been felt due to a reversible cause, with complete resolution of cardiovascular findings, with an ejection fraction >50% and not requiring supportive medications (including beta-blockers, ACE-inhibitors, aldosterone receptor antagonists, digitalis). Aeromedical Cardiology Consultant will likely review the case after submission with USAAMA. True primary hypertrophic cardiomyopathy is not granted a waiver; in fact, it is considered unfit for all military duties. Exception to policy is not recommended but may be requested for a case-by-case review.

## INFORMATION REQUIRED:

- Cardiology consultation is required, including
  - Echocardiogram, and
  - Cardiac catheterization, if indicated.
  - Exclusion of underlying disorders such as hypertension, pulmonary hypertension, valvular disorders, and hyperthyroidism is required.

**FOLLOW-UP:** Will be specified based on the diagnosis and condition

**TREATMENT:** Surgical treatment or medical treatment with Class IV medications is disqualifying for all flight duties. It must be noted, however, that almost all patients require some form of treatment.

**DISCUSSION:** Hypertrophic cardiomyopathy presents most frequently in the twenties. In a military population, it is important to differentiate between athletic heart syndrome and HCM. The majority of individuals will demonstrate ECG changes with LVH by voltage criteria and/or ST-T wave changes. The level of hypertrophy and the severity of the hemodynamic changes do not help to determine the prognosis. Poor prognostic factors are a family history of sudden death, diagnosis in childhood, and a history of syncope. Although many cardiomyopathies may be reversible, the underlying conditions may require separate review for waiver (e.g., atrial fibrillation, alcohol abuse, thyroid disorders, nutritional deficiencies, etc.). A unique entity to military personnel has been the identification of vaccine related myopericarditis, which has been seen to have a favorable prognosis even with initial identification of a dilated cardiomyopathy. Aircrew members should be encouraged to pursue a waiver after 6 months from time of acute illness due to a post-vaccination myocarditis with anticipated review by the Aeromedical Cardiology Consultant.

## CARDIOVASCULAR SCREENING PROGRAM

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Coronary artery disease (CAD) is the leading cause of permanent suspension from flying duties and non-accidental, premature death in aircrew members. The first signs and symptoms of CAD are often dramatic, incapacitating, or even fatal, too late for prevention interventions to preserve flight status. The CAD screening program for asymptomatic aircrew members is vital for aggressive risk factor modification to promote healthier lifestyles, prevent in- flight incapacitation with a secondary benefit of timely intervention and if possible, reverse/arrest the process.

**INFORMATION ONLY/WAIVERS (For all classes, Rated and Non-Rated, to include ALL Applicants):** For all aircrew and applicants age 39 years and younger, failure of Level 1 in Information Only with documentation of appropriate risk reduction counseling. No further work-up is necessary.

Age 40 years and older: Failure of any screening level with the subsequent passage of the following level is filed Information only. FDMEs submitted without completion of CAD screening will be returned "Disqualified Incomplete." Likewise, repeating measurements, labs or starting medication(s) to pass Level 1 is not appropriate and will be returned "Disqualified Incomplete." Waivers are required only for documented CAD. (See CAD APL)

Failure of Level 1 CAD screening may be locally returned to FFD while awaiting completion of Level 2 CAD screening for a maximum of 60 days. Abnormal Level 2 CAD screening may be returned to flying with a second rated pilot for a maximum of 60 days pending completion of Levels 3 and/or 4 after approval by USAAMA.

Aircrew members declining to complete any subsequent level of the screening program will require an aeromedical summary for permanent medical suspension.

Aircrew deployed or in remote locations where further assessment is unavailable shall note that in the "Remarks" section with a comment of completion upon redeployment, leave, or PCS.

**INFORMATION REQUIRED:** All aircrew members are required to undergo CAD screening at 40 years or greater. Report the result of each level used in screening as well as any corresponding consultations and evaluations. Risk factor evaluation should be assessed annually for all aircrew regardless of age and documented on the FDME/FDHS.

- **ATCs (Class 4 FDME):** Civilian ATCs failing Level one are normally counseled on risk factor modification without further assessment. However, the FDME may be returned for completion of Level 2 or higher CAD screening based on review of CAD Risk history, medical history, waivers, co-morbid conditions, and previous submissions. Military ATCs failing Level one will be further evaluated as outlined below.
- **LEVEL 1:** Annual submission of risk factors to include: age, family history, blood pressure, smoking history, serum lipids (See Hypercholesterolemia APL), blood sugar, ECG findings of Left Ventricular Hypertrophy (LVH). If Framingham risk index is 7.5 or greater, LDL cholesterol 190 or greater, total serum cholesterol 255 or greater, total cholesterol/HDL ratio is 6.0 or greater, or Metabolic Syndrome, rated aircrew members (except ATCs) will proceed to Level 2.
- **LEVEL 2:** AGXT or EBCT. If either of these is abnormal, proceed to level 3. An EBCT Calcium score greater than 400 is considered abnormal. Borderline abnormalities should be referred to USAAMA.

- **LEVEL 3:** Noninvasive Cardiac Imaging: Thallium or sestamibi GXT (preferred) or Stress Echocardiogram. If abnormal, proceed to level 4, but only after consultation with USAAMA. If no hemodynamically significant perfusion defects are detected, aggressive risk factor modification is to be done.
- **LEVEL 4:** Invasive Cardiac Procedure: Cardiac catheterization. Results of cardiac catheterization must be forwarded to USAAMA for review along with the other reports from Levels 1-3. Final Disposition on cases will be made after review of study results.

**FOLLOW-UP:** Continued failure of Level 1 CAD screening after a normal subsequent work-up will necessitate the submission of a repeat Level 2 CAD screening every 3 years.

**TREATMENT:** The key to lowering the incidence of coronary artery disease is aggressive risk factor modification and reduction. Treatment of hyperlipidemia, hypertension, and increased blood glucose are essential. Therapeutic lifestyle changes focused on tobacco cessation, regular exercise and a healthy diet are of the utmost importance in lowering cardiovascular risk. Aircrew that fail Level 1 screening with subsequent passage of level 2 still require careful assessment and treatment of risk factors. See appropriate APLs for aeromedically acceptable treatment for these conditions.

**DISCUSSION:** The Framingham CAD Risk Index calculator is a computer generated, weighted multiple regression formula available from USAAMA and the U.S. Army Health Care Systems Support Activity. The risk calculator is available via AERO, the Ultimate Flight Surgeon CD, the USASAM website, or the USAAMA website. TBD

Sudden incapacitation of aircrew secondary to heart disease may result in loss of life and aircraft, and resultant mission failure. In-flight cardiac events are rare. A review of the Army Combat Readiness Center Database over the last ten years indicates that there were no mishaps directly attributable to an incapacitating coronary event in flight. U.S. Air Force records analysis for the period 1988-1992 reveals an average 5-year incidence of cardiac events of less than 0.15%. The screening program is an opportunity to diagnosis disease at a subclinical or asymptomatic level in order to ensure that in- flight incapacitation remains a rare event.

**REFERENCE:** Prevention of Coronary Heart Disease in Clinical Practice. European Society of Cardiology/European Atherosclerosis Society/European Society of Hypertension/European Society of General Practice/Family Medicine/International Society of Behavioral Medicine/European Heart Network. 1998. (Available from the National Guideline Clearing House: [www.guideline.gov/index.asp](http://www.guideline.gov/index.asp))

#### FRAMINGHAM RISK INDEX

$$\text{Framingham Risk Index} = \frac{1}{1 + e^{-\text{coeff}}}$$

The variable "coeff" is the total beta coefficient and is derived from the multiple logistic regression formula. (Gordon et al., 1971)

Total beta coeff =  $b_0^* + (b_1 \times \text{age}) + (b_2 \times \text{age}) + (b_3 \times \text{age} \times \text{total cholesterol in mg/dl}) + (b_4 \times \text{total cholesterol in mg/dl}) + (b_5 \times \text{systolic blood pressure in mmHg}) + (b_6 \times \text{smoking history}^{**}) + (b_7 \times \text{LVH on ECG}^{***}) + (b_8 \times \text{diabetes}^{****})$

*Framingham Risk Index beta coefficients by gender*

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Factor	Gender is male	Gender is female
b0	-22.227532	-19.066572
b1	0.460575	0.311558
b2	-0.002882	-0.001724
b3	-0.000416	-0.000190
b4	0.028590	0.016802
b5	0.012444	0.015278
b6	0.447815	0.049966
b7	0.743158	0.441707
b8	0.265016	0.416906

**NOTES:**

- \* Factors “b0” through “b8” are gender adjusted and are listed in the above table.
- \*\* For the variable “smoking history”, the value is “1” if smoking history is 10 or greater cigarettes per day; value is “0” if smoking is less than 10 cigarettes per day.
- \*\*\* For the variable “LVH,” the value is “1” if left ventricular hypertrophy is found on ECG; and value is “0” if there is no left ventricular hypertrophy on ECG.
- \*\*\*\* For the variable “diabetes,” the value is “1” if the fasting blood glucose is 115 mg/dl or greater, and the value is “0” if the fasting blood glucose is less than 115 mg/dl.

## CHAMBER WALL OR SIZE ABNORMALITIES

Update: 21 AUG 2007

**AEROMEDICAL CONCERN:** Atrial enlargement can be caused by many cardiac problems but is usually associated with enlargement of one or both of the ventricles. Right atrial enlargement is most often associated with pulmonary disease and left atrial enlargement is commonly caused by mitral valve disease. Right ventricular hypertrophy is also often caused by pulmonary disease but can be compensatory rather than pathologic. Left ventricular hypertrophy is most commonly seen secondary to hypertension or aortic stenosis or associated with cardiomyopathies, which are discussed separately.

**WAIVERS (For all classes, Rated and Non-Rated, to include ALL applicants):** In the active duty military population, most chamber abnormalities are non-pathologic. True chamber enlargement due to underlying pathologic disease is only waived when treatment and the underlying causative condition are resolved. Valvular diseases require special consideration (see specific valvular disorder APL). LVH, based solely on ECG criteria, is usually false positive and requires an echocardiogram to discern. Current criteria, based on the general population, are not valid for our young, athletic population. Individuals with echocardiographically proven LVH are often terminated from flight status with no waiver recommended. Isolated findings of elevated voltages on ECG with normal echocardiogram are considered fully qualified with information only. Individuals with early mild LVH secondary to hypertension are waivable if satisfactory treatment of hypertension is achieved. Report all tracings and films results with the aeromedical summary to USAAMA--these may be requested for further review.

### G Code Condition

G-500	Left Atrial enlargement
G-720	Left ventricular hypertrophy by voltage criteria and ST-T segment abnormalities
G-727	Biventricular enlargement
G-501	Right Atrial enlargement G-728 Septal hypertrophy
G-502	Bi-atrial Enlargement
G-721	Right ventricular hypertrophy with tall R-wave
G-729	Left ventricular hypertrophy by voltage only
G-722	Right ventricular hypertrophy with RSR'

**FOLLOW-UP:** An annual echocardiogram, and 3-day b.i.d. BP check are required for hypertension induced mild LVH.

**TREATMENT:** Treatment of underlying cause of hypertrophy with approved medications.

**DISCUSSION:** In young individuals, the precordial voltages tend to be higher than in older individuals. If voltage criteria alone are used to diagnose LVH, many false positives will result. Below are some criteria for LVH from different authorities, although none has been validated in those less than age 45 years. Left atrial enlargement, ST segment abnormalities, widening of the QRS, and abnormal R-wave progression are supplemental characteristics of LVH. An echocardiogram should be obtained with M-mode Doppler measurement of the left ventricular posterior wall thickness in diastole and the interventricular septal wall thickness in diastole. Symmetric thicknesses of up to 1.5cm are considered normal in this healthy athletic population.

**Scott Criteria:**

- (1) S in V1 or V2 plus R in V5 or V6:  
    > 35 mm > 30 years old  
    > 45 mm > 20 - 30 years old  
    > 55 mm > 20 years old
- (2) R in V5 or V6 > 26 mm; R + S in any V lead > 45 mm  
    R in aVL > 7.5 mm;  
    R in aVF > 20 mm;  
    or S in aVR > 15 mm.

**Estes Criteria:**

- |   |            |
|---|------------|
| R or S in any limb lead > 20 mm               | = 3 points |
| S in V1, or V2, or V3 > 25 mm                 | = 3 points |
| R in V4, or V5, or V6 > 25 mm                 | = 3 points |
| Any ST shift without drugs                    | = 3 points |
| Typical "strain" pattern with digitalis       | = 1 point  |
| LAD of -15 or more                            | = 2 points |
| QRS width 0.09s or more                       | = 1 point  |
| Intrinsicoid deflection in V5 or V6 0.04 or > | = 1 point  |
| P terminal force in V1 more than 0.04         | = 3 points |

**USAFSAM Criteria:**

- S in V1 or V2 plus R in V5 or V6  
    > 55 mm if under 35  
    > 45 mm if over 35

A score of 4 points indicates probable LVH.  
A score of 5 and greater indicate definite LVH.

# CORONARY ARTERY DISEASE

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Coronary artery disease (CAD) is the leading cause of permanent suspension from flying duties. The major concern, although rarely documented, is sudden in-flight incapacitation as a result of sudden death, altered consciousness, or incapacitating angina. Heat, hypoxia, hyperventilation, work-related stress, and/or high Gz maneuvers all increase myocardial oxygen demand; thus, possibly provoking angina, dysrhythmia and infarction in individuals with pre-existing hemodynamically significant lesions.

**WAIVERS:** Hemodynamically significant lesions are disqualifying for all flying duty classes, and waiver will not be recommended. A waiver may be considered for those diagnosed with asymptomatic coronary artery disease, i.e. hemodynamically insignificant lesions, after appropriate evaluation.

## Initial Class 1A/1W Applicants:

No exceptions to policy.

## Initial Classes 2F, 3 and 4:

Waivers will be considered on a case-by-case basis for minimal coronary artery disease.

## Rated and Nonrated Aviation Personnel (All Classes):

Hemodynamically significant coronary lesions are routinely screened for in our over-40 population (excluding

Civilian ATC unless requested) using the Cardiovascular Screening Program (CVSP), which includes:

- LEVEL 1- Framingham Index, lipid profile
- LEVEL 2 -Aeromedical exercise stress test (AGXT) or Electron Beam CT
- LEVEL 3- Noninvasive Cardiac Imaging (i.e. Thallium or Sestamibi GXT and/or Stress echocardiogram)
- LEVEL 4- coronary angiography if perfusion deficits are noted.

**Minimal Coronary Artery Disease (MCAD)** is defined as no hemodynamic abnormalities. These lesions do not cause reperfusion deficit on exercise perfusion studies and have no abnormal wall motion on exercise echocardiogram. Waiver will be considered for MCAD.

**Percutaneous Coronary Intervention** with or without coronary stent placement may be waivered after the recovery period providing the patient remains asymptomatic and testing is normal. Follow-up exercise thallium or sestamibi and exercise echocardiogram at 6-months post for aviators and 3-months post for ATC's and non-rated must demonstrate hemodynamically normal function. Submit results in AMS for review and waiver recommendation.

**Significant Coronary Artery Disease (SCAD)** is defined as hemodynamically significant findings such as found with abnormal perfusion on exercise thallium or sestamibi or abnormal wall movement or poor ejection fraction on exercise echocardiogram +/- confirmation by coronary angiography. SCAD is normally not waivable.

For Class 2, regardless of luminal occlusion, if the lesion is associated with ventricular tachycardia, it is not waivable. Any history consistent with mild myocardial infarct is normally not waivable. Myocardial damage as detected by exercise imaging is normally not waivable. Coronary Artery Bypass Grafting is normally not waivable. Cases may be referred to full ACAP for request for restricted waiver for aviators with unique, mission- critical skill sets where actual flight performance duties are required after the

following: 1) sufficient recovery period; 2) aggressive risk reduction and modification with therapeutic lifestyle changes and aeromedically approved medications; 3) post-recovery assessment and testing documenting extent of healing, persisting scar/damage, perfusion adequacy around the affected area; 4) no abnormal dysrhythmias on Holter monitor; 5) Ejection fraction above 50%; and 6) Completion of MEB/PEB process for military aviators. All will be reviewed with USAAMA and Aeromedical Cardiology Consultant. Unit Commander and Flight Surgeon presence at the ACAP is requested to review the details of the potential restricted waiver and review of the aeromedical concerns, if such a waiver is recommended. Restrictions for the waiver may include limitation to particular airframe, unit assignment, mission limitations, non-deployability status, and annual follow-up requirements. This ACAP may be scheduled to coincide with the US Army Basic Flight Surgeon Course training.

For Class 2F/2P, non-rated aircrew, military ATCs, and Civilian ATCs, SCAD is normally not waivable, but may be considered in similar fashion to above on a case-by-case basis. Contact USAAMA to coordinate review.

**INFORMATION REQUIRED:** Aviators with CAD need:

- Initial complete cardiology evaluation to include risk factor analysis
  - Aeromedical graded exercise test (AGXT) or Electron Beam Computed tomography (EBCT)
  - Baseline Thallium or Sestamibi GXT scan
  - Stress echocardiogram
  - Cardiac catheterization (if the above testing is inconclusive)
- Post Intervention Studies (6-months post for Class 2, 3-month post for all others)
  - Stress Thallium or Sestamibi GXT (Perfusion, wall motion, EF with and without stress)
  - Stress Echocardiogram (EF and wall motion with and without stress)
- Post Event
  - Stress Thallium or Sestamibi GXT (Perfusion, wall motion, EF with and without stress)
  - Stress Echocardiogram (EF and wall motion with and without stress)
  - Cardiac catheterization (if indicated or to better define post-event state)
  - Aggressive lifestyle modifications (no smoking, normotensive, normoglycemic, LDL < 70, exercise)
  - MEB/PEB findings (for military aircrew)
  - Unique mission-skill needing continuation of in-flight performance duties

Following consultation with USAAMA and review with Aeromedical Cardiology Consultant testing may be done locally or with Brooks Aeromedical Consultation Service (USAF ACS). An Aeromedical Summary to include final reports of all studies will be forwarded to USAAMA for review prior to any waiver action. If films or complete tracings are required, they will be requested. Local flight clearance is not authorized unless granted in coordination with USAAMA.

**FOLLOW-UP:** Any person granted a waiver for Minimal Coronary Artery Disease or post-angioplasty or stenting shall report the results of an annual stress testing with imaging with FDME/FDHS. Repeat cardiac catheterization is not required unless there is a change in the patient's condition (decreased exercise tolerance or angina, for instance) or results from any of the previously mentioned follow up examination deviate from previous test results. In these cases, the aviator would be disqualified from aviation duties except for simulator flights until an evaluation and work-up by an aviation medicine qualified cardiology specialist is accomplished. The results would then be reviewed by USAAMA and a recommendation for flying duty made.

Any person granted a restricted waiver for SCAD shall follow the annual waiver requirements prescribed. Any change in the aviator's health or status shall warrant immediate grounding with review and consultation with USAAMA prior to consideration of returning to limited flight duties.

**TREATMENT:** Only aspirin, clopidogrel, nicotine weaning, antihypertensive therapy, oral diabetic, and lipid lowering medications are approved. All other medications are normally not waiverable. (See Medication APLs)

**DISCUSSION:** There is poor correlation between the severity of stenoses and their propensity to cause myocardial infarction, unstable angina, or sudden coronary death. Pathological studies have revealed that myocardial infarctions and unstable angina are most often caused by rupture of atherosclerotic plaques with formation of superimposed occlusive thrombus. Many atherosclerotic lesions responsible for serious events are mild stenoses of inconsequential hemodynamic significance and are characterized by abundance of lipid, numerous inflammatory cells, and a thin fragile fibrous cap. These observations suggest that although measurements of coronary flow reserve may be useful in the assessment of stenoses and in the identification of lesions responsible for effort angina, they are not likely to identify the more dangerous plaques responsible for unstable angina, acute myocardial infarction, and ischemic sudden death. Coronary artery bypass surgery will increase exercise tolerance and relieve angina in up to 85% of cases, but the symptoms recur in approximately 8% of the patients per year. Data on PCI shows that stent placement and aggressive risk factor reductions significantly reduce symptoms and infarction risks in near or long term studies.

**REFERENCE:**

Braunwald et al. 2001. Stenosis Severity And Clinical Events. In: Braunwald: Heart Disease: A Textbook of Cardiovascular Medicine, 6th ed., pp 1104. New York. W. B. Saunders Company

## HYPERLIPIDEMIA/HYPERCHOLESTEROLEMIA

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Coronary Artery Disease (CAD) or Coronary Heart Disease (CHD) is the leading cause of permanent suspension from flying duties and non-accidental, premature death in aircrew members. In an effort to reduce the risk of CAD, reduction of the identified risk factors is key. Optimizing lifestyle behaviors is the first line. With the availability of highly efficacious statin drugs, and with newer clinical trials demonstrating a profound effect of these drugs in primary and secondary prevention of coronary artery disease, there is now widespread agreement that primary treatment of hyperlipidemia is indicated. An increase in CAD risk occurs with elevated plasma cholesterol, increased low-density lipoprotein (LDL), and reduced high-density lipoprotein (HDL).

**INFORMATION ONLY:** Hypercholesterolemia controlled by either diet or by those drugs listed below is not disqualifying for applicants or aircrew members. No waiver is required. No AGXT testing is required in those under 40. This information is filed Information Only. Most drugs listed below require monitoring and annual submission of additional information with FDME/FDHS, such as hepatic function test results with creatine kinase (CPK). Submitted physicals without required laboratory values annotated (or at least a comment such as "LFTs/CPK normal and in AHLTA") are returned **DISQUALIFIED, INCOMPLETE (DI)**.

**WAIVER (For all classes, Rated and Non-Rated, including ALL applicants):** Waiver submission is reserved for those rare complicated cases where side effects or aeromedical issues inhibit safe use of the below listed medications, or permanent medical complications resulting from their use. These are rare.

### **INFORMATION REQUIRED:**

- For an accurate lipid profile determination: the patient should fast for 9-12 hours, with only water or fat-free fluids allowed. The aircrew member should be on a normal diet for the previous 2 weeks; have no illnesses, operation or injury for the previous 4 weeks; and no minor febrile episode for 1 week.
- Causes of secondary hyperlipidemia such as hypothyroidism, diabetes, obstructive liver disease (cholestasis), alcohol abuse, gout, renal failure, nephrotic syndrome, myeloma, systemic lupus erythematosus and use of drugs that may increase LDL cholesterol or decrease HDL cholesterol (progestins, anabolic steroids, and corticosteroids) should be excluded via history and appropriate laboratory testing, imaging, and consultation with specialists as required. For assistance in determining evaluation requirements, contact USAAMA staff.
- Aircrew members of any age with serum cholesterol values greater than or equal to 240 mg/dl (High risk for CAD based on NCEP) should be evaluated for treatment with options as listed below.

**FOLLOW-UP:** Follow-up for specific drug regimens is listed below. Annual submission of complete lipid panel and annual surveillance labs for the medication is required.

**TREATMENT:** The first line of treatment for mild cases is Therapeutic Lifestyle Changes (TLC) including dietary control, weight loss, and increased aerobic exercise. Use of medication should be determined by current standards of care as proposed by the Adult Treatment Panel III (ATP III) of the National Cholesterol Education Program (NCEP). The first drug of choice is the statins, possibly in concert with ezetimibe, followed by bile acid binding resins and then nicotinic acid. Use of fibrates is generally reserved for cases with significant hypertriglyceridemia. Recommended laboratory follow-up is as listed

below for each medication class. Report a current (within 90 days) set of values as specified for medication class on annual FDME.

- **HMG CoA Reductase Inhibitors (Statins):** LOVASTATIN, PRAVASTATIN, SIMVASTATIN, ATORVASTATIN, and FLUVASTATIN, ROSUVASTATIN. Liver Function tests (LFTs) and CPK prior to initiating treatment and 6-12 weeks after the start of therapy, annually thereafter. Lipid profile 3-6 months after initial therapy to determine efficacy and annually thereafter. (Rare concern for rhabdomyolysis)
- **Ferric Acids:** GEMFIBROZIL, FENOFIBRATE, CLOFIBRATE. Prior to initiating treatment and at 3, 6, and 9 months, then annually- do LFTs to include bilirubin and LDH, CPK, CBC and complete Lipid Profile. (Hypersensitivity, fatigue, dyspepsia, hepatic dysfunction, dizziness, depression and blurred vision have been reported).
- **Bile-Acid Binding Resins:** COLESTYRAMINE, COLESTIPOS. Lipid profile prior to initiation. Recheck Lipid profile at 2-4 weeks for efficacy. Submit prothrombin time and serum calcium annually. (These drugs cause constipation and interact with such drugs as hydrochlorothiazide, penicillin and tetracycline. Additionally, they may cause Vitamin A, D, E, K, folic acid, magnesium, iron, zinc deficiency)
- **Nicotinic Acid:** NIACIN, NIASPAN. Serum glucose and uric acid 6 months after initiation. LFTs every 6-12 weeks for the first year and then every 6 months thereafter. (<1% incidence of elevated LFT's, possibility of fulminant hepatic necrosis)
- **Cholesterol Absorption Inhibitors:** EZETIMIBE. LFT's prior to initiating treatment and Lipid Profile 6-12 weeks after initiation, annually thereafter. Evaluate for muscle ache/myalgias at follow up visits. Use with statin therapy is aeromedically acceptable provided providers follow the information requirement for both medications.

**DISCUSSION:** The treatment of mild/moderate cases of hyperlipidemia is becoming increasingly recommended as a preventive strategy for CAD. The primary target for therapy is the LDL with an optimal goal of <100 mg/dl. In determining which patients to treat, LDL concentrations should be below 160 mg/dL in patients with less than two CHD risk factors. A lower value of 130 mg/dL is recommended in patients with two or more CHD risk factors. Major CHD risk factors, other than increased LDL, include: tobacco use, hypertension (>140/90), low HDL Cholesterol (<40 mg/dl), family history of premature CAD (first degree relative male < 55 y/o and female <65 y/o) and age (male> 45 y/o and female > 55 y/o). Information regarding treatment of hyperlipidemia is continually evolving, and providers should remain current with the latest treatment recommendations.

This is one of the simplest and most common policy letters that may have a profound effect on aircrew health years ahead. Over the recent iterations, the process for use of medication for cholesterol has been made more user-friendly, from removal of submitting for a waiver or preparing an AMS, to removing age-criteria for introduction of medication therapy, and now, to removing this as a disqualifying condition for initial flight applicants. The underlying goal is to improve aircrew knowledge and health through lifestyle changes and education, and through lipid-lowering agents. If during the performance of flight physicals, one sees repeated comments annually about TLC with continually elevated lipid profiles, make the clinical call to initiate and monitor therapy.

#### **REFERENCE:**

Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults  
(Adult Treatment Panel III). NIH: National Heart Lung and Blood Institute, NIH 01-3670, May 2001.  
<http://www.nhlbi.gov/guideline/cholesterol/profmats.htm>  
Implications of Recent Clinical Trials for the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Circulation. 2004; 110:227-239.

# HYPERTENSION

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Untreated hypertension is a major risk factor for the development of cardiovascular disease including coronary artery disease, congestive heart failure, cerebrovascular accidents, peripheral vascular disease, and renal disease. The relative risk of developing coronary artery disease is compounded when untreated hypertension co-exists with hyperlipidemia, cigarette smoking, increasing age, or diabetes. Hypertension is relatively common, easily recognizable, and treatable with diet/exercise and/or approved medications. Hypertension increases the risk for developing diabetes.

**WAIVERS:** A documented history of hypertension, regardless of whether treated with diet or medication, is disqualifying for all classes of flight and requires a waiver or exception to policy.

**Initial applicants (all classes):** Exception to policy or waiver for initial aviation candidates is routinely recommended when treatment has achieved a normotensive state (less than 140/90 mm Hg) and evaluation reveals no underlying pathology. Individuals controlled with lifestyle modifications alone will also require a waiver even though control is achieved without medication.

**Rated and Non-rated (all classes):** Waivers are usually recommended provided when treatment has achieved a normotensive state (less than 140/90 mm Hg) and evaluation reveals no underlying pathology. Individuals controlled with lifestyle modifications alone will also require a waiver even though control is achieved without medication.

**INFORMATION REQUIRED:** The goal of initial work-up of a questionably hypertensive patient is to

- Verify the diagnosis with a 3-day b.i.d. BP reading in each arm. Report readings on AERO Form 2808, page 4 in blocks provided. If average is less than 139/89, counsel for appropriate lifestyle changes and return to flight duties. Submit.
- If the average of these readings is greater than 139/89, further evaluation must be done to exclude underlying pathology/secondary causes. Initial evaluation should include:
  - Documentation of aircrew member and family history with regard to CAD, Hypertension, Cerebrovascular accidents, Diabetes mellitus, Hyperlipidemia, and Renal Disease.
  - Documentation of lifestyle and habits with regard to recent weight gain, physical activity, diet, tobacco, and alcohol use.
  - Documentation of all medications currently in use to include OTC, herbal preparations, and prescription medications.
  - CBC
  - CHEM. 7 (serum electrolytes, glucose, BUN, and creatinine),
  - Uric acid
  - Lipid Profile (total serum cholesterol, HDL cholesterol, triglycerides),
  - ECG
  - Routine urinalysis
  - Direct ophthalmoscopic examination
  - If these studies are negative, nothing further is required. Abnormalities however, must be evaluated by internal medicine, cardiology, nephrology, or ophthalmology, as appropriate.
- Report results of treatment(s) used to achieve normotensive status (see treatment below), to include successful post-treatment 3-day b.i.d. BP results and average within standards as well as CHEM 7 while on medication, if utilized to treat.

**FOLLOW-UP:** FOR DIET/EXERCISE ONLY WAIVERS: Annual submission of 3-day BID BP determinations is required. FOR MEDICATION USAGE: Annual submission of a CHEM 7, ECG,

Urinalysis, and 3-day b.i.d. BP determination. Certain medications will require unique annual submissions - see below.

**TREATMENT:** The JNC VII report contains detailed guidance and evaluation and therapy for hypertension, introducing the issue of pre-hypertension and still endorsing first line therapy with diuretics. Hypertension is an established risk factor for diabetes, and patients warrant testing for impaired fasting glucose and impaired glucose tolerance. Lifestyle modifications lead therapeutic options but are often inadequate to maintain a normotensive state. These have included a proper diet, exercise, weight loss, salt restriction, alcohol abstinence, smoking cessation, and reduction in caffeine consumption. If medication is required, the aircrew member must be grounded for a sufficient period (1-4 weeks) to observe for side effects and can resume flight when assessed locally, stable on medications, and blood pressure is trending appropriately. The AMS for waiver should be requested when on a stable dosage with adequate BP control (3-day average <140/<90), and with normal lab evaluation on the medication. Waivers are usually granted for class of medication use; therefore, if local pharmacy policy or clinical judgment requires a change to a medication within the same class, no additional waiver action is required. A current (within 90 days) set of laboratory results, 3-day BP average, EKG, and Urinalysis are required for annual waiver requirements.

**ACE Inhibitors:** CAPTOPRIL (Capoten), ENALAPRIL (Vasotec), LISINOPRIL (Zestril), BENAZEPRIL (Lotensin), FOSINOPRIL (Monopril), QUINAPRIL (Accupril), RAMIPRIL (Altace), TRANDOLOPRIL (Mavik), MOEXIPRIL (Univasc). Required labs: Chem7 (basic metabolic panel) in first 7-10 days after initiating therapy to evaluate effect on BUN, creatinine and potassium levels, insuring stability. This should be medically followed every at one week, and again at 3 months of therapy and then followed annually, with reporting on FDMEs.

**Angiotensin II Receptor Blockers:** LOSARTAN (Cozaar), VALSARTAN (Diovan), IRBESARTAN (Avapro), CANDASARTAN (Atacand), and similar ARBs with FDA approval. ACE and ARB II in Combination with approved diuretics may be used. Similar reporting as above.

**Alpha Blockers:** PRAZOSIN (Minipress), DOXAZOSIN (Cardura), TERAZOSIN (Hytrin). When used for the treatment of hypertension or benign prostatic hypertrophy, report annual Chem-7.

**Beta Blockers: OK for use in ATC PERSONNEL ONLY-** ATENOLOL (Tenormin), METOPROLOL (Lopressor, Toprol), PROPRANOLOL (Inderal). These are Class 4 medication in pilots. Flight surgeons and non-rated aircrew are considered on a case-by-case basis. (See Medication APLs)

**Calcium Channel Blockers:** AMLODIPINE (Norvasc), FELODIPINE (Plendil), NISOLDIPINE (Sular) can be used with waiver in any aircrew member. **FOR ATC PERSONNEL ONLY** - VERAPAMIL (Calan), NIFEDIPINE (Procardia), DILTIAZEM (Cardizem). These are Class 4 medications for pilots. Flight surgeons and non-rated aircrew are considered on a case-by-case basis. (See Medication APLs).

**Clonidine: ATC PERSONNEL ONLY** – This is considered Class 4 medication for all other aviation classes.

**Diuretics** - Thiazide, Potassium-sparing, and combinations. All LOOP DIURETICS are Class 4 medications and will not be waived. Required labs: Thiazide use requires annual serum glucose, BUN, creatinine, and serum uric acid. Thiazides may alter serum cholesterol and triglycerides; therefore, monitor lipid profile after 6 months of therapy and then annually. Use of any potassium sparing diuretic requires serum potassium level every 6 months. TRIAMTERENE (Dyrenium) requires platelet count and CBC with differential every 6 months, with annual reporting on FDMEs.

**DISCUSSION:** Primary Prevention is key. FAA standards allow pilots to fly with inadequately managed blood pressure; OPM standards also allow for inadequately managed blood pressure. These conflicts with standard medical practice. A significant portion of cardiovascular disease occurs in people whose blood pressures are above the optimal level (120/80 mm Hg) but not so high as to be diagnosed or treated as hypertension. Hypertension as well as pre-hypertension is one of the criteria for metabolic syndrome. Review of AEDR data indicates that 86% of those requesting waiver for this condition have them granted and those who do not receive waivers generally have another more serious condition leading to suspension. USAAMA stresses the need for flight surgeons to work on primary prevention with aircrew members and to aggressively diagnose and treat hypertension to prevent long-term sequelae. In the Framingham study, the mortality of individuals with hypertension was more than double that of the normotensive population, with most of the deaths occurring suddenly. The risk of cardiovascular events increase with age, smoking, male gender, positive family history, excess alcohol intake, and high blood lipid levels. Several studies have demonstrated a reduction in mortality and morbidity resulting from the treatment of hypertensive patients.

**REFERENCE:** The Seventh Report of the Joint Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. NIH: National Heart, Lung, and Blood Institute 04-5230, Aug 2004  
<http://www.nhlbi.nih.gov/guidelines/hypertension/jnc7full.htm>

## IDIOVENTRICULAR RHYTHM

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Idioventricular rhythm is frequently asymptomatic, but not necessarily normal. If the ventricular rate is slow enough to depress cardiac output and decrease blood pressure, this may result in increasing fatigue, dizziness, syncope, and, rarely, angina. Thus, idioventricular rhythm disturbances deserve evaluation.

**WAIVERS (ALL Classes, RATED and NON-RATED, to include APPLICANTS):** Waiver/exception to policy are possible and will be reviewed on a case-by-case basis after complete cardiac evaluation rules out the possibility of underlying disease.

G Code	Condition
G-060	Idioventricular rhythm
G-076	Accelerated idioventricular rhythm

### INFORMATION REQUIRED:

- Complete cardiology evaluation is required. This should include the following:
  - AGXT
  - 24-hour Holter monitor
  - Echocardiogram.
- Asymptomatic aircrew member does not need to be grounded during this evaluation if the studies are normal.

**FOLLOW-UP:** None.

**TREATMENT:** Treatment includes correction of reversible precipitating factors such as hypoxia, hyperkalemia, or acidosis.

**DISCUSSION:** ECG shows a regular rhythm characterized by a wide, bizarre QRS and rates of 20 to 100 beats per minute. Idioventricular rhythm may occur as a result of hypoxia, acidosis, severe hyperkalemia, during general anesthesia, or with acute myocardial infarction. Idioventricular rhythm must be differentiated from any of the bradycardias and is most frequently confused with AV junctional rhythm with aberrant ventricular conduction or sinus bradycardia with bundle branch block. When the rate exceeds 50 beats per minute, the term "accelerated idioventricular rhythm" is used. This is often associated with acute myocardial infarction and thus, it is not normally waivable.

## INNOCENT MURMUR

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** The finding of a "new" heart murmur in an aircrew member has a broad range of implications depending upon the type of murmur, the valve involved, and the actual aircraft position the aircrew member occupies. It is important to identify and document the presence of an innocent heart murmur as soon as possible and to definitively rule out the presence of pathologic valvular changes. The presence of a truly innocent heart murmur is of no consequence in aviation medicine, but this determination can only be made after completing the evaluation.

**WAIVERS (All Classes, RATED and NON-RATED, to include APPLICANTS): NO WAIVER is required for Innocent Murmur.** The information below, which confirms the diagnosis, shall be reported in the "REMARKS" portion of the FDHS/FDME for INFORMATION ONLY filing.

**INFORMATION REQUIRED:** FDME must clearly document the presence of an innocent heart murmur. Evaluation should consist of:

- Complete history and physical
  - Describe the murmur, to include auscultation and palpation
- Resting 12-lead ECG
- Echocardiogram (2-D & M-Mode) with color-coded Doppler flow study report.
  - If no pathology is found, the murmur should be designated as "functional" or "innocent flow murmur." Rarely, echocardiography films may be requested.

**FOLLOW-UP:** If, on routine history and physical, the character of the murmur is felt to change (e.g., location of maximal appreciation, holosystolic to midsystolic, etc), or if there are any symptoms referable to cardiovascular disease, than one should plan on repeating the evaluation with repeating resting 12-lead ECG and echocardiogram.

**TREATMENT:** N/A

**DISCUSSION:** Innocent murmurs are, by definition, those murmurs occurring in the absence of anatomic or physiologic abnormalities of the heart. Such murmurs may be present at any time during anyone's life. An understanding of the nature of innocent murmurs is necessary in order to avoid mistaken diagnosis, which can result in erroneous administrative action in flight applicants as well as rated personnel. The majority of innocent murmurs are systolic.

## INTRAVENTRICULAR CONDUCTION ABNORMALITIES

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Acquired bundle branch or fascicular block(s) may be the result of serious underlying cardiac disease, including coronary atherosclerosis and myocardial infarction. These also may be the result of hypertension, volume overload states, cardiac valvular diseases, or primary conduction disease.

**WAIVERS (All Classes, RATED and NON-RATED, to include APPLICANTS):** Incomplete right bundle branch block (IRBBB) is often a normal variant, recorded as Information Only, with no waiver required. Acquired or complete right bundle branch block (RBBB), left bundle branch block (LBBB), left anterior hemiblock (LAHB), and left posterior hemiblock (LPHB) are usually not normal variants and require waiver action upon completion of a cardiology evaluation. Bifascicular blocks (LAHB or LPHB with RBBB) and trifascicular blocks (1st degree AVB with RBBB and either LAHB or LPHB) are more concerning and normally not considered favorably for waiver. Local flight clearance (temporary upslip) for any of these abnormalities is not authorized unless in coordination with USAAMA.

G Code	ICD9 Code	Condition
G-120	426.4	Right bundle branch block
G-121	None	Incomplete right bundle
G-126	426.2	Left anterior hemiblock
G-124	426.3	Left bundle branch block
None	426.53	Bifascicular block (LAHB &
None	426.54	Trifascicular block
G-128	None	Left posterior hemiblock

**INFORMATION REQUIRED:** A complete current FDME and cardiology evaluation are required for LBBB, RBBB, LPHB, and acquired LAHB with following information:

- AGXT
- 24-hour Holter
- Echocardiogram
- Exercise Thallium or Sestamibi Scan or Stress Echocardiogram.
- Cardiac catheterization, as indicated by abnormal noninvasive evaluation and/or other clinical indicators at the discretion of USAAMA with consultative review with Aeromedical Cardiology Consultant.
- If LAHB has been present for over 5 years, only an echocardiogram is required.

**FOLLOW-UP:** Only required in those with other underlying cardiac disorders.

**TREATMENT:** N/A

**DISCUSSION:** RBBB occurs on up to 2 per 1000 ECGs. It is often congenital (seen on earlier ECGs) or develops at high heart rates. If it has been present for years, is not associated with symptoms, and is accompanied by an otherwise normal cardiac examination, RBBB carries no known adverse risk or prognostic significance. One report states that the risk of RBBB progressing to complete block is a few percent a year. The risk increased when RBBB is associated with left posterior fascicular block or when RBBB and LBBB alternate. In the absence of heart disease, acquired RBBB carries the same risk for death or syncope as the general population. Similarly, isolated left anterior fascicular block carries no known increased risk; not enough is known about isolated left posterior fascicular block to access its risk potential. In the absence of demonstrable pathology, there is no justification for termination from flight status. Persons with known, recently acquired LBBB have a significant increase in mortality compared to normal. A large percentage of patients with asymptomatic LBBB have coronary artery disease.

# ION CHANNEL DISORDERS - BRUGADA SYNDROME, (LONG QT SYNDROME, CATECHOLAMINERGIC POLYMORPHIC VT)

## Family History of Sudden Cardiac Death prior to age 35

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Ion channelopathies are those genetic disorders leading to abnormality of sodium (Brugada syndrome), potassium (long QT syndrome), or calcium (catecholaminergic polymorphic VT, RyR2) transport across the myocardial cell. Commonly, these conditions may cause characteristic ECG changes and symptoms of syncope or palpitations unexpectedly, and there is an increased risk for sudden cardiac death. The initial clinical manifestation of these conditions may be sudden incapacitation without prodrome.

**WAIVERS (For all classes, Rated and Non-rated, including ALL applicants):** The definitive diagnosis of Brugada syndrome, long QT syndrome, or catecholaminergic polymorphic VT are non-waiverable conditions. Because the initial manifestation of these syndromes may be sudden death, identifying any of these diagnostic ECG patterns is also non-waiverable until thoroughly evaluated and reviewed. Because the diagnosis can be challenging, consultation with a cardiac electrophysiologist is required prior to submission of the case to USAAMA for Aeromedical Cardiology Consultant. Although the syndrome is not waivable, having a family history of premature sudden cardiac death (any first degree relative prior to the age of 35 without antecedent trauma or prolonged illness) will require review of the case by the Aeromedical Cardiology Consultant after submission with USAAMA.

### INFORMATION REQUIRED:

- Cardiology consultation is required for those with a family history of sudden death prior to the age of 35, including
  - Echocardiogram
  - 12 lead electrocardiogram
  - 24 hour Holter monitor
  - Genetic testing for SCN5a and LQTS at the discretion of the Aeromedical Cardiology Consultant

**FOLLOW-UP:** Will be specified based on the diagnosis and condition

**TREATMENT:** Treatment for those with identified ion channelopathy in addition to symptoms referable to that channelopathy lead to a diagnosis of a syndrome. The presence of Brugada syndrome, LQT syndrome, or RyR2 syndrome is treated with either antiarrhythmic drugs, or more commonly an implantable cardioverter-defibrillator. For those with a family history, no treatment is necessary, and if genetics can be used to disprove transmission through pedigree or identifiable mutation, there is no indication for treatment, and there is no limitation. For those with asymptomatic Brugada pattern or asymptomatic long QT pattern, close follow-up with query for symptoms is necessary.

**DISCUSSION:** Sudden death in the setting of a structurally normal heart, presumed arrhythmia, is the leading cause of non-traumatic death in the military population. Many of these cases are felt to be due to a genetic ion channelopathy. Ion channelopathies usually occur in the absence of structural heart disease, and the ECG pattern may be variable. Brugada syndrome has a characteristic ECG finding of incomplete right bundle branch block and ST elevation of more than 1mm in the anterior precordial leads V1 and V2, with a characteristic coved appearance. Long QT syndrome has a characteristic ECG finding of a prolonged QT interval (defined as a QT corrected of more than 440msec in males and 460msec in females). Measurement of the QT interval can be variable, and caution must be exercised not to include the U-wave, a normal variant in young people. Catecholaminergic polymorphic VT has a normal ECG at rest, but with exertion or stress may develop polymorphic ventricular tachycardia. Although the

transmission of ion channelopathies is genetic, many cases represent spontaneous mutations. Poor prognostic factors include a family history of sudden death, history of syncope, evidence of spontaneous ventricular arrhythmias on ambulatory monitoring, and response to electrophysiology study. The risk of sudden cardiac death does not decrease with age, and the only treatment available is an implantable cardioverter defibrillator (ICD).

# MITRAL VALVE PROLAPSE

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Most mitral valve prolapse (MVP) is considered a benign condition with no significant symptoms. However, MVP Syndrome is occasionally associated with development of palpitations, episodic chest pain, progressively worsening mitral regurgitation, infective endocarditis, syncope, atrial and/or ventricular dysrhythmias, and rarely sudden death.

## WAIVERS:

**Class 1:** Exception to policy is reviewed on a case-by-case basis based on information below.

**Class 2, 3, 4 (to include applicants):** Waiver is considered favorably in the presence of only mild mitral regurgitation and no significant dysrhythmia. All other case scenarios will be reviewed on a case-by-case basis. Surgically corrected MVP, even if minimally invasive, is non-waiverable.

## INFORMATION REQUIRED:

- Complete cardiology consultation is required, to include the following:
  - AGXT
  - 24-hour Holter Monitor
  - Echocardiogram with Doppler flow study

**FOLLOW-UP:** Submission every three years of 24-hour Holter monitor and echocardiogram with Doppler flow study documenting severity of regurgitation. Findings of progressive regurgitation or dysrhythmias will require further testing as indicated.

**TREATMENT:** SBE antibiotic prophylaxis is not required for MVP in the absence of thickened leaflets or mitral regurgitation. In specific circumstances, such as prophylaxis for all cases of MVP, the risk of death due to penicillin is estimated to be greater than the risk of infective endocarditis. Beta blockers, used to reduce the incidence of palpitations, may be used on ATC personnel but are prohibited for all other classes of aircrew.

**DISCUSSION:** Mitral valve prolapse (MVP) was once felt to be one of the most common abnormalities of the heart valves with prevalence in various studies up to 17%. Later review found that these were gross over-estimates as to the prevalence of the disease and due to inappropriate imaging and interpretation of echocardiography. A small percentage of MVP occurs with inheritable connective tissue disease (such as Marfan syndrome, pseudoxanthoma elasticum, and Ehlers-Danlos syndrome). Middle aged and elderly men, who have MVP, are at a higher risk of developing progression of mitral regurgitation (5.5%), ruptured chordae tendinea, and endocarditis (2-8%). Neurologic ischemic events occur in individuals with MVP more commonly than in the normal population, but this can only be clearly identified in groups at low risk of stroke, such as young women. Risk of sudden death is well established in MVP patients with severe mitral regurgitation. Patients without known MVP, at autopsy, are found often with an associated severe valvular deformity as well as increased heart weight suggesting the presence of undiagnosed regurgitation. To date specific dysrhythmias have not been documented to increase the risk of sudden death in the MVP, but have been linked with symptoms incompatible with aviation status, i.e., sudden onset syncope, chest pain, and associated anxiety.

# MITRAL REGURGITATION

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Aircrew members with mitral regurgitation (MR) may remain asymptomatic for decades. Over time, though, MR may progress leading to cardiomegaly and eventually heart failure. Generally, cardiac surgical intervention needs to be performed prior to the development of dysfunction and severe MR. Complications of mitral regurgitation include arterial or venous embolism, bacterial endocarditis, atrial enlargement, and left and right ventricular failure. Sudden attacks of acute pulmonary edema and atrial fibrillation are common in severe mitral regurgitation.

## WAIVERS:

**Initial Flight School Applicants (1A/1W):** Exception to policy is generally not recommended for more than trace MR after the work-up below. Cases beyond trace MR may be reviewed on a case-by-case basis with the complete evaluation below.

**All Rated and Non-Rated Aircrew (to include initial 2/3/4):** Waivers may be favorably considered for trace and mild cases of mitral regurgitation provided: 1) no association with mitral stenosis or connective tissue disease, 2) normal exercise tolerance, 3) no evidence of left atrial enlargement, 4) normal LV size and function, and 5) no dysrhythmias.

## INFORMATION REQUIRED:

- Complete cardiology evaluation including:
  - AGXT
  - 24-hour Holter monitor
  - Echocardiogram with Doppler flow study.
- Consultation with an aeromedical cardiology consultant may be required, particularly if moderate or severe disease is present, by USAAMA.

**FOLLOW-UP:** Annual submission of AGXT, 24-hour Holter monitor, echocardiogram with Doppler flow study, and cardiology consultation reports are required. If requested, submit actual tracings and films with FDME.

**TREATMENT:** SBE antibiotic prophylaxis may be required for all dental manipulations and potential septic exposures. Patients with echocardiographic evidence of physiologic or mild MR in the absence of a murmur and with a structurally normal valve do not require SBE prophylaxis.

**DISCUSSION:** MR, especially trace or mild, is a common finding routinely determined with echocardiogram. It may be the result of many different pathologic processes: rheumatic heart disease, coronary artery disease, bacterial endocarditis, myxomatous degeneration of the mitral valve (MVP), mitral annular calcification, left ventricular dilation, idiopathic hypertrophic subaortic stenosis, various congenital heart disease, and (more uncommonly) tumors, syphilis, ankylosing spondylitis, trauma, amyloidosis, granulomas, and Hurler's syndrome. With severe regurgitation without surgical intervention, the 5-year survival rate is less than 50%.

## DIAGNOSTIC CRITERIA:

**Mild**    Restriction of the regurgitant jet to less than or equal to 2 cm behind the valve leaflets. Additionally, it should be  $4 \text{ cm}^2$  or less by planimetry, or less than 20% of the total left atrial area by color-flow Doppler assessment. Trace is less than 5% of the total area.

<b>Moderate</b>	Signs of MR greater than mild present, but no criteria for severe MR.
<b>Severe</b>	Severe regurgitation should have a jet area greater than equal to $8 \text{ cm}^2$ , or $> 40\%$ of left atrial area. Regurgitant fraction more than 50%, with left atrial and ventricular enlargement. If there is a wall impinging jet of any size swirling in the left atrium, this is consistent with severe MR.

## MITRAL STENOSIS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Mitral stenosis (MS) is generally a result from rheumatic heart disease. This is becoming a rare cardiac entity. The first symptoms to appear include exertional shortness of breath and hemoptysis. Symptoms continue to worsen with continued loss of effective valve area, often due to calcification or scarring. Chronic fatigue, worsening dyspnea, and ankle edema are present in later stages. Complications include atrial fibrillation with or without rapid ventricular response, pulmonary edema, arterial or venous embolism, and right ventricular failure. Mitral stenosis may also present with chest pain. The progressive nature of this process and its risk of significant complications are incompatible with the military aviation environment.

**WAIVERS (includes ALL applicants, rated and Non-rated aircrew):** Any degree of mitral stenosis is disqualifying, and waivers or ETPs are generally not recommended or granted. Occasionally, aircrew members with extremely mild stenosis, who are asymptomatic with a pliable valve, minimal orifice reduction, normal exercise testing, and no dysrhythmia may be considered for a waiver. All MS will be reviewed on a case-by-case basis.

### INFORMATION REQUIRED:

- Complete cardiology evaluation including:
  - AGXT
  - 24-hour Holter Monitor
  - Echocardiogram (2-D & M-Mode) with color Doppler flow study.
- Consultation with the designated Army Aviation Medicine Cardiology Consultant or AMCS (Brooks AFB) may be required by USAAMA.

**FOLLOW-UP:** Annual submission of AGXT, 24-hour Holter monitor, and echocardiogram with Doppler flow study with cardiology consultation reports. If requested, submit complete tracings and films with FDME.

**TREATMENT:** SBE antibiotic prophylaxis is required for all dental procedures as well as any other potentially septic exposure. Valve replacement is normally not waivable, but cases will be reviewed on a case-by-case basis.

**DISCUSSION:** Approximately 50% of patients with mitral stenosis report an episode of rheumatic fever in childhood. The patient becomes symptomatic 10-20 years after an attack of rheumatic fever and becomes incapacitated 5-10 years later. Pregnancy can result in earlier manifestations of mitral stenosis due to the increased workload pregnancy places on the heart. Pulmonary edema, heart failure and even death have been reported in pregnant women with mitral stenosis. Atrial fibrillation becomes chronic in over 50% of patients with mitral stenosis. Paroxysmal atrial fibrillation will occur in up to 80% of patients with mitral stenosis and of these, 20-30% will form atrial thrombi with subsequent embolization. Between 10 and 20% of patients with mitral stenosis, including those with only mild disease, can throw off emboli with a subsequent mortality rate of 15%. Once patients become symptomatic, survival is 50% at 4-5 years without surgery. After valve replacement, the 50% survival rate is improved to 10 years.

## MYOCARDIAL ISCHEMIA / DAMAGE (SUSPECTED)

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** By definition, silent myocardial ischemia or infarction occurs in the absence of chest discomfort or other anginal equivalents. Objective evidence must be used to diagnose this condition. Occasionally ECG findings when discovered as new or serial changes are suggestive of ischemia or myocardial damage that has gone unrecognized by the aircrew member. With a lack of awareness as well as reduction or correction of risk factors, these individuals are at increased risk for cardiovascular events to include dysrhythmia and myocardial infarction as well as stroke.

**WAIVERS (All Rated and Non-rated aircrew, to include applicants):** In the absence of symptoms and with a negative cardiovascular evaluation, waivers are possible for several ECG variations. The flight surgeon should be familiar with recognizing changes in the morphology of the ECG tracing that increase the suspicion for undiagnosed myocardial ischemia or damage. Such findings include but are not limited to:

- ST-T segment changes
- Significant Q-waves
- Poor R-wave progression in the precordial leads
- Meeting criteria for L VH

**INFORMATION REQUIRED:** With ECG findings indicative of silent myocardial ischemia or infarction, the aircrew member will need:

- Complete FDME
- AGXT and Cardiology consultation. If normal, submit AMS for waiver. If this is abnormal, proceed to below. Temporarily suspend from flight duties until completion and review with USAAMA.
- Noninvasive Cardiac Imaging: Thallium or sestamibi GXT (preferred) or Stress Echocardiogram. If abnormal, proceed to invasive cardiac imaging after consultation with USAAMA. If no hemodynamically significant perfusion defects are detected, aggressive risk factor modification is to be done. Submit AMS to USAAMA for review, return to flight, and waiver.
- Invasive Cardiac Imaging: Cardiac catheterization. Results of cardiac catheterization must be forwarded to USAAMA for review along with the other reports above. Return to flight and waiver after review of all.

**FOLLOW-UP:** To be determined based on extent of work-up from above.

**TREATMENT:** Reduction of cardiac risk factors.

**DISCUSSION:** Silent infarction has been reported to account for anywhere from 20% to 35% of all myocardial infarcts. The presence of silent ischemia during normal daily activities is a strong predictor of cardiac mortality and acute cardiac events. Objective evidence of myocardial ischemia may be obtained in several ways including ambulatory monitoring, exercise testing, nuclear imaging, and stress echocardiography. The majority of patients who experience silent myocardial ischemia have evidence of inducible ischemia during exercise testing. Asymptomatic individuals with a positive exercise stress test had a 5-fold increase in cardiovascular mortality and a 2-fold increased risk of stroke after adjusting for conventional cardiac risk factors. Using the ECG alone for diagnosis is insufficient. The most common reason for 'anteroseptal Q-waves' is inappropriate lead placement, and one of the most common reasons for 'inferior Q-waves' is misinterpretation of non-pathologic changes in II, III, and aVF. As a result abnormal screening ECG findings, while not always indicative of underlying cardiovascular pathology, require careful consideration particularly when accompanied by other risk factors.

**REFERENCES:**

- Cohn, P, Fox, K. Silent myocardial ischemia. *Circulation* 2003; 108:1263-1277.
- Kurl, S, et al. Association of exercise-induced, silent ST-segment depression with the risk of stroke and cardiovascular diseases in men. *Stroke* 2003; 34:1760-5.

## NORMAL VARIANT ELECTROCARDIOGRAMS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Normal variant ECG findings differ from the normal pattern but are usually not indicative of underlying cardiovascular disorder.

**WAIVERS:** In the absence of underlying pathology, no waiver is required. The information is coded using the "G" coding system developed to compensate for the lack of coding ECG abnormalities in the ICD9 coding system, and entered as information only.

G Code Condition	Qualifiers to Diagnosis
700 Normal ECG	Without normal variant or any abnormal findings
002 Sinus bradycardia crewmember	Resting pulse 40 to 50 bpm, asymptomatic, conditioned
007 Sinus dysrhythmia (sinus arrhythmia)	
028 Ectopic atrial rhythm	
040 Accelerated junctional rhythm	
080 Supraventricular rhythm	With a rate of less than 100 beats per minute.
085 Wandering atrial pacemaker	
104 2 <sup>o</sup> AV block, Mobitz Type I (Wenckebach)	
121 Incomplete right bundle branch block	When not acquired as a serial ECG change. (See below) (i.e., S wave in V6 greater than or equal to 0.04 sec).
123 Terminal conduction delay	QRS is less than 120 msec in all leads.
132 Nonsp. intraventricular conduction delay	
204 ST segment elevation	Due to early repolarization.
219 Persistent juvenile T-waves	In anterior leads.
729 LVH and/or not	By voltage alone when not presenting as a serial change associated with hypertension.
735A Leftward axis	From 0 to -45 degrees unless a serial change.
736 Rightward axis	From +90 to +120 degrees unless a serial change.
737 Indeterminate axis	
743 S1-S2-S3 pat	With QRS less than 100 msec.
744 S1-S2-S3 and RR' in V1 or V2	With QRS less than 120 msec.
755 R>S in V1	With no other evidence of right ventricular hypertrophy.

### INFORMATION REQUIRED:

- 12-lead ECG interpreted by a physician is required on all flying duty medical examinations. The flight surgeon should line through computer-generated ECG readings that are in error, compare the ECG tracing with all available previous ECG tracings, and comment on serial ECG changes.
- Each ECG should be signed by the reviewing physician and submitted with relevant previous tracings. If no previous ECGs are available for comparison, further work-up may be required.

### TREATMENT/FOLLOW-UP: N/A

**DISCUSSION:** Normal variant ECGs are often found in young athletic individuals to include bradycardia, LVH by voltage criteria, etc. Other normal variants are found in large groupings of the normal population, i.e., ectopic atrial rhythms and congenital incomplete right bundle branch blocks, etc. In no study have these variants of normal been linked with any increased risk of cardiovascular disease or dysrhythmia.

## PERICARDITIS/MYOCARDITIS & ENDOCARDITIS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Pericarditis can lead to pericardial effusion and even cardiac tamponade in more severe cases. These result in chest pain and shortness of breath and even dysrhythmias, which can lead to dizziness, syncope and rarely death. Myocarditis, usually the result of a variety of causes including infection, toxins, rheumatoid disease, sarcoidosis, may also present in either an acute manner or in a chronic insidious form. Cardiac failure is an important feature of this disorder since it is prognostic of outcome. Endocarditis, generally the result of bacterial infection, can present in an acute or chronic nature. The subacute or chronic nature of the disease leads to vague symptoms, which are often difficult to diagnose. These symptoms include low-grade fever, weakness, easy fatigability, anorexia, weight loss, and muscle pain. Later manifestations of endocarditis include valvular damage with resultant regurgitation and potential for cardiac failure and embolic events. Recent experience suggests a low-grade form of myocarditis associated with vaccination (e.g. Smallpox vaccine). This particular form has demonstrated a favorable prognosis.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated, and Non-rated Aircrew):** The aircrew member should be grounded during the acute illness and for at least 6 months after recovery. Then, idiopathic pericarditis may be considered for waiver provided no recurrence or sequelae. Endocarditis may also be waivered if there are no recurrences or sequelae. Myocarditis is normally not waivered, but will be reviewed on a case-by-case basis, particularly if due to vaccination. The disposition of cases secondary to underlying disease will depend on the disease process.

G Code	ICD9 Code	Condition
G-706	420.9	Compatible with pericarditis
G-707		Compatible with myocarditis or endomyocarditis

### INFORMATION REQUIRED:

- Review of clinical history and records/evaluation leading to the diagnosis as well as treatment course.
- Cardiac evaluation is necessary to exclude connective tissue disorder, myocardial infarction or other disease, and neoplasm. This consultation should include:
  - EKG
  - Post-recovery echocardiogram to ensure the absence of pericardial effusion or constrictive pericarditis. If endocarditis, may also need TEE
  - AGXT
- Films and tracings may be requested for USAAMA and Aeromedical Cardiology review.

### FOLLOW-UP: N/A.

**TREATMENT:** Idiopathic pericarditis is usually self-limiting. Rest, aspirin or nonsteroidal anti-inflammatory agents, and time are often all that is required for treatment. If maintenance medication is required, waiver may not be favorably considered. Bacterial endocarditis, if treated early enough with appropriate antibiotic coverage, may require no other therapy. Six months of recovery time from the insult is required before waiver consideration.

**DISCUSSION:** About 50% of the cases of acute idiopathic pericarditis are viral in origin, usually Coxsackie B. A small minority of cases may progress to pericardial constriction or tamponade. On initial presentation, more than 90% of the patients will have symmetrical ST elevation of most or all ECG leads, which become inverted over the next 2-3 weeks before reverting to normal. Some patients will be left with minor nonspecific ECG abnormalities. Bacterial endocarditis is due in about 95% of cases to Streptococcus, Enterococcus, or Staphylococcus. Failure of diagnosis, delay in diagnosis and treatment,

and extreme resistance of the organism to available antibiotics are the factors that account for the mortality and associated morbidity. Other factors leading to a relatively less than favorable outcome include an age over 50 and persistently negative blood cultures. Relapses usually occur, if at all, in the first 4 weeks after discontinuing treatment. Rarely do relapses seem to develop as late as 3 months afterward. Clinical and bacteriologic cure for 6 months after treatment almost always denotes permanent recovery.

## PERIPHERAL VASCULAR DISEASE/CLAUDICATION

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Peripheral vascular disease, as manifest by symptoms of claudication, ischemic rest pain, or ulcerative skin changes is indicative of possible underlying cardiac disease. Because cardiac disease is the #1 killer of both men and women in the US; screening and evaluating aviation personnel serves an important step in maintaining aeromedical health. Furthermore, peripheral vascular disease may result in numbness to distal extremities to an extent where interference in fine motor skills may become paramount. These limitations may be more pronounced in the setting of abrupt climate changes, hypoxia, and/or high Gz maneuvers. Because the association between coronary atherosclerotic disease and atherosclerotic peripheral vascular disease is so high, all attempts must be made to diagnose coronary disease in personnel that present with symptoms that may be consistent with peripheral vascular disease.

**WAIVERS (For all classes, Rated and Non-Rated, to include Civilian ATC's):** The presence of significant atherosclerotic peripheral vascular disease, that being of sufficient severity to produce discomfort and inability to complete a walk of 200 meters or less on level ground without a rest, or objective evidence of hemodynamically significant disease with symptoms of claudication, ischemic rest pain, or with gangrenous or ulcerative skin changes of a permanent degree in the distal extremity are non-waiverable. For asymptomatic atherosclerotic peripheral vascular disease, waivers will be considered on a case by case basis for initial Classes 2F, 3 and 4 after completion of the evaluation below if all are normal. Symptomatic peripheral vascular disease or evidence of abnormal testing will be scrutinized on a case-by-case basis much closer for waiver versus suspension based on duties, missions, and risk/benefits of continued service in the Army aviation community--additional evaluations and waivers may result from the overall evaluation outlined below.

**INFORMATION REQUIRED:** Aviators with asymptomatic peripheral vascular disease need:

- Initial complete cardiology/vascular surgery evaluation to include risk factor analysis
  - Ankle/Brachial Index testing
  - Aeromedical graded exercise test (AGXT) with Thallium or Sestamibi perfusion imaging
  - Carotid ultrasound with report of intimal medial thickness
  - Cardiac catheterization (if the above testing is inconclusive)
- Review of risk factors and documentation of reduction of modifiable factors.
- Medication use
- Following consultation with USAAMA and review with Aeromedical Cardiology Consultant testing may be done locally or with Brooks Aeromedical Consultation Service (USAF ACS). An Aeromedical Summary to include final reports of all studies will be forwarded to USAAMA for review prior to any waiver action. If films or complete tracings are required, they will be requested. Local flight clearance is not authorized unless granted in coordination with USAAMA.

**FOLLOW-UP:** Any person granted a waiver for peripheral vascular disease shall report the results of an annual stress testing with imaging with FDME/FDHS in addition to annual Ankle/Brachial Index testing.

**TREATMENT:** Treatment for atherosclerotic peripheral vascular disease focuses on general cardiovascular health to include tobacco cessation, control of cholesterol and blood pressure. For management of these conditions, please refer to respective APLs. Once identified, even those with asymptomatic atherosclerotic peripheral vascular disease should be started on a HMG-CoA Reductase Inhibitor (e.g., lovastatin, pravastatin, simvastatin, atorvastatin, fluvastatin, and rosuvastatin). In accordance with APL, liver function tests and CPK prior to initiating treatment and 6-12 weeks after the start of therapy, and annually thereafter need to be performed. For those over age 40, treatment with either aspirin or clopidogrel should be encouraged.

**DISCUSSION:** The ankle-brachial index (ABI) is a reliable means for diagnosing peripheral vascular disease. Blood pressure measurements are taken at the arms and ankles using a Doppler. The ABI range that is generally considered normal is .95 to 1.2. An ABI value  $>0.80$  is suggestive of peripheral vascular disease, but may not be associated with symptoms; however, any ABI  $<1.0$  can be associated with increased risk for coronary artery disease and full evaluation is required. An ABI between 0.40 – 0.80 is moderately decreased and tends to be associated with symptoms such as claudication. An ABI of  $<0.40$  indicates severe peripheral vascular disease, and places the aviator at risk for non-healing wounds, rest pain, or even gangrene.

## PRE-EXCITATION SYNDROMES/TACHYDYSRHYTHMIAS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Pre-excitation syndromes, such as Wolff-Parkinson-White (WPW) (defined as a short PR interval, widened QRS complex with a prolonged upstroke (Delta Wave), and tachydysrhythmia) and Lown-Ganong-Levine syndrome (LGL) (defined as short PR interval with associated tachydysrhythmia), are considered not compatible with flying duties because of the increased risk of having symptomatic dysrhythmias. Tachyarrhythmias are associated with unpredictable hemodynamic compromise presenting with palpitations, lightheadedness, or syncope.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated and Non-Rated):** Waiver or ETP may be applied for 6 months after radiofrequency (RF) ablation, with a normal post-ablation evaluation (dysrhythmia unable to be provoked). A pre-excitation pattern alone, but only after electrophysiologic study (EPS) may be considered for waiver or ETP provided the full evaluation is normal as outlined below. Strong consideration should be given for radiofrequency ablation of accessory pathways, upon identification, even in the asymptomatic individual. Tachyarrhythmias and pre-excitation syndromes that are identified or suspected but not evaluated completely to include EPS, or that recur after RF ablation, will not be waived.

G-Code	ICD9 Code	Condition
G-702		Wolff-Parkinson-White pattern, Type A
G-703		Wolff-Parkinson-White pattern, Type B
G-705	426.81	Lown-Ganong-Levine syndrome

### INFORMATION REQUIRED:

- Cardiology evaluation, to include:
  - 24-hour Holter monitor
  - AGXT
  - Echocardiogram
- Electrophysiology report and 6-month follow-up report as applicable
- Cases will be reviewed with Aeromedical Cardiologist

**FOLLOW-UP:** Annual report of history of any hemodynamic compromise or tachyarrhythmia (negative comments are required) and an annual 24-hour Holter monitor.

**TREATMENT:** The only appropriate treatment for accessory pathway syndromes is ablation. Radiofrequency or cryoablation can be waivered provided the procedure is coordinated with USAAMA.

**DISCUSSION:** This condition occurs in 1 to 3 per 1000 of the population. The lowest incidence of dysrhythmia is in young adults without a past history; it is estimated that up to 20% of such individuals will develop tachycardia at some time. It is not possible to predict which patients will develop SVT and which will develop atrial fibrillation with or without catastrophic rapid ventricular response. Ablation is felt to be by the American Heart Association to be the primary treatment for all symptomatic individuals, and for those individuals with increased occupational risk. The 'cure' rate of ablation is in excess of 95%, and long-term success can be identified within 6 months of follow-up.

## SINUS BRADYDYSRHYTHMIAS

Update: 21 AUG 2007)

**AEROMEDICAL CONCERNS:** In our population of young adults, bradycardia occurs very commonly and is considered a normal variant. Indeed, in some individuals it is a sign of excellent physical conditioning. This dysrhythmia is known to occur also in a wide variety of cardiac and extracardiac pathologic conditions. Pathologic bradycardia can occur as a result of medications (e.g., beta-blockers, digitalis, quinidine, etc.) or pathology (myocardial infarction, sick sinus syndrome, pericarditis, hypothyroidism, hypothermia, etc). In the healthy adult, symptoms are usually not present. Individuals with impaired left ventricular function may be unable to compensate for the reduced heart rate and may exhibit symptoms referable to low cardiac output. These include: lassitude and easy fatigability, breathlessness upon exertion, postural dizziness and syncope, and even angina in extreme cases. Symptoms are unusual at any age in those with heart rates in excess of 40 beats per minute.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated and Non-Rated AircREW):** Sinus bradycardia of less than 40 beats per minute, if a new finding or not accounted for by a vigorous exercise program, is abnormal until proven otherwise and requires further cardiac work-up as described below. If testing is normal, no waiver is required and is filed information only. If sinus bradycardia is accompanied by symptoms or hypotension, waiver is unlikely unless the underlying pathology is determined, corrected with aeromedically acceptable method, and the hypotension or symptoms resolve. Medication use is incompatible with flight duties.

G Code	Condition
G-002	Sinus Bradycardia

### INFORMATION REQUIRED:

- Exercise Rhythm Strip-initially evaluate with performing a rhythm strip during exercise with the goal of attaining a heart rate of 100 beats per minute or double his resting heart rate (whichever is less).
- If unable to achieve this increase in rate, the aircrew member should undergo an AGXT and 24-hour Holter monitor. Further testing will be at the discretion of the USAAMA.
- Report results of exercise ECG, additional testing if done, and physical condition with complete FDME.

**FOLLOW-UP:** Required only if an associated waiverable condition requires follow-up.

**TREATMENT:** N/A

**DISCUSSION:** Bradycardia in the young is almost always physiologic, from a high resting vagal tone. Having the individual perform exercise (e.g. flutter kicks) while attached to an ECG is an easy way to determine if there is a normal increased response to exercise.

## SINUS PAUSE

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Sudden sinus pauses are common, but are abnormal when accompanied with symptoms and/or last more than 3 seconds. When sinus pauses are brief, the differential diagnosis includes sinus node failure, sinoatrial block, and an atrial premature beat (APB) that fails to conduct to the ventricles. When sinus pauses are prolonged, symptoms may include dizziness, sudden loss of consciousness or seizure.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated and Non-Rated Aircrew):** Waivers are largely dependent on lack of symptoms with relative brief pauses. The underlying cardiogenic or neurogenic etiology is often difficult to elucidate despite full evaluation. Waivers for prolonged sinus pauses and/or those with symptoms are not possible unless the underlying cause is discovered and correctable. Local flight clearance pending waiver is not authorized without prior coordination with USAAMA.

G Code	Condition
G-005	Sinus Pause (Arrest)
G-024	Atrial escape beat
G-044	Junctional escape beat
G-084	Supraventricular escape beat

### INFORMATION REQUIRED:

- Complete cardiology evaluation with:
  - AGXT
  - 24-hour Holter
  - Echocardiogram
- Electrophysiology study is rarely indicated, although consultation is of value in uncertain cases.
- If this fails to produce evidence of the underlying cause, a complete neurological evaluation is required
- Maintain all tracings and films for submission, if requested, for Aeromedical Cardiology review.

**FOLLOW-UP:** Annual submission of a history directed at detecting underlying symptoms and annual 24-hour Holter.

**TREATMENT:** Pacemakers are not waivable.

**DISCUSSION:** When pauses are significantly prolonged, failure of all pacemaking cells must be considered. The differential between an abnormality in the control of these pacemakers by the autonomic nervous system and an abnormality with the pacemaking cells is often difficult to determine, as previously mentioned. Without a known etiology, the risk for sudden incapacitation during flight is elevated, but admittedly difficult to quantify and thus not waivable in most cases.

## SINUS TACHYCARDIA

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Sinus (nodal) tachycardia is considered abnormal if the resting heart rate is greater than 100 beats per minute (bpm). In many cases, the source of sinus tachycardia is non-cardiac in origin. In the flight applicant, this tachycardia may simply be caused by anxiety and is rarely persistent. Persistent sinus tachycardia may be secondary to significant metabolic or other exogenous abnormalities and must be diagnosed and corrected prior to flight clearance. These include such entities as medication (prescribed and OTC), caffeine, nicotine, supplement use, fever, hyperthyroidism, dehydration, anemia, hypoxia, pulmonary emboli, pain, and psychosomatic and psychiatric disorders.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated and Non-Rated Aircrrew):** Anxiety-provoked sinus tachycardia, if found to be resolved upon retesting, is not considered disqualifying. Persistent tachycardia greater than 100 bpm while supine or greater than 110 bpm while standing is considered disqualifying. Waiver consideration is based upon the underlying cause of the tachycardia and the treatment plan.

If no cause is discovered, the aircrew member will not be considered for waiver or exception to policy without a case-by-case review with the Aeromedical Cardiologist.

G Code	Condition
G-001	Sinus (Nodal) Tachycardia

### INFORMATION REQUIRED:

- Obtain a 3-day b.i.d. pulse and BP determination.
- 24 hour Holter monitor for evaluation of normal circadian rhythm to heart rate. If heart rate is less than 100 during sleep, no further evaluation is required. If the heart rate is persistently elevated, further evaluation is required as follows:
  - Eliminate possible exogenous factors and obtain thyroid function tests.
  - Submit an internal medicine evaluation to assess underlying pathology.
  - AGXT and echocardiogram.
- Further evaluation will be at the discretion of the USAAMA.

**FOLLOW-UP:** Periodic follow-up is dependent upon the underlying etiology of the tachycardia.

**TREATMENT:** Treatment is determined by the nature of the etiology. Hyperthyroidism is covered under Metabolic/Endocrine Waivers. Negative chronotropic medication use is not waivable.

**DISCUSSION:** Anxiety of applicants, and rarely active aircrew members, often results in not only tachycardia but also hypertension. This "White Coat Syndrome" can often be overcome with desensitization, i.e., repeated exposure to the procedure of obtaining the measurement. Technicians obtaining these readings must be as non-threatening as possible, friendly, and not in a rush to complete the test.

## SUPRAVENTRICULAR TACHYCARDIA

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** The primary concern in supraventricular tachycardia (SVT) is the risk of significant hemodynamic compromise causing in-flight incapacitation. These symptoms include lightheadedness, dizziness, presyncope, and loss of consciousness. SVT is characterized as a ventricular rate greater than or equal to 100 bpm with a narrow or wide QRS complex that cannot be accounted for by normal physiologic response associated with sinus tachycardia. It may be a short run of 3 beats or last longer requiring vagal maneuvers, medication, or cardioversion.

**WAIVERS (to INCLUDE ALL APPLICANTS, Rated and Non-Rated Aircrew):** Waiver/exception to policy may be considered on a case-by-case basis after completing the evaluation below. Anti-arrhythmic medication is not allowable. Grounding (and reevaluation of waiver) is mandatory in cases of: symptomatic SVT; single sustained SVT with significant CAD; recurrent, sustained SVT; and any SVT associated with a pre-excitation pattern on ECG. Grounding should be for at least 6 months, but a trial period of return to flight may occur after a 2 month down period provided completion of the Cardiology evaluation through the first Holter where all is normal, no recurrences has occurred, and no medications is needed. Any further recurrence will require grounding, completion of the entire evaluation, and review with USAAMA and Aeromedical Cardiology prior to return to flight.

G Code	Condition
G-036	Multifocal atrial tachycardia
G-081	Supraventricular tachycardia

**INFORMATION REQUIRED:** For cases of a single, asymptomatic, 3-10 or more beat run of SVT will include

- Thyroid function testing
- Cardiology evaluation to include:
  - Echocardiography
  - AGXT
  - Three 24-hour Holter monitors at 2 months interval. Abnormalities will require further evaluation.
  - Electrophysiologic studies with consideration for ablation
- Documentation of studies may be requested for USAAMA and Aeromedical Cardiology review.

**FOLLOW-UP:** In the continued absence of recurrence, a repeat cardiac evaluation including AGXT and a 24-hour Holter monitor are required every 3 years. If ablation was utilized to treat an underlying accessory pathway, additional requirements include an annual report of history of any hemodynamic compromise or tachydysrhythmia (negative comments are required) and an annual 24-hour Holter monitor.

**DISCUSSION:** SVT is characterized by a narrow QRS complex rhythm (except with aberrant conduction in which the QRS is wide) and P waves are usually hidden. Seventy percent are related to an AV reentry mechanism; 20% involve an accessory conduction pathway e.g., WPW; and 10% are SA nodal in origin. Non-reentry SVTs are due to ectopic atrial tachycardias. Ablation is considered the treatment of choice for AV nodal re-entrant tachycardia and AV re-entrant tachycardia utilizing an accessory pathway.

# VALVULAR DISORDERS, PULMONARY AND TRICUSPID

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** The major aeromedical concern is the risk of incapacitating symptoms associated with mitral and aortic valves previously discussed. Pulmonary valve and tricuspid valve stenosis can both produce fatigue or shortness of breath. Moderate to severe tricuspid insufficiency can be associated with atrial dysrhythmias

## WAIVERS:

**INITIAL FLIGHT APPLICANTS:** Exception to policy for initial flight applicants is normally not recommended although mild, asymptomatic cases will be reviewed on a case-by-case basis.

**Rated and Non-Rated Aircrew (to INCLUDE Class 2/3/4 Applicants):** Newly discovered valvular disorder in rated aircrew members with mild functional abnormalities of the tricuspid or pulmonary valves may be considered for waiver provided complete cardiology evaluation is normal. Other valvular disorders not discussed within this policy book are too rare to develop formal waiver policy or are considered on a case-by-case basis.

ICD9 code	Condition
424.2	Tricuspid Valve (Stenosis & Insufficiency)
424.3	Pulmonic Valve (Stenosis & Insufficiency)

## INFORMATION REQUIRED:

- Complete cardiology evaluation including:
  - AGXT
  - 24-hour Holter monitor
  - 2-D M-Mode echocardiography with Doppler flow study.
- Further cardiology evaluation may occasionally be required by USAAMA.

**FOLLOW-UP:** Repeat cardiology evaluation every three years including 24-hour Holter monitor, 2-D M-Mode echocardiography with Doppler flow study. Further follow-up may be required upon development of a significant dysrhythmia, progressive regurgitation, or progressive hemodynamic instability.

**TREATMENT:** SBE antibiotic prophylaxis is required for all dental procedures as well as any other potentially septic exposure.

**DISCUSSION:** Tricuspid insufficiency may present with a clinical picture of severe right-sided heart failure. Fatigue, peripheral edema, anorexia, and abdominal swelling are its primary symptoms. Most pulmonary stenosis is congenital and if severe, is normally treated with surgical repair in infancy. Most patients with mild to moderate pulmonary stenosis rarely if ever develop heart failure and are easily managed usually with nothing more than antibiotic prophylaxis.

## VENOUS THROMBOSIS

Update: 21 AUG 2007

**AEROMEDICAL CONCERNs:** The pain and swelling from deep venous thrombosis (DVT) is incompatible with flight duties, potentially resulting in distraction and incapacitation from pain and discomfort locally to pulmonary embolism with chest pain, shortness of breath, hypoxia or cardiac dysrhythmias. Dyspnea occurs in nearly 90% of patients with symptomatic pulmonary emboli. Cramped cockpit conditions may exacerbate or provoke a thrombotic event.

**WAIVERS (All Rated and Non-Rated Aircrew to include ALL Applicants):** Waiver will be considered on a case-by-case basis for acute, nonrecurrent conditions after cessation of anticoagulant therapy provided a normal workup with no predisposing factors, such as malignancy or disorders of clotting. The development of pulmonary hypertension, the requirement for continued anticoagulation, or surgical procedures, such as plication of the vena cava, is disqualifying with waiver considered on a case-by-case basis. Superficial thrombophlebitis does not require a waiver and will be filed as Information Only.

### INFORMATION REQUIRED:

- Hematology consultation including coagulation studies
- Normal exercise tolerance (APFT) after recovery
- Pulmonary function testing with history of pulmonary embolism.
- Exclusion of underlying malignancy with history of pulmonary embolism.
- If MEB completed, results/recommendations shall be forwarded.

**FOLLOW-UP:** With a completely normal evaluation after acute, nonrecurrent event, annual evaluation with Internal Medicine or Hematology for 3 years is required. If complicated with pulmonary embolism or recurrence, annual consultation is for duration of flight status. Recurrence of thrombotic event will require resubmission for waiver with full work-up.

**TREATMENT:** Medication therapy, beyond aspirin, is considered incompatible with continued flying duties.

**DISCUSSION:** Prevalence of venous thrombosis history ranges from 2 to 5% of the population. Risk factors related to hypercoagulability (e.g., the risk of developing DVT after open prostatectomy has been quoted as 35%) and stasis (e.g., being strapped into an aircraft seat for long missions) should be considered. In 50% of cases of deep vein thrombosis (DVT) of the leg, there are no signs or symptoms relating to the lower limbs. Untreated, acute iliofemoral venous thrombosis has a 50% chance of causing pulmonary embolus. Malignancy is found in up to 30% of such patients. It is estimated that only 20-30% of pulmonary emboli cause concerning symptoms. The vast majority of patients who survive pulmonary embolism will recover normal or nearly normal cardiac and pulmonary functions within 2-8 weeks.

## VENTRICULAR PREMATURE BEATS (PVC's)

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** A single ventricular premature beat (PVC) may not be abnormal or even symptomatic, but requires further evaluation to verify the absence of any associated cardiac abnormality. If progression of disease occurs, this increases the risk of symptoms or more severe dysrhythmia, which could be disabling in flight.

### WAIVERS (All Rated and Non-Rated Aircrew to include ALL Applicants):

**INFORMATION ONLY** status will be given to those with a 24-hour Holter demonstrating the following: a frequency of 10 or less of any 50 beats; 10% or less of each hour of monitoring; or 1% or less of 24 hours of monitoring; and if the PVC is not a paired PVC (couplet), or a PVC with R on T.

**WAIVER/ETP** will be required if PVCs occur with a frequency of greater than 10 of any 50 beats; 10% of any one hour of monitoring; 1% of 24 hours of monitoring; or if the PVC is a couplet or with R on T. If the PVCs are not significantly decreased with exercise, the concern is for underlying cardiac abnormality.

Waiver/ETP will be considered on a case-by-case basis after the complete evaluation.

G Code	Condition
G-063	Uniform ventricular premature beats.
G-068	Multiform ventricular premature beats.
G-070	Fused ventricular premature beats.
G-072	Paired ventricular premature beats (couplets).
G-095	Ventricular premature beats with R on T.

### INFORMATION REQUIRED:

- Report results of 24-hour Holter monitoring. If requested, submit tracings of the original PVC and 24-hour Holter monitor.

If the beats occur with a frequency of greater than 10 of any 50 beats, or 10% of any one hour of monitoring, or 1% of 24 hours of monitoring; or if the PVC is a couplet or with R on T, obtain cardiology consultation with:

- AGXT
- Echocardiography
- Electrophysiology consultation for higher degrees of ventricular dysrhythmia (e.g. R on T phenomenon, 2 or more consecutive PVCs)

If these further tests are abnormal:

- Additional cardiology evaluation is required to rule out underlying cardiovascular disease. This may include thallium or persantine GXT or cardiac catheterization. Consultation with USAAMA is required.

**FOLLOW-UP:** No follow-up is required for those cases simply filed information only. If PVCs are detected on future routine annual ECG, then a repeat 24-hour Holter is required. If a change in morphology, or the aircrew member develops symptoms, then a complete work-up is required as above with AMS submission.

For those aircrew members with waivers for PVCs, a repeat 24-hour Holter and AGXT are required annually. Any change in rhythm or development of symptoms requires complete cardiovascular evaluation and AMS submission.

**TREATMENT:** No treatment is warranted for asymptomatic PVCs, and medication has been shown to increase mortality.

**DISCUSSION:** On routine ECG, 1-5% of healthy adults exhibit some form of ventricular ectopy; this increases to 20-30% in a maximal exercise test and to 40-60% during 24-hour Holter monitoring. The incidence of ventricular ectopy and its rate increases exponentially with age. Between 5-10% will show complex ventricular ectopy (multiform PVCs, pairing or more or PVCs or R on T phenomenon). In these cases, structural heart disease needs to be excluded.

# VENTRICULAR SEPTAL DEFECT (VSD)

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Adults with VSD may be symptom free, or they may complain of fatigue and exercise intolerance. Aortic insufficiency and bacterial endocarditis in patients with VSD result in marked increase in mortality as a result of right ventricular outflow obstruction and heart failure.

## WAIVERS:

**Initial Flight Applicants:** Those with current VSD are not considered for exception to policy. History of spontaneous or surgical closure with no significant childhood sequelae may be considered for exception to policy on a **case-by-case basis**.

**All Rated and Non-Rated Aircrew (to include Class 2/3/4 Applicants):** Newly discovered VSD in a rated aviator, with a history of spontaneous or surgical closure, may be recommended for waiver on a case-by-case basis provided complete recovery and normal cardiology work-up.

## INFORMATION REQUIRED:

- Complete cardiology consultation including:
  - AGXT
  - 24-hour Holter monitor
  - 2-D, M-mode echocardiogram with Doppler flow study is required.
- Further evaluation, to include possible right heart catheterization with sequential oxygen sampling and transesophageal echocardiography, may be required after consultation with USAAMA and an Aeromedical Cardiology Consultant.

**FOLLOW-UP:** Complete cardiology evaluation every three years including 24-hour Holter monitor and transthoracic echocardiography with Doppler flow study.

**TREATMENT:** SBE antibiotic prophylaxis is required for all dental procedures as well as any other potentially septic exposure.

**DISCUSSION:** VSD is the most common congenital defect in children. The incidence of VSD is decreased in adults as a result of either spontaneous/surgical closure of defects during childhood/adolescence or mortality from this lesion before adulthood. It is estimated that as many as 60% spontaneously close by 5 years of age and 90% by 18 years of age.

# VENTRICULAR TACHYCARDIA

Update: 21 AUG 2007

**AEROMEDICAL CONCERNS:** Ventricular tachycardia (VT) may be associated with underlying cardiac disease or represent a primary rhythm disturbance in some patients. Hemodynamic changes causing lowered blood pressure and reduced cerebral blood flow can result in sudden onset of weakness, dizziness, and frank loss of consciousness. Decreased myocardial perfusion may provoke angina with the risk of ventricular fibrillation and sudden death. However, short runs of VT usually do not produce cardiovascular symptoms.

## WAIVERS

**Initial Flight Applicants:** Exception to policy is normally not recommended--cases will be reviewed on a case-by-case basis after complete evaluation below.

**All Rated and Non-Rated Aircrew (to include Class 2/3/4 Applicants):** Waiver for VT may be recommended for those aircrew members with asymptomatic non-sustained VT less than or equal to 11 beats and less than or equal to 4 VT episodes per Holter evaluation in the absence of structural heart disease. Waiver will not be recommended for those with symptoms, those with non-sustained VT greater than 11 beats, sustained VT greater than 30 seconds in length, greater than 4 VT episodes per evaluation, or VT with associated structural heart disease. Waiver is not recommended following ventricular fibrillation or flutter.

G Code	Condition
G-061	Ventricular tachycardia
G-066	Ventricular fibrillation
G-067	Ventricular flutter
G-086	Reciprocating bi-directional tachycardia

**INFORMATION REQUIRED:** Cardiac evaluations of these cases should be coordinated with USAAMA.

- Complete cardiology evaluation including:
  - AGXT with thallium or Sestamibi
  - Echocardiography
  - Three 24-hour Holter monitors done at monthly intervals over three months
  - Cardiac MRI looking for arrhythmogenic right ventricular dysplasia
- Cardiac catheterization is required if these noninvasive tests are suggestive of underlying coronary disease.
- Electrophysiologic studies may be required if there is uncertainty regarding the origin of the tachycardia (VT vs. SVT with aberrant conduction).

**FOLLOW-UP:** Will require annual cardiology consultation, locally or with the Aeromedical Consultation Service, Brooks AFB, for every three years. Evaluation will include Thallium or sestamibi AGXT, 24-hour Holter monitor, and echocardiography. If other abnormalities are present, further testing may be indicated.

**TREATMENT:** The treatment for ventricular arrhythmia in the absence of structural heart disease (idiopathic VT) is ablation, with success rates in excess of 90%. In the setting of structural heart disease, the only available treatment is an implantable cardioverter-defibrillator, which is not compatible with flying duties.

**DISCUSSION:** AR 40-501 defines VT as 3 or more consecutive ventricular beats at a heart rate greater than 99 beats per minute. Recurrence is defined as occurring more than once in any Holter monitor or period of work-up, or more than once in any subsequent evaluation. The Air Force consultation service recently completed a review of 193 aviators with VT. All aircrew members with underlying atherosclerotic coronary artery disease had at least one abnormal noninvasive test. In another study, 35% of patients with VT had a recent myocardial infarct.



## DERMATOLOGY WAIVERS

## ACNE

Update: JAN 2003

**AEROMEDICAL CONCERNS:** Severe active cystic acne can produce lesions, which prevent proper or comfortable fit of a helmet, can impede proper harness or equipment fit, or act as a distraction in the aviation environment. If severe enough, cystic acne can even produce sufficient facial deformity to result in various psychological problems serious enough to impede adaptation to an aviation or military career. Treatment with certain drugs for any form of acne may be incompatible with the aviation environment.

### WAIVERS:

#### Initial Applicants (Class 1A/1W):

Severe active cystic acne is disqualifying for aviation service and is rarely granted exception to policy. Milder forms of acne requiring oral therapy may be considered for exception to policy. Milder forms of acne requiring topical therapy only may be entered as "Information Only" as long as proper fit and wear of equipment is possible.

#### Initial Applicants (Classes 2F, 3, and 4):

Severe active cystic acne is disqualifying for aviation service and is rarely granted a waiver. Milder forms of acne requiring oral therapy may be considered for waiver. Milder forms of acne requiring topical therapy only may be entered as "Information Only" as long as proper fit and wear of equipment is possible.

#### Rated Aviation Personnel (All Classes):

Most waivers of aircrew members with cystic acne are granted provided the aviator is not restricted from routine use of mask or helmet and approved drugs are used for treatment. Milder forms of acne requiring oral therapy will be routinely granted a waiver. Milder forms of acne requiring topical therapy only may be entered as "Information Only" as long as proper fit and wear of equipment is possible.

### INFORMATION REQUIRED:

- Aeromedical Summary (AMS) with:
- Current treatment plan,
- Side effects of treatment or documented lack of side effects,
- Verification of ability to properly fit and wear equipment to include protective mask and helmet.

**FOLLOW-UP:** Annual update of medication treatment plan and any limitations.

**TREATMENT:** Use of topical agents is the initial preferred mode of treatment. Topical bacteriostatics (Benzoyl peroxide), antibiotics (topical clindamycin or erythromycin), or topical tretinoin (RETIN A), or adapalene (DIFFERIN) are all acceptable forms of treatment and do not normally require waiver. Systemic antibiotic treatment using tetracycline, erythromycin, or doxycycline if used chronically must be reviewed and will be filed as Information Only; a waiver is usually not required. Initial use of oral antibiotics, Oral Contraceptives in females, or topical tazarotene should always be preceded by a period of observation for adverse effects prior to return to full flight status. Minocycline (MINOCIN), Sulfonamides, Dapsone, Spirinolactone, Prednisone, and Isotretinoin (ACUTANE) are considered non-waiverable.

**DISCUSSION:** Topical absorption of Tazarotene is generally minimal in acne patients, but special precautions must be taken in females of childbearing age. Oral contraceptives containing low androgenicity (desogestrel/gestodene/ortho-Tri- Cyclen) are an acceptable alternative for females with acne.

Minocycline is not acceptable because of the risk of CNS side effects such as light-headedness, dizziness, and vertigo. The incidence of dizziness with minocycline use has been reported as high as 17 percent; however, this is dose-related and the actual risk is only 5 percent with the dosages required for acne control. Sulfonamides are rarely prescribed due to their strong association with severe drug eruptions. Dapsone has been used in the treatment of severe acne, but may cause psychosis and peripheral motor neuropathy. The most potentially serious common adverse effect of spironolactone is hyperkalemia with arrhythmia. Isotretinoin (ACCUTANE) has frequently been associated with xerosis, cheilitis, alopecia, depression, and hypertriglyceridemia, but all of these are reversible upon discontinuation of therapy. Other disturbing side effects of isotretinoin therapy include the development of vertebral hyperostoses and pseudotumor cerebri. While not recommended, it would be feasible to use isotretinoin in aircrew members who are not required to fly for any given 6-8 month period.

**REFERENCE:**

Andrew's Diseases of the Skin – Clinical Dermatology 9th Edition, W.B. Saunders 2000. Chapter 13, ISBN-0-7216-5832-6.

Comprehensive Dermatologic Drug Therapy – Stephen E. Wolverton W.B. Saunders 2001 ISBN-0-7616-7728-2

Emedicine – <http://www.emedicine.com/derm/topic620.htm>

## ATOPIC DERMATITIS (ECZEMA)

Update: AUG 2002

**AEROMEDICAL CONCERNS:** One of the distinctive features of dermatitis is the itching, which may be severe and easily triggered. This can be distracting in the aviation environment. Some dermatitides may also interfere with proper wear of equipment. Patients with atopic dermatitis are often more susceptible to contact irritants found in the aviation environment.

### WAIVERS:

#### Initial Applicants (All Classes):

Any history of atopic dermatitis requiring anything more than an occasional use of low potency steroids is disqualifying and an exception to policy must be applied for. Dermatology consultation will be required.

#### Rated Aviation Personnel (All Classes):

- Mild to moderate atopic dermatitis is not disqualifying if the condition is controlled with the use of topical treatments to include tacrolimus ointment and mild steroids ointments (desonide and triamcinolone). This should be noted on the flight physical for information only.
- Moderate to severe atopic dermatitis requiring the need for moderate or high potency steroid ointments or oral medications is disqualifying and a waiver must be applied for. Annual Dermatology Consultation will be required.

#### ICD9 Code Condition

691	Atopic Dermatitis
692	Contact Dermatitis
708.0	Allergic Urticaria

### INFORMATION REQUIRED:

- Dermatology consultation.
- Allergy/Immunology evaluation for those with elevated IgE levels or respiratory difficulties.

### FOLLOW-UP:

 Annual dermatology consult.

**TREATMENT:** Intermittent use of topical steroids over a limited area is considered compatible with continued flight status. Topical tacrolimus (PROTOPIC) is an immunomodulator useful in treatment and is compatible with flight status, but should include an initial period of grounding and observation for rare side effects of headache, allergic reaction, and hyperesthesia or skin tingling. Non-sedating antihistamines can be approved for use in treating dermatitis.

**DISCUSSION:** Atopic dermatitis affects 1-3 percent of the population. Around 90 percent of affected children manifest their disease by 5 years of age. A family history of atopy is quite common (70 percent), and about 50 percent of children with atopic dermatitis, persistent beyond the age of 12, develop either rhinitis or asthma. Patients with atopic dermatitis have frequent immunologic abnormalities, including elevated serum IgE levels (strong association with concomitant asthma and allergic rhinitis), reduced cell-mediated immune responses, and slowed chemotaxis of neutrophils and monocytes. About 20 percent of adults with atopic dermatitis have normal or low IgE levels; others have no IgE at all.

Non-pharmacologic preventive measures should be stressed. Education on bathing, daily moisturizers, avoidance of triggers to include fragrances, wool clothing products, and environment/outdoor activities will help control some of the flaring associated with this chronic process. Acute changes in the otherwise stable atopic patient should raise the question of staphylococcus aureus and the involvement of a super-antigen reaction. These will be more common with deployments, but are easily screened for and treated.

Topical treatment with mild steroid ointments (desonide and triamcinolone) combined with the immunomodulating tacrolimus ointment will control most mild to moderate atopic dermatitis/eczema without the need for waiver.

For more severe cases requiring oral medication, the aircrew should be grounded during treatment and may be returned to flight status when off medication and the chance of possible side effects of treatment is minimized. By convention, this is commonly after approximately three half lives of the medication have passed. If chronic oral therapy is required, the aviator must be grounded and the case reviewed at USAAMA.

**REFERENCE:**

Andrew's: Diseases of the Skin—Clinical Dermatology 9th Edition, W.B. Saunders 2000. Chapter 5, ISBN-0-7216-5832-6.

Comprehensive Dermatologic Drug Therapy – Stephen E. Wolverton W.B. Saunders 2001 ISBN-0-7616-7728-2.

Emedicine - <http://www.emedicine.com/derm/topic38.htm>

<http://www.emedicine.com/derm/topic84.htm>

<http://www.emedicine.com/derm/topic443.htm>

## DERMATOPHYTOSIS OF THE NAIL

Update: AUG 2002

**AEROMEDICAL CONCERNS:** While the disease process does not interfere with aviation duties, the oral medications commonly used in its treatment do present enough side effects to warrant careful observation and grounding.

**WAIVERS:** Initial Applicants and Rated Aviation Personnel (All Classes): Dermatophytosis of the nail is not considered disqualifying. Waivers for topical antifungals are not required. Waivers for oral antifungal treatments are not required since they are only used for a short duration and the soldier is grounded during their use.

### INFORMATION REQUIRED:

- Documentation of treatment and ongoing follow-up plan,
- Documentation of Tinea involvement with KOH preparation, culture, or nail clipping for staining by the pathology department is highly recommended, but not required before any treatment is initiated. Ensure there are no mixed dermatophyte infections by screening with the wood's lamp for concomitant bacterial infections.

**FOLLOW-UP:** Liver Function testing should be monitored monthly in patients on oral itraconazole (SPORANOX) and monthly liver function testing and CBC for terbinafine (LAMISIL) antifungal treatment.

**TREATMENT:** Ciclopirox topical 8 percent (PENLAC) is the only routinely approved medication for chronic use. Other medications for chronic use may be considered on a case-by-case basis. While not approved for waiver for chronic use, itraconazole, and terbinafine are effective onycomycotic treatments. Recommended use in aviation personnel is to administer itraconazole in week-long pulses each month for four to six cycles. Aviators should be grounded each cycle, but since it is not administered chronically, waiver is not required.

**DISCUSSION:** The effective treatment of any tinea infection should start with the identification of a true infection by KOH, culture, or nail clipping analysis. The next paramount step in curing the mycotic process is educating the service member on prevention and daily foot care, to include good emollient, to assist in the treatment and to dampen the high recurrence rate.

Topical ciclopirox 8 percent applied to the affected nails with an emollient to the nail and foot (carmol or lachydrin) daily is an affect treatment that does not require a waiver nor grounding.

The oral medications itraconazole and terbinafine should also be combined with an emollient. Both medications have been associated with central nervous system difficulties that are incompatible with aviation duty. (Itraconazole: headache, dizziness, tremor, vertigo, peripheral neuropathy. Terbinafine: headache, visual disturbance, and change in concentration.)

### REFERENCE:

Andrew's: Diseases of the Skin—Clinical Dermatology 9th Edition, W.B. Saunders 2000. Chapter 15, ISBN-0-7216-5832-6. Comprehensive Dermatologic Drug Therapy – Stephen E. Wolverton W.B. Saunders 2001 ISBN-0-7616-7728-2.

Emedicine - <http://www.emedicine.com/derm/topic300.htm>

# PSORIASIS

Update: AUG 2002

**AEROMEDICAL CONCERNS:** Psoriasis is a chronic, proliferative epidermal disease affecting an estimated 2-8 million people in the United States. Its most common course is one of discreet, localized plaques that respond well to treatment; however, extensive or even generalized involvement may develop; and in some, its severity is incompatible with the military aviation environment and deployments. The condition will be exacerbated by the stress and anxiety brought about during a deployed situation. In addition, some forms of therapy have side effects incompatible with aviation duty.

## WAIVERS:

### Initial Applicants (Class 1A/1W):

A history of or an active case of psoriasis is considered disqualifying for initial flight applicants. Exception to policy is not generally recommended.

### Initial Applicants (Classes 2F, 3, and 4):

Waivers for psoriasis are considered on a case-by-case basis. A mild case of psoriasis localized to an area not affecting the aircrew member's ability to wear or operate safety garments, mask, or helmet and controllable with occasional use of topical steroids such as vitamin D analogs is readily waivered. More severe cases are considered on an individual basis.

### Rated Aviation Personnel (All Classes):

Waivers for psoriasis are considered on a case by case basis. A mild case of psoriasis localized to an area not affecting the aircrew member's ability to wear or operate safety garments, mask, or helmet and controllable with occasional use of topical steroids is readily waivered. More severe cases are considered on an individual basis.

## INFORMATION REQUIRED:

- Aeromedical Summary (AMS),
- Dermatology Consultation; and,
- If requested by USAAMA, photographs of affected areas.

**FOLLOW-UP:** Annual dermatology consultation.

**TREATMENT:** Use of topical steroids applied qd to bid to localized lesions are quite useful, especially in reducing scaling and thickness. Overnight or 24-hour occlusive therapy with these medications will initiate involution in most lesions. Caution: Prolonged use of fluorinated corticosteroids leads to skin atrophy, striae, and telangiectasia. Ultraviolet light is of substantial benefit in a garrison situation, but of little practical use when deployed to remote areas. Topical vitamin D analogs such as calcipotriene (DOVONEX) are a useful adjunctive treatment to topical corticosteroids. Calcipotriene is used topically BID and is useful in reducing the total amount of topical corticosteroids needed and does not require a waiver. Other topical therapies include tazarotene (TAZORAC), a topical retinoid. Special precautions in females of child bearing age must be taken with use of tazarotene. Other treatments such as tar products and dithranol produce staining and are not considered compatible with flight status. Antimitotic drugs such as methotrexate (can cause ataxia or hallucinations) and retinoic acid (can cause liver toxicity, dry mouth, sore lips, and conjunctivitis) and cyclosporine (hypertension, hematologic abnormalities, and neurologic abnormalities – tremor) are also incompatible with flying.

**DISCUSSION:** Psoriasis typically does not manifest itself until the 3rd decade of life, though it may develop at any time. A family history of psoriasis is found in 30 percent of patients. It is less common in sunny climates and in those with darker skins. Psoriasis patients have fluctuating courses of

spontaneous remissions and relapses making estimations of a cure totally unpredictable and unreliable. Complications include psoriatic arthritis and psoriatic trachonychia (nail involvement).

**REFERENCE:**

Andrew's: Diseases of the Skin—Clinical Dermatology 9th Edition, W.B. Saunders 2000. Chapter 10, ISBN-0-7216-5832-6.

Comprehensive Dermatologic Drug Therapy – Stephen E. Wolverton W.B. Saunders 2001 ISBN-0-7616-7728-2.

Emedicine – <http://www.emedicine.com/derm/topic365.htm>

<http://www.emedicine.com/derm/topic361.htm> <http://www.emedicine.com/derm/topic366.htm>



## ENDOCRINOLOGY WAIVERS

# DIABETES MELLITUS and GLUCOSE INTOLERANCE

Update: MAY 2002

**AEROMEDICAL CONCERNS:** The primary concern in any diabetic is the possibility of unexpected hypoglycemia and the associated risk of sudden loss of consciousness. This risk is greatest among those with Type I (insulin dependent) diabetes mellitus, but may also occur in diabetics controlled with oral hypoglycemics. Also of concern is the risk of renal, cardiovascular, neurological, and visual complications associated with any form of diabetes. Deployment frequently exacerbates symptoms/complications secondary to uncontrolled diet, long hours, and environmental stresses.

## WAIVERS:

### *Diabetes Mellitus:*

#### **Initial (Class 1A/1W):**

Exceptions to policy are generally not recommended.

#### **Initial (Class 2, 3,4):**

Waivers will be granted on a case-by-case basis.

#### **Rated Aviation Personnel:**

**Class 2 Aviators:** Waivers are recommended provided the diabetes is controlled without medication, i.e. treatment is with diet and weight control alone. These lifestyle changes must result in a normal fasting blood glucose (<126 mg/dl), a glycosylated hemoglobin (HbA1c) less than 7%, and no medical sequelae. Use of medications is considered on a case-by-case basis and in the majority of cases will not receive waiver.

**Class 2F, 3 and 4:** Waivers are recommended provided the diabetes is controlled with diet, weight control, or using medications: oral hypoglycemic agents or Metformin (See [Medication APLs](#)), laboratory values are as above, and there are no medical sequelae. Use of other medications is considered on a case-by-case basis.

Waivers/Exception to Policy will not be granted for diabetes requiring insulin for control.

### ***Impaired Glucose Tolerance (IGT):***

Uncomplicated asymptomatic cases of IGT as well as a history of IGT to include gestational diabetes that has completely resolved are considered fully qualified and will be filed as Information Only.

## INFORMATION REQUIRED:

- Internal Medicine consultation, and
- Testing confirming diagnosis (See below).

Category	Fasting Blood Sugar	2-Hour Post-Prandial
Normal	<110	<140
Impaired Glucose Tolerance	110 < FBS < 126	140< 2HPP< 200
Diabetes Mellitus	>126	>200
Gestational Diabetes Mellitus	>105	>165

**DIAGNOSTIC CRITERIA:** Diagnosis of these conditions can be made with confirmatory tests as listed below. All individuals with a fasting plasma glucose of >110mg/dl must have one of the three tests

meeting criteria and a second confirmatory test by any of the three methods done on a subsequent day.

**Methods:**

1. FPG (Fasting Plasma Glucose) >126 mg/dl,
2. OGTT 75 gm glucose load with 2-hour postprandial value > 200 mg/dl,
3. Symptoms present or review of symptoms positive with a casual plasma glucose > 200 mg/dl.

Fasting is defined as no caloric intake for at least 8 hours.

Casual is defined as any time of day without regard to time since last meal.

Classic symptoms of diabetes include polyuria, polydipsia, and unexplained weight loss.

**FOLLOW-UP:** Continuation of waiver requires semiannual evaluations with maintenance of satisfactory weight control, a fasting plasma glucose less than 126mg/dl, and a glycosylated Hb-A1c of less than 7%. These lab results must be submitted with the annual FDME.

For those aircrew on Metformin, the following laboratory evaluation is recommended: Renal function (BUN/Creatinine) and LFTs must be checked before the start of therapy and then every 3 months for the first year of therapy and then at least annually thereafter. On the annual FDME, in addition to the required evaluation listed above, the following laboratory values **MUST** be reported and should be assessed within 90 days of the date of the FDME: CBC, Chem 7 (to include BUN/Cr), Urinalysis, HbA1c, and Fasting Blood Sugar.

Routine follow-up should be every 3-4 months with visits including the following:

- a. Interval history,
- b. Blood pressure and weight,
- c. Evaluation of fasting plasma glucose; and, d. Every 3-6 month evaluation of HbA1c.

Annual follow-up should include:

- a. Interval history
- b. Exam to include cardiovascular, fundoscopic, peripheral, pulses/vascular, neurologic to include sensory and deep tendon reflexes to include ankle jerk and skin inspection, especially of feet
- c. Ophthalmologic examination by ophthalmologist; and
- d. EKG, labs as above and also check of renal function with BUN/CR, full lipid profile, and urinalysis.

**TREATMENT:**

*Diabetes Mellitus:* For aviation personnel, the following are approved methods of treatment:

1. Diet,
2. Weight reduction,
3. In addition, Class 2F, 3, and 4 rated aviation personnel may use oral hypoglycemics or Metformin with waiver approved by USAAMA. Any other medications must be submitted for waiver and may only be approved for use by USAAMA.

*Impaired Glucose Tolerance:* Diet, exercise, and weight reduction are primary therapies. These individuals also require aggressive cardiac risk factor modification.

**DISCUSSION:** Compared to healthy aviators, diabetic aviators are twice as likely to have a stroke, 2 to 10 times more likely to suffer a myocardial infarction, and 5 to 10 times more likely to suffer peripheral vascular disease. Diabetics are 25 times more likely to suffer partial or complete loss of vision compared to non-diabetics. The risk of cataracts is 4 to 6 times greater. Up to 20% of diet controlled diabetics have retinopathy at the time of diagnosis and all are at risk for maculopathy which can seriously affect visual acuity. Type II has an 8% chance of polyneuropathy being present at diagnosis and risk of neuropathy is

4% by 5 years and 15% by 20 years. Tight control of blood glucose levels has been demonstrated to delay the onset or reduce the risk of complications.

Screening fasting blood glucose is strongly recommended annually for all individuals at a higher risk for developing diabetes. These include: (1) Individuals with a parent, sibling, or child with diabetes mellitus; (2) A history of gestational diabetes mellitus or impaired glucose tolerance; (3) A history of previous abnormality of glucose tolerance associated with the metabolic stresses of obesity, trauma, surgery, infection, or alcohol intoxication; (4) A history of hypertension; (5) Cholesterol abnormalities with HDL <35 mg/dl and/or triglyceride level >250 mg/dl, and (6) members of high risk ethnic populations (See Reference).

**REFERENCE:** American Diabetes Association, Report of the Expert Committee on the Diagnosis and Classification of

Diabetes Mellitus, Diabetes 25(S1) S5-20, January 2002. American Diabetes Association:

[www.diabetes.org](http://www.diabetes.org)

## GOUT

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Gout may often present with an acute, severe, often disabling arthritic attack, usually without warning. It may be associated with underlying disorders such as atherosclerosis, diabetes mellitus, hypertension, and renal disease.

### WAIVERS:

#### Initial Applicants (All Classes):

Exceptions to policy are considered on a case by case basis.

#### Rated Aviation Personnel (All Classes):

Waivers are normally recommended when the aircrew member becomes asymptomatic and medication is tolerated without side effects.

### INFORMATION REQUIRED:

- Confirmation of the absence of renal stones via an IVP or CT Scan is necessary for waiver.

**FOLLOW-UP:** Annual serum uric acid.

**TREATMENT:** For an acute gout attack, treatment can be one of three medications: 1) Colchicine, 2) Non-steroidal Antiinflammatory Drugs (NSAIDS), or 3) Intraarticular corticosteroid injection. In the aviation environment, the preferred initial therapy for gouty arthritis is treatment with NSAIDs. Treatment should be initiated rapidly as sooner treatment results in better patient response. If the condition recurs, a joint aspiration should be performed with fluid analysis to confirm the diagnosis. NSAIDs are a symptomatic treatment but long term control of hyperuricemia is via uricosuric drugs or allopurinol. Allopurinol or Probenecid are both acceptable therapies, provided there are no significant side effects.

**DISCUSSION:** In primary gout, 10-25 % of patients will develop renal stones. Fifty percent of those with a serum uric acid level greater than 13 mg/dl will develop renal stones. Starting treatment with Probenecid can precipitate stone formation in the kidney and the maintenance of an alkali diuresis at the start of treatment is recommended. In individuals at greater risk of developing renal stones, a large urinary volume through liberal ingestion of fluid should be maintained. Of relevance to aircrew is the association of gout with an increased level of alcohol consumption. Alcohol (Ethanol) increases uric acid production and reports indicate that of alcoholic beverages, beer may have the most potent effect on uric acid production.

Analysis of AEDR data indicates that in 2000, ten aircrew had the condition of gout and 50 % of these were granted waivers.

### REFERENCE:

National Library of Medicine, <http://www.nlm.nih.gov/medlineplus/goutandpseudogout.html>

## HYPERTHYROIDISM

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Hyperthyroidism and the resulting thyrotoxicosis may either present with slowly progressive symptoms (thyroid ophthalmopathy, corneal damage, optic neuropathy, tachycardia, various supraventricular dysrhythmias, nervousness, emotional lability and hyperkinesis) or may present acutely as in thyrotoxic crisis with fever, marked tachycardia with possible pulmonary edema or congestive heart failure. Cardiac and psychiatric symptoms are common in men. Thyroid ophthalmopathy frequently limits full visual fields, primarily in the upward gaze and more specifically in the superolateral field of gaze.

### WAIVERS:

#### Initial Applicants (All Classes):

Exceptions to policy or waivers are commonly recommended if the individual is euthyroid and there are no residual ophthalmologic deficits.

#### Rated Aviation Personnel:

Waivers are commonly recommended once the patient is euthyroid, and there are no residual ophthalmologic deficits. Aircrew members with ophthalmopathy may require grounding during treatment. Aircrew with abnormal cardiac dysrhythmia will require possible waiver action for the dysrhythmia as well. Waivers are commonly granted for hyperthyroid-induced dysrhythmias once the patient is euthyroid and cardiac evaluation reveals no underlying pathology.

ICD9 Code	Condition
242.01	Graves' Disease
241.0	Thyroid Nodule
241.1	Multinodular Goiter, non-toxic
240.9	Goiter, unspecified
242.9	Thyotoxicosis other

### INFORMATION REQUIRED:

- Endocrinology consultation
- Ophthalmology consultation
- Recent (within the previous 90 days) thyroid panel (to include as a minimum TSH and Free T4)
- Cardiology consultation and full work-up may be required for any associated dysrhythmias. (See appropriate APL)

**FOLLOW-UP:** Submission of thyroid panel (TSH and Free T4 as a minimum) is required with all comprehensive FDMEs. Although this requirement is only with the comprehensive FDME, the flight surgeon should assess for symptoms and check levels annually. Ophthalmology and/or cardiology consultations with associated work-up may be required for those with residual abnormality or in those with unusual cardiac manifestations.

**TREATMENT:** The three main forms of therapy include: 1) antithyroid drugs, 2) radioactive iodine ( $I^{131}$ ), and 3) surgery. Antithyroid drugs (methimazole, and propylthiouracil) are waivable but may cause side effects including vertigo and drowsiness as well as agranulocytosis (< 1%). Radioactive iodine is a simple and economical means of treating thyrotoxicosis with the principle disadvantage of producing a high incidence of late hypothyroidism. Surgery is also an alternative but has been declining in popularity; it may still have a role in treating females in their child-bearing years. Complications of thyrotoxicosis

usually rapidly respond to therapy, but the patient usually requires grounding until euthyroid and all ophthalmologic or cardiac disorders, etc., are resolved.

**DISCUSSION:** Graves' disease is the most common cause of hyperthyroidism in patients younger than age 40 in the United States, occurring in an estimated 0.4% of the population. Muscle pain, weakness, and stiffness are the presenting symptoms in 25% of patients. Infiltrative ophthalmopathy is clinically evident in about 50% of patients. Approximately 10% manifest with atrial fibrillation. Paroxysmal supraventricular tachycardia may occasionally be present. Only about 25% of patients present with the classic features of thyrotoxicosis: tremors, tachycardia, nervousness, exophthalmos, heat intolerance, and weight loss despite increased appetite. When treated with drugs, there is a 30% lasting remission rate. Postradioiodine hypothyroidism occurs in 30% of patients at five years and may reach from 40-70% within 20 years. A third of patients undergoing surgery will be hypothyroid within 10 years. It is essential; therefore, that all treated patients be monitored regularly for the rest of their life. The complete remission rate after radioactive iodine is 86% with 60% developing myxedema after 10 years and a further 2-3% a year developing myxedema after that. More than 50% of cases of exophthalmos will spontaneously remit within 5 years with no other treatment than that of the underlying condition. Only 5% of patients with ocular pathology will require surgery.

**REFERENCE:**

Journal of the American Medical Association, Treatment guidelines for patients with hyperthyroidism and hypothyroidism. ,1995, 273: 808-12.

National Guidelines Clearinghouse: [www.guideline.gov](http://www.guideline.gov), AACE clinical practice guidelines for the evaluation and treatment of hyperthyroidism and hypothyroidism.

## HYPOGLYCEMIA

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Asymptomatic hypoglycemia may be seen during prolonged fasting, strenuous exercise, or pregnancy. However, symptomatic fasting hypoglycemia is a serious and potentially life-threatening problem and of significant concern in the aviation environment. Fortunately, the true condition of hypoglycemia is quite rare, and the most common cause of hypoglycemia is as a complication of diabetes. Symptoms vary according to the degree of hypoglycemia. Acute hypoglycemia symptoms include weakness, drowsiness, confusion, hunger, and dizziness. Additional symptoms can include paleness, headache, irritability, trembling, diaphoresis, tachycardia, and a sensation of cold. Severe cases can lead to loss of consciousness or coma. Subacute or chronic hypoglycemic symptoms may be subtler with progressive confusion, inappropriate behavior, lethargy, and drowsiness. If the patient does not eat, seizures or coma may develop. The deployment of such an individual to remote field sites with poor nutrition and long duty hours is likely to exacerbate the condition.

### WAIVERS:

#### Initial Applicants and Rated Aviation Personnel:

Transient asymptomatic hypoglycemia with a clear underlying etiology does not require waiver or exception to policy and will be filed as information only. Symptomatic hypoglycemia may be recommended for waiver or exception to policy if the underlying condition is readily controlled. Any underlying medical condition must be evaluated for waiver and fitness for aviation duty.

### INFORMATION REQUIRED:

- Diagnosis of Diabetes must be ruled out as cause. (See Diabetes APL for evaluation).

If the individual does not have diabetes, the following must be documented in the AMS:

- Patient complaint of symptoms consistent with hypoglycemia. (Refer to aeromedical concerns above)
- Blood glucose levels are measured while the person is experiencing those symptoms and found to be 45 mg/dl or less in a female or 55 mg/dl or less in a male.
- Symptoms are promptly relieved on ingestion or other administration of glucose.
- Laboratory: Plasma insulin and serum C peptide, done at the time of hypoglycemia if possible.

**FOLLOW-UP:** No follow-up is required for asymptomatic hypoglycemia unless the aircrew member develops symptoms or hypoglycemic lab values persist. Follow the procedures outlined in Information Required above. Those with waivers for symptomatic hypoglycemia require an annual internal medicine evaluation and a fasting blood glucose measurement.

**TREATMENT:** Dietary control of plasma glucose is the primary treatment available. If conscious and able to swallow, glucose-containing foods such as candy, orange juice with sugar, or cookies should be quickly ingested. If unconscious, rapid restoration of plasma glucose must be accomplished by giving 20-50 ml of 50% dextrose intravenously over 1-3 minutes in order to avoid possible permanent brain damage associated with prolonged hypoglycemia.

**DISCUSSION:** The most common cause of hypoglycemia is as a complication of diabetes. Other rare causes include early pregnancy, prolonged fasting, and periods of strenuous exercise. The entity of reactive hypoglycemia is a condition of low blood sugar with no known cause and in which symptoms appear 2-5 hours after consumption of foods high in glucose. In normal men, plasma glucose does not fall below 55 mg/dl during a 72-hour fast. However, for reasons that are not clear, normal women may experience a fall to levels as low as 30 mg/dl despite a marked suppression of circulating insulin to less than 6 U/ml. They remain asymptomatic in spite of this degree of hypoglycemia, probably because

ketogenesis is able to satisfy the energy needs of the central nervous system. Iatrogenic or surreptitious administration of insulin or sulfonylureas may also cause symptomatic hypoglycemia. Other disorders that are associated with hypoglycemias include severe hepatic dysfunction, chronic renal insufficiency, hypocortisolism, alcoholism, some nonpancreatic tumors, and inborn errors of carbohydrate metabolism (glycogen storage disease, gluconeogenic enzyme deficiencies). Nonfasting hypoglycemia can result from occult diabetes, alcoholism, leucine sensitivity, and galactosemia or after alimentary surgery.

A current review of the AEDR for the year 2000 reveals that only three cases of hypoglycemia were reported and all of these were disqualified most likely due to underlying medical conditions.

**REFERENCE:**

National Institutes of Health Publication No. 95- 3926, Hypoglycemia, May 1995 (e-text October 1999):  
[www.niddk.nih.gov](http://www.niddk.nih.gov)

# HYPOTHYROIDISM

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Hypothyroidism most often presents with slowly progressing symptoms of fatigue, lethargy, muscle weakness, decreased cognitive function, delayed reflexes, bradycardia, first degree heart block, cardiomegaly, pericardial effusion, menstrual irregularities, depression, sensorineural hearing loss, and anemia. These symptoms may slowly degrade flight performance and be totally unrecognized by the aviator until significant degradation is present.

## WAIVERS:

### Applicants (Class 1A/1W):

Exception to policy is considered on a case-by-case basis.

### Initial Applicants (Classes 2,3,4):

Waivers are commonly recommended once the individual is clinically and chemically euthyroid and on approved medication with no demonstrated side effects.

### Rated Aviation Personnel (All Classes):

Waivers are commonly recommended once the individual is clinically and chemically euthyroid and on approved medication with no demonstrated side effects.

ICD9 Code	Condition
244	Acquired hypothyroidism
245.0	Acute thyroiditis
245.1	Subacute thyroiditis
245.2	Hashimoto's thyroiditis
245.9	Thyroiditis, unspecified

## INFORMATION REQUIRED:

- Endocrinology Consultation (preferred) or Internal Medicine Consultation,
- Laboratory: Thyroid panel (to include TSH and Free T4 as a minimum) completed within 90 days of submission, and these laboratory results should be in the euthyroid range prior to submission for waiver.

**FOLLOW-UP:** Submission of thyroid function testing with all comprehensive physicals. Although this requirement is only with the comprehensive FDME, the flight surgeon should assess for symptoms and check levels annually.

**TREATMENT:** Levothyroxine (Synthroid, Unithyroid, Levoxyl) is an acceptable treatment.

**DISCUSSION:** Three main reasons exist for thyroid hormone deficiency: 1) primary hypothyroidism: permanent atrophy of the thyroid tissue, 2) goitrous hypothyroid: hypothyroidism with compensatory thyroid enlargement, or 3) insufficient stimulation of a normal gland as a result of hypothalamic or pituitary disease. The first two reasons account for 95% of the cases of hypothyroidism. In hypothyroidism, tiredness and lethargy are the two most common early symptoms. In over 90% of cases, patients will manifest these as well as dry, coarse skin, slowed speech, and eyelid edema. The severity of symptoms depends on the degree of hormone deficiency. The onset of hypothyroidism is usually so insidious that the typical manifestations may take months or years to appear and may go unnoticed by family and friends. The ratio of females to males is 5:1; no age group is immune. Indefinite follow-up is advised, mainly to confirm patient compliance.

**REFERENCE:**

- Journal of the American Medical Association, Treatment guidelines for patients with hyperthyroidism and hypothyroidism. ,1995, 273: 808-12.
- National Guidelines Clearinghouse: [www.guideline.gov](http://www.guideline.gov), AACE clinical practice guidelines for the evaluation and treatment of hyperthyroidism and hypothyroidism.

## METABOLIC SYNDROME

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Coronary artery disease (CAD) is the leading cause of permanent suspension from flying duties and premature, non-accidental death in aircrew members, with the major concern for sudden incapacitation in flight. Coronary artery disease is silent and evolves over a lengthy period of time, with clinical symptoms and signs being dramatic, life-threatening, or fatal. Numerous risk factors have been identified and are part of the current overall Cardiovascular Screening Program (CVSP) APL. The goal of the program is to identify those at risk for silent disease and mitigate reversible factors before the presence of disease becomes significant and disqualifying/life-threatening.

Metabolic syndrome is a clustering of cardiovascular risk factors including abdominal obesity, hypertriglyceridemia, low levels of high-density lipoprotein (HDL), high-normal blood pressure to hypertension, and impaired glucose tolerance to diabetes. APL's current exist for each of these individual factors, but none include an assessment of cardiovascular health unless these factors also cause a failure in the CAD Screening via failing one of the CVSP criteria. However, not every case of metabolic syndrome will cause a failure of the CVSP. These missed individuals, while having numerous factors, might not otherwise be assessed and provided preventive advice and care. Research has shown that synergy of these factors in metabolic syndrome (even with an aeromedically acceptable blood pressure) markedly increases the risk for development of cardiovascular disease and type 2 diabetes mellitus. Early identification and management of metabolic syndrome is necessary to reduce the risk of development of potential disqualifying conditions and improve the health and well-being of aviation personnel.

Criteria for diagnosis (3 or more of the 5 listed below) is as follows:

Criteria	Males	Females
Abdominal obesity, measured as waist circumference	$\geq$ 40 inches	$\geq$ 35 inches
Plasma triglycerides		$\geq$ 150 mg/dl
Plasma HDL	< 40 mg/dl	< 50 mg/dl
Blood pressure	Systolic $\geq$ 130 or Diastolic $\geq$ 85 mm Hg	
Fasting glucose		$\geq$ 110 mg/dl

**WAIVERS:** Metabolic syndrome is disqualifying for initial flight applicants. This parallels the disposition of the individual components. For rated aircrew, metabolic syndrome constitutes a failure of Level 1 in the Cardiovascular Screening Program (CVSP), follows the protocol outlined in that APL, and is annotated as INFORMATION ONLY. No specific waiver is required for metabolic syndrome. However, the individual components may warrant the need for an AMS and waiver request.

### INFORMATION REQUIRED:

- Thorough assessment of all of the underlying factors and components, to include documentation of treatment plan IAW with each of the APL's involved.
- Hypertensive patients warrant screening for type 2 diabetes mellitus.
- Abdominal circumference
- Annotation of the height, weight, and Body Mass Index (BMI).

**FOLLOW-UP:** Annual follow-up is required to review the overall health and progress of treatment. CVSP APL should be followed for those with a diagnosis of metabolic syndrome. Further follow-up guidelines are specified in the appropriate APL for each of the components of concern.

## TREATMENT:

1. **Lifestyle changes**—Lifestyle changes should be the FIRST therapy prescribed unless individual components below warrant therapy as 7-10% weight loss may obviate the need for additional medications initially. Weight loss through exercise (30 minutes/day, 5 days/week) and dietary changes are recommended. Lifestyle modification is the best method for reducing the risk of CAD and progression towards type 2 diabetes. Reducing abdominal obesity decreases insulin resistance and the hyperinsulinemic state, which improves free fatty acid, carbohydrate, and lipoprotein metabolism.
2. **Hypertension/Borderline (JNC VII)**—use of ACE-inhibitor or ARB to reduce BP below 130/85 is recommended. See [Hypertension APL](#).
3. **Hyperlipidemia**—use of Statins, to reduce LDL to < 100 mg/dl and improve HDL and lower triglycerides. Additional use of fibrates (Tricor is preferred over Lopid due to increased risk of side effects) and/or niacin may be needed, but these come with increased concern of side effects. See [Hyperlipidemia APL](#).
4. **Type 2 Diabetes/Impaired Glucose Tolerance**—use of Metformin helps with insulin utilization, reducing hepatic release, and weight reduction. Use of TZD helps with reducing hyperinsulinemia, which helps reverse the dysmetabolism, and preserving beta-cell function. In patients without type 2 diabetes mellitus, these medications do not reduce the risk of development of Coronary Artery Disease. See [Diabetes APL](#)—medication use requires AMS and waiver recommendation.
5. **Aspirin**—unless contraindicated, use of enteric-coated aspirin (81 to 325 mg) daily is recommended for all those over 35 years of age.

**DISCUSSION:** Metabolic syndrome was first described in 1988 and termed Syndrome X. It has been also referred to as dyslipidemic hypertension, atherogenic lipoprotein pattern, and dysmetabolic syndrome X. The formal definition of metabolic syndrome, as published in 2001 from the National Cholesterol Education Program Adult Treatment Panel III guidelines are include three or more positives of the five listed criteria above. Being on hypertensive OR glucose therapy meets criteria, and being on hyperlipidemic therapy may meet one or both of the lipoprotein criteria.

Metabolic syndrome is thought to be a product of complex pathophysiology involving progressive resistance of peripheral tissues to the effects of plasma insulin with disruption of normal metabolism with free fatty acids (FFA), carbohydrates, and lipoprotein. A synergy occurs with the factors above their independent contribution to accelerate coronary artery disease (CAD). Age, inactivity, and excessive calories worsen this.

NHANES III data (1988-1994) found the prevalence of metabolic syndrome to be 24%, or 47 million, of Americans, with 44% of Americans having 2 or more of the traits. These numbers are increasing with the continued societal problem of obesity and physical inactivity. Metabolic syndrome prevalence increases with age (1 in 16 ages 20-29 versus 1 in 3 ages 50-59 to 4 in 9 ages 60-69) and is seen more in minority populations. While related to insulin resistance syndrome, metabolic syndrome is distinct entity often appearing later on in the process.

Observational data from the Framingham study showed that metabolic syndrome accounted for almost 25% of all new-onset CAD. Although at one time felt to be a better predictor of CAD than the Framingham Risk Score, the additional components of metabolic syndrome have added little to the predictability of CAD risk to date. However, numerous studies have demonstrated the increased risk of CAD, cardiovascular death (CVD), and development of type 2 diabetes mellitus coming from the constellation of factors comprising the metabolic syndrome. Individual studies have shown a 3 to 5-fold increased risk of CAD or CVD and a 7 to 34-fold increased risk of developing type 2 diabetes mellitus. While the ADA and other organizations are currently evaluating metabolic syndrome's role in CAD and

diabetes, the clustering is easily identified and warrants regimented follow-up in aviation personnel to improve overall health and well-being.

**REFERENCE:**

Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). NIH: National Heart Lung and Blood Institute, NIH 01-3670, May 2001.  
<http://www.nhlbi.gov/guideline/cholesterol/profmats.htm>

Garber AJ. The metabolic syndrome. The Medical Clinics of North America.2004; 88: 837-846.

Kendrick C, Olson KK. Acanthosis nigricans, PCOS, insulin resistance, and metabolic syndrome—a differential diagnosis. Available via internet at: [www.tamucc.edu/~hsweb/downloads/ACHA.pdf](http://www.tamucc.edu/~hsweb/downloads/ACHA.pdf), accessed 23 MAR 2005.



## GASTROENTEROLOGY WAIVERS

## CIRRHOSIS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Liver cirrhosis may present slowly or acutely with associated development of gastrointestinal hemorrhage, malaise and lethargy, symptoms arising from encephalopathy and peripheral neuropathy, abdominal pain, jaundice, and Dupuytren's contracture. Osteomalacia occurring in cases of primary biliary cirrhosis could theoretically give problems on ejection. If secondary to alcohol use, the diagnosis of alcohol dependence must be considered. (See Alcohol Abuse APL)

**WAIVERS:** Rated aviators may be considered for waiver provided they are asymptomatic, stable, require no treatment, and do not exhibit any evidence of esophageal varices.

ICD9 Code	Condition
571.2	Alcoholic cirrhosis of the liver
571.6	Biliary cirrhosis
571.8	Other chronic non-alcoholic liver disease

### INFORMATION REQUIRED:

- Submission of an internal medicine or gastroenterology consultation is necessary.
- A complete panel of liver function tests is also required.
- A liver biopsy may be required.
- Alcoholic liver cirrhosis must also submit the requirements as discussed in the Alcohol Abuse APL.

**FOLLOW-UP:** Annual submission of an internal medicine or gastroenterology consultation with complete panel of liver function tests.

**TREATMENT:** The need for any form of therapy will probably lead to termination from flight duties.

**DISCUSSION:** Cirrhosis resulting from Wilson's disease, hemochromatosis or chronic active hepatitis tends to present in the teens and twenties, while patients with other etiological factors present after age 40. The male:female ratio for alcoholic cirrhosis ranges from 2-10:1 in contrast to that for primary biliary cirrhosis where it is 1:9. Alcoholic cirrhosis occurs in 15% of heavy drinkers. In clinically compensated cases, the 5-year survival for those who stop drinking alcohol is 90% as compared with 70% for those who continue drinking; for cases who are not clinically compensated, the corresponding figures are 60% and 30%. The incidence of symptoms in cirrhosis is malaise (30-80%), abdominal pain (30%), gastrointestinal hemorrhage (up to 25%), neurological features (<10%) and Dupuytren's contracture (10-30%). Survival rates in progressive cases are reported as > 50% at 1 year falling to 10% at 6 years. In primary biliary cirrhosis, pruritis occurs as the first symptom in 80% of cases and jaundice in the remainder. The incidence of collagen diseases in association with primary biliary cirrhosis is 70-80% with joint involvement in over 40%. Bacteriuria is found in 35% of cases but may be asymptomatic. For primary biliary cirrhosis, the average survival is 11.9 years but may be less than 2 years when serum bilirubin levels rise quickly.

## CROHN'S DISEASE

Update: JUL 2002

**AEROMEDICAL CONCERNS:** Frequent bowel movement, diarrhea, rectal urgency and incontinence are obviously things to be avoided in the military aviation environment where it can cause delay, interruption, or failure in completion of military operations. Abdominal cramps and pain and the potential for hemorrhage can cause incapacitation during flight. Anemia, bowel obstruction, fistulization, as well as a multitude of potential extraintestinal manifestations of Crohn's disease are also of grave concern. Deployment to remote areas with poor dietary habits, high stress, and little rest are all factors responsible for relapse.

### WAIVERS:

#### Initial Applicants (Class 1A/1W):

Exception to policy or waiver is not granted.

#### Initial Applicants (Classes 2F, 3, and 4):

Exception to policy or waiver is not granted.

#### Rated Aviation Personnel (All Classes):

Request for waiver may be considered provided the patient has been completely asymptomatic for 2 years, current colonoscopy reveals no active disease, a maintenance dose of Sulfasalazine is no greater than 2 gm/day or mesalamine at 2.4 gm/day to 6 gm/day depending on the formulation, and the initial disease presentation was mild and of short duration. Unlike ulcerative colitis, the risk of recurrence of Crohn's disease following surgery does not justify waiver action.

### INFORMATION REQUIRED:

- Aeromedical Summaries with detailed dietary history and record of disease course.
- Gastroenterology consultation.
- Colonoscopy report with biopsy results – if photographs are required they will be requested by the US Army Aeromedical Activity after initial case review.
- Reports of any radiologic studies if disease is in other areas of the GI tract (i.e. abdominal CT or barium studies).
- CBC
- Sedimentation rate (ESR).

**FOLLOW-UP:** Annual submission of an internal medicine or gastroenterology consultation, to include sigmoidoscopy or colonoscopy report, when indicated. Laboratory should include, at a minimum: CBC, blood chemistries, and if on Mesalamine, renal function.

**TREATMENT:** Sulfasalazine in doses up to 2 gm/day or Mesalamine up to 2.4 gm/day or 6 gm/day, depending on the formulation as maintenance therapy. Higher doses, if required, are not normally accepted for waiver.

**DISCUSSION:** Crohn's disease is common in 6-15 percent of young adults with a positive family history. There is an association with smoking. Patients present with diarrhea (70-90 percent), abdominal pain (45-60 percent), weight loss (65-75 percent), fever (30-40 percent), and rectal bleeding (50 percent). Extraintestinal manifestations include gallstones (15-30 percent), oxalate kidney stones (5-10 percent), sacroiliitis (15-18 percent), aphthous ulceration of the mouth (20 percent), erythema nodosum (5-10 percent), and acute arthropathy (6-12 percent). The risk of carcinoma of the colon is reported to be 3-5 percent. After the initial episode, there is a 70 percent chance of relapse in the following 5 years with most occurring in the first 2 years.

Between 70-80 percent of patients will need at least one operation (for failure of medical therapy in 33 percent, fistula formation in 24 percent, and intestinal obstruction in 22 percent). After resection, the risk of recurrence in the following 5 years is 30-70 percent and 50-85 percent in the next 10 years; of these, up to half will need further operation. Without an operation, the annualized risk for recurrence is 1.6 percent in those with single site involvement and 4 percent in those with multiple site disease. The overall mortality is 10-15 percent.

**REFERENCE:**

Chutkan, RK. Inflammatory Bowel Disease. Primary Care: Clinics in Office Practice. 28:3; 539-56.

## DIVERTICULAR DISEASE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** About 80% of those affected with diverticular disease never develop symptoms. The remaining 20% have a slight risk of in-flight incapacitation secondary to the development of severe colic or massive diverticular hemorrhage. Also there exists the possibility that the altered bowel habits, flatulence, pain or nausea may cause significant distraction in flight, possibly interfering with mission accomplishment. Completely asymptomatic diverticulosis without complication is not considered disqualifying but will be filed information only.

**WAIVER:** Waiver for rated aircrew members may be recommended provided symptoms are minimal and that grounding medication is not required.

ICD9 Code	Condition
562.10	Diverticulosis of Colon
562.11	Diverticulitis of Colon

### INFORMATION REQUIRED:

- Surgical consultation to exclude malignancy.
- Submit colonoscopy or barium enema report.

**FOLLOW-UP:** Minimally symptomatic diverticular disease previously granted waivers require annual submission of surgical consultation. Asymptomatic patients whose diverticulosis was found incidentally require no specific follow-up other than an annual FDME.

**TREATMENT:** A high fiber diet is compatible with flying. Psyllium or other fiber supplements may also be used under the flight surgeon's observation only due to the possibility of bowel obstruction. Partial colectomy may be required to control symptoms but surgery for asymptomatic diverticula should not be recommended.

**DISCUSSION:** Diverticulosis is rare before the age of 30 but affects 30% of the population by the sixth decade. It is more frequent in the 20 and 30 year age groups in patients with Marfan's syndrome. Some 20-25% of patients require surgery on their initial admission to the hospital. Once symptoms occur, the disease is one of frequent recurrence. Rectal bleeding may occur in 10-30% of patients with diverticular disease; severe blood loss from colonic diverticula is reported to occur in 3 to 5% of those with diverticulosis. Morbidity is reported as a 70% 5-year survival period. Mortality and morbidity information provided by most published clinical reports are unfortunately skewed with populations including the elderly. Little data is available in population groups matching the age distribution of the military population.

## GALLSTONES

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The most common presenting symptom (75%) of gallstone disease is pain. This pain often is acute and disabling and is a potential risk of incapacitation during flight. Complication of gallstones include acute cholecystitis (90% have gallstones), choledocholithiasis (common duct stones), bacterial cholangitis, and gallbladder perforation.

**WAIVERS:** Asymptomatic gallstones found incidentally and with no evidence of cholecystitis on ultrasound examination are routinely granted a waiver in rated aviation personnel. Initial applicants will be considered for exception to policy on a case-by-case basis. Aviators with symptoms should be grounded until the stones are removed. A history of cholecystectomy, if uncomplicated, does not require a waiver and will be filed as information only.

ICD9	Code Condition
574.0	Gallstones with acutecholecystitis
574.2	Gallstones without cholecystitis
575.0	Acute Cholecystitis
P51.2	Cholecystectomy

### INFORMATION REQUIRED:

- For symptomatic patients, the initial waiver requests should contain the operative report with confirmation that the patient is symptom-free after the procedure and that any bile duct stones are absent as demonstrated by ultrasound examination.
- Asymptomatic patients with gallstones require submission of report of ultrasound examination to confirm the absence of cholecystitis.

**FOLLOW-UP:** None required provided the aviator remains asymptomatic.

**TREATMENT:** Patients who have undergone conventional cholecystectomy can normally return to flying duties within 3 months provided that an absence of bile duct stones is demonstrated. Return to flying duties after endoscopic cholecystectomy may be achieved sooner provided the same criteria can be met. Extracorporeal shock wave lithotripsy (ESWL) and chemical dissolution of gallstones are not recommended for aviation personnel due to the high rate of recurrence of the stone.

**DISCUSSION:** Gallstones affect between 10 and 20% of the world's population. Cholesterol stones account for 70% of those found in the United States. The prevalence of asymptomatic cholelithiasis in USAF aircrew has been estimated as 2%; this is less than in the general population because of age and gender factors. An annual onset rate of 1-4% for developing severe medical symptoms requiring eventual cholecystectomy can be anticipated in this population group. Overall, it may be appropriate to offer treatment to younger patients with asymptomatic gallstones who run a greater cumulative risk of developing complications than older patients. However, the total incidence of acute cholecystitis would not be affected by cholecystectomy being carried out on incidentally found, asymptomatic gallstones. While 60% of patients with cholesterol stones and a functioning gall bladder will have a successful chemical dissolution of their stones, the risk of recurrence in the first year after treatment is 10-30%; chemical dissolution is not, therefore, recommended for waiver. The clearance rate in ESWL for those with 1 stone < 20mm diameter at 2/4/8/18 and 24 months is reported as 45/69/78/95/100%; the corresponding figures for a single stone < 30mm diameter are 18/29/51/81/100%; and for 2-3 stones 13/17/29/49/67%. About 35% of all patients undergoing ESWL have 1 or more episodes of biliary colic before the clearance of all stone fragments. About 10-15% of patients with gallstones will also have stones in the common bile duct.

## GASTRITIS / DUODENITIS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** While often patients with gastritis or duodenitis will be minimally symptomatic, some will experience significant pain and occasional severe hemorrhages. Chronic gastritis may also occur in conjunction with other conditions which in themselves are disqualifying. Complications may include Mallory-Weiss tear or ulcer formation.

**WAIVERS:** If symptoms are mild and controlled with occasional antacid use, no waiver is required. If, however, chronic medication requiring a waiver is used to control symptoms, a waiver must be obtained. (See Medications - Class 3 APL) No waiver action is required for transient gastritis which resolves easily with short term treatment or avoidance of inciting agents.

### INFORMATION REQUIRED:

- An internal medicine or gastroenterology consultation to exclude the presence of pernicious anemia, thyrotoxicosis, diabetes, and iron deficiency anemia.
- Endoscopy is required to exclude the possibility of ulceration, hiatus hernia, and malignancy.
- Cultures for H. pylori should also be obtained.

**FOLLOW-UP:** Follow-up examination by an internal medicine or gastroenterology specialist will only be required if there is evidence of progressive disease, poor maintenance control, or recurrent symptomatology.

**TREATMENT:** Life style changes such as reduction in smoking and alcohol intake are compatible with recommendation for waiver. The following medications may be used and a waiver recommended once the treated patient demonstrates no idiosyncratic reactions to the medication (a 30 day period of observation is recommended) and the medication is effective in providing relief of symptoms.

**Antacids** - Chronic use is Class 3. Occasional or infrequent use is Class 1. Check electrolytes when used chronically.

**H2 Blocker** - CIMETIDINE, RANITIDINE, FAMOTIDINE, NIZATIDINE. Occasional drowsiness is associated with these medications. When treatment is first initiated, a 72-hour observation while the aviator is DNIF is required to ensure the absence of any significant side-effect.

**Proton Pump Inhibitor** - Omeprazole

**Sucralfate** - Class 2A provided underlying condition does not require waiver.

Clinical trials have failed to present convincing evidence that clearance or eradication of Helicobacter Pylori (H. pylori) affects symptoms of gastritis or duodenitis.

**DISCUSSION:** Up to 25% of clinically significant upper gastrointestinal bleeding is caused by acute gastritis or duodenitis. Less than 5% require surgery to control the hemorrhage. Chronic atrophic gastritis increases the risk of pernicious anemia three-fold in the normal population and the risk of adenocarcinoma of the stomach twenty-fold. One of the most important discoveries to effect the understanding of gastritis in recent years is the recognition of H. pylori as the cause of most forms of nonerosive chronic active gastritis. Unfortunately, as stated above, this discovery has had little impact on the treatment of gastritis. H. pylori has also been proven to be of importance in regard to both the pathogenesis and potential therapy for peptic ulcer pathogenesis. (See Peptic Ulcer APL) Other recognized causative factors include: alcohol, NSAIDs, radiation, post-traumatic and prolapse gastropathy produced by repeated retching and vomiting.

## GILBERT'S SYNDROME

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Symptoms may include abdominal pain, weakness, and malaise but most cases remain asymptomatic.

**WAIVERS:** Waiver is not required for Gilbert's syndrome or disease provided the patient remains asymptomatic. This diagnosis is filed as information only.

**INFORMATION REQUIRED:**

Internal medicine or gastroenterology consultation is required to confirm the diagnosis. The diagnosis of Gilbert's syndrome can be established by the repeated demonstration of normal liver function tests in an asymptomatic individual with mild elevation in the concentration of unconjugated bilirubin in serum and no evidence of hemolysis. Liver biopsy is unnecessary in routine cases but may be required if the diagnosis is in doubt.

**FOLLOW-UP:** None

**TREATMENT:** N/A

**DISCUSSION:** The incidence of Gilbert's syndrome is 1-7% of the population. Up to 50% of cases have a slightly reduced red cell survival time compared to normals. The condition is totally benign and there is no known association with more serious conditions. Gilbert's syndrome results from a decreased hepatic clearance of unconjugated bilirubin, probably related to diminished hepatic UDP-glucuronosyltransferase activity. Serum bilirubin concentration in these patients may rise two- to threefold with fasting and dehydration. The condition may result in slower liver detoxification of some therapeutic agents such as acetaminophen.

## IRRITABLE BOWEL SYNDROME

Update: MAR 1997

**AEROMEDICAL CONCERNS:** While most of the patients with irritable bowel syndrome (IBS) have mild nonincapacitating symptoms, some will present with significant painful abdominal cramping and discomfort. Along with increased urgency and frequency of defecation, these symptoms may most certainly be distracting in flight and is inconvenient and possibly aggravated by mobilized "field" conditions. Often the disease is compounded after or during periods of stress and emotional tension. Perhaps, primarily because of the embarrassment over a perceived "inability to deal with stress", or due to the infrequency or inconsistency of the disease symptoms, most of the cases go unreported and thus, untreated.

**WAIVERS:** As long as the symptoms can be controlled, the evaluation is negative for underlying pathology, and the underlying psychological disorders have been fully treated, a waiver for rated aviators is normally recommended. Exception to policy is rarely granted.

### INFORMATION REQUIRED:

- Submit an AMS with complete description of symptom complex.
- An internal medicine consult
- psychology and/or psychiatry evaluation is normally required.

**FOLLOW-UP:** Close follow-up by the local flight surgeon. Further evaluation is only required with exacerbation of or failure to control disease symptoms.

**TREATMENT:** Advice, possibly including psychiatric counseling or stress management and dietary management to include pectin stool expanders, are compatible with continued flying status. Avoidance of caffeine and alcohol may also be of benefit.

**DISCUSSION:** Over 50% of patients are under 35 years old with female-male ratio being reported as 2:1, a report potentially biased by the greater tendency for women to seek medical assistance. The criteria for making the diagnosis can be met by 6-15% of normal young people. Only an estimated 20% of people who qualify for the diagnosis seek medical attention for it. Almost half of the reported IBS patients report sexual abuse as children. The four symptoms that help distinguish IBS from organic disease are: (1) visible abdominal distention, (2) relief of abdominal pain by bowel movement, (3) more frequent bowel movements with the onset of pain, and (4) looser stools with onset of pain. Ninety-one percent of IBS patients have two or more of these four symptoms, whereas only 30% with organic disease have two or more symptoms.

# PEPTIC ULCER DISEASE

Update: JUL 2002

**AEROMEDICAL CONCERNS:** Individuals presenting with acute hemorrhage and associated dizziness, perforation, pain, and/or vomiting are of primary concern in the aviation environment. Undetected chronic blood loss with no other symptoms can result in an iron deficiency anemia, which can lead to cardio-respiratory compromise in flight due to altitude or high G- maneuvers.

## WAIVERS:

### Initial Applicants (Class 1A/1W):

Exception to policy are rarely recommended.

### Initial Applicants (Classes 2F, 3, and 4):

Waivers will be considered on a case-by-case basis and are normally granted for a single occurrence. Recurrent disease will be evaluated on a case-by-case basis

### Rated Aviation Personnel (All Classes):

Waivers are normally recommended for a single occurrence, for Helicobacter pylori (H. pylori) induced ulcers after an appropriate treatment regimen, or for uncomplicated ulcers on approved maintenance drug therapy, currently asymptomatic, with ulcer healing demonstrated by endoscopy. Waivers for recurrent ulcer disease are considered on a case-by-case basis. Waivers are routinely recommended for conditions in response to a known precipitant, (e.g., NSAID ingestion). Complicated PUD consists of ulcers associated with hemorrhage, obstruction, perforation, or intractability of symptoms.

## INFORMATION REQUIRED:

- Aeromedical Summary including a history of caffeine, tobacco, and medication use, any hospital summaries or operative/endoscopy reports.
- Labs: CBC, three stool hemoccults and if a history of hemorrhage or heme positive stool, report PT/PTT and platelet count.
- Internal medicine or gastroenterology consultations to exclude malignancy.
- Endoscopy to demonstrate ulcer healing. If cancer is suspected, an endoscopy with biopsies is indicated.
- Other required studies may include gastric analysis, basal and stimulated, serum gastrin by radioimmunoassay, stool examination for ova and parasites, biopsies, and/or CLO test for H. pylori. If ulcer is not present on endoscopy, further work-up is required to determine etiology of any bleeding. Other causes of chest pain and associated symptoms must be considered to include checking an EKG for evidence of myocardial damage.

**FOLLOW-UP:** Gastrointestinal/internal medicine evaluation if symptoms recur.

**TREATMENT:** Ninety percent of ulcers are caused by H. pylori, and successful eradication reduces the recurrence rate of PUD from 90 to 20 percent. PUD generally does not recur with current therapy unless NSAID use is present. H. pylori eradication consists of antibiotics and antisecretory drugs (H<sub>2</sub> Blockers and PPIs). Long term acid inhibition is generally not needed after successful eradication. Various regiments of antibiotic therapy for H. pylori are acceptable as long as eradication is possible. Surgical intervention for peptic ulcer disease is now rare. Other approved medications include:

**GI MEDICATIONS:** All antacids (chronic use) and medications listed below are Class 3, except as noted. There are no additional requirements for a waiver other than the complete evaluation of the underlying condition and documentation of medication efficacy.

**Antacids** (Tums, Rolaids, Mylanta, Maalox, Gaviscon, etc.) - Chronic use is Class 3. Occasional or infrequent use is Class 1. Check electrolytes when used chronically.

**H2 Blocker** - (Cimetidine (Tagamet), Ranitidine (Zantac), Famotidine (Pepcid), Nizatidine (Axid)): Occasional drowsiness is associated with these medications. When treatment is first initiated, a 72-hour observation while the aviator is Duties Not Including Flying (DNIF) is required to ensure the absence of any significant side effect.

**Proton Pump Inhibitor** - Omeprazole (Prilosec), Lansoprazole (Prevacid), Pantoprazole (Protonix), Rabeprazole (Aciphex), and Esomeprazole (Nexium).

**Sucralfate** - (Carafate): Class 2A provided underlying condition does not require waiver.

**DISCUSSION:** Approximately 25 million Americans suffer from PUD at some point in their lifetime. Each year there are 500,000 to 850,000 new cases of PUD and more than 1 million ulcer-related hospitalizations. The most common ulcer symptom is gnawing or burning pain in the epigastrium. This pain typically occurs when the stomach is empty, between meals, and in the early morning hours, but it can also occur at other times. It may last from minutes to hours and may be relieved by eating food or by taking antacids. Less common ulcer symptoms include nausea, vomiting, and loss of appetite. Bleeding can also occur; prolonged bleeding may cause anemia leading to weakness and fatigue. If bleeding is heavy hematemesis, hematochezia, or melena may occur.

The causes of PUD can be divided into four major categories: H.pylori induced ulcers, NSAIDS, acid hypersecretory conditions (e.g. Zollinger-Ellison syndrome), and idiopathic. The use of H2 Blockers and PPIs has changed management of PUD from an inpatient to an outpatient setting. With continued use of chronic daily NSAIDS use, 1-10 percent of patients will suffer gastrointestinal bleeding or gastric/duodenal ulcers. The vast majority of PUD is caused by H. pylori and eradication is associated with a recurrence rate of less than 5 percent. The absence of the organism 4 to 6 weeks after discontinuation of therapy is accepted as an indication of sustained eradication. Eradication is best measured by the non- invasive C14 breath test or a repeat invasive endoscopy with biopsy.

Gastric ulcers and ulcers of the small bowel are found in 21.7 and 8.4 percent, respectively, of users of nonsteroidal anti- inflammatory drugs. Between 3 and 5 percent of gastric ulcers are carcinomatous. The death rate from acute hemorrhage from duodenal ulcer is 6-10 percent and is up to 22 percent in cases of acute upper gastrointestinal hemorrhage. Bleeding stops spontaneously in 85 percent of those cases presenting with acute gastrointestinal hemorrhage. Of those who perforate, 10 percent will do so with no previous history of symptoms. The use of H2 blockers is associated with 80-90 percent of patients healing in 2-3 months, although healing can be delayed in smokers; subsequent relapse rates while on maintenance therapy are higher in smokers than nonsmokers. Without maintenance medication, the relapse rate has been reported to be 50-100 percent at 1 year with 30 percent of the relapses being asymptomatic. The risk of hemorrhage has been reported as 2.5-2.7 percent per year in patients not on maintenance medication. The rate increased to 5 percent per year if there was a history of previous ulcer complications. The annual risk of perforation in similar patients ranges from 0.8-2 percent in males. There is no evidence that painless ulcers are less likely to bleed or perforate, although one bleed is predictive of others. With surgery, 5-15 percent of duodenal ulcers will recur after highly selective vagotomy and 3 percent will relapse after partial gastrectomy. Recurrence rates are less if the patient abstains from tobacco and alcohol.

#### **REFERENCE:**

Smoot DT, Go MF, Cryer B. Peptic Ulcer Disease, Primary Care: Clinics in Office Practice; 2001;28(3):487-503. Centers for Disease Control-information on H. pylori and current treatment regimens: [www.cdc.gov/ulcer/md.htm](http://www.cdc.gov/ulcer/md.htm)

# REFLUX ESOPHAGITIS (GERD) and HIATUS HERNIA

Update: NOV 2002

**AEROMEDICAL CONCERNS:** Retrosternal pain associated with either GERD or hiatus hernia can be a significant distracter in the aviation environment. Acid regurgitation can lead to attacks of bronchoconstriction in susceptible individuals. Exposure to -Gz may exacerbate the symptoms of both GERD and hiatus hernia.

## WAIVERS:

### Initial Applicants (Class 1A/1W):

Exception to policy for initial flight applicants are only required for cases of GERD or symptomatic HH demonstrating one or more of the five warning symptoms: dysphagia or odynophagia, symptoms persisting or progressive on chronic therapy, bleeding or iron deficiency, unexplained weight loss, or extraesophageal symptoms ( e.g. cough, choking, chest pain, asthma). GERD or HH which is asymptomatic or minimally symptomatic requiring chronic therapy or occasional treatment with the medications listed below to include over the counter H2 Blockers will be listed as Information Only.

### Initial Applicants (Classes 2F, 3, and 4):

Waivers are only required for cases of GERD or symptomatic HH demonstrating one or more of the five warning symptoms as listed above. GERD or HH which is asymptomatic or minimally symptomatic requiring chronic therapy or occasional treatment with the medications listed below to include over the counter H2 Blockers will be listed as Information Only.

### Rated Aviation Personnel (All Classes):

Waivers are only required for cases of GERD or symptomatic HH demonstrating one or more of the five warning symptoms as listed above. GERD or HH which is asymptomatic or minimally symptomatic requiring chronic therapy or occasional treatment with the medications listed below to include over the counter H2 Blockers will be listed as Information Only.

ICD9 Code	Condition
530.1	Reflux esophagitis
530.3	Esophageal stricture
530.7	Mallory-Weiss Tear
553.3	Hiatal Hernia

## INFORMATION REQUIRED:

- Symptoms of uncomplicated GERD may undergo an initial trial of empiric therapy without endoscopic evaluation as long as symptom relief along with medication regimen are documented in the annual FDME.
- Complicated (involving any of the five warning signs listed below) symptomatic GERD or HH requires submission of endoscopy to exclude gastric or duodenal ulceration and malignancy.
- Cultures for H. pylori may be indicated depending on endoscopic findings.
- Aeromedical summary must include documentation regarding the presence or absence of the following five warning symptoms:
  - a. Dysphagia or odynophagia.
  - b. Symptoms that are persistent or progressive on therapy.
  - c. Bleeding or iron deficiency.
  - d. Unexplained weight loss.
  - e. Extraesophageal symptoms (e.g. cough, choking, chest pain, asthma).

**FOLLOW-UP:** Follow-up examination by an internal medicine or gastroenterology specialist is only required if there is evidence of progressive disease, poor maintenance control, or recurrent symptomatology.

**TREATMENT:** Individuals with typical gastroesophageal reflux symptoms should initially be managed by lifestyle modifications. Often, control of mild symptoms may be achieved through conservative mechanisms. These include weight loss, elevating the head of the bed, judicious use of antacids, restriction of alcohol use, elimination of smoking, avoidance of meals before bedtime, avoidance of carminatives, and avoidance of tight fitting clothing. Refractory disease may require surgery for cure. Surgical repair of HH is compatible with return to full flight status, no waiver required, provided the repair is without complication and 60 days have elapsed since surgery.

The following medications may be used and waiver recommended once the treated patient demonstrates no idiosyncratic reactions to the medication and the medication is effective in providing relief of symptoms.

**GI MEDICATIONS:** All antacids (chronic use) and medications listed below are Class 3, except as noted. No additional requirements for a waiver other than the complete evaluation of the underlying condition and documentation of medication efficacy.

**Antacids** - Chronic use is Class 3. Occasional or infrequent use is Class 1. Check electrolytes when used chronically.

**H2 Blocker** - (CIMETIDINE (Tagamet), RANITIDINE (Zantac), FAMOTIDINE (Pepcid), NIZATIDINE (Axicid)): Occasional drowsiness is associated with these medications. When treatment is first initiated, a 72-hour observation (while the aviator has Duties Not Including Flying (DNIF)) is required to ensure the absence of any significant side effect.

**Proton Pump Inhibitor** - Omeprazole (Prilosec), Lansoprazole (Prevacid), Pantoprazole (Protonix), Rabeprazole (Aciphex), and Esomeprazole (Nexium).

**Sucralfate** - (Carafate): Class 2A provided underlying condition does not require waiver.

**DISCUSSION:** GERD is a chronic, relapsing condition with associated morbidity and mortality and an adverse impact on quality of life. The disease is common with an estimated lifetime prevalence of 25-35 percent in the U.S. population. GERD can usually be diagnosed on clinical presentation alone. As many as 10 percent of Americans have episodes of heartburn daily and 44 percent have symptoms at least once a month. Classic symptoms include heartburn (pyrosis) and regurgitation. Most patients gain adequate symptom control and esophageal healing through a combination of lifestyle modifications and drug therapy and do not require surgery. Lifestyle modification and antacids provide relief in 20 percent of patients. H2 Blockers should be used and dosage maximized prior to PPI use. PPI should be used in the event of treatment failure with H2 blockers and in those with erosive esophagitis by endoscopy.

Esophageal reflux is experienced by 10 percent of Americans at some time and, with careful scrutiny, HH can be demonstrated in most people over the age of 40. The majority of these cases are asymptomatic, but 15 percent of cases will have frequent symptoms of reflux. The major complications of esophagitis are stricture formation (8-20 percent), Barrett's epithelium (8-20 percent), and hemorrhage (less than 2 percent). Mortality associated with esophagitis is minimal with estimates of 0.1:100,000. Recovery from surgery for HH will depend on whether an abdominal, thoracic, or laposcopic (most common) approach was used. In esophagitis, 90 percent of patients lose their symptoms on reaching their recommended weight.

**REFERENCE:** Scott M, and Gelhot A. Gastroesophageal Reflux Disease: Diagnosis and Management. American Family Physician 1999. 59:5.

## ULCERATIVE COLITIS

Update: JUL 2002

**AEROMEDICAL CONCERNS:** Risk of in-flight incapacitation is small but real. The symptom complex tends to differ according to the extent of disease, but generally the severity of the symptoms correlates with the severity of the disease. Diarrhea, rectal urgency (occasionally intense), rectal bleeding, passage of mucus, and abdominal pain are all possible presentations and all in varying levels of severity. While most of the time the process is insidious with gradual onset of symptoms, it can also present with an acuteness, which mimics an infection (e.g., *Salmonella* sp. or *Campylobacter* sp.). Significant hemorrhage and even bowel perforation are possible complications of severe disease. There is also a risk of discomfort, anemia, feeling unwell, and chronic fatigue between episodes, which can detract from operational efficiency and availability. Iritis, primary sclerosing cholangitis, toxic megacolon, pyoderma gangrenosum, and colon cancer are complications of chronic ulcerative colitis.

### WAIVERS:

#### Initial Applicants (Class 1A/1W):

Exception to policy is rarely recommended.

#### Initial Applicants (Classes 2F, 3, and 4):

Exceptions to policy are rarely recommended, but can be considered on a case-by-case basis.

#### Rated Aviation Personnel (All Classes):

Waivers may be considered if disease is classified as mild, left-sided, in remission for at least 1 month, and limited to the distal 25 cm of the colon. If the disease is treated by partial colectomy, a waiver recommendation can be made 1 year after surgery, provided the patient is asymptomatic and is without a colostomy or ileostomy.

### INFORMATION REQUIRED:

- Internal medicine or gastroenterology consultation.
- Results of colonoscopy or sigmoidoscopy.

**FOLLOW-UP:** Annual submission of internal medicine or gastroenterology consultation to include CBC.

**TREATMENT:** Sulfasalazine in doses up to 2 gm/day or mesalamine in doses up to 2.4 gm/day or 6 gm/day, depending on the formulation, may be used as maintenance therapy. Higher doses may be required for treatment, but are not recommended for waivers. Steroid and 5-aminosalicylic acid (5-ASA) enemas have been approved for treatment of proctitis. Partial colectomy is a viable alternative in patients who cannot tolerate medication or are unmanageable with medical therapy. However, with pancolitis and/or the appearance of high-grade dysplasia or colon cancer, total colectomy with sparing of the rectal musculature for an eventual contingency procedure is the preferred operation.

**DISCUSSION:** Most patients (80 percent) with ulcerative colitis have intermittent attacks of their disease, but the length of the remission varies considerably from a few weeks to many years. Approximately 10 to 15 percent of patients will have a chronic continuous course, whereas the remainder will have a severe first attack requiring urgent colectomy. Few, if any, patients have one attack only. Following the initial attack, less than 10 percent remain in remission for 10 years without treatment. In patients younger than 40 years, up to 90 percent relapse within 5 years. Even on maintenance treatment with a 5-ASA product, there is an annual relapse rate of between 13 and 20 percent. Side effects of Sulfasalazine therapy include headache and nausea, oligospermia, skin rashes, agranulocytosis, interference with folate absorption, alopecia, hemolytic anemia, and occasionally hepatitis. These side effects are rare and side effects with other 5 ASA products are infrequent. About 15 percent of patients cannot tolerate this class of drugs. Mortality as a result of ulcerative colitis has diminished dramatically.

since the introduction of corticosteroids and the use of maintenance therapy with 5 ASA products. The mortality rate for a severe attack of ulcerative colitis has fallen from approximately 37 percent in the presteroid era to less than 2 percent. The lifetime rate of colectomy in UC patients is 30 percent. The risk of cancer in patients with ulcerative colitis begins with disease duration of seven years and rises about 10 percent per decade, reaching approximately 30 percent at 25 years. Episcleritis or anterior uveitis occurs in 5 to 8 percent of patients with active colitis. Ocular complications are present in 4-10 percent of cases, but this rises by 2-30 percent when arthritis is also present. About 1-2 percent of patients will also have ankylosing spondylitis and a further 12-15 percent will have asymptomatic sacroiliitis. Cirrhosis, bile duct carcinoma, and primary sclerosing cholangitis all occur in 1-4 percent of cases of ulcerative colitis.

**REFERENCE:**

Chutkan, RK. Inflammatory Bowel Disease. Primary Care: Clinics in Office Practice. 28:3; 539-56.



## HEMATOLOGY WAIVERS

## ANEMIAS/ACQUIRED (INCLUDING IRON DEFICIENCY ANEMIA)

Update: MAR 2003

**AEROMEDICAL CONCERNS:** Anemia is defined as a decrease in the hemoglobin concentration of whole blood below the lower limit of the normal range. It varies with age and sex. Anemia may arise acutely following blood loss, from decreased red cell production, or from increased destruction (hemolysis), and may be acquired or congenital. The degree of anemia and resultant end organ hypoxia, as well as the underlying disorder that may have been responsible for the anemia, both represent major concerns to aviation safety. While most individuals are asymptomatic with whole blood hemoglobin concentrations above 10.0 g./dl. or hematocrits above 30 percent, the clinical manifestations of anemia will vary with the speed of onset and the physical activity of the patient. Acquired anemias of concern include both those due to decreased red cell production and those due to hemolysis. Decreased red cell production may result from deficiency of nutrients essential for hemoglobin synthesis, decreased erythropoietin production, or intrinsic marrow failure (aplastic anemia or marrow replacement). Some of the underlying causes of these anemias are readily reversed with treatment, while others are due to conditions that are serious and not readily reversible. In general, most acquired hemolytic anemias are secondary to other medical conditions and many are reversible with appropriate treatment.

### WAIVERS:

#### **Initial Applicants (All Classes) and Rated Aviation Personnel (All Classes):**

Anemia is disqualifying for aviation service. While there is little data available relating the degree of anemia to aviation activity, individuals with hemoglobin levels less than 12.0 g./dl., and 11.0 g./dl., for men and women respectively, are not eligible for flying duty. Exceptions to policy or waivers will be granted if the underlying reason for the anemia is not disqualifying and the anemia is fully resolved. Conditions with associated anemia that are recurrent, progressive, or symptomatic will generally not be granted an exception to policy or waiver.

**INFORMATION REQUIRED:** In the case of an individual who has no prior history of anemia, and whose hematocrit or hemoglobin concentration is found to be below 40 percent or 14.0 g./dl., and 37 percent and 12.0 g./dl., for men and women respectively, the hematocrit and hemoglobin concentration should be repeated 3 times. The average of these determinations should be demonstrated to be below these lower limits of normal prior to initiating work-up. The following clinical and laboratory data is required for an exception to policy or waiver request:

- Clinical history of the condition, including diagnosis and course.
- Complete physical examination, with particular attention to possible lymphadenopathy or hepatosplenomegaly.
- Stool Guaiac from 3 separate stools.
- CBC with red cell indices, peripheral smear examination including red cell morphology, and reticulocyte count.
- Serum iron, TIBC, and serum ferritin.
- Serum folate and B12.
- Other laboratory tests - Basic metabolic and hepatic panel and thyroid functions.
- Internal Medicine or Hematology Consultation.

**FOLLOW-UP:** Follow-up will be directed at insuring treatment response and resolution or control of the underlying disease process. Complete CBC with all comprehensive FDME.

**TREATMENT:** Oral iron supplements are authorized for use for documented iron deficiency. Continued use of iron, folate, and B12 supplements, or other medications (e.g. thyroid supplements) require waiver.

**DISCUSSION:** The differential diagnosis of anemia is extensive. The local flight surgeon may proceed with the evaluation of anemia to his/her level of expertise. Decisions as to eligibility for flight status are determined by the waiver criteria. Interim assignment of a DNIF status should be based on the level of hemoglobin concentration, the rate of its decline, and the health of the aviator. Unexpected symptoms or a fall of hemoglobin to less than 11.0 g./dl. should result in prompt grounding and evaluation.

**REFERENCE:**

Merck Manual, Chapter 27 found online at: <http://www.merck.com/pubs/mmanual/>

## **ANEMIAS / CONGENITAL (INCLUDING SICKLE CELL TRAIT AND THALASSEMIA TRAIT)**

Update: MAR 2003

**AEROMEDICAL CONCERN:** Anemia is defined as a decrease in the hemoglobin concentration of whole blood below the lower limit of the normal range. It varies with age and sex. Anemia may arise acutely following blood loss, from decreased red cell production, or from increased destruction (hemolysis), and may be acquired or congenital. The degree of anemia and resultant end organ hypoxia, as well as the underlying disorder that may have been responsible for the anemia both represent major concerns to aviation safety. While most individuals are asymptomatic with whole blood hemoglobin concentrations above 10.0 g./dl. or hematocrits above 30 percent, the clinical manifestations of anemia will vary with the speed of onset and the physical activity of the patient. While there is little data available relating the degree of anemia to aviation activity, individuals with hemoglobin levels less than 12.0 g./dl., and 11.0 g./dl., for men and women respectively, are not eligible for flying duty.

Congenital anemias of concern in the adult include thalassemias, hemoglobinopathies, and other hemolytic anemias. The thalassemias are characterized by the deficient production of one of the globin chains of the hemoglobin molecule. According to currently used nomenclature, the disease is defined by the chain that is deficient and the number of missing chains. Beta – thalassemia denotes deficient production of beta chains. Absence of one of the two chains usually results in a subclinical condition termed beta thalassemia trait. Similarly, deficient production of alpha chains defines alpha-thalassemia. Absence of one or two of the four alphachains results in a subclinical (alpha thalassemia trait) or mild hemolytic anemia, respectively. Loss of both beta chains or more than two alpha chains results in a severe microcytic, hypochromic anemia that is disqualifying for military duty.

Hemoglobinopathies result from the structural alteration of one the globin chains, most commonly due to single amino acid substitutions that alter the solubility, stability, or function of hemoglobin. Hemoglobin S alters the solubility of hemoglobin causing it to crystallize at low oxygen tensions. Patients with sickle cell disorders (hemoglobin SS – sickle cell anemia, hemoglobin SC disease, and hemoglobin S – thalassemia) develop a normochromic, normocytic hemolytic anemia. They are at markedly increased risk for vaso-occlusive episodes, including infarction, involving the spleen, lungs, brain, and kidneys, when exposed to hypoxia, infection, dehydration, or cold. Cases of painful crises have been reported at altitudes as low as 2,500 feet. Individuals with Sickle Cell Trait (inherit only one hemoglobin S gene) are usually asymptomatic, although they are at a slightly increased risk for intravascular sickling at altitudes above 21,000 feet.

Other congenital hemolytic anemias are due to membrane structural defects, including hereditary elliptocytosis and spherocytosis, and red cell enzyme deficiencies, including glucose 6-phosphatedehydrogenase deficiency. Hereditary elliptocytosis is a common condition and usually subclinical or results in only very mild anemia. Hereditary spherocytosis, on the other hand, may cause a wide spectrum of disease, from mild to severe hemolysis. Glucose 6-phosphatedehydrogenase deficiency is an X-linked disorder affecting males. Severity of the disorder varies markedly according to the mutation involved and the oxidant stress placed on the red cells. The variety affecting African-Americans usually causes mild compensated hemolysis with only mild anemia. These individuals are, however, susceptible to the occurrence of severe hemolysis after the ingestion of oxidant drugs. The antimalarials are particularly hazardous.

### **WAIVERS:**

**Initial Applicants (All Classes) and Rated Aviation Personnel (All Classes):**

Congenital Hemolytic Anemias, including Thalassemia and Sickle Cell Disease, are disqualifying for all aviation duty. Individuals with thalassemia trait and sickle cell trait are usually granted an Exception to Policy or Waiver as long as the hemoglobin level is not less than 12.0 or 11.0 g./dl. for men and women respectively, and in the case of sickle cell trait, there is no history of vaso-occlusive crises. Any occurrence of vaso-occlusive crisis on exposure to altitude in flight or in the decompression chamber is disqualifying for all flying duty. Congenital conditions that do not result in anemia (eg. Elliptocytosis, hemoglobinopathy traits) and are asymptomatic may be classified as Information Only.

**INFORMATION REQUIRED:** The following clinical and laboratory data is required for an exception to policy or waiver request:

- Clinical history of the condition, including diagnosis and course
- CBC with reticulocyte count
- Hemoglobin Electrophoresis in cases of thalassemia and hemoglobinopathies. (In the case of sickle cell trait, the electrophoresis must document hemoglobin A > hemoglobin S)
- Hemoglobin A2 quantification in cases of beta-thalassemia trait
- Serum iron, TIBC, and serum ferritin in cases of thalassemia trait
- Internal Medicine or Hematology Consultation

**FOLLOW-UP:** Complete CBC with all comprehensive FDME. For individuals with sickle cell trait, annual evaluation on FDME/FDHS for any indicators of vaso-occlusive crises.

**TREATMENT:** N/A. (For aviators with sickle cell trait, avoidance of risk factors for intravascular sickling, as noted below).

**DISCUSSION:** The differential diagnosis of anemia is extensive. The local flight surgeon may proceed with the evaluation of anemia to his/her level of expertise. In general, the diagnosis of congenital anemias will have been made prior to the FDME and entail the review of clinical history and confirmatory laboratory tests. Decisions as to eligibility for flight status are determined by the waiver criteria. Interim assignment of a DNIF status should be based on the level of hemoglobin concentration, the rate of its decline, and the health of the aviator. Unexpected symptoms or a fall of hemoglobin to less than 11.0 g./dl. should result in prompt grounding and evaluation.

In addition, individuals with sickle cell trait should be counseled on risk factors for intravascular sickling, including hypoxia, and volume depletion. Finally, they should be counseled on the dangers associated with recreational diving and general anesthesia. It is generally accepted that those with hemoglobin S trait are not at significantly increased risk from general anesthesia.

**REFERENCE:**

Merck Manual, Chapter 27 found online at: <http://www.merck.com/pubs/mmanual/>

## ANEMIA/ACUTE BLOOD LOSS/BONE MARROW DONATION

Update: MAR 2003

**AEROMEDICAL CONCERNS:** Anemia is defined as a decrease in the hemoglobin concentration of whole blood below the lower limit of the normal range. It varies with age and sex. Anemia may arise acutely following blood loss, from decreased red cell production, or from increased destruction (hemolysis), and may be acquired or congenital. The degree of anemia and resultant end organ hypoxia, as well as the underlying disorder that may have been responsible for the anemia both represent major concerns to aviation safety. While most individuals area symptomatic with whole blood hemoglobin concentrations above 10.0 g./dl. or hematocrits above 30 percent, the clinical manifestations of anemia will vary with the speed of onset and the physical activity of the patient. While there is little data available relating the degree of anemia to aviation activity, individuals with hemoglobin levels less than 12.0 g. /dl., and 11.0 g. /dl., for men and women respectively, are not eligible for flying duty.

Anemia due to acute blood loss becomes manifest in the 72 hours following blood loss as the plasma volume is restored toward normal. The degree of anemia is directly related to the amount of blood acutely lost. The anemia is normocytic and normochromic and is therefore characterized by normal red cell indices and a normal to increased reticulocyte count.

### WAIVERS:

**Initial Applicants (All Classes) and Rated Aviation Personnel (All Classes):** Anemia resulting from acute blood loss, for reasons other than blood, peripheral stem cell, and bone marrow donation are disqualifying for aviation service. Exceptions to policy or waivers will be granted if the underlying reason for the blood loss is not disqualifying and the anemia is fully resolved. Sports anemia (a mild anemia detected in individuals who are highly athletic) may be classified as Information Only following a full work-up with no other cause for anemia detected. Acute blood loss (200 ml. or more) due to blood or peripheral stem cell donation requires a temporary grounding period of at least 72 hours. See AR 40-8, Temporary Flying Restrictions Due to Exogenous Factors, August 1976.

**Bone Marrow Donation:** Aircrew who donate bone marrow are temporarily grounded until the surgical site is healed, any associated discomfort is resolved, and the hemoglobin and hematocrit have returned to within the normal range.

**INFORMATION REQUIRED:** The following clinical and laboratory data is required for an exception to policy or waiver request:

- Etiology of the acute blood loss and subsequent management of underlying condition.
- CBC documenting a return of hemoglobin and hematocrit to the normal range.
- Other laboratory data, radio logic examinations, and consultations as required to document resolution of underlying condition.

**FOLLOW-UP:** Follow-up should be directed to assure continued resolution of the underlying condition. Any occurrence of repeat blood loss must be immediately reported and investigated.

**DISCUSSION:** Recurrence of bleeding must be immediately reported and evaluated. The aviator must be immediately assigned DNIF until evaluation is complete and any further disposition decided.

### REFERENCE:

Merck Manual, Chapter 27 found online at: <http://www.merck.com/pubs/mmanual/>

## HEMOCHROMATOSIS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Hemochromatosis may present with a classic triad of diabetes mellitus, hepatomegaly, and skin hyperpigmentation. Cardiac complications, primarily in the form of congestive heart failure, occur in 5-35% of patients and in the young may rapidly lead to death if untreated. Increased susceptibility to infection and arthropathy are also reported. CNS complications, primarily weakness, fatigue, and lethargy occur in up to 75% of symptomatic patients but occasionally severe depression with psychomotor retardation, frank disorientation, or stupor may occur.

**WAIVERS:** Aircrew members with hemochromatosis are granted waiver only on a case-by-case basis.

### INFORMATION REQUIRED:

- Internal medicine or hematology consultation is required to confirm the diagnosis and exclude hepatic involvement, diabetes, and other pathology causing secondary hemochromatosis.  
Investigations should include
  - Histocompatibility locus antigen (HLA) typing,
  - Serum iron, total iron-binding capacity
  - Serum ferritin,
  - Total iron body content, and
  - Transferrin saturation.
  - Liver biopsy and family studies may be necessary.
  - Cardiology consultation is required to exclude cardiac dysrhythmias with
    - 24-Holter monitor and
    - Echocardiogram.

**FOLLOW-UP:** Annual internal medicine with serum iron, total iron-binding capacity, serum ferritin, total iron body content, and transferrin saturation. Annual cardiology consultation with submission of ECHO and 24-hour Holter.

**TREATMENT:** Frequent phlebotomy and/or ongoing treatment with chelating agents such as desferrioxamine is not compatible with waiver.

**DISCUSSION:** Among populations of European origin (including U.S., Canada, Australia, etc.), the average frequency of hereditary hemochromatosis is estimated at about 3-5 per 1000 individuals. Phenotypic expression of the idiopathic hemochromatosis gene usually occurs between the ages of 20 to 40 with symptoms mainly occurring after the age of 50 and delayed until after menopause in females due to menstrual blood loss. The condition is lifelong in occurrence. Hepatic fibrosis is unusual in patients younger than 35 but will occur sooner and progress more rapidly to cirrhosis in heavy drinkers. Hypogonadism will occur in 25% of male patients and primary hypoaldosteronism in 10%. Cardiac failure and arrhythmias are common presenting features in younger patients. Up to 50% of patients over 40 years old have ECG irregularities and 43% of autopsied hearts from hemochromatosis patients show iron deposits in the AV-node and conduction system. Arthropathy is present in 30-50% of those patients with hemochromatosis (commonly in the proximal interphalangeal and metacarpophalangeal joints). A phlebotomy 2-3 times a week until hemoglobin is less than 10 g/dl, serum iron is less than normal, or ferritin is in the low normal range, followed by maintenance phlebotomy every 2-4 months, will reduce the incidence of complications other than arthropathy. The death rate at 5 and 10 years with phlebotomy is 32 and 66% compared to 6 and 18% in those who do not require treatment.

# POLYCYTHEMIA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Symptoms of increased hemoglobin levels (erythrocytosis or polycythemia) result largely from slowing of blood flow through capillaries as a result of the increased blood viscosity. Primary polycythemia, or polycythemia vera (PV), is a neoplastic disease with increased risk of stroke and myocardial infarction. Secondary polycythemia is less often symptomatic, but its cause (chronic carbon monoxide exposure, certain tumors, severe lung disease, etc.) may have a significant impact on aviation safety.

**WAIVERS:** Waivers for PV are unlikely to be approved. Waivers for secondary polycythemia will be dependent on the cause and severity of the underlying condition. Hematocrits (HCT) above 55%, especially with elevated white cell and platelet counts, strongly suggest PV and should prompt immediate grounding. Acceptable aeromedical values are HCTs from 40-52% in males, and 37-47% in females and hemoglobins from 14-18 gm in males and 12-16 gm in females. HCT averages of 47-50% for females or 52-55% for males are routinely recommended for waiver provided they are symptom free and have no underlying pathology (see work-up below). Temporary local flight clearance pending receipt of waiver is authorized. HCT averages of greater than 50% for females or greater than 55% for males are recommended on a case-by-case basis only. Local flight clearance is not recommended pending waiver action.

**INFORMATION REQUIRED:** Abnormal values should be verified by averaging three complete blood counts (CBC) obtained at one-week intervals. When this average is above the range of 40-52% for males and 37-47% for females should be evaluated using the following guide. Internal medicine or hematology consultation are required.

	Males	Females	
HCT	52-55	47-50	Obtain:

- Recent history of living at altitude over 5000 feet for longer than 6 months.
- Smoking history.
- Chest X-ray.
- Pulmonary function testing with DLCO.
- If any abnormalities are discovered, complete the evaluation listed below.

HCT      >55      >50      Obtain:

- Oxygen saturation.
- Spleen size (determined by CT, radionuclide scan or physical examination).
- B12 and B12 binding capacity.
- Leukocyte alkaline phosphatase score (LAP) values are used to diagnose PV.
- Erythropoietin levels currently do not play a role in separating primary from secondary polycythemia.
- If PV is ruled out, the secondary cause of polycythemia must be determined.

**FOLLOW-UP:** Insuring stability or improvement of secondary conditions is the goal of follow-up and will determine the frequency of visits.

**TREATMENT:** Hydroxyurea and phlebotomy are the common initial treatments for PV and are incompatible with waiver. Splenectomy has been proven to be valueless as primary therapy and is considered harmful. Treatment of secondary polycythemia is directed at the cause.

**DISCUSSION:** Secondary polycythemia may occur as a physiological response to decreased tissue oxygenation, i.e., high altitude, chronic lung disease, smoking, right to left cardiac shunt, etc. PV is a disease of insidious onset, chronic course, and unknown cause. The most common symptoms associated with PV are headache (48%), weakness (47%), pruritus (43%), dizziness (43%), sweating (33%), visual disturbances (31%), weight loss (29%), paresthesias (29%), dyspnea (26%), joint symptoms (26%), and epigastric distress (24%). Vascular occlusions of the brain and/or heart constitute the most serious complications. Various resulting paralyses may be the first symptoms of the disease. Myoclonia, chorea, grand mal seizures, general paresis, catalepsy, and various cognitive defects have all been reported. Investigators have shown clearly that cerebral blood flow is greatly diminished at hematocrit levels between 53 and 62%. Venesection can be the sole therapeutic measure in two-thirds of the patients. Venesection is performed repeatedly at 1-3 day intervals until the HCTs are between 40 to 45%. Good control can usually be maintained by one or two 500-ml phlebotomies every 3 to 4 months.

## SICKLE CELL DISEASE / TRAIT

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Patients with the sickling hemoglobins (SS, Sb-thal, SC and SD) are at risk for painful vaso-occlusive sickling crisis of multiple organ systems (especially in hypoxic environments), aplastic crises and overwhelming infection. Those with AS (sickle trait) are at increased risk for sudden death with exercise, and splenic infarcts even at moderate elevations (10-12,000 feet and, at times, even lower). There are no predictors in "pure" AS, except an accurate history of altitudes/extent of hypoxia that will induce symptomatic sickling in individual patients.

**WAIVERS:** Asymptomatic AS (where A is greater than S) is not disqualifying for aviation duty in the Army. A sickling history, history of painful crises, or presence of sickling hemoglobins is disqualifying with waiver unlikely. Note: The occurrence of abdominal pain with mountain climbing, chamber rides, or other hypoxic exposure in an individual with AS should be considered a sickling event unless another etiology is CLEARLY to blame.

### INFORMATION REQUIRED:

- A hematology consult is required for all patients except where hemoglobin electrophoresis clearly shows A greater than S, and history (as above) is negative.

**FOLLOW-UP:** For individuals with AS, specific indicators of crises (any pain) induced by hypoxic exposure should be sought at the annual FDME.

**TREATMENT:** Avoidance of hypoxia and dehydration is good advice for AS patients. Treatment for other types of sickling diseases is not within the scope of these policy letters and not considered waiverable .

**DISCUSSION:** It is becoming clear the AS disease (sickle trait) is not uniformly the benign disease once thought. Those individuals so affected should receive as up-to-date information regarding the understanding of this disease and its risks as it is available.

## SPLENECTOMY

Update: MAR 1997

**AEROMEDICAL CONCERNS:** There is a long term risk of overwhelming, serious infection leading to death. The increased risk of infection is related to the underlying illness for which the splenectomy was performed and is most marked in patients with neoplastic disease.

**WAIVERS:** History of splenectomy for any reason except trauma is considered disqualifying for all classes of aviation duties. Waiver recommendation can be considered on a case-by-case basis provided there is full recovery from the condition necessitating the operation. Initial flight applicants are rarely considered for exception to policy.

**INFORMATION REQUIRED:** The information required will depend on the precipitating condition. Coordination with USAAMA is required.

**FOLLOW-UP:** None.

**TREATMENT:** Prophylactic antibiotics may be acceptable in certain circumstances. Immunization against pneumococcus, meningitis, and Hemophilus B is highly recommended and is considered compatible with flying status. Repeat vaccination is often recommended every 5 to 10 years. Patient education is a must to reduce the mortality from postsplenectomy sepsis. Asplenic patients must be taught to recognize the earliest signs of infection in order to seek immediate medical care or promptly start taking antibiotics dispensed in advance by their physicians.

**DISCUSSION:** The underlying disease process which necessitates the splenectomy is generally responsible for the overall clinical outcome. The mortality following splenectomy, regardless of cause, is around 3% of which infection accounts for 11%. Mortality for isolated injury to the spleen is less than 1%. Late sepsis after splenectomy for Hodgkin's disease occurs in 11.5% with a 5% mortality. In adults who have had splenectomy, the mortality from pneumococcal pneumonia is 17% despite administration of antibiotics. If the patient is older than 50, the mortality is 28%.

## THALASSEMIA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Decreased oxygen carrying capacity secondary to decreased hemoglobin may lead to organ hypoxia.

**WAIVERS:** Waivers are normally granted to aviators with normal hemoglobin levels and microcytosis, and those with mild anemia. (See Discussion below)

**INFORMATION REQUIRED:**

- A consultation with a hematologist is required to insure accurate diagnosis.

**FOLLOW-UP:** Annual CBC is required.

**TREATMENT:** N/A

**DISCUSSION:** Thalassemia describes a condition of decreased amounts of hemoglobin due to faulty alpha and/or beta chain production. Old terms like "trait", "intermedia" and "major" are being replaced with more accurate descriptive terminology as a result of molecular biologic characterization of hemoglobin production. At any point in the initiation, promotion, transcription, translation and synthesis of hemoglobin protein chains, partial or complete absence of one or more of the 4 alpha chain gene products or one or both of the beta chain gene products can occur. The clinical course is determined by multiple factors including amounts of underproduced and overproduced chains, their interactions with other abnormal chains or hemoglobins, and individual patient characteristics. The diagnosis should result from a work-up prompted by anemia, microcytosis, or both.



## INFECTIOUS DISEASE WAIVERS

# HEPATITIS

Update: JAN 2002

**AEROMEDICAL CONCERNS:** The symptoms of acute and chronic hepatitis include fever, malaise, nausea, and pain, any or all of which could be distracting in an aviation mission. Risk of transmission to other unit personnel is of great concern. Cases may progress to cirrhosis which has its own aeromedical significance. (See [Cirrhosis APL](#)) Care should be taken to identify those individuals whose disease is complicated by alcohol ingestion.

## WAIVERS:

### Initial flight applicants :

- Acute Hepatitis A, B, E: A history of these acute infections is not disqualifying as long as six months have elapsed, liver functions have returned to normal, they remain asymptomatic and in the case of acute hepatitis B, that the HB surface antigen has cleared.
- Acute Hepatitis C: This condition may be filed as information only if the condition is fully resolved with no evidence of disease via RNA viral load testing.
- Chronic Hepatitis: Usually not granted exception to policy or waiver.
- Other Forms of Hepatitis: Evaluated on a case-by-case basis.

### Rated Aviation Personnel:

- Acute Hepatitis A or E: Personnel will be grounded until the liver enzymes have returned to normal, but then may be returned to full flying duty without further action.
- Acute Hepatitis B: Personnel may be returned to full flying duty when liver enzymes return to normal, they are asymptomatic and the HB surface antigen has cleared. This will be filed as information only.
- Acute Hepatitis C: Personnel may return to full flying duty if the condition is fully resolved with no evidence of disease via RNA viral load testing. This will be filed as information only.
- Chronic Hepatitis B: This condition is disqualifying but waivers are possible provided liver biopsy shows no evidence of significant fibrosis and hepatitis studies do not show active replication (HBeAg or HB DNA present).
- Chronic Hepatitis C: This condition may be considered for waiver after treatment and/or if liver enzymes are normal and liver biopsy does not reveal significant, progressive disease as reviewed by a gastroenterology specialist.
- Other Forms of Hepatitis: Evaluated on a case-by-case basis.

## INFORMATION REQUIRED:

- Complete IM or GI Consult,
- Complete panel of liver function studies (to include AST, ALT, Alkaline phosphatase, LDH, Total bilirubin, and GGT) and full hepatitis serologies (to include hepatitis A, B, and C); and
- Liver biopsy may be required.

**FOLLOW-UP:** Acute hepatitis once resolved requires no specific follow-up. Those aircrew members with chronic hepatitis will require annual internal medicine or gastroenterology consultation with annual submission of liver function tests and full hepatitis serologies. Due to the predisposition of the development of hepatoma, those with chronic hepatitis-B will require annual ultrasound evaluation with alpha-fetoprotein levels. Repeat liver biopsy may be required upon progression of liver disease or with any relapse. Those with chronic hepatitis C will require evaluation by gastroenterology every 3 years for repeat liver biopsy and evaluation for therapy.

**TREATMENT:** Treatment for hepatitis A and E is supportive. Aircrew will be grounded during the acute phase. All military personnel should be immunized with the two shot series of Hepatitis A vaccine as

prophylaxis. Aircrew will be grounded for the duration of all other forms of treatment for chronic hepatitis to include interferon with ribavarin or other nucleoside analogue (e.g. lamividine) combinations, steroids, or azathioprine due to multiple side effects. Treatment with alpha interferon and or lamividine has been shown to moderate signs of chronic HBV infection and eliminates HBeAg in one third of patients, with eventual clearance of HBsAg in some of the responders. Treatment for chronic hepatitis C has only a sustained virologic and biologic response rate of approximately 40% with the new, longer acting interferon and ribavarin. Waivers are not recommended during treatment.

**DISCUSSION:** The most common causes of hepatitis are the viruses (A, B, C, D, E), alcohol and drugs. Less common etiologies include other viruses (Epstein-Barr, yellow fever, cytomegalovirus, and coxsackievirus).

Hepatitis-A infection is fortunately brief in duration and chronic hepatitis does not follow acute infection. Rare cases lead to fulminant hepatitis. In the majority of aviation personnel, administration of the Hepatitis A vaccine should greatly reduce, if not eliminate, this disease in our population.

For those patients whose hepatitis is a result of infection with hepatitis-B virus as an adult, 10% progress to chronic disease; cases arising in childhood progress to chronicity more frequently. Spontaneous recovery after 1 year is rare and only occurs in 5-15% of cases.

With hepatitis C, after acute infection, 15%-25% of persons appear to resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels. Chronic HCV infection develops in most persons (75%- 85%) with persistent or fluctuating ALT elevations indicating active liver disease developing in 60%-70% of chronically infected persons. In the remaining 30%-40% of chronically infected persons, ALT levels are normal. Most studies have reported that cirrhosis develops in 10%-20% of persons with chronic hepatitis C over a period of 20-30 years.

The majority of those with chronic persistent hepatitis following acute hepatitis do not progress to cirrhosis. In autoimmune chronic active hepatitis, 25% have established cirrhosis at the time of the first biopsy. As many as 20-30% will have evidence of other autoimmune disorders such as arthritis, thyroiditis, or SLE. Mean survival is approximately 5 years in untreated patients. Treatment is often withdrawn at 1 year but there is a 50% relapse rate in the following year with most relapsing within six months. Many of those who relapse will require lifelong maintenance therapy. Approximately 40% of all patients with acute alcoholic hepatitis will develop cirrhosis in 5 years; abstinence in the interim does not guarantee avoidance of this condition. Those who continue heavy alcohol consumption have a mortality rate of greater than 50 % at seven years; this is reduced to 25% with abstinence.

## **REFERENCES:**

Centers for Disease Control and Prevention: <http://www.cdc.gov> "Recommendation for the Prevention and Control of Hepatitis C Virus (HCV) Infection and HCV-related Chronic Disease." MMWR Oct 16, 1998/47 (RR 19): 1-39.

# HIV INFECTION

Update: SEP 2004

**AEROMEDICAL CONCERNS:** Human Immunodeficiency Virus (HIV) is a chronic infection with variable course, ultimately causing a decline in immune functioning resulting in opportunistic infections, malignancies and neurologic problems. Treatment of HIV requires at least three antiretroviral medications with multiple side effects, toxicities and drug interactions which are not compatible with flight duties. Persons with HIV are monitored in CONUS and nondeployable, thereby precluding operational assignments.

## WAIVERS:

**Initial Applicants (all classes):** HIV is disqualifying from aviation service and exceptions to policy or waivers for initial applicants are not granted.

**Rated Aviation Personnel (all classes):** Waivers will be considered on a case-by-case basis. Waivers may be granted for full or restricted duties if completely asymptomatic with quarterly monitoring unless otherwise determined per ID specialist.

**INFORMATION REQUIRED:** AR 600-110, Identification, Surveillance, and Administration of Personnel Infected with Human Immunodeficiency Virus (HIV), guides management of HIV positive individuals.

- AMS to include presentation, as well as complete, current clinical staging
- CD4 cell count
- Plasma HIV RNA level (viral load) – include testing methods
- Consult from Infectious Disease with assessment, prognosis and plan for care (to include medication regimen if required)
- Consult from Psychiatry to include clinical evaluation and baseline neuropsychiatric/cognitive testing
- Command support

**FOLLOW-UP:** Per Infectious Disease specialist, periodic (e.g. quarterly) labs will be evaluated. A change in clinical status (CD4 count <350 or viral load > 55,000) requiring initiation of antiretroviral therapy or from asymptomatic to symptomatic will require immediate re-assessment of waiver. Annual evaluation at a MEDCEN or its equivalent is required.

**TREATMENT:** Treatment is disqualifying. Antiretroviral regimens are complex, have serious side effects, pose difficulty with adherence, and carry serious potential consequences from the development of viral resistance because of nonadherence to the drug regimen or suboptimal levels of antiretroviral agents. Highly active antiretroviral therapy (HAART) with a three- drug regimen has dramatically improved survival rates. Treatment should be offered to all patients with symptoms ascribed to HIV infection. Recommendations for offering antiretroviral therapy among asymptomatic patients require analysis of real and potential risks and benefits. Treatment should be offered to persons who have < 350 CD4+ T cells/mm<sup>3</sup> or plasma HIV ribonucleic acid (RNA) levels of > 55,000 copies/mL (by b-deoxyribonucleic acid [bDNA] or reverse transcriptase- polymerase chain reaction [RT-PCR] assays).

**DISCUSSION:** The mean incubation time between infection with HIV to development of AIDS is ten years. Highly active antiretroviral therapy (HAART) has significantly contributed to this success. The side effects of these medications make them incompatible with flight duties. HIV infects cells with CD4 receptors causing a cell death and decline in immune function. The resultant opportunistic conditions or CD4 count <200 cells/mm<sup>3</sup> defines the change from HIV to Acquired Immune Deficiency Syndrome (AIDS). The primary aeromedical concern of HIV is its neurologic manifestations.

Neurologic features of primary HIV-1 are uncommon but include meningoencephalitis, peripheral neuropathy, Guillain-Barré syndrome, brachial neuritis, radiculopathy, cognitive impairment, or psychosis. Neurologic dysfunction may be seen even in asymptomatic HIV positive patients, warranting thorough baseline evaluation. Infection of nonlymphoid organs with high levels of HIV does not occur until late-stage disease. At this time the CNS becomes a target for opportunistic infections, as well as effects attributed to the virus itself.

Strong command support for continuing duties in aviation given the deployability restrictions of AR 600-110 will be carefully weighed.

**REFERENCE:** <http://uptodateonline.com/>

## LYME DISEASE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The neurological complications of the early disseminated stage of Lyme disease may include headache, photophobia, difficulty with memory or concentration, and emotional lability. Carditis during the same stage can cause tachyarrhythmias, atrioventricular conduction defects, and rarely, mild congestive heart failure. Late neurological complications may include progressive encephalopathy, polyneuritis, and psychiatric changes. Arthritis may also occur in the late stage. Persistent fatigue and malaise have been reported as features of the condition.

**WAIVERS:** Waiver is not required for acute Lyme disease, although patients should be DNIF during antibiotic therapy. Any case of disseminated Lyme disease, substantiated by appropriate serology (acute IgM titer, rising IgG titers) will require waiver. CNS findings will require complete resolution and a 3-month period of observation prior to consideration of waiver recommendation.

**INFORMATION REQUIRED:** Appropriate specialist consult will depend on the nature of the symptom developed.

- Internal medicine or infectious disease consultation may be required.
- Neurology consultation with neuropsychiatric testing will be required in all cases with CNS findings.

**FOLLOW-UP:** No follow-up is required unless there has been residual damage.

**TREATMENT:** Patients should be DNIF during treatment of early localized cutaneous disease with oral amoxicillin, penicillin, doxycycline, tetracycline or cefuroxime. Intravenous therapy, with third generation cephalosporins or other antibiotics, for disseminated or chronic disease (Stages 2 and 3), is compatible with later waiver depending on outcome.

**DISCUSSION:** The risk of developing Lyme disease from a single tick bite has been reported to be so low that prophylactic therapy for asymptomatic patients is unjustified. Between 50-70% of patients with chronic disease recall erythema migrans, occurring one day to one month after tick bite. About one-half of patients have multiple lesions. Up to 50% of patients in the early stage have elevated erythrocyte sedimentation rate and about 20% have mildly abnormal liver function tests. Disseminated disease occurs mainly in untreated or inadequately treated cases. Up to 10% of such patients will have carditis and up to 15% will have neurological symptoms. Months to years after the tick bite, up to 50% of untreated patients will have intermittent arthritis, of whom one fifth have a chronic monoarthritis usually of the knee.

## MALARIA

Update: OCT 2005

**AEROMEDICAL CONCERNS:** Contracting malaria is a risk to aircrew members deployed to endemic regions such as Central and South America, the island of Hispaniola (Dominican Republic and Haiti), Africa, Asia (including the Indian subcontinent, Southeast Asia, and the Middle East), Eastern Europe, and the South Pacific. Malaria is endemic in more than 100 countries and territories and kills over one million people worldwide every year. Widespread occurrence of malaria may result in significant loss of personnel. During the Vietnam War, entire units were declared "Combat Non-effective" due to high incidence of malaria.

Malaria is a protozoan infection that is spread by the Anopheles mosquito. Clinical signs and symptoms include fever, tachycardia, hypotension, cough, headache, delirium, vomiting, and diarrhea. The most severe form of malaria can cause seizures, coma, renal and respiratory failure, and death.

**WAIVERS:** History of uncomplicated, fully recovered malaria does not require waiver and will be recorded in the AEDR as "Information Only."

Malaria with severe symptoms (seizures, coma, renal or respiratory failure, other complications) on flight personnel of all classes is DISQUALIFYING and will be considered for waiver or exception to policy on a case-by-case basis after full recovery.

Chemoprophylaxis during deployment to endemic areas is not considered disqualifying, but it should be performed under careful supervision of a flight surgeon/APA and with aeromedically acceptable medications.

### INFORMATION REQUIRED FOR WAIVER/EXCEPTION TO POLICY:

- Current infectious disease or internal medicine consultation, documenting treatment and full recovery.
- Current applicable consultations regarding resolution of complicating conditions from infection.
- Results of microscopic examination of both a thin and a thick blood smear for malaria.

**FOLLOW-UP:** No follow-up is required once a cure has been obtained. Service member needs to be aware that the disease can occur months, even years after exposure. Malaria can also recur several months to years after the initial infection. Unexplained fevers and symptoms should be evaluated promptly and the evaluating care provider should be made aware of the service member's history of travel to a malaria endemic area.

**TREATMENT:** Chloroquine is the first line agent for chloroquine-sensitive malaria. Treatment protocol consists of initial dose of 10 mg base/kg (maximum 600 mg base) orally, followed by 5 mg/kg base (maximum 300 mg base) 6, 24, and 48 hours later. For chloroquine-resistant malaria, first line therapy is quinine sulfate 10 mg salt/kg (maximum 650 mg) every 8 hours for three to seven days, combined with either 3 tablets of pyrimethamine-sulfadoxine (25/500 mg) on day #3 (if the malaria was acquired in an area without significant sulfonamide-resistance); or doxycycline (100 mg PO bid for seven days). New medications that are FDA-approved may be necessary for use as well that have not been addressed in this APL—follow the best practice guidance for medical care. Individuals being treated should be temporarily grounded until recovered, and then processed as outlined above.

**PROPHYLAXIS:** It is important to consider that chemoprophylaxis is only one component of malaria prevention. Proper wear of clothing, use of insect repellents, mosquito nets, and mosquito avoidance are all important and can also protect against other mosquito borne illnesses.

Approved medications for malaria prophylaxis include chloroquine phosphate, primaquine phosphate, and doxycycline. Single dose ground testing is advised with a 24-hour grounding period. **Mefloquine is not approved for use in flight personnel. New medications that have not been evaluated yet or FDA-approved are not for routine use in flight personnel—special cases should be referred to USAAMA.**

Recommendations for prophylaxis change frequently due to variability of organism susceptibility to treatment. Prior to deployment to an endemic area, the latest recommendations should be obtained using the Armed Forces Medical Intelligence Center (AFMIC), Fort Detrick (password-secure website at [www.afmic.detrick.army.mil](http://www.afmic.detrick.army.mil)). AFMIC should be the primary source of information. In addition to AFMIC, medical guidelines can also be found at the Centers for Disease Control (CDC) online at [www.cdc.gov/travel](http://www.cdc.gov/travel), or the CDC Malaria Hotline (770-488-7788); or at the World Health Organization (WHO) online at <http://www.who.int/ith/en>.

**DISCUSSION:** There is growing incidence worldwide of chloroquine-resistance malaria. The proper chemoprophylactic agent needs to be determined on the basis of deployment country or region. Current information on medications can be found at AFMIC. Follow AFMIC recommendations.

Recommendations can also be found on other government and/or medical sources (be aware that AFMIC recommendations supersede those of other government or medical agencies). Prophylaxis should begin before deployment and continue 1-4 weeks upon return to home station, depending on the agent used. Side effects to malarial prophylactic agents are usually minor, but can be as serious as psychoses, seizures, retinopathy, and sensory or motor neuropathies. Flight Surgeons should review individual drug information and monitor for side effects and signs of toxicity as well as stay abreast of changing developments.

#### **REFERENCES:**

Treatment dosages taken from “Drugs for Parasitic Infections”. Medical Lett Drugs Ther; August 2004. online: [www.medletter.com/freedocs/parasitic.pdf](http://www.medletter.com/freedocs/parasitic.pdf).

## SYPHILIS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Known for centuries as "The Great Imitator", syphilis, if not treated in its primary stage, can affect any organ in the body producing clinical illness years after initial infection. Neurosyphilis may present with the insidious onset of changes in personality, intellect, affect, insight, and judgment totally unrecognizable to the individual. A host of symptoms may develop too lengthy to discuss or even list, many of which are incompatible with continued aviation.

**WAIVERS:** Syphilis in any of its stages is considered medically disqualifying until treatment is completed and there are no residual effects. Primary syphilis, once treated, is not considered disqualifying. Any positive antibody test, i.e., FTA abs, MHA-TP, or TPI with no history of primary disease or those at clear risk of neurosyphilis, will require the aircrew member to undergo further evaluation or treatment for neurosyphilis (as described below). Residual complications of tertiary syphilis are rarely recommended waivers.

### INFORMATION REQUIRED:

- Documentation of adequate treatment is required with a normal convalescent VDRL titer.
- Positive serology will not be assumed false positive until confirmed by negative spinal tap or the aircrew member undergoes complete treatment for neurosyphilis.
- Infectious disease, neurology, cardiology, or ophthalmology consultations may be required.

**FOLLOW-UP:** Careful monitoring for relapse following treatment is required, especially when this treatment is provided with other than penicillin. If treated with benzathine penicillin alone, the patients should be evaluated at 6-month intervals for neurosyphilis. Re-treatment is required in 1 out of 10 cases.

**TREATMENT:** Primary and secondary syphilis may ideally be treated with Benzathine penicillin G, 2.4 million units IM weekly for 2 or 3 doses. Since a few treatment failures have been reported when using benzathine penicillin alone, the addition of an alternative oral medication, e.g., Doxycycline 200 mg po bid x 21 days is advisable. Other treatment regimens are possible but their effectiveness has not been well studied especially in syphilis of longer than 1 year's duration. Neurosyphilis may ideally be treated with aqueous crystalline penicillin G, 2.0 - 4.0 million units by IV injection q4h x 10 days.

**DISCUSSION:** The number of reported cases of syphilis in the U.S. has waxed and waned since the 1940s. Its latest peak starting in 1986 primarily as a result of HIV and the increased usage of drugs such as cocaine. Within hours to days after *T.pallidum* penetrates intact mucous membrane or gains access through abraded skin, it disseminates throughout the body. The primary stage, development of a chancre, takes an average 21 days. But a chancre does not develop in every case or may be so inconspicuous as to go unnoticed. Secondary syphilis becomes evident in 2-12 weeks after the appearance of the chancre. After the secondary stage subsides, the patient enters a latent period during which the diagnosis can only be obtained by a positive serologic test. Late syphilis (tertiary) develops in up to one-third of untreated patients. False-positive nontreponemal reaginic tests can usually be verified and syphilis excluded by obtaining a negative, specific treponemal antibody test (FTA-abs, TPHA, MHA-TP). Occasionally the FTA-abs will also give a false reaction and even be positive in the presence of a negative VDRL. The only definitive way to make the distinction is to obtain the functional TPI test. The reaginic antibody (RPR, VDRL, ART) tests are used for screening sera; the specific treponemal tests (TPHA, MHA-TP, FTA-abs) for confirming the diagnosis; and the quantitative nontreponemal antibody tests (RPR, VDRL) for assessing adequacy of treatment.

## TUBERCULOSIS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The primary concern is prevention of this communicable disease's spread to other members within the aviation unit. While active tuberculosis (TB) is somewhat unlikely in the aviation community, it is still important to provide adequate treatment for those unit members discovered to be at risk for TB. Primary infection with TB may occur without symptoms and signs or may generate classical symptoms of low grade fever, night sweats, weight loss, cough, bloody sputum, etc. This pneumonia-like process puts an aviator at additional risk when exposed to altitude changes by causing small pulmonary plugs of sputum which close off alveolar ventilation. These obstructed air-sacks may expand and burst when exposed to decreased ambient pressure resulting in possible pneumothorax, pneumomediastinum, or even air embolism.

**WAIVERS:** Active tuberculosis is considered disqualifying with no waiver possible until complete recovery. Individuals with no evidence of active disease but who are a recent tuberculin converted (especially when young) will normally be recommended for chemoprophylaxis. If used as chemoprophylaxis, INH does not require waiver activity. (See Medications APL) Any other prophylactic drug is unlikely to have favorable waiver action due to potential side effects.

### INFORMATION REQUIRED:

- Complete AMS with
- Infectious disease or pulmonary medicine consultation and with documentation of complete recovery from infection.
- Post-convalescent negative sputum cultures followed by an observation of 6 months is generally required before return to aviation duties.

**FOLLOW-UP:** Following successful treatment of active TB, a program of continued observation should be developed for the next two years. However, relapse after adequate treatment of drug-sensitive infections is very infrequent. Patients receiving INH should be instructed about symptoms of hepatitis and have serum transaminase levels monitored every month.

**TREATMENT:** The Centers for Disease Control currently recommends several regimens for the initial treatment of tuberculosis. One such regimen employs 2 months of isoniazid (INH), rifampin (RMP), and pyrazinamide (PZA) [plus either ethambutol (EMB) or streptomycin (STM) if INH resistance is suspected] followed by INH and RMP daily or 2-3 times weekly for 4 months. Chemoprophylaxis is achieved with use of INH 300mg daily for 12 months (6 months has recently been proposed as providing greater risk/benefit for most individuals). Pyridoxine supplementation, 10-25 mg daily, is recommended for ages older than 65, pregnancy, diabetes mellitus, chronic renal failure, alcoholism, use of anticonvulsants, and malnutrition.

**DISCUSSION:** Mycobacterium tuberculosis infects 1.7 billion people worldwide, a third of the world's population, and causes 3 million deaths each year. In the U.S., the steady decline in TB infection occurred until 1986, at which time a steadily increasing infection rate occurred, probably due to increase incidence within the homeless, HIV epidemic, increased intravenous drug use, and declining TB control measures. About 3-4% of infected individuals will develop active TB during the first year after tuberculin conversion and a total of 5-15% will develop at some later time.

Criteria for Prescribing Preventive Therapy for Persons with Positive Tuberculin Reaction From CDC

Category	less than 35 years of age	35 and older
With risk factor <sup>a</sup>	Treat at all ages if reaction to 5 TU (PPD) > 10 mm (or > 5 mm if recent contact, HIV infected, or x-ray evidence of old TB)	
No risk factor, high-incidence group <sup>b</sup>	Treat if PPD > 10 mm	Do not treat
No risk factor, low-incidence group	Treat if PPD > 15 mm	Do not treat

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<sup>a</sup> Risk factors: HIV infection, known recent exposure, recent skin-test conversion, abnormal chest x-ray, IV drug abuse, other.

<sup>b</sup> High-incidence group: immigrant from high incidence areas, medically underserved population, resident of long-term care facilities. Lower or higher cutoff points may be used depending on the prevalence of TB infection & nonspecific cross-reactivity of the population.



## MALIGNANCY WAIVERS

## INTRODUCTION

Update: MAR 1997

**AEROMEDICAL CONCERNs:** Cancer may present with a myriad of signs or symptoms, including those which may present with sudden incapacitation, cognitive disorders, or seizures. The known cancer patient must face innumerable psychological adjustments, life style changes and a lengthy treatment process with follow-up which often interferes with deployment as well as their normal duties. The impact that cancer has on aircrew requires consideration of the organ of origin, the clinical or surgical stage and the treatments that are being or have been used.

**WAIVERS:** Initial flight applicants are rarely considered for exception to policy. Occasionally survivors of childhood leukemia or lymphoma are considered cured if their disease-free survival is greater than 5-10 years. Waiver recommendations are based upon the type of tumor and any residual effects of therapy. In general terms, waiver authorities will often recommend a return to restricted flying status as long as there is a minimal risk of incapacitation as a result of recurrence, treatment is complete, no residual affects from surgery/treatment are present, and the risk of relapse/CNS relapse is minimal (note: USAAMA ACAP has established that risks of CNS relapse of greater than 1%/year is not currently considered waivable. In many cases, upgrading to a less restrictive waiver or a return from termination of flying status can be considered 2 years after completion of therapy provided there is no recurrence. Specific exceptions to this are addressed on the individual data sheets.

**INFORMATION REQUIRED:** For the vast majority of tumors,

- Tumor Board evaluation and
- (if done) Medical Evaluation Board (MEB) recommendations and
- Armed Forces Institute of Pathology (AFIP) confirmation of diagnosis are essential before waiver consideration can be given.
- It is extremely helpful to include an objective assessment by the oncologist of the chances of cure, the risks, likely nature and ease of detection of recurrence and recommendations for follow-up.
- Also submit complete AMS summarizing the complete course of the disease and copies of diagnostic procedures, hospitalization, treatment, and recommended limitations.

**FOLLOW-UP:** The necessity for follow-up will almost certainly interfere with mobility requirements unless the follow-up is at greater than 6-month intervals or the tests required are very simple.

**TREATMENT:** Surgery is not disqualifying for flight as long as major organ dysfunction does not exist. The condition for which the surgery was performed may, however, be disqualifying. All surgical procedures for the removal of cancer will require a variable period of grounding. The time of disqualification will depend on the chance of cure, the likelihood that recurrence will cause a flight safety hazard or otherwise interfere with the military task and on the site and extent of operation. Radiation therapy is generally delivered to a localized area for a limited time. The immediate side effects of nausea, neutropenia and other dose-related effects usually disappear a few weeks after completion of therapy. Until then, the patient should be disqualified from flying. Follow-up is required because of the risk of developing another primary cancer. Chemotherapy is incompatible with flying until full recovery from side effects such as anemia, thrombocytopenia, granulocytopenia, nausea and vomiting has occurred. Use of steroids or hormone therapy for the treatment of tumors is also disqualifying although waivers can be granted for their use as replacement therapy. Follow-up may be required for long term side effects of chemotherapy such as cardiac or pulmonary toxicity.

**DISCUSSION:** Classification of tumors into categories facilitates decision making on aeromedical outcome. The minimal requirements are accurate diagnosis, indication of tumor size, differentiation and

local invasion, and confirmation of the presence or absence of lymph node or distant metastases. The American Joint Commission on Cancer (AJCC) TNM classification of malignant disease allows an accurate standardization of the staging of the malignancy which, in turn, should allow more consistency in the aeromedical disposition. In summary, T refers to the size of the primary tumor with subscripts to quantify the size; N with subscripts 0 or 1 identifies absence or presence of spread to the lymph nodes; and M with subscripts 0 or 1 identifies absence or presence of distant spread. Other classification systems for staging cancer exist and are useful. Further classification gives some indication of the virulence and potential for relapse. To provide standardization in disposition of these cases, it is essential for the histology to be confirmed by AFIP.

## BLADDER CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Tumors of the bladder may cause pain, urgency, chronic blood loss with development of anemia, or acute blood loss with obstruction by clot. Metastatic disease may cause pain from organ invasion and pathologic fractures.

**WAIVERS:** A recommendation for waiver will be considered after initial, localized therapy, provided the tumor is confined to the epithelium. Localized transitional cell carcinoma generally responds well to treatment. Muscle invasive disease may require more extensive resection, which results in residual defects and may be incompatible with aviation duties. Cystectomy or the requirement for repeated catheterization results in disqualification with only rare waiver recommendations.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- (if done) MEB recommendations and
- AFIP confirmation of histology are necessary for the initial waiver request.
- Oncology or urology evaluations are required to include:
- FDME with AMS
- Chest X-ray
- Cystoscopy
- Contrast studies of the entire urinary tract
- CT scanning of the abdomen and pelvis.

**FOLLOW-UP:** Oncology or urology review is required annually for continuation of waivers. CT scanning of the abdomen and pelvis may be required periodically. Frequency of follow-up is dependent upon the severity of the disease and may vary from case by case as indicated upon review by the aeromedical oncology consultant.

**TREATMENT:** Surgical resection via transurethral approach is usually used for diagnosis and therapy of localized disease. BCG is often added for treatment of residual superficial disease. Surgery, radiation, and chemotherapy are used for more extensive disease. Ongoing therapy is not considered compatible with continued flying duties.

**DISCUSSION:** An estimated 50,000 new cases of bladder cancer occur in the U.S. each year, 75% of these new cases will occur in males. Most cases occur in the 50 to 70 year-old age group. However, carcinoma in situ or papillary noninvasive carcinoma are associated with a high probability of cure. Recurrence is primarily local. Bladder cancer most frequently results from the effect of carcinogens (smoking in the U.S.). This diffuse exposure results in a "field cancerization" where all the urothelium is at risk. Urologic expertise is critical to accurate staging (obtaining bladder muscle at biopsy, for example). Though risk of CNS recurrence is minimal, high risk of recurrence and the deforming surgeries done for more advanced disease make consideration for waiver difficult in all but the most local and superficial cases.

## BREAST CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Advanced local disease and effects of surgery or radiation can affect comfort in restraint harness, and metastatic disease can cause pathologic fractures and involve the CNS. As in all forms of cancer, careful consideration must be given to the patient's overall psychological fitness for flying.

**WAIVERS:** Waivers will normally be granted for those aviators who have completed and recovered from therapy and are free of disease. Patients with metastasis to lymph nodes or more distant sites will not normally be considered for waiver.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- (if done) MEB recommendations and
- AFIP confirmation of the histology are all necessary.
- For initial waiver, surgical / oncology opinion is needed including:
  - CBC
  - Chest x-ray
  - Bone scan
  - CT scan of the liver and
  - Mammography of the opposite breast.
  - MRI scan of the brain is required in the presence of any suspected neurological disorder.

**FOLLOW-UP:** Annual surgical / oncology consultation, mammography, and chest x-ray are required. MRI scan of the brain, bone scan, and CT scan of the liver are required, if clinically indicated, as directed by the patients specialist.

**TREATMENT:** Surgery followed by radiation, chemotherapy or hormonal therapy based upon the extent of the surgery, tumor size and lymph node involvement, and patient's age. The aircrew member must be grounded during treatment. Tamoxifen, a common adjuvant treatment, is not an approved medication for aviation.

**DISCUSSION:** Breast cancer is slowly increasing in incidence and prevalence. The incidence of breast cancer is 100 per 100,000 females in any given year. The mortality rate of 28 per 100,000 has remained unchanged for over 50 years. At the time of detection, about half of breast cancers have metastasized to lymph nodes. Of those detected by screening, 42% are too small to detect by physical examination. Up to 80% of those detected by screening have negative axillary lymph nodes. Of patients with up to 3 affected nodes, 60% will relapse by 10 years. Even the earliest stage of breast carcinoma (Stage I) carries a relapse rate of 10% by 5 years. The average time to relapse is 3-4 years in patients with 1-3 involved nodes and 1-2 years if more nodes are involved, but may occur as late as 30 years after initial diagnosis. Aviators with a history of breast cancer should receive special attention at FDME for evidence of local recurrence at the surgical site or in the remaining breast tissue, occurrence in the opposite breast, bone pain, liver enlargement, neurologic and chest radiograph abnormalities, and be encouraged to report early, any new symptoms or findings. Immediate grounding and evaluation by specialists should be performed at the onset of any such abnormalities. From the point of view of comfort when wearing restraint harnesses, it may be necessary to delay return to flying duties until after breast reconstruction has been carried out in cases where simple mastectomy rather than "lumpectomy" has been performed. The site of metastasis is bone in 27% of cases, local in 26% and pulmonary in 21%.

Screening for breast cancer with the "Breast Self Exam" should be encouraged at FDME in all female aviators. Mammography screening is not required for FDME, or routinely for women under 50 years of age. A strong history would make earlier screening by mammography appropriate.

## CARCINOID TUMOR

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Carcinoid syndrome can produce a fall in systolic blood pressure, a rise in heart rate, sudden dyspnea with wheezing and altered mental function. Another presenting symptom which could cause embarrassment in flight is a copious secretory diarrhea accompanied by pain, nausea and occasionally vomiting. Severe abdominal pain can be caused by hypoxia of hepatic metastases.

**WAIVERS:** Patients with an adequately excised primary lesion may be considered for waiver. Patients presenting with carcinoid syndrome are unlikely to be waivered, unless rendered free of disease and symptoms with surgery.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Surgical consultation to include confirmation that the liver is free of metastases is also required.
- Cardiology consultation with echocardiogram may be needed to confirm that the tricuspid and pulmonary valves are not stenosed.
- If the primary is a lung lesion, cerebral metastasis should be excluded.
- AFIP confirmation of the histology,
- Tumor Board recommendations and
- (if done) MEB disposal are required.

**FOLLOW-UP:** Annual surgery/oncology consultations are required.

**TREATMENT:** Surgical removal is compatible with waiver.

**DISCUSSION:** Symptoms of carcinoid syndrome usually do not occur unless there are metastases, particularly when the drainage of the primary tumor is through an intact liver. Carcinoid tumors arising in the hindgut are usually benign and, along with bronchial carcinoids are often metabolically inactive. Bronchial carcinoids usually metastasize to the regional lymph nodes (30%) and to distant organs such as the liver or brain (10%). The 5-year survival of bronchial carcinoids is 70% if the regional lymph nodes are involved and is quoted to be "much higher" when there is no metastasis.

## CERVICAL CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Minimal symptoms occur with limited disease. Later manifestations of the disease include anemia, weakness and weight loss. Distracting pain may be caused by local invasion.

**WAIVERS:** Waiver is readily recommended for carcinoma in situ or for those cases treated by laser or cautery. For other patients without evidence of spread, waiver can be considered 6 weeks after surgery. Aircrew with evidence of metastasis are grounded but may be considered for waiver 2 years after completion of therapy as long as there is no evidence of recurrence. Those aviators requiring radiation as part of their treatment will require much closer scrutiny to insure absence of disease and side effects.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board recommendations
- (if done) MEB
- AFIP confirmation of the histology are required.
- Waiver requests should be accompanied by gynecology/oncology opinion.

**FOLLOW-UP:** Determined at time of initial treatment, normally by the treating subspecialist.

**TREATMENT:** Cervical cancer is treated with surgical techniques with early disease. Radiation is incorporated with invasive disease. Continuation of therapy is incompatible with flying status.

**DISCUSSION:** In the U.S., there are 12,900 new cases of invasive cervical cancer annually and it is responsible for approximately 7,000 deaths per year. For carcinoma in situ, there is an almost 100% survival rate with therapy. The 5-year survival rate for patients with localized but invasive carcinoma of the cervix is about 82% while for all groups as a whole it is 59%. Advanced cervical cancer is preventable when regular screening with exam and PAP smears is done. The history of multiple sexual partners and viral infection (Human papillomavirus and Herpesvirus type 2) should demand enforcement of screening.

# COLORECTAL CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Carcinoma of the colon presents as an emergency (abdominal pain, obstruction, or perforation) in up to 30% of cases. Rectal carcinoma rarely presents as an emergency. Both can cause anemia sufficient to cause problems in flight if undetected.

**WAIVERS:** Waiver can be considered where all gross tumor was removed at surgery, adjuvant therapy has been completed, all side effects of therapy have resolved, and no evidence of tumor is detected at post-therapy evaluation. For cases where nodes are involved, waiver may be considered 2 years after completion of therapy. Patients with metastasis, residual disease, or treatment-related side-effects will not normally be considered for waiver.

## INFORMATION REQUIRED:

- Complete AMS is required.
- Histologic diagnosis, TNM tumor stage,
- Tumor Board
- (if done) MEB evaluation
- AFIP confirmation of the diagnosis are necessary.
- Any post-operative therapies, results of restaging, and documentation of full recovery from effects of therapy are also required.
- CBC
- Liver enzymes
- PT, PTT
- BUN, creatinine
- Chest x-ray
- Computerized tomography (CT) to rule out extension to bone or other vital area
- Colonoscopy or adequate air contrast barium enema
- Serum carcinoembryonic antigen (CEA) measurements are also required.

**FOLLOW-UP:** The best follow-up for these malignancies is not clear. CT scanning can pick up early liver lesions, but at the cost of substantial radiation exposure. MRI is also effective but expensive. Liver enzyme testing has very low sensitivity and need not be done. Carcinoembryonic Antigen (CEA) is the first evidence of recurrent disease in 50% of patient, and will eventually become positive in 60-94%. The following are required: 1) History and physical (with rectal exam and occult blood testing), CEA, (and, for patients with anastomosis in the pelvis, sigmoidoscopy) every 3 months for 3 years, then every 6 months for 2 years. 2) Postero-anterior and lateral chest x-ray every year. 3) Annual colonoscopy for 3 years, then every 3 to 5 years thereafter, if first three are normal. Discovered abnormalities will result in immediate grounding and referral to appropriate subspecialty physicians.

**TREATMENT:** Surgical exploration is the only curative treatment, and consists of resection of the tumor and surrounding lymph nodes, and search for metastatic disease. Pathologic evaluation of the surgical specimen for depth of tumor invasion and involvement of lymph nodes follows. Patients with colon cancer and positive lymph nodes should receive chemotherapy, generally for one year. Patients with rectal cancer with tumor through the bowel wall or with positive lymph nodes should receive combined chemotherapy and radiation therapy. Continuing treatment is incompatible with waiver. Potential treatment-related complications/side-effects include: Diarrhea, a common side-effect of surgery, radiation, and chemotherapy; post-operative constipation, less common and may be due to anastomotic strictures, disease recurrence, or adhesions; Chemotherapy may induce anemia, risk of bleeding from thrombocytopenia, and risk of infection from neutropenia, though generally, the incidence of these side-

effects is low. Neurologic symptoms (dizziness and vertigo), effects on the eye (conjunctivitis), and nausea and vomiting may be seen during chemotherapy. Colostomy is not considered compatible with military aviation. Variations in atmospheric pressure may cause the colostomy bag to rupture.

**DISCUSSION:** Colorectal cancers account for more than 12% of all carcinomas and is the most common malignancy in the USA after lung, breast, and skin cancer. On average, 30% arise in the rectum, 30% in the sigmoid colon, and 30% in the proximal colon. The distribution of metastases is liver >60%, lung >50%, peritoneum 15% and bone 15%. There is a 20% incidence of coexisting benign or malignant neoplasms elsewhere in the colon. The 5-year survival rates for patients with Duke's stage A (limited to bowel wall, no nodes) is 90%; the corresponding rates for other stages are; stage B1 (not invading into the peritoneal cavity, no nodes) 80%; B2 (directly invading other organs or in the free peritoneal cavity, no nodes, no metastases) 65-75%; C1 (with positive nodes near the primary lesion) 50-65%; and C2 (proximal node involved at point of ligation) 25-50%. Between 60 and 84% of metastases occur within the first 2 years after resection and can be predicted up to 6 months in advance by CEA estimation in those cases with CEA-secreting tumors. Up to 20% of single hepatic or pulmonary metastases can be cured by resection. Liver function tests (LFT) can remain within normal limits until quite advanced disease exists.

## GASTROINTESTINAL POLYPS (BENIGN)

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Large polyps may bleed and cause mild anemia. Juvenile polyps may intussuscept in childhood but also rarely in later life and cause an acute abdomen. Some polyps may exhibit neoplastic change.

**WAIVERS:** Waiver may be considered for aircrew members with Peutz-Jeghers syndrome, the precise category depending on the mode of presentation. Peutz-Jeghers syndrome and familial adenomatous polyposis are both disqualifying for entry to flying training, and the latter is likely to lead to separation from the U.S. Army. Waiver is possible for other types of polyps, the category depending on type, symptoms, requirement for follow-up and potential carcinogenic change.

**ICD9    Code Condition**

759.6    Peutz-Jeghers syndrome  
211.3    Familial adenomatous polyposis

**INFORMATION REQUIRED:**

- Complete AMS is required
- Gastroenterology consultation
- AFIP confirmation of histology are mandatory
- MEB (if done)
- Tumor Board recommendations may be needed.

**FOLLOW-UP:** Annual Gastroenterology consultation with colonoscopy or ileostomy.

**TREATMENT:** Simple surgery is permitted although the presence of a colostomy or ileostomy is not compatible with military aviation.

**DISCUSSION:** Malignancy associated with Peutz-Jeghers syndrome is rare except for the few cases that arise in polyps in the stomach or duodenum. Adenomatous polyps occur in 10% of the Western population. Approximately 5% of such polyps undergo carcinomatous transformation. The higher the number of adenomatous polyps, the higher the risk of carcinoma. Patients with familial adenomatous polyposis have a risk of 100%. About 90% of patients with polyps have only 1 or 2 of them. Once a polyp has been removed, that patient has a 30% chance of developing further polyps and a 2-4% chance of carcinoma.

## GASTROINTESTINAL TUMORS (OTHER)

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The most commonly presenting symptoms of discomfort, vague/nonspecific symptoms or occult/mild bleeding often prompt the search which finds the disease. Occasionally more serious complications may present. Esophageal carcinoma carries a risk of sudden hemorrhage and aspiration. Gastric carcinoma has the risk of incapacitating hemorrhage, anemia, or metastasis to brain, bone or lungs. Hemorrhage is also a risk in primary hepatic carcinoma. Pancreatic carcinoma is associated with a risk of developing diabetes mellitus and thrombophlebitis.

**WAIVERS:** Malignant tumors of the esophagus, stomach, and pancreas generally present in advanced stages or require significant surgery to render patients disease free. Waiver would be appropriate for early stage disease where patients are rendered disease free, "normal" function of the remaining organ, and recovered from surgery. These will be rare patients.

ICD9 Code	Condition
150.9	Malignant neoplasm of the esophagus
151.9	Malignant neoplasm of the stomach
157.9	Malignant neoplasm of the pancreas
211.0	Benign neoplasm of the esophagus
211.1	Benign neoplasm of the stomach
211.6	Benign neoplasm of the pancreas

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations
- AFIP confirmation of the histology are essential.
- Full flight physical
- Gastroenterology/oncology / internal medicine review
- Chest x-ray
- CT scan of mediastinum and abdomen, together with
- Endoscopy if indicated.

**FOLLOW-UP:** Follow-up as directed by the treating subspecialist. Other follow-up may be required as indicated by the aeromedical oncology consultant and may vary for each tumor type or organ affected.

**TREATMENT:** Surgical resection remains the only recognized means of cure, and it is frequently extensive. Radiation Therapy and/or Chemotherapy cannot be currently considered to add to surgical cure or to result in cures on their own.

**DISCUSSION:** The 5-year survival rates for the various carcinomas are as follows: esophagus 3%, stomach 12% (although 90% with early detection and resection has been reported), liver <1%, gall bladder 2%, and pancreas 1%. Three disorders occur in pancreatic carcinoma that could affect aircrew efficiency. Diabetes mellitus occurs in 10-20% of patients. Thrombotic disorders including thrombosis of the splenic vein (15% of cases) or pulmonary embolism (10%) may also occur. Primary lymphoma of the bowel is discussed on page 5-3 under lymphomas. Colonic polyps are also considered separately.

# HEAD AND NECK TUMORS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Local expansion and impingement on adjacent structures is the initial manifestation of most of these tumors. The extensive resection and resultant loss of structures vital for speech, swallowing (and control of secretions) and equipment fit will be important post-therapy concerns in the return of affected aviators to flight duties.

**WAIVERS:** Appropriate candidates for waiver are those aviators whose tumors have been completely removed in a manner that has not disturbed the surrounding structures needed to perform aviation duty. Impairment of speech, secretion control, and equipment fit are not considered favorably for waiver. Radiation Therapy will significantly impair chances of waiver.

ICD9 Code	Condition
161.9	Laryngeal Cancer
145.9	Oral Cavity Cancer

## INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations and
- AFIP confirmation of the histology is necessary.
- In addition, documentation of return of function of "aviation-quality" speech, swallowing/control of secretions, and equipment fit are required.

**FOLLOW-UP:** Determined by the ENT surgeon, with other involved specialists.

**TREATMENT:** Combined Chemo-Radiotherapy can result in retention of the larynx in 2/3rds of patients with laryngeal cancer, though results are not usually compatible with return to FFD. Surgical removal of the primary tumor, and further exploration of the neck based upon tumor size and clinical evidence of nodal involvement remains the standard for other malignant tumors of the Head and Neck. Radiation may add to cure, but only with more extensive tumors that are not likely to be waivered. Chemotherapy has no current role in adjuvant therapy in most tumors of the Head and Neck.

**DISCUSSION:** Peak incidence of laryngeal cancer occurs during the 6<sup>th</sup> and 7<sup>th</sup> decade of life with a male/female ratio of 9/1. Overall, early laryngeal cancer carries a 5-year survival of 76%, but localized glottic cancer has a figure of 90%. Recurrence is primarily local. Early laryngeal carcinoma (all sites) has a 5-year survival of 76%, while localized true vocal cord carcinoma has a 5-year survival of 90%. Laryngeal carcinomas are uncommon among nonsmokers, and tobacco use is incriminated as an etiology.

Cancer of the lower lip has the best prognosis, with a 10-year survival rate for early cases of over 95%. Most recurrence (to the lip in 43% and neck nodes in 43%) occurs in the first 2 years. Up to 12% of patients with lip cancer develop a second primary lesion, usually of the mouth or pharynx. Cancers of the upper lip carry a 5-year survival rate of 58-73%. Stage I (T1N0M0) and Stage II (T2N0M0) cancers of the oral cavity carry 5-year survival rates of 76% and 65% respectively but overall the 5-year survival rates are 25-35% for tongue, 20-40% for the floor of the mouth, 30-50% for cheek and 25% for oropharynx, palate and gingiva. Recurrence is primarily local, but up to 15% will metastasize while the local lesion is controlled. Up to 50% will manifest their metastasis within 9 months, and 80% will manifest it by 2 years. Between 15-35% of patients develop a second squamous carcinoma (head and neck 10-20%, esophagus 2-10%, bronchus 3-10%). Of those patients who have had a radical neck dissection, 30% develop a

dropped shoulder because of sacrifice of the XI cranial nerve and weakness of the trapezius muscle; this may preclude flying duties. Pharyngeal cancers are usually diagnosed late and carry a 5-year survival of 33%.

## HODGKIN'S DISEASE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** There is little risk of incapacitation with active disease or in those undergoing therapy. However, more advanced cases can cause dysfunction of multiple organ systems due to tumor invasion and bulk.

**WAIVERS:** The significant curability of Hodgkin's Disease makes waiver, especially for early disease, appropriate. Waiver for more advanced disease is complicated by insuring that residual masses contain no active disease. Patients with IIB through IVB disease have a greater recurrence rate with up to 75% achieving median length of remission of 3½ years but can be considered for a waiver if free of disease, therapy is complete, and recovery from therapy is complete.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Staging classification must be submitted using Ann Arbor classification.
- Histology must be confirmed by AFIP.
- Tumor Board report and
- MEB (if done) recommendations are also necessary.
- There should be confirmation that the chemotherapy has not caused residual toxicity.
- A complete pulmonary functions testing, including DLCO, and an
- Echocardiogram, with ejection fraction, can support lack of pulmonary and cardiac toxicity.
- A neurological exam for the presence of peripheral neuropathy is also necessary.

**FOLLOW-UP:** An appropriate follow-up plan should be determined by the treating subspecialist.

**TREATMENT:** Treatment options include radiation and/or chemotherapy. Patients must be DNIF when undergoing therapy. Patients treated with radiation are at risk for developing hypothyroidism and should have Thyroid Stimulating Hormone (TSH) tested yearly.

**DISCUSSION:** A bimodal age peak occurs with the incidence first peak in the mid to late 20s and the second peak in late adulthood. Because of the risks of long term complications of therapy, patients should be followed at least quarterly for the first 2 years, then at 6 month intervals for the next 8 years and then annually thereafter. After 3 years remission there is an 80% chance of permanent cure which rises to 96% after 5 years. The small risk for developing secondary tumors is enhanced when alkylator chemotherapy is added to radiation, and careful exam of the radiation port area during FDME in these patients is essential for detecting radiation induced skin cancer.

## KIDNEY TUMORS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Early disease may present with significant bleeding and localized pain. There is a risk of metastasis to brain, with a risk of seizure, or to bone, with a risk of pathological fracture. Metastasis may also occur to the lung, mediastinum, skin and liver.

**WAIVERS:** Stage 1 tumors, completely surrounded by normal kidney tissue, with no involved lymph nodes, and completely resected, are good candidates for waiver. Those with more extensive disease may have an unacceptable risk of developing of CNS disease. Since applicants for flying training with congenital absence of one kidney are rejected, it follows that applicants with a history of nephrectomy for Wilm's tumor will be treated the same way.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board appraisal,
- MEB (if done) recommendations, and
- AFIP confirmation of the histology are mandatory.
- Full flight physical, AMS,
- Oncology consultation
- Urology consultation,
- CBC,
- Liver enzymes
- Chest x-ray,
- CT scan of abdomen and retroperitoneum,
- MRI scan of the brain
- Bone scan.

**FOLLOW-UP:** Annual oncology and urology consultation is required. Further testing will vary and is dependent upon the type, stage of the tumor and the type of treatment and the recommendations of the patients urologist or oncologist.

**TREATMENT:** Surgical removal of the primary tumor is the most effective treatment. Renal cell carcinoma remains the most unresponsive tumor to radiation and chemotherapy. These agents do not yet play a significant role in improving survival in patients with extensive local or metastatic disease. Ongoing therapy is not compatible with flying status.

**DISCUSSION:** The most frequent traditional presentations are hematuria (56%), pain (38%), palpable mass (36%), weight loss and fatigue (27%), fever (11%), varicocele (2%), and incidental (27%). With localized disease, the 5-year survival rate is reported as 72%. The smallest tumors that exhibit minimal caliceal distortion and are surrounded by normal renal parenchyma have a good prognosis after surgery, but they are at risk for relapse. One third of patients already have disseminated disease at diagnosis, involving lung in 50% of cases, bone in 30%, liver in 30% and brain in 25%. Brain metastases from kidney are reported to be particularly susceptible to hemorrhagic degeneration with abrupt onset of headache and neurological difficulty. Hypertension occurs in about 30% of cases with renal cell carcinoma (hypernephroma) and a polycythemia syndrome occurs in 2-3%.

# LEUKEMIA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Acute leukemias can cause overwhelming complications with bleeding and infection. Chronic leukemias are usually less catastrophic, though most will progress with time, and produce the same end results as their acute counterparts.

**WAIVERS:** A history of ALL as a child is compatible with waiver or exception to policy. Aircrew members with other leukemias may be considered for restrictive waivers provided they have been free of symptoms and off treatment for 2 years. While there may be rare aviators with successful treatment and recovery from therapy that may return to flight duties, this is not currently a possibility for most.

ICD9 Code	Condition
204.9	Lymphoid leukemia
205.9	Myeloid leukemia
206.9	Monocytic leukemia

## INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations are required.
- In patients who have had prophylactic CNS radiation, neuropsychology review and testing is necessary.

**FOLLOW-UP:** Oncology/hematology consultation is required at least annually for continuation of waiver. Other requirements may vary based upon the nature of the tumor, its stage and the treatment program. The requirement for frequent assessment may interfere with military mobility

**TREATMENT:** Acute leukemias are treated with intensive therapy, and relapse is still all too common. All acute leukemias should undergo MEB. Treatment of chronic leukemias mirrors the aggressiveness of the disease at presentation, though curability is not yet possible in most cases. Ongoing therapy is not compatible with waiver. Patients who have had marrow transplant are not likely candidates for waiver, unless they are asymptomatic and on no medications.

**DISCUSSION:** Acute ALL is primarily a disease of childhood; chronic lymphocytic leukemia (CLL) is a disease of the aged; acute myelogenous leukemia (AML) occurs with similar frequency at all ages; and chronic myelogenous leukemia (CML) occurs most frequently in middle life. Sex differences are slight except in CLL, where male predominance is more striking. Adult ALL has a high relapse rate and long term survival is uncommon; CNS relapse occurs in 50% of cases although this figure is reduced to 5% with chemical or radiation prophylaxis. Although 60-80% of cases of AML go into remission, this is short (15 months on average) and there is a high relapse rate. 60-90% of AML will respond to induction chemotherapy, and median survivals at 3.5 years of 83%, 50%, and 23% are reported for age groups 25 or less, 26-45, and more than 45 years of age. High dose chemotherapy with hematopoietic progenitor support (bone marrow transplant, peripheral stem cell harvest, etc) may have a place in some patients with AML, but are not yet standard in the care of all AML patients. CLL spans the spectrum from indolent to aggressive disease, the development of a blast crisis is unpredictable and may be sudden. Therapy for CLL is currently directed at resolving symptoms or cytopenias; reproducible cure is not yet possible, and intense therapy may be no better than periodic therapy at prolonging life. Significant immune suppression and, paradoxically, autoimmune phenomenon (hemolytic anemia) may further complicate the clinical course. Hairy Cell Leukemia is a rare disease. 2-Chlorodeoxyadenosine (2-CdA) may be the treatment of choice, and long term disease-free survival (? cure) is increasingly being appreciated. Significant, long-term immune suppression may follow the use of 2-CdA.

## LUNG CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The major concern for aviators is the risk of cerebral metastasis with the development of seizures and neurologic compromise. In addition, bone metastasis could give rise to pathological fractures during emergency ground egress or ejection. There is also a possibility of diminished pulmonary function with compromised oxygenation, producing symptoms in-flight. Chest discomfort and/or hemoptysis is a presenting feature in 40% of cases and this discomfort may be exacerbated by the pressure of a restraint harness. Lack of energy and loss of interest in normal pursuits may impinge on flying ability or keenness to fly. Certain types of tumor may also be associated with neuropathies or endocrine disturbances. Small cell lung cancer commonly presents with paraneoplastic syndromes, and represent their own threats to aviation safety.

**WAIVERS:** Aircrew with small cell lung cancer are not considered waiverable in any stage due to the significant risk of development of CNS disease. Only those primary nonsmall cell lung cancers of less than 2 cms can be considered for waiver. Many of these tumors will be denied waivers(for example those patients with adenocarcinoma) as they represent a greater than acceptable risk for developing CNS metastasis. Tumors larger than 2 cms, or those with positive lymph nodes also carry a greater than acceptable risk of developing CNS metastasis, and are not appropriate for waiver. Aviators more than 3 years out from initial diagnosis, fully recovered from therapy and free of disease, may be considered favorably for waiver action.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board recommendations,
- Results of MEB (if done), and
- AFIP confirmation of the diagnosis are necessary.
- In addition, oncology consultation,
- Chest x-ray,
- Pulmonary functions testing, and
- MRI of the brain are required for initial waiver request.

**FOLLOW-UP:** No follow-up schedule is proven to improve survival. Aviators who have been waivered are at high risk for second primaries of the aero-digestive and urinary systems, and specific follow-up requirements will depend upon the nature of the tumor, its stage, the treatment program, and the recommendations of the treating oncologist.

**TREATMENT:** Surgical treatment is the only current curative therapy for nonsmall cell lung cancer. Radiation therapy and chemotherapy is used in limited small cell lung cancer, with chemotherapy alone for extensive disease.

**DISCUSSION:** Lung cancer accounts for 19% of all cancer in men, compared to 11% in females. Overall, lung cancer has a 5-year survival rate of 9%; between 17-20% survive one year after diagnosis. Even those who have curative surgery for localized cancer of the lung and in whom all disease is confined to the lung without any spread to any lymph nodes have a 5- year survival rate of only 42% and a 10 year survival rate of 16-18%. The 5-year survival rate for resected Stage I carcinoma has been reported as 70%. However, most recurrences are distant suggesting that micrometastasis has already occurred by the time of diagnosis. The rate of cerebral metastasis for the varying types of lung carcinoma have been reported as ranging from 14-30%. Small cell lung cancer has a 15%, 3-year survival with limited disease, and less than 3% with extensive. Chest irradiation, used as therapy in small cell lung cancer, may result in the development of a second primary (most commonly nonsmall cell lung cancer) at the rate of 4.4%/year.

# MALIGNANT MELANOMA

Update: APR 2003

**AEROMEDICAL CONCERNS:** The ultimate aeromedical concern is the risk of an in-flight incapacitating event. Failure to recognize early disease will compromise cure and result in the loss of the aviator. Advanced disease can affect many organ systems, especially the Central Nervous System (CNS), with obvious risks to aviation safety.

## WAIVERS:

### Initial Applicants (Class 1A/1W):

Exception to policy for initial flight applicants will be considered for cases of malignant melanoma that are less than 2 mm in depth and do not show lymph node involvement or distant metastases (AJCC stage IA and IB). For lesions between 2 and 4 mm, without nodal involvement, there must be a 5-year disease free interval prior to consideration (AJCC stage IIA and IIB). Lesions deeper than 4 mm, or that involve lymph nodes or distant metastases will not generally be considered for an exception to policy since the risk of CNS disease recurrence is greater than acceptable limits (AJCC Stage IIC, IIIA/B/C, IV).

### Initial Applicants (Class 2, 3, 4):

Waivers will routinely be granted for cases of malignant melanoma where the lesion is less than 2 mm in depth without evidence of lymph node involvement or distant metastases. For lesions between 2 and 4 mm there must be a 5-year disease free interval prior to consideration (AJCC Stage IIA and IIB). Lesions deeper than 4 mm, or that involve lymph nodes or distant metastases will not generally be considered for a waiver since the risk of CNS disease recurrence is greater than acceptable limits (AJCC Stage IIC, III A/B/C, IV).

**Rated Aviation Personnel (All Classes):** Lesions that are less than 2 mm in depth without lymph node involvement are good candidates for a waiver (AJCC Stage IA and IB). Lesions that are between 2 and 4 mm, without ulceration or nodal involvement (AJCC Stage IIA), may be considered for a waiver after complete excision and necessary follow up. For those lesions with AJCC Stage II B/C and III A/B/C there must be a 5- year disease free interval (after completing all necessary treatment) prior to consideration for waiver, provided all follow up evaluations show no evidence of disease. Those lesions deeper than 4 mm or any lesion with distant metastases (AJCC IV) will not generally be considered for a waiver since the risk of CNS disease recurrence is greater than acceptable limits. Patients who have had melanoma of the uveal tract with enucleation of the orbit cannot be considered for waiver..

## INFORMATION REQUIRED:

- Complete AMS with results of surgery, including lymph node involvement and metastatic work-up. Metastatic work up for localized lesions should include an alkaline phosphatase, LDH and CXR. For Stage IIA and IIB lesions a sentinel node analysis is required prior to consideration for return to flight status.
- Complete mucocutaneous examination performed by a dermatologist.
- Neurological and lymph node exam (performed by the flight surgeon).
- CXR.
- Tissue examination performed by a dermatopathologist that must include a comment about the presence or absence of ulceration and the breslow depth. A simple Clark's level description is not sufficient. If no dermatopathologist is available then tissue sample should be sent to AFIP for diagnosis.
- Tumor board report and medical board report returning the member to full duty (if applicable).
- MRI of the brain is required only if neurologic abnormalities are discovered.
- If neurologic abnormalities are discovered a complete neurology consult is required.

**FOLLOW-UP:** Aviators must examine their excision site and skin monthly for signs of new lesions. Flight surgeons must take an active role in educating the aviator on how to do this exam and what to look for. For Stage IA a dermatology exam every 6 months for 2 years and then every year is recommended. For Stage IB a dermatology exam every 6 months for 3 years and then every year is recommended. A dermatology consult should be obtained every year. For Stage II and III a full mucocutaneous exam every 6 months for 5- years and then annually is recommended. A dermatology consult should be obtained every year. The dermatologist or other subspecialist may direct additional studies.

**TREATMENT:** Surgical excision of the primary lesion is the primary means of treatment. Lymph node dissection may play a role in improving survival in some stages, but should not be done simply to increase the chance of waiver approval.

**DISCUSSION:** Two different studies found tumor ulceration the second most powerful prognostic indicator. The presence or absence of ulceration on histology heralds a high risk of metastases and its presence upstages the prognosis of all lesions. Patients with the excision of tumors < 1.0 mm without evidence of ulceration are considered cured after the appropriate margin is performed at the area of biopsy and there is a careful dermatopathologist review of the excision with comment on clear histological margins. These lesions should be reviewed regularly because of the propensity for the melanoma to recur at the original site or elsewhere. The aviator should be educated to look for pigmented lesions in addition to reporting nodular developments or the development of amelanotic lesions in and around the area of the initial biopsy. Tumors of the head, neck, trunk, hands and feet have a worse prognosis than those on the arms and legs and should be monitored more vigilantly. The 10- year survival rate reported by the American Joint Committee on Cancer Staging (AJCC) for tumors without evidence of ulceration is 87.9 percent for lesions with a depth < 1.0mm, 80.0 percent for tumors 1.0 to 2.0mm, 63.8 percent for tumors 2.0 to 4.0 mm, and only 53.9 percent for those >4.0 mm. Lymphatic mapping and sentinel lymphadenectomy are technological advances that allow the more accurate staging of melanoma. The AJCC recommends all patients with tumors > 1.0 mm in depth have pathologic nodal staging with lymphadenectomy. Newer technologies are being investigated for the staging of malignant melanoma and include reverse transcriptase polymerase chain reaction, positron emission tomography scanning, and the use of antimelanoma antibodies. These modalities are still being investigated and are not required for submission with a waiver request.

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# NEUROLOGICAL TUMORS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Normal neurologic function is critical to aviation safety, and tumor disturbance may span the range of subtle loss of fine motor function to catastrophic seizure or loss of major function.

**WAIVERS:** Aircrew with tumors of the spinal cord may be granted a waiver provided there is no recurrence and any remaining neurological sequelae are acceptable 5 years after therapy. Waiver may be granted for tumors of the peripheral nervous system if there is no appreciable impairment of function. All tumors involving the brain or meninges, irrespective of therapeutic outcome, are permanently disqualifying. Waivers may be considered when: the tumor is clearly small, and benign; there is no risk of recurrence; and a neurological exam is completely normal. In general, the likelihood of waiver is inversely proportional to potential for tumor recurrence. Also see Pituitary Tumors APL and Acoustic Neuroma APL.

ICD9 Code	Condition
171.9	Malignant neoplasm of the peripheral nervous system
191.9	Malignant neoplasm of the brain
192.2	Malignant neoplasm of the spinal cord
215.9	Benign neoplasm of the peripheral nervous system
225.0	Benign neoplasm of the brain
225.3	Benign neoplasm of the spinal cord
225.4	Benign neoplasm of the spinal meninges

## INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations, and
- AFIP confirmation of the histology are required.
- Detailed neurologic exam by a neurologist is essential.

**FOLLOW-UP:** Work-up may vary upon the type and staging of the tumor, the organ infected, the treatment regimen, and is normally determined by the consulting Neurologist/Neurosurgeon.

**TREATMENT:** Complete surgical removal is the preferred means of therapy. A history of CNS radiation is incompatible with continued aviation duties.

**DISCUSSION:** The spectrum of neurologic tumors is broad. Terms such as "benign" mean little with tumors that, despite the lack of "invasive" potential, continue to grow and compress surrounding structures. The tremendous variation of neurologic tumors in their natural history, the lack of ability to "get clear margins", the recurrence potential even for "benign" tumors, and the multiple potential deficits therapy may induce and the criticality of an intact neurologic system for safe aviation makes clear guidance for each tumor type impossible. Fifteen thousand new cases of primary brain tumors and more than 4,000 new spinal cord tumors occur each year. Twenty to 40% of brain tumors are metastatic lesions from lung, breast, kidney, melanoma, and the gastrointestinal tract. Gliomas comprise 50% of all primary brain tumors, occur most commonly in the cerebrum, and most frequently between the ages of 40 to 74 years. Approximately 33% of all patients with malignant brain tumors experience unexpected and incapacitating seizures. Survival rates for malignant gliomas approach 20% after one year. Survival rates for other tumors range up to 90% but in most there is a greater than 10% chance of recurrence. Those tumors with the best prognosis (i.e., the least chance for subsequent seizure disorders or loss of neurologic function) are subtentorial, axial, and encapsulated. Those with the greatest chance of subsequent seizure disorder are supratentorial, extra-axial, and unencapsulated.

## NON-HODGKIN'S LYMPHOMA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Early disease usually presents little risk to aviation, though advanced disease can cause dysfunction of multiple organ systems due to tumor invasion and bulk.

**WAIVERS:** Waivers are appropriate after successful treatment of aviators with malignant lymphoma, diffuse, large cell, especially stage I or II, or low grade stage I lymphomas. Cure of other types of lymphomas are not yet a reality (most low grade lymphomas), or involve therapy of such intensity (lymphoblastic, and Burkitts-type), that waiver is inappropriate.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations, and
- AFIP confirmation of the histology is mandatory.
- Oncologist / hematologist consultation together with report of recent CT scans of the chest and abdomen.
- Bone marrow biopsy may be indicated.
- Experts in lymph node pathology, hematology, and radiology must be intimately involved to insure proper treatment, and correct information for waiver recommendation, if appropriate, is afforded the aviator.

**FOLLOW-UP:** Follow-up will vary and is normally determined by either the treating subspecialist or the Aeromedical Oncology Consultant.

**TREATMENT:** Ongoing treatment is not compatible with flying.

**DISCUSSION:** Each year, approximately 31,700 patients in the U.S. are diagnosed as having non-Hodgkin's lymphoma, and about 16,500 patients die of this disease. Extranodal presentation occurs in 20-30% of patients. Primary lymphoma of the stomach represents up to 10% of all gastric cancers; the presenting symptom is pain in 80% of cases and hemorrhage in 20%. The non-Hodgkin's lymphomas represent an extremely diverse group of malignancies. Current classification schemes have not yet incorporated advances in molecular biology for characterization, and, especially for T-cell lymphomas, are excessively complicated and diagnoses are often not reproducible among different pathologists. Padoxically, the more aggressive tumors are the most curable, and the indolent lymphomas, though often characterized by years of symptom-free survival, are ultimately progressive and fatal.

# OVARIAN CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Abdominal enlargement secondary to ascites may cause discomfort with restraint harness. Even with advanced disease, however, ascites and pain may be the only prominent finding.

**WAIVERS:** Most patients present with advanced disease, and even with surgical debulking and chemotherapy, will relapse. Waiver would be appropriate for early stage 1A or B. Waiver may be considered for aviators with higher stage, with minimal disease rendered free of disease at surgery, and who have recovered from surgery and chemotherapy. Waiver is not required for benign ovarian tumor. (See Leiomyoma of the Uterus APL)

## INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations and
- AFIP confirmation of the histology are mandatory.
- Recent gynecology / oncology consultation,
- CT scan of the abdomen, retroperitoneum and pelvis and
- Intravenous pyelogram.
- Negative tumor markers may also be helpful. The tumor markers, CA-125, AFP or BCG, if appropriate, should be obtained both pre- and post-operatively.

**FOLLOW-UP:** Determined by medical and gynecologic oncologists.

**TREATMENT:** Surgical debulking of tumor is critical. Post-operative chemotherapy appears to enhance the chance of remaining disease free in those patients with large tumors or intra-abdominal spread. Hormone replacement therapy after bilateral oophorectomy is acceptable.

**DISCUSSION:** There are 20,000 new cases of ovarian cancer diagnosed annually. A female born in the U.S. has about 1.4% chance of developing ovarian cancer within her lifetime. Almost 75% of ovarian tumors are benign. Of those with malignant disease, 80% will have metastases by the time of diagnosis and partly as a result of this, yearly mortality in ovarian cancer is approximately 65% of the incidence rate. Metastasis of breast or colonic carcinoma to the ovary is more common than primary carcinoma of the ovary. The 5-year survival of early ovarian carcinoma can reach 90%. CA-125 antigen assay is most useful in the detection of treatment failure and recurrence of epithelial ovarian cancer. AFP and BCG are useful in following response to therapy and recurrence of germ cell tumors that are antigen-positive, i.e., endodermal sinus tumor, embryonal carcinoma, and choriocarcinoma. Screening for ovarian carcinoma is currently not productive. Female aviators with a marked family history of ovarian cancer should consider innovative screening protocols, and prophylactic oophorectomy, though even this surgery does not absolutely eliminate the risk of developing this malignancy.

## PITUITARY TUMORS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The major complications of pituitary tumors arise from enlargement. Hormonal hypersecretion may cause heat intolerance, diabetes mellitus, diabetes insipidus, hypercalciuria, hypothyroidism, nerve entrapment syndromes, hypertension, cardiomyopathy and spondylosis. Local pressure effects of the tumor can cause headache, cranial nerve palsies and visual defects.

**WAIVERS:** Waiver may be considered provided sequelae are within acceptable limits. Diabetes insipidus (either as a result of posterior pituitary tumor or following surgery or 90Yttrium implant) is not waiverable.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations and
- AFIP confirmation of the histology (in those cases where surgical removal or biopsy has been carried out) are required.
- Endocrinology consultation and
- Postoperative visual field studies are required for initial waiver.

**FOLLOW-UP:** Annual endocrinology consultation.

**TREATMENT:** Surgical removal of the tumor and insertion of 90Yttrium implant are both compatible with waiver if there are no complications or sequelae. Treatment with bromocriptine is also waiverable once the dosage is stable and the initial side effects have disappeared.

**DISCUSSION:** Cure rates of up to 80% for anterior pituitary tumors resulting in acromegaly can be expected with any of the treatment modalities. Prolactinomas have an even better success rate. There is no increased risk of seizure after normal trans-sphenoidal resection of a pituitary adenoma. Improvements in visual loss depends on the duration and extent of pretreatment visual loss but overall can be expected in 50% to 95% of patients.

## PLASMA CELL DYSCRASIAS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Plasma cell dyscrasias encompass a diverse spectrum of diseases with varying clinical manifestations. Those that secrete the amyloid proteins result in diffuse organ damage due to these abnormal proteins. The "malignant" disease (multiple myeloma) infiltrate and crowd out bone marrow elements and suppress the immune system. Abnormal proteins can also result in intravascular sludging (Waldenstroms and Heavy Chain Disease), organ damage and immune suppression and infection.

**WAIVERS:** Most of these processes are progressive, incurable, not easily controlled, and are thus not candidates for waiver. Soft tissue plasmacytomas that are eliminated by treatment represent a rare type of this disorder that may be waivered. Benign Monoclonal Gammopathy may also be considered for waiver provided that the monoclonal spike comprises <2 g/dl of protein, there are fewer than 5% plasma cells in the bone marrow, the serum viscosity is normal, and there is no hematopoietic compromise or osteolytic lesions. Other conditions are not waiverable. These include amyloidosis associated with plasma dyscrasias, heavy chain disease, cold agglutinin disease and cryoglobulinemia.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Oncology/hematology review is necessary along with
- MEB (if done) and
- Tumor Board recommendations and
- AFIP confirmation of diagnosis.
- An extensive restaging post-treatment to insure all of the organs/organ systems that may be affected by the process in question are uninvolved must be included in initial waiver packet.

**FOLLOW-UP:** Appropriate follow-up will be established by the treating subspecialist. Those aviators granted waiver must anticipate evaluation every three months for life.

**TREATMENT:** Treatment will be determined by the type of plasma cell dyscrasia. Continuing therapy is not compatible with waiver.

**DISCUSSION:** The risks of benign monoclonal gammopathy are of progression to multiple myeloma and of increased serum viscosity leading to neurological impairment. The median survival for patients with gamma heavy chain disease is 12 months. Neuropathic involvement is insidious and, although usually a condition of older patients, has been reported in those as young as 23. Alpha heavy chain disease is associated with progressive and fatal abdominal lymphoma. There is a risk of sudden hemolysis in cold agglutinin disease and a risk of sudden vascular accidents and neurological dysfunction in cases of cryoglobulinemia. Up to 60% of patients with myeloma present with skeletal pain while anorexia and depression associated with hypercalcemia are present in 30%. About 10% present with paraplegia while others exhibit mental impairment or visual disturbance resulting from hyperviscosity. Amyloidosis is encountered in 5-10% of myeloma patients. Two year survival ranges from 9-76% depending on the stage of the disease at the time of diagnosis.

# PROSTATE CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Growth of the prostate cancer into the urethra or bladder neck may result in obstructive or irritative voiding symptoms (e.g., hesitancy, urgency, nocturia, decreased force of the urinary stream, intermittency) that can interfere with aviation duties. Metastatic disease can occur affecting bony sites, especially the spine, with resultant impairment or incapacitation secondary to pain or paraplegia.

## WAIVERS:

### Initial (Class 1A/1W):

Exceptions to policy will be considered on a case by case basis provided the applicant has undergone treatment and is at least 1 year out from therapy.

### Initial (Class 2, 2F, 3, 4)

Exceptions to policy will be considered on a case by case basis.

### Rated Aviation Personnel ( All Classes):

Any stage and grade of prostate carcinoma is considered disqualifying. Ongoing treatment is also disqualifying. Waivers will be considered for individuals at least 6 months out from therapy provided the following conditions are met:

- Able to perform all duties without discomfort
- Regained full bladder continence (does not require pads) and has no other side effect of treatment affecting conduct of flying duties and
- Has a post-op (for those undergoing prostatectomy) PSA less than 0.4 (usually performed 1-2 months after surgery).

## INFORMATION REQUIRED:

Complete AMS is required including:

- Initial report of presentation.
- Serial PSAs, including post-op PSAs.
- Recent laboratory studies (u/a, renal function).
- Bone scan/MRI if recommended by urologist (usually done if PSA >20, Gleason's grade 8 or higher, or clinically extracapsular disease on exam).
- Surgical and pathological reports (histology/Gleason grade).
- Chronology of therapy and results.
- Remarks that patient is free of physical limitations, retains full bladder continence and functions without discomfort, and any medications in use.
- Remarks concerning future follow-up including oncology or urology recommendations and tumor board results (if available).

## FOLLOW-UP:

Follow-up will be per urology/oncology recommendations;

- Submit copies of reports and post-treatment PSAs with annual FDME/FDHS.
- PSAs should be done at the following intervals post-treatment 1,3,6,12,18,24,36,48,60 months.

**TREATMENT:** All forms of therapy are compatible with waiver. Present therapeutic options for the treatment of clinically localized prostate cancer include (1) watchful waiting/deferred therapy; (2) definitive local therapy, radical prostatectomy, and externalbeam radiation therapy; or (3) investigational interstitial seed radiation therapy and cryosurgery. Each form of therapy is associated with undesirable risks and side effects.

**DISCUSSION:** Over their lifetime, 15 percent of the United States men eventually will be diagnosed with prostate cancer, three-fourths of whom will be diagnosed after age 65. A man in the United States has a 3 percent chance of dying from prostate cancer. Because many prostate cancers grow slowly, many men diagnosed with prostate cancer will die of other causes, especially men older than 65. Considerable debate is ongoing concerning the best mode of therapy for each particular stage of carcinoma of the prostate. The rational selection of treatment options often places the patient and treating physician in the dilemma of attempting to maintain quality of life while increasing the duration of survival. Many older men with carcinoma of the prostate have other comorbid illnesses that may pose a greater threat than prostate cancer to their overall survival.

Prostate cancer rarely causes symptoms early in the course of disease because the majority of adenocarcinomas arise in the periphery of the gland distant to the urethra and other pelvic organs. The presence of symptoms as a result of prostate cancer suggests locally advanced or metastatic disease such as that which occurs from bony and neurologic involvement of the spine.

**REFERENCE:**

<http://www.nci.nih.gov/cancerinfo/types/prostate> , National Cancer Institute, Prostate Cancer Homepage  
Goldman: Cecil Textbook of Medicine, 21st ed., Copyright © 2000 W. B. Saunders Company  
Noble: Textbook of Primary Care Medicine, 3rd ed., Copyright © 2001 Mosby, Inc.

## SKIN CANCERS (OTHER)

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The lesion may be irritated by the wearing of protective equipment or, if it is on the face, may prevent adequate mask seal.

**WAIVERS:** Waiver is not required for the adequately treated initial occurrence of basal cell carcinoma. Waiver may be required if grafting has been necessary once the graft has settled adequately to allow wearing of flying clothing or equipment and provided there is no disability. Waiver of squamous cell carcinoma is considered on a case-by-case basis depending upon the stage and mode of therapy as well as complications to treatment.

### INFORMATION REQUIRED:

- Complete AMS is required for recurrent basal and initial squamous cell carcinoma.
- Tumor Board and MEB recommendations are unnecessary but
- Pathology report with histology is required.

**FOLLOW-UP:** Requirements may vary based upon the nature of the tumor, its stage and the treatment program.

**TREATMENT:** The aircrew member should be grounded during treatment.

**DISCUSSION:** Basal and squamous cell carcinomas are the most common types of malignant skin disease. Actinic keratoses (solar keratoses) are extremely common, but only a small fraction progress to frank cancer. The incidence of metastasis varies. The incidence of metastatic basal cell carcinoma is reported as less than 0.1%. Primary cutaneous squamous cell carcinomas have a secondary rate of 3%, compared to 11% with mucocutaneous lesions and 10-30% with tumors secondary to inflammatory and degenerative processes. Metastases tend to be in the regional lymph nodes.

# TESTICULAR TUMORS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Bulky disease may cause varying discomfort, especially back pain. Pulmonary and rare CNS metastasis may cause hypoxia and seizures, respectively, though these are signs of advanced disease. **NOTE: THOSE AVIATORS TREATED WITH BLEOMYCIN ARE CURRENTLY PROHIBITED FROM EVER BEING EXPOSED TO HIGH (OVER 40% FIO<sub>2</sub>) CONCENTRATIONS OF OXYGEN. THIS PRECLUDES CHAMBER RIDES OR OPERATIONS IN AIRCRAFT WITH OXYGEN USE AS A PART OF THE MISSION.**

**WAIVERS:** Waivers are appropriate for those aviators rendered free of disease, and recovered from surgery, chemo- and/or radiotherapy. Note: The MANDATORY frequent follow-up in the two to three year period after treatment may significantly effect deployment, thus is viewed negatively in some waiver considerations.

## INFORMATION REQUIRED:

- Complete AMS is required.
- Histology and staging confirmed by AFIP and
- Tumor Board report, and
- (if done) MEB recommendations are required.
- Confirmation of absence of tumor markers and
- MRI scan report.
- If Bleomycin-based chemotherapy has been used, a complete set of pulmonary functions testing is required as well.

**FOLLOW-UP:** Non-seminomatous germ cell tumors (NSGCT) need to be followed every month for the first year, every two months for the second year, and every three months for the third year, and every 6 months thereafter. Alphafeto protein and Beta HCG are required at these visits. CT scans need to be done every three months for the first 2 years, then less frequently thereafter. Follow-up of seminoma mirrors that of NSGCT.

**TREATMENT:** Treatment involves surgical excision of the primary tumor, and extensive surgery may be required with NSGCT for residual masses after chemotherapy. Chemotherapy is used for residual disease in NSGCT. Radiotherapy is used adjuvantly, and/or chemotherapy, for extensive disease in seminoma. Treatment with Bleomycin-based chemotherapy may result in permanent termination of flight duties as noted above. Testicular tumors represent one of the few curable solid tumors. The care of these patients, however, requires absolute expertise to maximize this likelihood of cure. Aviators with these tumors must receive care at institutions skilled in the multidisciplinary approach required for these tumors.

**DISCUSSION:** Testicular tumors comprise 1% of all tumors in men and 0.1% of all cancer deaths. Seminoma (40% of the total) has a peak incidence at 30 years of age. The results of treatment, particularly for seminomas, are impressive. In Stage 1 tumors, orchidectomy alone leads to relapse in 26% in 2 years (the vast majority occurring in the first 9 months) but orchidectomy with retroperitoneal radiotherapy or dissection gives a relapse rate of 5-16% at 2 years, and approaches 100% survival at 5 years after chemotherapeutic salvage of those who relapse. Overall relapses after 2 years are uncommon. On the other hand, non-seminomatous tumors (embryonal carcinoma, teratocarcinoma, teratoma) have a peak incidence at 20 years. Approximately 33% are Stage 1 at presentation (disease confined to the testis). The risk of relapse of non-seminomatous tumors after treatment depends on stage (14% when limited to the body of the testis, 47% when extending through to the tunica albuginea), the type (teratoma <teratocarcinoma <embryonal carcinoma) and whether or not there is vascular/lymphatic invasion.

# THYROID CARCINOMA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** There is a substantial risk of hypothyroidism after surgical treatment. Local invasion and/or surgical damage may rarely result in injury to the parathyroid glands and/or recurrent laryngeal nerves.

**WAIVERS:** Waiver will be considered after treatment of papillary or follicular carcinoma of the thyroid. Medullary or anaplastic thyroid tumors are not normally considered for waiver recommendation due to the poorer prognoses of these tumors.

## INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- (if done) MEB recommendations and
- AFIP confirmation of the histology is mandatory.
- Confirmation of euthyroid status and evidence of TSH suppression are also needed for initial waiver action.

**FOLLOW-UP:** Continuation of waiver requires annual submission of internal medicine/endocrinology consultation to include complete thyroid function testing.

**TREATMENT:** Surgery is the preferred form of therapy. Some authorities prefer to use radioiodine treatment after surgery.

**DISCUSSION:** Thyroid cancers are for the most part characterized by slow growth, delayed symptoms, and low morbidity and mortality. Thyroid nodules are quite common in our population, occurring in about 4%. Fortunately only few of these nodules prove to be malignant at time of biopsy. Generally, men over 40 years old and women over 50 have a worse prognosis. Another poor prognosticator is a primary tumor over 5 cm. Papillary carcinoma is slow growing, spreading locally to the strap muscles of the neck, lymph nodes and occasionally trachea but it may metastasize to lungs or bone. Some 20% are said to be multicentric. Overall 5/10 year survivals of better than 95 -90% can be achieved. Because the growth rate is slow and there is no particular trend to early recurrence (recurrence rates from 10-24% have been reported); patients should be able to return to flying as soon as they are euthyroid. Medullary carcinoma is often associated with the MEN II syndromes [for more detail click here] and routine screening should be conducted for the early detection of these syndromes. Follicular carcinoma tends to metastasize to lungs and bone rather than infiltrate locally. A major determinant of outcome is the extent of microinvasion. The usual treatment of choice is total thyroidectomy because there is an 87.5% chance of the opposite lobe containing microscopic follicular carcinoma. For patients treated with total thyroidectomy and radioactive iodine, the death rate at 5 years is quoted as 11%, rising to 30% when treatment is by incomplete thyroidectomy alone. This can be largely explained by the fact that only total thyroidectomy allows subsequent accurate localization and treatment of distant metastases by I-131. Medullary carcinoma and anaplastic carcinomas have a 10 year survival of 50 and essentially 00% respectively.

## MEN II Syndromes

Multiple endocrine neoplasia (MEN) syndromes arise from Amine Precursor, Uptake and Decarboxylation (APUD) neuroendocrine cells, and are inherited as an autosomal dominant trait.

### MEN 2a Syndrome

MEN type 2a involves patients with virtually a 100% incidence of medullary thyroid carcinoma (MTC), a 50% incidence of clinically significant, usually bilateral pheochromocytomas and a lesser incidence of parathyroid adenomas with associated hyperparathyroidism.

### **MEN 2b Syndrome**

Men type 2b patients also have 100% incidence of MTC and frequent pheochromocytomas. They have a characteristic physical appearance due to multiple neural defects including mucosal neuromas of the eyelids, lips, and tongue. These neural abnormalities within the gastrointestinal tract often lead to diarrhea, constipation or megacolon. Patients with MEN 2b seldom have hyperparathyroidism.

## UTERINE CANCER

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Some cases develop anemia but there are otherwise very few specific aeromedical concerns in carcinoma of the uterus.

**WAIVERS:** Waiver may be considered 3 months after hysterectomy provided that there has been a full recovery and there is no indication of metastasis. Waiver may be requested 2 years after treatment of disseminated disease provided there is no evidence of sequelae or recurrence.

### INFORMATION REQUIRED:

- Complete AMS is required.
- Tumor Board and
- MEB (if done) recommendations and
- AFIP confirmation of the histology are required.
- Gynecology/oncology opinion, together with reports of the
- Intravenous pyelogram and
- CT scan of the abdomen, retroperitoneum and pelvis.

**FOLLOW-UP:** Annual gynecology/oncology consultation are required.

**TREATMENT:** Aircrew are grounded during treatment and during the immediate postoperative period.

**DISCUSSION:** Endometrial carcinoma is the most common of the cancers of the female genital tract in the U.S. Thirty-four thousand new cases are diagnosed annually, but an effective screening program has reduced the death rate to 3,000 women annually. The median age at onset is 61, however, 2.9% - 14.4% of patients with endometrial cancer are less than 40 years of age. The earliest truly invasive carcinoma of the endometrium has a cure rate of 90%. Spread is usually slow and recurrence is usually local for long periods of time. However, recurrence for all stages is unpredictable. The incidence of leiomyosarcoma arising in uterine fibroids has been reported to be 0.1-0.6% with a 5-year survival rate of 31%.



## MEDICATION WAIVERS

## INTRODUCTION

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Aircrew-members should be evaluated for restriction from flying duties when initiating any medication and also be advised of potential side effects. When using a medication, the following should be considered: (1) Medication and/or the underlying medical condition is compatible with aviation duty, (2) Medication is effective and essential to treatment, (3) Aircrew member is free of aeromedically significant side effects after a reasonable observation period.

**WAIVERS:** The Commander, U.S. Army Aeromedical Center, has reviewed and classified a wide range of medications for use in the aviation environment. Medications are designated Class 1, 2A, 2B, 3 and 4. Medications not on this list are currently incompatible with the aviation environment or little information of its safe use in the aviation environment exists. New medications are reviewed constantly and waiver requests are considered on a case- by-case basis but often take a great deal of time. Flight surgeons are encouraged to use the medications on this list to avoid lengthy delays in the waiver action process.

**Class 1:** Over-the-counter medications which may be used without a waiver. Occasional and infrequent use of these over-the-counter medications does not pose a risk to aviation safety or violate the intent of AR 40-8 , Temporary Flying Restrictions Due to Exogenous Factors, August 1976, when a flight surgeon is not available. These are approved for acute non-disqualifying conditions and do not require a waiver. Use in accordance with standard prescribing practices.

**Class 2A:** These medications require a prescription and may be used short term under the supervision of a flight surgeon without a waiver. CAUTION: The underlying medical condition may be disqualifying and require a waiver.

**Class 2B:** These medications require a prescription and may be used for short-term or chronic use under the supervision of a flight surgeon without a waiver. CAUTION: The underlying condition may require a waiver. These medications must be noted annually on the FDME for Information Only and the flight surgeon must comment on usage and dosage. First time use requires an initial 24-hour grounding period to ensure the aircrew member is free of significant side effects. Subsequent use does not require grounding.

**Class 3:** These medications require a prescription and may receive favorable waiver recommendation only on an individual basis for treatment or control of certain chronic conditions. The underlying disease process may also require a waiver.

**Class 4:** Use of these medications necessitates grounding the aviator and is not waivable for flying duty. **Herbal Preparations/Supplements:** The majority are prohibited for aviation duty as many are used in cases of self-diagnosis and self treatment. In many cases, studies do not reveal significant clinical efficacy. Some preparations may be used under the guidance of the flight surgeon. See the Herbals/Dietary Supplements APL (TBP).

### INFORMATION REQUIRED: AMS listing:

- Dosage
- Frequency of use
- Any side effects
- Complete summary of the aircrew-members medical condition.
- If a new drug is being recommended, forward a complete justification of the medication, i.e., rationale for use, safety considerations, availability of the drug during mobilization of the unit,

and any studies supporting its use in the aviation environment. Bear in mind that all FS/APAs can be contributors to policy change.

**FOLLOW-UP:** Appropriate follow-up is predicated upon the specific medication and the underlying medical condition. These requirements are given under specific reference to the applicable medication or medical condition.

**TREATMENT:** N/A

**DISCUSSION:** Medication side effects are very hard to predict. They occur with irregularity and often differently in any given population group. The side effects relating to central nervous, cardiogenic, ophthalmologic, and labyrinthine systems are understandably the most troubling in the aircrew member. One must also consider the unique environmental considerations present in the aviation environment, i.e., G-forces, hypoxia, pressure changes, noise, heat, cold, acute and chronic fatigue; and how these effect the medication or the underlying medical condition.

**REFERENCE:**

Physicians Desk Reference, 56th Edition, Medical Economics, Montvale, NJ, 2002.

American Hospital Formulary Service Drug Information 2001, American Society of Health System Pharmacists, Bethesda, MD, 2001.

## CLASS 1: OVER-THE-COUNTER MEDICATIONS

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Self-medication in anyone on flight status is prohibited by AR 40-8 .

Over-the-counter (OTC) medications frequently are combination medications, with one or more components contra- indicated for safety of flight. Many OTC medications do not provide a listing of ingredients on the package and often give only sketchy information on side effects.

**WAIVER:** The OTC medications listed below are Class 1 medications. If a flight surgeon is not immediately available, the below listed medications can be used on a short term basis until a flight surgeon can be seen for appropriate evaluation and treatment. Combination medications are acceptable only when each component in the combination is separately acceptable. Any prohibited component makes the combination a prohibited medication.

**Antacids:** (Tums, Rolaids, Mylanta, Maalox, Gaviscon, etc.) When used occasionally or infrequently. Chronic use is Class 3.

**Antihistamines:** Loratadine (Claritin)-Short term use by individual aircrew is authorized but the aircrew member must report use of this medication to the FS/APA as soon as possible. FS/APA should be concerned not only with the use of this medication but also the underlying problem that the individual is self- treating (e.g. allergic rhinitis) and the aeromedical implications of the diagnosis.

**Artificial Tears:** Saline or other lubricating solution only. Visine or other vasoconstrictor agents are prohibited for aviation duty.

**Aspirin/Acetaminophen:** When used infrequently or in low dosage.

**Cough Syrup Or Cough Lozenges:** [Guaifenesin (Robitussin plain)]. Many OTC cough syrups contain sedating antihistamines or Dextromethorphan (DM) and are prohibited for aviation duty.

**Decongestant:** Pseudoephedrine (Sudafed). When used for mild nasal congestion in the presence of normal ventilation of the sinuses, and middle ears (normal valsalva).

**Pepto Bismol:** If used for minor diarrhea conditions and free of side effects for 24 hours.

**Multiple Vitamins:** When used in normal supplemental doses. Mega-dose prescriptions or individual vitamin preparations are prohibited.

**Nasal Sprays:** Saline nasal sprays are acceptable without restriction. Phenylephrine HCL (Neosynephrine) may be used for a maximum of 3 days. Long-acting nasal sprays [oxymetazoline (Afrin)] are restricted to no more than 3 days. Use of neosynephrine or oxymetazoline for longer than the above time must be validated and approved by a flight surgeon. Recurrent need for nasal sprays must be evaluated by the flight surgeon. Use requires the aircrew member to be free of side effects.

**Psyllium Mucilloid:** (Metamucil). When used to treat occasional constipation or as a fiber source for dietary reasons. Long term use (over 1 week) must be coordinated with the flight surgeon due to possible side effects such as esophageal/bowel obstructions.

**Throat Lozenges:** Acceptable provided the lozenge contains no prohibited medication.

Benzocaine (or similar analgesic) containing throat spray or lozenge is acceptable. Long term use (more than 3 days) must be approved by the local flight surgeon.

**DISCUSSION:** The aviator requires constant alertness with full use of all of his senses and reasoning powers. Many OTC medications as well as most prescribed medications cause sedation, blurred vision, disruptions of vestibular function, etc. Often the condition for which the medication is used is mild; however, it can produce very subtle effects which may also be detrimental in the flight environment. Just like the subtle deterioration of cognitive ability that occurs with hypoxia and alcohol intoxication, medication effects may not be appreciated by the individual taking the medicine. These effects may have disastrous results in situations requiring full alertness and rapid reflexes.

## CLASS 2A: NO WAIVER ACTION REQUIRED

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Certain medications, available by prescription only, have proven to be quite safe in the aviation environment. These medications, when dispensed and their usage monitored by flight surgeons, have been quite effective in returning aviators more rapidly to their respective flying positions. While generally safe, one still must take into consideration the underlying medical condition and the ever present possibility of side effects.

**WAIVERS:** No waiver is usually required, especially if the medications are used on a short term basis. Occasionally the underlying health condition requires a waiver; and if the medication is required on a frequent or maintenance basis, a waiver may also be needed.

### **ANTIHISTAMINES:**

FEXOFENADINE (Allegra) - If used for chronic or recurrent allergic rhinitis, a waiver is required. (See Class 3) Short term use is permissible without waiver. All other anti- histamines are grounding (See Class 4). DESLORATIDINE (Claritin) - Class 2A (No waiver action required) for use less than 30 days per year and is Class 3 Chronic use requiring waiver for chronic or recurrent use.

### **ANTIMICROBIALS, ANTIFUNGALS, ANTIVIRALS:**

ACYCLOVIR (Zovirax) VALCYCLOVIR (Valtrex), FAMCYCLOVIR (Famvir), AUGMENTIN (Amoxicillin), BACTRIM/SEPTRA, CEPHALOSPORINS, CHLOROQUINE (Aralen) or CHLOROQUINE/PRIMAQUINE, CLINDAMYCIN (remember Pseudomembranous colitis), ERYTHROMYCINS to include Azithromycin and Clarithromycin, ETHAMBUTOL HYDROCHLORIDE (Myambutol) (monitor serum uric acid during treatment), FLUCONAZOLE (Diflucan), METRONIDAZOLE (Flagyl), NITROFURANTOIN (Macrodantin) (watch for pneumonitis or peripheral neuropathy), PENICILLINS, QUINOLONES (many potential drug interactions), RIFAMPIN (Rifadin), TETRACYCLINES, DOXYCYCLINE (Vibramycin) for prophylaxis - includes malaria or leptospirosis [(MINOCYCLINE (Minocin) is Class 4. Many potential drug interactions.)] Short term use does not require a waiver. A minimum of 24 hours of observation to ensure the lack of side effects and the overall general health of the aviator should be considered prior to return to flight status. For long term use refer to Class 2B.

### **ANTI-MOTION SICKNESS AGENTS:**

PROMETHAZINE/EPHEDRINE, or SCOPOLAMINE/DEXTROAMPHETAMINE (alternative, monitor intraocular pressure), or Transderm Scopolamine (alternative, monitor intraocular pressure and wash hands after application). When used in accordance with approved Motion Sickness Protocols (See Motion Sickness APL). Other use is disqualifying. (See Class 4).

### **GI MEDICATIONS:**

CALCIUM POLYCARBOPHIL (FiberCon), LOPERAMIDE (Imodium) (when medical condition is not a factor and free of side effects for 24 hours), SUCRALFATE (Carafate) (providing underlying condition does not require waiver.) Other medications are Class 1or Class 3.

### **HORMONAL PREPARATIONS:**

ESTROGEN/PROGESTERONE preparations when used solely for contraception or replacement following menopause or hysterectomy. (Class 3 for other conditions). No other information required. Other hormonal drugs are Class 3.

**PRE-DEPLOYMENT REST OR SUSTAINED OPERATIONS AGENTS:** See Pre-Deployment Rest Or Sustained Operations Agents APL

**PROPHYLAXIS:** Class 2A when used for prophylaxis. Must be prescribed by a flight surgeon or under a protocol reviewed by the flight surgeon.

**Abstinence Assistance:** Following Track II or III treatment for alcohol abuse/dependence, DISULFIRAM (Antabuse) may be continued for up to 1 year as a Class 2A medication. All other components of an alcohol abuse/dependence waiver must also be completed. Use of DISULFIRAM requires documentation of LFTs, every 6 months while on therapy. Additionally, a baseline LFT must be obtained prior to initiating therapy. VHA/DOD guidelines recommend monitoring monthly for the first three months of therapy and then every 3 months thereafter for the first year. This is left to the discretion of the flight surgeon.

**Diarrheal Prophylaxis:** In general (especially when periods of risk exceed 3 weeks) early treatment is preferable to prophylaxis. CIPROFLOXACIN (Cipro) 500 mg q.d., or BISMUTH SUBSALICYLATE 2 tablets q.i.d., or TRIMETHOPRIM/SULFAMETHOXAZONE DS (Bactrim DS) 1 tablet q.d. are acceptable forms of prophylaxis. Local resistance specific drug regimens may also limit the effectiveness of antibiotic prophylaxis.

**Leptospirosis Prophylaxis:** DOXYCYCLINE 200 mg weekly during and one week following exposure.

**Malarial Prophylaxis:** CHLOROQUINE PHOSPHATE 500 mg weekly or DOXYCYCLINE (Vibramycin) 100 mg daily. PRIMAQUINE PHOSPHATE 26.3 mg daily for 14 days is required for terminal prophylaxis after leaving areas where P.Vivax and/or P.Ovale are present. SULFADOXINE/PYRIMETHAMINE is a treatment medication, not prophylaxis, and cannot be used without temporarily grounding the aviator. MEFLOQUINE 250 mg weekly may be used ONLY when CHLOROQUINE resistance is known and DOXYCYCLINE is contraindicated due to allergy and only when monitored closely by a flight surgeon. (Note: Recommendations for malarial prophylaxis change frequently due to the variability of susceptibility of the organism to treatment. Prior to deployment to an endemic area the latest recommendations should be obtained using such sources as the Armed Forces Medical Intelligence Center (AFMIC), Fort Detrick at 1-301-619-7574 (DSN 343) or <http://mic.afmic.detrick.army.mil>; or the Center for Disease Control (CDC) at Traveler's Hotline 1-877-394-8747; or at [www.cdc.gov](http://www.cdc.gov) or at the US Army Center for Health Promotion and Preventive Medicine at <http://chppm-www.apgea.army.mil> (See Malaria policy letter)

**Subacute Bacterial Endocarditis Prophylaxis:** Penicillin, Amoxicillin, Ampicillin, Clindamycin, Azithromycin, Clarithromycin, or Cephalosporins may be used in appropriate doses and when indicated. (See Prevention of Bacterial Endocarditis. Recommendations by the American Heart Association. JAMA 1997; 277 (22): 1794-801.)

**Tuberculosis Prophylaxis:** After documentation of skin test conversion, a course of PYRIDOXINE (Vitamin B6) 50 mg daily with ISONIAZID is an acceptable prophylaxis, unless INH resistance is likely. The treated aviator must also be followed in a Tuberculosis Surveillance Program. See Antimicrobials, Antifungals and Antivirals for documentation of use of ISONIAZID.

#### **SMOKING CESSATION AIDS:**

NICOTINE GUM, NICOTINE PATCH, NICOTINE INHALER (Use of any tobacco with initial patch may cause nicotine toxicity). Must be enrolled in a smoking cessation program, under supervision by the program director or designated representative, and remain abstinent from any tobacco use. Requires initial grounding of 72 hours and if tolerating treatment well, may be returned to

flying duty. Effectiveness of smoking cessation aids without participation in an ongoing support program is minimal to ineffective. (See Smoking Cessation APL)  
ZYBAN: See Smoking Cessation APL.

#### **TOPICAL PREPARATIONS:**

Topical preparations are generally Class 2A due to the minimal systemic absorption of most topical treatments. Remember that the underlying condition may require a waiver. Use of any topical preparation does require evaluation for systemic effects.

TOPICAL MINOXIDIL 2% & 5% for use in male pattern hair loss is Class 2A.

## CLASS 2B: INFORMATION ONLY , CHRONIC USE

Update: JAN 2002

**AEROMEDICAL CONCERNS:** This classification of drugs still requires a prescription and is used under the supervision of the flight surgeon. Unlike Class 2A, they are often employed for chronic long term use and more likely to be used for underlying medical conditions which require a waiver. They also have greater potential for side effects, so all must have a period of observation of at least 24 hours.

**WAIVERS:** Use of these drugs requires they be coded for Information Only. No waiver is required unless the underlying medical condition necessitates it.

**INFORMATION REQUIRED:** All drugs in this Class require comment on dosage and usage. They may also require other periodic follow-up specifically indicated for each drug (see below).

**ALLERGIC RHINITIS AGENTS:** (See Allergic/Nonallergic Rhinitis APL)

**Intranasal Steroids** – Dexamethasone (Dexacort), Flunisolide (Nasarel or Nasalide), Beclomethasone (Beconase, Beconase AQ, Vancenase, Vancenase AQ DS), Budesonide (Rhinocort), and Triamcinolone (Nasacort or Nasacort AQ), Fluticasone (Flonase), and Mometasone (Nasonex). This is the recommended first line treatment for moderate disease.

**Intranasal Anticholinergics - Ipatropium bromide** (Atrovent) 0.03% nasal spray is effective when rhinorrhea is the predominant symptom. It is not very helpful for relieving congestion, itchy watery eyes or sneezing.

**Cromolyn sodium (Nasalcrom)**- This is effective, but requires frequent (qid) dosing.

**ANTI-HYPERLIPIDEMICS:** (See Hyperlipidemia/Hypercholesterolemia APL)

**HMG CoA Reductase Inhibitors (Statins):** LOVASTATIN, PRAVASTATIN, SIMVASTATIN, ATROVASTATIN, and FLUVASTATIN. [Liver Function tests (LFTs) 6- 12 weeks after the start of therapy and then every 6 months thereafter, CPK every 6 months and Lipid profile every 6 months].

**Ferric Acids:** GEMFIBROZIL, FENOFIBRATE. Prior to initiating treatment and at 3, 6, and 9 months, then annually, do LFTs to include bilirubin and LDH, CPK, CBC and complete Lipid Profile. (Hypersensitivity, hepatic dysfunction, dizziness, depression and blurred vision have been reported).

**Bile-Acid Binding Resins:** CHOLESTYRAMINE, COLESTIPOL. Submit prothrombin time and serum calcium annually. (These drugs cause constipation and interact with such drugs as hydrochlorothiazide, penicillin and tetracycline. Additionally, they may cause Vitamin K deficiency and subsequent hypoprothrombinemia).

**Nicotinic Acid:** NIACIN, NIASPAN. Serum glucose and uric acid every 6 months. LFTs every 6-12 weeks for the first year and then every 6 months thereafter.

### ANTIMICROBIALS, ANTIFUNGALS, AND ANTIVIRALS:

Chronic use of all antibiotics fit within this classification. Use of Antifungals or Antivirals (Amantadine) require annual reporting of AST (SGOT), ALT (SGPT), Alkaline Phosphatase, Total Bilirubin, BUN, Creatine, and CBC on FDME. Abnormal values require flight surgeon comments. Pulse antifungal therapy for onychomycosis requires baseline LFTs and a recheck 6 weeks after start of therapy.

### NON-STEROIDAL ANTI-INFLAMMATORY AGENTS:

Chronic use of any NSAID requires a measurement of BUN and Creatinine to be completed every 6 months with a single set completed within the previous 90 days submitted with each annual FDME. Additionally, stool for occult blood must be completed annually and documented on the annual FDME. Persistent upper GI complaints necessitate grounding and upper GI evaluation for possible GI toxicity.

**Acetic acids:** Diclofenac (Voltaren), Indomethacin (Indocin), Sulindac (Clinoril), Tolmentin (Tolectin)

**Fenamates:** Meclofenamate, Mefenamic acid (Ponstel)

**Naphthylalkanones:** Nambumetone (Relafen) Oxicams: Piroxicam (Feldene), Meloxicam (Mobic)

**Propionic acids:** Fenoprofen (Nalfon), Flurbiprofen (Ansaid), Ibuprofen (Motrin), Ketoprofen  
(Orudis; Oruvail),

Naproxen (Naprosyn; Anaprox), Oxaprozin (Daypro)

**Pyranocarboxylic acid:** Etodolac (Lodine)

**Pyrrolizine carboxylic acid:** Ketorolac (Toradol)

## OTHER:

**Finasteride (Propecia):** when used for hair loss; other usage is categorized as Class 3 medication.

**Sildenafil (Viagra):** Individuals using this preparation are restricted from flying duties for 12 hours after use.

### NOTE

- As with all medications in this class there is a greater risk for side effects so a 24 hour period of grounding and observation is required with the first dose. After this observation period, the aircrew may be returned to full flying duties after followup with the FS/APA.
- The FS/APA should be aware of the short-term visual disturbances that can occur in up to 5% of those using this medication. These visual disturbances include blue/green discrepancy, increased brightness of lights, and halos. Visual disturbances tend to occur at peak levels (1.5 hrs after use) and are not usually persistent. Individuals should be questioned about visual changes and referred to an eye care specialist for persistent abnormalities.
- An information only note must be included in the FDME/FDHS detailing the reason for use and the completion of an evaluation for causes of erectile dysfunction. (e.g. after therapy for prostate cancer, medication side effects, drug or alcohol abuse, diabetes mellitus, hypertension, psychogenic factors, or hormonal problems including hypo/hyperthyroidism, hypogonadism and hyperprolactinemia, etc.).

## CLASS 3: CHRONIC USE REQUIRING WAIVER

Update: JAN 2002

**AEROMEDICAL CONCERNS:** These medications are generally given for treatment of underlying conditions which require a waiver, may have significant side effects, or require significant evaluations as follow-up for safe use.

**WAIVERS:** May receive favorable waiver recommendation only on an individual basis for treatment or control of certain chronic conditions. The underlying disease process may also require a waiver. Other medications may be waivable upon complete presentation to ACAP but often require extensive evaluation before approval.

**INFORMATION REQUIRED:** Complete AMS with full details of drug use and underlying condition is required. Specific requirements are given under each drug or drug category listed below. Other requirements as dictated by the underlying medical condition may also be added at the discretion of the Consultant, Aeromedical Activity.

**ALLERGIC RHINITIS AGENTS:** (See Allergic/Nonallergic Rhinitis APL) When used chronically and recurrently for allergic rhinitis, they are considered Class 3.

**Antihistamines:** Fexofenadine (Allegra), and Loratadine (Claritin), (all other antihistamines are Class 4 [non-waiverable] this includes Cetirizine (Zyrtec)).

**Desloratadine (Claritinex)** - Class 2A (No waiver action required) for use less than 30 days per year and is Class 3 Chronic use requiring waiver for chronic or recurrent use.

**ANTIHYPERTENSIVES:** (See Hypertension APL) Waivers are recommended for medication class, not individual medications. Use of any of these drugs requires a 3 day (6 readings) blood pressure check and laboratory values as indicated for each medication class. A current (within 90 days) set of laboratory results is required on the annual FDME.

**Ace Inhibitors:** CAPTOPRIL (Capoten), ENALAPRIL (Vasotec), LISINOPRIL (Zestril), BENAZEPRIL (Lotensin), FOSINOPRIL (Monopril), QUINAPRIL (Accupril), RAMIPRIL (Altace), TRANDOLOPRIL (Mavik), MOEXIPRIL (Univasc). Required labs: Chem -7 in first 7 to 10 days of therapy to evaluate effect on BUN, creatinine and Potassium levels and then this will be required every 3 months for the first year of therapy, followed by annual reporting of these levels on FDME.

**Angiotensin II Receptor Blockers:** LOSARTAN (Cozaar), Valsartan (Diovan), Irbesartan (Avapro), Candasartan (Atacand). ACE and ARB II in Combination with approved diuretics may be used.

**Alpha Blockers:** PRAZOSIN (Minipress), DOXAZOSIN (Cardura), TERAZOSIN (Hytrin).

**Beta Blockers:** ATC PERSONNEL ONLY- ATENOLOL (Tenormin), METOPROLOL (Lopresor), PROPRANOLOL (Inderal). These are considered Class 4 medication for all other aircrew.

**Calcium Channel Blockers:** AMLODIPINE (Norvasc) can be used with waiver in any aircrew member. ATC PERSONNEL ONLY - VERAPAMIL (Calan), NIFEDIPINE (Procardia), DILTIAZEM (Catapres). These are considered Class 4 medications for all other aircrew.

**Clonidine: ATC PERSONNEL ONLY** – This is considered Class 4 medication for all other aviation classes.

**Diuretics:** Thiazide, Potassium-sparing, and combinations. All LOOP DIURETICS are Class 4 medications and will not be waived. Required labs: Thiazide use requires annual serum glucose, BUN, creatinine, and serum uric acid. Thiazides may alter serum cholesterol and triglycerides; therefore, monitor lipid profile after 6 months of therapy

and then annually. Use of any potassium sparing diuretic requires serum potassium level every 6 months. TRIAMTERENE (Dyrenium) requires platelet count and CBC with differential every 6 months.

**ANTI-INTRAOCULAR HYPERTENSION/GLAUCOMA AGENTS:** (See Glaucoma APL)

Acetazolamide (Diamox): Must be free of side effects for 48 hours before resuming flying duties. Check for alterations in potassium and uric acid early in the treatment program. Must submit CBC, platelet count, and serum electrolytes with annual FDME. Betaxolol (Kerlone), Dipiverin (Propine), Levobunolol (Betagan), Timolol Maleate (Timoptic), Dorzolamide (Trusopt), Latanoprost (Xalatan).

**GI MEDICATIONS:**

All antacids (chronic use) and medications listed below are Class 3 except as noted. No additional requirements for a waiver other than the complete evaluation of the underlying condition and documentation of medication efficacy.

**Antacids:** Chronic use is Class 3. Occasional or infrequent use is Class 1. Check electrolytes when used chronically.

**H2 Blockers:** CIMETIDINE (Tagamet), RANITIDINE (Zantac), FAMOTIDINE (Pepcid), NIZATIDINE (Axit). Occasional drowsiness is associated with these medications. When treatment is first initiated, a 72-hour observation while the aviator is DNIF is required to ensure the absence of any significant side effect.

**Proton Pump Inhibitor:** Omeprazole (Prilosec), Lansoprazole (Prevacid), Pantoprazole (Protonix), Rabeprazole (Acifex), and Esomeprazole (Nexium).

**Pepto Bismol:** Class 2A for diarrheal prophylaxis.

**Loperamide (Imodium):** Class 2A for treatment of minor diarrhea if medical condition is not a factor and no side effects for 24 hours.

**Motility Enhancing Agents:** Class 4, not waivable. METOCLOPRAMIDE (Reglan).

**Sucralfate (Carafate):** Class 2A provided underlying condition does not require waiver.

**HORMONAL PREPARATIONS:** Class 3 medications unless specified otherwise below. Chronic use of any systemic steroid requires monitoring of liver functions every 6 months for the first year and annually thereafter. Lipid profile required annually for systemic steroids. Report on annual FDME.

**Clomiphene Citrate:** (Clomid) Documentation of infertility evaluation required. Must be free of side effects for 24 hours before resuming any aviation duties. See systemic steroid requirement.

**Estrogen/Progestin Preparations:** Class 2A medication when used solely for contraception or hormonal replacement following menopause or hysterectomy. Class 3 when used for any other condition. See systemic steroid requirements above.

**Finasteride (Proscar):** See systemic steroid requirements above. Document improvement in both objective and subjective signs for hyperplasia on annual FDME. Document annual digital rectal exam on FDME.

**Intranasal Steroid Preparations:** (See Class 2A Agents APL)

**Orally Inhaled Steroid Preparations:** BECLOMETHASONE (Vanceril, QVAR), FLUNISOLIDE (AeroBid, AeroBid-M), FLUTICASONE (Flovent), TRIAMCINOLONE (Azmacort), and Budesonide(Rhinocort) inhalers may be approved. Full aeromedical summary with justification for use required.

**Testosterone:** DITATE, TESTAVAL have been approved. See systemic steroids for requirements. Full aeromedical summary with justification for use is required.

**Thyroid Preparations:** LEVOTHYROIDINE (Synthroid, Unithyroid, Levoxyl) is an acceptable treatment. Requires annual submission of complete thyroid function and ophthalmology evaluation.

**MISCELLANEOUS AGENTS/TREATMENTS:** Class 3 medications unless otherwise indicated. Appropriate medical evaluation is required. Waivers have been granted for each of the following agents under the appropriate circumstances and conditions.

- Allopurinol:** Annual CBC, BUN, creatinine, serum calcium and uric acid required with FDME.
- B12 Injections:** Annual CBC with indices, serum folic acid, and reticulocyte count required with FDME.
- Botulinum Toxin**
- Desensitization Therapy/Injections:** must be grounded for 12 hours (See AR 40-8 ).
- Folic Acid:** Annual CBC with indices.
- Hydroxychloroquine sulfate:** CBC, complete neuromuscular examination, and complete ophthalmologic exam are required on annual FDME.
- Iron Supplements:** Monitor and report serum ferritin and serum iron concentrations. Also report reticulocyte count and total iron binding capacity with annual FDME.
- KCL Supplements:** Annual ECG, serum potassium, BUN, creatinine, and serum magnesium required with FDME.
- Metformin (Glucophage):** Waiverable for class 2F, 3, and 4. (See Diabetes APL)
- Mesalamine (Rowasa, Asacol, Pentasa):** BUN, creatinine, and urinalysis required annually with FDME. Proctoscopy and/or sigmoidoscopy as indicated.
- Beta 2 Agonists:** Metaproterenol (Alupent), Terbutaline (Brethaire), Albuterol (Proventil;Ventolin), Salmeterol (Sereve nt), Bitolterol (Tornalate), Pibuterol (Maxair), Isoproterenol (Isuprel), and Fromoterol (Foradil). Inhaled use only. Waivered only on a case-by-case basis. Monitor PFTs.
- Olsalazine (Dipentum):** CBC required every 6 months. BUN, serum creatinine, and urinalysis required annually with FDME. Proctoscopy and/or sigmoidoscopy as medically indicated.
- Pentoxifylline (Trental)**
- Probenecid (Benemid):** Serum uric acid, 24-hour urinary uric acid, BUN, and creatinine clearance are required with annual FDME.
- Propylthiouracil (Propyl-Thyiacil):** CBC and thyroid function test (TFT) are required annually.
- Sulfasalazine (Azulfidine):** CBC required every 6 months. Proctoscopy and/or sigmoidoscopy as medically indicated.

## CLASS 4: MANDATORY DISQUALIFYING MEDICATIONS

Update: JAN 2002

**AEROMEDICAL CONCERNS:** Use of certain medications is strictly contraindicated in the aviation environment due to significant side effects. The underlying cause or need for use of these medications may result in a permanent disqualification or require a waiver for return to flying duty.

**WAIVERS:** A period of continuous grounding is mandatory (AR 40-8 , Temporary Flying Restrictions Due to Exogenous Factors, paragraph 4a, August 1976) from the initiation of therapy through cessation of these drugs plus a specified time period to rid the drug completely from the body (usually at least three half lives). Continuous use of these medications is incompatible with continuation of aviation status. Waiver is not recommended.

**ALCOHOL:** Requires 12 hours of flight restriction following termination of use with no residual effects.

**NON-ALCOHOLIC BEER:** Require 12 hours of flight restriction following termination of use with no residual effects.

**ANABOLIC STEROIDS:** Waiver is not recommended.

**ANTI-ARRHYTHMICS:** Waiver is not recommended.

**ANTI-DEPRESSANTS:** Waiver is not recommended.

**ANTI-MIGRAINE AGENTS:** Waiver is not recommended.

**ANTI-MOTION SICKNESS AGENTS:** Temporary use is approved when used in accordance with approved Motion Sickness Protocol. Chronic use is not waivable.

**ANTI-PSYCHOTICS:** Waiver is not recommended.

**ANTI-VERTIGO AGENTS:** Waiver is not recommended.

**ANTI-CONVULSIVES:** Waiver is not recommended.

**ANTI-HISTAMINES:** Cetirizine (Zyrtec). Waiver is not recommended for this medication; see other medication policy letters and Allergic/Nonallergic Rhinitis APL for acceptable medications.

**BETA BLOCKERS:** Waivable (Class 3) for ATC personnel. Waiver is not recommended for all other classes.

**BARBITURATES, MOOD AMELIORATING, TRANQUILIZING, OR ATARAXIC DRUGS:** Requires 72 hour flight restriction following termination of treatment. The half- life of Phenobarbital is 2-5 days. Waiver is not recommended.

**CALCIUM CHANNEL BLOCKERS:** Waivable (Class 3) for ATC personnel. Waiver is not recommended for all other classes with exception of Norvasc which may be approved for all other classes.

**CLONIDINE:** Waivable (Class 3) for ATC personnel. Waiver is not recommended for all other classes.

**COUGH PREPARATIONS WITH DEXTROMETHORPHAN, CODEINE, OR OTHER CODEINE-RELATED ANALOGS:** Require 24 hours of flight restriction following termination of treatment.

**DEA SCHEDULED MEDICATIONS:** Waiver is not recommended.

**DIET AIDS:** Waiver is not recommended.

**HYPOGLYCEMIC AGENTS:** Chlorpropamide (Diabinese), Glipizide (Glucotrol, Glucotrol XL), Glyburide (Micronase, Diabeta, Glynase), Tolbutamide (Orinase), Tolazimide (Tolinase), Acetohexamide (Dymelor), Glimepiride (Amaryl). All of these agents are waivable (Class 3) for Classes 2F, 3, and 4. Waiver is not recommended for all other classes.

**HYPNOTICS:** Waiver is not recommended. Temazepam (Restoril), Zolpidem (Ambien), Zaleplon (Sonata), and Triazolam (Halcion) may be used for pre-deployment rest only. This is not approved for manipulation of work/rest cycle or as a sleep aide during normal operations.

**INSULIN:** Waiver is not recommended.

**ISOTRETINOIN:** (Accutane) Waiver is not recommended.

**MINOCYCLINE:** (Minocin) Waiver is not recommended.

**MOTILITY ENHANCING AGENTS:** Metoclopramide (Reglan), Waiver is not recommended.

**NARCOTICS:** Waiver is not recommended.

**QUININE, BITTERS, TONIC WATER:** Requires 72 hour flight restriction following termination of treatment when these formulations are used for medical conditions. Ingestion of tonic water or bitters on an infrequent basis does not require flight restriction.

**LOOP DIURETICS:** Waiver is not recommended.

**SLEEPING AIDS:** Requires 24 hours of restriction after use. (See Predeployment drugs).

**SEROTONIN (5HT) RECEPTOR AGONISTS:** SUMATRIPTAN (Imitrex), NARATRIPTAN (Amerge), RIZATRIPTAN (Maxalt; Maxalt-MLT), ZOMITRIPTAN (Zomig; Zomig ZMT), Almotriptan (Axert). Requires 12 hours of flight restriction following termination of treatment.

**TRANQUILIZERS:** Waiver is not recommended

## HERBALS and DIETARY SUPPLEMENTS

Update: SEP 2005

**AEROMEDICAL CONCERNS:** Recent surveys in the United States reveal that 69 percent of those surveyed use some form of complementary or alternative medicine. This undoubtedly affects Army aircrew. Some dietary supplements have clear benefits, some have uncertain benefits, and others are unsafe especially if taken in combination with medication or in certain work environments. The short term effects of some of these preparations are dangerous and use can result in sudden incapacitation in flight. The long term effects of many of these unregulated preparations are unclear and have not been studied to any degree in the aeromedical environment. Ascertaining the use of dietary supplements is an important aircrew safety issue. Aeromedical health care providers (FS/APA) need to research and provide information and education on dietary supplements to all aircrew. This aeromedical policy is to outline those products which may be viewed as nonharmful in limited doses and can be used in the aeromedical environment with the knowledge and monitoring of the FS/APA.

Any preparation not clearly permitted for use per this policy is not authorized for flight without clearance from USAAMA.

**WAIVERS:** The majority of herbal and dietary preparations are prohibited for aviation duty as many are used in cases of self-diagnosis and self-treatment. In many cases, studies do not reveal significant clinical efficacy. Any herbal and dietary supplements being used will be entered on the FDME/FDHS. Herbal and dietary supplements are designated Class 1, 2, or 3.

**Class 1:** Individual aircrew may use the following supplements without prior approval of a flight surgeon. Any use, whether periodic or regular, must be reported on the annual FDME/FDHS:

- Single multivitamin/mineral tablet per day
- Vitamins C, E, B6, B12 (oral)
- Calcium
- Folate
- Protein supplementation to include shakes, capsules, and nutritional bars, but they may only contain additives specifically approved as Class 1.
- Sports drinks which contain a mixture of carbohydrates, vitamins, and minerals and without creatine, ephedra, herbal supplements

**Class 2:** Individual aircrew may use the following supplements with prior approval of a flight surgeon. Any use, whether periodic or regular, or as part of beverages or other supplement combinations must be reported on the annual FDME/FDHS:

(NOTE: With use of these supplements by aircrew, the FS/APA needs to be concerned not only with the use and potential side effects of the supplement, but also with the underlying medical condition that the individual is treating.)

- Vitamins A, K, D, Niacin, Riboflavin, Thiamine
- Magnesium, Zinc, Chromium, Selenium, Copper
- Glucosamine with or without Chondroitin
- Echinacea for short term (less than two weeks) use
- Saw Palmetto
- Creatine
- Ginseng- this preparation is prohibited 24 hours before flight

**Class 3:** All other preparations not specifically listed above are currently disqualifying for flight duties without review by the FS/APA and concurrence with USAAMA. Again, it may not be the actual herbal or supplement, but the underlying condition that is of aeromedical concern. Waivers may be applied for on a

case-by-case basis with an accompanying AMS discussing the underlying condition of concern and aspects of herbal/supplemental therapy.

**INFORMATION REQUIRED:** All aircrew and those applying for any form of aviation or aeromedical training will report the use of any form of dietary supplement to their FS/APA. The presence or absence of side effects should be noted.

**FOLLOW-UP:** Use of any form of dietary supplement will be addressed at each visit with the FS/APA to include the annual FDME/FDHS. Any side effects of use must be documented.

**TREATMENT:** The individual aircrew may be using these preparations for self-medication and should be carefully screened with regard to underlying medical problems.

FS/APA must educate themselves on the indications, use, and side effects of the preparations used by their aircrew. Use the references below to obtain information to assist in monitoring aircrew health.

**REFERENCE:** In this rapidly evolving area, check with your medical librarian for current references. Available internet references on this topic:

<http://www.brooks.af.mil/web/af/altmed/HOMEFRAME.htm>

<http://ncca.nih.gov> - National Center for Complementary and Alternative Medicine also at 1-888-644-6226

<http://dietary-supplements.info.nih.gov/> Office of Dietary Supplements, National Institutes of Health also at 1-301-435-2920

<http://www.cfsan.fda.gov/~dms/supplmnt.html> Food and Drug Administration

## **PRE-DEPLOYMENT REST OR SUSTAINED OPERATIONS AGENTS (Medication Class 2A)**

Update: FEB 2003

**AEROMEDICAL CONCERNS:** Continuous and sustained operations are based on the premise that the enemy's systems (logistic, materiel and human) can be fatigued to failure faster than friendly systems. Army doctrine places fatigue and fatigue countermeasures under the purview of the operational commander. The flight surgeon's role is as advisor to the commander in developing and monitoring unit crew rest policy (AR 385-95) in accordance with published policy.

Fatigue is a state of feeling drowsy or sleepy resulting from a number of factors to include prolonged mental or physical work, exposure to harsh environments, extended periods of anxiety, loss of sleep, or monotonous tasks. All of these may be present in the aviation operational environment. Fatigue interrupts attention and causes slow and inaccurate performance, with a greater tolerance for error on the part of the individual. Lapses of attention and failure of crew coordination stemming from fatigue has been shown to cause mishaps in the high task load environment of the cockpit.

Acute or Chronic fatigue in sustained or continuous Army flight operations is expected and can lead to poor flight performance and increased safety risks. A vigorous program emphasizing non-pharmacological measures to optimize crew rest per the guidelines in AR 95-1, Flight Regulations, Table 3-1, September 1997 and incorporating guidelines in the references below is necessary to ensure aeromedical readiness and is the primary means to combat aircrew fatigue.

The administration of rest agents to assist in circadian cycling and ensure adequate sleep or stimulant agents for continued mission execution in sustained operations is an additional measure to consider to manage fatigue and maintain aircrew performance after non-pharmacological measures have been considered and deemed inadequate.

**WAIVERS:** No waiver is required. Use must be on a short-term basis. Stimulant or rest agents should only be in combat or during exceptional ("fly or die") circumstances of operational necessity. Use of these agents and medication accountability must be under the direct supervision of the flight surgeon and must be authorized by the local commander.

**INFORMATION REQUIRED:** Guideline for Administration. (See Below)

**FOLLOW-UP:** The unit flight surgeon must rigorously monitor and document use of these agents for any adverse medication effects and for strict administration/dosage accountability.

**TREATMENT:** Administering a test dose (ground testing) and monitoring for adverse effects assures safe use of these interventions. Anyone with suspicious symptoms (e.g. palpitations, headache, dizziness, mood disturbance, etc.) should be immediately grounded until symptom resolution. Use of these agents should be under the direct supervision of the supporting flight surgeon following pre-established guidelines approved by brigade level or higher.

**REST AGENTS:** Class 2A (No waiver action required) when prescribed and closely monitored by the unit flight surgeon. Do not mix with alcohol.

- TEMAZEPAM (Restoril) – Indicated for long duration rest due to long half-life (12 hours). May perform crew duties 24 hours after administration.

- TRIAZOLAM (Halcion) - May perform crew duties 9 hours after use. (NOTE: Memory loss with associated alcohol use and night terrors have been reported)
- ZOLPIDEM (Ambien) or ZALEPLON (Sonata) – Indicated for short duration rest due to short (2.5 hour) half-life. May perform crew duties 8 hours after use.

**STIMULANTS:** Class 2A when used in support of sustained operations.

- DEXEDRINE: May use in dosages of 5mg or 10mg not to exceed 30mg in 24hour period. May not use to prevent sleep for longer than 64 continuous hours. Be aware of the after effects of sustained use of stimulants due to its long half-life of 10.25 hours. For example, aviators have required two 8-hour night sleep periods following 64 hours of continuous wakefulness using Dexedrine to recover near normal sleep architecture.

**DISCUSSION:** A recommended guideline for Flight Surgeon administration of these agents:

- Ground testing must be completed prior to operational use of dextro-amphetamine (Dexedrine) or temazepam (Restoril), triazolam (Halcion), zolpidem (Ambien), or zaleplon (Sonata). No flying will be done the day of the pretest (24 hour DNIF period). An entry will be made in the medical record documenting conduct of the pretest, medications administered, and any side effects. All involved crew should sign an informed consent form to be kept in the medical record.
- Fully brief all aircrew and supervisors on the proper use of the medication and possible side effects. (See references below)
- Ensure the line commander has authorized use of the medication. It is essential that the administering FS/APA ground tests or employs these medications in consultation with the next higher medical authority in the chain-of-command.
- Issue the stimulant in amounts for one flight and document with an entry in the medical record. Aircrew are not authorized to carry additional doses of sedative. Sedatives will not be carried in the aircraft to preclude inadvertent use during flight operations. A check to ensure aircrew are not carrying sedatives in flight must be part of safety, mission, and pre-flight briefings during use of these agents.
- Collect unused medication at the end of continuous operations.
- It is a flight surgeon responsibility to monitor medication use and levels of aircrew fatigue during daily interactions with aircrew (AR 385-95). Screen for unauthorized use and possible interactions with over-the-counter or other prescription medications.

**REFERENCE:**

Leader's Guide to Crew Endurance, USAARL and USASC, August 1997

Performance Maintenance During Continuous Flight Operations: A Guide for Flight Surgeons, NAVMED P-6410, January 2000

[AR 95-1, Flight Regulations](#), September 1997

[AR 385-95, Army Aviation Accident Prevention](#), December 1999

[AR 40-3, Medical, Dental and Veterinary Care](#), November 2002

The Efficacy of Amphetamines for 64 Hours of Sustained Operations, J Caldwell, PhD, NATO RTO Human Factors- Medicine Workshop



## MISCELLANEOUS WAIVERS

## ALLERGIC REACTIONS TO INSECT BITES OR STINGS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Anaphylactic reactions to insect bites or stings may cause symptoms ranging from just mild local reactions to more severe reactions, i.e., generalized hives, angioedema, shortness of breath, wheezing, cardiac arrhythmias, and even death. Acute anaphylactic reactions may cause significant incapacitation within as little as 3 - 5 minutes. Although avoidance procedures and the availability of personal anaphylactic kits help to minimize the possibility of an acute reaction, deployment to field sites may place such individuals in significant jeopardy of health and cause mission delay or even mission failure.

**WAIVERS:** Any history of generalized allergic reaction is disqualifying and requires waiver action. Waiver recommendations primarily rest upon the severity of previous reactions coupled with the inherent risk of re-exposure. Immunotherapy is waivable, when asymptomatic, and is also the preferred means of therapy for severe reactions. Initial flight applicants will only be recommended for exception to policy when they have completed a course of desensitization and have no reaction to a challenge dose.

### INFORMATION REQUIRED:

- A thorough summary of all allergy history and symptoms along with
- Allergy consultation are required.
- Medical records of previous treatments may also be required.

**FOLLOW-UP:** None required unless an anaphylactic reaction recurs.

**TREATMENT:** Avoidance procedure and anaphylactic treatment kits, when immediately available, may be waived for those individuals with mild generalized allergic reactions. Desensitization therapy may also be waived.

**DISCUSSION:** Following an initial anaphylactic reaction to an insect sting, the likelihood of a second anaphylactic reaction is 28 - 74 % (depending upon the study), and is unrelated to the time interval since the initial sting reaction. Traditional evaluations of susceptibility to allergic reactions, i.e., IgE, IgG4, skin venom tests are of little help in predicting the severity or likelihood of this second reaction. Too often the risk of a potentially lethal secondary reaction is minimized or completely ignored. Avoidance procedures and anaphylactic kits are generally of minimal benefit in severe anaphylactic reactions. Immunotherapy can reduce the risk of subsequent reaction from about 60% to less than 5%.

## ANTHROPOMETRY

Update: SEP 2004

**AEROMEDICAL CONCERNS:** Individuals with short sitting height may not be able to see over the instrument panel. With short leg length, they may be unable to apply the full range to the foot pedals with sufficient force. With short arm length they may be unable to reach crucial instruments or circuit breakers. Individuals with too long a sitting height often sit in hunched positions or must tilt their head forward to avoid the cabin ceiling; this reduces their range of vision, increases fatigue during long missions, and puts them at greater risk of significant spinal injury during heavy G-loading, e.g., ejection or crash. Excessive leg length, normally present in those with excessive sitting height, may interfere with full range of motion of the foot pedals and increased discomfort. Any combination of the above may exceed the optimal safety envelope developed during the aircraft's design and development as well as become uncomfortable enough to be distracting during flight.

### WAIVERS:

#### Initial Applicants (Class 1A/1W):

Exceptions to policy for initial flight applicants may be considered if a full cockpit evaluation has been conducted in IAW the established guidelines per the Directorate of Evaluation and Standard (DES), accepted and applied by USAAMA and USAAVNC, in all initial training (OH-58A/C, TH-67) and advanced rotary wing aircraft (OH-58D, UH-60, AH-64, CH-47). Exceptions may include specific aircraft restrictions.

#### Initial Applicants (Class 2):

Anthropometric measurements are taken and recorded in AEDR for flight surgeons, however, waivers are not necessary.

#### Initial Applicants (Class 3 and 4):

Require no anthropometric measurements.

#### Rated Aviation Personnel (Class 2):

Waivers for failure of anthropometric standards for rated personnel are usually recommended provided they have demonstrated full adaptation to the designated aircraft. Waivers may include specific aircraft restrictions.

### INFORMATION REQUIRED:

- Complete anthropometric measurements in centimeters with tenth of a centimeter accuracy are required in Block 73 of DD 2808. These may be repeated under the direct supervision of a flight surgeon.
- The average of three such measurements may be submitted for waiver action, if required. An aeromedical summary is required for anyone not meeting anthropometric standards.
- In cockpit evaluations of individuals are best performed in accordance with the Ft.Rucker established guidelines, as described below. A unit instructor pilot or standardization instructor pilot, with the flight surgeon may do the initial evaluation if the total arm reach is equal to or greater 159 cm. If the TAR is less than 159 cm the only accepted in-cockpit evaluation will be completed at Ft. Rucker. All evaluations will be conducted with ALSE vest and helmet. Written results of these evaluations should be submitted with the waiver request.
- Total arm reach less than 164CM-The person is evaluated in the pilot's station as well as the copilot's station to determine if they can safely reach all switches and flight controls and operate controls through full motion. Emphasis is placed on determining that the person can reach those switches and circuit breakers that are necessary for safe flight. This evaluation

must be completed in all Go to War Rotary Wing Aircraft (UH-60, CH-47, AH-64D and OH-58D).

- Total Leg Length (Crotch Height) of less than 75CM is evaluated as above.
- Sitting Height in excess of 95CM- The person is evaluated in the pilot's position of the OH-58A/C to determine if they can safely sit in the Aircraft and reach the flight controls while in a normal sitting position. Check for helmet contact on the overhead greenhouse and make sure the shins are not hitting the instrument panel with full pedal movements.
- The evaluations in the Go to War Aircraft are conducted with a SME of that aircraft when possible.
- After the evaluation is completed, the memo is sent (within the context of an Aeromedical Summary written by the flight surgeon) to the Army Aeromedical Activity with a recommendation for a waiver (or exception to policy) or no waiver (no exception to policy) of the linear anthropometrics standard.
- POC is DAC Jerry Bonham @ (334)255-3259

**FOLLOW-UP:** Additional in-cockpit evaluations are required before transition to new aircraft. Any failure of initial anthropometric in-cockpit evaluation must be re-evaluated at Ft. Rucker.

**DISCUSSION:** The cockpits of most aircraft are developed using measurements based upon a normal distribution curve. On several aircraft, the seating is either not adjustable or has limited adjustability, therefore making the distribution curve even narrower. As new anthropometric standards are developed for newer aircraft, modifications to existing standards will be developed.

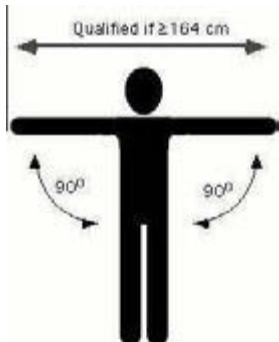
**Crotch Height (Leg Length)** - The subject must stand completely erect against a wall, heels together, weight evenly distributed, and knees locked. The measurement is taken parallel with the wall from the floor to a point where light contact is made with the perineum in the midline.

**Total Arm Reach** - The subject must stand erect against a wall, arms outstretched at a 90 degree angle and parallel with the wall. The elbows must be locked. The fingertips of one hand must be in contact with the adjacent wall in the corner of the room. The horizontal distance between fingertips is recorded.

**Sitting Height** - The subject must sit on a hard, flat surface, facing forward, feet flat on the floor, with buttocks, shoulders, and back of head against the wall. Using a right angle on the head, the distance between the sitting surface and the top of the head is recorded in centimeters.

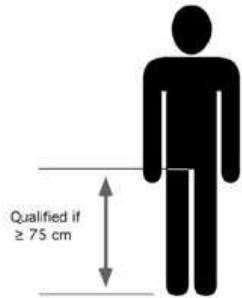
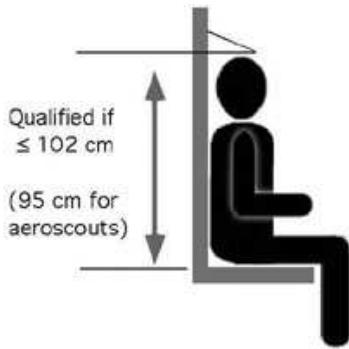
Measurement	Class 1/1A/2/2F	OH-58 Pilot or Aeroscout
	Qualified if:	Qualified if:
Crotch Height	$\geq 75.0$ cm	$\geq 75.0$ cm
Total Arm Reach	$\geq 164.0$ cm	$\geq 164.0$ cm
Sitting Height	$\leq 102.0$ cm	$\leq 95.0$ cm

## Anthropometric Diagrams



**TOTAL ARM REACH**—The aviator candidate must stand erect against a wall, arms outstretched at a 90 degree angle and parallel with the wall. The elbows must be locked with the fingertips of one hand in contact with the adjacent wall in a corner of that room. The horizontal distance between fingertips is recorded in centimeters.

**SITTING HEIGHT**—The aviator candidate must sit on a hard flat surface, facing outward, feet flat on the floor, with the buttocks, shoulders, and back of head against the wall. Using a straight angle ruler on the head, the distance between the sitting surface and the top of the head is recorded in centimeters.



**CROTCH HEIGHT**—The aviator candidate must stand completely erect against a wall in bare feet, heels together, weight evenly distributed, and knees locked. The measurement is taken parallel with the wall from the floor to a point where light contact is made with the perineum in the midline. Results are recorded in centimeters.

## COLD INJURIES

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Previous cold injuries including frostbite, chilblain, immersion foot, or trench foot may lead to residual extremity damage resulting in extensive tissue and vascular damage, nerve injury, leaving the extremity sensitive to cold re-exposure (e.g., Raynaud-like phenomena). Resulting numbness or pain may interfere with proper use of controls or may lead to distraction in flight.

**WAIVERS:** Residual damage manifesting as deep-seated ache, paresthesia, hyperhidrosis, easily traumatized skin, cyanosis, amputation of any digit, or ankylosis resulting from a previous cold injury requires waiver action. Waiver may be granted provided the residual injury is limited in nature, will not interfere with control operation, and the aircrew member is not restricted from cold weather operations.

### INFORMATION REQUIRED:

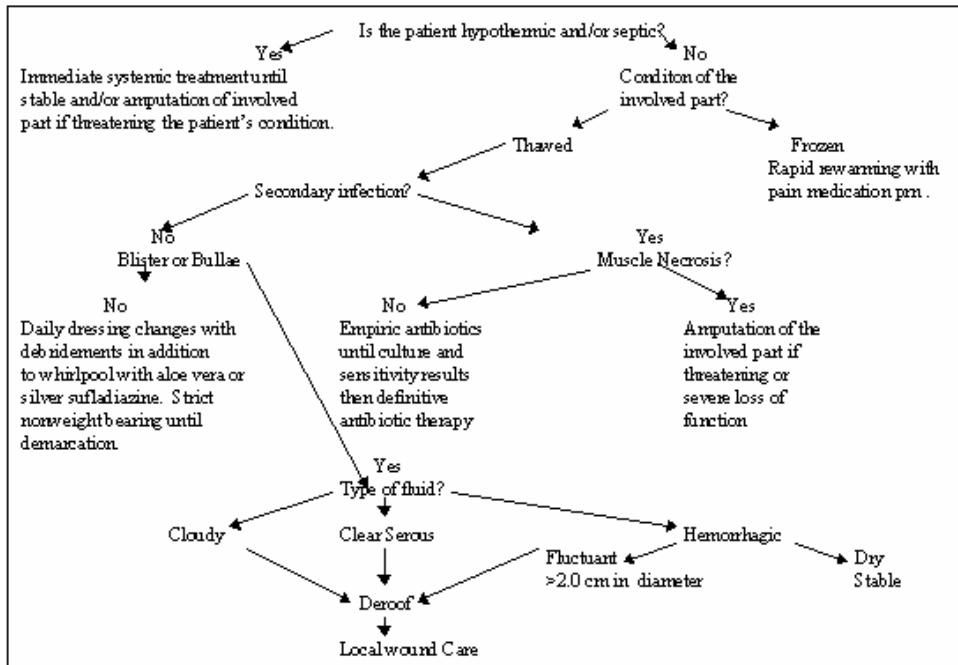
- A complete AMS to include
- Neurologic examination.
- Cold water immersion test or in-flight evaluation may be required.
- Photographs of the injured extremity are recommended.

**FOLLOW-UP:** None normally required unless an associated neurovascular injury exists.

**TREATMENT:** Education and cold weather survival training is essential to successful military operations in cold weather and high altitude environments. Avoidance of fatigue, proper use of dry and insulated or layered clothing, and a buddy system of inspection are important prevention techniques. Once cold injury occurs rapid rewarming is the most affective initial therapy. The goal is to save as much viable tissue as possible. Do not do this rewarming if re-exposure to cold is likely. Subsequent efforts are oriented toward preventing injury to and infection of the involved areas.

**DISCUSSION:** Frost bite is a localized lesion preferentially affecting the extremities: feet 57%, hands 46%, and open areas such as the face (ears, nose, cheeks) 17%. Chilblain, a mild form of frost bite, is the presence of red, itchy lesions found on the dorsum of the foot due to prolonged and repeated exposure to above-freezing temperatures in the presence of high humidity. Trench foot or immersion foot is directly due to prolonged exposure (over 12 hours) to cold water, generally under 32°F. Hypothermia, unlike all the other cold injuries, can occur with prolonged exposure to any temperature below body temperature.

**TREATMENT PROTOCOL** From J. Foot and Ankle Surg.



## DENTAL READINESS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Dental health is an essential component of medical readiness for Army aircrew. Dental panographic records are often the only means of identification following a fatal aircraft accident. Dental examinations may detect oral signs or symptoms of systemic disease.

**WAIVERS:** Dental Fitness Classification (see Dental Fitness Classification Table) establishes the basis for the aeromedical disposition of all aircrew members. In the event that no dentist is available, the flight surgeon may issue flight clearance provided there is no obvious contraindication to flight safety and a dental panograph has been documented as completed.

Dental Fitness Class 1 is fully qualified for all aviation-related duties.

Dental Fitness Class 2 may be recommended for full aviation duties unless temporary medical suspension is indicated for dental treatment requiring grounding medications (See Medications APL) Dental Fitness Class 3 or 4 is considered disqualifying until the dental examination and treatment is complete and dental panograph is updated IAW AR 40-35.

Waivers are generally not required due to the transient nature of most dental conditions. Orthodontic appliances which interfere with proper enunciation or are a hazard in the aviation environment are not authorized. Local medical restriction (no DA 4186 form is required) from flying for 6 hours will follow routine dental procedures requiring short acting local anesthetics such as lidocaine and mepivacaine.

**INFORMATION REQUIRED:** Complete dental examination is required. An oral surgeon consultation may be required. All comprehensive FDMEs require the dentist to record the current dental examination and dental fitness classification IAW AR 40-35 in Block #44, SF 88, and sign Block #81, SF 88. The flight surgeon may transcribe this information to the FDME and sign Block #81, SF 88. If, due to mobilization, shortage of personnel, etc., a dental examination by a dentist is not possible, the FS will determine dental fitness to the best of his ability, but is not expected to be able to determine Dental Fitness Classes. As above, if a dental panograph is available and there is no obvious contraindication to flight safety, the dental portion of the FDME may be completed by the examining FS, and a local flight clearance issued. All Class I, IA, and Initial Classes 2, 3, and 4 are required to undergo examination by a military dentist.

**FOLLOW-UP:** Required follow-up conditions are established by the underlying nature of the disorder.

**TREATMENT:** The local flight surgeon must coordinate with the dental staff to ensure the staff is completely familiar with the unique requirements of the aircrew member, to include the AR 40-8, Medications APL, Dental APL, and that procedures are established which require the flight surgeon to be notified of all grounded aviators. The flight surgeon should also ensure that procedures are established to conduct annual dental examinations on aviation personnel with completion of SF 88 prior to the completion of the comprehensive FDME.

**DISCUSSION:** The DoD Dental Fitness Classification System is extracted from DoD Instruction 6410.1 (8 Nov 90), Standardization of Dental Classification. Department of the Army Civilian (DAC) and contract civilian aircrew members are authorized DoD provider dental examinations IAW AR 40-3, Medical, Dental, and Veterinary Care, Ch. 4-50a, and Appendix B, paras 4-21 and 4-52. Dental fitness does not strictly apply to these civilians since they are not deployable, however, identification of potentially disqualifying dental conditions and maintenance of current panographic records are still essential. Dental assets within the reserve components in each state will provide this service to Reserve Component aircrew members. If military dental assets are unavailable, a civilian dentist may complete the examination upon coordination with the unit flight surgeon. The unit flight surgeon may then transcribe the results of the civilian examination upon the SF 88 and sign at Block #81. Flight surgeons without military dental

consultation available can request assistance in coordinating dental care from U.S. Army Dental Command, Fort Sam Houston, TX 78234-6000; Commercial 210-221-6528/8241; DSN 471-6528/8241.

## DoD DENTAL FITNESS CLASSIFICATION SYSTEM

**1. Dental Fitness Class 1:** No pathological oral conditions exist and no treatment is required to include no dental caries or defective restorations, healthy periodontium with oral prophylaxis not required, replacement of missing teeth not required, unerupted / partially erupted teeth not requiring care, and emergency care not required.

**2. Dental Fitness Class 2:** Oral conditions exist that will not require emergency care within 12 months. These include:

- Dental caries with minimal extension into dentin.
- Minor defective restorations maintainable by the patient.
- Periodontal conditions limited to:
  - Oral prophylaxis.
  - Generalized marginal gingivitis.
  - Early Periodontitis.
  - Maintenance therapy.
  - Slight to heavy plaque.
  - Any supragingival or slight subgingival calculus.
- Dentulous areas requiring elective replacement.
- Unerupted / malposed / partially erupted teeth recommended for extraction but without clinical radiographic pathosis.

**3. Dental Fitness Class 3:** Oral conditions exist that if not treated will require emergency dental care within 12 months. Place patients in Class 3 when they are determined to be between Class 2 and Class 3.

Class 3 conditions include:

- Dental caries, tooth fractures, or defective restorations where the condition extends beyond the dentoenamel junction and causes definitive symptoms; dental caries with moderate or advanced extension into dentin; defective restorations not maintained by the patient.
- Interim restorations or prostheses which cannot be maintained for a 12-month period. This includes teeth that have been restored with permanent restorative material but for which protective coverage is indicated.
- Periodontal diseases or periodontium exhibiting:
  - Acute gingivitis or pericoronitis.
  - Active moderate to advanced periodontitis.
  - Periodontal abscess.
  - Progressive mucogingival condition.
  - Periodontal manifestations of systemic disease or hormonal disturbances.
- Edentulous areas or teeth requiring immediate prosthodontic treatment for adequate mastication, communication, or acceptable esthetics.
- Unerupted, partially erupted, or malposed teeth with historical, clinical, or radiographic signs or symptoms of pathosis which are recommended for removal.
- Chronic oral infections or other pathological lesions including:
  - Pulpal or periapical pathology requiring treatment.
  - Lesions requiring biopsy or awaiting biopsy report.
- Emergency situations requiring therapy to relieve pain, treat trauma, treat acute oral infections, or provide timely follow-up care until resolved.

- Temporomandibular disorders requiring active treatment.

**4. Dental Fitness Class 4:** Patients who require dental examinations and / or updating of dental panographs as required by AR 40-35, Medical, Dental, and Veterinary Care. This includes patients whose dental classification is unknown.

## HEAT EXHAUSTION / HEAT STROKE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Susceptible aircrew members are at risk for recurrence of heat exhaustion/heat stroke during critical operations in hot environments, thus putting their own safety and the accomplishment of these missions in jeopardy. A previous heat injury may result in residual injury which will compromise flight safety or the individual's health.

**WAIVERS:** Those individuals predisposed toward heat injury with recurrent episodes requiring medical care, or those with residual injury are considered disqualified from aviation duties. Waiver may be possible provided: (1) There is no evidence of a congenital predisposing condition (e.g., anhidrosis); (2) An identifiable situational stressor led to the episode, such as lack of acclimatization, dehydration, coexisting infectious disease, medication effect, fatigue, or sleep deprivation; (3) No residual injury exists; (4) A minimum of three months have passed since an episode of heat stroke; and (5) There is evidence of normal heat tolerance after recovery from the heat stroke episode. Individuals who fail to meet these criteria will remain disqualified with no waiver recommended. Recurrent episodes of heat stroke are considered nondeployable, thus disqualified with waiver unlikely. Initial flight applicants are not granted an exception to policy.

### INFORMATION REQUIRED:

- Any history of heat stroke or a history of severe or recurrent heat exhaustion requires a full AMS.
- Complete cardiac consultation
- Neurologic consultations are required.
- CT or MRI of the brain may be required.
- Further evaluation to include a heat tolerance test at the Consultation Service, Brooks AF Base, San Antonio, TX. Or NAMI, Pensacola, FL, may be required.

**FOLLOW-UP:** None required unless the aircrew member experiences another heat injury.

**TREATMENT:** Prevention is the key. Encourage gradual acclimatization to the heat accomplished by gradually increasing, over 10 to 14 days, daily exposure to work and heat. Also, increased fluid intake with intake of at least 8 oz of water before heat exposure and moderate amounts of fluid every 15-20 minutes during intense exertion, vapor-permeable clothing, and frequent rest periods are important in preventing injury. Persons taking high-risk medications and those suffering from a mild illness or fever should avoid heat or extreme exercise.

**DISCUSSION:** Military operations, especially those in tropical and desert locations, continue to place crew members at risk for heat injury. Prolonged preflight exposure to extreme heat, humidity, dehydration, and the additional heat load occurring in an enclosed heated cockpit are major contributors to this increased risk. Studies show that exertional heat stroke in a young, healthy individual usually results from situational factors; an intrinsic predisposition to heat intolerance is extremely rare. Dehydration, febrile or infectious illness, skin disorders, poor physical fitness, the elderly, and obesity are all well accepted predisposing situational factors. Some of these are temporary or treatable, while others are permanent and thus put individuals at higher risk for heat injury. Exertional heat stroke is a state of hyperthermia that occurs when excess heat generated by muscular exercise exceeds the body's ability to dissipate it. Any individual with an alteration of consciousness in the presence of physical exertion in hot weather should be considered having a heat stroke; a core temperature of < 105° C does not preclude the diagnosis of heat stroke. Heat stroke may cause damage to the brain, liver, heart, kidneys, and occasionally result in adult respiratory distress syndrome, and coagulation disturbances. Complications of acute respiratory distress syndrome (ARDS), renal failure, and intractable disseminated intravascular coagulation is a common cause of death.

## MOTION SICKNESS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Motion sickness may present with profuse sweating, nausea, vomiting, drowsiness, lethargy, apathy and headache. Depending upon the degree of these symptoms the pilot may be distracted or totally incapacitated. Motion sickness occurs most commonly in initial trainees. The early symptoms of motion sickness, especially in the student, may be interpreted incorrectly as the lack of skill or ability. Simulator sickness, a form of motion sickness, may occasionally occur in even highly experienced aircrew members.

**WAIVERS:** Aircrew members with intractable airsickness are considered disqualified and are normally terminated from aviation duties. A local program of airsickness desensitization is permissible (see below). Aircrew members with motion sickness or simulator sickness should be restricted from aircraft controls until fully recovered. Aircrew members involved in simulator training should not be in direct control of an aircraft following simulator training.

### INFORMATION REQUIRED:

- Complete AMS with detailed history of airsickness, its effect on aviation duties, and results of a
- Locally supervised airsickness desensitization program.

**FOLLOW-UP:** None required unless symptoms reoccur.

**TREATMENT:** The majority of aviators become habituated to the stimuli and do not require treatment other than frequent regular flying. Others may benefit from a combination of desensitization, biofeedback training, relaxation training and psychological counseling. Promethazine (Phenergan) 25 mg. combined with ephedrine 25 mg. or L-scopolamine hydrobromide alone or in combination with dextroamphetamine (Scop/Dex) taken 1 hour prior to flight is permitted for up to 3 flights during training or for reacclimation of a rated aviator provided the patient is accompanied in flight by an instructor pilot. The scopolamine transdermal patch achieves peak blood levels 8-12 hours after application, but peak levels may not be needed to achieve symptom control.

**DISCUSSION:** In the RAF, 39% of flying students had airsickness at some stage during their training and in 15% of students, this is sufficiently severe to disrupt or abandon the flight. The USN experience is that 13.5% of all flights will lead to airsickness in non-pilot crews with vomiting occurring in 5.9%. Up to 63% of students were sick on their first flight, with only 15-30% not experiencing airsickness at all during their training. Females are almost twice as likely to report nausea as males and the incidence declines with age. While rare in rated aviators, most cases may be attributed to lack of acclimation to the flight environment. Occasionally, airsickness will present as a manifestation of an underlying psychological disorder or even fear of flying. Treatment utilizing biofeedback training, relaxation and psychological counseling achieves a success rate of 40%; when exposure to incremental Coriolis effect and flying is included, these success rates rise to 85%. All of the drugs used for motion sickness control have unacceptable side effects. Scopolamine and antihistamines act as central depressants; the former particularly degrades tasks that involve continuous attention and memory storage, as well as causing blurred vision, sedation and dizziness in some individuals. Mild in-flight conditions cause air sickness in only 10% of the untreated population, 0.4 mg. of scopolamine will reduce that number to 2%. Similarly, in rough conditions, airsickness occurs in 50% of the untreated population, 1 mg. of scopolamine will reduce the incidence to 8%, but with unacceptable side effects. The USN offers a formal desensitization training program at NAMI and the USAF offers a similar program at Shepard AFB.

## SMOKING CESSATION

Update: JUN 2002

**AEROMEDICAL CONCERNS:** Cigarettes smoking is the leading cause of preventable death and disability in the United States. Smoking is associated with heart disease, stroke, certain cancers, chronic obstructive pulmonary disease, and adverse pregnancy outcomes. Smokeless tobacco products increase the risk for oropharyngeal cancers. In the US, 25% of the adult population smokes and this is felt to contribute to 400,000 + deaths per year. In the aeromedical environment, tobacco use leads to increased carbon monoxide levels with subsequent ophthalmologic effects and potentially harmful peripheral capillary effects on thermoregulation. Heavy smokers may desaturate as much as 10% of their oxyhemoglobin with carbon monoxide. This produces at sea level a 90% oxygen saturation level equivalent to an altitude of 10,000 feet. Visual changes at this equivalent or physiologic altitude include loss of 20% of night vision, and decreases in accommodation, convergence, brightness sensitivity, color detection, oculomotor coordination, flicker detection, and peripheral vision.

As aeromedical healthcare providers, assisting our aircrew in smoking cessation is associated with substantial health benefits and furthers our work in health promotion, and improves flight safety. This policy helps to provide an effective, safe methodology for achieving smoking cessation while ensuring a close monitoring program to provide a supportive platform, as well as to detect significant side effects as soon as possible. This policy also applies to weaning from smokeless tobacco products.

**WAIVERS:** No waivers or exceptions to policy are required for smoking cessation therapy. Use of Bupropion (Zyban) must be closely monitored as noted below and its use must be annotated on the annual FDME for Information Only.

**INFORMATION REQUIRED:** Local flight surgeons must be fully familiar with the potential effects of any prescribed medication, assess the patient's motivation for smoking cessation, and thoroughly counsel the patient regarding the role of medication in smoking cessation, the need for absolute smoking abstinence while using a patch or gum, the correct technique for chewing gum to avoid nicotine overdose, the possible side effects, and a discussion of all restrictions while under treatment.

- For use of Bupropion (Zyban), an annotation in the annual FDME reference use of therapy, any side effects, and success of therapy is required. This information will be filed as Information Only.

**FOLLOW-UP:** For Nicotine replacement therapy (NRT) (patch, inhaler, gum), initial follow-up should occur after 72 hours and then within 14 days; subsequent visits should be at least every 30 days. Nicotine gum may not be used while flying. Nicotine patches may be worn while flying; however, it is advisable to fly with another fully qualified, rated aviator. Local flight surgeons are responsible for prescribing and managing the nicotine weaning program for all aviation personnel. When initially prescribed a nicotine patch or gum, the aviator will be restricted from flying for 72 hours. Once 72 hours has passed with no evidence of significant side effects and the patient has successfully abstained from smoking, the aviator may return to full aviation duties. Smoking is absolutely forbidden at all times. One episode of smoking voids the contract made with the flight surgeon and the aviator must be considered to be medically restricted until cleared by the flight surgeon (FS). Temporary clearance should be granted for the duration of treatment while under the direct guidance of the FS.

For Bupropion (Zyban) therapy, aircrew that meet criterion for treatment must be grounded for at least the initial 2 weeks of therapy. During this time, the FS must closely monitor the individual for medication side effects to include insomnia and elevations in blood pressure. At the end of the two week grounding period, the FS must determine if the individual can resume flight duties and a temporary upslip can be issued. The aircrew should be seen by the flight surgeon every two weeks while on therapy to assess effectiveness, potentially hazardous side effects, and to offer support to the individual. Those on

combination Bupropion (Zyban) and NRT must be closely monitored for elevations in blood pressure. Using Bupropion (Zyban) in association with group or individual counseling in a smoking cessation program is highly encouraged.

Contraindications to Bupropion (Zyban) use are as follows:

- History of seizure disorder,
- Conditions predisposing to lowered seizure threshold:
  - History of head trauma or seizures
  - Excessive alcohol use/abuse/dependence
  - Concomitant use of other drugs: theophylline, or corticosteroids
- History of eating disorder (bulimia, anorexia nervosa),
- Hepatic or renal disease,
- Uncontrolled hypertension,
- Pregnancy or lactation; and,
- Recent use of other medications: monoamine oxidase (MAO) inhibitors, other antidepressants, and antipsychotics. (These are not authorized for use in aviation personnel)

**TREATMENT:** Aircrew members are encouraged to participate in formal smoking cessation or similar tobacco abuse programs with individual or group counseling offered. Bupropion (Zyban) dosing for smoking cessation starts at 150 mg qd for 3 days and then increases to 150 mg bid. Doses should be taken 8 hours apart and doses higher than 300 mg should not be used. Usual treatment course is 8-12 weeks. The medication is started while the aircrew is still smoking and a target quit date is set for within the first two weeks of treatment. If no progress towards abstinence has been made, stopping treatment should be considered after 7 weeks of therapy.

**DISCUSSION:** In the U.S. in 1990, smoking was directly responsible for 418,690 deaths. It was linked to nearly one in five of all deaths and more than one in four deaths in people ages 35-64. Cigarette smoking significantly increases the risk of cardiovascular disease, including coronary heart disease, stroke, sudden death, aortic aneurysm, and peripheral vascular disease. Of the more than 4000 substances in cigarette smoke, 43 are known carcinogens. Cigarette smokers have twice the risk of death from cancer as nonsmokers, and smoking accounts for 30% of all cancer-related deaths. Cigarette smoking is the leading cause of pulmonary illness and related deaths in the U.S. Smoking has also been shown to increase the risk of miscarriage and stillbirth and smokers have a higher risk of neonatal death. Smokers not only harm themselves, they harm those around them. Environmental tobacco smoke is increasingly being recognized as a major cause of morbidity and mortality; children are particularly vulnerable. Cigarette smoking is a preventable hazard in the aviation environment.

The health benefits of smoking cessation are substantial. After 10-15 years of abstinence, the overall risk of mortality approximates the mortality rate of those people who have never smoked. After one year of abstinence, excess risk of CAD is reduced by one-half and approaches normal after 3 to 4 years. After 10 years of abstinence, the risk of lung cancer is reduced by 50-70% and almost all other smoking-related cancers occur less frequently. Behavioral modification is the mainstay of most smoking-cessation programs. Nicotine-replacement therapy has clearly been established as effective when used in combination with such programs. There have been no controlled studies showing that nicotine replacement is effective when used alone. Complications of nicotine replacement therapy are mostly minimal, but occasionally excessive nervousness, gastrointestinal complaints, sleep disturbance including insomnia and vivid dreams, and lightheadedness have been reported.

A simple strategy to aid in smoking cessation attempts uses the 5 "A's": 1) Ask about tobacco use, 2) Advise to quit, 3) Assess willingness to make quit attempt, 4) Assist in quit attempt, and 5) Arrange follow-up- starting with one week after quit date.

The most frequently used method for smoking cessation is to quit "cold turkey." Fifty percent of those who attempt this method do have success but only after 7-9 attempts. Of those who quit on recommendation of a health care provider, 8.5-10% are still successful at six months. On Bupropion (Zyban) therapy, 10-25% of those treated remain abstinent at six months. Bupropion (Zyban) assists with the weight gain issue often encountered by smokers after quitting, and also helps to decrease the anxiety and cravings often experienced. The most frequent reasons to discontinue Bupropion (Zyban) therapy are tremors and skin conditions - rash and pruritis. Use of Bupropion (Zyban) does increase seizure risk, but limiting use to patients without the contraindications listed above decrease that risk. Insomnia can also be a problem and this effect is increased with simultaneous use of NRT.

**REFERENCE:** Tobacco Cessation Guideline <http://www.surgeongeneral.gov/tobacco/>

# OVERWEIGHT AIRCREW MEMBERS

Update: JUN 2002

**AEROMEDICAL CONCERNS:** Aircrew overweight/obese status becomes a safety of flight issue when body shape affects manipulation of aircraft controls, safe aircraft egress, or wear of safety (ALSE) equipment. In addition, overweight/obese status resulting from a disqualifying underlying medical problem may also be of concern. The weight control program as outlined in AR 600-9 is not an aeromedical program but an administrative personnel program overseen by the aviation unit commander.

## WAIVERS:

### Initial Applicants (All Classes):

All initial applicants are administratively required to meet height/weight or body fat standards as defined in AR 600-9. Height/weight will be recorded on the FDME, but no medical disqualifications will be entered for failing to meet these standards. Entry into aviation training may be administratively barred for failing to meet these standards.

### Rated Aviation Personnel (All Classes):

No waiver action or aeromedical summary is required for exceeding the height/weight standards listed in AR 600-9. Adherence to the standards described in AR 600-9 is a command issue. Waiver/AMS is only required if the overweight condition is caused by an underlying medical problem. (See Applicable APL)

## INFORMATION REQUIRED:

- Initial Applicants: Height/weight as recorded on initial FDME.

## FOLLOW-UP:

None.

**TREATMENT:** An effective weight loss program includes the establishment of a supportive rapport with frequent follow-up visits, the institution of a nutritional, well-balanced diet, and an aerobic exercise program. For weight loss of 10 lbs. or less, simple dietary changes which involve avoidance of fried foods, alcohol, soft drinks, sugar rich foods, and "junk" food and the greater reliance upon foods rich in complex carbohydrates - beans, grains, fresh fruits, vegetables, low fat dairy products and fish is recommended. For weight loss of greater than 10 lbs., caloric restriction must be included. The caloric intake must be over 1200 calories but less than approximately 13 times the patient's ideal weight in pounds. Dietitian consultation is required. If weight loss is unsatisfactory, a psychological consultation with consideration of behavior modification should be obtained. Weight loss goals should be realistically set at 4 to 8 lbs. / month. Fad diets, excessive exercise programs, hypnosis, either OTC or prescribed weight loss drugs, and surgery should be avoided. An effective weight loss program includes the establishment of a supportive rapport with frequent follow-up visits, the institution of a nutritional, well balanced diet, and an aerobic exercise program. For weight loss of 10 lbs. or less, simple dietary changes which involve avoidance of fried foods, alcohol, soft drinks, sugar rich foods, and "junk" food and the greater reliance upon foods rich in complex carbohydrates - beans, grains, fresh fruits, vegetables, low fat dairy products and fish is recommended. For weight loss of greater than 10 lbs., caloric restriction must be included. The caloric intake must be over 1200 calories for females and 1500-1800 calories for males, but less than approximately 13 times the patient's ideal weight in pounds. Dietitian consultation is required. If weight loss is unsatisfactory, a psychological consultation with consideration of behavior modification should be obtained. Weight loss goals should be realistically set at 4 to 8 lbs. / month. Fad diets, excessive exercise programs, hypnosis, either OTC or prescribed weight loss drugs, and surgery should be avoided. Detailed guidelines are available at the websites listed below.

**DISCUSSION:** Initial applicants for all classes of flight duty or training must administratively meet basic height/weight standards. For rated aviation personnel, after training and entry into aviation service,

aviation medicine is mainly concerned with obesity/overweight aircrew when it becomes a safety of flight issue as described above. AR 600-9 outlines a personnel program not related to safety. The standards listed in AR 600-9 do not by themselves constitute grounds for the basis of a disqualifying condition. The FS/APA should be ready to support the command with in-flight evaluation, advice on nutrition, detection of unhealthy eating habits at mess and flight line visits, counseling of individual aircrew, and diagnosis of underlying organic diseases. The FS/APA serves to assist the aircrew member in achieving unit height/weight goals.

Obesity is associated with a host of adverse health outcomes and places a severe burden on the U.S. health care system. National estimates in the United States show a striking increase in the prevalence of overweight people during the past decade. The U.S. National Health Interview Survey (NHIS) found that the prevalence of overweight increased from 21.6% in 1983 to 27.5% in 1990. Currently, obesity is epidemic in the United States with over 40% of adults over 18 years of age having body mass indexes of greater than 31 (obese). Factors such as dietary knowledge, attitudes, and practices, physical activity levels, and perhaps social, demographic, and health behavior factors are the most likely candidates responsible for these increases in prevalence. Various techniques to lose weight may be initially effective; however, most individuals eventually gain this weight back. Because weight-related problems combine the physical and the psychological, multiple interventions are often appropriate. Although such programs as Optifast, Nutri-System, or Jenny Craig are thought to provide good motivational support, there has been little in the way of scientific analysis of their long-term effectiveness. If used, they should be combined with exercise and other behavioral changes. Using any anorectic drug currently is considered unsafe in the aviation environment due to potential side-effects. Their use, even in the temporarily grounded aviator, is not a miracle cure. Unless this medication is part of a comprehensive approach to nutrition and behavior, the patient will simply regain the weight lost after completion of the drug program. Note: Long-term use of anorectic medications is not approved in the United States.

## **REFERENCES:**

American Dietetic Association: [www.eatright.org](http://www.eatright.org)

National Heart, Lung, and Blood Institute: [www.nhlbi.nih.gov/guidelines/obesity/ob\\_home.htm](http://www.nhlbi.nih.gov/guidelines/obesity/ob_home.htm)



## NEUROLOGY WAIVERS

# CRANIAL NEURALGIA

Update: DEC 2003

**AEROMEDICAL CONCERNS:** The pain of cranial neuralgia can be incapacitating in flight. The symptoms of trigeminal neuralgia may be stimulated by the wearing of an oxygen mask. Glossopharyngeal neuralgia has been associated with syncope and cardiac arrest.

**WAIVER:** Because of the severity and chronic recurrent behavior of the neuralgias, a waiver is usually not considered.

ICD9 Code	Condition
350.1	Trigeminal neuralgia
352.1	Glossopharyngeal neuralgia

## INFORMATION REQUIRED:

- Neurology or neurosurgical consultation.

**FOLLOW-UP:** Annual neurology or neurosurgical consultation required **only** in the presence of continued or recurrent symptoms.

**TREATMENT:** Pharmacological treatments (Tegretol, Triavil, Prolixin, Mexitil), although effective, are not waivable due to their side effects profiles. Surgical "cures" (microvascular decompression) may be achieved in selected cases and subsequent waivers may be considered.

**DISCUSSION:** Although most cranial neuralgias are probably due to microvascular compression at the root entry zone, other etiologies need to be considered, especially in the young adult population in whom demyelinating disease, aneurysms, neoplasms, and infectious etiologies (post-herpetic, Lyme disease, etc.) may be more common. The finding of sensory loss with neuralgia should alert the flight surgeon to consider these other causes of cranial neuralgia. The branches of the nerve involved in trigeminal neuralgia are mandibular alone (20%), maxillary alone (16%), both combined (36%), ophthalmic alone (3%), maxillary/ophthalmic (11.5%), and all 3 divisions (16%). Medical treatment with carbamazepine, which is also used for glossopharyngeal neuralgia, can produce dizziness, somnolence, ataxia, disorders of accommodation and increased reaction times. Over time, the effectiveness of medication declines in 50-75% of patients. Microvascular decompression of the trigeminal root has a failure rate of 65% by 5 years. Gangliolysis, by a variety of techniques, has a failure rate of 20% after 2 years. Surgical treatment of glossopharyngeal neuralgia is of uncertain benefit.

## REFERENCE:

- Trigeminal Neuralgia, <http://www.emedicine.com/NEURO/topic593.htm>
- Atypical Face Pain, <http://www.emedicine.com/neuro/topic25.htm>

# DECOMPRESSION SICKNESS

Update: APR 2003

**AEROMEDICAL CONCERNS:** Decompression sickness (DCS) is one of the two medical conditions described under Decompression illness (DCI), which is a result of rapid exposure to low ambient pressure that cause bubble formation in a tissue or a vessel. The bubbles formed from an inert gas (mainly nitrogen), which normally dissolved in the blood stream. It is further divided into Type I DCS or Type II DCS depending on its clinical presentation or organ system involvement. It has a wide range in terms of clinical presentation from minor skin itching, to joint or limb pain, and to neurological injury or circulatory collapse. Type II DCS is the more serious of the two presentations and it is usually involved with the neurological system. Since there is no pathognomonic signs for this condition, clinical suspicion coupled with a history of recent hypobaric exposure is the key for diagnosing this condition. Prompt treatment is required to relieve the symptoms. Delay in treatment may result in residual neurologic/neuropsychologic impairment, which is detrimental to the aviator. Most but not all individuals who have suffered from DCS make a full recovery and are not at increased risk for recurrent DCS.

ICD9 Code	Condition
993.3	Decompression Sickness
993.30	Type I DCS, pain only
993.35	Type II DCS

## WAIVER:

### Type I DCS (single episode, pain only):

- Waiver is not required upon full recovery and no residual defect for all classes.
- Seventy-two hours waiting period before return back to flying duty after the symptoms are completely resolved.

### Recurrent Type I DCS or Type II DCS:

#### Initial (Class 1W/1A):

Exceptions to policy (EP) have never been granted for initial flight applicants with a history of recurrent

Type I DCS or Type II DCS.

**Initial (Class 2F, 3, and 4):** Exception to policy will be considered on a case-by-case basis for recurrent or type II DCS.

#### Rated Aviation Personnel (All Classes):

Waiver is considered on a case-by-case basis for rated aviator with Type II DCS or recurrent Type I DCS. All Type II patients should be grounded for one month before waiver can be requested.

## INFORMATION REQUIRED:

- AMS about the condition, course of treatment and, and outcome of the treatment.
- Document course of treatment or evaluation by a Hyperbaric or Diving Medical Officer.
- Neurology consultation and neuropsychologic testing ("Cog screen", MMPI, Halstead-Reitan and WAIS-R) is required when behavioral, neurological, and cognitive signs and symptoms are part of the presentation.

**TREATMENT:** Recompression therapy is the overall standard, however many Type I patients will respond completely to surface oxygen therapy and may not require hyperbaric oxygen.

**FOLLOW-UP:** No follow-up is required unless the aircrew member has a recurrent DCS event or has residual abnormalities, which require monitoring.

**DISCUSSION:** This is a difficult diagnosis to make and often we err on the conservative side. Patients whose findings and symptoms may be equivocal get treated anyway. This is especially true in the training commands where students are instructed to report all and any symptoms that occur following low-pressure chamber flights. A high index of suspicion in this setting coupled with enthusiasm for treatment is factors that must be weighed in evaluating the outcome and disposition of these patients. Diving-related cases of DCS tend to be more straightforward as well as more severe. Patients who receive relatively delayed treatment are more likely to suffer permanent residual effects of DCS. Except for age (older versus younger), no other factors are clearly linked to increased risk for recurrent DCS. Individuals who do suffer recurrent DCS are probably at higher risk for reasons that cannot be defined or predicted and should not be considered for waiver without careful evaluation of risk-benefit factors. The incidence of DCS in high altitude reconnaissance fliers has been reported to be 4.2%, with 62% of the pilots having experienced DCS. The predominant symptom was pain (51%) but skin (14%), neurological (14%) and respiratory (3%) symptoms were also reported. The US Navy has not found any evidence that divers who have had "Type II" DCS were statistically more likely to have a second episode than the remainder of the population. In another study of sub atmospheric DCS, there was a 7.4% incidence of recurrent symptoms. Female risk generally is just over 2 times that of males; the incidence is highest just after the menstrual period, declining linearly to the next period. A variety of studies have shown that the incidence of residual sequelae is 2-4%; however, another study which looked very carefully for neurological involvement in divers found that the sequelae is about 70% for those with initial CNS symptoms one month after decompression.

#### **REFERENCES:**

- FAA office of Aviation Medicine Civil Aeromedical Institute Publication, Altitude-Induced Decompression Sickness, Tiny Bubble, Big Trouble.  
<http://flysafe.faa.gov/Flysafe/Library/Airman%20Medical%20Info/Decompression%20Sickness.htm>
- Moon RE, Sheffield PJ. Guidelines for Treatment of Decompression Illness. Aviation Space Environment Medicine 1997; 68:234-43.
- Dart TS, Butler W. Toward New Paradigms for the Treatment of Hypobaric Decompression Sickness. Aviation Space Environment Medicine 1998; 69:403-9.
- Shank ES, Muth CM. Decompression Illness, Iatrogenic Gas Embolism, and Carbon Monoxide Poisoning: The Role of Hyperbaric Oxygen Therapy. Int Anesthesiol Clin 2000; 38(1): 111-138.

## EPILEPSY / SEIZURE

Update: DEC 2003

**AEROMEDICAL CONCERNS:** The risk from a seizure in flight is obvious. The number of solo airborne seizures with a survivor equals zero.

**WAIVER:** A single, febrile seizure under age 5 is not considered disqualifying. Two or more febrile convulsions are considered disqualifying for initial entry into aviation, but an exception to policy may be considered. A single seizure clearly attributable to a remedial and avoidable cause may be considered for waiver. All other seizures are considered disqualifying with no waiver recommended. Myoclonic jerks associated with G-LOC or hypoxia during exposure to altitude are not considered disqualifying.

ICD9 Code	Condition
780.3	Convulsive episode, unspecified cause
780.3	Infantile Seizure
459.0	Epilepsy (w/o intractable epilepsy)
3459.1	Epilepsy (with intractable epilepsy)
3450.0	Absence Seizure (w/o intractable epilepsy)
3450.1	Absence Seizure (with intractable epilepsy)
345.50	Partial Seizure

### INFORMATION REQUIRED:

- Neurological consultation,
- EEG (routine and sleep deprived)
- MRI scan.

**TREATMENT:** N/A for waiver purposes.

**FOLLOW-UP:** Since aircrew with seizures are rarely granted waivers, follow-up per neurology recommendation.

**DISCUSSION:** The risk of having a first seizure falls from about 0.4% at age 20 to 0.06% at age 50 before rising sharply to 0.8% by age 70. The late rise is because of the increase in precipitating factors such as neuronal degeneration and cerebrovascular disease. After a single, unprovoked seizure in adults, the risk of a second episode while not taking anticonvulsants is 64% over 3 years and 80% at 5 years, with over two-thirds of these occurring during the first year. With no risk factors such as previous neurological insult or a sibling with epilepsy, the risk of a second seizure is 23% at five years. Relapse even after many years of symptom-free existence without therapy is possible. These figures apply to individuals living at one atmosphere and one +Gz. The risk for seizure recurrence associated with exposure to the physiological stressors of military aviation is likely to be much higher. Etiologies for seizures in the adult: alcohol (25%), brain tumor (16%), cerebral infarction (14%), trauma (4%), miscellaneous (5%) and unknown (38%). The EEG does not prove or disprove the diagnosis, although an unequivocally abnormal EEG with a good history of seizure does support the diagnosis. EEGs are normal in half the patients with frank epilepsy. An epileptiform EEG does not, by itself, signify the presence of epilepsy.

### REFERENCES:

Seizures and Epilepsy: Overview and Classification, <http://www.emedicine.com/neuro/topic415.htm>

## GUILLAIN-BARRE SYNDROME (ACUTE INFLAMMATORY DEMYELINATING)

Update: DEC 2003

**AEROMEDICAL CONCERNS:** Skeletal muscle weakness which can involve extremity, truncal or bulbar groups and typically evolves over a matter of several hours to a few days can affect flying and aircrew abilities creating safety of flight as well as mission completion concerns. In the C. Miller-Fisher variant, ataxia as well as ophthalmoplegia (internal and external) accompany the obligatory findings of areflexia. Dysautonomia may also be present, posing an additional concern regarding tolerance of gravitational force changes, blood pressure and cardiac rhythm disturbances that may be especially life-threatening in the aviation environment.

**WAIVER:** A waiver can be considered after full recovery of strength and autonomic nervous system function. Tendon- stretch reflexes may never return but would not prohibit waiver recommendation.

### INFORMATION REQUIRED:

- Neurology or physical medicine and rehabilitation consultation with
- Quantified strength testing of all motor groups and
- Assessment of autonomic nervous system function (orthostatic BP measurements, treadmill testing and, if appropriate, thermal stress testing).
- Consider performing functional cockpit and egress testing.
- If autonomic instability is a concern, then gravitational tolerance testing should also be performed.

**FOLLOW-UP:** Annual neurology evaluation is required only in the presence of continued neuromuscular deficit.

**TREATMENT:** Plasmapheresis and/or intravenous immunoglobulin therapy is warranted in those cases which involve weakness progressing to the point of impairing walking or respiratory abilities. Adrenocorticosteroid therapy is not beneficial and may actually worsen the outcome.

**DISCUSSION:** Antecedent flu-like illness within two weeks prior to the onset of neurological symptoms occurs in approximately 65% of cases. This syndrome often occurs in clusters of small epidemic proportions and may have broad spectral presentations ranging from minor (e.g., Bell's palsy) to severe (complete paralysis of all skeletal muscle groups with respiratory and cardiovascular support dependency). Some of these patients may experience relapses and progress to chronic inflammatory demyelinating polyneuropathy (CIDP). HIV victims may present with AIDP. Lyme disease may mimic AIDP. The presence of pleocytosis in the CSF is incompatible with AIDP and suggests alternative diagnoses (e.g., sarcoidosis, leptomeningeal lymphomatosis). When adequate intensive care and respiratory support are available, overall mortality is less than 5%.

### REFERENCES:

Guillain-Barré-Strohl syndrome, <http://www.emedicine.com/neuro/topic598.htm>

## HEAD INJURY – MILD

Update: MAR 1997

- Loss of Consciousness (LOC) < 15 minutes.
- Post-Traumatic Amnesia (PTA) is < 12 hours
- Post-Traumatic Headache (PTH) is < 14 days
- Post-Traumatic Syndrome (PTS) is < 48 hours

**AEROMEDICAL CONCERNS:** Clinically these may appear to be mild injuries, although a surprising percentage of these patients (up to 11%) have significant craniocerebral damage (basilar skull fractures, linear as well as depressed skull fractures, sinus fractures, intracranial hemorrhages, fronto-temporal contusions) which would upgrade the severity level of their injury.

**WAIVER:** Temporary medical suspension is required for one month for all rated aircrew members (three months for applicants) if there are no fractures or intracranial structural pathology.

### INFORMATION REQUIRED:

- Neurology and
- Neuropsychological consultations and a
- Brain imaging study (CT or MRI).

**FOLLOW-UP:** N/A

**TREATMENT:** All patients with head injury causing either loss of consciousness or amnesia (no matter how long) should undergo brain imaging (preferably CT) ASAP as part of their initial management.

**DISCUSSION:** Acute post-traumatic seizures (within one hour of the injury) are not a factor in determining the risk for developing post-traumatic epilepsy (PTE). The risk of developing PTE is not appreciably greater in the mildly head-injured population than in the general population. There is a risk of post-traumatic cognition problems (e.g., memory and information processing skills) and recovery should be documented prior to requesting a waiver.

## HEAD INJURY - MODERATE

Update: MAR 1997

- Loss of Consciousness (LOC) > 15 minutes but < 2 hours
- Post-Traumatic Amnesia (PTA) > 12 hours but < 24 hours
- Post-Traumatic Syndrome (PTS) > 48 hours but < two weeks
- Post-Traumatic Headache (PTH) > 14 days but < 1 month, or linear Basilar fracture with LOC < 15 minutes,
- Cerebral Spinal Fluid (CSF) leak < 7 days.

**AEROMEDICAL CONCERNS:** Risks include personality and performance changes and the development of post-traumatic epilepsy.

**WAIVER:** All aircrew members must be temporarily suspended for a 3 month period of observation. Applicants will not be considered qualified until two years post-injury pending normal neurological exam. (see below)

### INFORMATION REQUIRED:

- Neurology consultation and
- Neuropsychological consultations ("Cog Screen", Minnesota Multiphasic Personality Inventory [MMPI], Halstead-Reitan test battery, Wechsler Adult Intelligence Scale-Revised [WAIS-R]) and
- Brain imaging (either CT or MRI) are required.

**FOLLOW-UP:** Any abnormalities on initial screening must be resolved upon retesting at end of observation period. Further follow-up only required for continued abnormalities.

**TREATMENT:** These patients should undergo initial CT scanning and, if neurologically impaired, repeat scanning within 12 hours of the injury in order to detect "delayed" or progressive intracranial damage that would warrant a change of therapy. Non-surgical measures consist of the basic "ABCs" of ATLS, 30 degrees head elevation, beta-blockers as needed for control of elevated blood pressure and, when indicated, intubation with hyperventilation, mannitol, and THAM to manage increased ICP (best done with intracranial pressure monitoring).

**DISCUSSION:** The risk of post-traumatic epilepsy (PTE) in cases of moderate head injury at one and 5 years is 0.6% and 1.6%. Of those individuals who develop PTE, 80% do so within the first 2 years. The risk then declines to equal that of the normal population by 10 years post-injury. Approximately 50% of cases with PTE will spontaneously remit within 20 years.

## HEAD INJURY - SEVERE

Update: MAR 1997

- Loss of Consciousness (LOC) > 2 hours but < 24 hours ,
- Post-Traumatic Amnesia (PTA) > 24 hours,
- Post-Traumatic Syndrome (PTS) > 2 weeks but < 6 weeks,
- Linear fracture with LOC < 15 minutes but > 2 hours,

**AEROMEDICAL CONCERNS:** There are greater risks for the development of post-traumatic epilepsy (PTE) and the persistence of permanent neurologic and neuropsychologic sequelae.

**WAIVER:** After 24 months grounding, designated personnel may be considered for waiver. Initial flight applicants are considered permanently disqualified.

**INFORMATION REQUIRED:** Same as for moderate head injury. Note that EEGs are no longer required as they have very poor predictive value for PTE. Furthermore, the finding of epileptiform activity in the EEG following head injury has only a 14% correlation with the development of PTE while fully one half of patients with epilepsy will have normal or non-diagnostic EEG findings even after the clinical appearance of seizures.

**FOLLOW-UP:** Following waiver action no further follow-up is normally required.

**TREATMENT:** These patients require neuro-ICU level care, frequently with neurosurgical intervention as well.

**DISCUSSION:** The cumulative risk of PTE at 1 and 5 years is 7.1% and 13.3%.

## HEAD INJURY – PERMANENTLY DISQUALIFIED

Update: MAR 1997

### Permanently disqualifying for all aviation personnel (All Classes):

- Depressed skull fracture with or without dural penetration
- Basilar or linear skull fracture with Loss of Consciousness (LOC)> 2 hours
- Post-Traumatic Syndrome (PTS) > 6 weeks
- Loss of Consciousness (LOC) > 1 day
- Cerebral Spinal Fluid (CSF) leak > 7 days
- Any intracranial bleeding (SDH, EDH, ICH, IVH, SAH)\*
- Dural or brain penetration (traumatic or surgical)
- Intracranial bone fragment or foreign body
- CNS deficits indicating parenchymal injury
- EEG abnormality due to injury

**AEROMEDICAL CONCERNS:** These patients are likely to have permanent, disabling residual neurologic and neuropsychologic impairments as well as an unacceptably high risk for post-traumatic epilepsy (PTE).

**WAIVER:** These aircrew members are usually permanently terminated from flight status, no waiver recommended.

**INFORMATION REQUIRED:** At least a brief AMS summarizing the case is required for termination.

**FOLLOW-UP:** These patients will probably be under the long-term care of neuro-rehab as well as

**neurology care.** **TREATMENT:** These individuals will often require neuro-ICU and neurosurgical care.

**DISCUSSION:** The likelihood for developing PTE is nearly 30% in this group of head-injured individuals.

\* Glossary

SDH	Subdural Hematoma
EDH	Epidural Hematoma
ICH	Intracranial Hemorrhage
IVH	Intraventricular Hemorrhage
SAH	Subarachnoid Hemorrhage
PTE	Post-Traumatic Epilepsy

# HEADACHE

Update: FEB 2002

**AEROMEDICAL CONCERNS:** Headaches are common and estimated to affect over 70% of Americans. Occasional headaches, responding to simple analgesics, are not a major aeromedical concern and do not require extensive evaluation. Severe headaches can be incapacitating in flight while milder headaches will act as a distraction. Cluster headaches are incapacitating and may be associated with transient neurologic symptoms, rhinorrhea, lacrimation and a unilateral Horner's syndrome. (See also Migraine APL) Two main questions must be answered with regard to aeromedical evaluation of headaches: 1) Are the headaches primary or secondary to an underlying condition? 2) Are the headaches chronic, recurrent, and /or of sufficient severity to pose a risk to flight safety?

## WAIVER:

**Initial Applicants (All Classes) & Rated Aviation Personnel:** The aeromedical disposition of members with headache will depend on the frequency and severity of the symptoms, the etiology, and the medication required to control the headaches.

The specific nomenclature or diagnostic label of the headaches is not the key factor for determining fitness for aviation duty. Of greater concern is the effect on general performance, special senses, and the risk of recurrence.

ICD9 Code	Condition
346.2	Cluster headache
307.81	Tension headache

## INFORMATION REQUIRED:

- Neurology consultation,
- AMS listing the timing, duration, frequency, triggers, and predictability of episodes,
- FDME- complete physical examination to rule out secondary causes; and,
- Brain imaging- contrast-enhanced CT or MRI when indicated by history or examination.

**FOLLOW-UP:** Follow-up is dictated by the frequency or severity of the headache as well as the response to therapy. If symptoms warrant, an annual neurology or internal medicine consultation may be required.

**TREATMENT:** Simple analgesics are acceptable. The chronic use of NSAIDs may be considered for waiver. Life-style changes, biofeedback and relaxation therapy, if successful, may permit return to flight status for the muscle-contraction or "tension" headache sufferer. Psychiatric/psychologic evaluation of these members is strongly recommended. Treatments for cluster headaches that are effective but not compatible with flight training include lithium, methysergide, intranasal lidocaine, adrenocorticosteroids, and oxygen inhalation. Sumatriptan or other 5HT serotonin receptor agonists may be used but require a 12-hour mandatory grounding period following use; frequency of its use should be carefully evaluated by the local FS. Frequent use of medications in this class may reflect vascular or migraine headaches. Verapamil may be an effective prophylactic treatment for cluster or vascular headaches in some cases. Use of verapamil must be waivered for rated aviation personnel and waivers for this will be considered on a case-by-case basis.

**DISCUSSION:** Cluster headaches occur almost exclusively in men, begin in the third or fourth decade, are unilateral and never change sides. Clusters consist of recurrent headaches lasting about 45

minutes, several times a day and night for a few weeks to months at a time with a tendency to recur annually, often around the summer or winter solstice. Recurrence patterns may be characteristic for an individual, but may vary considerably between sufferers. Recurrent muscle-contraction or tension headaches are normally associated with some psychosocial stress in the majority of cases; however, underlying cervical spondylosis and DJD may be a contributing factor and will respond to NSAIDs and physical therapy. Exertional headaches, cough headaches and immersion headaches may be associated with posterior fossa pathology (especially Arnold- Chiari Malformation) warranting an MRI scan. Coital headaches are almost always benign, but are sometimes associated with subarachnoid hemorrhage and should be evaluated with CT with and without contrast, MRI, and possibly even Lumbar Puncture (LP). Incorrect prescription for astigmatism may be a cause for headache. In general, however, eye and ENT pathologic explanations for headache are unlikely unless the patient has obvious gross clinical findings of disease in these areas.

**REFERENCE:**

American Academy of Neurology, Multispecialty Consensus on Diagnosis and Treatment of Headache, "Headache Guidelines."

[www.aan.com/public/practiceguidelines/](http://www.aan.com/public/practiceguidelines/)

# MIGRAINE

Update: FEB 2002

**AEROMEDICAL CONCERNS:** Migraine headache may be incapacitating if not distracting for flight. Visual and other aura, nausea and vomiting, transient neurologic deficits (which may include aphasia, hemisensory and hemimotor impairment, vertigo, syncope, confusion and disorientation) may accompany migraines and are of obvious concern. (Also see Headache APL)

## WAIVER:

### Initial Applicants (Class 1A/1W):

Exception to policy is usually not granted but may be considered if the individual has been symptom free for 12 months on no medication and the information required below reveals no underlying problems.

### Initial Applicants (Classes 2F, 3, and 4):

Waivers may be granted provided that the information required below reveals no underlying medical problems and will depend upon whether the condition will effect general performance and the risk of recurrence.

### Rated Aviation Personnel (All Classes):

Waivers may be considered on a case-by-case basis. Waivers are usually not recommended if visual or other neurologic symptoms accompany the headaches, but final determination with regard to aviation duties will be based on effects on general performance, special senses, and the risk of recurrence. The specific nomenclature or diagnostic label of the headaches is not the key factor for determining fitness for aviation duty.

ICD9 Code	Condition
346.0	Migraine with aura (Classic Migraine)
346.1	Migraine without aura (Common Migraine)
346.8	Other forms of Migraine (Ophthalmoplegic)

**FOLLOW-UP:** Annual neurology or internal medicine consultation required.

## INFORMATION REQUIRED:

- Neurology consultation,
- AMS listing the timing, duration, frequency, triggers, and predictability of episodes,
- FDME- complete physical examination to rule out secondary causes,
- Brain imaging- CT with contrast or MRI to evaluate for structural disease when indicated by history or exam; and
- Ophthalmology evaluation in the case of visual disturbances.

**TREATMENT:** Although there are many effective pharmacologic treatments for migraine, most are incompatible with waiver. Standard migraine therapy includes prophylactic, therapeutic, and abortive measures. The first line of prevention is avoiding known triggers.

**DISCUSSION:** Those patients who have returned to flying duties claimed to have had no symptoms for periods ranging from 6 months to several years. This suggests that the original diagnosis was incorrect, that our understanding of the natural history of migraine is at fault or that symptoms are being deliberately suppressed in order to return to flying. The International Headache Society criteria for migraine without aura include: episodic attacks of headache lasting 4-72 hrs, with two of the following symptoms: 1) Unilateral pain, 2) Throbbing, 3) Aggravation on movement, 4) Pain of moderate or severe intensity, and either nausea/vomiting or photo / phonophobia. Diagnosis is almost

entirely dependent on the individual's description of the attacks. Migraines often begin in adolescence then may remit for several years, usually returning by mid-life. The prevalence of migraines is 11% overall with 6% among men and 15-18% among women. At least 70% of migraineurs have a family history for the same. Less than one third of patients have "classic" migraine with visual aura, but nearly one half will have paresthesias with their attacks. Vertigo occurs in about 10% of the cases. Auras typically last 15 - 20 minutes and are followed by unilateral, throbbing headaches associated with photophobia and phonophobia, nausea, anorexia and torpor. Most patients prefer to lie in a dark quiet room for relief. Precipitants for migraine may include dairy products, chocolate, MSG, nitrates (preserved meats), tyramine (aged cheese, pickled herring, yogurt, fava beans), sleep deprivation or other chronobiologic challenges such as altered sleep patterns, or extended sleep periods, hormonal changes, osmotic stimuli, (e.g. cigar smoke, perfumes, oils), food deprivation, barometric pressure changes, ice cream and invariably, alcoholic beverages. Digital pressure applied to the temples, cold packs and caffeine may be beneficial. Many patients have a history of car sickness in childhood.

REFERENCE:

American Academy of Neurology, Multispecialty Consensus on Diagnosis and Treatment of Headache, "Headache Guidelines."

[www.aan.com/public/practiceguidelines/](http://www.aan.com/public/practiceguidelines/)

## MULTIPLE SCLEROSIS

Update: DEC 2003

**AEROMEDICAL CONCERNS:** MS typically presents with visual disturbance, vertigo, lower body weakness or sensory changes. The symptoms can present over a period as short as a few hours. Mild dementia may occur in 20% or more of patients. In some cases, paroxysmal events lasting less than 5 minutes (trigeminal neuralgia, abdominal "crises", myoclonus) can be the presenting feature.

**WAIVER:** A diagnosis of definite MS is permanently disqualifying without waiver. Waivers may be considered for uncertain diagnoses that may be classified as monosymptomatic demyelinating disease, possible MS, etc. Usually a period of grounding for observation of 6 to 12 months after full recovery from the "attack" of monosymptomatic disease is required. Additionally, laboratory findings are critical in predicting the likelihood of progression to MS.

ICD9 Code	Condition
341.9	Monosymptomatic demyelinating disease or possible MS
340	Multiple sclerosis

### INFORMATION REQUIRED:

- Neurology consultation
- Multimodality evoked potentials
- MRI scans (brain and spinal cord)
- CSF (cells, protein electrophoresis, IgG, oligoclonal bands, myelin basic protein)
- Monocular color vision testing
- Visual fields, and
- Where indicated, retinal photographs and
- Where indicated, neuropsychological testing.

**FOLLOW-UP:** Annual neurology evaluation is required.

**TREATMENT:** High dose intravenous methylprednisolone (250 mg qid x 3 days) followed by seven days of tapering prednisone (1 mg/kg) given ASAP for the first "attack" of MS may reduce or delay the subsequent progression to relapsing-remitting or chronic progressive MS. Beta Interferon may also have a prophylactic or delaying effect on the development of MS.

**DISCUSSION:** The average age of onset is 33 years, with a male:female ratio of 2:3. The onset is of a single CNS white matter lesion in 55% of cases, optic neuritis (ON) occurring in 16-30% of initial presentations. ON will occur at some time during the disease in 30-70% of cases and 25% of these will have a recurrence of ON. In 90% of persons with ON, recovery is complete. Up to 20% of cases follow a benign course with no permanent disability; 20-30% follow an exacerbating/remitting course; 40% follow a remitting/progressive course; and 10-20% show steady progression. In the early stage, the attack rate is 0.5/year falling to 0.25/year in intermediate years. In 5% of cases, there is a latent period of several years between first and second attacks while in a few cases the disease becomes totally quiescent. The features suggesting favorable prognosis are onset before 35 years, acute onset with only 1 symptom, and predominantly sensory symptoms. Poor prognosis is associated with onset older than 35 years, more than 1 symptom with each attack, early onset of motor signs within 5 years and male gender.

### REFERENCE:

Multiple Sclerosis, <http://www.emedicine.com/neuro/topic288.htm>

# PERIPHERAL NEUROPATHY

Update: DEC 2003

**AEROMEDICAL CONCERNS:** Depending upon the nerve or nerves involved, peripheral nerve dysfunction may represent a trivial nuisance (e.g., meralgia paresthetica) or a grounding impairment (e.g., radial nerve palsy). Full recovery of neurologic function, elucidation of the underlying etiology and certainty regarding the prognosis are issues to be considered in the individual with peripheral nerve abnormalities.

**WAIVER:** Most conditions require grounding pending full recovery (if it occurs) and establishment of a firm diagnostic understanding of the cause of the patient's neuropathy.

## INFORMATION REQUIRED:

- Neurology consultation including supporting laboratory findings (where appropriate) such as EMG, NCV, Evoked Potentials, thyroid functions, Lyme serology, VDRL, HIV, B12, folic acid, ESR, protein electrophoresis, heavy metals, etc.

**FOLLOW-UP:** Required follow-up may vary due to the type of condition, its severity, response to treatment, etc.

**TREATMENT:** Depends on the underlying cause, if known and if treatment exists.

## DISCUSSION:

**Bell's Palsy (ICD9 351.0):** During the acute phase of the paralysis, grounding is required both as a result of the disabling nature of acute facial nerve weakness (difficulty speaking clearly, inability to blink and close the eye in response to visual threats) and because of the fact that not all Bell's palsies are mononeuropathies (i.e., may evolve into acute inflammatory demyelinating polyneuropathy a.k.a. Guillain-Barre, or may be associated with other systemic conditions such as Lyme disease or sarcoid). Once full function has returned, the aircrew member is considered fully qualified, no waiver required. In the event of incomplete recovery or recurrence of facial palsy, waivers are considered on a case-by-case basis.

**Carpal Tunnel Syndrome (ICD9 354.0):** Safety of flight concerns due to impaired fine motor coordination, strength, sensation and abnormal sensations in the fingers and hands require grounding until adequate resolution of the neuropathy has been achieved. Waiver requests should include results of electrophysiologic studies and functional demonstration of satisfactory recovery (e.g., performance in simulator, cockpit egress testing, operation of safety harness and parachute fittings, etc.).

**Ulnar/Radial Neuropathy (ICD9 354.2/729.2):** Same as for Carpal Tunnel Syndrome.

**Peroneal Neuropathy (ICD9 356.1):** Please also submit electrophysiologic test results.

**Sciatica (ICD9 724.3):** Must demonstrate sufficient return of strength to control rudder and brake pedals and safely egress from aircraft (document by actual testing) to be considered for waiver. In addition, the disappearance of pain (while off medication) is required for waiver consideration.

**Meralgia Paresthetica (355.1):** As this is only a sensory neuropathy, waiver can be recommended as long as the member is not disabled or impaired by discomfort and can tolerate the symptoms without need of medication.

## REFERENCES:

- Ulnar/Radial Neuropathy, <http://www.emedicine.com/neuro/topic387.htm>
- Peroneal Neuropathy, <http://www.emedicine.com/neuro/topic588.htm>
- Meralgia Paresthetica, <http://www.emedicine.com/neuro/topic590.htm>

# SUBARACHNOID HEMORRHAGE

Update: DEC 2003

**AEROMEDICAL CONCERNS:** The major risk is rebleeding but there is also a risk of developing hydrocephalus. Bleeding usually follows sudden increases in blood pressure, and it is likely that the anti-G straining maneuver could be just as potentially harmful in this as exercise, lifting or defecation.

**WAIVER:** Waiver is not usually granted for patients who have undergone surgical repair of leaking intracerebral aneurysms or removal of arteriovenous malformations (AVM). Patients who have recovered fully from idiopathic subarachnoid hemorrhage (SAH) with conservative measures may be considered for waiver after 1 years. Patients who have undergone surgical repair of unruptured aneurysms and exceptional cases of repaired ruptured aneurysms also may be considered for waiver.

## INFORMATION REQUIRED:

- Neurosurgical opinion and
- Confirmation of successful obliteration of the vascular anomaly
- Neurologic and
- Neuropsychologic evaluations,
- MRI or CT scan to confirm absence of hydrocephalus or superficial siderosis.

**FOLLOW-UP:** Annual neurology/neurosurgical consultations are required.

**TREATMENT:** Intracranial surgery is medically disqualifying for flying duties.

**DISCUSSION:** Other than case reports there are no major studies on subarachnoid hemorrhage in the active duty population age range. Most studies focus on the population at risk, those over the age of 55. Most patients with this condition have ruptured a Berry aneurysm. Approximately 5% have bled from an AVM and 15% have no identifiable cause. About 25% of patients treated conservatively die within 24 hours of rupture of intracranial aneurysm and up to 25% die in the following 6 months from recurrent hemorrhage, cerebral infarction or following vasospasm. In the survivors, the risk of rebleeding is just over 2% for the first year declining to almost 1%/year after that. Only 32% of such cases are reported to lead a normal life after the bleed. Those patients in whom no cause is found tend to have a better prognosis. Aneurysms are multiple in 10-20% of cases and the rate of rebleeding for these is 3% a year. In those patients treated surgically, the risk of rebleed is negligible if the aneurysm is solitary and has been successfully isolated from the cerebral circulation; but up to 20% of such patients exhibit cognitive or psychosocial decrements at one year. AVMs cause less early death (about 10%); the risk of rebleeding is 7% in the first year and 3% a year thereafter. In those patients with no prior surgery with AVMs followed for 20 years, there was a 42% incidence of hemorrhage, 29% incidence of death, 18% risk of epilepsy, and a 27% chance of having neurological impairment.

## REFERENCE:

Subarachnoid Hemorrhage, <http://www.emedicine.com/neuro/topic357.htm>

## SYNCOPE

Update: DEC 2003

**AEROMEDICAL CONCERNS:** An episode of syncope in flight could obviously cause catastrophic results. The ability to determine which individuals are at a greater risk for recurrence under any given set of circumstances is, thus, of greatest interest.

**WAIVER:** A waiver is not required for simple episodes of vasovagal syncope with known precipitating causes such as pain, standing at attention for lengthy periods, or at the sight of blood (filed as information only). Normal physiological syncope in response to a training event (example: hypoxia demonstration in an altitude chamber or G-induced loss of consciousness in a centrifuge) does not require a waiver. A waiver is necessary for unexplained syncope, recurrent syncope, syncope associated with pathology (e.g., cardiac conduction or valvular defect), or when associated with incontinence or when associated convulsions last over 6 seconds. Recurrent syncope as a result of cough, Valsalva maneuver, certain postural positions, or exertion are generally considered non-waiverable. Unexplained syncope with no clear precipitating events are also generally not considered waiverable.

**INFORMATION REQUIRED:** In the presence of syncope, other than a single episode of vasovagal syncope, a

- Detailed AMS with a complete history of the event(s) is required.
- Complete neurological evaluations and cardiovascular evaluations may be required.

**FOLLOW-UP:** Follow-up is rarely required unless an underlying etiology requires recurrent evaluation.

**TREATMENT:** Avoidance, if possible, of known precipitating causes is the single most effective treatment.

**DISCUSSION:** In 12% of patients with syncope, some type of convulsive movement may occur. Careful history taking, the presence of facial pallor and the rapid recovery without amnesia help to distinguish syncope from epilepsy. Head injury sustained during the fall may confuse the issue. Presence or absence of incontinence does not help in distinguishing between syncope and seizure. Tongue-biting is strong evidence in support of a seizure and unlikely in syncope. Recurrent, unexplained syncope often can be attributed to psychiatric causes, especially panic disorder, depression and somatization. Brain scans, EEGs, carotid ultrasound and lab tests are not usually helpful in arriving at a cause for syncope. If the history, PE and ECG don't provide the diagnosis, it is unlikely that further studies will help. In cases of cough-, Valsalva-, and exertion-induced syncope, remember to consider posterior fossa pathology, especially Arnold-Chiari malformation. Patients with micturition syncope rarely have underlying disease and can often safely continue unrestricted flying; they should, however, be warned that it would be wise to reduce alcohol intake.

### REFERENCE:

Syncope and Related Paroxysmal Spells, <http://www.emedicine.com/neuro/topic446.htm>

## TRANSIENT ISCHEMIC ATTACK

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The symptoms develop abruptly and unrelated to any particular activity. Symptoms depend on the distribution of the blood vessel concerned and can range from distracting to incapacitating.

**WAIVER:** Transient ischemic attacks (TIAs) are permanently disqualifying. In rare cases where a curable cause is identified and treated (e.g., Atrial septal defect with aneurysmal defect - surgically cured), waiver consideration may be undertaken.

### INFORMATION REQUIRED:

- Neurology consultation,
- MRI scan
- ECHO to include bubble-contrast and if negative, trans-esophageal ECHO,
- Cerebral angiography
- ESR
- Lupus anticoagulant,
- Antiphospholipid antibodies
- Platelet count
- CBC
- PT, PTT
- Protein S
- Homocysteine levels

**FOLLOW-UP:** Annual neurology consultation is required.

**TREATMENT:** Depends upon underlying cause, if identified. If no surgically correctable etiology, then ASA, low-dose Coumadin or ticlopidine may be appropriate. Life-style changes and treatment of risk factors (smoking, obesity, HBP, diabetes, hyperlipidemia, alcohol excess, sedentary behavior) need to be explored.

**DISCUSSION:** About 25% of patients with TIA do not appear to have any identifiable serious disease. Approximately 30% have a potential cardiac cause and diabetes is present in 6-28% of patients with TIA. The risk of developing cerebral infarction following TIA is 5-7% a year with a further 5% a year developing myocardial infarction. The risk of stroke and/or death is 10% a year. These risks rise with age, blood pressure and the presence of ischemic heart disease. In cases of purely retinal TIA (amaurosis fugax), the 7-year cumulative rate of cerebral infarction is 14% and the 5-year cumulative rate of recurrence is 37%.



## OBSTETRICS & GYNECOLOGY WAIVERS

## ABNORMAL PAP SMEAR

Update: NOV 2001

**AEROMEDICAL CONCERNS:** The purpose of the pap smear screening test is to detect premalignant conditions of the cervix. When positive, regardless of the nature of the underlying abnormality, this may be devastating news to the female aircrew member. Concern over the potential findings and the delay often associated with definitive diagnosis is most certainly a detractor to aviation duties. If cytology is positive for malignant cells, it is 95% predictive of cervical cancer. (See Cervical Carcinoma APL)

**WAIVERS:** Pap smears are not required for initial flight applicants. Pap smears resulting in a diagnosis of benign cellular changes with or without atypia (inflammation, infection, repair, reactive) require evaluation with subsequent treatment and follow-up and require local flight surgeon review only. Rated aviation personnel may be followed locally for Atypical squamous cells of undetermined significance (ASCUS), and Low-grade squamous intraepithelial lesions (LGSIL) with no waiver action required and filed as information only. High Grade squamous intraepithelial lesions (HGSIL) and carcinoma in situ (CIS) are considered non-waiverable until satisfactory treatment is achieved (See Cervical Carcinoma APL).

**INFORMATION REQUIRED:**

- OB/GYN consultation is required.

**FOLLOW-UP:** Annual OB/GYN consultation. High risk patients will require serial cytological studies as indicated for their class of disease.

**TREATMENT:** Treat underlying etiology of inflammatory changes [Human Papilloma Virus (HPV), bacteria, Trichomonas vaginalis, Herpes simplex virus, etc.]. Cryosurgery, laser therapy, loop electrosurgical excision procedure (LEEP), and electrocoagulation are methods used most commonly to treat LGSIL. HGSIL lesions require laser, LEEP or definitive surgical therapy. CIS is often treated with hysterectomy but cervical conization may be considered for patients who desire pregnancy. Close monitoring is required.

**DISCUSSION:** Cervical cancer is the end result of progressive cervical epithelial alterations. Risk factors include multiple sexual partners, early first coitus (< 20 years of age), , young age of first pregnancy, lower socioeconomic status, smoking, male partners with multiple sexual partners, current or prior infection with HPV, condylomata, or herpes simplex infection, HIV infection, abuse of alcohol or other substances, and immunosuppression. Approximately 36% of treated CIS cases progress to invasive cervical cancer. 75% of lower grade dysplasias regress or persist without treatment with the remaining number progressing over various time intervals. The average time for progression of HGSIL to CIS varies and often depends on HPV serotype and can vary from just a few months to several years. Screening may reduce the risk of death from cervical cancer by as much as 80%. A review of current data in the AEDR indicates that in the past 15 years, screening revealed only four cases of CIS on initial exams and only three of these were disqualified. Other initial cases involved dysplasia of various degrees, and the majority of these cases went on to enter aviation service after treatment.

**REFERENCE:** Noble, Textbook of Primary Care Medicine, Chapter 44, Gynecologic Neoplasms, 3<sup>rd</sup> Ed., 2001, p. 378-381.

# ENDOMETRIOSIS

Update: MAR 1997

**AEROMEDICAL CONCERNs:** Pelvic pain, infertility, and abnormal menstrual bleeding are the primary symptoms. These symptoms may become severe enough to become distracting and the bleeding may be heavy enough to result in significant anemia. There is also a rare association with spontaneous pneumothorax.

**WAIVERS:** Mild endometriosis, requiring only mild analgesia for symptom control, is not considered disqualifying. A waiver may be required for more recalcitrant cases after the symptoms are controlled. Recommendations for waiver will be based upon degree of symptoms and the medications used and will vary case by case.

ICD9 Code	Condition
617.0	Endometriosis of uterus
617.9	Endometriosis, site unspecified

## INFORMATION REQUIRED:

- OB/GYN consultation is required.

**FOLLOW-UP:** Those patients with a waiver will require periodic OB/GYN consultation. Frequency of consultation will vary by severity of disease process.

**TREATMENT:** Mild analgesia with NSAID or equivalent is permitted without waiver action. The use of progesterone or antagonist agents such as Danazol may be compatible with selected flying duties once the patient is stabilized. Patients may also be returned to flying duties after laser ablation of the lesions.

**DISCUSSION:** Endometriosis is the extrauterine occurrence of endometrial glands and stroma, most often involving the ovaries or dependent visceral peritoneal surfaces. Although a benign disease, endometriosis is progressive, tends to recur, may be locally invasive, may have widespread disseminated foci, and may exist in pelvic lymph nodes (30%). Ten to twenty percent of menstruating women are affected and it is found in 30% to 45% of all infertile women. Danazol is the most common medical treatment but almost 80% of patients have side effects (10%-20% severe enough to discontinue medication). These symptoms include: acne(15%), hot flashes (15%), uterine spotting (10%), gastrointestinal disturbances (8%), weakness and dizziness (8%), hirsutism (6%), edema (6%), decreased breast size (5%), weight gain, (5%), and change in libido (3%-5%). In addition, migraine headaches (2%), emotional lability and depression may occur. Spontaneous pneumothorax, sometimes called catamenial pneumothorax, occurs more on the right side (93%) than the left.

## LEIOMYOMA OF THE UTERUS (FIBROIDS)

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The majority (about two-thirds) of women with leiomyomas are asymptomatic. When symptoms occur, they depend on the number, size, location, situation, and status (usually vascular supply) of the tumor(s). Symptoms most often are abnormal uterine bleeding, pressure effects, pain, and infertility. Iron deficiency anemia commonly occurs as a result of increased menstrual blood loss. Larger tumors may exert pressure on various organs, producing symptoms of urinary frequency and ureteral obstruction. Pelvic congestion may occur rarely with very large tumors with resulting lower extremity edema or constipation. There is also an association between fibroids and polycythemia.

**WAIVERS:** Asymptomatic fibroids do not normally require waiver action. Once symptomatic fibroids are surgically removed, no waiver is required. Symptomatic fibroids, if symptoms are mild and there is no significant anemia, may be waivered.

### INFORMATION REQUIRED:

- OB/GYN evaluation is required.
- If surgically removed, pathology report should confirm diagnosis of benign leiomyoma.

**FOLLOW-UP:** No follow-up is required for asymptomatic or surgically removed fibroids; however, routine OB/GYN follow-up is suggested. Symptomatic aircrew members require annual OB/GYN consultation with ultrasonic imaging as indicated.

**TREATMENT:** The majority of small asymptomatic leiomyomas can be managed conservatively with close observation. Surgical removal of the tumor or hysterectomy are possible options for symptomatic or large fibroids. If hysterectomy is performed, the aircrew member may be returned to full flight status following a 90 day recovery period. Aircrew members must be grounded during treatment with gonadotrophin releasing hormone agonist (GnRH) because of the incidence of depression and abdominal pain.

**DISCUSSION:** Fibroids are discreet, rounded, firm, white to pale pink, benign myometrial tumors composed primarily of smooth muscle with some connective tissue. About 95% arise from the uterine corpus and about 5% from the cervix. Only rarely do they arise from the fallopian tube or round ligament. They are the most frequent pelvic tumor, occurring in 25% of white and 50% of black women by age 50 years. Repeated surgery for adnexal disease occurs in up to 7% of patients following hysterectomy. Solitary fibroid removal results in 27% recurrence; for multiple fibroids the figure rises to 59%. The incidence of leiomyosarcoma arising in uterine fibroids has been reported to be 0.1 - 0.6%, with a 5-year survival rate of 31%.

## PELVIC INFLAMMATORY DISEASE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Symptoms of pelvic inflammatory disease (PID) may include acute or chronic lower abdominal or pelvic pain, possibly radiating from the back to the leg, fever, headache, malaise, nausea, and vomiting. Such symptoms may cause distraction in flight or, in severe cases, could cause incapacitation. Sequelae may include hydrosalpinx, pyosalpinx, tubo-ovarian abscess, infertility, ectopic pregnancy and chronic pelvic pain, many of which may cause acute abdominal emergencies. Anxiety, depression, and tension can become important if the illness becomes chronic and treatment provides little relief.

**WAIVERS:** PID may be routinely recommended for waiver provided that the aircrew member is symptom-free and is undergoing approved treatment. Frequent episodes of PID may be grounds for termination of flight status.

### INFORMATION REQUIRED:

- OB/GYN consultation is required.

**FOLLOW-UP:** None required when symptoms do not reoccur. Any recurrence of symptoms will require repeat OB/GYN consultation. This information must be referred to USAAMA for review.

**TREATMENT:** Mild cases of PID may be treated with oral antibiotics. Full flight status may be granted provided symptoms are absent, approved medications are used, and duty does not compromise the possibility of recovery. More severe cases may require intravenous medication and even exploratory surgery. Once recovered from surgery they may return to full flight status. Patients can return to flying one week following laparoscopy provided they are asymptomatic.

**DISCUSSION:** PID is an extraordinary health problem. There are about 1 million cases of acute PID a year in the United States, and the total cost is estimated to exceed \$3.5 billion per year. PID affects 1% - 2% of sexually active females yearly and is more frequent in young women (75% of those affected are less than 25 years of age). PID is responsible for .29 deaths/100,000 women of age 15-44. A first attack of PID is followed by subsequent attacks in 20% of women. Perihepatitis can occur in 5% of patients with PID. Intraluminal adhesions, especially if the Fallopian tube is kinked, predisposes to ectopic pregnancy; the risk for patients who have had PID is increased from 0.7% to 4%. Up to 20% of patients develop chronic pelvic pain. Primary infertility has been reported in up to 20% and this is likely to have a psychological effect. Patients who have had gonococcal rather than non-gonococcal PID have a better prognosis since the symptoms are more acute, provoking much more rapid medical treatment.

## PREGNANCY

Update: MAR 1997

**AEROMEDICAL CONCERNS:** The effect of the aviation environment, i.e., vibration, high decibel noise, increased heat exposure, hypoxia, G-forces, toxic fumes, and other physiological stresses on the developing fetus is not clearly understood. During the first trimester, spontaneous abortion or tubal pregnancy may result in disabling pain, distracting symptoms, or total incapacitation. Complications of pregnancy, such as morning sickness, heat intolerance, genito-urinary infections, gestational diabetes, hypertension, pre-eclampsia, kidney stone and physiologic anemia may arise at any time during pregnancy. G-forces sustained during high performance maneuvers, ejection, or crash dynamics may be of danger during the entire pregnancy but is of particular concern during the final trimester when increasing size puts the pregnant aviator at greater risk of hemorrhage and premature labor.

**WAIVERS:** Initial flight applicants are considered disqualified until fully recovered (6 weeks postpartum). Rated aircrew members may, if the pregnancy is not complicated, remain on restricted flight status provided that this has been approved by the OB/GYN physician and the patient. This restriction should include: "Temporary flying duties with RESTRICTION to Synthetic Flight Training Simulator (SFTS)." After 12 weeks of gestation until the 25th week of gestation, the restriction may be changed to include: "May fly multiengine, non-ejection seat, fixed-wing aircraft with dual-pilot status and a cabin altitude less than or equal to 10,000 feet." During complications of pregnancy or from delivery until complete recovery, the aviator should be grounded. ATC (Class 4) may perform duties throughout pregnancy unless medical complications or hospitalization for delivery will prohibit or interfere with ATC duties. Uncomplicated pregnancy will be coded information only. **NOTE:** Pregnant aircrew members are now allowed up to 365 days DNIF status before DA waiver/termination action is required.

### INFORMATION REQUIRED:

- An abbreviated AMS must be submitted at both the initial diagnosis of pregnancy (providing information of the expected date of confinement (EDC) and lack of risk factors) and upon termination of pregnancy with recovery (providing information of actual termination of pregnancy, lack of complications, and full recovery).
- Complicated pregnancy may require OB/GYN consultation.

### FOLLOW-UP: N/A

**TREATMENT:** Prenatal vitamins, FeSO<sub>4</sub>, and folic acid are permissible. Medications for morning sickness are not permitted due to secondary sedative side effects.

**DISCUSSION:** During the first trimester, teratogenic effects of the flight environment are unknown. Various animal studies have demonstrated potential teratogenic effects of vibration, hypoxia and to the various potential chemical hazards the aviator may be exposed to during military operations. In the second trimester, theoretically the fetus is relatively well protected against the aviation environment with its own liquid filled anti-G suit and with fetal hemoglobin. The restrictions in the final trimester are related to the increased risk of premature labor that is reported to occur with reduced atmospheric pressure and to the increasing physical difficulty in carrying out military duties.

# PREGNANCY ABBREVIATED AEROMEDICAL SUMMARY

## PART I: DEMOGRAPHICS

Full Name: \_\_\_\_\_ Rank: \_\_\_\_\_ SSN: \_\_\_\_\_

**Component:** (check one)

- AD
- USAR-AGR
- ARNG-AGR
- USAR
- USAR-IRR
- ARNG
- DAC
- CIV

**Unit**

Address \_\_\_\_\_

Phone \_\_\_\_\_

**Aviation Medicine Clinic**

Clinic Code \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

**Aviation Class:**

- 2 (Aviator)
- 2F (Flight Surgeon)
- 2S (Aeroscout Observer)

## PART II: INITIAL DIAGNOSIS OF PREGNANCY

Gravida

Parity

Sab

Tab

Date of Diagnosis:

Expected Date of Confirmation:

## PART III: COMPLETION OF PREGNANCY

**Outcome:** (check one)

- Spontaneous Miscarriage
- Elective Abortion
- Normal Vaginal Delivery
- Caesarian Section

Date of Pregnancy Completions: \_\_\_\_\_

Weeks of Gestation at Completion: \_\_\_\_\_

Report complications in complete aeromedical summary.

FLIGHT SURGEON'S SIGNATURE BLOCK

DATE



## OPHTHALMOLOGY WAIVERS

## CATARACT

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Aircrew members with cataracts are prone to develop uncorrectable visual acuity changes. When the cataract involves the visual axis, visual acuity can be further reduced in bright sunlight and conditions of glare. Cataracts are considered disqualifying once diagnosed even if they are asymptomatic since most are progressive.

### WAIVERS:

**Initial Flight Applicants:** Exception to policy is rare, but will be reviewed on a case-by-case basis.

**All Rated and Non-Rated Aircrew (to include Class 2/3/4 Applicants):** Waivers for asymptomatic cataracts without visual impairment are reviewed on a case-by-case basis and routinely granted.

Once vision has deteriorated to less than 20/20 correctable or the patient has a positive Glare test, the aircrew member should be disqualified from flying until successful surgical removal of the cataract. This cataract surgery requires resubmission for waiver and is usually granted provided the visual acuity returns to 20/20 corrected, is within refraction limits, and the Glare test is negative (normal). Visual acuity less than that will be reviewed on a case-by-case basis and usually not granted.

### INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation is required for initial waiver request.
- Mentor Brightness Acuity Test (BAT, a glare testing device), should be performed prior to and after surgery with visual acuity documented for each eye separately at the low, medium and high settings.
- Confirmation is needed of the exclusion of underlying pathology such as Wilson's disease, diabetes or hypoparathyroidism.

**FOLLOW-UP:** Annual comprehensive ophthalmologic/optometric evaluation is required unless more frequent follow-up is clinically indicated

**TREATMENT:** Extracapsular lens extraction with intraocular lens (IOL) implants usually provides a sufficiently acceptable visual acuity result for military flying duties.

**DISCUSSION:** The visual effect of a cataract depends on its encroachment on the visual axis and the proximity to the nodal point. A posterior subcapsular cataract can have a devastating effect on vision. Two to three episodes of serious dehydration can increase the risk of developing a cataract 21-fold. Surgical success rates of greater than 90% in achieving a 20/40 best corrected VA after 1 year has been reported. The RAF restricts the flying of personnel with IOL from high performance aircraft and helicopters. This is because of the risk of pressure on ciliary body blood vessels under high Gz or vibration and because of the unknown long term effect on the corneal epithelium.

## COLOR VISION DEFICITS

Update: MAR 2008

**AEROMEDICAL CONCERNS:** Color vision is required to accurately identify warning lights. Color visual displays in the cockpit, external visual cues including airfield lighting, the Fresnel lens, aircraft formation lights and colored smoke or light signals are commonly used in military operations. Interactions with other optical devices, such as laser protective visors, may compound the problem. While color vision deficiencies are largely congenital, some occur as a result of ocular disease and/or medication side effects. The US Air Force standard for pilot accession is COLOR NORMAL (no deficits found on screening) while the US Army and US Navy standard is for COLOR SAFE, translating to accepting those who may have some mild deficit, yet still pass the screening test algorithm (see the ATB, Color Vision Testing).

**Revised Standard (Algorithm):** The Army passing standard is PIP PASS (2 or less errors out of 14 presentations) plus passing the single F2 plate (or the PIP2 series with eye specialist if F2 not available) (i.e., PIP series). If failing the PIP series, but passing FALANT (no errors in 9 presentations), this meets the standard, but REQUIRES ophthalmology evaluation to define the potential color axis and specific type of deficiency as well as assess for any underlying abnormalities for INFO ONLY status. This information must be reported on the DD 2808. Failing PIP series and FALANT fails the standard. The former standard of testing color vision on the initial FDME is revised to include initial, comprehensive, and required post-mishap FDMEs. The Navy testing standards are similar to the revised Army standard.

**WAIVERS/ETP/DQ: Failing both PIP series and FALANT is disqualifying. AMS is required as follows:**

**Initial Flight Applicants:** Exception to policy is normally not granted and may be reviewed on a case-by-case basis via Mini-ACAP and/or ACAP after the complete evaluation as outlined below.

**Flight Surgeons (to include 2F/2P applicants):** Waivers are routinely granted for aeromedical practitioners given the complete evaluation below.

**Rated and Non-Rated Aircrrew (to include 2/3/4 applicants):** Non-rated aircrew will normally be waived with a restriction to flying with an individual with "normal" color vision after the complete evaluation outlined below. Waiver for discovery of or a change in color vision in rated aircrew is usually granted if not due to ocular pathology and with complete information below. Aviators will carry the restriction of flying with an individual with "normal" color vision.

### INFORMATION REQUIRED:

- PIP Series and FALANT lantern testing results given under proper testing conditions. (See ATB).
- Ophthalmology evaluation
  - Determine the color axis and the specific type of deficiency, i.e., tritanomaly, protanomaly, or deuteranomaly
  - Rule out the existence of an underlying abnormality such as an optic nerve disorder or retinal/macular problem.
- An in-flight evaluation for rated and non-rated aircrew who fail both PIP and FALANT, with Aldis Gun Light sequences from a control tower at a distance of 1/2 to 1 mile (normal traffic pattern, VFR conditions). Three of 5 sequences of lights each will be viewed.

**FOLLOW-UP:** No follow-up is generally required unless underlying abnormalities exist.

**TREATMENT:** N/A.

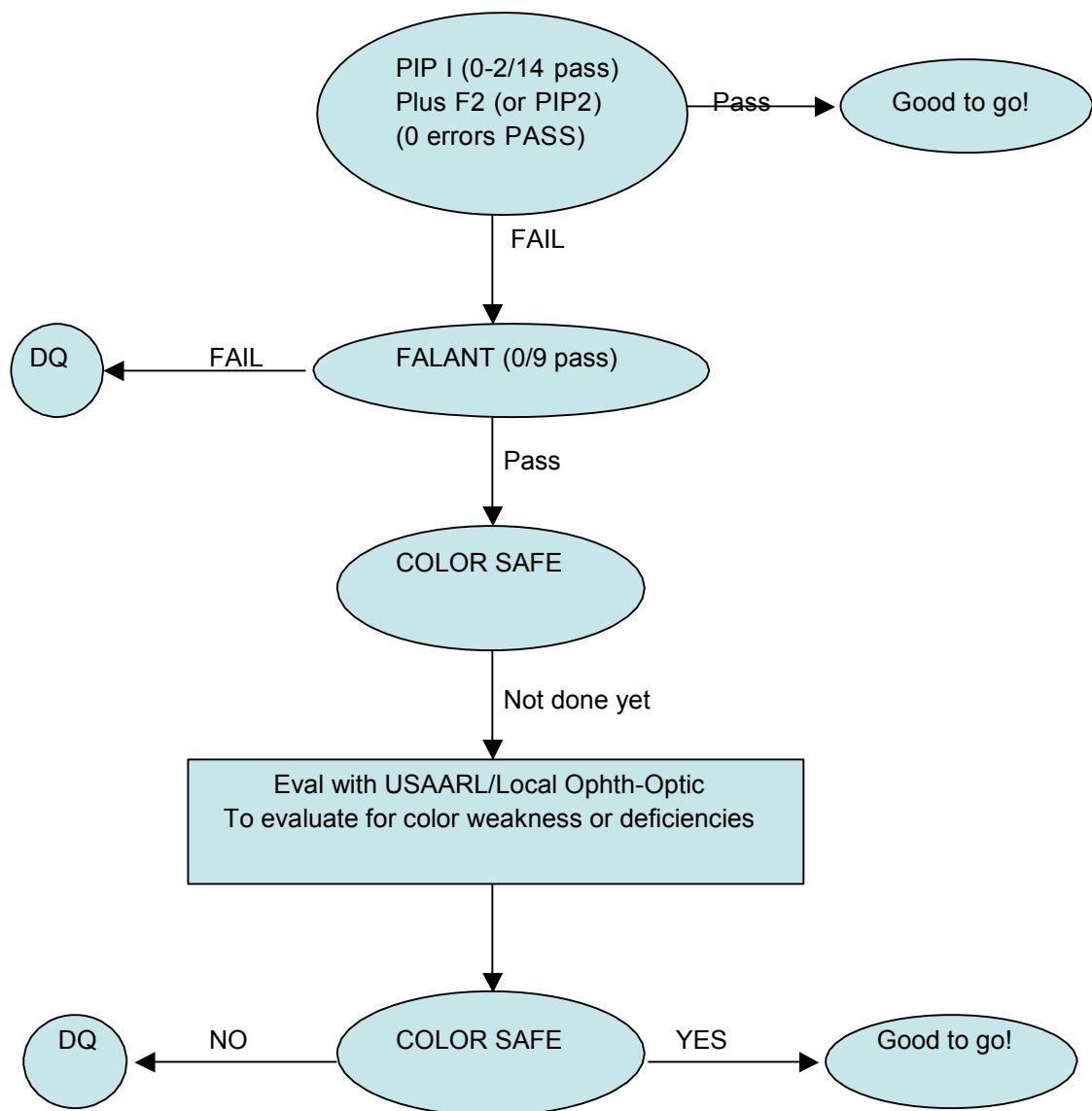
**DISCUSSION:** Defective color vision is usually congenital, showing the X-linked recessive pattern. In Caucasians, more than 8% of males and 0.5% of women have inherited color defective vision and more than 2% are dichromats with severe deficiency. A tendency toward is termed an –anomaly; a severe condition is called an –opia. The largest group is actually trichromatic, considered color weak rather than color deficient. Dichromatics are protanopes if they have a red-green deficiency related to red-sensitive cone loss; deuteranopes if they are red-green deficient related to green-sensitive cone loss; and tritanopes if they have blue-yellow deficiency related to blue-sensitive cone loss. Deutanopes and protanopes have difficulty interpreting VASI lights' red-white color relationship. Protanopes have difficulty interpreting red high-speed taxiway exit and runway end marker lights. At night, dichromats may be further reduced to monochromaticity when the physiological phenomenon of small field tritanopia is added; this is of relevance in distinguishing navigation and anti- collision lights. Thus, while some color vision deficiencies are acceptable, the most problematical is obviously red/green abnormalities. Color vision can be affected after optic neuritis or in macular degeneration, central serous retinopathy, multiple sclerosis, as a sequela to heavy metal poisoning, or by a number of medications to include aeromedically waived medications when without side effects. The 5-PDE class has received a large amount of press in the recent years. Proper testing procedures are necessary for accurate assessment—hence, the rationale for one screening regimen and further evaluation with an optometrist or ophthalmologist for any failures. Refer to the ATB, Color Vision Testing for procedures.

**Pseudoisochromatic Plates (PIP):** The primary color vision test for the FDME. The plates should be viewed at a distance of 20-30 inches under proper illumination (McBeth easel lamp, indirect sunlight, or fluorescent light). Do not use incandescent lighting as this may allow mild deutanomalous (green weak) individuals to pass. Each eye should be tested separately. Greater than 2 errors out of the 14 plate set or greater constitutes a failure of the PIP color vision test. The plates should be shuffled periodically to avoid memorization of the testing sequence and they should be replaced every 1-2 years due to fading. Results should be recorded as Pass or Fail with the number wrong/total (ex. PASS 2/14, FAIL 3/14).

**Farnsworth Lantern test (FALANT):** Used when an aircrew member fails the PIP series tests. It is given in normal room light with the patient seated eight feet from lantern. The patient is asked to identify the Red/Green or White pairs of light combinations presented. Nine pairs are given to the patient, and if all are identified correctly, the patient passes. Record this exam same as above (number wrong/total) (ex. PASS 0/9, FAIL 1/9). If any pair is missed, the aircrew member fails and should be sent to the eye clinic for further evaluation.

**PIP2/F2 Plate:** F2 is a single plate used to assess for blue/yellow weakness or deficiency and some red-green deficiencies— this is PASS/FAIL. PIP2 is a 10-plate series and should be administered and scored with an eye specialist. Blue-yellow deficiency is normally rare without other deficits in the red-green axis, but may present with age, ocular diseases, or medication side-effects (such as Viagra®).

**Algorithm:**



# CONVERGENCE DEFICITS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Most aircrew members with convergence insufficiency are asymptomatic since they are only exophoric at near. Symptomatic aircrew, however, may break down to exotropia with fatigue or stress and complain of asthenopic problems (i.e., tearing, blurring, headache, fatigue, halo images) or frank diplopia. Near point of convergence insufficiency greater than 100 mm is considered disqualifying for Class 1 and cause for evaluation for Class 2/3/4.

## WAIVERS:

**Initial Flight Applicants:** Initial flight applicants with confirmed convergence insufficiency are disqualified; exception to policy is rarely recommended and requests will be reviewed on a case-by-case basis.

**Rated and Non-Rated Aircrew (to include Class 2/3/4 applicants):** Rated aircrew applicants and members with asymptomatic convergence insufficiency after completing ophthalmologic/optometry evaluation are routinely waived. Symptomatic convergence insufficiency may be granted waiver provided treatment (see below) provides relief of symptoms.

## INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation is required.

**FOLLOW-UP:** An annual ophthalmology/optometry evaluation is required. More frequent (every 6 mo.) evaluations may be required as clinically indicated.

**TREATMENT:** Treatment consists of a regular series of orthoptic exercises which can easily taught by the ophthalmologist or optometrist. Treatment usually takes four to eight weeks and follow-up is usually performed bi-weekly and includes the following exercises:

### Base Out Prism Exercises

Consists of viewing near objects (i.e., reading) with a base out prism over one eye for 10 minutes then the other eye for 10 minutes. The exercise should be performed twice daily starting with a prism power equal to the patient's near fusional convergence and steadily increase the power of the prisms until 30-50 PD is reached.

### Binocular Push-ups

Consists of viewing a visual acuity chart as close to eyes as possible for 10 minutes twice a day. This exercise is useful if the near point of convergence is abnormal, but is usually not effective without concurrent use of the base out prism exercise.

**DISCUSSION:** Successful treatment is determined by relief of symptoms, improved near point of convergence, or improved fusional convergence, and can be expected in 90% of the cases.

## CONTACT LENS WEAR

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Soft contact lens wear in place of spectacles is acceptable in all classes of aviation after meeting the unaided and corrected visual standards. The use of non-medical soft contact lenses poses no significant medical risk in the aviation environment while supervised by the military optometrist or ophthalmologist and unit flight surgeon. Contact lenses may introduce certain operational and medical risks and cannot be worn by everyone all of the time. Some personnel may not be able to meet visual standards with contacts and, therefore, would be required to wear spectacles only. Complications of contact lens wear, which include but are not limited to corneal abrasion, corneal ulceration, infection, and transient or permanent loss of vision, can be detrimental in the aviation environment and permanent suspension. Appropriate contact lens fit and visual acuity correction, at both distance and near, are required for safe flight operations.

THE USE OF MONOVISION CONTACT LENSES, HARD (GAS PERMEABLE) CONTACT LENSES OR BIFOCAL CONTACT LENSES IS NOT AUTHORIZED FOR FLIGHT OPERATIONS (AR 40-63)

### WAIVERS (INFORMATION ONLY):

**All Rated and Non-Rated Aircrew to INCLUDE ALL Applicants:** Contact lens wear will be recorded as Information Only on the Initial FDME provided all visual standards are met and appropriate Contact Lens evaluation is performed and reported as below.

**INFORMATION REQUIRED:** On the initial FDME or the first FDME listing contact lens wear, the following information must be submitted in Remarks section of DD2808, block 73:

- Current contact lens parameters: brand, base curve, diameter, and power
- Visual acuity with lens wear: both distance and near for each eye
- Slit-lamp examination (noting fit, centration, and movement of contact lenses)
- Presence / absence of contact lens related complications
- Keratometry readings for each eye

**FOLLOW-UP:** All aircrew using contact lenses will have a yearly eye exam to ensure adequacy of function and fit, physiological compatibility, and to monitor for complications. The following information must be included on annual FDME:

- Current contact lens parameters: brand, base curve, diameter, and power
- Visual acuity with lens wear: both distance and near for each eye
- Slit-lamp examination (noting fit, centration, and movement of contact lenses)
- Presence / absence of contact lens related complications. Personnel with repeated complications will be required to use spectacles until resolved and cleared by eye specialist.

**DEPLOYMENT REQUIREMENTS:** Aviators must train in the same manner as they fight. Aircrew members subject to deployment are responsible for maintaining the following in their personal equipment bag:

- Two pair of clear and one pair of tinted ("sunglass") spectacles with current prescription achieving at least 20/20-1 at both distance and near in each eye.
- If aircraft requires the use of an optical device (currently the AH-64 A/D), one (1) pair of spectacles, adequate for accommodating the optical device, should be maintained in lieu of one of the clear pair of spectacles stated above, if a different or special frame is needed.
- If specifically required by the unit mission, the individual should also maintain one (1) pair of KG-5 laser lenses, with the current spectacle prescription achieving visual standards for flight

(these are not intended for wear over contact lenses and are only available in the military-issued “Apache frame”).

- Per AR 40-5, Preventive Medicine, contact lens wear is prohibited during gas chamber exercises, field training and combat. However, contact lens wear may be feasible in deployments to areas other than combat (i.e. Honduras-JTF Bravo, or other deployments where clean facilities are available). The only exception to this policy is Apache pilots. Aircrew members who wear soft contact lenses that are not disposable, should maintain two spare sets of soft contact lenses, sealed in their original containers and clearly labeled for left and right eyes (labeling only necessary if the prescription is not the same in each eye). Aircrew members with disposable soft contact lenses should keep an additional 12 pair of soft contact lenses, in addition to their normal 24-week supply.
- One spare case for disinfecting soft contact lenses; one spare, sealed case (no vent) for temporary storage and transportation; at least three months and preferably six months current supply of disinfecting solutions. Also, if required per prescribed cleaning regimen, three to six month's current supply of enzymatic solutions, rewetting drops, artificial tears, and/or special cleaners, whichever apply.

**TREATMENT:** Aircrew members using contact lenses are encouraged to seek medical evaluation for even the most minor eye symptom. Delay may be detrimental—corneal ulceration and scarring may jeopardize visual acuity and flight status! Corneal transplant is permanently disqualifying.

**DISCUSSION:** The following points should be considered in selecting aircrew to use routine non-medical contact lenses:

- Not all aircrew can be successfully fitted with contact lenses. Therefore, contact lens use should always be considered optional.
- Individuals must meet all vision standards while wearing contact lenses.
- Contact lens wearers should achieve at least 8 hours per day of comfortable and successful lens wear.
- Individuals must be free from eye disease and infections that contraindicate contact lens use.
- Individuals must be available for follow-up care for a minimum of one month after initial contact lens fit to monitor the personal and operational efficacy of their contact lenses and report complications to the Flight Surgeon immediately.
- It is recommended that the unit flight surgeon/APA office maintain records on all of the active aircrew wearing contact lens to include contact lens parameters, related complications, and spectacle back-up prescription data.
- Aircrew should be proficient in removing contact lenses in flight with or without gloves.
- Contact lens wear may be considered for aviation personnel regardless of aircraft type.

With regard to contact lens selection, the following guidelines are provided:

- Darkly tinted contact lenses or lenses to achieve cosmetic alteration of iris colors are not approved, even if the color of the contact is the same natural color of the eye. This can act as a selective waveband filter or a limitation of field of view and can adversely affect color perception or peripheral viewing, respectively. However, a light tint regarded as a “visibility tint” to facilitate location of a dropped contact lens is recommended.
- Monovision fitting with contact lenses is not approved. Such fitting techniques are known to acutely degrade stereopsis, contrast sensitivity, and target acquisition. In non-presbyopes, both eyes must be bilaterally corrected for both distant and near vision at the same time. If reading correction is required this should be provided with a spectacle with the appropriate reading add as a bifocal segment.
- Bifocal and multifocal contact lenses are not approved. Such lenses are difficult to fit, costly, and depend too critically on lens position to achieve optimal visual performance.

With regard to operational Contact lens issues:

- For Apache pilots requiring optical correction, the optometrist should fit a silicone hydrogel, if at all possible. The use of these types of lenses will allow the pilot to safely wear contact lenses for an extended period of time without compromising their ocular health (the use of extended wear may be necessary in a combat environment due to a lack of clean facilities for insertion or removal). Due to material costs, Apache pilots will not be fit with daily disposable contact lenses unless medically necessary. Otherwise, contact lenses should be worn primarily on a daily-wear basis (no more than 16 hours per day). A minimum of six to eight (6-8) hours of time without contacts is recommended between periods of contact lens wear. Wearing a standard contact lens (not a silicone hydrogel) during sleep is highly discouraged as it can lead to oxygen deprivation of the cornea. If operational conditions preclude removal, remove the contact lenses for cleaning at first opportunity in order to minimize the risk of complications.
- Aircrew must be advised of the need to maintain the highest possible standard of lens hygiene. Smoking cessation is strongly recommended for all contact lens wearers to reduce the incidence of serious complications. The potential hazards of contact lens use should be explained by both the consulting optometrist/ophthalmologist and the FS.
- Dislocation or loss of a contact lens while flying is a definite possibility. It is highly advised that aircrew become proficient in removing contact lenses in flight in case one becomes dislodged or the need arises in which contacts must be removed. Should a contact lens dislocate or fall out of the eye, it is usually best to immediately remove the other contact lens and utilize the carried spectacle correction. However, safety and pilot judgment always take precedence in these situations to maneuver the aircraft in the safest manner possible.

**IMPORTANT NOTES:** Currently, contact lens wear is only required to operate the Apache helicopter. Apache pilots on Active Duty will procure their occupational contact lenses through their servicing optometry clinic as per the Apache Contact Lens Program. Reserve and National Guard Apache pilots DO NOT qualify for government purchased lenses under the Apache Contact Lens Program; they must obtain their lenses through their unit, as they do with other optically necessary devices such as glasses and protective mask inserts. Reserve and National Guard pilots that are activated for deployment will be treated as Active Duty Apache pilots.

Other aircrew members may be fit with contacts at their local optometry clinic if the clinic provides this service; however, the purchase, examination, follow-up care, and supply costs may all be at the aircrew member's own expense.

All aviation personnel wearing contact lenses must be correctable to a minimum 20/20-1 visual acuity or better, at both distance and near in each eye, during contact lens wear.

The use of contacts while flying does not preclude the requirement, for all aviation personnel required to fly with corrective lenses, to carry one pair of corrective spectacle lenses on their person while performing aviation duties. An additional (second) pair of corrective spectacle lenses must be kept either on their person or in the flight bag accompanying the flight.

It is strongly encouraged that the individual units ensure personnel train in both contact lenses and spectacles to maintain proficiency flying with their spectacle prescription. If a near prescription is required for presbyopia, the aircrew member must utilize the prescription that affords them 20/20-1 vision at both distance and near in each eye while performing aviation duties. It is highly advised that any personnel wearing contacts for the first time wear the contacts successfully for a minimum of one month's time prior to flight operations, flight duties, or air traffic control duties to ensure there are no unforeseen complications, eye health concerns, or safety risks.

**REFERENCE:** AR 40-63, Ophthalmic Services, January 1986.

# CORNEAL REFRACTIVE SURGERY

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Uncomplicated, successful completion of LASIK (laser in-situ keratomileusis), LASEK (Laser Subepithelial Keratomileusis), or PRK (Photo Refractive Keratectomy) to improve visual acuity within pre-surgical standards and post-surgical assessment as outlined below will be qualified as **Information Only**.

Cases outside of standards will require a waiver or exception to policy (ETP) request in the form of an Aeromedical Summary (AMS).

Corneal refractive surgery (CRS) is indicated for the correction of refractive error (myopia, hyperopia or astigmatism). Only LASIK, LASEK, and PRK,(including the wavefront techniques) are currently acceptable for all FDME classes, to include applicants.

Alternate procedures, complications, and failure to meet pre/post-op standards will require consultation with USAAMA for consideration on a case-by-case basis.

## WAIVERS:

**All Rated and Non-Rated Aircrew (to include ALL Applicants):** FDMEs with PRK, LASEK or LASIK with an acceptable pre-/post-surgical assessment as outlined below shall be submitted "qualified, information only." Personnel failing to meet pre-/post-operative standards will be submitted "disqualified" and require an AMS for formal waiver/ETP consideration.

**Active duty** personnel undergoing refractive surgery must receive authorization from their commanding officer prior to the procedure. Commanders should be advised that the procedures have a 6-12 week recovery period before aviation duties can be resumed (Appendix 1).

## INFORMATION REQUIRED on DD 2808, BLOCK 73 for ALL TYPES OF CORNEAL REFRACTIVE SURGERIES:

- Document that at least 3 months (for initial applicants) or 6 weeks (for current aviation personnel) have elapsed since surgery or re-treatment and evidence of stable refractive error is demonstrated by two separate examinations performed at least one month apart. These should reveal successful recovery.
- From the Checklist for Eye Care Provider (Appendix 3):
  - Pre-operative refraction—if completely unavailable, so state. If manifest Rx known, substitute.
  - Type of procedure—LASIK, LASEK, PRK
  - Date(s) of procedure—enhancements that result in optimal outcome within standards is acceptable.
  - Post-op Measurements ( 23 mos, applicants/26 wks aircrew)—USAAMA requires only the latest set of measurements:
    - Refraction within standards—Cycloplegic for Class 1 (if not already annotated on FDME); Manifest refraction for all others.
    - Intraocular Pressure—annotate if not reported on FDME, have optometry note otherwise normal if < 8 mm Hg
    - Visual Acuity within standards.
    - Slit Lamp Examination—showing no residual haze
    - Corneal Topography—post-operative, reviewed by Optometrist/Ophthalmologist, reported as acceptable”
    - Low-Contrast Sensitivity Testing (5% contrast using the Precision Vision backlit chart)—must pass 20/60 or better. If not available at the local optometry/ ophthalmology

clinic, so state—will be done at Lyster if selected for Flight School. The preferred test is the 5% contrast test; however, the following tests may be submitted in lieu of the 5% contrast test:

- BVAT low contrast acuity (set on 5%)
- Bailey-Lovie 10% low contrast acuity test
- Pelli-Robson Contrast Sensitivity Test
- Small Letter Contrast Test
- VisTech or FACT Contrast Sensitivity Test

- For any part of the evaluation that is out of CRS policy standards, thus requiring an AMS, do the following:
  - Pre-operative refraction out of CRS standards: must include ophthalmology/optometry evaluation to include dilated fundoscopic examination to document no retinal strain, tears, or holes as well as corneal pachymetry to insure adequate corneal thickness.
  - SLE reveals haze: must include ophthalmology/optometry evaluation documenting no visual impairment, glares, or halos as a result of haze.
  - For any other deviations: call USAAMA

**FOLLOW-UP:** The five year comprehensive FDME must include an optometry/ophthalmology consult with completion of a slit lamp examination of the cornea, manifest refraction, corrected visual acuity and 5% contrast sensitivity test. NOTE: The 5% contrast test is not required for follow-up for classes 2F, 3, and 4 but should be completed if available.

**TREATMENT:** Per appropriate surgical protocols.

**DISCUSSION:** Since allowing PRK, LASEK, and LASIK, the trend in USAAMA has been that those personnel with good surgical outcomes, passing all of the above post-operative tests and standards have gone on to receive a waiver without subsequent aeromedical problems. Those with a less than favorable outcome have not progressed as easily to receiving a waiver. Corneal refractive surgery will optimally result in less optometric support before and during deployment to Stability and Support Operations as well as combat operations. There is a significant medical logistics “footprint” of combat health support activities providing corrective lenses and protective mask inserts that may be lessened. This is especially important in current rapid deployment, high ops tempo environments. Corneal refractive surgery is an additional benefit in the continuous development of new man-machine interfaced weapons based on routinely updated detailed vision parameters. This is especially important for increasingly complex flight environments where corrective lenses would be a hindrance.

APPENDIX 1. Aviation Commander's Authorization

APPENDIX 2. Medical Release

APPENDIX 3. Corneal Refractive Surgery Information Worksheet

APPENDIX 4. Refractive Surgery Fact Sheet for Flight School Applicants

## **Appendix 1: Aviation Commander's Authorization**

Memorandum to: Unit Flight Surgeon

CC: Ophthalmology, Refractive Surgeon

Subject: Authorization for Aircrew members to receive refractive surgery under the Aeromedical Policy Letter for Refractive Surgery and the Corneal Refractive Surgery Surveillance Program.

1. \_\_\_\_\_, SSN \_\_\_\_\_ is authorized to receive refractive surgery per the guidance outlined in the Aeromedical Policy Letter: Corneal Refractive Surgery.

2. This authorization is based on the following understandings:

a. This authorization does not constitute a medical waiver; it only authorizes the individual to have refractive surgery. The individual will be DNIF for at least 6 weeks, up to a maximum 12 weeks. The medical waiver request will be submitted to USAAMA upon receipt of information from the flight surgeon as to the successful outcome of the individual's surgical procedure. USAAMA will determine if the individual meets the medical waiver requirements when the applicant's eyes and vision meet and retain FDME standards and all requirements for waiver have been met.

b. In approximately 2-3 of every 1,000 refractive surgery procedures (0.2 to 0.3%), the individual will not recover 20/20 best-corrected vision after surgery. Individuals who fall in this category will be evaluated by USAAMA to determine whether a waiver to continue on flight status may be issued. Although slight, there is a possibility the individual may lose his/her flight status in the event of significant visual loss that cannot be resolved.

c. Questions about the updated policy may be directed to USAAMA at 334-255-0750; questions about refractive surgery to the local eye care provider.

d. A copy of this correspondence will be kept on file in the local flight surgeon's office.

3. POC is the undersigned at \_\_\_\_\_.

Commander's Signature Block

## **Appendix 2: Request for Release of Medical Records**

(To be completed by patient and provided to eye care provider for completion)

From: (enter your information)

Date:

To: (enter eye clinic information)

Subject: Request for records related to refractive surgery procedure

1. Request a copy of records pertaining to my refractive surgery be provided to:

(Enter unit flight surgeon information and address)

2. The following information is needed: (see attached Checklist for Eye Care Provider):

Date of procedure

Type of procedure (PRK, LASEK, or LASIK)

Type of laser (brand name)

Ablation parameters (size of ablation zone, microns of tissue removed, number of pulses, if available) Amount of correction (sphere, cylinder and axis)

Pre-operative refraction and date (specify manifest or cycloplegic)

Follow-up refractions with visual acuities and dates (most current refraction and as many postoperative refractions as possible)

Slit lamp assessment of cornea (presence or absence of haze or other complications)

Latest **post-operative COLOR** corneal topography (instantaneous or tangential corneal maps)

Contrast Sensitivity (preferred test is the 5% low contrast letter acuity)

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Typed or Printed Name

---

Signature

## Appendix 3: Corneal Refractive Surgery Information Worksheet

### Corneal Refractive Surgery Information Worksheet

#### Flight Applicant Identification:

Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_ Middle Initial: \_\_\_\_\_

#### Procedure History:

##### 1. Procedure Date(s):

Type: [ ] PRK [ ] LASIK [ ] LASIK  
Eye: [ ] Both [ ] Right [ ] Left

2. Pre-op Refraction: Pre-op refraction standard for info only: Sphere -6 to +4 and Cylinder -3 to +3; use sphere equivalent calculation (sphere + 1/2 cylinder) to determine if meets info only standards. Values outside the above require an AMS.

OD Sphere \_\_\_\_\_ Cylinder \_\_\_\_\_ Axis \_\_\_\_\_  
OS Sphere \_\_\_\_\_ Cylinder \_\_\_\_\_ Axis \_\_\_\_\_

AMS waivable pre-op refraction: Sphere -8 to +4

[ ] Pre-op refraction not available – If pre-op refraction is not available a dilated fundus exam with scleral depression is required.

Dilated fundus exam with scleral depression: [ ] Normal [ ] Abnormal

Current Optometry Exam Date: \_\_\_\_\_

Optometry Exam: Minimum of 6 weeks post-op for those already on flight status and 3 months for all applicants.

##### 3. Refraction Post-operative:

[ ] Manifest – Only if eyewear is necessary for 20/20 and no cycloplegic done.

[ ] Cycloplegic – Only required for pilot candidates (1A/1W and RO/RW FDMEs);

OD Sphere \_\_\_\_\_ Cylinder \_\_\_\_\_ Axis \_\_\_\_\_  
OS Sphere \_\_\_\_\_ Cylinder \_\_\_\_\_ Axis \_\_\_\_\_

**STD: Cyclo:** Sphere: -1.5 to +3.0  
Cylinder: -1 to +1

##### 4. Visual Acuity:

Distant: OD 20/\_\_\_\_\_ Corrected to 20/\_\_\_\_\_ OS 20/\_\_\_\_\_ Corrected to 20/\_\_\_\_\_

Near: OD 20/\_\_\_\_\_ Corrected to 20/\_\_\_\_\_ OS 20/\_\_\_\_\_ Corrected to 20/\_\_\_\_\_

##### 5. Intraocular Tensions:

OD \_\_\_\_\_ OS \_\_\_\_\_

**STD:**  
1. <21 mm Hg. If less than 8 mm Hg requires optometry note stating otherwise normal.  
2. Difference of <4 mm Hg between eyes

##### 6. Slit Lamp Exam (SLE for Haze)

OD: 0 1 2 3 4 [ ] Non-pathologic for 1+  
OS: 0 1 2 3 4 [ ] Non-pathologic for 1+

**STD:** Haze = 0 or 1+ (optometry states non-pathologic in each eye)  
Haze Scoring: 0 = no haze (passing), 1 = trace haze, 2 = minimal, 3 = moderate, and 4 = iris obscured

##### 7. Corneal Topography (required):

[ ] Acceptable

[ ] Abnormal

Reason abnormal: \_\_\_\_\_

##### 8. Low Contrast Sensitivity (LCS):

OD: 20/\_\_\_\_\_

OS: 20/\_\_\_\_\_

**STD: LCS 20/60 or better each eye or comment as below.**

[ ] Contrast sensitivity testing not readily available. Applicant denies difficulty with night vision, glares, halos, or visual distortions.  
**Note: If SLE Haze = 1+ normal low contrast sensitivity testing plus annotation it is non-pathologic is required.**

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

Contact Info: \_\_\_\_\_

Upload form to AERO or fax or e-mail to USAAMA staff:

Phone 334-255-0749/0750 (DSN 558)

Fax: 334-255-0747

E-mail: [usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil](mailto:usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil)

## **Appendix 4: Refractive Surgery Fact Sheet for Flight School Applicants (Update February 2007)**

**What:** LASIK (laser in-situ keratomileusis), LASEK (Laser Subepithelial Keratomileusis), and PRK (Photo Refractive Keratectomy) are now aeromedically acceptable provided the post-surgical outcome meets standards IAW the current Corneal Refractive Surgery APL. It is important for all applicants to do research on the Internet, or elsewhere, about the differences between the types of surgeries. The US Army Aeromedical Research Laboratory (USAARL) study was initiated in February 2001 and was closed to new applicants as of 1 October 2004. A decision was recently made (8 Dec 2005) by the OTSG (Office of the Surgeon General) to allow LASIK to be accepted along with both LASEK and PRK.

**Who:** The policy applies to individuals applying for flight training. Active duty, Reserve, National Guard, ROTC, Academy cadets, OCS candidates, and civilians are all eligible to submit a flight physical with a history of refractive surgery. You will need to coordinate with your eye surgeon and/or eye clinic to complete the visual exam forms needed for your waiver request (see "Release of Medical Information" form). You will need to provide this to your flight surgeon to complete the Class 1 flight physical. All must be reviewed and commented prior to submission to the US Army Aeromedical Activity (USAAMA) at Fort Rucker for review. Having a qualified physical does NOT guarantee a flight school slot; it only verifies your medical eligibility to apply for flight school given the presence of a refractive surgery procedure. You still need to work through the standard channels to apply to flight school with your recruiter and/or the Aviation branch.

**How, When and Where:** This section describes the steps you will need to accomplish in order to receive a qualified flight physical given a history of LASIK, LASEK or PRK surgery. 1) Complete the Class 1 flight physical—nothing happens without its completion. 2) Include results of all of the required post-operative tests on Block #73 (remarks) of the DD2808—these are post-surgical cycloplegic refraction, 3 visual acuities and manifests, slit lamp examination demonstrating healing without complication, scarring, or adverse haze, color corneal topography, and low contrast sensitivity visual testing. 3) Submit the physical to USAAMA. USAAMA will review the entire Class 1 Flight Physical and qualify it if all of the criteria listed below are met along with the rest of the standards. If not meeting all of the post-surgical criteria, the flight surgeon shall submit the physical with an Aeromedical Summary requested an Exception to Policy (see below). Your medical qualification is provided to the board or agency working your flight school application, and you are eligible to compete for the slot. A flow diagram is provided to help you work through the process.

**Waiver/Exception to Policy:** A waiver or exception to policy is required for applicants failing to meet published standards as outlined in AR 40-501, the Aeromedical Policy Letters, or the Aeromedical Technical Bulletin—this is no different for corneal refractive surgery. Similar to any other medical issue, if not meeting the post-surgical standards, applicants must have their flight surgeon request an exception to policy (ETP), submitted in the form of an Aeromedical Summary. ETPs are reviewed on a case-by-case basis and require longer processing time for review. Not all requests for flight school applicants are granted.

### **Points of Contact:**

**USAAMA** – 334-255-0750

**Recruiting Command** [www.usarec.army.mil/hq/warrant/warrant.htm](http://www.usarec.army.mil/hq/warrant/warrant.htm)

Warrant Officer Flight Training Program (civilians, NG or Reservists)—502-626-0467/1554

Active duty (Army, AF, Navy, marine, Coast Guard)—502-626-0458

Army Branch Officer applying to aviation needing a branch transfer—

<https://www.perscomonline.army.mil/opavn/Branch%20Transfers.htm>

**Aviation Propriety** – <http://www-rucker.army.mil/ap/default.htm> Or 334-255-3999/2359

**QUESTIONS ABOUT SURGERY AND THE EYE INFORMATION:** Some common questions are as follows:

**a. If I had a surgery other than PRK, LASEK or LASIK, can I still get an exception to policy?**  
No, radial keratotomy (RK), intrastromal corneal rings (Intacs) or any other type of refractive surgery have not been aeromedically approved.

**b. If I have NOT had refractive surgery yet, what do I do?** Follow the steps in the flowchart. You should consult at least 2 eye surgeons before deciding to get surgery. It is also important to do individual research as to the pros and cons of each type of surgery.

**c. How can I verify if I meet the limits of AR 40-501?** Consult with your eye doctor or flight surgeon. He/she will review your current eyeglass or contact lens prescription (if you have not had surgery) or records of your eyeglass or contact lens prescription before surgery (if you have already had surgery). Provide your eye doctor with the limits listed in the flowchart to help them in the review (-6.00 diopters myopia, +4.00 diopters hyperopia).

**d. My refraction is outside the limits of AR 40-501, is it still possible to apply for flight school?**  
Yes, however you will require an Exception to Policy with your Class 1 Flight Physical.

**e. What information do I need to provide about my surgery and where do I get it?** All the information needed is listed on the "Release of Medical Information" and "Corneal Refractive Worksheet" forms. Provide the forms to your eye surgeon and/or the eye doctor who is providing your vision care after surgery. You may have to submit multiple forms to get all of the required information.

1. Surgical Information: Your eye surgeon will need to fill out the information about the laser, the type of surgery and the amount of correction.

2. Manifest Refraction: You will need three post-surgical refractions (measures of any residual prescription) and three visual acuities. This information can be a combination of examinations provided by your surgical center, your optometry office and your flight physical.

3. Corneal Exam (Slit-Lamp Exam): You will need verification that your cornea is clear of haze or any other post- surgical complication. Your eye doctor can provide this information.

4. Corneal Topography: This is the corneal map that shows the shape of your cornea after surgery. You must have a color copy of the map, either mailed, e-mailed, or taken to your flight surgeon. FAX'd versions are currently not acceptable because they come through in black and white.

5. LOW Contrast Sensitivity: This is a measure of your vision under low contrast conditions (5% is the preferred method). Normal low contrast is 20/40 or better, but with corrective surgery, acceptable limits are 20/60 or better. Ask your eye doctor about availability of a contrast sensitivity or low contrast acuity test in your area. Examples of acceptable tests are:

- VisTech Contrast Grating Test
- Functional Acuity Contrast Test (F.A.C.T.)
- Pelli-Robson Contrast Sensitivity Test
- Bailey-Lovie 10% low contrast acuity chart
- ETDRS low contrast acuity chart (5% is preferred)
- Mentor BVAT low contrast acuity chart (set on 5%)

**f. What do I do if a contrast sensitivity or low contrast acuity test is not available in my area?**  
Your packet can be processed without this test, if the other eye information you provide indicates a good outcome from the surgery (specifically the corneal topography and corneal exam). Your local flight surgeon will make this determination. NOTE: If not done prior to coming to flight school, you must have it completed with your Rucker flight physical prior to beginning flight training. Integrity as a future warrant

officer or officer dictates that you disclose this need to the Rucker Physical Exam staff to coordinate having this done. Make sure your eye doctor notes on the form that these tests are not available to you.

**g. Where do I send all of my information?** Your flight surgeon should collect and submit as much information as possible on AERO. Additional information may be mailed or fax'd to USAAMA (US Army Aeromedical Center (USAAMA), Building 110, Fort Rucker, AL 36362-5333 or fax 334-255-0747). Note: the color corneal topography, if needed, must be mailed or emailed to usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil.

#### **QUESTIONS ABOUT THE FLIGHT PHYSICAL**

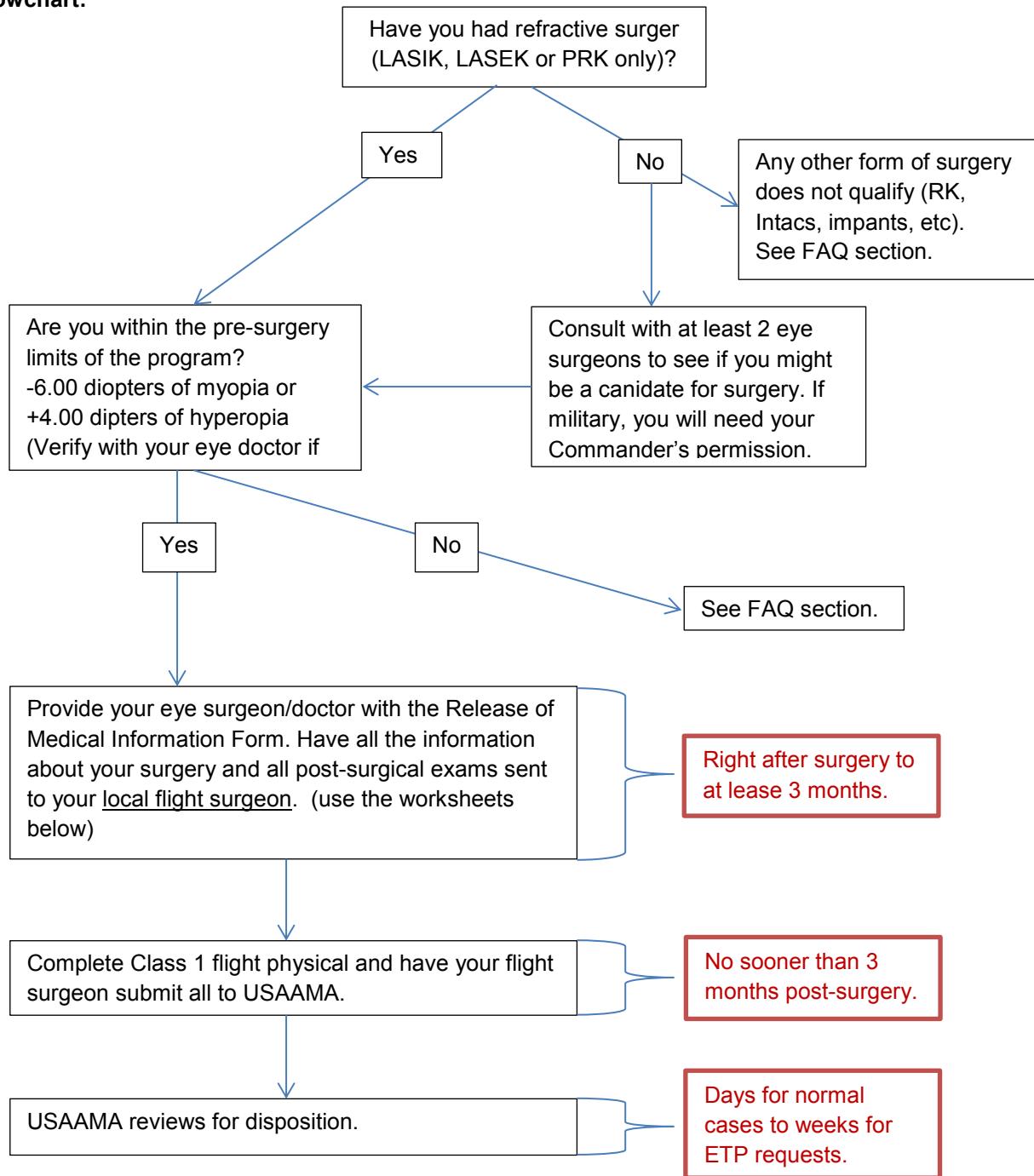
**a. How long do I have to wait after surgery to get a flight physical?** Start your physical so it is completed 3-months after the surgery to be able to complete all of the required post-operative information.

**b. I already took a flight physical before surgery; do I have to take another physical?** No, as long as your initial Class 1 flight physical is still valid (up to 18 months). You MUST repeat the eye exam portion of the flight physical after surgery, however, and submit the required information. Coordinate this through your flight surgeon and the supporting eye clinic.

**c. I have not taken a general military entrance physical yet; do I have to do that first?** Yes, if you have not taken the MEPS, ROTC or other entrance physical, you will have to complete that physical before scheduling your flight physical. The entrance physicals require a 90-day waiting period after refractive surgery. Therefore you will have to wait 3 months after surgery, take the entrance physical, and then you can schedule to take the flight physical. You will have to coordinate this with your recruiter. Go to the link "Refractive Surgery" on the USAARL website ([www.usaarl.army.mil](http://www.usaarl.army.mil)) to find the current Army Surgeon General's policy.

**d. I still need to wear glasses after surgery; does that mean I will fail the flight physical?** No, as long as you meet the general entry standards for Class 1 which include 20/50 or better uncorrected visual acuity, and no more than -1.50 diopters of myopia or +3.00 diopters of hyperopia or 1.00 diopters of astigmatism. If you are outside of these limits, however, you will need an ETP. You should consult with your eye doctor and flight surgeon if this is the case.

**Flowchart:**



**\*\*ATTENTION ALL APPLICANTS\*\***

**ALL REQUIRED INFORMATION SENT TO USAAMA MUST BE COMPLETE!**

You will be subject to a returned/delayed packet if you do not follow these instructions.

## DECREASED VISUAL ACUITY

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Decreased visual acuity degrades look-out and target acquisition, two important factors in successful outcomes of aviation combat operations.

### WAIVERS:

**Initial Flight Applicants:** Failure to meet Class 1 visual standards will be considered for exception to policy on a case-by-case basis in the age of Refractive Surgery and considering the needs of the Army. Applicants must correct to 20/20, both near and distant. Uncorrected distant visual acuity must be 20/70 or better. Uncorrected near visual acuity must be better than 20/40. Cycloplegic refraction within 3/4 diopter of standards will be considered.

**Rated and Non-rated Aircrew (to include Class 2/3/4 applicants):** Waivers are required for anyone with uncorrected distant or near visual acuity of greater than 20/400 in any eye, provided correction to 20/20. Restrictions require flight with spectacles or contact lenses that correct to 20/20 and must have in possession a backup pair of spectacles. Waiver for visual acuity outside standards will be considered on a case-by-case basis in designated individuals provided the central and peripheral retina is normal, no other ocular conditions exist, and all other visual standards are met.

### INFORMATION REQUIRED:

- Optometry/ophthalmology consultation.
- Optometry/ophthalmology evaluation must include dilated fundus examination for cases of decreased visual acuity not due to simple myopia, hypermetropia (hyperopia), astigmatism or presbyopia.
- Retinal evaluation must be obtained refractive errors corrections greater than  $\pm 5.5$  diopters.
- Patients with progressive astigmatism should be evaluated to exclude keratoconus.  
Class 1 applicants shall submit three cycloplegic refractions completed IAW ATB-5 (Cycloplegic Refraction)

**TREATMENT:** Refraction by spectacles is allowed within the limits set by HHTAR 40-501THH, Chapter 4. See APL Corneal Refractive Surgery.

**FOLLOW-UP:** Depending on the findings, annual follow-up requirements may range from annual vision screening with FDHS/FDME to annual optometric/ophthalmologic evaluation.

**DISCUSSION:** Myopes (persons with elongated globes) have a risk of further myopic progression, which rises with the degree of myopia regardless of age. High myopes have considerable visual distortion at the periphery of their spectacle lenses. In addition, they may see halos or flares around bright lights at night and are at increased risk of night blindness. Whereas myopes have an increased risk of retinal detachment and lattice degeneration of the retina, exposure to routine G-forces in flying has not been shown to increase these risks. Myopia is usually a progressive condition, stabilizing for individuals around the age of 30. Whenever a prescription is changed, aircrew should be warned about transient visual distortion and counseled on the period of adjustment necessary. Evidence suggests that there is no difference in civil accident rates or in naval carrier landing accidents in pilots who require visual correction. Severe myopia tends to be a problem pertaining to Class 2 personnel since the entry requirements for other aircrew tend to be sufficiently stringent to exclude those whose vision would deteriorate that much.

Hyperopes with +3.0D or more of correction may experience problems with vision after treatment with anticholinergic agents. Hyperopes also have more problems with visual aids such as night vision goggles when they develop presbyopia. The interposition of another layer of transparency (spectacle lenses)

between the aircrew and the outside world increases the risk of internal reflections, fogging and reduces the light reaching the retina by about 6%. Finally, spectacle frames interfere with look-out, cause hot spots and create unacceptable interactions with items of aircrew equipment. Decreased visual acuity is often associated with other visual performance degradation such as decreased stereopsis.

# DEPTH PERCEPTION FAILURE

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Stereopsis is important for the aviator to maintain proper visual references. Defective stereopsis may make certain aviation duties such as hover, taxiing, landing, formation flying, aerial refueling, hoist and rescue equipment operations, significantly more difficult.

## WAIVERS:

**Initial Flight Applicants:** Exception to policy is considered on a case-by-case basis after review of work-up below.

**Rated and Non-rated Aircrew (to include Class 2/3/4 applicants):** Waivers will be considered for selected aircrew such as flight surgeons, physiologists, and Air Traffic Controllers. Waivers for aviators are considered on a case-by-case basis with a restriction of flying with another fully qualified pilot, rated in the type and model of the aircraft being flown. No waivers will be considered for aviators in solo control of aircraft.

## INFORMATION REQUIRED:

- Ophthalmologist/optometrist evaluation. The evaluation should address any history of diplopia or previous eye surgery and include the following tests, as clinically indicated:
  - Full ocular muscle balance testing,
  - Testing for diplopia in the nine cardinal directions,
  - Pupillary exam
  - Cover test (both near and far)
  - Red lens test
  - Maddox Rod test
  - Worth four-dot exam
  - AO vectograph.
- Completion of the pre-printed ocular motility worksheet (available under Excessive Phoria APL below).
- Submit AMS with information. If need be, fax or e-mail Ocular Motility worksheet. If there is an obvious defect, such as a frank tropia, it is not strictly necessary to fill in every block in the motility worksheet since no waiver is possible.

**TREATMENT:** N/A

**FOLLOW-UP:** Depending on the findings, annual follow-up requirements may range from annual vision screening with FDHS/FDME to annual optometric/ophthalmologic evaluation.

**DISCUSSION:** Defective stereopsis can be innate. Several sources of defective stereopsis include: defective ocular muscle balance, amblyopia, anisometropia, microtropia, and monofixation syndrome. All of these possible etiologies should be evaluated in the ophthalmology/optometry evaluation. The most common causes of a recent loss of stereopsis are a change in refraction or presbyopia. The visual cues to the perception of depth are both monocular and binocular. The monocular cues are learned and some investigators feel that they can be improved by study and training. Monocular cues are ones that can be the most easily fooled by illusions. Binocular cues (stereopsis) are innate and are not easily fooled by illusion. Stereopsis is not an absolute must in flying an aircraft, and in fact, the FAA does not require this to be tested. Through mathematical derivation, it has been shown that true stereopsis does not exist beyond approximately 200 meters; some believe it does not actually work beyond 20 meters. Numerous civilian individuals and past military aviators who lacked stereopsis have still made good aviators. However, the visually demanding environment of nap of the earth (NOE), pinnacle landings, and other various military operations requires the optimal senses.

## DETACHED RETINA and OTHER RETINAL CONDITIONS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** A detached or torn retina can lead to visual impairment. Severity of the condition depends on the part of the retina involved and the success of therapy. Routine exposure to G-forces has not been shown to increase the risk of retinal detachment. Other retinal conditions or abnormalities likewise can lead to visual impairment and are of concern. Detached retina and other retinal abnormalities are disqualifying for aviation service.

### WAIVERS:

**Initial Flight Applicants:** Detached retina and other retinal conditions are disqualifying with exception to Policy rarely granted on a case-by-case basis after review of the information below.

**Rated and Non-Rated Aircrew to Include Class 2/3/4 Applicants:** Waiver may be considered if the applicant has normal vision without complications.

### INFORMATION REQUIRED:

- Complete Ophthalmologic evaluation is required in all cases, but particularly for retinoschisis, retinal tears, or central serous retinopathy.

**TREATMENT:** Diathermy, photocoagulation, cryotherapy, scleral buckling or laser therapy are acceptable treatments for retinal detachment or tears. The duration of central serous retinopathy may be shortened and the incidence of further attacks reduced by laser photocoagulation. Usually no treatment is required for retinoschisis unless rhegmatogenous detachment occurs.

**FOLLOW-UP:** Annual optometric/ophthalmologist evaluation is required. More frequent (every 6 months) evaluations may be required in some cases. Additional testing may be required at the recommendation of the treating practitioner and with consultation of the Aviation Ophthalmology/Optometry consultants.

**DISCUSSION:** A retinal detachment is the separation of the neuro-sensory retina from the underlying retinal pigment epithelium, usually with accumulation of fluid between them. There are three types: (1) rhegmatogenous, (2) exudative, and (3) traction. The incidence is approximately 10 per 100,000. This incidence increases with myopia, diabetes, age, and trauma. Certain vitreoretinal degenerations such as lattice degeneration increase the risks of retinal detachment. With surgical treatment, there will be permanent reattachment in up to 90 percent of uncomplicated cases. If the macula is involved, the resulting vision in that eye is likely to be on the order of 20/200. The risk of the occurrence of a retinal detachment in the other eye is as high as 12 percent and is most likely to occur within 5 years of the initial detachment. Retinoschisis occurs in 3 percent of the population, with increasing frequency from the second decade. The final outcome of central serous retinopathy (choroidopathy) seems unaffected by the duration of the condition, the initial visual acuity or the age of the patient. Recurrences are frequent and approximately 20 percent of patients have the condition for more than 6 months.

REFERENCE: Emedicine: <http://www.emedicine.com/emerg/topic504.htm>

# EXCESSIVE PHORIAS/TROPIAS/AMBLYOPIA

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Excessive phorias are frequently associated with defective stereopsis and/or diplopia, a devastating state if this occurs during a critical phase of flight. Excessive esophoria/exophoria (>8 prism diopters), hyperphoria (> 1 prism diopters,) heterotropia of any degree, or a history of extraocular surgery after age 4 (to include before age 4 if other residual ocular abnormalities exist) are disqualifying for flight duties.

**WAIVERS (Rated and Non-Rated Aircrew to Include ALL Applicants):** Exceptions to policy or waiver requests are reviewed on a case-by-case basis and not normally recommended due to the relative high risk of developing of diplopia during extended operations and night or reduced ambient light flights.

ICD9 Code	Condition
378.41	Esophoria
378.42	Exophoria
378.40	Hypophoria/Hyperphoria

## INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation. The evaluation should address any history of amblyopia (lazy eye) or diplopia, any patching of one/both eyes, or previous eye surgery, and include the following tests, as clinically indicated:
  - Full ocular muscle balance testing,
  - Testing for diplopia in the nine cardinal directions with vision testing apparatus (VTA), or Randot depth perception testing
  - Pupillary exam
  - Cover test (both near and far), alternate cover test
  - Near point of conversion (NPC)
  - Red lens test
  - Maddox Rod test
  - Worth four-dot exam
  - AO vectograph.
- The pre-printed Ocular Motility Worksheet shall be completed and sent in along with the waiver request
- Cranial nerve palsies must be ruled out by this evaluation.

**TREATMENT:** N/A

**FOLLOW-UP:** Depending on the findings, annual follow-up requirements may range from annual vision screening with FDHS/FDME to annual optometric/ophthalmologic evaluation.

**DISCUSSION:** A phoria is a latent deviation of an eye which is present (at least to a slight degree) in nearly 100% of the population. When the phoria is in excess of the standards of AR 40-501 a large neuromuscular effort would be required to maintain fusion and binocular vision. Such individuals often break fusion during extreme fatigue or when flying at night with loss of external fixation points. Rapid instrument scanning is interfered with and flight students often are not able to overcome this handicap, resulting in elimination from the program. Any added stress might cause a breakdown of fusion, leading to diplopia and loss of stereopsis. Tropias (manifest ocular deviations) are present in approximately 3% of the population and may not be clinically obvious on examination. Subclinical tropia patients may be reluctant to divulge a history of double vision or decreased visual acuity in the affected eye.

# Ocular Motility Worksheet

(Exam and the reporting of results must conform with the instructions in the APL)

## Pertinent History

<b>Distant Visual Acuity</b>	OD 20/ OS 20/	<b>Manifest Refraction</b>	OD OS	Corrected to 20/ Corrected to 20/
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<b>Cycloplegic Refraction</b>	OD OS	<b>Habitual Rx</b>	OD OS
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Correction used for remainder of examination:  
 Habitual    Manifest    None

## Cover Test

<b>Far</b> (all gazes)			<b>Near</b> (all gazes)		

Extraocular Motility	Maddox Rod or Von Graeffe	Stereopsis
Worth 4 Dot	Vectograph (anti-suppression)	Red Lens
4 Base Out (if applicable)	Other test results (if applicable)	

Impression       Qualified       Disqualified  
 Provider Signature Block      Provider Phone Number:

Date of Exam:

SPECIALTY:	LOCATION:	SSN:
Patient Name		
Rank	Flight Class (circle one):  1    2    3    4	Unit Address:

## **INSTRUCTIONS FOR OCULAR MOTILITY WORKSHEET**

Update: FEB 2007

**PERTINENT HISTORY:** Explain why the work-up is being done. For example: "scored 7 esophoria on VTA" or "muscle surgery OS at age 6 years."

**REFRACTION:** All Class 1 flight applicants require a cycloplegic refraction recorded; all others require a manifest refraction. Those applicants with less than 20/20 unaided also require a manifest refraction.

**HABITUAL RX:** Record the subject's habitual Rx here if different from the manifest. If none is used, or the subject wears contact lenses, please note on the form.

**COVER TEST:** Report numerical values. Use a prism bar or loose prisms. Do horizontal and/or vertical as applicable to the case. Horizontal limits are approximately 45 degrees to the left and right of center. Vertical limits are approximately 25 degrees above and 35 degrees below center. Limits may need to be modified as dictated by the size of the nose and brow.

**EXTRAOCULAR MOTILITY:** Give description, such as "smooth and full."

**MADDOX ROD/VON GRAEFE:** Report numerical values for both horizontal and vertical phorias. Fixation target must be at 20 feet.

**STEREOPSIS:** **RANDOT done at 16 inches in a normally lit room.** Neither the device nor the patient should move during the test.

**WORTH 4 DOT:** Perform at both distance and near. Report "fusion," "diplopia," or "suppression OD/OS."

**VECTOGRAPH:** Test on the 20/40 (V O C S R K 4) line of the A.O. Vectographic slide. Report any suppression and which eye is suppressing. If there is no suppression, state so.

**RED LENS TEST:** Test all 9 positions of gaze, just like the cover test. Report any diplopia. If no diplopia is reported, state so.

**4<sup>1</sup> BASE OUT TEST:** Used to augment the A.O. Vectograph in the diagnosis of microstrabismus. This test is not always applicable and may be left blank if not used.

**PROVIDER PHONE NUMBER:** Indicate both commercial and DSN.

### **FLIGHT CLASS:**

- 1      Flight Student Applicant
- 2      Rated aviator (pilot), Flight Surgeon/APA
- 3      Crew Chief, Flight Medic, Flight Engineer (Non-Rated Aircrew)
- 4      Air Traffic Controller

## GLAUCOMA & OCULAR HYPER/HYPOTENSION

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Glaucoma and ocular hypertension (IOP of 22.0 mm Hg or higher), or a persistent difference of 4 or more mm Hg tension between the two eyes when confirmed by applanation tonometry, are disqualifying. Glaucoma is typically asymptomatic, but early signs may include a slow progressive loss of contrast sensitivity and loss of central or peripheral visual fields. Patients with Acute Angle Closure Glaucoma may present with night vision problems, such as halos and flares around lights or with a sudden painful, red eye with an edematous cornea, fixed, mid-dilated pupil, and markedly decreased visual acuity. Low intraocular pressure (IOP) may be present after some significant pathology such as retinal detachment, chronic uveitis, or status post corneal refractive surgery or glaucoma filtering surgery. Determination of the underlying condition is more critical than the presence of low pressure.

### WAIVER:

**ALL Rated and Non-Rated Aircrew (to Include ALL Applicants):** Exception to policy or waiver will be considered on a case-by-case basis, especially with no visual field loss and IOP is controlled at normal levels. Miotic drugs are incompatible with night operations due to the inability of the pupil to dilate to admit sufficient light. No waiver is required for low IOP (IOP of 7.0 mm Hg or lower) and will be filed as Information Only after a normal investigation below.

### INFORMATION REQUIRED:

- The first step in assessment of either high IOP or low IOP is confirmation that the measurement is correct. An optometrist or ophthalmologist should confirm the IOP with applanation tonometry.

#### *Elevated IOP:*

- Ophthalmology/optometry evaluation is required anytime there is any one of the following:
  - one or more documented IOPs > or equal to 22 mmHg;
  - IOP difference between the eyes of 4 mmHg or greater;
  - optic nerve cup-to-disc ratio > 0.5, or an asymmetrical cup-to-disc ratio between eyes with a difference of > 0.2;
  - a visual field deficit is suspected;
  - when there is a recent change of visual acuity, ocular trauma, uveitis, or iritis.
- IOPs must be documented from a Goldman's Applanation Tonometer, not from a non-contact tonometer "puff test" or
- Tono-pen, and must be obtained in the AM and PM for two days.
- Dilated fundus examination (to include comment on the cup-to-disc ratio)
- Humphrey visual field test battery (30-2 or 24-2),
- Slit lamp examination,
- Gonioscopy
- Corneal Pachymetry
- Bilateral color photographs of the optic disks or drawings of the optic nerve head.

#### *Low IOP:*

- If a low IOP of 7 mm Hg or less is confirmed by Goldman's Applanation Tonometry done by an optometrist or ophthalmologist, then document the following:
  - Corneal Pachymetry
  - Slit lamp examination to rule out underlying pathology or refractive surgery.

**FOLLOW-UP:** The patient should be evaluated every 6 months by an ophthalmologist or optometrist for those aviators labeled with ocular hypertension or glaucoma suspect. Aircrew members with proven glaucoma should be evaluated quarterly at least for the first year of treatment unless the consultant ophthalmologist specifies less frequent assessment.

No follow-up is required for ocular hypotension (low IOP). Persistent ocular hypotension on future FDME/FDHS will be listed as "Information Only" if the initial evaluation is normal.

**TREATMENT:** The decision to treat aircrew members with ocular hypertension with IOPs between 22-27 mm Hg will be decided on a case-by-case basis after all risk factors are considered by the ophthalmologist/optometrist. Those patients with anatomically thick corneas, as measured with corneal pachymetry with no other risk factors for glaucoma will be classified as ocular hypertensives (as defined by OHTS). Annual requirements for these patients will include Goldmann tonometry and a dilated fundus exam (DFE). Those with ocular hypertension with IOPs greater than or equal to 28 mmHg should be treated regardless of other concomitant risk factors. Aircrew members with definitive glaucomatous optic atrophy and characteristic visual field changes require treatment. For open angle glaucoma and ocular hypertension, the first choice agents are topical beta-adrenergic blockers such as timolol (Timoptic), levobunolol (Betagan), or betaxolol (Betoptic). Other acceptable treatments include brimonidine (Alphagan), latanaprost (Xalatan), Dipivefrin (Propine) and the carbonic anhydrase inhibitor dorzolamide (Trusopt) provided there are no aeromedically significant side effects. Side effects may be minimized by pinching off the lacrimal duct on administration in order to limit systemic absorption. Other options for treatment include argon laser trabeculoplasty (ALT) or selective laser trabeculoplasty (SLT). Waiver can be considered for successful surgical treatment of closed angle glaucoma.

**DISCUSSION:** As stated above, not all cases of ocular hypertension (IOP of 22 or higher) require treatment. Approximately 4% of the population has IOP greater than 21, yet many of these individuals never develop glaucomatous optic neuropathy with characteristic visual field loss. Conversely, some individuals do indeed develop frank glaucoma despite never having any IOP measurement greater than 21. Thus elevated intraocular pressure is only one, albeit probably the most important, risk factor for the development of glaucoma. Other risk factors for glaucoma include age greater than 40, black race, positive family history of glaucoma, myopia, enlarged cup to disc ratio, and diabetes. The recently released data from the Ocular Hypertension Treatment Study concluded that topical anti-glaucoma medications delay the onset of primary open angle glaucoma (POAG) in those patients with elevated intraocular pressure. But, it was also the conclusion of this study that not all patients with elevated IOP require treatment, and the decision to treat is based on an individual's combined risk factors. Applying evidence-based medicine, The Ocular Hypertension Treatment Study (OHTS), completed in 2002, was designed to determine the effect of IOP reduction in patients not with glaucoma per se, but those with ocular hypertension. Goals of this study were to evaluate the safety of ocular hypertensive medications in delaying or preventing Primary Open Angle Glaucoma (POAG) and to identify baseline factors that predict the development of POAG. A major finding of the OHTS was the increased risk of POAG associated with thinner central corneal measurements. Subjects with the highest IOPs and the thinnest central corneal thicknesses (CCT) were at the highest risk (36%) over 6 years. Given the clear-cut association between CCT and risk that was shown by this study, CCT should be measured in all patients with ocular hypertension or glaucoma. Even in those cases of definite primary open angle glaucoma, the progression of visual field loss can be delayed or halted in most cases with available therapeutic ocular medications. ALT or SLT laser treatment may be an effective option in ocular hypertension/preglaucoma patients and may obviate or delay the need for ocular glaucoma medications for up to a decade or more in some cases. In aircrew members with narrow anterior chamber angles, prophylactic laser peripheral iridotomy may be necessary to decrease the risk of acute angle closure glaucoma.

#### Relationship Between Ocular Parameters and Progression to POAG in OHTS

	High Risk	Moderate Risk	Low Risk
IOP (mm Hg)	>25.75	>23.75 to < 25.75	<23.75
CCT (microns)	<555	>555 to <588	>588
Vertical C/D	>0.5	>0.3 to <0.5	<0.3

**REFERENCE:**

Glaucoma at: <http://www.nlm.nih.gov/medlineplus/glaucoma.html>

Gordon MO, Beiser JA, Brandt JD, Heuer DK, Higginbotham EJ, Johnson CA, Keltner JL, Miller JP, Parrish RK 2<sup>nd</sup>, Wilson MR, Kass MA. The Ocular Hypertension Treatment Study: baseline factors that predict the onset of primary open-angle glaucoma. Arch Ophthalmol. 2002 Jun;120(6):714-20; discussion 829-30.

## KERATOCONUS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Keratoconus is considered disqualifying for all classes of aviation duty. Blurred vision can interfere with flying. There is a long term risk of corneal scarring.

### WAIVERS:

**Initial Flight Applicants:** Initial applicants are not considered favorably for exception to policy.

**Rated and Non-Rated Aircrew to Include Class 2/3/4 Applicants:** Waiver may be possible for all other aviation classes in the early stages of keratoconus provided visual standards are met.

*Note:* Keratoconus “suspects” who do not have definitive keratoconus will be reviewed on a case-by-case basis for waiver or exception to policy.

### INFORMATION REQUIRED:

- An optometry or ophthalmology consult with corneal topography
- Exclusion of connective tissue disorders such as Marfan's or Ehlers-Danlos syndromes may be indicated.
- Patients whose best corrected acuity falls below 20/20 or those requiring corneal transplant will be disqualified from flying.

**FOLLOW-UP:** Annual eye exam by an optometrist or ophthalmology is required.

**TREATMENT:** Spectacles and/or hard contact lenses may be necessary to restore visual acuity to acceptable standards. Hard contact lens wearers must have in possession a pair of spectacles with corrected vision to 20/20.

**DISCUSSION:** The syndrome is usually bilateral but may rarely affect one side only. The symptoms usually start during adolescence. The condition has been reported to be slowly progressive in 22.5% of cases but stabilization can occur at any time. It is very difficult to diagnose keratoconus in the early stages unless a corneal topographic mapping apparatus is used. Aviators with rapidly increasing myopia or astigmatism may warrant such testing.

## OCULAR HISTOPLASMOSIS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** The maculopathy that occurs in ocular histoplasmosis syndrome can lead to legal blindness. Performing the Valsalva maneuver can cause leakage into the macula. Hemorrhages can occur in the fundus at high altitudes.

### WAIVERS:

**Initial Applicants (All Classes):** Cases involving the macular area will rarely be granted an exception to policy. Exceptions to policy will be considered on a case-by-case basis provided visual acuity is normal.

**Rated Aviation Personnel (All Classes):** Waivers will be considered on a case-by-case basis. Waiver is possible provided visual acuity is normal. If histoplasmosis spots are present in the macular area, the aircrew member should be grounded until case review is complete. Restriction from unpressurized flight over 8,000 feet must be considered in cases with histoplasmosis spots.

### INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation. Questionable macular findings will be referred to an ophthalmologist for possible fluorescein angiography.

**FOLLOW-UP:** Annual ophthalmology consultation is required. If histoplasmosis spots are in the vicinity of the disc or macula reevaluation may be required every six months. Macular histoplasmosis involvement should be followed daily by the individual aircrew member using an Amsler grid. Peripheral manifestations of histoplasmosis are usually asymptomatic and clinically irrelevant, requiring less frequent follow-up.

**TREATMENT:** Laser photocoagulation to limit exudation and prevent serous retinopathy is compatible with flying status. Patients should not be flying while on steroid therapy and may return to flying duty within 72 hours after completion of treatment if asymptomatic. An eye care provider must perform a thorough evaluation after completion of any therapy to include a slit lamp examination and biomicroscopy. Complications of treatment include recurrence of retinal neovascularization and elevation of IOP.

**DISCUSSION:** Over 99 percent of histoplasmic infections are benign. Up to 2 percent of adults in the Midwest have histoplasmosis spots disseminated in the fundus. The spots are more frequent in left than right eyes, but they are bilateral in 67 percent of patients. Some studies have reported 60 percent of patients with macular involvement become legally blind. If spots are present in the area of the disc, the risk of a symptomatic attack in the next 3 years is 20 percent; if none are present, the risk declines to 2 percent.

**REFERENCE:** Presumed Ocular Histoplasmosis Syndrome; <http://www.revoptom.com/handbook/sect5o.htm>

## OPTIC NEURITIS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Optic neuritis causes a decrease in visual acuity which may progress rapidly over 1-3 days to a level of counting fingers. The symptoms may be worsened on exercise or exposure to high environmental temperatures. In some cases, the condition may be an early indication of multiple sclerosis (MS).

**WAIVER:** Waiver may be considered provided MS has been definitively excluded and provided that the patient has recovered and is clinically stable with normal visual acuity, stereopsis and color vision.

### INFORMATION REQUIRED:

- Complete Ophthalmology/optometry evaluation
- Complete Neurology evaluation. MRI and lumbar puncture may be required to definitively rule-out MS.

**FOLLOW-UP:** An annual comprehensive eye examination is required, noting specifically visual acuity, stereopsis, and color vision.

**TREATMENT:** N/A

**DISCUSSION:** An Air Force study group has shown that over 90% of patients had the condition in only 1 eye. Approximately 17% of the patients had a recurrence. Up to 93% eventually recovered to a visual acuity of 20/40 with 87% achieving 20/20. A total of 30% of patients eventually progressed to MS within a time span of 3 months to 6 years. While this percentage is much less than reported elsewhere, it is worth noting that the females are 3 times as likely as males to develop MS.

## RETINAL ARTERY/VEIN OCCLUSION

Update: FEB 2007

**AEROMEDICAL CONCERNS:** Symptoms range from mild peripheral visual blurring to severe visual field loss.

**WAIVER:** The granting of a waiver will depend on the resultant visual acuity and the absence of other pathology.

### INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation
- Evaluation must address that the visual acuity meets aeromedical standards and that neovascular glaucoma has not developed.
- Exclusion of other pathology such as hypertension, diabetes, blood dyscrasias, multiple myeloma and dysgammaglobulinemia is required. Work-up may need to include studies to rule-out valvular and carotid disease.

**FOLLOW-UP:** An annual ophthalmology/optometry evaluation is required.

**TREATMENT:** Photocoagulation is sometimes useful in central retinal vein thrombosis and in long-standing cases of branch retinal vein occlusion.

**DISCUSSION:** Macular edema occurs in 57% of cases of occlusion of the temporal branch of the retinal vein. Visual acuity improves in 60% of patients with branch retinal vein occlusion and 50% achieve visual acuity of 20/40 or better within 1 year. In central retinal vein occlusion, neovascular glaucoma develops in 15% of cases.

## UVEITIS/IRIDOCYCLITIS

Update: FEB 2007

**AEROMEDICAL CONCERNS:** The acute condition can cause distracting pain in the eye, floaters, excessive tearing, photophobia, and blurred vision. Long term sequelae include cataract, glaucoma, retinal damage, corneal band keratopathy, and loss of vision. Uveitis is often associated with other autoimmune and infectious diseases.

### WAIVERS:

**Initial Applicants (All Classes):** More than one episode of any form of uveitis is rarely granted exception to policy or waiver. When transient uveitis is due to a traumatic event, this will be filed as Information Only provided symptoms completely resolve, visual acuity returns to baseline and is within current aeromedical standards. A single nontraumatic episode requires an ophthalmology evaluation only. Multiple nontraumatic episodes require evaluation as listed below to exclude underlying systemic diseases.

### Rated Aviation Personnel (All Classes):

Waiver may be considered for chronic or recurrent cases, but is rarely granted. When transient uveitis is a single episode or due to a traumatic event, this will be filed as Information Only provided symptoms completely resolve and visual acuity returns to baseline and is within current aeromedical standards. More than one nontraumatic episode requires the evaluation as listed below to exclude underlying systemic diseases.

### INFORMATION REQUIRED:

- Ophthalmology/optometry evaluation
- Associated diseases causing uveitis, such as sarcoidosis, ankylosing spondylitis, tuberculosis, syphilis and toxoplasmosis should be excluded and the following initial studies should be completed:
  - ANA
  - Angiotensin Converting Enzyme
  - HLA B 27
  - Lyme serology
  - PPD
  - Syphilis Serology
  - CXR
  - Other tests as indicated by history/physical and ophthalmology consultant.

**FOLLOW UP:** Annual comprehensive eye exam may be required.

**TREATMENT:** Patients should be grounded during the active phase of the disease and during treatment.

**DISCUSSION:** Uveitis is any condition that involves inflammation of the uveal tract (iris, ciliary body, choroid) or adjacent structures. The key features of the condition are inflammatory cells in the anterior chamber and/or vitreous cavity. Associated features include pain, redness, photophobia, and anterior and posterior synechiae. Following traumatic iridocyclitis, the most common causes of anterior uveitis are idiopathic (38-56%), the seronegative spondyloarthropathies (21-23%), juvenile rheumatoid arthritis (9-11%), and herpetic keratouveitis (6-10%). The vast majority of cases of intermediate uveitis are idiopathic. Toxoplasmosis is the most common cause of posterior uveitis, and the most common causes of panuveitis are idiopathic (22-45%) and sarcoidosis (14-28%).

**REFERENCE:**

Foster, D. "General Approach to Uveitis Patient and Treatment Strategies," in Ophthalmology, Yanoff, Ed., 1st Ed., Mosby International, 1999.

## UVEITIS

Update: MAR 2003

**AEROMEDICAL CONCERNS:** The acute condition can cause distracting pain in the eye, floaters, excessive tearing, photophobia, and blurred vision. Long term sequelae include cataract, glaucoma, retinal damage, corneal band keratopathy, and loss of vision.

### WAIVER:

**Initial Applicants (All Classes):** More than one episode of any form of uveitis is rarely granted exception to policy or waiver. There is no requirement for waiver request when transient uveitis is due to a traumatic event, provided symptoms completely resolve and visual acuity returns to baseline and is within current aeromedical standards. A single nontraumatic episode requires an ophthalmology evaluation only. Multiple nontraumatic episodes require evaluation as listed below to exclude underlying systemic diseases.

### Rated Aviation Personnel (All Classes):

Waiver may be considered for chronic or recurrent cases, but is rarely granted. There is no requirement for waiver request when transient uveitis is a single episode or due to a traumatic event, provided symptoms completely resolve and visual acuity returns to baseline and is within current aeromedical standards. More than one nontraumatic episode requires the evaluation as listed below to exclude underlying systemic diseases.

### INFORMATION REQUIRED:

- Ophthalmology consultation
- Associated diseases causing uveitis, such as sarcoidosis, ankylosing spondylitis, tuberculosis, syphilis and toxoplasmosis should be excluded and the following initial studies should be completed:
  - ANA
  - Angiotensin Converting Enzyme
  - HLA B 27
  - Lyme serology
  - PPD
  - Syphilis Serology
  - CXR
  - Other tests as indicated by history/physical and ophthalmology consultant.

**FOLLOW UP:** Annual Ophthalmology consult may be required.

**TREATMENT:** Patients should be grounded during the active phase of the disease and during treatment.

**DISCUSSION:** Uveitis is any condition that involves inflammation of the uveal tract (iris, ciliary body, choroid) or adjacent structures. The key features of the condition are inflammatory cells in the anterior chamber and/or vitreous cavity. Associated features include pain, redness, photophobia, and anterior and posterior synechiae. Following traumatic iridocyclitis, the most common causes of anterior uveitis are idiopathic (38-56%), the seronegative spondyloarthropathies (21-23%), juvenile rheumatoid arthritis (9-11%), and herpetic keratouveitis (6-10%). The vast majority of cases of intermediate uveitis are idiopathic. Toxoplasmosis is the most common cause of posterior uveitis, and the most common causes of panuveitis are idiopathic (22-45%) and sarcoidosis (14-28%).

**REFERENCE:**

Foster, D. "General Approach to Uveitis Patient and Treatment Strategies," in Ophthalmology, Yanoff, Ed., 1st Ed., Mosby International, 1999.



## ORTHOPEDIC WAIVERS

## ABNORMAL SPINAL CURVATURE

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Excessive kyphosis, scoliosis, lordosis or combinations may predispose to spinal instability under aircraft accident or ejection situations. It may predispose to chronic discomfort, producing cockpit distraction and/or lost time.

**WAIVERS/ETPs/INFO ONLY/DQ:** All Classes, including all Initial and Rated/Non-Rated personnel Scoliosis or deformity of spine of any significant degree is considered potentially disqualifying—certain situations are Information Only as outlined below. Any history of surgical corrective spinal surgery is disqualifying.

**Information Only (I/O)** for all classes if given the following: 1) deviation is less than 20 degrees; 2) stability for a minimum of one year has been documented; 3) no corrective surgeries has been performed or recommended; 4) there are no associated profiles; and 5) no current or recurrent associated symptoms.

**Waivers/ETPs** will be routinely considered for deviations up to 25 degrees and for cases with remote, but resolved symptoms. Consideration is on a case-by-case basis for those cases with presumed, but unknown or undocumented stability if asymptomatic, without permanent 3 profile, and without history of any other non-waiver elements.

**DQ/no ETP/No waiver conditions include any of the following:** 1) deviations over 30 degrees; 2) history of symptomatology, to include chronic or recurrent pain; 3) corrective surgery; 4) compromise of neurologic, or cardio-pulmonary function; 5) interference with function (to include Permanent 3 (P3) profile and/or profile restrictions impacting training, safety, egress, equipment utilization, or job performance); or 6) condition is progressive.

ICD9 Code	Condition
737.0	Kyphosis
737.2	Lordosis
737.3	Kyphoscoliosis
737.30	Scoliosis, within standards

### INFORMATION REQUIRED:

- Orthopedic consultation for ALL cases with Scoliosis Measurement (Quantification) by the Cobb method.
- Cardiology consultation, as indicated, for evaluation of any Right Axis Deviation or EKG abnormalities suggestive of pulmonary hypertension.
- The following, either in electronic or hard copy, may be requested for forwarding to USAAMA:
  - Radiographic Plain films.
  - Photograph(s) of the deformities with any necessary markers or views deemed helpful in demonstrating deformity extent and function.

**TREATMENT:** Surgical treatment, to include recommendation for surgical intervention, or any required use of braces/ prosthetics, are disqualifying for all classes.

### DISCUSSION:

Because in the normal individual, the upper torso's center of lies anterior to the spine, applying high vertical G forces from ejections seats, a high-sink rate hard-landing, or an accident, subjects the spine

not only to the expected in-line force load but also a significant non-in-line torque force. This non-in-line torque force is proportionate to the distance between the long axis of the spine and the line of force application along the upper torso's center of gravity. Excessive spinal curvature (scoliosis, kyphosis or lordosis) serves to further displace this CG in one or more planes increasing the torque forces (linear and/or rotary) acting on the spine. This results in the abnormally spinal curved individual having unacceptably increased potential during an aviation mishap for serious injury, to include spinal fracture(s) or intervertebral disc herniation(s).

NOTE: The long-term outcome progression of scoliosis of 30 degrees or less is very favorable, but above 30 degrees is uncertain. The routine waiver standard is set at 25 degrees rather than 30 to compensate for the 3-5 degree error potential inherent in the Cobb measurement method. 25-30 degrees is the "gray zone."

# AMPUTATION, PARTIAL UPPER/LOWER EXTREMITY

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Partial loss of extremities may adversely affect aircrew performance and successful mission to include hand-eye coordination, manual dexterity, and physical agility, which includes the ability to survive, evade, resist, and escape.

## WAIVERS/ETPs/INFO ONLY:

**Initial Applicants (All Classes, Rated/Non-Rated):** Initial flight applicants with partial upper or lower extremity amputations who meet induction criteria per chapters 2-9 and 2-10 of AR 40-501 will be evaluated as "Information Only" unless the examining flight surgeon questions the ability or safety with flight duties. Partial or complete loss of an upper or lower extremity greater than permissible by above standards shall be considered disqualifying and may be considered for waiver/exception to policy on a case-by-case basis. Successful Performance Based Assessment (PBA) in actual or simulated aviation work environment is required.

**Rated/Non-rated Aviation Personnel (All Classes):** Aviation personnel with static, healed, fully rehabilitated partial upper extremity (UE) or lower extremity (LE) losses must submit an AMS for determination of waiver or "Information Only" status. Information Only disposition is similar to above. Waiver requests are required if failing to meet standards for chapters 2-9, 2-10, and 3-14 of AR 40-501, or for permanent profiling. Waiver is contingent upon submission of information listed below and successful completion of Performance Based Assessment (in-flight (for crew) or in-tower (for ATC) assessment).

## INFORMATION REQUIRED:

Aeromedical summary (AMS) to include the following:

- History and physical with specific reference to right/left dominance, range of motion at joints adjacent to amputation, related neuromuscular deficits, psychosocial adaptation, etc.
- Operative note, radiographs, and summary from orthopedic surgeon declaring the patient rehabilitated.
- Physical and/or occupational therapist evaluation.
- Performance Based Assessment:
  - Army Physical Fitness Test (AFPT) [current within 3 months].
  - Demonstrated preflight maneuvers and the donning and use of all Aviation Life Support Equipment (ALSE).
  - An aircraft/cockpit in- flight evaluation by the standardization IP, as designated by the first O-6 in the chain of command, including access and egress, emergency procedures appropriate for airframe, as well as close evaluation of any "loss-challenged activities," e.g. emergency procedures
  - Flight surgeon disposition with regard to aeromedical fitness. This should be based, when possible, upon observed in-flight evaluation, utilization of ALSE, and preflight maneuvers. Flight surgeon assessment of endurance factors, body mechanics, and ergonomics while completing PBA is a valuable part of the AMS.
- Findings from the Medical Evaluation Board (MEB) and/or Physical Evaluation Board must be submitted, if applicable.

**FOLLOW UP:** Per specialist(s) recommendation, with annual comment from flight surgeon/APA at a minimum.

**TREATMENT:** Per specialist(s) recommendation.

**DISCUSSION:** Successful functional adaptation to loss of an appendage is dependent upon a host of factors, including the following: age at time of loss, R/L dominance, associated neural deficits, loss of motion of adjacent joints, psychological adaptation and most importantly, motivation on the part of the amputee. Traditionally, partial or complete loss of an appendage has been considered disqualifying. Documented cases of successful return to military flight status following severe anatomic loss are on record. The following three criteria shall be met for any aviation personnel status post amputation:

1. Amputee is in excellent general health with a limited, static loss and has completed maximal rehabilitation.
2. Aviator's ability to perform specific military tasks relating to survival, evasion, resistance, and escape have been demonstrated through retention via MEB/PEB as well as AFPT.
3. Performance based evaluation for aviation duties has been completed by the battalion's standardization IP in a functional check ride to include standard and emergency procedures.

**REFERENCE:** Assessment of motor and process skills.

<http://www.colostate.edu/Programs/AMPS/amps.htm> Published: March 2003

# ANKYLOSING SPONDYLITIS

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Cramped workplace conditions, vibration, positional immobility (sitting) and wear of heavy equipment for prolonged periods may exacerbate symptoms and adversely affect the eventual disability. Active cases have more missed duty due to flares or medical care. Seen in more advanced cases, spinal rigidity predisposes to increasing vulnerability to spinal injury from otherwise mild trauma, increases risk of spontaneous C1-2 dislocations, limits head rotation necessary to maintain adequate situational awareness, and restricts emergency egress capacity. Extraspinal manifestations may include recurrent iritis (10 to 25%), pulmonary impairments, cardiac blocks, valvular disease, and renal impairment.

## WAIVERS/ETPs/DQ:

**Initial Class 1 Applicants:** Exception to Policy is not expected for initial applicants for flight training (pilots) who have confirmed diagnosis. Cases may be reviewed with information below submitted in AMS.

**Rated and Non-Rated Aircrew (to include Class 2/2F, 3, and 4 applicants):** Waiver will be considered on a case-by case basis for applicants and aircrew for early stage, mild or inactive disease who have minimal symptoms, require minimal medications for symptom control, have had no recurrent symptoms or extra-spinal manifestations, who continue to have normal spinal mobility, and job environmental safety risk remains acceptable. Disqualification or (Discontinuation of Waiver) will often be recommended for individuals whose disease involves any of the following: 1) Extra-spinal manifestations; 2) Use of Class IV medications; 3) Symptom or performance issues (such as chronic pain, anxiety, frequent work absences or profiles, issues of potential impact on aviation work performance/safety; or 4) Failure to meet retention standards, need for Permanent 3 or 4 profile, or inability to take/perform at least one aerobic AFPT event.

## INFORMATION REQUIRED:

- Orthopedic or Rheumatology Consultation.
- Radiographic Imaging of Spine.
- EKG, HLA B-27, Arthritis Profile (RA, ANA, ESR), HIV, Renal Function panel.
- Pulmonary function testing.
- Physical Therapy/Occupational Therapy functional assessment (spinal mobility).
- Optometric/ophthalmologic evaluation.
- If requested: Last three AFPT Scores for each event, Profiles, MMRB/PEB/ MEB required.

**FOLLOW-UP:** Annual waiver requirements include completion and documentation of the following:

- Musculoskeletal functional assessment: orthopedics/rheumatology, PT/OT or flight surgeon
- Ocular, retinal, and visual acuity evaluation to include (slit lamp) with optometry/ophthalmology
- Chest Examination: Cardiac auscultation for murmur, notation of chest wall expansion (by FS or PCM)
- EKG, CBC, and Renal Function Panel; other labs as required for monitoring chronic medication use.
- Annual Flight Surgeon evaluation with reference for continuation of aviation status, aeromedically-approved medication(s) in use, progression of disease state, and worsening of condition to warrant suspension.

**TREATMENT:** A regular exercise program, weight control, and a healthy lifestyle with periodic medical and functional re- evaluations form the basis for ankylosing spondylitis control. OTCs are useful for occasional minor flares or may require a period of NSAID use and /or physical therapy intervention/modalities. NSAIDS use on a regular basis should be under physician care, requiring a

routine waiver. Use of immunomodulators, either recurrent or chronic, unless specifically waived, requires full re-evaluation, consultation with USAAMA and a new AMS for Waiver Amendment request.

**DISCUSSION:** Sacroiliitis is often the earliest manifestation of ankylosing spondylitis and can be noted on an AP view of the pelvis. No lab test is diagnostic, but the HLA-B27 gene is present in over 90% of Caucasians and 50% of Blacks. The ESR and C-reactive protein are usually elevated. Clinical diagnosis should be suspected with a history of chronic back pain, loss of motion of lumbar spine, limited chest expansion, and radiographic evidence of sacroiliitis. Other possible complications include cardiac conduction defects, aortic incompetence in about 4% of patients who have had the condition for 15 years, uremia arising from amyloidosis in up to 6%, and chest rigidity giving rise to ventilation/perfusion abnormalities. Spinal cord damage can arise from fractures of the rigid cervical spine, and spontaneous subluxation at the atlantoaxial joint with quadriplegia has been described. Thus, this condition has significant progression-risk and complications that warrant eventual suspension.

# BACKACHE & OSTEOARTHRITIS OF THE SPINE

Update: JUL 2007

**AEROMEDICAL CONCERNS:** This APL addresses the non-specific severe, persistent, and/or recurrent episodes of back or neck pain which are not specifically covered by the other APLs for Intervertebral Disc Disease, Ankylosing Spondylitis, Spinal Fractures, and Spondylolysis/Spondylolisthesis. Categories covered by this APL include: spinal spondylosis, spinal degenerative disc disease, degenerative joint-facet arthropathy, generalized sero-negative spinal osteoarthritis, spinal osteoporosis, and "mechanical low back pain." History of recurrent or low back pain is of aviation medicine concern in that the individual is placed at risk both for compromise of mission capacity and for the acceleration of underlying spinal degenerative processes, making it disqualifying for all classes of duty.

## WAIVERS/ETPs/INFO ONLY/DQs:

**Initial Class 1 Flight Applicants:** History of recurrent or persistent back pain is disqualifying and will not ordinarily be considered favorably for exception to policy, but reviewed on a case-by-case basis.

**Rated and Non-Rated Personnel (all classes, including Applicants):** Waiver request will be favorably considered if the recurrent or chronic back pain has been easily controllable with OTC's/NSAIDS without significant/frequent lost duty time, use of class IV medications, or assignment of Permanent 3 or 4 profiles. Isolated cases may be considered for Information Only disposition with full recovery. Permanent 2 profiling in trained personnel are not cause for disqualification and waiver if assigned for APFT elements as a preventive precaution and not impacting mission capacity, safety, or egress-rescue.

## INFORMATION REQUIRED:

- Local PCM/FS Evaluation with treatment plan outlines, to include:
  - Sufficient to exclude prolapsed (herniated) intervertebral discs, structural spinal disease (degenerative disease, spondylolysis or -lithesis), spinal injury (fractures), metabolic bone disease, metastatic lesions, myeloma, ankylosing spondylitis, rheumatoid arthritis, infection, or other structural defects and injury.
  - FS or PT documentation of back exam, mobility, and peripheral neuron-motor-sensory function
  - Laboratory Minimum (Rheum eval): CBC, CMP, Calcium, Uric Acid, UA, Arthritis Panel/ESR
  - Imaging Minimum: Plain Films of affected region with CT or MRI-studies only as clinically indicated.
  - AFPT Scores and/or presumptive subsequent evidence of fitness (e.g., finished Ranger School, 15 month OIF)
- Orthopedic, Physical Therapy and/or Rheumatology Evaluation: As required as part of the clinical evaluation and treatment, based on severity, progression, deficits, or positive findings.

**FOLLOW-UP:** No annual follow-up requirement, beyond local flight surgeon assessment, is required for non-specific, stable back pain, which is non-progressive and without impact on flight duties/safety. Orthopedic or other specialty annual evaluations may be required for cases with deficits or significant potential for progression. Progression of pain, worsening of symptoms, increased lost duty-time, or emergence of new findings/limitations will mandate complete re-evaluation, advanced imaging and specialty consultation followed by re-submission of AMS for status recommendations and amendment.

**TREATMENT:** For back pain, simple conservative measures are usually effective, and often will not require prolonged restriction from flight. This can encompass temporary restriction from flight and strenuous PT, remedial exercises, hot/cold packs, and OTCs or NSAIDS. Employment of bed rest, spinal corsets, muscle relaxants, narcotic analgesics, hypnotics, oral steroid courses, anti-depressants, back injections, and epidural steroids require temporary DNIF status, with close flight surgeon follow-up and

careful reevaluation prior to return to FFD. Chronic medication for back pain beyond acetaminophen and NSAIDs are rarely considered for waiver.

**DISCUSSION:** The incidence of backache in pilots occurring only during flight has been reported as 13%. Helicopter pilots reported a higher incidence. Degenerative changes in the cervical spine are common over the age of 30 years. Aviation environments require wear of heavy equipment, long periods of forced immobility (sitting) in seats designed for safety rather than comfort, exposure to high levels of vibration, and frequent awkward postures, all associated with aggravating back discomfort. Back discomfort, either in-flight or in a flight-associated environment, can result in task distraction, decreased concentration, and decrease in the motion/flexibility necessary for performance and safety. Individuals with recurrent or prolonged back pain are at risk for increased duty absences, disqualifying medications/profiles, and its association with depression. Two or more episodes of back discomfort indicate a substantial risk for future recurrence. The flight environment, like the commercial truck driving environment, is a risk factor for development of and/or worsening of degenerative spinal disease, presumably due to prolonged exposure to sitting and vibration.

# SHOULDER DISLOCATIONS

Update: MAR 2015

**AEROMEDICAL CONCERN:** Chronically dislocating is defined as more than one dislocation of the same shoulder at any point in time. A chronically dislocating shoulder history carries with it an unacceptable risk to aircraft safety and mission performance due to the risk of unexpected dislocation and its concomitant pain, limited range of motion, apprehension, and/or paresthesias. An initial shoulder dislocation under age 20 carries a 50-90% probability of recurrence and dislocations that occur over age 40, a 5-15% probability, either of which is a substantial risk in the aviation environment and must be watched closely. A single reoccurrence increases the risk of subsequent reoccurrence.

## CONDITIONS:

Single dislocation of shoulder,  
Recurrent dislocation of shoulder  
Repair of shoulder dislocation

## Waivers/ETPs/Information Only (All Classes to include applicants):

Condition/Treatment	Class 1	Class 2 and 3	Class 4
Distracting Pain during the performance of flight duties	Exception to policy not recommended	Waiver not recommended	Waiver not recommended
Single dislocation with no residual pain or limitations which impact aviation duties.	Information only  No exception to policy recommended if has residual pain or any limitations that impact the performance of aviation duties.	Information only  Waiver required if does not meet these criteria.	Information only  Waiver required if does not meet these criteria and if could impact the performance of UAS or ATC duties.
More than one dislocation of the same shoulder – Unrepaired, residual pain controlled with medications or limitations that could impact aviation duties after recovery from surgery.	Exception to policy not recommended	Waiver required	Information only  Waiver required if there is residual pain or limitations that could impact the performance of UAS operator or ATC duties.
More than one dislocation of the same shoulder – Repaired with no residual pain and no limitations that impact aviation duties.	Information only	Information only	Information only

\* Table above includes applicants.

\* AMS only required for waivers/exceptions to policy. All information only may be documented in the flight physical.

## INFORMATION ONLY:

- a. Classes 1, 2 and 3 to include applicants: A single episode of shoulder dislocation is disqualifying until completely healed with full range of motion, strength and released by orthopedics back to full duty with no limitations. May not have any joint instability, pain, or unrepaired shoulder internal derangement. Well healed, repaired shoulders after a single dislocation or multiple dislocations will be considered information only. Consideration for information only is strengthened in those who have demonstrated satisfactory post-repair performance under rigorous training or deployment conditions (e.g. Ranger, SF, Parachute, deployment, West Point).
- b. Class 4 to include applicants: Single or recurrent dislocations are considered information only with or without surgical correction provided there is no residual pain or any limitations that would impact the performance of ATC or UAS operator duties.

**Exception to Policy (Class 1):** More than one instance of dislocation of the same shoulder without surgical repair of the affected shoulder, or surgical repair with residual pain or limitations is disqualifying. No exception to policy recommended.

**WAIVERS:**

- a. Classes 2-3 to include applicants: A history of uncorrected recurrent shoulder dislocation is considered disqualifying until repair is complete, at which time the individual will qualify for Information Only. Any distracting pain is not considered for a waiver. A waiver may be considered on a case by case basis for more than one dislocation treated without surgery provided there is no joint instability or distracting pain. Those who have well controlled non-distracting pain after surgery or have limitations that could impact aviation duties may be considered for a waiver.
- b. Class 4 to include applicants: Residual pain or any limitations that may impact the performance of ATC or UAS operator duties requires a waiver.

**Information required for surgical and non-surgical intervention for Waiver/ETP or Information Only:**

- a. Orthopedic consult documenting bilateral intact range of motion, stability, strength and neuromuscular function as well as prognosis for future joint stability.
- b. Documentation of passing three-event APFT (pushups, sit ups, 2 mile run).
- c. In-flight evaluation involving all controls, switches, emergency procedures, and egress is required if there are any permanent profile limitations beyond an alternate aerobic event or no pushups that could impact the safe performance of aviation duties for Classes 1-3.

**FOLLOW UP:** Follow up beyond annual flight surgeon evaluation is not normally required. Recurrences require immediate grounding, reevaluation, and reporting of above information.

**TREATMENT:** Surgical correction and rehabilitation.

**DISCUSSION:** Potential post-operative complications include: recurrence of dislocation, bone resorption, chronic pain, or functional limitations. Surgical failure and surgical complication rates are low with current operative techniques, particularly with modified Bristow procedures. With the extraordinarily high reoccurrence rate of shoulder dislocations especially in the younger population, great caution must be exercised in allowing aviation duties in unrepaired individuals.

**REFERENCES:**

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# INTERVERTEBRAL DISC DISEASE

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Intervertebral Disc Disease (herniated nucleus pulposus, HNP) at any spinal level is of concern in an aviation environment due to its potential impact on mission availability, functional limitation, task distraction, and treatment side effects. Further of concern is the individual's increased risk in both short-term health status and in long-term progression/extent from G-Forces, ejections, hard-landings, prolonged sitting, frequent awkward postures, wear of heavy equipment and career-long exposures to vibration. History of clinically significant spinal HNPs, degenerative disc disease (DDD), spinal stenosis, conditions producing neural impingement, and spinal conditions with histories associated radiculopathy (with or without corrective surgery and with or without current symptomatology) is disqualifying for all classes, both Initial and Rated.

## WAIVERS/ETPs/DQ:

**Initial Class 1 Applicants:** History of HNP or any spinal condition producing radiculopathy, with or without surgery is disqualifying. Exception to policy, although not normally recommended, may be considered on a case-by-case basis with information below for remote histories with excellent recovery.

**Rated and Non-Rated Aircrew, including all Applicants:** Waivers are favorably considered for cases, whether treated conservatively or surgically, with resolution of symptoms, return to normal duties, no residual motor-sensory-reflex deficits, no instability of posterior elements, no Permanent 3 profiles and no requirement for limiting treatments or Class IV medications. Aircrew members with histories of cervical HNP and/or history of spinal fusion will normally be restricted from aircraft requiring ejection seat capacity (which involves no current Army aircraft).

## INFORMATION REQUIRED:

- Orthopedic or Neurosurgical consultation with appropriate imaging Studies: MRI, CT, and / or CT-Myelography.
- Electro-diagnostic studies and/or Operative/Treatment Report (if applicable) with diagnosis and procedures
- Post-fusion stability studies (if applicable): PA/LAT and/or CT demonstrating satisfactory healing/stability of posterior (fused) elements.

**TREATMENT:** Initial conservative treatment follows that of the Back Pain APL, with discovery of disc disease through the evaluation or due to persistence or severity of symptoms. Further treatments range from conservative measures with PT, to medications and epidural injections, chemonucleolysis, and beyond. Standard surgical options include microdiscectomy, laminectomy, and fusion procedures. Newer techniques are being reviewed to include lumbar disc implant replacement. Cervical disc replacement is not yet approved for continued aviation duties. The patient should be DNIF throughout this time frame and return to flight duties off Class IV medications, healed, back to full duties, and after cleared from surgery and PT.

**FOLLOW-UP:** No follow-up is normally required other than a routine FDME. Recurrence of symptoms will require further orthopedic/neurosurgical consultation and supplemental AMS submission. Use of NSAIDs/acetaminophen is waivable.

**DISCUSSION:** Spinal Disc Disease (HNP, bulging disc, DDD, foraminal impingement, spinal stenosis) is a frequent, and often non-pathologic, finding on advanced imaging of all populations, regardless of presence/absence of symptomatology. Its prevalence is often reported in the range 1% for every year of age in randomly selected, asymptomatic populations. That is, in asymptomatic 50 year olds, over 50% will have a HNP noted on MRI. Bulging Discs are even more common, approaching 80% by middle age, and may be unrelated to the underlying symptoms. Most cases of foraminal impingement are not due to disc

disease, but rather to degenerative osteophyte encroachment, often with associated further decrease in foraminal space by a disc bulge. Surgical treatment is indicated for cases with neurologic deficits and for those cases with significant symptomatology, unresponsive to conservative measures. Surgical treatment is over 80% effective in relief of pain in those cases where imaging demonstrates a lesion correlating with peripheral findings. In cases where there are no neurologic deficits or there is incomplete correlation of symptoms to lesion, the five-year outcome is the same for conservative and for surgical treatments (although very recent data may suggest still better results). Cervical symptoms are particularly concerning with pain, radiculopathy, exposure to Gz maneuvers, and additional weight of ALSE equipment. Cervical disc implants show promise for future options, but have not undergone the requested and required airworthiness evaluation at this time.

**ICD9 Code, Condition:** 722.0, Cervical disc displacement without myelopathy; 722.11, Thoracolumbar disc displacement without myelopathy; 722.70, Herniated Nucleus Pulposus with symptoms; P80.51, Laminectomy; P80.52, Intervertebral Chemonucleolysis; 722.10, Lumbar, lumbosacral

## KNEES

Update: MAR 2015

**AEROMEDICAL CONCERNS:** Knee instability is a safety risk factor in the aviation environment during foot pedal operations of the aircraft, climbing ladders/preflight, emergency egress/rescue, or water and land survival. In most cases, knees can be operatively or non-operatively rehabilitated, returning the aircrew member to normal duty with no or few limitations.

**Conditions with or without surgical repair:**

- Medial or lateral meniscal derangement
- Anterior or posterior cruciate ligament derangement
- Medial or lateral collateral ligament tear
- Chondromalacia of the patella
- Patellofemoral syndrome
- Chronic knee pain
- Other knee conditions not otherwise covered in another APL

**Waivers/ETPs/Information Only/DQ (All Classes to include applicants):**

Condition/Treatment	Class 1	Classes 2 and 3	Class 4
Distracting pain during the performance of flight, ATC or UAS operator duties	Exception to Policy not recommended	Waiver not recommended	Waiver not recommended
Knee Instability	Exception to Policy not recommended	Waiver not recommended	Information only
Knee stable, but symptomatic or with functional deficits	Exception to Policy required	Waiver required	Waiver required if impacts the safe performance of duties.  Information only if no impact on the safe performance of duties.
Knee stable and asymptomatic with or without surgical repair	Information only	Information only	Information only

\* Above includes applicants.

\* Information only may be documented on the flight physical and an AMS is not required.

**DQ:** Internal derangement of the knee resulting in instability of the ACL or PCL is disqualifying for classes 1-3. Distracting pain is disqualifying for all classes.

**WAIVER/ETP:**

**Classes 1, 2, and 3 to include applicants:** Any symptoms/deficits that persist post repair or abnormal functional testing requires a waiver or ETP.

**Class 4:** A waiver for ATC or UAS operator duties is required only if there are limitations that would prevent the individual from safely performing their duties. In general, Class 4 would normally be information only.

**INFORMATION ONLY:**

Asymptomatic when surgically repaired or non-operatively healed knee lesions if:

- a. Repair is successful and activity generally unlimited as per orthopedic consult.
- b. Stable, functional joint, well healed, fully mobile, and without pain, effusion, or deficit.
- c. Sharp/well-defined end point on anterior/posterior drawer or Lachman's test, McMurray's test and medial and lateral stability testing.

- d. Able to perform all flight duties for position with no limitations and safely egress or evade.
- e. Permanent profile is acceptable only for minimal protective limitations, such as but not limited to "run own pace and distance" and "APFT walk". These limitations may not include activities likely to be required during survival and evasion such as walking and running on uneven ground or required for flight duties such as climbing or kneeling.

**INFORMATION REQUIRED FOR INFORMATION ONLY, ETP AND WAIVER:**

- a. Orthopedic consultation, documenting stability and treatment success. Knee exam will document a negative anterior/posterior drawer or Lachman's test, McMurray's test and medical and lateral stability testing.
- b. Documentation of symptom-free, full ROM, adequate strength, medication requirements limited to OTCs or NSAIDs, and no metal-containing brace or support use required other than as a protective measure while doing sporting activities.
- c. Most recent APFT scores.
- d. Flight surgeon description of patient's level of physical activity and limitations. The individual's case is strengthened by successful participation in challenging physical activities such as completing a marathon or triathlon or successful completion of physically strenuous military courses such as Ranger, Airborne, or Air Assault schools.

**FOLLOW UP:** No follow up is normally required other than an annual aeromedical provider comment on continued stability of the knee and any current limitations. If the individual has a permanent 2 profile or higher, the aeromedical provider will comment on current exam of knee with specific comment about the individual's ability to perform all required aviation duties such as emergency egress, pre-flight, foot pedal operations, etc.

**TREATMENT:** With Orthopedic and Physical Therapy management, most knee injuries are successfully managed with full return to function without limitations. While in therapy or rehabilitating, personnel should be temporarily grounded with simulator duties allowable until cleared by orthopedics to return to full flight duties. Aircrew to include ATC and UAS operators requiring knee replacement will be followed IAW the joint replacement APL. Aircrew to include ATC and UAS operators receiving lubricant injections will be locally grounded for 24 hours following each injection or until the aviator has regained pain free full range of motion. NSAIDs and glucosamine are authorized for use under the supervision of the flight surgeon. Retained hardware is acceptable as long as it does not limit motion or cause pain.

**DISCUSSION:** Injuries producing tears to the cruciate ligaments are commonly of the force/direction to have potential for injury to other knee internal structures. For example, anterior cruciate ligament tears are usually accompanied by associated damage to the medial and often the lateral complexes as well. These result from forced flexion or hyperextension injuries. A positive "anterior drawer sign" is evident on physical exam, usually with findings of medial ligamentous instability as well. Avulsion fracture of the anterior tibial spine may also be noted on x-ray. Prior to and following surgical repair, intensive quadriceps building is required to assist recovery and prevent recurrent injury. By contrast meniscal injuries may be isolated, but due to the poor blood flow in the menisci are still likely to require surgical correction, though recovery from meniscectomy is often remarkably fast.

## JOINT REPLACEMENT

Update: JUL 2007

**AEROMEDICAL CONCERNS:** The major concerns following joint replacement relate to stability of the artificial joint during ejection, crashes/hard landings, emergency ground egress, or escape and evasion.

### WAIVERS/ETPs/DQ:

**Initial Class 1 Applicants:** Joint replacement, usually resulting from significant trauma and/or significant degeneration of the joint, is disqualifying, generally without exception to policy. Such cases will be on a case-by-case basis.

**Rated and Non-Rated Aircrew, to include all other Applicants:** Waivers will be considered on a case-by-case basis following joint replacement Surgery. AMS is required after recovery, rehabilitation, and off Class IV medications.

ICD9 Code	Common Conditions
8151	Hip Replacement (total)
8152	Hip Replacement (partial)
8154	Knee Replacement
8156	Ankle Replacement

### INFORMATION REQUIRED:

- Full orthopedic evaluation is required.
- A cockpit assessment by a flight surgeon and the unit's senior instructor pilot may be necessary.

**FOLLOW-UP:** Annual orthopedic consultation is required.

**TREATMENT:** Per specialist(s) recommendations.

**DISCUSSION:** The cemented total hip replacement provides a good to excellent clinical result in up to 85% of patients for at least 15 to 20 years. The failure rate is about 1% a year of follow-up. Cementless hip replacement has not been used for as many years but there is low revision rate and high durability for at least 12 years. Up to 20% of patients with cementless hips experience unexplained pain or limp. Some movements predispose to dislocation of an artificial hip although dislocation is only reported in 1% of patients. In particular, the abduction, flexion and rotation of the hip during entry to the cockpit may result in dislocation. In addition, flailing of the limbs following ejection may result in dislocation. Moreover, the replacement joint is often much heavier than the original and may affect flotation. A case has been reported where a strong swimmer could not stay afloat following bilateral knee replacement. Failure of the artificial joint (fracture) or loosening of the attachment of the joint has been reported during athletic activity in up to 6% of patients, particularly in those who are younger and heavier, and in those with cementless prostheses. Heterotopic bone formation occurs in up to 70% of patients with total hip replacement, but this causes pain in less than 4%.

## ORTHOPEDIC HARDWARE - RETAINED

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Fracture and migration of retained hardware when stressed, weakening of the bony structures, and failure to heal the condition for which the hardware was placed are all safety of flight and mission completion concerns. Retained staples, wires, screws, etc., are considered disqualifying until reviewed by USAAMA.

### WAIVERS/ETPs/INFO ONLY/DQ:

**Rated and Non-Rated Aircrew, including ALL Applicants:** *INFO ONLY* criteria for retained hardware includes the following restrictions (if not meeting these means a waiver/ETP is required):

- a. It does not traverse a joint.
- b. It is not located in the spine.
- c. It is not intramedullary within major long bones (i.e., radius, ulna, humerus, femur, or tibia).
- d. It does not constitute replacement arthroplasty.
- e. It is asymptomatic without tenderness, overlying skin irritation, or pain with ambient temperature change.

Waiver/Exceptions to Policy will be reviewed on a case-by-case basis provided the waiver information required is completed as below.

Retained bioelectric devices (implanted bone and nerve stimulators) imply the persistence of a disqualifying condition and are considered disqualifying with waiver unlikely. If the device is no longer required, it may be removed and waiver requested, unless removal would be detrimental.

### INFORMATION REQUIRED:

- Orthopedic consultation:
- Imaging Studies: As required.
- In-cockpit (or workplace functional) evaluation: as required, if there is concern of ability to perform specific workplace task, to include emergency egress.

**TREATMENT:** Per specialist(s) recommendations. Removal may be considered if the retained hardware becomes problematic or no longer necessary, and the underlying condition has resolved without complications or interference with performance of duties. A supplemental AMS to remove the waiver may be considered.

**FOLLOW-UP:** Annual flight surgeon evaluation and comment is required. Problems or concerns shall have specialist consultation prior to clearance.

**DISCUSSION:** Often the underlying orthopedic condition is disqualifying and of greater concern. Pedicle screws, Harrington rods, circlage wires and fixation plates too frequently become broken as a result of "metal fatigue" over time, often with disastrous neurologic consequences.

## RAYNAUD SYNDROME

Update: AUG 2007

**AEROMEDICAL CONCERNS:** The primary concern is that the symptom complex (which includes numbness, tingling, and burning sensation along with the tissue color changes within the fingers) could interfere with successful operation of cockpit buttons, switches, and controls. Raynaud syndrome has also been linked with the development of connective tissue disorder (See Discussion and APL on Systemic Rheumatologic Diseases, if applicable).

**WAIVERS (to Include ALL Initial Applicants, Rated and Non-Rated aircrew):** Waivers are considered favorably provided symptoms within the cockpit are manageable and underlying pathology has been excluded. The requirement to be deployed to cold environments may lead to limitations in deployability. This limitation is often viewed unfavorably in the waiver recommendation decision process.

### INFORMATION REQUIRED:

- Complete history with:
  - Complete hand radiography
  - Thoracic outlet radiography to exclude cervical rib and thoracic outlet syndrome are required
  - Blood tests including anti-DNA and anticentromere (ANA) antibodies
  - Nerve conduction studies to exclude nerve entrapment syndrome should be considered.
  - Local MEB recommendations should be submitted
- An in-flight evaluation with cold exposure may be recommended by USAAMA.

**FOLLOW-UP:** Yearly complete history with specific attention to functional limitations and progression of symptom complex. Worsening symptom complex or limitations may warrant future suspension.

**TREATMENT:** Behavioral adaptations such as avoidance of cold conditions, tobacco cessation, wearing layered clothing, and keeping the hands warm are acceptable preventative measures. Drug therapy (Persantine, Amyl Nitrite) are not compatible with waiver because of the side effects of the drugs in common use. Thoracic sympathectomy is also not compatible with flying status.

**DISCUSSION:** Females constitute 60-90% of the patients presenting with Raynaud syndrome. Males present when older and are more likely to have arteriosclerosis. Up to 50% of patients with Raynaud syndrome develop a connective tissue disorder (frequently scleroderma) within 10 years. There is a strong relationship between presence of ANA and the later onset of scleroderma. Between 70-80% of scleroderma patients and 8-10% of systemic lupus erythematosus patients present with Raynaud syndrome. Migraine development was reported in 61% of one series of patients. There was a positive association with self-reported use of alcohol. Vasospasm is also reported to occur in the lungs resulting in a decrease in gaseous diffusion capacity.

## Systemic Rheumatologic Diseases (RA, SLE, MCTD, Fibromyalgia, etc.)

Update: JUL 2007

**AEROMEDICAL CONCERNS:** Systemic diseases, often autoimmune, are fraught with complications and aeromedical concern. Pain, joint swelling, and stiffness can be distracting for flight, but also the underlying disease process may cause further concern with increased fatigue and symptoms of depression. These diseases often have systemic involvement and complications that are limiting to safe performance and duty. With rheumatoid arthritis and lupus, patients tend to "gel" from the stiffness when in one position for a long time, and this could impair emergency egress on the ground. Cervical spine involvement with RA at the atlanto-axial junction could lead to quadriplegia after violent movements of the neck, exposure to high Gz, hard landings, or ejection. The requirement for maintenance therapy and specialist review may make worldwide deployment difficult and the underlying condition may not be suitable for continued military service.

### WAIVERS/ETPs/DQ:

**Initial Class 1 Applicants:** Exception to policy is highly unlikely, but will be reviewed on a case-by-case basis.

**Rated and Non-Rated Aircrew, including all other Applications:** Waiver may be possible on a case-by-case for asymptomatic aircrew with normal function, able to perform full duties, without duty limitations, using aeromedically acceptable medications, and without extra-articular manifestations.

### INFORMATION REQUIRED:

- Rheumatologic , orthopedic, PMR, physical therapy, and other consultations (ophthalmology, cardiology, neurology, pulmonary, gastroenterology, psychology/psychiatry, and more) as applicable
- Imaging Studies as appropriate, for RA must include cervical x-rays in full extension/flexion to exclude cervical spine subluxation.
- Laboratory evaluation, as appropriate, including documenting stability of basic laboratory screening elements (CBC, BUN, Cr), to include indicators of disease control (ESR) and medication monitoring requirements.
- Neuropsychological testing as applicable or required

**TREATMENT:** Treatment with first line drugs such as salicylates/NSAIDs and second line drugs such as chloroquine may rarely be considered for waiver provided there are no side effects. Patients who have a good result from synovectomy and those requiring joint replacement may be considered on an individual basis. Gold therapy has been waived once the course of therapy has been completed. Prednisone, injectable monoclonal antibody therapies, and methylcholine are not usually waivable. These medications imply that the disease process is beyond what might be considered waivable for continuation of military duties and deployment—MEB is warranted prior to waiver consideration.

**FOLLOW-UP:** As per the underlying condition and involved specialists' recommendations. Annual reporting on FDME or FDHS needs to include review of overall health state, function, profiles, medications used, and ability to perform safely. Significant changes may require USAAMA review/consultation and AMS.

**DISCUSSION:** This APL is meant to provide the broad overview for the evaluation of a number of systemic conditions, most of which fall into the rheumatologic spectrum of care that are not addressed elsewhere in the APL guide. These conditions often involve multiple systems, which require multiple evaluations and input. Because of the nature, course, prognosis, unpredictability, and treatment options, a number of individuals will not be recommended for a waiver. Most will require a MEB/PEB at some

point. Those that receive a waiver will require ongoing evaluation and may subsequently require grounding if the underlying disease or condition deteriorates to the point of jeopardizing crew health, safety, mission, deployment, and retainability. Medication adjustments may be the reason for termination. A subsequent AMS will be required and most likely a MEB/PEB, if not previously done.

Rheumatoid arthritis occurs in 1% to 3% of white adults. The peak incidence is 35-55 for females and 40-60 for males. There is sudden onset with anorexia, weight loss, fever, fatigue, and malaise in 10-20% and insidious onset in the remainder. There is involvement of the cervical spine in 80% of cases, often asymptomatic, with about 25% having atlantoaxial joint subluxation and up to 86% having radiological evidence of instability of the cervical spine. Up to half will have no symptoms referable to their necks. Sudden onset of quadriplegia and death has been reported although both are rare. In addition to the dangers of flying at high Gz and of ejection, patients with rheumatoid arthritis must have their neck x-rayed at full flexion and extension to identify any instability before any general anesthetic. Rheumatoid nodules are present in 20% of cases, mainly on the elbow or extensor aspect of the forearm. There is pericardial effusion in 55% of patients with nodular disease (and 15% of those without). A nonspecific (usually aortic) valvulitis has been reported in up to 30% of cases at postmortem. Anemia is common although the most common cause is drug toxicity. Of all cases, 30% will progress to severe disability, 10% will have no disability and the remainder will usually progress on a spectrum between the two extremes on a course of remissions and exacerbations. Between 10-15% will progress relentlessly, but 10% of cases will have only one attack of the disease. Poor prognosis is related to insidious onset, early involvement of large joint, early extra-articular manifestations of the disease and persisting active disease without remission for more than 1 year. The measurement of conserved sequence in the third allelic hypervariable region of the major histocompatibility complex class II beta chain (DR4/Dw4, DR4/Dw14, DR1/Dw1), defective sulfoxidation capacity in combination with rheumatoid factor may be of assistance in determining which patients will develop bone erosion. In one study, 92% of patients with early symmetrical rheumatoid arthritis who had all 3 of these factors, developed erosive bone lesions within 4 years compared to 62% of those patients with 2 risk factors and 7% of those with only one risk factor.

# SPINAL FRACTURES

Update: AUG 2007

**AEROMEDICAL CONCERNS:** Spinal fractures that do not heal or result in significant vertebral height loss are more readily de-stabilized under physical stress such as ejections, hard-landings, or crashes to increase the risk of sudden spinal cord injury. This increased spinal vulnerability to trauma has been associated with severe injury to the spinal cord, nerve root and plexus complexes. Significant forces are often involved to obtain vertebral bony injury with neurologic and ligamentous sequelae as well that often need to be assessed and addressed.

## WAIVER/ETP/DQ/INFO ONLY:

**Class 1 Initial Applicants:** Exception to policy will be reviewed on a case-by-case basis for any spinal fracture(s) provided fully recovered, without injury or decrement/sequelae, and no duty limitations, following the guidance below.

**Classes 2/3/4 (to include ALL applicants):** Follow the guidance below:

**Spinous or transverse process fracture:** At any level, not involving the lamina, pedicle or body, once healed, asymptomatic, off medications, and returned to full duty is not disqualifying and is considered information only.

**Cervical:** 3-month grounding is required for patients with small anterior chip fracture or less than 25% compression. At 3 months, a patient that is asymptomatic (pain-free, has full ROM, no instability on lateral views, and has no radicular symptoms) may be returned for trial of duty. By 12 months, if still asymptomatic, waiver may be requested. On a case-by- case basis, cervical spine fractures with more than 25% compression, evidence of instability on lateral views, or radicular symptoms will rarely be considered for waiver.

**Thoracic:** Except for the 12th thoracic vertebra, thoracic vertebral compression fractures less than 25% once healed, 12- months old and asymptomatic is not disqualifying and Information Only. For all thoracic compression fractures, 3-month grounding is required for healing. For those with a single fracture with less than 50% compression or wedge, no scoliosis on AP views, pain-free, and no instability, may be returned for trial of duty. By 12 months, if still asymptomatic, waiver may be requested. Thoracic spine fractures with more than 50% compression, evidence of scoliosis, or involving more than one vertebra may be rarely considered for waiver on a case-by-case basis. All 12th thoracic vertebra fractures require waiver.

**Lumbar:** Except for the 1st lumbar vertebra, lumbar vertebral compression fractures less than 25% once healed, 12-months old and asymptomatic is not disqualifying and Information Only. For all lumbar compression fractures, 3-month grounding is required for healing. For those with a single fracture with less than 50% compression or wedge, no scoliosis on AP views, pain-free, no spondylolysis/spondylolisthesis, no radicular pain, and no instability, may be returned for trial of duty. By 12 months, if still asymptomatic, waiver may be requested. Lumbar spine fractures with more than 50% compression, instability on x-ray, radicular symptoms/deficits, or associated HNP, a waiver can be considered only on a case-by-case basis.

ICD9 Code	Condition
805.00	Fracture of Cervical spine, closed, without spinal injury
805.2	Fracture of Thoracic spine, closed
805.4	Fracture of Lumbar spine, closed

**INFORMATION REQUIRED:**

- Orthopedic or neurosurgical consultation
- Imaging studies
- MRI scan of regional neuroanatomical structures may be required.

**TREATMENT:** Stable fractures without neurologic injury respond well to conservative management. Those spinal fractures requiring surgical decompression and/or stabilization imply in flight crew personnel a significant risk of either permanent disabilities incompatible with return to aviation duties or unacceptably increased risk in aviation environments.

**FOLLOW-UP:** Follow-up is directed per specialist recommendations. At a minimum, annually requires a comment on the FDME or FDHS regarding symptoms, profiling, performance, medication use, and any aeromedical concerns.

**DISCUSSION:** In C-spine injuries, the key question in returning to flight status is stability of the spine. Often, bony injuries heal with no residual instability. Ligamentous injuries, in contrast, may heal with various degrees of instability. Early on, instability may be detectable by obtaining lateral views in flexion and extension of the C-spine. Chronic instability results in degenerative changes such as disc space narrowing and asymmetry. Osteophytic changes and foraminal narrowing may be seen in the oblique views. The common wedge or chip fracture often seen at the C4-6 level, with no instability noted, has an excellent prognosis.

Lumbar compression/wedge fractures generally heal with no instability. Those less than 50% have a similar excellent prognosis and are rarely associated with any resultant instability. Purely ligamentous injuries of the L spine are uncommon. However, there is potential for degenerative disc disease, which could lead to herniation. Although not specifically relevant to Army aviation, spinal compression fractures are a common ejection injury (20 - 30% of ejections) with most fractures occurring between T9 and L1. For this reason, all survivors of ejections should undergo complete spine x-rays. Finding a compression fracture on x-ray often raises the question of age of the fracture. Widening of the paraspinous line on x-ray and symptoms appropriate to the location of the identified fracture are indicative of an acute injury. A radioisotope bone scan may remain "hot" for up to two years post-compression fracture. Once healed, the damaged area does not appear to be unduly susceptible to repeat fracture.

## SPONDYLOLISTHESIS

Update: AUG 2007

**AEROMEDICAL CONCERNS:** Spondylolisthesis is unlikely to cause incapacitation in flight but, if symptomatic, will cause considerable distraction. Theoretically, spondylolisthesis could cause severe problems on ejection.

**WAIVER:** Asymptomatic Grade I spondylolisthesis without spina bifida is considered qualified. Asymptomatic cases or patients who have had successful surgery may be considered for waiver on a case-by-case basis. Higher grades of spondylolisthesis or symptomatic Grade I are considered disqualified, exceptions to policy or waivers rarely considered.

**WAIVERS/ETP/DQ/INFO ONLY: All Classes, Rated and Non-Rated, to include ALL Applicants-**

**INFORMATION ONLY:** Asymptomatic Grade I spondylolisthesis without spina bifida is considered qualified.

**WAIVER/ETP:** Asymptomatic cases of spinal bifida with Grade I spondylolisthesis and successfully repaired, asymptomatic cases may be considered for waiver/ETP on a case-by-case basis.

**DQ/WAIVER or ETP RARE:** Symptomatic cases (recurrent low back pain episodes, chronic low back pain) or Grade II (or higher) spondylolisthesis cases are disqualified with exception to policy or waiver rarely considered.

### INFORMATION REQUIRED:

- Neurosurgical, orthopedic, PMR, or rheumatology consultation
- Imaging Studies, to include demonstration of spinal stability
- Additional evaluation, as required, to evaluate any comorbid conditions and to demonstrate adequate spinal function.

**TREATMENT:** Education in proper body mechanics and use of the back. A program of daily back exercises. Spinal fusion may be appropriate in certain cases.

**DISCUSSION:** Aircrew with frequent symptoms should not continue to fly. Further slipping of the vertebra (usually L5) can occur with exposure to excessive gravitational forces, ejection or even during normal activities on the ground. Further exposure to vibration, vertical and lateral forces, awkward postures and prolonged sitting can both aggravate symptoms and accelerate the development of chronic degenerative disease. Risk of vertebral displacement slipping of the vertebra (usually L5) is increased with exposure to excessive gravitational forces, ejection or even during certain normal ground activities.

## SPONDYLOLYSIS

Update: AUG 2007

**AEROMEDICAL CONCERNS:** This condition usually is a cause of low back pain but may also cause radiculopathy secondary to accumulation of fibrocartilage at the site of defect in pars interarticularis. Distracting pain and nerve root impairment are incompatible with safe flight operations.

**WAIVERS/ETP/DQ: All Classes, Rated and Non-Rated, to include ALL Applicants--**

**WAIVER:** Asymptomatic cases in designated aircrew may be considered for waiver on a case-by-case basis.

**DQ/WAIVER or ETP RARE:** Class 1 applicants will be reviewed on a case-by-case basis, but rarely will this condition receive an exception to policy. For symptomatic cases (recurrent low back pain episodes, chronic low back pain) waiver will be rarely considered.

**INFORMATION REQUIRED:**

- Neurosurgical, orthopedic, PMR, or rheumatology consultation
- Imaging Studies, to include demonstration of spinal stability
- Additional evaluation, as required, to evaluate any comorbid conditions and to demonstrate adequate spinal function.

**TREATMENT:** Conservative treatment may achieve temporary relief of symptoms; however, upon resumption of vigorous physical activities, symptoms usually return. Eventually fusion and nerve root decompression may be required.

**DISCUSSION:** The defect in the pars interarticularis (neck of the "Scotty dog") may be acquired from acute trauma, or more commonly, may result from chronic stress (stress fracture). Rarely is it of congenital origin. These occur primarily at L5-S1 and somewhat less at L4-L5. There is an inherited proclivity for the condition (dominant transmission) with an incidence that increases with age up to the end of the fourth decade. It exists in about 5% of the general population but is much higher in certain races (Japanese, Eskimo) where it may be as high as 45%. Instability of the posterior spinal elements is associated with the development of spondylolisthesis which is frequently progressive. This condition is likely to be accelerated by the physiological stresses of military flight activities.

## UNSPECIFIED ORTHO PERMANENT PROFILES and PULHES

Update: OCT 2007

**AEROMEDICAL CONCERNS:** Physical profiling, covered in chapter 7 of AR 40-501, is a useful medical tool to allow continuation of service while limiting certain activities to prevent further injury or disability. Chapter 3 outlines those conditions warranting evaluation with MEB and PEB. A number of the APLs covered in this guide address common underlying conditions that warrant a permanent profile, but the guide does not address all of them. This APL provides aeromedical guidance for review of ANY condition requiring a permanent profile, even if just a Permanent 2 profile, to insure appropriate reporting of the profile and review of underlying condition for its potential impact on aeromedical safety. Permanent profiling in itself is not a disqualifying condition; however, the underlying condition may be if it is to the level of warranting such a restriction in activity. The clinic or hospital manages permanent profiles, sometimes omitting review for continuation of aviation duties. Annotate PULHES on every FDME, FDHS, and AMS.

### **INFO ONLY/WAIVERS/ETP/DQ: All Classes, Rated and Non-Rated, to INCLUDE ALL Applicants:**

**GENERAL GUIDANCE:** Unless an underlying disqualifying condition exists, annotate permanent profiles in the "Remarks" section of the FDME or FDHS, with clear delineation of reason why. This should be coded as "Information Only." When the permanent profile is for a previously waived or INFO ONLY disqualifying condition, so state in the Remarks section. If the permanent profile is for an "unreported condition" after review of the HISTORY SUMMARY in AERO, submit enough detail and information to document aeromedical safety review to warrant INFO ONLY status or prepare an AMS requesting waiver for the underlying condition.

**PERMANENT 2 PROFILES:** A permanent 2 (P2) profile may or may not be for a disqualifying condition. Most P2 conditions that are for disqualifying conditions will receive a waiver or exception to policy, provided it does not impact flight performance, duties, or emergency egress. Often P2 profiles restrict a single AFPT event to reduce the risk of injury (sit-ups with back pain, APFT run for shin splints). Combinations of P2 conditions resulting in restriction of all anaerobic PT events (push-ups and sit-ups) or not allowing run at own pace and distance should raise concern for improper profiling (this should be a permanent 3 or 4) and aeromedical issues affecting performance.

**PERMANENT 3 PROFILES:** Most permanent 3 (P3) profiles are associated with disqualifying conditions, and often these warrant a MMRB or MEB—refer to Chapter 3 of AR 40-501. Waivers are routinely granted for H3 hearing and on a case-by-case basis for all other P3 conditions. Exception to policy is less common, but reviewed on a case-by-case basis.

**PERMANENT 4 PROFILES:** All permanent 4 (P4) profile conditions reflect disqualifying conditions warranting MMRB/MEB, most of which after careful case-by-case review are not favorably considered for waiver or exception.

**OTHER CONCERNING PROFILES:** Any permanent profile shall raise concern if it limits the wear of the protective mask and all chemical defense equipment, Kevlar wear, duty, deployment, or more. Senior officers and NCOs have seen all kinds of profiles. The wording and condition may be suspect or truly valid, but it is the underlying condition and its potential impact on aviation duties that requires aeromedical attention and review.

### **INFORMATION REQUIRED:**

- Sufficient information regarding the profile and underlying condition. Contact USAAMA if questions or concerns.

- If underlying condition is disqualifying, follow the APL guidance for submission
- Effect of profile on ability to perform aviation duties, and if required, command input

**TREATMENT/FOLLOW-UP:** Per the underlying condition and applicable APL(s).

**DISCUSSION:** Permanent profiles infrequently exist without aeromedical knowledge or review in terms of flight safety and performance of duty. They may affect readiness and deployability. AERO works with MEDPROS and will soon be interfacing with HRC in terms of readiness and personnel. Without knowledge and monitoring those with permanent profiles, concerns for the aeromedical community include: prevention of future progression of the underlying condition, effect of the limitation on the normal aviation duty, effect limitations on function in unanticipated high-demand situations as in deployments or accidents, and effect of continued aviation duty on the condition's progression or on its level of symptoms.



## OTORHINOLARYNGOLOGY WAIVERS

## ACOUSTIC NEUROMA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Progressive hearing loss, tinnitus, trigeminal hypesthesia, imbalance, and occasionally true vertigo have all been attributed to acoustic neuromas. However, the onset is not normally acute. Following surgery, total hearing loss, labyrinthine dysfunction, and facial nerve weakness or paralysis can be present on the side of surgery.

**WAIVER:** A request for waiver may be submitted 6 months after successful removal of the tumor provided the sequelae are within acceptable limits. Specifically, the tumor must have been 2.5 cm diameter or less; unilateral, postoperative vertigo must have completely resolved; and any damage to cranial nerves should allow full eye movement without strabismus or tracing deficit and acceptable mask sealing. Psychomotor performance should be within normal limits for aircrew members.

### INFORMATION REQUIRED:

- A complete AMS with
- ENT,
- Audiology (to include speech discrimination in each ear),
- Neurology and
- Neurosurgery evaluations are required.
- Surgical and pathology reports are also required..

**FOLLOW-UP:** Annual ENT evaluation is required.

**TREATMENT:** Surgical excision is compatible with waiver in selected cases.

**DISCUSSION:** Acoustic neuromas have a peak incidence between 40 and 50 years. The majority are schwannomas arising from the superior vestibular division of the eighth nerve, usually extending from the internal auditory canal into the cerebellopontine angle as they enlarge. In patients with neurofibromatosis, neuromas can occasionally be bilateral. Acoustic neuromas are virtually always benign. Operative morbidity is related to the size of the tumor, and hearing is often affected. Up to 50% of patients will have no useful hearing in the involved ear after surgery. Other cranial nerves also may be damaged during surgery (i.e., trigeminal and facial). Facial paralysis may make wearing of an oxygen mask difficult, may result in speech problems, and can cause eye symptoms due to inability to close the eyelids.

# ALLERGIC / NONALLERGIC RHINITIS

Update: SEP 2005

**AEROMEDICAL CONCERNS:** Allergic rhinitis is a common upper respiratory condition with a potential for causing significant medical incapacitation in flight personnel. Rhinitis is not usually disabling but is a distraction possibly causing significant periods of down time and, thus, reduced operational effectiveness. The reduced sense of smell could be hazardous in the cockpit. Congestion and swelling of the nasal passages could interfere with the movement of air and result in airway compromise, discomfort, the use of medications with unacceptable side effects (i.e., drowsiness), ear and sinus barotrauma with potential for in-flight incapacitation.

## WAIVER:

### Initial Class 1A/1W Applicants:

Mild seasonal or perennial allergic rhinitis, treated successfully with short acting decongestants, non-sedating antihistamines, leukotriene modifiers, and/or intranasal steroids without side effects or adverse reactions will be recorded as information only. Exception to policy must be requested for initial flight applicants who have required systemic steroids, immunotherapy within a 5-year period to application, or have a history of sinus surgery to include polyp removal.

### Initial Classes 2, 3 & 4 Applicants:

Mild seasonal or perennial allergic rhinitis treated successfully with short acting decongestants, non-sedating antihistamines, leukotriene modifiers, and/or intranasal steroids will be recorded as information only. Exception to policy/waiver must be requested for initial flight applicants who had required systemic steroids, immunotherapy within the past 5 years, or had a history of sinus surgery to include polyp removal.

### Rated Aviation Personnel (All Classes):

Mild seasonal or perennial allergic rhinitis treated successfully with short acting decongestants, non-sedating antihistamines, leukotriene modifiers, and/or intranasal steroids will be recorded as information only. A waiver will be required if the condition is controlled by immunotherapy, required systemic steroids, or specialty care, as long as there are no significant adverse effects. (See Medications APL)

### INFORMATION REQUIRED:

All requests for exception to policy or waiver should include:

- Brief AMS – to include major symptoms, duration and frequency of symptoms, medications or treatments used in the past, environmental triggers (e.g. animals, pollens, cold, altitude changes, etc.), and any smoking history
- Allergy skin testing if indicated or done in conjunction with work-up for education or immunotherapy.
- ENT and allergy evaluations in cases of prolonged or moderate-to-severe symptoms should be included, if consultation was requested or surgery was recommended.

**FOLLOW-UP:** None required unless symptoms worsen with significant impact on aircrew readiness.

### TREATMENT:

- **Antihistamines** — Fexofenadine (Allegra), and Loratadine (Claritin), (all other antihistamines are Class 4-non- waivable, including Cetirizine (Zyrtec)). This is the recommended first line treatment for mild disease.
- **Leukotriene Modifiers**—Montelukast (Singulair)
- **Intranasal Steroids** — Dexamethasone (Dexacort), Flunisolide (Nasarel or Nasalide), Beclomethasone (Beconase, Beconase AQ, Vancenase, Vancenase AQ DS), Budesonide (Rhinocort), and Triamcinolone (Nasacort or Nasacort AQ), Fluticasone (Flonase), and

Mometasone (Nasonex). This is the recommended first line treatment for moderate disease. (See Medications APL)

- **Short Acting Decongestants** – use as needed.
- **Intranasal Cromolyn Sodium (Nasalcrom)** —This is effective, but requires frequent (qid) dosing.
- **Intranasal Anticholinergics** — Ipatropium bromide (Atrovent) 0.03% nasal spray is effective when rhinorrhea is the predominant symptom. It is not very helpful for relieving congestion, itchy watery eyes or sneezing.
- **Immunotherapy** — may be used while the aviator remains on flight status provided he (or she) remains relatively asymptomatic without the use of antihistamines. Occasional sudafed or use of an intranasal steroid is permitted. Aviation personnel should be grounded 12 hours following immunotherapy injection or for the duration of local or systemic reaction. (AR 40-8, Temporary Flying Restrictions due to Exogenous Factors, paragraph 4 b, August 1976) The accelerated method of reaching maintenance immunotherapy (Rush technique) can be used and should be considered to minimize grounding time.
- **Allergy Testing** – Consider allergy testing if no response to therapeutic course of antihistamines/intranasal steroids after 30-90 days of treatment or for patient education for control of trigger exposure.

**DISCUSSION:** Rhinitis is an inflammation of the nasal passages which can be subdivided into two major categories: Allergic and Nonallergic. Allergic rhinitis can be either seasonal or year round and can be characterized by any or all of the following symptoms: rhinorrhea, nasal congestion, sneezing, nasal or ocular pruritis and lacrimation. Seasonal allergic rhinitis is caused by an IgE mediated reaction to seasonal aeroallergens, typically tree, grass and /or weed pollens as well as molds. Perennial allergic rhinitis is a year round condition also due to an IgE mediated reaction to aeroallergens which primarily include dust mites, animal allergens and molds. Intranasal steroids and cromolyn have minimal side effects and are approved for use in aviation personnel. Nonallergic rhinitis may consist of nasal congestion, sneezing, and rhinorrhea. The congestion is often seen as alternating, with sometimes severe nasal obstruction. Inciting factors include temperature and humidity changes, odors, irritants, recumbency, and emotion. Treatment of nonallergic rhinitis with inhaled nasal steroids can be effective; and if symptoms are not disabling, no waiver is required. Daily antihistamine use is not recommended for treatment of nonallergic rhinitis.

The diagnosis rests primarily on history (time of day, seasonal variation of symptoms, frequency and duration of episodes, environmental factors such as home or work exposures, whether symptoms improve with altitude or humidity and if there are any triggers such as MSG, pollen, smoke, cold weather, physical exertion). Further evaluation is indicated if symptoms are severe and do not respond to medical therapy. Sinus CT scans or rhinoscopy would be part of a more in-depth evaluation. Allergy skin prick testing is the most sensitive test for identifying specific allergies. It is simple and inexpensive. RAST testing is a good screening test to help with identifying suspected triggers. Total IgE or eosinophil counts are not good screening tests and therefore are not recommended.

Well controlled, medical managed rhinitis, without aeromedical side effects or complications, requires no AMS and will be noted on the FDME/FDHS as *Information Only*.

## REFERENCES:

Dykewicz, MS, Fineman, S, et al. Diagnosis and Management of Rhinitis: Parameter Documents of the Joint Task Force on Practice Parameters in Allergy, Asthma, and Immunology. Annals of Allergy, Asthma, Immunology 1998; 81: 463-518. Allergic or Nonallergic Rhinitis? Taking the Questions Out of Diagnosis and Treatment. Video CME program. Leawood, Kan.: American Academy of Family Physicians, May 2003.

## CHOLESTEATOMA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Hearing loss and risk of recurrence, with the possibility of labyrinthine involvement, and even intracranial extension, in the more advanced cases.

**WAIVERS:** A history of cholesteatoma is disqualifying. It must be surgically removed before a waiver can be considered. Since the recurrence rate is approximately 35%, initial waivers are for one year only, with a mandatory ENT consultation before the waiver can be continued. Persistence of cholesteatoma after surgery would be cause for waiver denial.

### INFORMATION REQUIRED:

- A current ENT and
- Audiology evaluation are necessary, even if the surgery was in the distant past.
- At the time of initial submission, the operative report should be included; since cholesteatomas can vary hugely in extent and effect, the report will be of great help in deciding waiverability.
- Since cholesteatoma surgery usually involves the mastoid, there is risk to hearing, balance, and facial nerve function.
- Any impairment in these areas should be addressed in the waiver request.
- Post-op hearing that is below standards will also require a waiver. (See Hearing Loss APL).

**FOLLOW-UP:** An ENT evaluation is required annually. An audiology evaluation may be required if hearing is below standards.

**TREATMENT:** Surgical removal.

**DISCUSSION:** Given the relatively high recurrence rate, it is important that every attempt is made to assure that there is no residual disease. Recurrent or continuous drainage following surgery may indicate the presence of cholesteatoma residue, and is not waivable. Occasionally, the surgeon will plan (or advise) a re-exploration of the ear at a specific time in the future, usually 12-18 months. Every attempt should be made to have this done as the chance of residual disease is significant.

# DISORDERS OF THE SALIVARY GLANDS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Pain or discomfort often result from retained salivary stones, especially after eating or drinking. Tumors may interfere with oxygen mask fit.

**WAIVER:** Following successful treatment of salivary stones or tumors, a waiver may be granted provided there is no facial deformity or nerve damage that would interfere with flight duties.

ICD9 Code	Condition
5270	Atrophy
5271	Hypertrophy
5272	Sialoadenitis

## INFORMATION REQUIRED:

- A complete AMS is required along with
- Copies of all pertinent consultations, plus
- CT/MRI reports (and films, if available);
- If surgery has been done, copies of the operative and pathology reports
- If malignant, an oncology evaluation as well.

**TREATMENT:** Stone or gland excision (partial or total) is compatible with waiver, as are most cases of benign tumor removal; extensive surgery for malignancy may not be waivable, so each case of malignancy will be considered in detail by USAAMA before a recommendation can be made.

**DISCUSSION:** Mixed tumors (pleomorphic adenomas) comprise 65% of all salivary gland tumors; only a small number of these (5-6%) are malignant. The great majority of salivary tumors (85%) occur in the parotid gland, and 60% of these are the benign mixed type. Another benign tumor, the Warthin's tumor, accounts for 7% of parotid neoplasms, while malignant tumors (in descending order of frequency: mucoepidermoid carcinoma, malignant mixed tumor, acinous cell, adenoid cystic, and squamous cell carcinomas) and other rare lesions account for the remaining 33%. Benign mixed tumors have a recurrence rate of approximately 2%, usually due to incomplete removal or seeding at the time of removal. Malignant tumors have a much higher rate of recurrence. With adenoid cystic carcinoma, 40% have metastasized by the time of diagnosis; 5- year survival is 45-82%, depending on the study, falling to as low as 13% at 20 years. The corresponding figure for adenocarcinoma is 49-75% at 5 years, with a drop to 41-60% at 10 years. The 20-year survival figures are not readily available.

# HEARING LOSS

Update: OCT 2005

**AEROMEDICAL CONCERNS:** Adequate hearing is essential for communication in flight and also for rapid and accurate assessment of warning tones in the cockpit.

**WAIVERS:** Unrestricted waiver can be considered depending on amount of hearing loss and functional capability, provided a complete Audiological evaluation indicates no underlying pathology, and binaural speech recognition score is 84% or higher. Aircrew members with a recognition score of less than 84% may receive a waiver, but are generally handled on a case-by-case basis. Patients who are H4 profile will inevitably be disqualified.

## HEARING STANDARDS

### Acceptable audiometric hearing levels for Army aircrew members and ATC

Class	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz *
1/1A	25	25	25	35	45	45
2/3/4	25	25	25	35	55	65

\* Isolated hearing loss at 6000 Hz will not require full audiology work-up unless recommended by the local FS or audiologist (i.e., new onset, etc.) and is not considered disqualifying; however, 6000 Hz hearing measurements will be reported for AEDR data base and/or research and academic interest.

### INFORMATION REQUIRED:

- Complete initial audiological evaluation is required to include pure-tone air conduction testing (and bone conduction if deemed necessary by audiologist or FS), immittance audiometry to include:
  - Tympanometry
  - Acoustic reflex threshold testing
  - Speech reception threshold testing
  - Speech recognition (discrimination) testing in quiet under earphones. Speech recognition testing will be conducted both monaurally and binaurally utilizing the North Western University (NU6) word list material. Monaural testing will be conducted at a sensation level (SL) of 40 decibels (dB). Binaural recognition testing will be conducted at the patient's most comfortable listening level (MCL).

### ADDITIONAL INFORMATION, IF APPLICABLE:

- Significant hearing loss may require ENT evaluation and/or an in-flight evaluation. An in-flight evaluation may be obtained through the US Aeromedical Consultation Service or may be conducted locally. The in-flight evaluation consists of doing a speech audiometry (using common aviation terms) while exposed to in-flight conditions of noise and normal flight conditions in the individual's primary aircraft (if this is a solo- aircraft, a dual-aircraft with similar noise level should be chosen). An individual with normal hearing should also be tested at the same time to verify the accuracy of testing and all microphones and headsets should be tested prior to testing.  
Note: A list of common aviation terms is available upon consultation with USAAMA.

**FOLLOW-UP:** An annual manual or microprocessor pure-tone evaluation at 500 Hz, 1000 Hz, 2000 Hz, 3000 Hz, 4000 Hz, and 6000 Hz in each ear is required. Automatic Bekesy type tracings are not acceptable. A shift of 20 db or greater in EITHER ear (from the baseline established with the current waiver) at 1000 Hz, 2000 Hz, 3000 Hz, and 4000 Hz will require a submitting a complete audiometric assessment to USAAMA, including air conduction, speech audiometry, and tympanometry.

**NOTE:** The current DOD Hearing Conservation Program (DA PAM 40-501) requires a follow-up hearing test or medical work-up for a shift of 15dB from baseline in either ear, or a 10 db average shift in both ears at the frequencies noted above. While local FS's should continue adhere to this DOD policy, submission of the complete aeromedical audiometric assessment is only required for a 20db shift in either ear or inability to hear adequately in the aircraft environment.

**TREATMENT:** Patients with conductive hearing loss may be helped by the use of hearing aids for ground duties in nonhazardous noise. The use of a hearing aid in flight is not recommended or authorized since the headsets have volume controls.

**DISCUSSION:** Patients with conductive hearing losses often hear better in a noisy background, such as in the air; whereas those with sensorineural hearing loss, tend to perform less accurately in the noisy flight environment. The factors to be taken into account in deciding an aeromedical disposition are the degree and type of loss, the need to hear accurately on the ground and in the air, the possible effects of fatigue, and the rate and degree of hearing loss progression.

**REFERENCES:**

DA PAM 40-501, 10 DEC 98

## MENIERE'S DISEASE / VERTIGO

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Incapacitating vertigo may occur suddenly in flight, a potentially catastrophic occurrence. Attacks may be precipitated by stress and fatigue. A fluctuating hearing loss usually accompanies the labyrinthine symptoms, and may progress over a period of time to a significant and permanent impairment.

**WAIVER:** Due to the unpredictable and sudden nature of the vertigo episodes in many patients, and the tendency for the condition to become bilateral, waivers are very rarely granted for a diagnosis of Meniere's Disease. Other causes of vertigo may be waivable, hence the importance of gathering as much diagnostic information as possible.

### INFORMATION REQUIRED:

- ENT consultation
- Audiology evaluation to confirm diagnosis and to rule out other pathology. Not all vertigo is Meniere's and causes which are self-limiting and non-recurrent may well be waivable once symptoms have abated.
- A neurology consultation can be of great help in making or ruling out specific diagnoses.

**TREATMENT:** Treatment with low sodium diet, HCTZ, stress management, and vestibular sedatives such as diazepam may diminish symptoms but the underlying condition persists, and is very unlikely to be waivable. Surgery (labyrinthectomy, endolymphatic sac drainage or decompression, or vestibular nerve section) is of variable effectiveness. Surgery may diminish or even abolish some of the more severe symptoms, but generally the patient is left with some vestibular dysfunction, so waiver remains highly unlikely.

**DISCUSSION:** The cause of symptoms in Meniere's Disease is an increase in pressure of the endolymph within the labyrinth. The reason for this increase is not known, although theories abound. The average age of onset is in the forties, with a range between 20 and 60, which includes virtually all military aviation personnel. The disease is progressive in approximately 10% of patients, with a relentless worsening of the vertigo episodes and hearing loss. Medical treatment is usually of no help, and surgery is often the only option. The other 90% can expect some symptomatic relief from medical therapy and, on occasion may show spontaneous long-term remission, although the underlying pathology is not actually altered by medical therapy. One should therefore be reluctant to say that a case of Meniere's is cured or "burned out", even in the face of a prolonged symptom-free interval. Other vertigo-producing labyrinthine disorders, such as vestibular neuronitis and Benign Paroxysmal Positional Vertigo (BPPV) are not nearly as likely as Meniere's Disease to be recurrent, and recovery is usually complete, so a waiver for these conditions is far more likely. A precise diagnosis is not always possible in cases of vertigo, but if a waiver is sought, the more specific a diagnosis one has, the easier it is to determine waiverability.

## NASAL POLYPS

Update:MAR 1997

**AEROMEDICAL CONCERNS:** Sinus barotrauma with potential for in-flight incapacitation and prolonged periods of grounding.

**WAIVER:** Initial flight applicants with nasal polyps are not granted exception to policy. An aircrew member may be considered for waiver. Waivers are considered if the condition is controlled with intranasal steroids or cromolyn (long term usage of nasal steroids is expected and accepted).

### INFORMATION REQUIRED:

- Complete AMS is required.
- Nasal polyps (either past history of, or current diagnosis of) require sinus x-rays, ENT evaluation, and all surgical reports.
- If polyps are actually present, a sinus CT is usually necessary to diagnose accompanying sinus disease.

**TREATMENT:** Resection of nasal polyps is advisable in most cases; this is a must if a waiver is to be considered, with one exception: If polyps are very small and in no way blocking the middle meatus according to the ENT consultant, then a waiver may be recommended even without surgery.

**DISCUSSION:** Nasal polyps have poorly understood etiology and tend to be recurrent and many involve concurrent allergy. Sinus polyps alone are not disqualifying, but the underlying diseases which lead to their formation are invariably disqualifying. Sinus mucus retention cysts are often mistakenly called "polyps", and these cysts are not disqualifying unless they are close to the sinus ostium. X-rays revealing a very large cyst should be sent to the designated USAAMA ENT consultant for a decision as to the need for drainage or removal.

## OTOSCLEROSIS / STAPEDECTOMY

Update: SEP 2005

**AEROMEDICAL CONCERNS:** The inability to clearly hear cockpit radio transmissions and warning tones can have a significant impact on flight safety.

**WAIVER:** Waivers will be considered depending on the degree of hearing loss and functional capability. Waivers following surgical treatment of conductive hearing loss may or may not be granted, depending on the final hearing result and the nature of the surgery. However, a stapedectomy done to treat otosclerosis is disqualifying and must be waivered. Aircrew with severe conductive loss attributed solely to otosclerosis, and who elect to have surgery, should have a permanent tissue seal covering the inner ear fenestra inserted before prosthesis placement to prevent perilymph fistula. Full evaluation is required following surgery for otosclerosis and also following spontaneous perilymph fistula, whether surgically repaired or not. Aviators are grounded for six months following stapedectomy, then a waiver to dual-pilot status may be considered. Dual-pilot status is recommended for 2.5 years before waiving to unrestricted full flying duties. Bilateral stapedectomy is not waivable. Initial flight applicants with a history of stapedectomy are considered disqualified, no exception to policy granted.

### INFORMATION REQUIRED:

- ENT consultation
- And audiology evaluations, to include
- Speech reception thresholds and
- Speech discrimination scores.
- Stapedectomy requires surgical report.
- Wearers of hearing aids will require an in-flight hearing evaluation without the aid to demonstrate the ability of the subject to communicate adequately (testing in a multiplace aircraft will suffice for testing of aviators normally assigned to single seat aircraft, provided ambient noise levels are similar).

**TREATMENT:** Conductive hearing loss may well be improved with amplification (hearing aid) if surgical treatment is not a reasonable alternative; benefits from amplification for neurosensory losses are variable, but often beneficial; the use of hearing aids in flight, however, is not advocated due to possible interference with wearing of the helmet, and the apparent lack of benefit in the noisy cockpit environment. Aircrew with hearing loss will often do well in the cockpit with proper helmet fitting and careful adjustment of radio volumes. Hence, the in-flight hearing test is performed without the hearing aid. As a general rule, the use of hearing aid in-flight is not recommended; the headsets have volume controls.

**DISCUSSION:** Persons with conductive hearing loss usually hear relatively well in noisy backgrounds, while those with sensorineural loss are more often handicapped when there is significant background noise such as in the cockpit. Therefore, aeromedical decisions should be based on evaluation of hearing on the ground and in the cockpit, especially if the loss is severe enough to warrant use of a hearing aid or aids on the ground. Unilateral hearing losses present few operational problems, but new or progressive unilateral losses can have significant medical implications, and an ENT consultation is necessary to rule out such conditions as acoustic neuroma or atypical Meniere's. Stapedectomies present problems because the operation creates an opening into the labyrinth, and involves the placement of a prosthesis in most cases. There is a risk of postoperative perilymph fistula, as well as subsequent shifting of the prosthesis, both of which can result in sudden attacks of vertigo. The post-op waiting period allows for healing which reduces the chances that barotrauma (or an over enthusiastic Valsalva maneuver) will cause a perilymph leak.

## OVAL /ROUND WINDOW FISTULA

Update: MAR 1997

**AEROMEDICAL CONCERNS:** A perilymph fistula can result in either the sudden onset of sensorineural hearing loss, or a rapidly progressive loss, with or without episodic vertigo. It may mimic Meniere's Disease.

**WAIVER:** A history of fistula is disqualifying with no exception to policy for initial flight applicants. All aviation personnel with a unilateral healed fistula will require a period of six months grounding for observation. Bilateral healed fistula, while rare (with no record on file at USAAMA), will require evaluation by the designated Army Aeromedical ENT Consultant.

### INFORMATION REQUIRED:

- A complete AMS is required along with
- copies of all records involving the initial clinical presentation, as well as all
- ENT consults, notes, tests, operation reports, etc.
- Audiologic and vestibular test results are of particular interest.

**TREATMENT:** Initial treatment is conservative with avoidance of lifting and straining, or exposure to significant barometric pressure changes, especially ones that might require a Valsalva maneuver. If hearing and vestibular symptoms don't improve, and certainly if they worsen, exploratory tympanotomy is indicated. If a fistula is present, it can be surgically sealed.

**DISCUSSION:** While fistulae may occur spontaneously, most are associated with head injury or barotrauma, especially in the active duty population. They may also occur as a result of Q-tip misadventure, or improper cerumen irrigation technique. As surgery does not always seal the fistula, and recurrence is possible, various waiting periods are prescribed for different classes of personnel. The longest period is for Army aviators, as there is a considerable safety issue should acute vertigo occur during flight.



## PSYCHIATRIC WAIVERS

## **INTRODUCTION**

Update: JUN 2005

### **MENTAL HEALTH EVALUATIONS**

Mental health evaluations of aircrew are conducted by licensed mental health practitioners in consultation with the flight surgeon. Command-directed mental health evaluations are conducted in accordance with MEDCOM Reg 40-38, DOD Instruction 6490-4 and DOD Directive 6490.1

A mental health evaluation should reflect a detailed history of illness from initiation until the present time. It should cover precipitating events, signs, symptoms, and pertinent family, social occupational and medical history. Any other information such as legal history or educational background that may have bearing on the case should be included. Substance and alcohol use history is required in all cases. Physical exam results and any other pertinent studies should also be included in the evaluation.

At initial presentation of the illness, the patient undergoes a mental status examination that should be summarized in the evaluation along with the current status of the patient. The evaluation should also include the results of psychological testing as indicated by the parameters of the case, for example, neuropsychological testing for cognitive deficits.

The mental health evaluation should also include a diagnostic impression based on criteria from the current version of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, (DSM-IV) and Axes I-IV of the Multiaxial Evaluation System. Recommendations for clinical follow-up/therapy should also be reported. Issues of risk to aviation safety, prognosis, and limitations to deployability must also be addressed.

### **CONFIDENTIALITY OF MENTAL HEALTH INFORMATION**

Although command and medical personnel may need information about an aircrew member's mental health status in order to make decisions about aeromedical disposition, special care is taken to maintain the confidentiality of mental health information to the fullest extent possible and to limit the disclosure of such information to the minimum amount necessary and only to persons with an official need to know.

### **AEROMEDICAL POLICY LETTERS**

The following policies outline each chapter of the DSM-IV, which should be used as a reference for diagnostic criteria and coding. The policies provide practice guidelines and requirements for clinical follow-up as indicated. With sufficient information, the Aeromedical Consultants Advisory Panel (ACAP) can make decisions that preserve resources, maximize safety, and expedite case disposition.

## AEROMEDICAL ADAPTABILITY (AA)

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Unsatisfactory AA is not a diagnosis, but is a determination by the FS and aviation commander of suitability or adaptability. Unsatisfactory AA (formerly ARMA) may be a manifestation of underlying psychiatric disease, personality trait(s) or other behavioral factors not considered compatible with aviation duties (see AR 40-501 for more information). Assessment of unsatisfactory AA is made in consultation with an aeromedically trained psychiatrist or psychologist.

**WAIVERS:** Trained aircrew with an unsatisfactory AA will be referred to the aviation unit commander or civilian employee supervisor for administrative evaluation for nonmedical disqualifications and determination of fitness to retain an aeronautical rating and military status (see AR 600-105). Initial flight applicants with an unsatisfactory AA will not be granted an exception to policy. Reversal of this disqualification at a later date is very difficult. However, if the crew member demonstrates substantial behavior change over a period of 2-3 years and a level of insight that would support sustained adaptive functioning in the aviation environment, accompanied by strong recommendations from local command and the local flight surgeon, s/he may be considered for reversal of an unsatisfactory AA.

**INFORMATION REQUIRED:** Requests for waiver will include a

- Complete AMS to include the following:
  - Results of an evaluation conducted by an aeromedically trained psychiatrist or psychologist.
  - Psychological testing is required and results will be reported in the AMS.
  - Positive recommendation from the aviation unit commander or civilian supervisor is required.
  - All legal issues such as sexual or racial discrimination or harassment must receive appropriate administrative action including UCMJ and/or IG determination before a final medical recommendation can be made.

**FOLLOW-UP:** N/A

**TREATMENT:** If an underlying psychiatric disorder exists, treatment would correspond to the particular diagnosis. Treatment does not apply if the underlying reason for the unsatisfactory AA is other than psychiatric.

**DISCUSSION:** An unsatisfactory AA is not a DSM IV diagnosis. It is a consensus of opinion endorsed by the Commander, USAAMC, after thorough investigation involving the unit flight surgeon, aeromedical psychiatrist/psychologist, and the aviation chain of command (military) or civilian supervisory chain, that certain behavior or conduct is not adaptable to or is unsuitable for Army aeronautics. An unsatisfactory AA must not be used if a FEB or other legal, administrative, or medical action is appropriate and sufficient to decide the disposition of the aircrew member. Rated aviators will not normally be considered for waiver of an unsatisfactory AA unless overwhelming evidence and support exist from command as well as the local flight surgeon.

# AEROMEDICAL DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNs:** Adjustment Disorders are characterized by the development of clinically significant emotional or behavioral symptoms in response to an identifiable psychological stressor. Fitness for flight status will be determined by the severity and the required treatment.

**WAIVER:** Complete recovery without chronicity or medications supports waiver consideration. A mild Adjustment Disorder with complete recovery within 90 days can be considered "Information Only." If the disorder persists beyond 90 days the aviator is disqualified and a waiver is required. An evaluation by a qualified mental health professional is required prior to waiver consideration.

## DSM-IV CODES:

- 309.xx Adjustment Disorder (Specify if: Acute/Chronic):  
.0 With Depressed Mood  
.24 With Anxiety  
.28 With Mixed Anxiety and Depressed Mood  
.3 With Disturbance of Conduct  
.4 With Mixed Disturbance of Emotions and Conduct  
.9 Unspecified

(For diagnostic criteria, see DSM-IV-TR)

## INFORMATION REQUIRED:

- Complete AMS outlining social, occupational, administrative or legal problems associated with the case.
- Psychiatric and psychological evaluation as indicated, to include present functioning.
- Treatment summary
- Letters from the aviator's supervisor and treating psychiatrist or psychologist supporting a return to flying status.

**TREATMENT:** Psychotherapy is incompatible with flying to the extent that it is a treatment for symptoms that qualify the individual for a diagnosis of Adjustment Disorder. Follow-up psychotherapy is compatible with flying duties when it is for mild symptoms or stress management after the aircrew member no longer qualifies for an Adjustment Disorder diagnosis. Medication is incompatible with flying duties until reviewed by USAAMA.

**DISCUSSION:** Most individuals with Adjustment Disorder experience full recovery; however, some progress to chronicity and would thus be considered for permanent disqualification. A severe Adjustment Disorder with violence, suicidality, or other significantly deviant behavior requires review for waiver. The US Air Force experience includes 60 FCII aviators diagnosed with adjustment disorders of greater than 60 days duration in a 15 year (1981-1996) review. Forty-one (67%) were waived to return to fly.

## REFERENCES:

- PsychNet-UK. Online Psychological Services. Last updated 21 August 2003. [http://www.psychnet-uk.com/dsm\\_iv/adjustment\\_disorder.htm](http://www.psychnet-uk.com/dsm_iv/adjustment_disorder.htm)
- Adjustment Disorders. eMedicine.com. Last Updated: 3 September 2004. <http://www.emedicine.com/med/topic3348.htm>

# ATTENTION DEFICIT HYPERACTIVITY DISORDER

Update: JUN 2005

**AEROMEDICAL CONCERNS:** An inability to sustain or appropriately divide attention is not compatible with aviation service.

## WAIVERS:

### Initial Applicants (Class 1A/1W):

A history of ADHD is disqualifying. Exceptions to policy are sometimes granted for initial flight applicants provided all the information below is submitted for review by USAAMA.

### Initial Applicants (Classes 2F, 3, and 4):

A history of ADHD is disqualifying on initial FDME. Waivers are possible provided all the information below is submitted for review by USAAMA.

### Rated Aviation Personnel (All Classes):

New diagnosis of adult ADHD will be evaluated case-by-case based on the information listed below.

**DSM IV CODES:** For the appropriate codes and diagnostic criteria, see DSM-IV.

## INFORMATION REQUIRED:

- Detailed clinical interview by a clinical psychologist or psychiatrist to include developmental, academic, employment, psychiatric, social, drug, alcohol, criminal driving infraction and medication history, with special attention to other psychiatric conditions that may contribute to symptoms.
- Review of treatment records.
- If clinical interview and records review suggest normal attention or inappropriate diagnosis of ADHD in childhood or adolescence this may be noted as "information only."
- If interview and records review suggest positive findings for ADHD, a detailed neuropsychological assessment to include cognitive domains, IQ, and achievement testing is required. If treatment includes the use of medication(s), this assessment should be conducted both on and off medication. An in-flight performance evaluation in either actual aircraft or a simulator is recommended concurrent with each of the neuropsychological assessments to add ecological validity.
- Continuous Performance Testing (e.g., Conners, Integrated Visual and Auditory Continuous Performance Test, TOVA) is recommended

**FOLLOW-UP:** The diagnosis of childhood ADHD that has not required treatment since adolescence, and does not prove to be currently impacting the individual based on testing, will not require annual follow-up. Those diagnosed with adult ADHD will require annual follow up with a treating psychologist or psychiatrist.

**TREATMENT:** Treatment of ADHD will be considered on a case-by-case basis. Indication of mild to moderate ADHD with demonstrably improved performance on objective testing will be considered more favorably. Behavioral management strategies should be maximized before resorting to the use of medications in aircrew. Waiver for the chronic use of stimulant medication in aviators will not be considered. Waivers for the use of the Selective Monoamine Reuptake Inhibitors bupropion (Wellbutrin®) and atomoxetine (Strattera®) may be considered if supported by the assessment above and the crewmember has remained free of aeromedically significant symptoms and medication side effects on a stable dosage for a minimum of three months.

**DISCUSSION:** The diagnosis of ADHD in children and adults can be difficult. Some adults may have inappropriately received the diagnosis in childhood or adolescence. In addition, many adults with poor concentration without hyperactivity may have ADHD but were never diagnosed in childhood. Utilizing neuropsychological testing will assist in quantify the extent of the condition as well as favorable response to treatment.

# SUBSTANCE-RELATED DISORDERS: ALCOHOL ABUSE OR DEPENDENCE

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Ethyl alcohol has a depressant effect on the CNS. Subtle performance effects such as procedural errors, decreased reaction time, and inattentiveness may occur even after low doses. More importantly, alcohol consumption can cause disorientation, including production of positional alcohol nystagmus and vertigo and impairment of the ability to suppress inappropriate vestibular nystagmus. This susceptibility exists long into the "hangover" period. Ingestion of alcohol causes reduced Gz tolerance by 0.1-0.4 G. Alcohol is associated with a higher accident rate in both ground and flight operations. Chronic ingestion with associated CNS, GI, and CV effects can produce performance degradation in flight and ground jobs.

**WAIVER:** Exception to policy is not recommended. Waiver is possible if the patient: (1) Maintains unqualified acknowledgment of the alcohol abuse disorder. (2) Successfully completes the appropriate treatment program. (3) Remains abstinent for 90 days without need for medication. (4) Maintains satisfactory participation with documentation in an organized alcohol recovery program (AA, Rational Recovery, etc.), 3-5 times per week for the first 90 days of recovery and then 1-3 times per week thereafter for a period of 5 years total. Noncompliance: Continued denial of an alcohol problem and refusal to abstain from alcohol following treatment are grounds for permanent termination from aviation duties. Any relapse requires resubmission for waiver. Waivers for relapses with further outpatient and/or residential treatment are rarely granted by HRC.

## DSM IV-TR CODES:

### Alcohol Use Disorders:

303.90 Alcohol Dependence  
305.00 Alcohol Abuse

### Alcohol-Induced Disorders:

303.00 Alcohol Intoxication/291.8 Alcohol Withdrawal (Specify if: With Perceptual Disturbances)  
291.0 Alcohol Intoxication Delirium/291.0 Alcohol Withdrawal Delirium  
291.2 Alcohol-Induced Persisting Dementia/291.1 Alcohol-Induced Persisting Amnestic Disorder  
291.x Alcohol-Induced Psychotic Disorder  
.5 With Delusions (Specify: With Onset During Intoxication or During Withdrawal)  
.3 With Hallucinations (Specify: With Onset During Intoxication or During Withdrawal)  
291.8 Alcohol-Induced Mood Disorder/291.8 Alcohol-Induced Anxiety Disorder  
291.8 Alcohol-Induced Sexual Dysfunction/291.8 Alcohol-Induced Sleep Disorder

## INFORMATION REQUIRED:

- Complete flight physical,
- CBC
- LFTs
- A complete AMS with the flight surgeon's recommendations to include a search for underlying psychiatric disorders, medical disorders, or significant social or family dysfunction and a detailed description of the aircrew member's drinking history.
- Copy of ASAP outpatient or inpatient/residential (or civilian equivalent) treatment summary.
- FS and ASAP Clinical Director's statement to document aftercare including AA attendance.
- Chain-of-command recommendations through general officer level.

## FOLLOW-UP REQUIREMENTS:

An active sobriety program with continued abstinence is essential.

The member must visit the following professionals at the intervals specified: (1) Flight surgeon, monthly for the first year, every 3 months for the 2nd and 3rd years, every 6 months for the 4th and 5th years, then annually thereafter. (2) ASAP Clinical Director, monthly for the first year, every 3 months for the 2nd year, and then annually for the 3rd through 5th years. (3) Annual submission of the flight surgeon's

recommendations, ASAP counselor's recommendations, documentation of AA attendance, and a letter of support from the aviation unit commander are also required for a period of 5 years total.

**TREATMENT:** ASAP outpatient or inpatient/residential program as clinically indicated..

**DISCUSSION:** Acute alcohol intoxication is implicated in about 16 percent of general aviation fatal accidents. The risk of liver damage in men drinking 80gm ethanol (equivalent to one 6-pack of beer, 3-4 mixed drinks, or 4-6 glasses of wine) and in women drinking about 50gm a day for some years has been reported as 15 percent. Acute alcohol intoxication can produce arrhythmias that usually disappear quickly but can leave moderate conduction delays for up to one week (the "holiday heart" syndrome). Although relapse after treatment for alcohol dependence may be as high as 41% at two years, it is "rare after five years" according to Vaillant, with a rate of about 7%, less than the incident risk in the general population . However, the prognosis is much better for professionals (e.g., physicians, pilots, and lawyers) than for the general population, probably related to the potential loss of professional status. Note: Non-alcoholic beer is considered an alcoholic beverage. The 12-hour "bottle-to-throttle" rule (see AR 40-8) applies to drinking non-alcoholic beer.

**REFERENCES:**

- Vaillant, G, The Natural History of Alcoholism, Alcohol Health and Research World, 1996, (20) 3, 152-161.  
O'Brien, C and McLellan A, Myths about the Treatment of Addiction, Lancet 1996; 347: 237-240.

## ALCOHOL-RELATED DISORDER, NOS (Alcohol Misuse)

Update: JUN 2005

**AEROMEDICAL CONCERNS:** While a single incident of alcohol misuse (mild or minimal alcohol-related problem) is not of significant concern, it may be an indication of underlying alcohol abuse or dependence.

### WAIVER:

#### Initial Applicants (Class 1A/1W):

A single episode of alcohol misuse will be filed as Information Only provided that a current (within 90 days of the date of FDME submission) Alcohol Substance and Abuse Program (ASAP) evaluation reveals no underlying problem with abuse or dependence. Multiple episodes will require a request for exception to policy and are rarely granted.

#### Initial Applicants (Classes 2F, 3, and 4):

A single episode of alcohol misuse will be filed as Information Only provided that a current Alcohol Substance and Abuse Program (ASAP) evaluation reveals no underlying problem with abuse or dependence. Multiple episodes will require a request for waiver and these will be evaluated on a case-by-case basis.

#### Rated Aviation Personnel (All Classes):

A single episode of alcohol misuse will be filed as Information Only provided that a current Alcohol Substance and Abuse Program (ASAP) evaluation reveals no underlying problem with abuse or dependence. Multiple episodes will require a request for waiver and these will be evaluated on a case-by-case basis.

**DSM-IV CODE:** 291.9 Alcohol-Related Disorder, NOS

### INFORMATION REQUIRED:

1. For a single episode of alcohol misuse
  - A copy of a recent ASAP evaluation must be submitted with the FDME.
  
2. For multiple episodes an AMS must be submitted with the following:
  - Completion of an alcohol education program, such as PERR, (Prevention, Education, Risk Reduction) or equivalent and a favorable recommendation from the program director.
  - Letters of recommendation and support from the immediate aviation chain of command to the level of Bn CO.
  - Flight surgeon recommendations and a summary of findings, to include: absence of any significant underlying psychological or psychiatric disorders or evidence of lasting or residual health impairment or significant work, social, or family dysfunction.
  - Laboratory Evaluation: CBC, Liver Function Tests to include AST/ALT and Gamma GT.

**FOLLOW-UP:** The local flight surgeon will continue to reevaluate the individual at 2-month intervals for the first year after return to full flying duties and then annually in conjunction with annual FDME.

**TREATMENT:** An alcohol education program is generally adequate therapy. NOTE: If the aircrew member requires disulfiram as treatment or to demonstrate abstinence, then the condition cannot be classified as alcohol misuse. Refer to APLs for alcohol abuse and dependence.

**DISCUSSION:** Alcohol-related incidents such as driving under the influence (DUI), under age drinking, and public intoxication resulting in unusual, bizarre, or violent behavior or any other alcohol-related

misbehavior, which in the opinion of the commander or the flight surgeon deserves attention, must be viewed with caution because of the potential for creating unusual stress on the aviator. These stressors may arise from pending legal action, command pressure, marital discord, or even self-generated pressures. Local Duties Not Including Flying (DNIF) is appropriate pending completion of evaluations and will allow the aviator time to cope with these demands. A single episode of alcohol abuse may reflect an isolated event, but may represent the initial presentation of an underlying substance problem and deserves thorough evaluation by the unit FS/APA.

The Alcohol-Related Disorder, NOS or Alcohol Misuse category is for disorders associated with the use of alcohol that are not classifiable as Alcohol Dependence, Alcohol Abuse, Alcohol Intoxication, Alcohol Withdrawal, Alcohol Intoxication

Delirium, Alcohol Withdrawal Delirium, Alcohol-Induced Persisting Dementia, Alcohol-Induced Persisting Amnestic Disorder, Alcohol Induced Psychotic Disorder, Alcohol-Induced Mood Disorder, Alcohol-Induced Anxiety Disorder, Alcohol-Induced Sexual Dysfunction, or Alcohol-Induced Sleep Disorder.

**REFERENCE:**

Burge SK. Alcohol Related Problems: Recognition and Intervention. *Am Fam Physician* 1999;59(2): 361-70, 372

# ANXIETY DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Anxiety disorders may produce symptoms that are distracting in flight and occasionally result in autonomic symptoms such as hot flashes, sweating, nausea, and vomiting, as well as various mental deficiencies. Panic attacks can occasionally produce sudden incapacitation. Anxiety can be a manifestation of **unconscious** fear of flying.

**WAIVERS:** Panic Disorder, Post-Traumatic Stress Disorder (PTSD), Acute Stress Disorder (ASD), Generalized Anxiety Disorder (GAD), Obsessive-Compulsive Disorder (OCD), and Anxiety Disorder NOS are considered disqualifying for all aviation-related duties. Waiver may be requested for ASD when the aviator is asymptomatic without medications for three months. Waiver may not be granted for true panic disorder or obsessive-compulsive disorder. Waiver may be considered for PTSD, ASD, GAD, and Anxiety Disorder NOS as part of the "Selective Monoamine Reuptake Inhibitor Surveillance Program." This requires that the crewmember remain free of aeromedically significant symptoms and medication side effects on a stable dosage of an acceptable medication for a minimum of four months before submission of a waiver request. Further recurrences of anxiety symptoms are disqualifying with permanent termination of flying duties. Specific Phobias and Social Phobias are considered medically disqualifying only if they impact on flight performance or flight safety.

## DSM IV CODES:

- 300.01 Panic Disorder Without Agoraphobia
- 300.21 Panic Disorder With Agoraphobia
- 300.22 Agoraphobia Without History of Panic Disorder
- 300.29 Specific Phobia (Specify type: Animal Type/Natural Environment Type/Blood-Injection-Injury Type/Situational Type/Other Type)
- 300.23 Social Phobia (Specify if: Generalized)
- 300.3 Obsessive-Compulsive Disorder (Specify if: With Poor Insight)
- 309.81 Post-Traumatic Stress Disorder (Specify if: Acute/Chronic) (Specify if: With Delayed Onset)
- 308.3 Acute Stress Disorder
- 300.02 Generalized Anxiety Disorder
- 293.89 Anxiety Disorder Due to . . . (Indicate General Medical Condition)  
\_\_\_\_\_. Substance-Induced Anxiety Disorder (Refer to Substance-Related Disorders for substance-specific codes)
- 300.00 Anxiety Disorder NOS

(For diagnostic criteria, see DSM-IV )

## INFORMATION REQUIRED:

- Detailed clinical interview by an aeromedically trained clinical psychologist or psychiatrist to include target symptoms, medication history, and specific diagnostic conclusions.
- Review of treatment records.
- Neuropsychological assessment and in-flight performance evaluation are also required if waiver is sought for the use of an approved medication. Refer to the "Selective Monoamine Reuptake Inhibitors Surveillance Program" for specific requirements.

**FOLLOW-UP:** Psychiatric follow-up for anxiety disorders is at the discretion of the treating mental health provider. Anxiety Disorder patients are generally seen at least monthly while on limited duty. If a waiver has been granted for the use of medication, consultation with an aeromedically trained psychiatrist will be completed every 6 months, and before resuming flying duties after any change in dosage or discontinuation of medication.

**TREATMENT:** The indicated treatments are psychotherapy and psychotropic medications, either alone or in combination.

**DISCUSSION:** Anxiety disorders are among the most prevalent in the general population, although depression is the most common among clinical populations. Patients with PTSD, Acute Stress Disorder, Panic Disorder and GAD may complain of palpitations, dizziness, headaches, shortness of breath, tremulousness, and impaired concentration and memory. OCD patients complain of obsessive rumination and/or compulsive rituals that interfere with functioning. Long-term prognosis for Anxiety Disorders is a matter of some debate and varies depending on diagnosis. Panic Disorder has a high rate of recurrence and is frequently associated with Major Depressive Disorder. Acute Stress Disorder that continues beyond one month would be reclassified as PTSD.

## ATTEMPTED SUICIDE

Update: JUN 2005

**AEROMEDICAL CONCERNS:** There is a risk that a person with suicidal ideation may attempt suicide in an aircraft and even jeopardize the safety of others. Aircraft have occasionally been the selected means of suicide in civil aviation, but there are no known Army aviation accidents where suicide was confirmed. According to AR 40-501, history of suicide attempt or suicidal gestures is disqualifying.

**WAIVER:** A "suicide attempt" itself is a behavior, not a DSM-IV psychiatric diagnosis. Waivers are based in part on the psychiatric diagnosis of which the suicidal behavior is a manifestation. Additionally, waivers are based upon (1) the effectiveness of the remediation of the precipitating causes for the attempt, (2) the quality and duration of emotional and behavioral stability, and (3) reports from supervisors, the local flight surgeon, and mental health. Recurrent suicidal ideation, gestures or attempts are the basis for permanent disqualification. Exception to policy for history of suicide attempt is not recommended but may be considered using the guidelines above.

### INFORMATION REQUIRED:

- Complete AMS with report of psychiatric evaluation, to include a detailed account of the suicidal behavior.
- Psychological testing will be conducted and reported as indicated.
- In addition to the criteria for waiver mentioned above, the aviator should be symptom-free and treatment should be completed for at least six months before waiver will be considered.

**TREATMENT:** Treatment is based on the individual's psychiatric diagnosis. However, primary emphasis should be on the assessment of dangerousness and ensuring the safety of the patient. Inpatient hospitalization may be indicated.

**FOLLOW-UP:** Follow-up psychiatric care is at the discretion of the treating mental health provider, and the frequency should be clearly stated in the psychiatric evaluation or hospital discharge summary.

**DISCUSSION:** Of those who make a suicidal gesture, 66 percent are involved in acute personal crisis and many will have ingested alcohol within 6 hours of the attempt. Within one year, 20-25 percent will repeat the attempt and 2 percent will be successful. There is an underlying personality disorder in 20-25 percent of cases. In those who go on to successful suicide, 70 percent confide their intentions to someone before doing so. Risk factors include living alone, recent stress or loss, being male (especially over 45 years of age), heavy drinking, and a family history of alcohol dependence, mental illness, or suicide.

## **DELIRIUM, DEMENTIA, AND AMNESTIC AND OTHER COGNITIVE DISORDERS**

Update: JUN 2005

**AEROMEDICAL CONCERNs:** Impaired cognitive performances due to organic conditions render individuals unfit for flight.

**WAIVERS:** Conditions that are temporary and completely reversible with treatment would be considered for waivers, depending upon the underlying cause.

**DSM-IV CODES:** For the appropriate codes and diagnostic criteria, see DSM-IV.

### **INFORMATION REQUIRED:**

- Complete AMS including complete physical and lab findings and
- Reports of neurological, psychiatric and neuropsychological evaluations if performed.

**FOLLOW-UP REQUIREMENTS:** As medically indicated.

**TREATMENT:** As medically and psychiatrically indicated.

**DISCUSSION:** See Neurology policy for information concerning Cognitive Disorders due to head injury.

# LEARNING DISORDERS AND OTHER DISORDERS USUALLY FIRST DIAGNOSED IN INFANCY, CHILDHOOD, OR ADOLESCENCE

Update: JUN 2005

**AEROMEDICAL CONCERNs:** The majority of these disorders do not apply to the adult aviator population. However, childhood and adolescent learning disorders and Attention Deficit/Hyperactivity Disorder and disruptive behavior disorders may have adult manifestations that could affect the safety of flight. The label "learning disability," once associated with reading problems, is now a non-specific term for numerous disorders of cognition with childhood onset and varying levels of severity. This variability directly impacts the specific disorder's aeromedical significance, making knowledgeable evaluation of the individual, rather than simple identification of the diagnosis, essential to the final aeromedical disposition.

**WAIVERS:** Exception to policy and waivers can be considered if medications, (e.g., stimulants) are not needed to maintain adequate performance and if behavioral characteristics do not hinder flight performance or flight safety.

**DSM IV CODES:** For the appropriate codes and diagnostic criteria, see DSM-IV.

## INFORMATION REQUIRED:

- Complete AMS to include
- Psychiatric, psychological, and educational evaluation as indicated.

**TREATMENT:** Many of the conditions are not amenable to treatment and/or require continuous treatment.

**DISCUSSION:** Childhood Learning Disorders (LD) and Attention-deficit/Hyperactivity Disorder (ADHD), once thought to "burn themselves out" in adolescence, can persist into adulthood (Spencer et al., 1998; Barkley, Hill & Schoener, 1997). Both genetic and environmental factors are undoubtedly important in the etiology of these disorders. Physiological as well as anatomic markers are being sought. Still, current practice requires clinical, historical, and often psychometric indicators in order to make these diagnoses. Learning disorders may be associated with underlying abnormalities in cognitive function, including deficits in attention, memory, or linguistic processes. Impaired vision or hearing may affect learning ability and should be investigated through audiometric or visual screening tests. A learning disorder may be diagnosed in the presence of such sensory deficits only if the learning difficulties are in excess of those usually associated with these deficits.

## DISSOCIATIVE DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** These disorders feature a disruption of integrated functions of consciousness, memory, and identity or perception of the environment. This impairment of cognitive abilities is incompatible with flying duties.

**WAIVER:** Dissociative Disorders are chronic, unpredictable, and difficult to treat. Exception to policy and waiver are not considered.

### DSM-IV CODES:

- 300.12 Dissociative Amnesia
- 300.13 Dissociative Fugue
- 300.14 Dissociative Identity Disorder
- 300.6 Depersonalization Disorder
- 300.15 Dissociative Disorder NOS

(For diagnostic criteria, see DSM-IV, page 477.)

### INFORMATION REQUIRED:

- Complete AMS with
- Psychiatric evaluations

**TREATMENT:** As psychiatrically indicated.

**DISCUSSION:** Treatment is often long-term, and effects of dissociative disorders bar any consideration for flight status.

## EATING DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Eating disorders can cause potentially life-threatening metabolic alkalosis, hypochloremia, and hypokalemia, which can have drastic implications for aviation safety. Anxiety and depressive symptoms are common, and suicide is a risk.

**WAIVERS:** Eating Disorders (Anorexia, Bulimia, and Eating Disorders NOS) are disqualifying for all aviation duties. Reports of PEB and MEB, if available, are required. Many of the soldiers with these disorders will be discharged via a PEB medical board due to lack of treatment options within the military. Waiver may be considered on a case-by-case basis if the patient is off medication, symptom-free, and fully functional in an alternate duty assignment for one year. These patients must meet the minimum aviation weight standards.

### DSM-IV CODES:

307.50 Eating Disorder

307.51 Bulimia

307.1 Anorexia Nervosa

(For diagnostic criteria, see DSM-IV, page 539.)

### INFORMATION REQUIRED:

- Submit a full AMS to include:
- Psychiatric and/or psychological evaluation,
- Copy of MEB if applicable, and
- Flight surgeon's narrative outlining any social, occupational, administrative, or legal problems of the patient.

**FOLLOW-UP:** Follow-up psychiatric care is at the discretion of the treating mental health provider, but should involve at least monthly follow-up during the first year of treatment.

**TREATMENT:** Treatment is very difficult and involves intensive, long-term therapy, group therapy, and possibly pharmacotherapy, all of which are incompatible with aviation duty.

**DISCUSSION:** Relapse rate is high. With long-term follow-up treatment of anorexia, 40 percent of patients recover, 30 percent improve, and 30 percent are chronic. Anorexia is potentially fatal in 5-12 percent of cases. Bulimia is often associated with alcohol abuse.

### REFERENCES:

UpToDate internet search engine. "Eating disorders: Epidemiology, pathogenesis and clinical features" Sara F Forman, MD Ferri: Ferri's Clinical Advisor: Instnat Diagnosis and Treatment, 2004 ed., Copyright 2004 Mosby, Inc.

## IMPULSE CONTROL DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Stereotyped or impulsive behavior may lead to aviation safety problems. These disorders involve an inability to resist acting on an impulse that can be dangerous to self or others and that is characterized by a sense of pleasure when gratified. These disorders occur very infrequently among military aviators. Disorders of impulse control, when present, include features that are incompatible with mission readiness and flying safety. Their presence may also arouse specific perceptions and concerns in other aircrew about leadership, reliability, and trustworthiness.

Persons with Intermittent Explosive Disorder may have a significant history of unstable interpersonal relationships, illegal behavior, and substance abuse, and so would be unlikely to complete a rigorous pilot training program. A troublesome pattern might include isolated outbursts of extreme temper with long periods of reasonably normal functioning, which differs from the more diffuse and continuous impulsivity of a personality disorder.

The features of the other Impulse Disorders may not bear as directly upon cockpit safety. However, such behaviors as compulsive gambling, thievery or fire-setting may disrupt sleep, consume time and mental energy, and cause anxiety or stress-related distractions. Any of these factors can affect primary flying duties. Thus, administrative or legal action may be required even if the primary problem is not medically disqualifying. Also, keep in mind the possibility of a reverse effect: the increased stresses of an aviation career (or, indeed, any increased life stressors) may precipitate increased manifestations of any underlying problem with impulse control.

**WAIVERS:** Impulse Control Disorders (Intermittent Explosive Disorder, Kleptomania, Pathological Gambling, Pyromania, Trichotillomania) are considered permanently disqualifying with no waiver recommended. These aviators are also considered unsatisfactory AA. These cases are handled on a case-by-case basis and questions should be referred to the designated Army aeromedical psychiatric or psychological consultant or USAAMA.

### DSM IV CODES:

- 312.30 Impulse-Control Disorder NOS
- 312.31 Pathological Gambling
- 312.32 Kleptomania
- 312.33 Pyromania
- 312.34 Intermittent Explosive Disorder
- 312.39 Trichotillomania

(For diagnostic criteria, see DSM-IV.)

### INFORMATION REQUIRED:

- Psychiatric evaluation and
- Flight surgeon's narrative outlining any social, occupational, administrative, or legal problems of the patient are required.

**FOLLOW-UP:** Follow-up psychiatric care is at the discretion of the mental health provider.

**TREATMENT:** Psychotropic medications used with Intermittent Explosive Disorder and Trichotillomania are incompatible with aviation duty. Pathological Gambling and Kleptomania are generally treated with behavior therapy.

**DISCUSSION:** Differential diagnosis should include substance abuse, temporal lobe epilepsy, head trauma, Bipolar Disorder (Manic Episode), and Personality Disorder (e.g., Antisocial or Borderline). The diagnosis is usually not made if the behavior occurs only in the context of another mental disorder such as Schizophrenia or Bipolar Disorder, or when it is associated with a personality disorder such as Borderline Personality Disorder. Isolated incidences of poor impulse control that violate policy, regulation, or the UCMJ should be dealt with administratively by the command rather than medically. A repeated pattern of poor impulse control that does not fit one of the specific diagnoses *above and is not a manifestation of another mental disorder* may be diagnosed as Impulse Control Disorder NOS. If the pattern of impulsive behavior coexists with other character pathology *but does not qualify for a Personality Disorder diagnosis*, a label of unsatisfactory Aeromedical Adaptability may be considered.

## MENTAL DISORDERS DUE TO A GENERAL MEDICAL CONDITION NOS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Almost the entire spectrum of psychiatric disorders may be manifestations of primary medical conditions. Disqualification from flying would be due to the underlying medical condition.

**WAIVERS:** Waiver would depend on the specific medical condition, the course of the medical condition, and residual effects on patient's personality or emotional state. Consideration for waiver would also depend on severity of the disorder and the required course of treatment.

### **DSM-IV CODES:**

293.89 Catatonic Disorder Due to (Indicate the General Medical Condition.)

310.1 Personality Change Due to (Indicate the General Medical Condition.) (Specify type: Labile Type/Disinhibited Type/Apathetic Type/Paranoid Type/Other Type/Combined Type/Unspecified Type)

293.9 Mental Disorder Due to (Indicate the General Medical Condition.)

(For diagnostic criteria, see DSM-IV, page 165.)

### **INFORMATION REQUIRED:**

- Complete AMS including
- Psychiatric evaluation.

**TREATMENT:** As medically and psychiatrically indicated.

**DISCUSSION:** Refer to the APL of the underlying medical condition of concern.

## MOOD DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Mood disorders are associated with decreased concentration, inattention, indecisiveness, fatigue, insomnia, agitation and occasionally psychosis, all of which are incompatible with aviation duties. Risk of suicide is 15 percent, the highest of all mental disorders. Dual diagnosis of a Mood Disorder and Substance Abuse or Dependence is common.

**WAIVERS:** Major Depression/Dysthymia/Depressive Disorder NOS: Disqualifying for all aviation duties. Exception to policy is not recommended. Waiver may be considered as part of the "Selective Monoamine Reuptake Inhibitors Surveillance Program." This requires that the crewmember remain free of aeromedically significant symptoms and medication side effects on a stable dosage of an acceptable medication for a minimum of four months before submission of a waiver request. Bipolar Disorder: Disqualifying for all aviation duties. The aviator should be referred to PEB for determination of general duty/retention.

### DSM IV CODES:

Depressive Disorders:

296.xx Major Depressive Disorder,  
.2x Single Episode  
.3x Recurrent  
300.4 Dysthymic Disorder  
311 Depressive Disorder NOS

Bipolar Disorders:

296.xx Bipolar I Disorder  
.0x Single Manic Episode (Specify if: Mixed)  
.40 Most Recent Episode Hypomanic  
.4x Most Recent Episode Manic  
.6x Most Recent Episode Mixed  
.5x Most Recent Episode Depressed  
.7 Most Recent Episode Unspecified  
296.89 Bipolar II Disorder Specify (current or most recent episode): Hypomanic/Depressed  
301.13 Cyclothymic Disorder  
296.80 Bipolar Disorder NOS  
293.83 Mood Disorder Due to . . . (Indicate the General Medical Condition)  
\_\_\_\_ Substance-Induced Mood Disorder (Refer to Substance-Relate  
Disorders for substance-specific codes)  
296.90 Mood Disorder NOS

(For diagnostic criteria, see DSM-IV.)

### INFORMATION REQUIRED:

- Detailed clinical interview by an aeromedically trained clinical psychologist or psychiatrist to include target symptoms, medication history, and specific diagnostic conclusions.
- Review of treatment records.
- Neuropsychological assessment and in-flight performance evaluation are also required if waiver is sought for the use of an approved medication. Refer to the "Selective Monoamine Reuptake Inhibitors Surveillance Program" for specific requirements..

**FOLLOW-UP:** Psychiatric follow-up is at the discretion of the mental health provider. Mood Disorder patients are generally seen at least monthly while on limited duty. If a waiver has been granted for the use of medication, consultation with an aeromedically trained psychiatrist will be completed every 6

months, and before resuming flying duties following any change in dosage or discontinuation of medication.

**TREATMENT:** The indicated treatments are psychotherapy and psychotropic medications, either alone or in combination.

**DISCUSSION:** Fifteen percent of depressed patients eventually commit suicide. Fifty to seventy-five percent of affected patients have a recurrent episode, but this may be reduced with treatment. Acute major depression is treatable in 80 percent of patients. The prevalence of depression in aircrew is estimated to be about 6%, similar to the general population (Schneider, et al, unpublished data), yet the prospect of being grounded for an extended period has led many to forego treatment and suffer in silence, or to "go downtown" or to the Internet and use antidepressant medications without proper psychiatric or aeromedical supervision. This risk to aviation safety must be weighed against the potential use of newer psychotropic medications with well-established records of efficacy and minimal side effect profiles.

## OTHER CONDITIONS THAT MAY BE A FOCUS OF CLINICAL ATTENTION (V Codes)

Update: JUN 2005

**AEROMEDICAL CONCERNS:** The DSM-IV "V Codes" are broadly divided into three groups. *Relational Problems* (such as marital or parent-child problems) occur when maladaptive patterns of individual behavior within some sort of unit or group cause symptoms in the individuals, or impair function of the unit or group. *Problems Related to Abuse or Neglect* (such as spouse abuse or child neglect) may involve physically or sexually abusive behavior. The *Additional Conditions* (such as an occupational problem or spiritual problem) vary from Non-Compliance With Treatment through Bereavement to Phase of Life Problems. The 23 "V Codes" are listed in DSM-IV (1994, pp 680-6). V Codes are recorded on DSM-IV Axis I when they are the primary focus of clinical attention. When they are secondary to another disorder, they may be included on Axis IV.

The V Codes represent a psychiatric gray area in aerospace medicine. Many of the everyday problems faced by aviators may be described by V Codes. V Code issues may interfere with safe or effective flying, *or they may not*. Matters such as adjusting to different cultures, dealing with a recalcitrant child, or trying to save a failing marriage are of obvious aeromedical concern, but whether they are grounds for administrative or medical removal from flying duties, or for establishing a psychiatric diagnosis, are matters of degree. What becomes most relevant to aeromedical judgments is the *response of the aviator* to the stressor rather than the severity of the stressor. Numerous "small" stressors can produce fatigue, irritability, early task saturation, distraction and cognitive inefficiency as much as a single major stressor. Aeromedically dangerous responses include those of worry, anxiety, anger, depression, guilt, somatization, and behavioral acting-out. Other aeromedically relevant issues include disturbed patterns of sleep and/or eating, preoccupation, inability to relax, depressed or anxious mood, and especially changes in flying performance as assessed by the aviator, peers, and the supervisor.

The flight surgeon should approach V Code problems in aircrew carefully, using techniques that range from *informal discussion* as the least intrusive intervention to a *full mental health evaluation* as the most rigorous appraisal of whether the aviator should continue to fly. If an Axis I diagnosis seems warranted, it should be established in accordance with DSM-IV criteria and treated properly. Mental health counseling may also be indicated as a way of preventing a V code problem from overtaxing an aviator's resources even if no Axis I or II diagnosis other than a V code is warranted. *NOTE: beware of delaying or withholding diagnosis and proper treatment solely in order to avoid DNIF.* When the aviator has completed use of any medications, and the symptoms are sufficiently relieved so that return to flying is possible, then decide whether a waiver will be necessary. *NOTE: an aircrew member may be recommended for return to flying even though non-medication "talk therapy" is continuing when the symptoms have subsided sufficiently (during marital therapy, for example) to allow for safe flying.* In some cases, the flyer may be able to resolve the troubling issue without being placed in a DNIF status. However, when 1) an aviator becomes so disturbed as to be placed DNIF, and 2) IF at the end of that period of DNIF the flight surgeon decides that the situation warrants a formal diagnosis requiring waiver action, then the waiver considerations below apply.

**WAIVER:** If the V Code diagnosis is a byproduct of an Axis I or II disorder, waiver action should be taken in accordance with the APL for that diagnosis. If the V Code diagnosis stands alone as an Axis I diagnosis, then a waiver will be considered when the individual has resolved the presenting problem and has returned to full functioning without medication.

**DSM-IV CODES:** (For diagnostic codes and criteria, see DSM-IV.)

**INFORMATION REQUIRED:**

- Complete AMS a recent mental health evaluation, along with treatment summaries and present status
- Any psychological testing or evaluation reports
- An aeromedical summary that includes any pertinent social, occupational, legal or financial information

**TREATMENT:** As indicated.

**DISCUSSION:** Most V Code problems resolve satisfactorily and should have no permanent impact on flight status. However, chronicity or need for medication could lead to permanent disqualification.

# PERSONALITY DISORDERS

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Personality Disorders involve an enduring pattern of inner experience and behavior that deviates markedly from expectations of the individual's culture, is pervasive and inflexible, is stable over time, and leads to marked distress or social and/or occupational impairment. These problems lead to difficulty conforming, being a team member, and making rational decisions.

**WAIVERS:** Personality Disorders are disqualifying for flying duties; no waiver is recommended. Exception to policy is not recommended. Reversal of a Personality Disorder disqualification at a later date is very difficult. However, if the individual demonstrates (over a period of 2-3 years) substantial improvement in terms of ability to sustain the stressors of the aviation environment, work in harmony with other members, and stabilize his or her personal life and turmoil, then the individual, with strong support from the chain-of-command and the flight surgeon, may be considered for re-evaluation by an aeromedically trained psychiatrist or psychologist. Such patients may also be referred to NAMI, Pensacola, FL, or AMCS, Brooks AFB, TX. Contact USAAMA for further information.

## DSM IV CODES:

- 301.0 Paranoid Personality Disorder
- 301.20 Schizoid Personality Disorder
- 301.22 Schizotypal Personality Disorder
- 301.7 Antisocial Personality Disorder
- 301.83 Borderline Personality Disorder
- 301.50 Histrionic Personality Disorder
- 301.81 Narcissistic Personality Disorder
- 301.82 Avoidant Personality Disorder
- 301.6 Dependent Personality Disorder
- 301.4 Obsessive-Compulsive Personality Disorder
- 301.9 Personality Disorder NOS

(For diagnostic criteria, see DSM-IV)

## INFORMATION REQUIRED:

- Complete mental health evaluation
- Results of psychological testing for character pathology
- A letter from the crew member's commander regarding the individual's work performance and social adjustment.

**FOLLOW-UP:** Further evaluations are at the discretion of the treating psychiatric team.

**TREATMENT:** Treatment is often long-term and involves intensive psychotherapy, which is not available in the military sector of care. Depending on the severity of the Personality Disorder, returning to flying duties is highly improbable.

**DISCUSSION:** Personality disorders and traits may impact performance of military duty, including aviation duty, because of associated social, occupational, administrative, and legal ramifications. As a general rule, successful treatment requires long-term, time intensive psychotherapy that can render the service member unavailable for full duty performance for a prolonged period of time. Since personality disorders are considered, by definition, conditions that existed prior to military service, they cannot be addressed by a medical evaluation board and cannot be grounds for medical retirement. Therefore, when a personality disorder diagnosis is confirmed by mental health consultation, administrative separation due to psychological unsuitability for military service is often pursued. This administrative action requires

evidence of negative impact on duty performance due to the disorder, in addition to the diagnosis of the disorder itself. Typically, other potentially medically disqualifying disorders are considered and ruled out before taking this action.

Unfortunately, many persons with personality disorders spend a long time between initial referral for evaluation and final diagnosis and disposition decision-making. Care is needed to avoid hasty over-diagnosis of personality disorders in personnel with idiosyncratic personality traits presenting for evaluation. Thus, in questions of possible administrative separation action by command, consultation with a mental health provider should be considered by the flight surgeon early on in the process. The flight surgeon and mental health provider may assist the commander in the decision-making process through explanation of personality disorder manifestations and discussion of the associated prognosis.

## **SELECTIVE SEROTONIN OR MONOAMINE REUPTAKE INHIBITOR (SSRI/SMRI)**

Update: JAN 2006

**AEROMEDICAL CONCERNS:** The SSRI (SMRI) APL was first drafted and presented for ACAP review in June 2005 and posted to the web. This update is intended to refine or clarify aspects of the APL after feedback from mental health professionals and field flight surgeons. Further, no program had been established to provide surveillance of performance. This update will include information regarding such surveillance.

This APL applies to all aviation personnel and applicants with a history of use of any SSRI, or diagnosis of mood disorder for which treatment includes medication. Closely related medications, such as Selected Norepinephrine Reuptake Inhibitors (SNRIs), with similar efficacy and minimal side effect profiles (e.g., bupropion, venlafaxine) will also be included—hence, the term Selective Monoamine Reuptake Inhibitors (SMRI). This APL is referenced in numerous psychiatric disorder APLs, updated June 2005, such as, but not limited to Major Depressive Disorder, Dysthymia, Depressive Disorder NOS, medication use in support of Adjustment Disorder with affected mood, Posttraumatic Stress Disorder, Acute Stress Disorder, Generalized Anxiety Disorder, and Anxiety Disorder NOS. Premenstrual Dysphoric Disorder (PMDD) treated with a SSRI also follows this APL. Treatment must be limited to a single agent in this class that has been approved by the FDA for treatment of depression or anxiety for at least three years with favorable post-marketing surveillance. The only exception to monotherapy may be the addition of bupropion to a therapeutic dose of an SSRI for the management of medication-related sexual dysfunction.

All use of SSRI as well as the underlying disorder are **DISQUALIFYING** for all classes of aviation. Waiver/exception to policy (ETP) may be considered as outlined below. The process from time of diagnosis to waiver request submission will often take more than 6 months, due to the requirement of being on maintenance therapy for at least 4 months prior to submission of a request for waiver/ETP.

### **WAIVERS:**

#### **Initial Applicants (Class 1A/1W):**

Exception to policy will be considered on a case-by-case basis after review of the required elements outline below. ETP may be granted in the rare case where the underlying disorder is of a discrete nature with a favorable prospect of low recurrence in the future.

#### **Initial Applicants (Classes 2F, 3, and 4):**

Waiver will be considered on a case-by-case basis after review of the required elements outlined. Class 3 Initials must be submitted to USAAMA.

#### **Rated Aviation Personnel (All Classes):**

Previously qualified aviation personnel may apply for waiver and will be considered on a case-by-case basis after review of the required elements outline below. Class 3 personnel may be managed locally or referred to USAAMA for disposition.

### **INFORMATION REQUIRED:**

- Detailed clinical interview by a psychiatrist or psychologist. If the psychiatrist or psychologist is not aeromedically trained, the Aviation Psychiatry Consultant, or designee, will review the case also. Notes must include target symptoms, medication history, specific diagnostic conclusions supporting one of the included diagnoses listed above, and corroboration of the information provided.

- Narrative summary or treatment records, from the psychiatrist or prescribing physician (non-psychiatrist). This must include documentation of uncomplicated illness without evidence of psychosis or suicidal behavior, medications tried, and titration to therapeutic effect. Medication use must be at a stable dose for at least 4 months without aeromedically significant symptoms/side effects before submission.
- Neuropsychological assessment to include cognitive domains and motor skills testing (e.g., CogScreen®) to demonstrate functional ability.
- Operational assessment and command endorsement to demonstrate aeronautical ability after the 3rd month of maintenance therapy. For rated personnel, this must include an in-flight performance evaluation (IFPE), or MOS-equivalent assessment, in either an aircraft (preferred) or a simulator. The IFPE must be the identical to the annual A-Part evaluation and performed by an IP or SIP (preferred is IP/SIP from another unit who is blinded to the reason for the IFPE).
- Aviators who have successfully met the above requirements, with command and local flight surgeon endorsement, may continue on flight duties on temporary upslip up to 90 days at a time while waiver is being processed.

**FOLLOW-UP:** If a waiver is recommended and granted, the aviator will be required to follow-up with his/her treating psychiatrist as recommended in accordance with their clinical condition.

The aviator will also be required to undergo evaluation by a psychologist or psychiatrist (aeromedically-trained preferred) every 6 months for the duration of treatment, plus six months after medication cessation to insure stability. After that period, the flight surgeon shall note mental health status on an annual basis to continue the waiver. Results should be annotated on the annual flight physical.

Relapse, change in mental health, or return to medication after cessation is disqualifying and will require a new aeromedical summary for assessment and disposition (outcomes: subsequent waiver issuance, continuation of current waiver, or suspension).

**DISCUSSION:** The prevalence of depression in aircrew is estimated to be about 6%, similar to the general population (Schneider, et al, unpublished data). Cross-sectional surveys have shown the anxiety disorders to be even more prevalent in the general population, even though depression is seen more frequently in clinical settings. The prospect of being grounded for an extended period inevitably leads many to forego treatment and suffer in silence, to seek medical care at their own expense to avoid reporting to aeromedical authorities, or to use herbal remedies and antidepressant medications obtained via the Internet without proper psychiatric or aeromedical supervision (see Herbal Supplement APL). Return to flight through this policy letter may occur as early as 4-5 months after presenting for care. Recent combat experience and OPTEMPO have increased the variety of stress-type reactions that may lead to presentation and the need for evaluation for care (reference recent study of psychiatric diagnoses on returning OIF/OEF soldiers).

This risk to aviation safety must be weighed against the potential use of newer psychotropic medications with well-established records of efficacy and minimal side effect profiles. Previous antidepressant medications generally had side effects quite incompatible with flying duties, including fatigue, drowsiness, and marked anticholinergic effects. In the past decade, increasing experience has been gained with this new generation of antidepressants (SSRIs and SNRIs) whose effect is to modulate the intracellular action of neurotransmitters in various parts of the brain whose imbalance is thought to be a causative factor in anxiety and depression. There is an increasing consensus of medical opinion that it is possible to allow the use of these medications in aircrew in circumstances that would not compromise flight safety or operational effectiveness, and would allow the preservation of trained aircrew resources.

There is also widespread recognition that medical personnel sometimes collude with patients and choose diagnoses or treatments to avoid administrative requirements. This may lead to inappropriate diagnosis (e.g., diagnosing adjustment disorder when depression is more appropriate to avoid grounding, or using bupropion under the pretext of smoking cessation in order to treat depression). Efforts to avoid prolonged grounding may also contribute to undertreatment, avoiding the use of medications and thereby adding to morbidity, which may paradoxically extend the time required before return to aviation duties is possible. There is often considerable overlap between the clinical syndromes of depression and anxiety, leading to comorbid diagnoses and similar treatments, with SSRIs currently the mainstay of treatment for both. To avoid encouraging the misdiagnosis of anxiety disorders as depression by excluding them from this protocol, the less severe anxiety disorders will be addressed as well.

All of the medications in this class have similar efficacy. They also have similar side effect profiles, including potential discontinuation symptoms, but may vary somewhat in the relative frequency of these side effects. Adverse effects tend to occur early in treatment and diminish as the patient becomes physiologically accustomed to the medication. This individual variability obviates the need to specify a preference for approval of one medication over another, especially since personnel will be required to be demonstrably free of symptoms or neurocognitive side effects. The most common side effect with prolonged treatment is sexual dysfunction, which may not be aeromedically significant but may lead to cessation or alteration of therapy. SSRI-induced sexual dysfunction may be managed by switching to or augmentation with another agent (most commonly bupropion). Changing dosage or discontinuation of medication requires temporary grounding and close monitoring for aeromedically significant symptoms.

**RESEARCH ASPECTS:** US Army Aeromedical Research Laboratory (USAARL) is working on designing a study to assess the effects of medication therapy with flight performance. Part of their work is to validate that medication use does not have a decrement in flight performance, which is different from showing no cognitive deficit changes with such instruments as the CogScreen® assessment.

Participants will be requested from those applying for and receiving an aeromedical waiver on a voluntary basis. Participation will not be mandatory and will not be used in a negative manner (i.e., to remove anyone from flight status or rescind a waiver). Participation in this study is akin to participants that helped with changing the Army aeromedical opinion of Corneal Refractive Surgery, which returned positive, policy-changing results

# SCHIZOPHRENIA AND OTHER PSYCHOTIC DISORDERS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Symptoms of aeromedical concern include eccentric behavior, illogical thinking, hallucinations, social withdrawal, and a risk of suicide. Recurrence is abrupt, unpredictable, and incapacitating in aviation.

**WAIVERS:** Schizophrenia, Schizophreniform Disorder, Schizoaffective Disorder, Delusional Disorder, Brief Psychotic Disorder Without Marked Stressors, and Psychotic Disorder NOS: Disqualifying for aviation; no waivers granted. Should be referred to PEB/MEB for fitness for general duty/retention. Brief Psychotic Disorder With Marked Stressors (Brief Reactive Psychosis): Considered disqualifying for all aviation duties. Waiver may be requested when asymptomatic and off medications for one year in a Full-Duty status. These cases are handled on a case-by-case basis depending on the prognostic factors of the case. Substance-Induced Psychotic Disorder with clear evidence from the history, physical examination, or laboratory findings that the disturbance is etiologically related to medication use: Not considered disqualifying when resolved, as long as the "substance" inducing psychosis was not alcohol or illicit drugs. Psychotic Disorder Due To General Medical: Not considered disqualifying when the general medical condition is resolved and if the precipitating organic factors are identified and considered not likely to recur. (Physical illness or other disorders causing persistent delirium are permanently disqualifying and should be referred to PEB/MEB.)

## DSM IV CODES:

- 295.xx Schizophrenia:
- 295.30 Paranoid Type
- 295.10 Disorganized Type
- 295.20 Catatonic Type
- 295.90 Undifferentiated Type
- 295.60 Residual Type
- 295.40 Schizophreniform Disorder (Specify: Without Good Prognostic Features/With Good Prognostic Features)
- 295.70 Schizoaffective Disorder (Specify type: Bipolar Type/Depressive Type)
- 297.1 Delusional Disorder (Specify type: Eerotomaniac/Grandiose/Jealous/Persecutory/Somatic/Mixed/Unspecified)
- 298.8 Brief Psychotic Disorder (With Marked Stressor(s)/Without Marked Stressor(s)/With Postpartum Onset)
- 297.3 Shared Psychotic Disorder
- 293.xx Psychotic Disorder due to . . . (Indicate the general medical condition.):
  - 293.81 With Delusions
  - 293.82 With Hallucinations
    - \_\_\_\_ Substance-Induced Psychotic Disorder (Refer to Substance-Related Disorders for substance-specific codes.) (Specify: With Onset During Intoxication/With Onset During Withdrawal.)
- 298.9 Psychotic Disorder NOS

(For diagnostic criteria, see DSM-IV, page 273ff.)

## INFORMATION REQUIRED:

- Complete AMS to include
- Psychiatric and
- Psychological evaluation,
- Psychological testing if necessary, and
- Copy of PEB/MEB if applicable.

**FOLLOW-UP:** Psychiatric follow-up is at the discretion of the treating psychiatrist. The majority of these disorders require PEB/MEB due to their incompatibility with general duty.

**TREATMENT:** Antipsychotic medications and close psychiatric follow-up care are incompatible with aviation duty.

**DISCUSSION:** Increased vulnerability to stress is considered lifelong in these disorders. In Schizophrenia, one-third will lead somewhat normal lives; one-third will continue to have significant symptoms; one-third require frequent hospitalization and chronic care. Fifty percent of schizophrenics will attempt suicide; ten percent will succeed.

# SEXUAL AND GENDER IDENTITY DISORDERS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Generally, these do not impact on a person's aviation performance. However, the social consequences of some of the paraphilic behaviors, such as exhibitionism and transvestic fetishism, may impact aviation performance. Some patients exhibit questionable judgment, and certain legal ramifications may cause the person to be inattentive to detail and thus become a safety risk.

**WAIVERS:** Sexual disorders are considered disqualifying if they impact on aviation performance. If a person becomes dysfunctional due to a sexual disorder, refer to PEB/MEB review. Many cases are handled by administrative disposition due to the legal implications and impact on good order and discipline.

## DSM IV CODES:

### Sexual Desire Disorders:

- 302.71 Hypoactive Sexual Desire Disorder
- 302.79 Sexual Aversion Disorder

### Sexual Arousal Disorders:

- 302.72 Female Sexual Arousal Disorder/Male Erectile Disorder

### Orgasmic Disorders:

- 302.73 Female Orgasmic Disorder
- 302.74 Male Orgasmic Disorder
- 302.75 Premature Ejaculation

### Sexual Dysfunction (Due to a General Medical Condition):

- 625.8 Female Hypoactive Sexual Desire Disorder
- 608.89 Male Hypoactive Sexual Desire Disorder
- 607.84 Male Erectile Disorder
- 625.0 Female Dyspareunia
- 608.89 Male Dyspareunia
- 625.8 Other Female Sexual Dysfunction
- 608.89 Other Male Sexual Dysfunction

### Sexual pain Disorders:

- 302.76 Dyspareunia Not Due to a General Medical Condition
- 306.51 Vaginismus Not Due to a General Medical Condition

### Paraphilic Behaviors:

- 302.4 Exhibitionism
- 302.81 Fetishism/
- 302.89 Frotteurism/302.2 Pedophilia
- 302.83 Sexual Masochism
- 302.84 Sexual Sadism
- 302.3 Transvestic Fetishism
- 302.82 Voyeurism
- 302.9 Paraphilia NOS

### Gender Identity Disorders:

- 302.xx Gender Identity Disorder
  - .6 in Children
  - .85 in Adolescents or Adults
- 302.6 Gender Identity Disorder NOS

302.9 Sexual Disorder NOS  
\_\_\_\_\_. Substance-Induced Sexual Dysfunction  
302.70 Sexual Dysfunction NOS (Refer to Substance-Related Disorders for substance-specific codes.)

(For diagnostic criteria, see DSM-IV, page 493.)

**INFORMATION REQUIRED:**

- Psychiatric and
- Psychological evaluation with
- Statement from the flight surgeon and
- Statement from commander regarding the individual's aviation performance.

**FOLLOW-UP:** Psychiatric follow-up is at the discretion of the mental health provider in those cases in which treatment is deemed necessary

**TREATMENT:** The treatment of sexual desire/aversion/arousal/pain/orgasm disorders generally involves behavioral techniques that should not preclude aviation duty. Use of medication is incompatible with aviation duty. Treatment of paraphilic disorders is less successful, but the same rules apply.

**DISCUSSION:** Paraphilic activity often has a compulsive quality. Patients may repeatedly engage in deviant behavior, and this behavior increases when the patient feels stressed, anxious, or depressed. The legal consequences generally preclude treatment within the military.

## SLEEP DISORDERS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Problems initiating or maintaining sleep or sleeping excessively can lead to degradation of performance. Daytime drowsiness or somnolence can interfere with psychomotor performance and flying safety. Physical and mental changes are usually insidious, and there is often an association with an underlying psychiatric disorder or other pathology. Complications of Sleep Apnea are cardiac arrhythmias and hypertension. Automatic behavior, intellectual decline, and lapses of memory have been reported in Narcolepsy and Sleep Apnea.

**WAIVERS:** Sleep Disorders that cannot be treated by short-term surgical or medical means will not be considered for waivers. Disorders that resolve with treatment could be considered for waivers. A waiver may be considered after full recovery for those transient cases related to life crises, medical conditions, or obesity. Patients with restless extremity syndrome (RES) may be considered for waiver if the cause has been defined and permanently cured, and the sleep disorder secondary to the syndrome has resolved. Successful waiver is unlikely in other cases of Hypersomnia.

### DSM-IV CODES:

#### Primary Sleep Disorders:

- 307.42 Primary Insomnia
- 307.44 Primary Hypersomnia (Specify if: Recurrent)
- 347 Narcolepsy
- 780.59 Breathing-Related Sleep Disorder
- 307.45 Circadian Rhythm Sleep Disorder
  - (Specify type: Delayed Sleep Phase Type/Jet Lag Type/Shift Work Type/Unspecified Type)
- 307.47 Dyssomnia NOS

#### Sleep Disorders Related to Another Mental Disorder

- 307.42 Insomnia Related to . . . (Indicate the Axis I or Axis II Disorder)
- 307.44 Hypersomnia Related to . . . (Indicate the Axis I or Axis II Disorder)

#### Other Sleep Disorders:

- 780.xx Sleep Disorder Due to
  - .52 Insomnia Type
  - .54 Hypersomnia Type
  - .59 Parasomnia Type
  - .59 Mixed Type

\_\_\_\_ Substance-Induced Sleep Disorder (Refer to Substance-Related Disorders for substance-specific codes)  
(Specify type: Insomnia Type/Hypersomnia Type/Parasomnia Type/Mixed Type)  
(Specify if: With Onset During Intoxication/With Onset During Withdrawal)

#### Parasomnias

- 307.47 Nightmare Disorder
- 307.46 Sleep Terror Disorder
- 307.46 Sleepwalking Disorder
- 307.47 Parasomnia NOS

(For diagnostic criteria, see DSM-IV, page 551.)

### INFORMATION REQUIRED:

- Complete AMS including
- Sleep Disorder work-up with polysomnography as needed.

**FOLLOW-UP:** Follow-up treatment is at the discretion of the treating clinician. Waivers are unlikely to be given to those that need any significant follow-up other than routine annual FDME and close questioning of the individual.

**TREATMENT:** Some of the Sleep Disorders such as Sleep Apnea and Sleep Disorder due to a General Medical Condition can be cured and would allow return to flight status. Drug therapy is incompatible with flying status.

**DISCUSSION:** Sleep Disorders are increasingly recognized and directly impact performance. Diagnosis and treatment are becoming more sophisticated and available. Of those cases referred to a sleep clinic, 51 percent suffered from hypersomnia, of whom 43 percent had Sleep Apnea; 25 percent, Narcolepsy; and 9 percent idiopathic CNS Hypersomnia. There is evidence of autosomal transmission of a recessive trait for Narcolepsy, which increases in prevalence from 6.7 per million to 1 in 10,000. Of all patients with Narcolepsy, 80 percent develop their symptoms by 35 years of age. Cataplexy will ultimately develop in 85 percent of patients with Narcolepsy.

## SOMATOFORM AND FACTITIOUS DISORDERS

Update: MAR 1997

**AEROMEDICAL CONCERNS:** These disorders have a chronic course and patients make repeated visits to physicians due to multiple physical or somatic complaints. Patients with factitious disorders may seriously injure themselves (injecting feces, swallowing ground glass, injecting insulin) and are at extreme risk in the aviation environment. In the aviation community, somaticizing may mask an unconscious fear of flying.

**WAIVERS:** These disorders are disqualifying: no waiver is recommended. They should be referred to PEB/MEB for review for retention. Waivers may be considered for those rare cases that are successfully treated provided they remain asymptomatic and off medications for one year in a full-duty status. An unconscious fear of flying is a disqualifying condition but may be waivable with successful treatment and if the aviator remains asymptomatic for one year.

### DSM IV CODES:

Somatoform Disorders:

- 300.81 Somatization Disorder
- 300.81 Undifferentiated Somatoform Disorder
- 300.11 Conversion Disorder (Specify type: With Motor Symptom or Deficit/With Sensory Symptom or Deficit/With Seizures or Convulsions/With Mixed Presentation)
- 307.xx Pain Disorder (Specify if Acute/Chronic)
  - .80 Associated with Psychological Factors
  - .89 Associated with Both Psychological Factors and a General Medical Condition
- 300.7 Hypochondriasis (Specify if: With Poor Insight)
- 300.7 Body Dysmorphic Disorder
- 300.81 Somatoform Disorder NOS

(For diagnostic criteria, see DSM-IV, page 445.)

Factitious Disorders:

- 300.xx Factitious Disorder
  - .16 With Predominantly Psychological Signs and Symptoms
  - .19 With Predominantly Physical Signs and Symptoms
  - .19 With Combined Psychological and Physical Signs and Symptoms
- 300.19 Factitious Disorder NOS

(For diagnostic criteria, see DSM-IV, page 471.)

### INFORMATION REQUIRED:

- Psychiatric and
- Psychological evaluation,
- Copy of Medical Board if applicable, and
- Flight surgeon's narrative outlining any social, occupational, administrative, or legal problems of the patient.

**FOLLOW-UP:** Follow-up psychiatric care is at the discretion of the treating mental health provider.

**TREATMENT:** Treatment offers little hope of return to flight status in Factitious Disorders. These patients are rarely motivated for psychotherapy, and generally change physicians when confronted. The psychotropic medications used in Somatoform Disorders are incompatible with aviation status.

**DISCUSSION:** Fifteen to thirty percent of patients with hypochondriacal disorders have physical problems. Thirty percent of Conversion Disorders have associate physical illness. Factitious Disorders have a high risk of substance abuse over time. Somatization and Hypochondriasis may be seen as a behavioral manifestation of an unconscious fear of flying.

## SUBSTANCE-RELATED DISORDERS: SUBSTANCES OTHER THAN ALCOHOL

Update: JUN 2005

**AEROMEDICAL CONCERNS:** Abuse of controlled substances, to include anabolic steroids, marijuana, prescription medications, and other psychoactive substances is incompatible with aviation service and presents a serious risk to aviation safety.

**WAIVERS:** Abuse of controlled substances is disqualifying for all aviation related duties. Exception to policy is not recommended but may be requested for history of experimental (not habitual) use of cannabinoids or other drugs, short of addiction or dependence, if there is evidence of current drug abstinence, no history of drug abuse treatment and the individual is otherwise qualified for aviation service. Trained aircrew will not normally be considered for waiver of substance abuse unless overwhelming evidence and support exist from command as well as the local flight surgeon and ASAP Clinical Director.

### INFORMATION REQUIRED:

- Complete flight physical
- A complete AMS with the flight surgeon's recommendations to include a search for underlying psychiatric disorders, medical disorders, or significant social or family dysfunction.
- Report of evaluation and recommendations by ASAP, to include a detailed description of the aircrew member's use of controlled substances.

**TREATMENT:** As clinically indicated.

**DISCUSSION:** According to a study conducted by the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA), in 1999 an estimated 14.8 million Americans were current illicit drug users. This estimate represents 6.7 percent of the population 12 years old and older. Marijuana is the most commonly used illicit drug in the U.S. and in the U.S. Army (according to 2001 Army statistics). The highest rate of illicit drug use in the SAMHSA study was found among persons aged 18-20 years, with rates of use between 20 and 21 percent. For these older youths, use is dominated by marijuana (18 percent of sample). The rates of use generally decline in each successively older age group, with the exception of the 40-44 year old age group. Members of this cohort were teenagers during the 1970s, the period when drug use incidence and prevalence rates were rising dramatically.

Relapse rates for cocaine and opioids are higher than those for alcohol in the first year of sobriety in many studies (although studies of opioid dependence usually focus on heroin addicts rather than prescription drug abusers). However, the prognosis is much better for professionals (e.g., physicians, pilots, and lawyers) than for the general population, with even higher success rates for the treatment of cocaine and opioid dependence than for alcohol, probably related to the potential loss of professional status. This finding is true in rural populations as well, probably due to issues of availability and social acceptance (greater for alcohol, nicotine dependence has the worst prognosis of all), which are also operative in the military.

Applicants to Army aviation that have used controlled substances experimentally may be found unfit for flying duties. Given the prevalence in current society of young individuals that have experimented with controlled substances on a limited basis, short of addiction, exception to policy may be considered on a case-by-case basis. However, Army aircrew that misuse or abuse controlled substances are without exception medically unfit for flying duties secondary to the serious cognitive, psychomotor and other physical impairment caused by these substances. These individuals may also be subject to disciplinary and administrative action by the aviation command.

**REFERENCES:**

- Vaillant, G, The Natural History of Alcoholism, *Alcohol Health and Research World*, 1996, (20) 3, 152-161.
- O'Brien, C and McLellan A, Myths about the Treatment of Addiction, *Lancet* 1996; 347: 237-240.
- Burge SK. Alcohol Related Problems: Recognition and Intervention. *Am Fam Physician* 1999;59(2): 361-70, 372



## PULMONARY DISEASE WAIVERS

# ASTHMA

Update: MAR 2003

**AEROMEDICAL CONCERNS:** Asthma symptoms can rapidly progress from minimal to totally disabling at any time. Exacerbations and asthmatic symptoms may pose a threat to aviation safety by interfering with cockpit tasks and duties as well as general mission completion.

## WAIVER:

**Initial (Class 1A/1W):** Asthma, including reactive airway disease, exercise induced bronchospasm, or asthmatic bronchitis reliably diagnosed at any age is disqualifying. Exceptions to policy are possible with submission of required information as listed below.

### **Initial (Class 2, 3, 4) and Rated Aviators (Class 2):**

Waivers are possible for mild intermittent and mild persistent asthma if individual meets the following criteria:

- Meet criteria for mild intermittent or mild persistent asthma (see below).
- Has demonstrated they can perform all military training and duties (including the APFT) without activity limitations.
- Has no past history of sudden severe exacerbations, severe persistent or moderate persistent asthma.
- No history of any hospitalizations or intubations for exacerbations.
- No history of recurrent oral steroid use for exacerbations.

## INFORMATION REQUIRED:

- Statements from the aeromedical provider demonstrating aircrew member meets the criteria set forth above.
- Internal Medicine and/or pulmonology consultation to include complete pulmonary function testing (PFT).
- Baseline, post bronchodilator, and methacholine/provocative testing may be required.
- Chest X-ray (PA/LAT) results where appropriate.
- Allergy/immunology work-up may be required.

**FOLLOW-UP:** Follow- up with aviation health-care provider is required annually with notes on degree of symptom control, history of any exacerbations, current medications, in addition to annual spirometry testing.

**TREATMENT:** For aircrew members who meet the above criteria, short-acting beta-agonist rescue inhalers, low-dose inhaled corticosteroids, and leukotriene modifiers are authorized in addition to cromolyn sodium and nedocromil sodium inhalers. Smoking cessation, if applicable, is also an essential component of the treatment regimen to prevent worsening of symptoms and exacerbations. Applicants for waiver who continue to smoke should be counseled on cessation and offered assistance. (See Smoking Cessation APL). Immunotherapy is authorized where indicated and patient will be considered for waiver 30 days post-completion of therapy provided relief of symptoms and above criteria are met.

**DISCUSSION:** Reliable diagnostic criteria for asthma should consist of any of the following:

- Substantial history of cough, wheeze, and/or dyspnea that persists or recurs over a prolonged period of time, generally more than 6 months.
- If the diagnosis is in doubt, a test for reversible airflow obstruction (greater than a 15 percent increase in FEV1 following administration of an inhaled bronchodilator OR airway hyperactivity (as demonstrated by exaggerated decrease in airflow induced by bronchoprovocation challenge such as methacholine inhalation or a demonstration of exercise induced bronchospasm)).

Chronic asthma that results in a P3 or P4 profile and MEB/PEB as outlined in AR 40-501 paragraph 3-27 a (2) will not be considered for waiver. The table below provides guidance on definition and treatment with respect to mild persistent and mild intermittent asthma as well as general follow-up guidelines for the aeromedical healthcare provider.

**Adapted from: National Asthma Education and Prevention Program Expert Panel Report 2:  
Guidelines for the Diagnosis and Management of Asthma**

Class Severity	Day/Night Symptoms	PEF or FEV1 PEF Variability	Daily Medications *
STEP 2	>2/week but <1x/day	Greater than or equal to 80% 20-30%	Preferred Treatment: Low-dose inhaled corticosteroids Alternative Treatment (listed alphabetically): cromolyn, leukotriene modifier, nedocromil No daily medication needed.
Mild Persistent	>2 nights/month	Greater than or equal to 80% 20-30%	Severe exacerbations may occur, separated by long periods of normal lung function and no symptoms. A course of systemic corticosteroids is recommended.
STEP 1	<u>Less than or equal to</u> 2 days/week	Greater than or equal to 80% < 20%	
Mild Intermittent	Less than or equal to 2 nights/month		

For mild intermittent asthmatics, the recommended follow-up is every 6-12 months to reassess symptoms and appropriate classification. For those with mild persistent asthma, the recommended follow-up is every 6 months.

Asthma currently affects 5-10 percent of the U.S. population. Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, macrophages, neutrophils, and epithelial cells. In susceptible individuals this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyperresponsiveness to a variety of stimuli and pharmacologic therapy is directed at suppressing airway inflammation. Asthma may have an allergic basis, be it associated with allergic rhinitis, occur secondary to gastroesophageal reflux, or occur subsequent to upper respiratory infection. Attacks can be precipitated or exacerbated by breathing dry, cold air, exercise, or exposure to a known allergen.

**REFERENCES:**

- <http://www.nhlbi.nih.gov/health/prof/lung/asthma/practgde.htm> Practical Guide for the Diagnosis and Management of Asthma
- <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm> Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics 2002

## CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Chronic obstructive pulmonary disease (COPD) results in reduction in maximum oxygen uptake and exercise tolerance . Cerebral hypoxia can adversely affect psychomotor skills, memory, judgment and cognition. Decrement in judgment and the ability to perform complex tasks are also caused by carbon dioxide retention which can occur in COPD. Sudden incapacitation, even death as a result of pneumothorax and fatal air embolism, can occur if bullae rupture.

**WAIVER:** Waivers may be considered for designated aviators only on a case-by-case basis if: (1) There is no cardiovascular decompensation; (2) Exercise tolerance is unimpaired; (3) The patient does not require medications; and (4) There are no bullae evident.

### INFORMATION REQUIRED:

- Internal medicine or pulmonology consultation is required, to include
- Chest x-ray and/or CT to exclude bullae, and
- Complete PFT including bronchodilator challenge.
- Cardiology consultation may be required if there is evidence of RVH.

**FOLLOW-UP:** Annual PFT with internal medicine or pulmonology consultation is normally required.

**TREATMENT:** The use of steroid inhalers either alone or in concert with beta agonists or cholinergic antagonists is considered disqualifying and waiver is rarely granted. Treatment of reversible airway obstruction by immunotherapy is considered waivable. The expense and questionable effectiveness of immunotherapy for COPD, however, makes this option less attractive. Use of cromolyn sodium is not normally waivable in this condition. Annual influenza immunization, pneumovax, and treatment aimed at smoking cessation and weight loss (if overweight) are encouraged.

**DISCUSSION:** The lower limit of oxygenation needed to permit adequate cerebral oxygenation is  $\text{PaO}_2 > 65 \text{ mm Hg}$  at sea level. With extreme COPD, obesity or tight-fitting clothing can reduce lung volumes leading to hypoventilation and ventilation/perfusion imbalance. Patients with COPD are also at increased risk of acute chest infections, complicating care in the operational setting. Symptoms will be expected when the forced expiratory volume at 1 second (FEV1) reaches 50% of that predicted by sex and age. While the normal FEV1 declines at about 30 ml/year, the reduction in smokers can reach 90 ml/year. Of all COPD patients, up to 50% will have persistent, productive cough; up to 25% will be moderately disabled with recurrent chest infections and increasing absences from work; and up to 25% will be severely disabled within 10 years.

# OBSTRUCTIVE SLEEP APNEA

Update: JAN 2003

**AEROMEDICAL CONCERNS:** Obstructive Sleep Apnea (OSA) is a condition resulting in disrupted sleep and excessive daytime sleepiness with demonstrable deficits in cognitive and psychomotor performance. The condition is linked to hypertension, angina, nocturnal cardiac arrhythmias, myocardial infarction, and stroke - many of which would be incapacitating in flight. In addition, aircrew with OSA may develop cardiovascular abnormalities to include dilated cardiomyopathy. The repetitive nocturnal oxygen desaturations that are part of this condition can lead to the development of pulmonary hypertension and Cor Pulmonale.

## WAIVERS:

**Initial Applicants (Class 1A/1W):** Exception to policy are rarely granted unless the individual was surgically treated and postoperative polysomnography (PSG) demonstrates resolution.

**Initial Applicants (Classes 2F, 3, and 4):** Waivers are granted on a case-by-case basis.

**Rated Aviation Personnel (All Classes):** Sleep apnea is disqualifying for aviation duty.

Class 2, 2F, 3, and 4: Waivers are possible and granted on a case-by-case basis if the condition is treated with weight loss, dental device, surgery, or use of Continuous Positive Airway Pressure (CPAP) devices with documented resolution via PSG.

## INFORMATION REQUIRED:

Aeromedical Summary (AMS) with:

- Results of PSG to confirm diagnosis and a post-treatment PSG to document improvement with therapy,
- ENT or Pulmonary consultation,
- Oral Surgery consultation if a dental device is used,
- Note of current treatment for the condition,
- Copy of operative report if surgically treated.

**FOLLOW-UP:** Annual ENT or Pulmonary Consultation. Oral Surgery consultation if a dental device is used.

**TREATMENT:** Weight loss is the simplest treatment and a loss of 10 percent body weight can result in symptom resolution. The identification and treatment of risk factors such as obesity and hypothyroidism may lead to resolution. In some cases, modification of sleep position may be adequate. Dental devices that modify position of the tongue or jaw, and upper airway and jaw surgical procedures such as Uvulopalatopharyngoplasty (UPPP) and Laser-assisted uvulopalatoplasty (LAUP) are additional therapies. Nasal CPAP is a common treatment, but may not be feasible in the army aviation environment with the possibility of service in austere environments.

**DISCUSSION:** OSA is caused by repetitive upper airway obstruction during sleep as a result of narrowing of the respiratory passages. Obstructive apnea is the cessation of airflow for 10 seconds or more associated with continued respiratory effort. Obstructive hypopnea is the reduction in airflow for 10 seconds or more associated with continued respiratory effort. The Apnea/hypopnea index (AHI) is a commonly reported result of the PSG. AHI is defined as the number of apneas and hypopneas per hour of sleep. Normal AHI is fewer than five per hour. In severe cases, of OSA, AHI exceeds 30 per hour. Another measure on the PSG is the respiratory distress index (RDI). Normal RDIs are generally less than 10 with values between 5 and 20 considered mild, 20-50 moderate, and greater than 50 indicative of severe sleep apnea. The obstructive episodes are often associated with a reduction in oxyhemoglobin saturation. The multiple arousals with sleep fragmentation are the likely cause of excessive daytime

sleepiness. OSA is a significant medical problem affecting up to 4 percent of middle-aged adults. Common features include: Loud snoring, disrupted sleep, nocturnal gasping and choking, witnessed apnea, daytime sleepiness and fatigue, crowded posterior airway and short, thick neck.

**REFERENCE:** American Sleep Apnea Association, <http://www.sleepapnea.org/>

# PNEUMOTHORAX

Update: MAR 1997

**AEROMEDICAL CONCERNS:** Pneumothorax may cause acute chest pain and shortage of breath in flight, worsening as ambient pressure falls. Tension pneumothorax may cause hypoxia arising from ventilation/perfusion imbalance and mediastinal shift may cause cardiovascular embarrassment. Spontaneous pneumothorax is the result of some underlying pulmonary disorder (COPD, bullae, bronchiolitis, emphysema, asthma, sarcoidosis, histoplasmosis, etc.) which places an individual at higher risk of morbidity as well as recurrence of pneumothorax.

**WAIVER:** Previous history of a spontaneous pneumothorax is disqualifying for initial flight applicants. Exception to policy is not recommended. Single instance of spontaneous pneumothorax requires no waiver, but must be grounded locally for at least 2 months or until complete recovery, normal PFTs, and no underlying pathology is present. Waiver may be possible for patients with recurrent spontaneous pneumothorax after surgical pleurodesis and a satisfactory period of postoperative observation of 6 months. Chamber flight before return to flying duties is no longer required.

## INFORMATION REQUIRED:

- Chest x-ray and
- Thin cut CT scan should demonstrate full lung expansion,
- Normal PFTs, and
- No pathology exists which could predispose to recurrence.
- Thoracic surgery consultation may be required, especially in recurrent cases.

**FOLLOW-UP:** Recurrence of pneumothorax requires resubmission for waiver and an evaluation as above.

**TREATMENT:** All recognized forms of surgical treatment are compatible with waiver. There is a substantial failure rate after chemical pleurodesis and chemical pleurodesis is not an acceptable treatment.

**DISCUSSION:** Over 90% of patients presenting with spontaneous pneumothorax are under 40 years old with 75% being less than 25. In women, there is sometimes a relationship to menstruation. Onset of spontaneous pneumothorax is accompanied by chest pain in 90% of cases and by dyspnea in 89%. Tension pneumothorax develops in 5% and hemopneumothorax in 2.5%. Recurrence rates in patients who have not had definitive treatment has been reported from 5- 60% with most in the first year. In one series of patients followed for 10 years without surgery, ipsilateral recurrence followed in 50% of which 62% happened in the first 2 years. Another study reported recurrence of 30% after a first spontaneous pneumothorax, 50% after a second episode and 80% after a third. The contralateral risk was reported as 10%. The recurrence rates after surgery depend on the procedure used. After thorascopic pleurodesis, it can be as high as 16% while fibrin pleurodesis has been reported to have a recurrence rate of 4%. Surgical pleurodesis/pleurectomy has a 1% recurrence. A recent USAF review of patients exposed to chamber flight before return to flying duties revealed that none was eliminated, and there was no prediction of later recurrence, so this test has been discontinued.

# SARCOIDOSIS

Update: APR 2003

**AEROMEDICAL CONCERNS:** Sarcoidosis is a multi-organ system granulomatous disorder of unclear etiology. Sarcoidosis can affect any organ system. The most common is the lung followed by the skin, lymph nodes, eye, and liver. Cardiac sarcoidosis, with an incidence of between 5 and 20 percent, is associated with restrictive cardiomyopathy, ECG abnormalities such as ectopy and atrioventricular blocks, and sudden death from arrhythmias. Pulmonary involvement is progressive in 15-20 percent and results in a mix of restrictive and obstructive impairments. Uveitis can cause permanent visual damage. Neurologic involvement can produce a variety of symptoms to include fluctuating hearing loss, cranial nerve palsies, and seizures. Hypercalcemia can predispose the aircrew member to renal stones.

## WAIVER:

**Initial Applicants (Class IA/1W):** All forms of sarcoidosis are disqualifying. Initial flight applicants with either a history of or an active case of sarcoid will not be granted an exception to policy.

**Initial Applicants (Classes 2F, 3, and 4):** Waivers will not routinely be granted. Applicants with a history of sarcoidosis, who have been in remission for at least 1 year without the need for chronic medication, may be considered with a normal work-up (see below).

**Rated Aviation Personnel (All Classes):** Aircrew members with asymptomatic sarcoidosis may be considered for a waiver if in remission for at least 1 year and with a normal work-up (See below). Persistent, widespread pulmonary shadowing on x-ray with abnormal pulmonary function testing, and/or evidence of myocardial involvement (e.g., fixed thallium defect, significant arrhythmia, or wall motion abnormalities on ECHO) are all considered permanently disqualifying, no waiver recommended.

## INFORMATION REQUIRED:

- A complete AMS is required.
- A definitive histological diagnosis is required with AMS submission. This may be from a transbronchial lung biopsy or from skin, conjunctiva or salivary gland biopsy.
- Pulmonary medicine consultations are required.
- Ophthalmology (including slit lamp examination) is required at the time of waiver request.
- Recent PA and lateral chest x-ray (within 6 months) and a chest CT.
- CBC, liver function tests, serum electrolytes, ACE, ESR, transaminase, serum calcium and phosphorous, and 24-hour urinary calcium.
- Pulmonary function testing (PFT) with diffusion studies (e.g., DLCO), thallium AGXT, 24-hour Holter monitor.
- All cases with possible systemic or cardiac sarcoid should be referred to the USAAMA for further evaluation.

**FOLLOW-UP:** Annual internal medicine or pulmonary medicine consultation, PA, and lateral chest x-ray, ECG, CBC, LFT's, serum electrolytes, serum Calcium, and phosphorous and PFT's with diffusion studies are required. Further work-up is at the discretion of USAAMA. Reactivation of the disease will require a complete work-up as above and resubmission for waiver.

**TREATMENT:** Seventy-five percent of patients with asymptomatic sarcoidosis will spontaneously remit without treatment. Use of corticosteroids is not indicated in the absence of progressive end organ damage. The most common indication to begin corticosteroids is progression of disease in any organ system. Active treatment of sarcoidosis with any medication is NOT compatible with flying duties.

**DISCUSSION:** The incidence of sarcoidosis is highest in the 20 - 29 age group and is 3-4 times more common in African Americans. The majority of patients diagnosed with sarcoidosis present with abnormal radiographic findings (usually bilateral enlargement of hilar nodes) or nonspecific respiratory symptoms. Lung involvement occurs in over 90 percent of patients with sarcoidosis. The pulmonary classification of sarcoidosis is based on radiographic findings and can be divided into Stages 0-IV. Stage 0 indicates no visible radiographic involvement. Stage I is identified by the presence of bilateral hilar adenopathy. Stage II includes bilateral hilar adenopathy and interstitial infiltrates. Stage III is demonstrated by reticulonodular infiltrates without hilar adenopathy and Stage IV by advanced pulmonary fibrosis without adenopathy. Other presenting signs and symptoms associated with sarcoidosis include erythema nodosum (10 to 50 percent with females predominating), uveitis (15 to 25 percent) and enlargement of superficial nodes (30 percent of Europeans and up to 80 percent of African-Americans). Up to 30 percent of cases with acute sarcoidosis will have abnormal thallium scans suggesting myocardial involvement and liver biopsy will show sarcoid granulomas in 70 percent of cases without evidence of altered liver function. Nervous system involvement is demonstrable in 10 percent, but may be sub clinical in a greater percentage. Osteolytic or osteosclerotic bone lesions are also present in 10 percent of cases. Healed myocardial granulomas may lead to arrhythmias, and patients in remission who have had myocardial involvement remain at risk for sudden death. MRI scan may eventually prove to be the method of choice for identifying cardiac sarcoid granulomas.

**REFERENCE:** [www.utdol.com](http://www.utdol.com) (can be accessed through <http://medlinet.amedd.army.mil> with AKO username and password)



## UROLOGY WAIVERS

## CYSTIC AND CONGENITAL ABNORMALITIES OF THE KIDNEY

Update: DEC 2003

**AEROMEDICAL CONCERNS:** Polycystic disease (ICD9 753.12) may be associated with hypertension, Berry aneurysms, renal stones, infection, hematuria, GI symptoms and mitral valve prolapse. Simple retention cysts in the renal cortex may be susceptible to trauma. Medullary sponge kidneys (ICD9 753.17) can be associated with hematuria and formation of calculi. Large polycystic kidneys are not compatible with high performance flying because "G" forces cause the kidney to pull on the pedicle, which may result in bleeding.

### WAIVERS:

**Initial Applicant (All Classes):** Exception to policy for initial flight applicants is rarely granted.

**Rated Aviation Personnel (All Classes):** A waiver is possible in most cases provided adequate renal function and no symptoms are present.

**INFORMATION REQUIRED:** A complete AMS is required including:

- Nephrology consultation
- Appropriate imaging studies of the head (MRI or MRA) and US or CT-scan of the kidney need to be completed prior to waiver consideration. Approximately 20% of polycystic disease may have a coexisting Berry aneurysm.
- Normal Renal function and ruled out retained stone.

**FOLLOW-UP:** Annual nephrology or urology consultation to insure stable disease. Periodic CT of the kidney may be required to confirm lack of progression of the disease.

**TREATMENT:** Will vary depending on the patient's present condition and diagnosis.

**DISCUSSION:** The majority of patients with polycystic disease present with evidence of impaired renal function between the ages of 30 and 50. Approximately 10-40% of these patients will have Berry aneurysms, and 9% will die of intracranial hemorrhage. More than 60 % of patients with PKD will have hypertension. Upper urinary tract infections are common, especially in women. Unilateral renal agenesis with a normal functioning kidney is waivable. Medullary sponge kidney and hereditary megacalycosis are also waivable.

### REFERENCES:

Cystic Diseases of the Kidney, <http://www.emedicine.com/med/topic3189.htm>

Medullary Sponge Kidney, <http://www.emedicine.com/radio/topic433.htm>

## ERECTILE DYSFUNCTION

Update: DEC 2003

**AEROMEDICAL CONCERNS:** Male erectile dysfunction (ED) is a common medical disorder that affects 10 to 30 million men in the United States. Hormonal, diabetes mellitus, vascular insufficiency, and neurologic abnormalities may predispose men to erectile dysfunction. Psychogenic causes include inability to trust, feelings of inadequacy or difficulties with one's partner. Potential implications of coronary artery disease (CAD) should be considered in individuals that plan to resume sexual activity because of the high incidence of overt and covert CAD in patients with erectile dysfunction. The condition itself is not disqualifying in the aviation environment, however the cause of ED may lead to incompatible duty in aviation environment. There are many methods of treatments for ED; however, most current preferred method is using oral sildenafil citrate (Viagra).

### WAIVER:

**Initial Applicants (All Classes):** Waiver is considered on a case by case basis as the causes of ED can exclude an individual from duty in aviation environment.

**Rated Aviation Personnel (All Classes):** Rated individual who has ED and has been evaluated for the causes of ED, and has been treated with sildenafil may request a waiver for the use of this medication. Please see the medication APL for guidelines and restrictions on sildenafil use.

**INFORMATION REQUIRED:** All requests for waiver or exception to policy should include:

- Brief AMS – The workup process including history and physical, treatment course and side effects of the medication.
- The Urologist or Family practice must do the workup of this condition and document the initial dose of this medication and its side effects on an individual.

**FOLLOW-UP:** Interval history and physical examination. Complete Urological work-up if no resolution after trial of medication. Psychological consult must be done if a non-organic cause is suspected.

**TREATMENT:** Must use only the dosage indicated in the product insert. Must be free of side effects for 2 doses after beginning medication before returning to flying duties. No flying duties within 8 hours of last dose (two half-life).

**DISCUSSION:** The introduction of sildenafil (Viagra) has allowed an oral treatment (pill form) to be used for the treatment of ED to replace more invasive methods used in the past. Sildenafil belongs to a class of medications referred to as phosphodiesterase (PDE) inhibitors. Sildenafil indirectly causes an erection by acting as a selective inhibitor of cyclic GMP- specific phosphodiesterase type 5 (PDE5), resulting in smooth muscle relaxation and vasodilatation in the corpus cavernosum. Cyclic GMP also acts as a second messenger of nitric oxide (NO), which acts as an arterial dilator and smooth muscle relaxant. Relatively high levels of PDE5 are found in the human corpus cavernosum. Peak concentrations occur within 30 to 120 minutes after administration. Sildenafil is primarily metabolized by the cytochrome p450 hepatic microsomal enzymes to an active N-desmethyl metabolite with 50% of the parent drug's potency for PDE5 inhibition. Both the parent compound and its active metabolite are highly bound to plasma proteins with a terminal half-life of about 4 hours. Plasma levels are increased in patients over 65 (40% increase) and in patients with hepatic impairment (80% increase), severe renal impairment (creatinine clearance < 30mL/min; 100% increase), and concomitant use of potent cytochrome p450 3A4 inhibitors (e.g., macrolide antibiotics [200% increase], cimetidine, and antifungal agents). The pharmacodynamic effects of sildenafil reflect the distribution of PDE5 in different tissues and the favorable selectivity of this isozyme. Of primary concern to the aviator are cardiovascular and visual side effects. Single oral doses of sildenafil (100mg) administered to healthy volunteers produced decreases in supine blood pressure (mean maximum decrease of 8.4/5.5 mmHg). Peak effects coincide with peak plasma concentrations at

one to two hours after the dose and returning to baseline at 4 hours. This effect was not different than placebo at 8 hours. Significant effects have not been observed on the heart rate or no changes seen on electrocardiogram. Hypotensive effects are neither age dependent nor dose-related (range 25 to 100mg). Orthostatic effects have been rarely reported (< 2%) and occur at a similar rate in sildenafil and placebo-treated patients. Transient disturbances of visual function have also been observed (3%), especially at doses > 100mg. These effects include "blue-green" color-tinged vision, increased perception of light, and blurred vision. The effects on visual function appear to be related to weaker inhibitory effect of sildenafil on PDE6, which regulates signal transduction pathways in the retinal photoreceptors. Sildenafil exhibits a 10-fold selectivity for PDE5 over PDE6. Patients with inherited disorders of the retina are at particular risk for visual side effects. Vasodilatory effects of sildenafil also result in headache (16%), facial flushing (10%), and rhinitis (4%). The gastrointestinal effects of dyspepsia and reflux are seen secondary to relaxation of the lower esophageal sphincter (7%). Musculoskeletal effects of myalgia have also been observed although no treatment-related changes in serum creatine kinase or electromyogram have been recorded.

#### **REFERENCES:**

- NIH Consensus Development Panel on Impotence. Impotence. JAMA 1993; 270: 83-90.  
ACC/AHA Expert Consensus Document. Use of Sildenafil (Viagra) in Patients with Cardiovascular Disease. Circulation 1999; 99:168-177.  
Miller, TA. Diagnostic Evaluation of Erectile Dysfunction. AFP 2000; 61(1): 95-104, 109-110.

## HEMATURIA

Update: FEB 2014

**AEROMEDICAL CONCERN:** Hematuria is present when a urinalysis (UA) demonstrates three or greater red blood cells per high powered field ( $\geq 3$  RBCs/HPF). Hematuria is often asymptomatic, transient and of benign origin, but may also indicate the presence of an underlying disqualifying condition such as a renal stones or a renal tract malignancy.

### WAIVER:

**Note:** All UAs should be performed after 24-48 hours of no exercise and benign causes of hematuria, including urinary tract infections (UTI) have been resolved.

**All Classes to include applicants:** Waivers for isolated hematuria are considered after the appropriate work up and any underlying disqualifying conditions have been ruled out. Significant renal function impairment, significant polycystic kidney disease, or anemia secondary to hematuria is generally not considered for waiver. Underlying conditions must be addressed in accordance with the applicable APLs.

### Waiver Required:

- 1 or more microscopic UAs with  $> 50$  RBCs/HPF (gross hematuria)
  - Urology consultation required
- 2 of 3 microscopic UAs taken at weekly intervals with results  $\geq 3$  RBCs/HPF
  - Urology consultation required
- Unfavorable UAs, as above, accompanied by  $> 1+$  proteinuria, dysmorphic red blood cells, cellular casts, renal insufficiency, or any other clinical indicator suspicious for renal parenchymal pathology
  - Urology and internal medicine/nephrology consultations required.

**Information only:** Hematuria due to benign causes that is  $\geq 3$  RBCs/HPF on initial UA and resolves to  $< 3$  RBC/HPF on two subsequent UAs performed a week apart will be documented as "information only" and will not require further workup.

**No action required:** microscopic hematuria  $< 3$  RBCs/HPF on initial urinalysis (UA).

ICD 9 Code	Condition
599.7	Hematuria - excludes hemoglobinuria (791.2)
599.70	Unspecified
599.71	Gross (or High Grade) - greater than 50 RBCs/HPF or visibly bloody specimen
599.72	Microscopic - $\geq 3$ RBCs/HPF but $\leq 50$ RBCs/HPF, as determined by microscopic examination

**INFORMATION REQUIRED:** A complete AMS will contain the following documentation:

- A history and physical examination that documents presence or absence of flank pain, fever or urinary symptoms such as dysuria, frequency and urgency, addresses benign causes and includes risk factors.
- Cystoscopy
  - Cystoscopy with cytology for  $> 35$  years of age or having a risk factor outlined in the discussion section. [Evidence Strength Grade C]
  - In patients younger than 35 years of age, cystoscopy may be performed at the consultant's discretion. [Evidence Strength Grade C]
- Imaging results:

- Multi-phasic computed tomography (CT) urography (without and with intravenous (IV) contrast) or alternative imaging such as magnetic resonance urography (MRU). [Evidence Strength Grade C]
- Renal Ultrasound with/without IVP if there is a contraindication to performing one of the above studies.
- Results of renal biopsy, only if biopsy is deemed necessary by the consulted physician.
- Serum creatinine level and BUN.
- All UAs (dipstick and microscopic analysis) performed.
- All tests performed by the consulted physician(s).
- Medical summary from the consulted physician(s) that describes treatment, significance of imaging and test results, to what extent the condition has resolved, anticipated progression of condition, possibility of sudden incapacitation and necessary follow-up for the condition.

**FOLLOW-UP:** Annual internal medicine, nephrology or urology evaluation may be required for aircrew members granted a waiver. Follow-up requirements are based upon the underlying medical condition and must be documented by consulted physician.

**TREATMENT:** Standard of care for underlying medical condition.

**DISCUSSION:** The prevalence of hematuria, in general, has been estimated as 1 to 20% in the general population [1]. The prevalence of clinically significant hematuria in Army aviation personnel is largely unknown. However, it is likely to be on the lower side of the previously stated prevalence range owing to the selective nature of military service for healthy individuals and that studies suggest that aviation duty does not increase the likelihood of hematuria [2]. The Kaiser Permanente (KP) evidence based Common Methodology as applied to hematuria determined that there is insufficient evidence to support or refute the effectiveness of UAs as a screening tool for clinically significant hematuria [1]. Therefore, the results of UAs must be interpreted wisely in order to avoid subjecting the aviation crew member to unnecessary tests. Patients who are most likely to derive benefit from urological workups are those with a high risk for malignancy and other serious pathology. These individuals have the following risk factors: male gender, >35 years of age, history of cigarette smoking, pelvic radiation and chemical exposures (ex: cyclophosphamide and aromatic compounds), irritative voiding symptoms and prior urologic disease or treatment. The American Urologic Association (AUA) defines microhematuria as the presence of three or more RBCs/HPF but is only a recommended practice at the *expert opinion* level of evidence [3]. Neither KP nor the AUA recommends cytology for routine screening and will only be required for those who have elevated risk factors, as discussed above [1],[3]. It is recommended that a hematuria workup should be performed only when there is no evidence of infection. The combination of microscopic urinalysis and dipstick should be performed to exclude abnormalities such as pyuria, bacteriuria, and contaminants. In addition, benign causes, such as menstruation, sexual intercourse, vigorous exercise, viral illness, superficial trauma and analgesic use should also be evaluated and excluded before referral. Hematuria due to renal stones or malignancy should be addressed using the corresponding Kidney Tumors and Renal Stones APLs.

#### **REFERENCES:**

National Practice Recommendations for Hematuria: How to Evaluate in the Absence of Strong Evidence?  
 Perm J. 2009 Winter; 13(1): 37–46. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3034463/>.  
 Asymptomatic microscopic hematuria in pilots. *Aviat Space Environ Med.* 1987 May; 58(5):435-7.

Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline.  
<http://www.auanet.org/> education/asymptomatic-microhematuria.cfm Published: May 2012.

## PROSTATITIS

Update: DEC 2003

**AEROMEDICAL CONCERNS:** The symptoms of acute prostatitis (ICD9 601.0), which include severe perineal discomfort, backache, urgency, and frequency of micturition can be extremely distracting in the cockpit. Similarly, the backache from chronic prostatitis (ICD9 601.9) can be an irritant in flight. The side effects of some forms of medication are not compatible with flying.

### WAIVER:

**Initial Applicants:** Exception to policy is considered case-by-case for applicant with chronic prostatitis. Applicant with acute prostatitis is disqualified until the condition completely resolved.

**Rated Aviation Personnel (All Classes):** Patients with acute prostatitis should be grounded until symptoms have resolved. An acute episode does not require a waiver unless it becomes recurrent or chronic. Waiver is possible for patients with chronic prostatitis. DNIF is still recommended for flare-ups of symptoms.

**INFORMATION REQUIRED:** An abbreviate AMS is required including:

- Urology consultation.

**FOLLOW-UP:** Annual urology consultation is required in the event of recurrence or if chronic in nature.

**TREATMENT:** Waivers may be granted for patients on DOXICYCLINE, TRIMETHOPRIM/SULPHAMETHOXAZOLE, CARBENICILLIN, and CIPROFLOXIN.

**DISCUSSION:** Some patients with prostatitis are very sensitive to the effects of alcohol although the mechanism for this is unclear. Personnel on medication should be warned to restrict their alcohol intake while on treatment. They should also avoid spicy foods. Patients with chronic prostatitis, with symptoms of pain and discomfort, often respond to short courses of anti-inflammatory agents (i.e., ibuprofen/naproxen). The side effects of nitrofurantoin relevant to aviation include an acute pulmonary reaction with cough, dyspnea and chest pain, a chronic reaction with similar symptoms but with a more insidious onset, and occasionally, nystagmus, vertigo and dizziness. Trimethoprim can rarely cause hallucinations, ataxia, vertigo, apathy or depression. Ciprofloxin can cause tremor, light-headedness, confusion, lethargy, drowsiness, insomnia, blurred vision, changes in color perception and headache. The reported incidence of headaches is 1.2% with other CNS side effects arising in 0.4% of cases. Photosensitivity has also been reported with the use of quinolones.

### REFERENCES:

- Prostatitis, <http://www.emedicine.com/emerg/topic488.htm>
- Prostatodynia, <http://www.emedicine.com/med/topic1922.htm>

# PROTEINURIA

Update: DEC 2003

**AEROMEDICAL CONCERNS:** Proteinuria is a symptom of potential underlying medical conditions, which are considered disqualifying. Significant renal disease may lead to chronic fatigue, near syncope, or loss of consciousness. The active duty aviation environment (heat, dehydration, prolonged duty) may exacerbate such conditions.

## WAIVER:

**Initial Applicants (All Classes):** Exception to policy is considered case-by-case for applicant with mild proteinuria with no underlying renal pathology and systemic diseases.

**Rated Aviation Personnel (All Classes):** Mild proteinuria without underlying renal disease and stable without systemic diseases, waiver is possible.

Significant proteinuria often is associated with immune-mediated glomerular diseases or metabolic disorders with glomerular involvement such as diabetes mellitus. Waiver for these diseases is usually based upon the stability of the disease and the lack of significant symptoms as well as the lack of environmental exacerbation of the condition.

**INFORMATION REQUIRED:** A complete AMS is required including:

- Trace proteins and 1+ protein found on routine urinalysis require little more than repeating under favorable conditions.
- If proteinuria on dipstick is persistent upon repeated testing, obtain a 24-hour urine collection for quantitative assessment of protein excretion.
- For any determinations greater than 200 mg/24 hr, a more thorough nephrology/urology consultation is required.
- Renal biopsy may also be required.

**FOLLOW-UP:** Dependent upon the underlying medical condition. An annual 24-hour urine protein is required to monitor progression of disease. A nephrology/urology consult is required if an annual 24-hour urine protein  $\geq$  200mg.

**TREATMENT:** As appropriate for the underlying medical condition and the discretion of the nephrologist/urologist

**DISCUSSION:** Causes for false positive are concentrate, alkaline (pH > 7.5), mucus, RBC's, WBC's or semen in the urine. Cause for false negative is dilute urine. Proteinuria should also be interpreted with consideration of the urine specific gravity since a proteinuria of 1+ in diluted urine may indicate a considerable protein loss.

## REFERENCE:

Albuminuria, <http://www.emedicine.com/med/topic94.htm>

# RENAL STONES

Update: JAN 2002

**AEROMEDICAL CONCERNS:** The pain resulting from renal colic can be very severe and disabling. In-flight incapacitation is the main concern. There has been one reported USAF mishap secondary to renal colic.

## WAIVER:

**Initial Class 1A/1W Applicants:** A history of kidney stone is disqualifying. Exceptions to policy are sometimes granted for initial flight applicants and require the information listed below.

**Initial Class 2, 3, & 4 Applicants:** A history of kidney stone is disqualifying on initial physical. Waivers are possible and require information listed below.

### Rated Aviation Personnel (All Classes):

For rated aircrew members with a history of a solitary unilateral kidney stone that has resolved and a normal metabolic work-up, no waiver is generally required and condition may be coded as Information only.

A history of multiple stone formation is usually granted a waiver unless there is a history of 3 or more episodes of stone formation within a 2 year time span.

Waivers are granted for the presence of retained stones provided they are in the renal parenchyma, the metabolic work-up and renal function are normal, and the patient is asymptomatic. Retained stones within the calyx must be too large to pass into the ureter. If the metabolic work-up is abnormal, a waiver may be requested granted the metabolic condition can be controlled with approved medication. Difficulty in controlling a metabolic abnormality may result in a permanent disqualification.

### INFORMATION REQUIRED:

- Renal Stone Worksheet—urinalysis should be negative for hematuria, granular casts, or proteinuria.
- Urine Culture and sensitivity- reflecting no bacterial growth
- CBC with differential

Initial AMS requires:

- One set of blood chemistries collected when asymptomatic
- 24-hour urine chemistry
- IVP (after stone passage/removal)
- Stone analysis (if possible)

The IVP is required as a functional study of the kidney as well as to rule out any evidence of obstruction or residual dilatation after stone passage.

**FOLLOW-UP:** Continued waiver will require blood chemistries and CBC with differential submitted with each annual FDME. A 24-hour urine should also be performed if the patient has had an abnormal 24-hour urine in the past or is currently on medication for their abnormality. If there is a prior retained stone, a KUB or CT should be done to confirm any increase in size or change in position. Any doubts must be confirmed by an IVP or CT. A urologist should review CT scan results.

**Note:** Annual KUBs or CTs are no longer required as follow-up for the history of solitary kidney stone that has been passed and provided the individual has a normal 24 hour urine collection. These studies may be

required for individuals with a history of multiple stones, retained stones, or hypercalciuria. The presence of microhematuria in a patient with a prior history of stones will require imaging of the urinary tracts with either an IVP or CT to rule out an asymptomatic stone. A CT would be the preferred initial study. Consultation with a urologist will be required.

**TREATMENT:** Conservative management aimed at encouraging natural passage of the stone, surgery, or extracorporeal shock wave lithotripsy (ESWL) will result in grounding until fully recovered. For those individuals with recurrent stones or those with metabolic abnormality, providing dietary advice and maintenance of adequate hydration with or without thiazides will normally allow for favorable waiver consideration. Patients requiring placement of a temporary ureteral stent will be grounded until the stent has been removed and the stone condition resolve.

**DISCUSSION:** The peak incidence of urinary calculi occurs in the twenties to forties, with a 3: 1 male to female ratio. Dehydration is one of the contributing factors. There is usually a gradual onset of flank, abdominal or back pain over an hour or more before the acute colic episode. The patient can also present with micro or gross hematuria. The lifetime risk for stone formation in adult white men approaches 20%, while it is only 5-10% for women. In general, stone disease in adult white males is one-fourth to one-third more common than in black men. The recurrence rate of urolithiasis is reported to be as high as 50% within five years of the initial stone occurrence. Despite the less invasive nature of ESWL, there still remains a relatively high incidence of retained stone fragments and retreatment.

#### **REFERENCES:**

- American Urological Association, Clinical Practice Guidelines, Management of Ureteral Calculi, 1997  
[www.auanet.org](http://www.auanet.org)- Go to Publications/Catalog and click on "Clinical Practice Guidelines"
- Lifshitz DA, Shalhav AL, Lingeman JE, and Evan AP: Metabolic evaluation of stone disease patients: a practical approach, J Endourol 13: 669-678, 1999.
- Rivers K, Shetty S, and Menon M: When and how to evaluate a patient with nephrolithiasis. Urological Clinics of North America 27: 203-213, 2000.
- Menon M, Parulkar B, Drach G: Urinary Lithiasis: Etiology, Diagnosis, and Medical Management, Campbell's Urology, 7th Edition, Chapter 91, 2661-2734

## RENAL STONE WORKSHEET

NAME: \_\_\_\_\_ SSN: \_\_\_\_\_ DATE: \_\_\_\_\_

**Urinalysis:** Date: \_\_\_\_\_

Ph \_\_\_\_\_  
Protein \_\_\_\_\_  
Microscopic \_\_\_\_\_  
Culture & Sensitivity \_\_\_\_\_

**CBC:** Date: \_\_\_\_\_

HCT \_\_\_\_\_  
HGB \_\_\_\_\_  
WBC \_\_\_\_\_  
Seg: \_\_\_\_\_ Band \_\_\_\_\_ Mono \_\_\_\_\_ Lymph \_\_\_\_\_  
Baso \_\_\_\_\_ Eos \_\_\_\_\_

**Blood/Serum Chemistry** Date: \_\_\_\_\_

Creatinine \_\_\_\_\_  
Uric Acid \_\_\_\_\_  
Calcium \_\_\_\_\_  
Phosphate \_\_\_\_\_  
Na \_\_\_\_\_  
K \_\_\_\_\_  
Cl \_\_\_\_\_  
HCO<sub>3</sub> \_\_\_\_\_

**24-hour Urine Collection** (Report in gm/24 hr): Date: \_\_\_\_\_

Calcium \_\_\_\_\_  
Phosphate \_\_\_\_\_  
Uric Acid \_\_\_\_\_  
Creatinine \_\_\_\_\_  
Total Volume \_\_\_\_\_

**IVP Results:** Pre (if available) \_\_\_\_\_

Post (required) \_\_\_\_\_

**Stone Analysis** (if available): \_\_\_\_\_



## AEROMEDICAL TECHNICAL BULLETINS

## **Administrative Guide Statement of Purpose**

This guide is intended to provide aeromedical providers (flight surgeons, aeromedical physician assistants, aviation medicine nurse practitioners, and aeromedical examiners) and the office staff all the tools necessary for accurately completing flying duty medical exams (FDME), flying duty health screens (FDHS), and aeromedical summaries (AMS). The required Aeromedical Policy Letters and Aeromedical Technical Bulletins (ATB) are available as detailed in the external links and purpose, authority and points of contact sections of this document.

Additionally, there are convenient flow sheets and tables designed to ensure that flight physicals (referred to simply as "physicals" in the remainder of this chapter) are performed correctly and completely, thereby minimizing returns for errors.

In addition to guaranteeing a complete physical, the flow sheets and tables will ensure:

1. Other regulatory and preventive health requirements are adhered to (pap smears, mammogram, retirement physical requirements, etc.).
2. Important readiness issues are addressed (HIV, dental, eyeglass prescriptions).

Summary sheets of aeromedical standards are provided. These tables (2 through 7) should be utilized whenever personnel are reviewing physicals prior to electronically submitting or mailing them to Fort Rucker. These sheets along with electronic standards checking within the Aeromedical Electronic Resource Office (AERO) will help ensure that all required entries are made and to standard.

There are "special tests" that most probably never heard of or were not aware of in such detail prior to becoming an aeromedical provider, and that are often performed poorly in the field. These are the reading aloud test, anthropometrics, cycloplegic refraction, and stereopsis among others. Each test is addressed in an aeromedical technical bulletin.

In order to help all complete high quality Aeromedical Summaries (AMSSs), there is a section covering the waiver process. Included are templates for both the complete AMS and the abbreviated AMS. AERO has greatly eased the creation and submission of AMSSs and is the preferred method for managing these. This is followed by a brief discussion of the Aeromedical Consultation Service and the waiver authorities. This will help explain the disposition of AMSSs and waiver, exception to policy and suspension requests.

Please address any comments or questions about this guide or USAAMA policy via the helpdesk. Links to the helpdesk can be found on the AERO website or the Purpose Authority and Points of Contact section of this document.

## **The Army Flight Physical**

### **Definition and Responsibility for Flight Physicals (Flying Duty Medical Examination (FDME) and Flying Duty Health Screen (FDHS))**

The FDME is a periodic, comprehensive medical examination performed for occupational and preventive medicine purposes. The FDME is used as a starting point for the careful evaluation and treatment of aircrew members. It includes a review of medical history, which often alerts the flight surgeon to potentially disqualifying conditions that may require further assessment in the course of completing the examination. It promotes and preserves the fitness, deployability, and safety of aviation personnel. The FDHS is the interim health-screening tool done between comprehensive FDMEs. Medical history should be reviewed to comply with the Annual PHA requirements and formally documented on the DD2807. The aeromedical provider shall review the medical records and AHLTA for disqualifying medical conditions. The goal is to ensure maintenance of aircrew health, fitness for aviation duty, and to serve as an opportunity for health promotion. With the introduction of the annual PHA, additional screening and counseling requirements will be set forth in AERO so all annual military needs are met in one setting. To ensure the annual FDME or FDHS meets the requirements for a PHA, all should be familiar with the United States Preventive Services Task Force (USPSTF) requirements and any modifications to the USPSTF recommendations as detailed in AR 40-501, chapter 8. The USPSTF homepage can be found at <http://www.uspreventiveservicestaskforce.org>.

The aircrew member is responsible for maintaining a current medical certification—DD Form 2992, Medical Recommendation For Flying or Special Operational Duty. In order to have a current DD Form 2992, the aircrew member must maintain a current and qualified FDME/FDHS. The following Army regulations and publications address the importance of the physical and place the responsibility squarely on the aircrew member.

1. AR 600-105 is applicable to rated aircrew (pilots and flight surgeons) and stipulates that Army officers who enter aviation service must continually maintain medical and professional standards. Failure to maintain medical certification is reason to convene a Flying Evaluation Board (FEB). All aviators regardless of component or whether or not assigned to operational flying duties must maintain certification for flying duty through timely completion of the physical.
2. AR 600-106 has similar stipulations and covers non-rated aircrew (flight medics, aeromedical psychologists, aeromedical physician assistants, aviation medicine nurse practitioners, flight engineers, crew chiefs, stewards and others not covered in AR 600-105).
3. FM 3-04.300 covers flight operations procedures and mandates that individuals who do not have a current flight physical or flight physical extension will be suspended from flying status until medical clearance is given.

### **Proponent for Aeromedical Policy and Standards**

US Army Aeromedical Activity (USAAMA) is located at Fort Rucker. The USAAMA does the following:

1. Writes, implements and interprets aeromedical policy in consultation with and for the Aerospace Medicine Consultant to The Surgeon General.
2. Reviews and dispositions of all class 1, 2, 3 and 4 flight physicals.
3. Provides the final aeromedical recommendation regarding waiver, exception to policy and suspension recommendations in cases of disqualified aircrew.
4. Maintains the Aviation Epidemiology Data Registry (AEDR).

## **Types of Physicals—the Basics**

There are three broad categories of FDMEs and the FDHS is its own category. They are:

1. Initial FDME—Performed for accession purposes and is comprehensive. This type of physical is valid for up to 18 months regardless of physical class.
2. Comprehensive FDME— Performed on trained rated and non-rated aircrew, air traffic controllers (ATC), and unmanned aerial system (UAS) operators, covering the annual PHA and retention requirements. This is performed every 5 years between the ages 20 and 50 and then annually thereafter. The five year period shall be aligned as practicable with ages ending in “0” or “5” so comprehensives are accomplished at 20, 25, 30, 35, 40, 45, and 50—this makes clinic management and scheduling simpler and easy to remember. It is generally valid for 12 - 14 months based on when it was completed during the birth month window, and it is synchronized to expire the last day of the aircrew member’s birth month. Comprehensives may be done more frequently at the discretion of the flight surgeon, when requesting a return to aviation service after medical termination, as part of the requirements for aeromedical waiver requests, after Class A or B aircraft accidents, or for retirement. See AR 40-501 for further details.
3. Rucker FDME—Performed only at Lyster Army Health Clinic, Fort Rucker, on Class 1 Flight School students just prior to beginning flight training. This reviews, documents, and verifies medical qualification for flight training as well as addresses any interim aeromedically significant changes since completing the Initial FDME. This is valid for up to 24 months only at Fort Rucker to allow the flight student to complete flight training. Upon completion of flight school and PCS, the graduated flight student will require a FDME/FDHS with birth month realignment upon reporting to their new duty station.
4. FDHS—Performed annually during the interim years between comprehensive FDMEs on rated and non-rated trained aircrew, ATCs, and UAS operators. This is a retention-type of health screen and meets the annual PHA requirement. It is generally valid for 12 - 14 months based on when it was completed during the birth month window and it is synchronized to expire the last day of the aircrew member’s birth month.

## **Aeromedical Standards Class or Physical Class**

Flight physicals are typically referred to by the specific class or more accurately, by the aeromedical standards classification that applies to an aircrew member. The type of duties performed by the aircrew member as well as whether he is an applicant or a trained crewmember determines the applicable standards. These aeromedical standards are analogous to the accession and retention standards found in chapters 2 and 4 of AR 40-501, Standards of Medical Fitness, and applicable to all Army soldiers. These standards apply to Department of the Army Civilians and contractors unless otherwise specified in AR 40-501 or the ATBs. Chapter 4 of this regulation addresses aeromedical standards while chapter 6 addresses the aeromedical administrative of the aviation medicine program. The following is a brief description of the classes of aeromedical standards and examples of aircrew members of that class. See Table 1 below for a summary of the physical codes found in AERO.

1. Class 1 (1W/1A)
  - a) Class 1 comprises the initial entrance (accession) physical examination standards for pilot applicants, to include warrant officer candidates and commissioned officer candidates. Physical examinations performed for this purpose are always initial FDMEs and are valid for up to 18 months from date of examination. If the Class 1 exam expires or is about to expire prior to reporting date, the applicant must repeat, submit, and have on record a qualified Class 1 physical. These are centrally reviewed and given final disposition by USAAMA.
2. Class 2
  - a) Class 2 comprises all rated aviators (pilots) as well as flight surgeons (FSs), aeromedical physician assistants (APAs), and aviation medicine nurse practitioners (AMNPs). These are centrally reviewed and given final disposition by USAAMA.

1. Aeromedical examiners (AMEs) and civilian aeromedical providers do not require a Class 2 flight physical.
  2. Contract pilots will complete a FAA Class 2 physical unless the contract stipulates an Army Class 2 flight physical must be completed.
- b) Class 2 can be further broken down as follows:
- 1) Initial Class 2: Accession standards for FSs, APAs, and AMNPs. Accession standards for all rated (trained) aviators returning to aviation service with a 5 or more year break in aviation service or a rated aviator from another service trying to transfer to the Army. Valid for up to 18 months.
  - 2) Comprehensive Class 2 (trained personnel): FDME standards applied to rated aviators and FSs. This also applies to APAs and AMNPs (though these are technically "non-rated") and flight students once in flight training (though not yet rated). A flight student's status changes from class 1 to class 2 at the start of the initial flight training course leading to award of an aeronautical rating, per AR 600-105, Aviation Service of Rated Army Officers, and AR 40-501, Standards of Medical Fitness. This realistically is started at taking the aircraft controls. A comprehensive FDME is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window. Exceptions will be discussed in subsequent sections.
  - 3) Interim Class 2: FDHS standards applied to rated aviators, FS, APA and AMNPs. The FDHS is done in the years that a comprehensive FDME is not required. The annual FDHS is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window.

3. Class 3

- a) Class 3 encompasses all other non-rated crewmembers and other personnel required by competent authority to fly in Army aircraft. This includes flight medics, aeromedical psychologists, flight engineers, crew chiefs, stewards, door gunners, and any other personnel not covered under Class 2 or 4. These are centrally reviewed and given final disposition by USAAMA.
  - b) Contract crewmembers will complete a FAA Class 3 physical unless the contract stipulates an Army Class 3 flight physical must be completed.
- c) Class 3 can be further broken down as follows:
- 1) Initial Class 3: Accession standards for non-rated aircrew. Valid for up to 18 months.
  - 2) Comprehensive Class 3: Retention standards for non-rated aircrew. An annual FDME is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window. Exceptions will be discussed in subsequent sections.
  - 3) Interim Class 3: Retention standards for non-rated aircrew. The FDHS is done in the years that a comprehensive FDME is not required. The annual FDHS is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window.

4. Class 4—Military ATC and Military and Civilian UAS Operators

- a) These standards are applied to military air traffic controllers (ATC) and unmanned aerial system (UAS) operators. These are centrally reviewed and given final disposition by USAAMA.
- b) Contract UAS operators will complete a FAA Class 2 physical unless the contract stipulates an Army Class 4 flight physical must be completed.

- c) Class 4 can be broken down further.
  - 1) Initial Class 4: Accession standards for all ATC and UAS operators. Valid for up to 18 months.
  - 2) Annual Class 4: Retention standards for all ATC and UAS operators. A comprehensive FDME is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window. Exceptions will be discussed in subsequent sections.
  - 3) Interim Class 4: Retention standards for all ATC and UAS operators. The FDHS is done in the years that a comprehensive FDME is not required. The annual FDHS is generally valid for a period of 12 - 14 months based on when it is completed within the birth month window.

## 5. Class 4—Department of the Army Civilian (DAC) and Contract ATC

- a) Current Operating Manual for Qualification Standards for General Schedule Positions Office of Personnel Management (OPM) standards address both application and retention for ATCs, found at <https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/2100/air-traffic-control-series-2152/>. While the standards may appear outside the norms of standard care, remember they are occupational standards. Paragraph F, and specifically subparagraph (3), provides the verbiage to raise issue and concern when reviewing or discovering medical issues that are potentially hazardous, warranting waiver consideration. Note: OPM standards do not outline any process for managing standards failure or medical conditions, and thus refer back to AR 40-501 and the Aeromedical Policy Letters for the evaluation, management, and annual requirements of medical conditions for waiver consideration. The APLs and ATBs apply to all DAC or Contract ATC civilians unless otherwise specified in the APLs.
- b) The Class 4 FDME requirements, as outlined in paragraph 4-33 (c) of AR 40-501 will be used as the basis for conducting annual FDMEs for DAC and contract ATC personnel. OPM standards apply for these individuals. Refer to the Aeromedical Technical Bulletin below on the conduct of these examinations. Note: IAW AR 40-400 completion of the flight physical rests with the individual patient and the local flight surgeon, and while MTFs may provide the basic portion of the physical, additional requirements, and in particular payment (such as labs, X-rays, consultations, evaluations, procedures, and/or follow-on care) are the responsibility of the individual patient.
- c) Aeromedical Summaries and waiver requests for those conditions not meeting current OPM application or retention standards for DAC and contract ATCs will be processed per current USAAMA policy and the APLs. Review of cases involving DAC or contract ATCs are generally favorable and will include consideration of safety as well as the likelihood of deployment to austere environments or stationing away from regular medical care.

**Table 1: Physical Codes in AERO**

<b>Physical Codes in AERO</b>	<b>Description</b>
AS	Aeromedical Summary
<b>Class 1 Physicals</b>	
IA	Commissioned Officer flight school applicant
IW	Warrant Officer flight school applicant
<b>For use at Fort Rucker Only</b>	
RO	Commissioned Officer student aviator
RW	Warrant Officer student aviator
RA	Birth month realignment student aviator
<b>Class 2 Physicals</b>	
AI	Rated aviator initial - used only for aviators with 5 or more years since last flight physical, transferring from another service, or rated international pilot coming to Fort Rucker with no prior US Army flight physicals
AA	Rated aviator comprehensive FDME (long)
AB	Rated aviator FDHS (short)
<b>Class 2F</b>	
FI	Flight surgeon initial FDME
FA	Flight surgeon comprehensive FDME (long)
FB	Flight surgeon FDHS (short)
PI	Physician assistant or nurse practitioner initial FDME
PA	Physician assistant or nurse practitioner comprehensive FDME (long)
PB	Physician assistant or nurse practitioner FDHS (short)
<b>Class 3</b>	
CI	Nonrated aircrew initial FDME
CA	Nonrated aircrew comprehensive FDME (long)
CB	Nonrated aircrew FDHS (short)
<b>Class 4</b>	
TI	ATC initial FDME
TA	ATC comprehensive FDME (long)
TB	ATC FDHS (short)
UI	UAS operator initial FDME
UA	UAS operator comprehensive FDME (long)
UB	UAS operator FDHS (short)

## **Birth Month Window**

The FDME and FDHS are synchronized with the birth month. Army regulations allow for a generous birth month window that encompasses the three-month period preceding the end of the birth month. It includes the birth month plus the two previous months. All exams taken within this period are considered to have been taken within the birth month and will be good to the last day of the birth month of the following year. When operationally required to complete a FDME or FDHS prior to entering the birth month window, contact USAAMA for guidance and approval.

Example: A soldier born in July may begin his FDME or FDHS 3 months prior to 31 July. That means he/she can start the process on 1 May and must complete it no later than 31 July. By the same token, if he/she completes it in May it will still be valid until the last day of July in the following year. All exams taken within this period comply with meeting the requirement.

## **Birth Month Realignment**

Just as the type of physical (comprehensive (FDME) or interim (FDHS)) is aligned with a crewmember's age, his/her physical is aligned with his/her birth month. The physical is completed in conjunction with the birth month (in the three-month window) and it is valid until the last day of the birth month the following year. Sometimes, a crewmember may get a physical outside of his/her birth month window. The initial FDME is done without regard to the birth month and it is performed when it is needed for application to aviation service. Another example is deployment that can impact and upset the birth month cycle. Other examples include FDMEs performed for permanent medical suspension, FEB, or in conjunction with an accident investigation. All of these can disrupt the birth month cycle.

In these cases, we strive to realign the crewmember with his/her birth month and avoid performing excessively frequent FDMEs and FDHSs. In these cases, Table 2 may be used. This table provides you with the maximum period of validity (18 months) for a physical in order to realign the crewmember with his/her birth month. To avoid confusion with the flight records section, the aeromedical provider must clearly document the "birth month realignment" in the remarks block of the DD Form 2992. Otherwise, the flight records sections may ask questions as to why the upslip was valid for longer than 12 months.

Example: A crewmember has a July birth month, but he/she just had an FDME post-mishap in February, the flight surgeon can extend that validity of clearance until July of the following year instead of performing another FDME or FDHS in five months. In this example, the FDME will have a period of validity of 17 months (remember, the maximum allowed is 18 months).

Note this has nothing to do with extensions beyond the end of the birth month. That topic follows next. The FDME or FDHS must be completed prior to the end of the birth month in which it is due.

**Table 2: Birth Month Realignment Table (number of months for which a flight physical is valid):**

Birth Month	Month in which the flight physical was completed											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Jan	12	11	10	9	8	7	18	17	16	15	14	13
Feb	13	12	11	10	9	8	7	18	17	16	15	14
Mar	14	13	12	11	10	9	8	7	18	17	16	15
Apr	15	14	13	12	11	10	9	8	7	18	17	16
May	16	15	14	13	12	11	10	9	8	7	18	17
Jun	17	16	15	14	13	12	11	10	9	8	7	18
Jul	18	17	16	15	14	13	12	11	10	9	8	7
Aug	7	18	17	16	15	14	13	12	11	10	9	8
Sep	8	7	18	17	16	15	14	13	12	11	10	9
Oct	9	8	7	18	17	16	15	14	13	12	11	10
Nov	10	9	8	7	18	17	16	15	14	13	12	11
Dec	11	10	9	8	7	18	17	16	15	14	13	12

Note: Read down the left column to the examinee's birth month. Read across to month the physical was completed. The intersection number is the maximum validity period.

## **Extensions**

If the FDME or FDHS cannot be performed prior to the end of the birth month, the aviator may request and the flight surgeon may grant a one calendar month extension (to the last day of the following month). An extension must be requested in the birth month prior to the end of the birth month. Any extensions requested and granted in the month after the birth month are not valid. The effective date of the extension is the day it was requested.

Example: the Soldier born in July fails to complete the FDME/FDHS before 31 July. The Soldier may request an extension in July before the end of July and the flight surgeon may grant an extension and

upslip to cover him/her through 31 August. Back-to-back extensions or extensions exceeding one calendar month are not authorized. If on 31 August this crewmember still has not completed his FDME or FDHS, he/she must be grounded. The only exception to this policy is per special policy directive from the Surgeon General's office.

TIP: If the aviator completed the FDME/FDHS in time, but more assessment or testing is required (such as failed level 1 or the cardiovascular screening program that requires an AGXT and there is a 30-day or more wait for scheduling), the flight surgeon may if aeromedically appropriately complete the DD Form 2992, checking the "Cleared After Flight Duty Medical Examination" and "Other" blocks, recommending in the remarks section, "Continue FFD for (30, 60, or 90) days until evaluation complete." The medical exam has been accomplished, but is not finished. This keeps the aircrew engaged and tracked to get the FDME/FDHS completed. Avoid giving the blanket full year upsip with the expectation that everything will be completed. Out of sight, out of mind occurs too often and completing the physical is forgotten. Subsequent physicals filed may be returned as disqualified incomplete.

## **Civilian Aeromedical Providers and AMEs Physicals**

While civilian aeromedical providers and AMEs are not required to maintain a current Class 2 flight physical, all are encouraged to do an initial Class 2F/2P flight physical in preparation for attending the US Army Flight Surgeon Primary Course.

## **Internal Summary—The Army Flight Physical Key Points**

1. The period of validity for all physicals is determined by if it is an initial physical or a periodic physical (comprehensive or abbreviated). Regardless of class (1, 2, 3, or 4), all initial FDMEs are valid for up to 18 months, and all periodic physicals are valid for 12 - 14 months based on when it was completed during the birth month window.
2. All FDMEs and FDHSs should be completed within the birth month window.
3. All periodic FDMEs and FDHSs upon completion are valid until the last day of the birth month in the following year.
4. The period of validity of a periodic FDME or FDHS may be extended up to 18 months in order to realign a crewmember with his/her birth month. See the Birth Month Realignment Table above (Table 2).
5. An extension for only one calendar month beyond the birth month is possible. No other extensions beyond this are allowed.

## **Completing the Flight Physical Paperwork**

To ensure a FDME or FDHS is completed properly, use AERO and the checklists during completion of the FDME or FDHS and review it for accuracy prior to submission. The next pages provide checklists for all physicals (tables 3 through 9). Physicals are commonly broken down into two parts—Part 1, the setup, and Part 2, the examination completed by the aeromedical provider. This is an artificial break to allow time for the labs, vision, hearing, and paperwork to be completed and resulted, but not required. It is employed at most Army clinic and some places have the ability to get it all done without delay. The checklists are an aid for the aviation medicine clinic staff in completing Part 1 of the physical. With the few requirements for the FDHS, both parts can easily be completed the same day. Be sensitive to the needs of your crewmembers and if necessary, conduct the entire physical on the same day (Part 1 in the morning, Part 2 in the afternoon).

### **Part 1**

Part 1 of a physical consists of compiling all the information/data required on the DD Form 2807-1 and DD Form 2808 or DA Form 4497-R. It covers:

- Personal information
- Past medical history

- Vital signs/Anthropometrics
- Vision testing
- Audiology
- ECG (Only required on initial FDMEs and then annually starting at age 40 as part of Cardiovascular screening program.)
- Dental
- Pap result (Not required on Initial FDMEs)
- Required Labs
- Review and completion of any annual waiver or information requirements
- Creation and data entry into AERO

## **Part 2**

Part 2 is the aeromedical provider's hands-on part of the physical. Ideally, all the data collected in Part 1 is in AERO and available for review when the patient returns for Part 2. This way, the physical exam may be completed and submitted in AERO. In addition, this is the time to address PHA and preventive health measures and key areas of medical history, such as cardiovascular risk factor reduction and use of dietary and herbal supplements or over the counter products. Detailed guidance for the completion of the examination portion of the DD Form 2808 can be found in AR 40-501, and in the applicable ATBs below, which include information for the completion of additional aviation specific tests: vision tests, valsalva, reading aloud test, and anthropometrics.

### **FDME/FDHS Checklists**

Notice that the checklists have several features to ensure accuracy and completeness. There is no requirement to use these checklists—it is furnished as an aid for clinic operations. AERO is in sync with the checklists, except for the OPM standards for the Department of the Army Civilians and contract ATCs. Some issues to consider:

1. Date of birth and age for this exam are noted at the very top. This will help you determine:
  - Does he/she require a comprehensive or interim exam?
  - Is the patient over 40? (triggers over-40 requirements)

Remember that when a crewmember reports for his/her comprehensive FDME, this is usually reporting one or two months prior to the birth month. In determining the type of physical (comprehensive or abbreviated), annotate the age for the upcoming birthday. For example, a crewmember is 38 today but will be 39 next month. Use 39 as the age for this exam.

2. Aviation requirements for HIV testing are required with the comprehensive FDME every five years. Remember that for Army Force Protection requirements, HIV testing is required every two years. This should be done, but it only requires reporting on the comprehensive FDME.
3. Good telephone, address, and email points of contact are noted in order to facilitate contact with the patient.
4. Notice there are only three types of physical exams regardless of the class, except Class 1 that is always an initial physical.
  - Initial
  - Comprehensive
  - Interim (Abbreviated)

The contents for all initial physicals are the same regardless of class, except the Class 1 that requires anthropometric measurements and a cycloplegic refraction. The contents for all comprehensive FDMEs

and the FDHS are the same for Class 2, 3 and 4. The exception is for Class 4 civilian and contractor ATC personnel that have different standard as outlined in the ATB for ATC Medical Standards (Department of the Army Civilians and Contractors). Note that individuals with an existing waiver may have additional requirements based on their annual waiver requirements as specified in the APL for the medical condition or as specified in AERO. Table 4 depicts the differences between physical type and class when they exist. Select the applicable column and ensure all items in the column are completed.

5. There are two additional sections that are age dependent and may be applicable. If they are, ensure they are completed. These sections are listed immediately following the three main columns. They are required for all types of physicals (initial, comprehensive and abbreviated).

- Over 40
- Retirement/Separation

6. The last section allows the administrative staff to note any additional tests or studies that may be required (for information only or waiver requirements). The easiest way to determine this is to check AERO as well as ask the patient. If the aircrew member has a waiver, a copy should be kept in the electronic health record and if not available then in the paper health record (HREC). The History Summary within AERO will mention all waivers in effect and any additional tests or studies required beyond those listed in the annual waiver requirements in the APLs. If any additional tests or studies are required, the clinic staff should order them now to ensure the results are back in time for Part 2. If there are any questions reference additional requirements, the clinic staff shall address them with the aeromedical provider during Part 1. Tables 4 and 5 provide a consolidated list of physical requirements by type.

#### **The Required Forms (available in AERO)**

Initial and Comprehensive FDME: Performed on the same DD Form 2807-1 and DD Form 2808 on which other military physicals are performed. When the crewmember shows up for Part 1 of his/her FDME, he/she should fill out all the demographic data either on paper and/or directly to AERO. All entries (dental, optometry, etc.) should be annotated either electronically or manually. Submission to USAAMA when completed should be done via AERO.

Interim FDHS/Flying Duty Health Screen: Performed on DD Form 2807-1 and DA Form 4497-R and entered as detailed in the paragraph above. Submission to USAAMA should be done via AERO.

DA Form 4497-R or DD Form 2808 with the DD Form 2807-1 and the required USPSTF age-specific counseling and screening meet the requirement for the annual PHA and must be documented in AERO.

The DD Form 2807-1 and DD Form 2808 or the DA Form 4497-R, whichever is submitted to meet requirements, must be reviewed. Submission in AERO will put an electronic signature on the forms. All physicals submitted by any method other than AERO requires a manual signature on the physical forms. ECGs with abnormal readings may be requested by USAAMA but remember to code the interpretation on the AERO FDME or FDHS.

**Table 3: Summary of Requirements for FDME and FDHS**

Home Phone: ( ) Work Phone: ( )	DOB: Age for this exam:	HIV Required? Yes/No	Date:
Class 1 and all initial Class 2, 3 and 4	Comprehensive FDME: Every 5 years between the age of 20 and 50 (ages ending in 0's and 5's) then annually thereafter		FDHS
DD Form 2807-1 completion  Vital Signs: <ul style="list-style-type: none"><li>• Blood pressure, pulse, height, and weight</li><li>• Waist circumference in cm if BMI exceeds 30</li><li>• Anthropometric measurements (Class 1 only)</li></ul> Vision: <ul style="list-style-type: none"><li>• Visual acuity (near and distance), phorias by AFVTA, cover-uncover test (tropias), near point of convergence, intraocular pressures, color vision, stereopsis/depth perception, visual fields and night vision by history</li><li>• Refraction<ul style="list-style-type: none"><li>➢ Cycloplegic (Class 1 only)</li><li>➢ Manifest (All classes if uncorrected worse than 20/20<sup>-1</sup>)</li></ul></li><li>• Corneal topography (Class 1 only)</li></ul> Audiogram:  ECG:  Dental:  Pap results:	DD Form 2807-1 completion  Vital Signs: <ul style="list-style-type: none"><li>• Blood pressure, pulse, height, and weight.</li><li>• Waist circumference in cm if BMI exceeds 30</li></ul> Vision: <ul style="list-style-type: none"><li>• Visual acuity (near and distance), phorias by AFVTA, stereopsis/depth perception and color vision</li><li>• Manifest refraction (all classes if uncorrected worse than 20/20<sup>-1</sup>)</li></ul> Audiogram:  Dental:  Pap & Pelvic (Gyn report accepted):	DD Form 2807-1 completion  Vital Signs: <ul style="list-style-type: none"><li>• Blood pressure, pulse, height, and weight.</li><li>• Waist circumference in cm if BMI exceeds 30</li></ul> Vision: <ul style="list-style-type: none"><li>• Visual acuity (near and distance) and stereopsis/depth perception</li><li>• Manifest refraction (all classes if uncorrected worse than 20/20<sup>-1</sup>)</li></ul> Audiogram:  ECG (required if clinically indicated, required for a waiver per the APLs or age 40 or over):  Dental (See notes below):  Pap & Pelvic see notes below (Gyn report accepted):	
Labs <ul style="list-style-type: none"><li>• Urinalysis with microscopic</li><li>• Hematocrit/hemoglobin</li><li>• HIV</li><li>• Fasting blood sugar</li><li>• Sickledex (excluding Class 4 – ATC and UAS operators)</li><li>• Lipid panel (Cholesterol, HDL, LDL and Triglycerides)</li><li>• Annual Pap per guidelines in AR 40-501, para 11-4i</li></ul>	Labs <ul style="list-style-type: none"><li>• HIV</li><li>• Urinalysis with microscopic</li><li>• Hematocrit/hemoglobin</li><li>• Fasting blood sugar</li><li>• Lipid panel (Cholesterol, HDL, LDL and Triglycerides)</li><li>• Others required for a waiver per the APLs</li><li>• Annual Pap per guidelines in AR 40-501, para 11-4i</li></ul>	Labs  Required for the following: <ul style="list-style-type: none"><li>• Waiver requirement</li><li>• Clinically indicated</li><li>• Over 40 requirements</li><li>• Annual Pap per guidelines in AR 40-501, para 11-4i</li></ul>	

<p>Notes</p> <ul style="list-style-type: none"> <li>• RAT and AA</li> <li>• Valsalva</li> <li>• Refractive surgery (see APL)</li> <li>• Contact lens wear (see APL)</li> <li>• Fecal occult blood test required at age 50 and over</li> <li>• Class 1 and Aviation SERE: DD Form 2808 block 40 annotate: "Not afraid of dark spaces or confined places."</li> </ul>	<p>Notes</p> <ul style="list-style-type: none"> <li>• See below for 40 and older requirements</li> <li>• Annual PHA requires review and counseling documented for age specific requirements</li> <li>• Fecal occult blood test required at age 50 and over</li> </ul>	<p>Notes</p> <ul style="list-style-type: none"> <li>• Health screening and directed physical exam (annual PHA requires review and counseling documented for age specific requirements)</li> <li>• Dental and Pap/pelvic are recommended for health promotion but are not required FDHS entries</li> <li>• Fecal occult blood test required at age 50 and over</li> </ul>
<p>Age 40 and over for all classes initial, comprehensive FDME and FDHS add:</p> <ul style="list-style-type: none"> <li>• Fasting blood sugar</li> <li>• Lipids</li> <li>• Cardiac Risk Screening Program (CVSP) – Cardiac risk index calculated by AERO</li> <li>• Fecal occult blood test age 50 and older</li> <li>• Mammogram: 40, 42, 44, 46, 48, 50 and they yearly (required for all military females)</li> <li>• Intraocular pressures</li> <li>• ECG</li> </ul>	<p>Retirement (see AR 40-501, Chapter 8 for full list of requirements)</p> <ul style="list-style-type: none"> <li>• Perform a comprehensive FDME (FDHS is not authorized for a retirement physical)</li> <li>• CXR if age 40 or over</li> <li>• DD Form 2697 (Report of Medical Assessment)</li> <li>• Counseling on Hepatitis C screening</li> </ul> <p>Note: Retirement physicals must be a comprehensive physical using DD Forms 2807-1 and 2808.</p>	
<p>Additional Tests, studies and consults for waivers and information only conditions (see APLs):</p>		
Last Name First Name MI Rank	Provider's Stamp	Status of physical:  Status of AMS:

**Table 4: Summary of DD Form 2808**

Block on DD Form 2808	Class 1 and Class 2/3/4 Initial	Class 2/3/4 Comprehensive
1-16. Admin Data	Y	Y
17 – 44. Clinical Exam	Y	Y
Dental	Y	Y
Fecal Occult Blood Test	>age 50	>age 50
45a. Urine Albumin	Y	Y
45b. Urine Glucose	Y	Y
47. Hematocrit and Hemoglobin	Y	Y
49. HIV	Y Annotate date drawn	Y(3)(4), Force protection every 2 years Annotate date drawn
52a. Pap Smear	N	(3)
52c. Sickledex	Y(1)	N
53. Height	Y	Y
54. Weight	Y(7)	Y(7)
58a. Blood Pressure – only one reading required	Y	Y
57. Pulse	Y	Y
60. Other vision: Cycloplegic Refraction (annotate procedure in block 73. Notes) Corneal Topography (annotate results in this block or block 73)	Class 1 only Class 1 only	N N
61. Distant Vision	Y	Y
62. Manifest Refraction	(5)	(5)
63. Near Vision	Y	Y
64. Heterophorias Cover Test / Cross-cover test Near Point of Convergence	Y Y Y	Y N N
66. Color Vision	Y	Y
67. Depth Perception	Y	Y
68. Field of Vision	Y	N
69. Night Vision History	Y	N
70. Intraocular Pressure	Y	(2)(3)
71a. Audiometer	Y	Y
72a. Reading Aloud test	Y	N
72b. Valsalva (block 22 in AERO)	Y(1)	N
73. Notes (continued) Additional Labs: Urine Micro (WBC and RBC) Total Cholesterol, HDL, LDL, and Triglycerides CAD Risk Index Fasting Glucose EKG Chest X-ray Anthropometrics Aeronautical Adaptability Cycloplegic Protocol Waist Measurement in cm Corneal Topography (annotate results here or block 60)	If needed Y(6) Y (2) Y Y N Class 1 only Y Class 1 only (7)(8) Class 1 only	If needed Y(6) Y (2) (2)(3) (2)(3) (3) N N N (7)(8) N
74a. Qualification	Y	Y
77. Summary of Defects	Y	Y
78. Recommendations	Y	Y
81a – 84b. Examiner Names and Signatures	Y	Y

Notes:

- (1) Not required for Class 4 (Air Traffic Control) or UAS operators.
- (2) Required age 40 and older.
- (3) Required if medically indicated or required by AR 40-501 based on the United States Preventive Health Task Force's recommendations.
- (4) HIV testing in civilian aircrew members is voluntary, not required.
- (5) Required if unaided near/distant vision is not 20/20<sup>-1</sup>.
- (6) Urinalysis Dipstick Results of ALL Negative for Blood, Nitrite, and Leukocyte Esterase are acceptable for RBC and WBC NEG annotations. Microscopic evaluation is not required.
- (7) If calculated BMI  $\geq 30$ , waist circumference (in cm) required. Annotate in AERO, page 4 on DD Form 2808, or in remarks section.
- (8) Required as per APL "Cardiovascular Screening Program" and/or "Metabolic Syndrome."

**Table 5: Summary of DA Form 4497**

Block on 4497	Class 2, 3 and 4 Interim FDHS
1-14b. Admin Data	Y
15. Blood Pressure	Y
16. Pulse	Y
17. Height	Y
18. Weight	Y
Waist Measurement in cm	(6)(7)
20a. Depth Perception	Y
20b. Test Score	Y
20c. Test Result	Y
21a. Distant Visual Acuity	Y
21b. Near Visual Acuity	Y
Manifest refraction	(5)
22. Intraocular Pressure	Y(2)(3)
23. Audiometry Screening	Y
24. History and Physical	DD 2807-1 and focused physical as required
Fecal Occult Blood Test	Starting at age 50
Pelvic/Pap	(3)
HIV	(1)(3)(4) Force protection=Q2 years Annotate date drawn
Fasting Glucose	(1)(2)(3)(6)
Total Cholesterol, HDL, LDL, and Triglycerides	(1)(2)(3)(6)
CAD Risk Index	(1)(2)(6)
25. ECG	(2)(3)(6)
26. Recommendation	Y
27. APA or Aviation Medicine Nurse Practitioner name and signature	Y
28. Flight surgeon name and signature	Y

## Notes:

- (1) Not required for Civilian or Contract Class 4 (Air Traffic Control).
- (2) Required age 40 and older.
- (3) Required if medically indicated or required by AR 40-501 based on the United States Preventive Health Task Force's recommendations.
- (4) HIV testing in civilian aircrew members is voluntary, not required.
- (5) Required if unaided near/distant vision is not 20/20<sup>-1</sup> or better.
- (6) Required as per APL "Cardiovascular Screening Program" and/or "Metabolic Syndrome."
- (7) If calculated BMI  $\geq 30$ , waist circumference (in cm) required. Annotate in AERO DA 4497-R, or remarks section.

\*\*\*A dental exam is not required on this exam but it is still required for medical force readiness. Don't forget to have all soldiers complete their birth month exam.

**Table 6: Summary of Aeromedical Standards – Vision, Hearing, Labs, and Anthropometrics**

Aeromedical Vision Standards																	
Cycloplegic Refraction Standards			Visual Acuity, DQ if worse than:			Phorias, DQ if:											
Class 1	[Qualified] Sphere: DQ <-1.50 to +3.00 < DQ Cyl: DQ <-1.00 to +1.00 < DQ		Distant 20/50	Near 20/20 <sup>-1</sup>		Eso >8	Exo >8										
							Hyper >1										
2/3/4	Not Required		20/400	20/400		>8	>8										
Class		Cover-Uncover Test	Cross-Cover Test	NPC DQ If:	Color Vision DQ If:												
1 and 2/3/4 Initial	Any detectable movement refer to optometry		Any detectable movement refer to optometry	>100 mm	PIP: 3 or more errors out of 14 plates and/or failing the PIP2 or F2 single plate and FALANT: any errors out of 9 presentations (Standards above the same for initial physicals and FDMEs)												
2/3/4 Other	Not Required		Not Required	Not Required													
All Classes of Aeromedical Standards																	
Field of Vision, DQ if:	Any Defects																
Depth Perception, DQ If:	>40 seconds of arc at 20 feet <ul style="list-style-type: none"> <li>Any error in block B of the AFVT or Optec 2300, or</li> <li>Any error in lines 1 through 9 for TITMUS II, or</li> <li>Any errors in lines 1 through 7 of the 10 level for the RANDOT Circles test</li> </ul>																
IOP, DQ if:	<ul style="list-style-type: none"> <li>&lt;8 or &gt;21 mmHg in either eye or 4 mm Hg or more difference between eyes</li> <li>If &lt;8 due to corneal refractive surgery, so state on FDME or FDHS</li> </ul>																
Aeromedical Audiology Standards																	
Qualified if equal or better than:																	
Class	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz											
1	25 dB	25 dB	25 dB	35 dB	45 dB	45 dB											
2/3/4	25 dB	25 dB	25 dB	35 dB	55 dB	65 dB											
Laboratory Normal Values, All Classes																	
HCT/Hg	Male 40% - 52% / 14 - 18 gm/dl			Female 37% - 47% / 12 – 26 gm/dl													
UA Dipstick	Glucose Neg	Protein Neg	Micro / Dipstick	<3 RBC / Neg	<5 WBC / Neg												
Category	Fasting Blood Sugar			2-Hour Post-Prandial		A1C											
Normal	<110			<140													
Impaired Glucose Tolerance	110< FBS <126			140< 2HPP <200													
Diabetes Mellitus	>126			>200													
Gestational Diabetes Mellitus	>105			>165													
Anthropometric Standards Class 1																	
Total Arm Span (TAS)	Greater than or equal to 164 cm																
Crotch Height (CH)	Greater than or equal to 75 cm																
Sitting Height (SH)	Less than or equal to 95 cm for OH-58 and TH-67 Less than or equal to 102 cm for all other aircraft																

Note: Blood Pressure less than 140/90 (regardless of age or flight class) with exception for Class 4 OPM standards. For OPM standards and requirements see ATB below and Tables 12 and 13.

Table 7: Flight Duty Medical Exam and Flight Duty Health Screen Checklist

♦= 50 and over ◇= 40 and over ■= Required ( ) = Recommended or req by AR 40-501, readiness requirements, or other physcials

Initial  
Comp\*  
FDHS\*

\*Note: Comprehensive FDME q5 yrs between ages 20-50; then annually

\*Note: FDHS requires physical exam only as indicated

**Aeromedical Standards**

DD2808  
Blocks

Check in & Vital Signs				ALL Standards Qualified if:		
■ ■ 4497	DD 2807, DD 2808 (DD 2697 Retirement Physicals)					1-30
■ ■ ■	Sitting BP, Pulse, (Temperature)			Pulse ≥50 and ≤100 BP <140/90		56-58
■ ■ ■	(Height, Weight)			See AR 600-9		53-54
■ ■ ■	[Waist circumference (in cm)] Not required if meets standard			If BMI < 30		73
■	Anthropometrics (1A/1W Only)			Crotch Ht (CH) ≥75cm Total Arm Reach (TAR)≥164cm Sitting Ht (SH) ≤102cm (≤95cm for OH-58); >102cm req waiver		73
Vision				Class 1/1A	Class 2/3/4	
■ ■ ■	Distant Visual Acuity By projected chart only			20/50	20/400	61
■ ■ ■	Near Visual Acuity			20/20	20/400	63
■ ■ ■	Refraction: Manifest/Subjective (May use lens Rx if corrected to 20/20-1)			Required if not 20/20-1	Required if not 20/20-1	
■	Refraction: Cycloplegic (1A/1W only) Annotate cycloplegic protocol 1gtt proparacaine 0.5% → 1gtt cyclopentolate 1.0% @1 min and 6min			-1.50 ↔ +3.00 S. Must -1.00 ↔ +1.00 Cx. Transpose	Not Required	62
■ ■ ■	Stereopsis (Randot, Titmus, or AFVT)			≤40° arc @ 20' (Titmus 0/9, Randot ≤3/10, AFVT:Group B)		67
■ ■ ■	Phorias by AFVTA			≤8 Eso; ≤8 Exo; ≤1 Hyper		64
■	Cover-uncover test (tropias)			No detectable movement (ORTHO)		64
■	Near Point Convergence (NPC)			≤100mm		64
■ ○ ○	IOPs			≥7 and ≤21mmHg; <4mmHg Δ between eyes		70
■ ■ ■	Color vision (Must use PIP; Falant for PIP failures only)			PIP: ≤ 2/14 + PIP2 or F2 plate; Annotate "PASS" in AERO remarks		66
■	Visual fields (confrontation)			NTC or FTC OU		68
■	Night Vision Hx			NIBH		69
■	Corneal Topography (1A/1W Only)			Normal		73
Check in & Vital Signs				Class 1/1A	Class 2/3/4	
■ ■ ■	500 -2000Hz			≤25 dB [no shift > 20 in any freq from baseline (after waiver granted)]		71
■ ■ ■ ■	3000 Hz			≤35 dB		
■ ■ ■ ■	4000 Hz			≤45 dB	≤55 dB	
■ ■ ■ ■	6000 Hz			≤45 dB	≤65 dB	
(Dental) (annual readiness requirement IAW AR 40-3)				Class I or II		
ECG (Initial, over 40 or required by APL for waiver)				See APL (Ensure G-Code is entered in AERO)		
Laboratory				Male	Female	
■ ■	UA w/Micro; Report Glu, Pro, RBC, WBC			Glu Neg ; Pro Neg ; ≤ 2 RBC ; ≤ 4 WBC		45,73
■ ■ ■	HCT or Hgb			40-52% (14-18 gm/dl)	37-47% (12-16gm/dl)	47
■ ■ ■	HIV (annotate date drawn) (optional for DAC)			Performed every 2 yrs		49
■ ○ ○	Fasting Glucose			≤109 (see DM APL)		73
■ ■ ○	Lipid Panel (chol, HDL, LDL, Trig, Chol:HDL ratio)			See APL		73
■ ■	Sickledex (except Class 4)			Negative		73
○ ○ ○	Cardiac Risk Index (AERO)			<7.5 (see CV Screening APL)		73
◆ ◆ ◆	Stool Guiac (50 and over)			Negative		30
	PSA (no longer req'd; age-appropriate counseling per PHA reqs)			See APL		73
Radiology						
	CXR → SF, MFF, Dive, Retirement (>40) Physicals only					73
○ ○ ○	(Mammogram (Females)) → Age 40,42,44,46,48,50, then yearly					73

<input checked="" type="checkbox"/> Flight Surgeon's Evaluation				
		■	Physical Exam	
	■		Reading aloud Test	Satisfactory (Clear, deliberate; without hesitation, error, or stuttering)
	■		Aeronautical Adaptability (AA)	Satisfactory
	■		Valsalva (except Class 4)	TM's Mobile
	■	■	PHA/periodic health assessment credit (Req DD 2807-1 "Remarks")	Hx + Education for Tobacco/EtOH/Mental Health/TBI + age-spec req's
	■	■	Contact Lens or Refractive surgery history ( Comp or FDHS if new history)	See Corresponding APLs
	■		"Not afraid of dark or confined spaces" (SERE Statement - Class I Only)	
	■	■	PAP Test & pelvic (Chlamydia req for Female <25y/o)	Follow Guidance in AR 40-501 Chap 11-4i
			DRE(+Prostate) - Only if clinically indicated or req'd by waiver	
(■)			SF, MFF, Dive ↳ G6PD, WBC, CXR	
(■)			Pre-commissioning/induction ↳ Pregnancy Test, Urine Drug/EtOH Screen	
			Retirement ↳ Comprehensive exam + CXR (>40), DD FORM 2697, Counseling re: HCV	
Additional tests, studies and consults needed:				
<input type="checkbox"/>			DOB:	Today's Date:
<input type="checkbox"/>			Age:	Date of last Comprehensive FDME:
Name	Rank	Provider's Stamp		Status
SSN	Unit			

Table 8: Corneal Refractive Surgery Information Required

<b><u>Corneal Refractive Surgery Information Worksheet</u></b>					
<u>Flight Applicant Identification:</u>					
Last Name: _____ First Name: _____ Middle Initial: _____					
<u>Procedure History:</u>					
1. <u>Procedure Date(s):</u> _____					
Type: <input type="checkbox"/> PRK <input type="checkbox"/> LASEK <input type="checkbox"/> LASIK	Eye: <input type="checkbox"/> Both <input type="checkbox"/> Right <input type="checkbox"/> Left				
2. <u>Pre-op Refraction:</u> Pre-op refraction standard for info only: Sphere -6 to +4 and Cylinder -3 to +3; use sphere equivalent calculation (sphere + ½ cylinder) to determine if meets info only standards. Values outside the above require an AMS.					
OD Sphere _____	Cylinder _____	Axis _____	OS Sphere _____	Cylinder _____	Axis _____
AMS waivable pre-op refraction: Sphere -8 to +4					
[ ] Pre-op refraction not available – If pre-op refraction is not available a dilated fundus exam with scleral depression is required.					
Dilated fundus exam with scleral depression: <input type="checkbox"/> Normal <input type="checkbox"/> Abnormal					
<u>Current Optometry Exam</u> Date: _____					
Optometry Exam: Minimum of 6 weeks post-op for those already on flight status and 3 months for all applicants.					
3. <u>Refraction Post-operative:</u>					
[ ] Manifest – Only if eyewear is necessary for 20/20 and no cycloplegic done. [ ] Cycloplegic – Only required for pilot candidates (1A/1W and RO/RW FDMEs);					
OD Sphere _____	Cylinder _____	Axis _____	OS Sphere _____	Cylinder _____	Axis _____
STD: Cyclo: Sphere: -1.5 to +3.0 Cylinder: -1 to +1					
4. <u>Visual Acuity:</u>					
Distant: OD 20/_____	Corrected to 20/_____	OS 20/_____	Corrected to 20/_____	Near: OD 20/_____	Corrected to 20/_____ OS 20/_____ Corrected to 20/_____
<u>5. Intraocular Tensions:</u>					
OD _____	OS _____	STD: 1. <21 mm Hg. If less than 8 mm Hg requires optometry note stating otherwise normal. 2. Difference of <4 mm Hg between eyes			
6. <u>Slit Lamp Exam (SLE for Haze)</u>					
OD: 0 1 2 3 4 [ ] Non-pathologic for 1+	OS: 0 1 2 3 4 [ ] Non-pathologic for 1+	STD: Haze = 0 or 1+ (optometry states non-pathologic in each eye) Haze Scoring: 0 = no haze (passing), 1 = trace haze, 2 = minimal, 3 = moderate, and 4 = iris obscured			
7. <u>Corneal Topography (required):</u>					
[ ] Acceptable	[ ] Abnormal				
Reason abnormal: _____					
8. <u>Low Contrast Sensitivity (LCS):</u>					
OD: 20/_____	OS: 20/_____	STD: LCS 20/60 or better each eye or comment as below.			
[ ] Contrast sensitivity testing not readily available. Applicant denies difficulty with night vision, glares, halos, or visual distortions. Note: If SLE Haze = 1+ normal low contrast sensitivity testing plus annotation it is non-pathologic is required.					
Submitted by: _____ Date: _____					
Contact Info: _____					
Upload form to AERO or fax or e-mail to USAAMA staff: Phone 334-255-0749/0750 (DSN 558) Fax: 334-255-0747 E-mail: <a href="mailto:usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil">usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil</a>					

Table 9: Army Anthropometric Standards for Entry Pilot Training

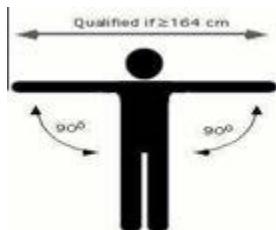
Measurement	Class 1/1A and RW/RO	OH-58 or Aeroscout
	Qualified if:	Qualified if
Crotch Height	$> 75.0$ cm	$> 75.0$ cm
Total Arm Reach	$> 164.0$ cm	$> 164$ cm
Sitting Height	$\leq 102.0$ cm	$\leq 95.0$ cm

**Crotch Height (Leg Length)** - The subject must stand completely erect against a wall, heels together, weight evenly distributed, and knees locked. The measurement is taken parallel with the wall from the floor to a point where light contact is made with the perineum in the midline.

**Total Arm Reach** - The subject must stand erect against a wall, arms outstretched at a 90 degree angle and parallel with the wall. The elbows must be locked. The fingertips of one hand must be in contact with the adjacent wall in the corner of the room. The horizontal distance between fingertips is recorded.

**Sitting Height** - The subject must sit on a hard, flat surface, facing forward, feet flat on the floor, with buttocks, shoulders, and back of head against the wall. Using a right angle on the head, the distance between the sitting surface and the top of the head is recorded in centimeters.

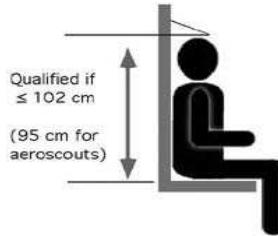
#### Anthropometric Diagrams



**TOTAL ARM REACH (TAR)** — The aviator candidate must stand erect against a wall, arms outstretched at a 90 degree angle and parallel with the wall. The elbows must be locked with the fingertips of one hand in contact with the adjacent wall in a corner of that room. The horizontal distance between fingertips is recorded in centimeters.

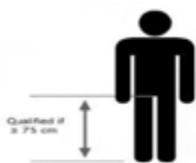
TAR \_\_\_\_\_ cm (std  $\geq 164$  cm)

**SITTING HEIGHT (SH)** — The aviator candidate must sit on a hard flat surface, facing outward, feet flat on the floor, with the buttocks, shoulders, and back of head against the wall. Using a straight angle ruler on the head, the distance between the sitting surface and the top of the head is recorded in centimeters.



SH \_\_\_\_\_ cm (std  $\leq 102.0$  cm)

**CROTCH HEIGHT (CH)** — The aviator candidate must stand completely erect against a wall in bare feet, heels together, weight evenly distributed, and knees locked. The measurement is taken parallel with the wall from the floor to a point where light contact is made with the perineum in the midline. Results are recorded in centimeters.



CH \_\_\_\_\_ cm (std  $> 75$  cm)

X \_\_\_\_\_  
Signature of Examiner / Date

If out of standards, see Anthropometric APL.

If TAR  $< 159.0$  cm, must have in-cockpit evaluation at Fort Rucker. Current POC: DAC Tony Keener, 334-255-3259 (DSN 558)

#### Special Tests—Aviation Unique

The flight physical is conducted just like any other physical exam. The procedure is the same. There are a few items that are commonly checked on the flight physical that most physicians are unfamiliar with because they are unique.. Some of these items may be performed somewhat differently between the various military services and the FAA. These tests and procedure instructions are written in the form of a

Aeromedical Technical Bulletins (ATB). Aeronautical Adaptability is found in the APLs and AR 40-501 and the remaining topics below are in the ATBs.

- The Valsalva Maneuver
- Reading Aloud Test
- Anthropometrics
- Cycloplegic Refraction
- Color Vision Testing
- Binocular Depth Perception
- Aeronautical Adaptability
- Aeromedical Graded Exercise Tolerance (AGXT) Test
- Class 4 Civilian OPM Standards and Requirements

### **Aeromedical Adaptability (AA)**

It is easier to explain what Aeromedical Adaptability is not than it is to explain what it is. An unsatisfactory AA is not a DSM V diagnosis. AA covers sociobehavioral factors considered potentially unsuitable for adapting to military aviation, both medical and non-medical. It is behavior that may be caused by underlying, undiagnosed psychiatric disorder, or traits, that often do not meet full DSM-V criteria, but it is not limited to this. There is no diagnostic test or battery of questions to determine whether the aviator is AA Satisfactory (SAT) or Unsatisfactory (UNSAT). Aeromedical Adaptability is covered in AR 40-501, paragraph 4-29.

UNSAT AA is a consensus of opinion developed after a thorough investigation determines that a certain behavior or conduct is unadaptable or unsuitable for Army aviation. It may be a fear or trust issue, a breakdown in effective crew coordination, or personality traits adversely affecting mission execution and completion. This often will involve the aeromedical provider(s), aviation chain of command (military) or supervisory chain (civilian), and often a psychologist/psychiatrist evaluation. Admittedly, this is not an exact science and often the case should be discussed with USAAMA prior to rendering the final determination. The issue in question may not be a medical issue, but rather, and more often, an administrative, command issue or a Flight Evaluation Board issue.

Before rendering an UNSAT AA, it is best to step back and review the reasons for making this determination. Was it a “bad” provider-patient interaction? Was it concealment of information (often from encouragement from others) due to fear of not being qualified for flight, but not knowing the policies and that the condition is amenable to an exception to policy or waiver? Is it other observations? USAAMA will often, but not always, request the following:

1. The patient undergo a psychological evaluation and testing to identify or eliminate an underlying psychological diagnosis or traits that may be concerning for aviation service.
2. Interview with another aeromedical provider.
3. Memorandum from command in trained aircrew.

An UNSAT AA in an applicant is an automatic DQ. Fixing this, if in error, requires an aeromedical summary requesting the initial determination be overridden with the “new” information.

An UNSAT AA in a trained aircrew is a permanent suspension and shall have an aeromedical summary submitted for removal from future aviation duties. Again, repairing an incorrect determination requires an aeromedical summary request to override the previous determination with the “new” information.

## **Aeromedical Disposition**

The aeromedical provider first makes the fitness for duty determination after careful examination and thoughtful application of current aeromedical standards and annotating such on the DD Form 2992, Medical Recommendation For Flying or Special Operational Duty,(up and downslip). USAAMA reviews all classes of physical and displays its determination in AERO with 2-letter codes (see table 10 below)

Table 10: AERO's USAAMA Aeromedical Disposition Codes

<b>AERO Qualification Status</b>	<b>AERO Code</b>	<b>Notes</b>
Qualified	QU	Qualified with no waivers.
Qualified information only	QI	Medical condition is tracked but does not require a waiver.
Qualified deployed incomplete	QD	Physical done under deployment standards meaning not all physical requirements were completed. Must complete the missing items within 90 days from redeployment.
Disqualified	DQ	Disqualified and waiver is not possible or new disqualified condition found by USAAMA that requires an evaluation.
Disqualified incomplete	DI	Disqualified due to missing information required by USAAMA.
Waiver recommended	WR	USAAMA recommends a waiver to the waiver authority.
Waiver granted	WG	Waiver has been approved by the waiver authority.
Waiver continued	WC	Meets the annual waiver requirement for an existing waiver.
Exception to policy recommended	ER	USAAMA recommends an exception to policy to the waiver authority.
Exception to policy granted	EG	Exception to policy has been approved by the waiver authority.
Exception to policy not recommended	EN	Exception to policy is not recommended to the waiver authority.
Exception to policy or waiver denied	WD	Exception to policy for Class 1 or waiver for Class 2, 3 or 4 initial physicals is not approved by the waiver authority.
Exception to policy continued	EC	Has an existing exception to policy, has not completed training and continues to meet the annual waiver requirements.
Suspension recommended	SR	Suspension recommended by USAAMA to the waiver authority.
Suspension granted	SG	Suspension approved by the waiver authority.
Suspension continued	SC	Has an existing suspension with no change or waiver request to reverse suspension is denied.

1. Medically Qualified [QU, QI (Qualified, Information Only)]: Whenever a crewmember meets the aeromedical standards set forth in AR 40-501 and the Aeromedical Policy Letters (APLs).
2. Medically Disqualified [DQ, DI (Disqualified Incomplete)]: Whenever a crewmember does not meet the medical standards set forth in AR 40-501, chapter 4 and the APLs or is not able to safely perform the duties required, the crewmember is said to be medically disqualified from aviation service. Incomplete physicals shall be identified for deficiencies and corrected with submission of additional information missing or an aeromedical summary per the APLs. Physicals that are submitted as "disqualified," completed but with an identifiably disqualifying and non-waiverable condition, still require an AMS to terminate ACIP as well as alert HRC of unit manning/assignment issues.

#### A. Permanent Disqualification

When a medical condition that impairs the safe performance of aircrew duties is expected to last longer than 365 days or is specifically listed in AR 40-501, Chap. 4 or the APLs, it is termed as aeromedically permanently disqualifying. Examples include insulin-requiring diabetes, heart attack, HIV seropositivity, hypothyroidism, malignancies, or hypertension. These conditions are listed in AR 40-501 as being unfit for aviation service and are thereby disqualifying. Some of these conditions (e.g. hypothyroidism and hypertension) when properly treated will not present a danger to aviation safety and these crewmembers may apply to receive a waiver. Other conditions such as a heart attack, severe traumatic brain injury, or stroke will present a persistent danger to aviation safety and the aircrew member will usually not be granted a waiver. Permanent disqualifying conditions require a waiver in order for the aircrew to continue in aviation service. See waiver below.

#### B. Temporary Disqualification

Imposed for a condition that is not permanently disqualifying per the APLs or AR 40-501. It is expected to last less than 365 days prior to resolution. When the condition resolves, the crewmember is again considered qualified to perform aviation duties. Examples include the common cold, ankle sprain, minor back injuries, simple extremity fracture, and uncomplicated pregnancies. If however, the condition fails to resolve within 365 days and/or it continues to prevent the crewmember from safely performing his duties, the condition will be treated as a permanent disqualification (see above). Temporary disqualifications usually do not require waiver action.

3. Waiver [WR (Waiver recommended), WG (Waiver granted)]: For most aeromedical summaries, USAAMA will recommend a waiver from the waiver authority. A document, waiver letter, from the waiver authority (e.g. HRC, NGB, or DAC/contract officials) grants continued flight status in spite of a disqualifying defect. This document waives the requirement for the aviator to meet a specific medical standard and provides the annual waiver requirements to maintain the waiver specified. Medical to include USAAMA recommends waivers and the waiver authority grants the waiver.

4. Exception to Policy [ER (Exception recommended) and EG (Exception granted)]: A matter of semantics, waivers are not granted for Class 1 applicant standards. If a Class 1 applicant does not meet medical standards, he/she must receive an exception to policy prior to entering aviation service. An exception to policy is scrutinized more carefully though the process is the same as that for a waiver. As above, the waiver authority grants the exception.

More semantics: a Flight Student's status changes from class 1 to class 2 at the start of the initial flight training course leading to award of an aeronautical rating,. Flight students that are now Class 2 aviators require a waiver and not exception to policy.

5. Aeromedical Summary (AS is the AERO code): In order for an aircrew member to get a waiver or exception to policy, the aeromedical provider performs a thorough medical evaluation of the condition and documents the evaluation in an Aeromedical Summary (AMS) IAW the APLs. Use AERO for AMS submission. The AMS process is detailed below and is similar in structure to a Narrative Summary. The flight surgeon reviews and submits the AMS along with his/her recommended aeromedical disposition (waiver/ETP recommended versus not recommended) to the U.S. Army Aeromedical Activity (USAAMA). Only a flight surgeon or AME (physician) may submit an AMS. APAs and AMNPs may not submit an AMS to USAAMA except in rare occasions approved by the Director, USAAMA. If a waiver/ETP recommendation is ultimately approved, the crewmember may continue on flight status or be medically cleared to assess to flight training. If not approved, the crewmember will be removed from flight status or flight training selection.

6. Medical Recommendation: The flight surgeon is a special staff officer on the commander's staff. Like other staff officers, the flight surgeon is a subject matter expert who makes recommendations to the commander. The flight surgeon enjoys a position of special trust with the commander and typically, the commander approves the flight surgeon's aeromedical recommendations. Technically, until the commander approves the flight surgeon's recommendations, they are just recommendations and carry little weight.

7. Approval Authority: The commander is the approval authority. The goal is to determine at what level of the command this authority resides. When dealing with DA waiver (or exception to policy) recommendations, this is also known as the DA waiver authority. A comprehensive list of waiver authorities is listed in AR 40-501, chapter 6 and in Table 12 below.

## **FDME/FDHS Review and Disposition**

Class 1, 2, 3 and 4: All class 1, 2, 3 and 4 FDME/FDHSs are submitted to USAAMA at Ft. Rucker via AERO for final review, and disposition (this includes all initial, comprehensive FDMEs and interim FDHSs). If not submitted via AERO, USAAMA inputs the submitted paper FDME/FDHS into AERO to insure the FDME/FDHS is complete and that all parameters are within Army aeromedical standards. If it is complete and within standards, it will be stamped or coded as "Qualified" or "Qualified, Information Only." If mailed to USAAMA, the FDME/FDHS will be returned to the originating clinic for inclusion in the health record. If using AERO, the FDME/FDHS form will be printed and placed in the HREC showing the electronic qualification. If the FDME/FDHS is missing required information or it has any parameters outside Army aeromedical standards it will be stamped or coded as "Disqualified Incomplete" or "Disqualified." If mailed to USAAMA, the FDME/FDHS will be returned to the originating clinic with the AERO cover sheet of deficiencies for review to correct the defects, and then resubmission of the FDME/FDHS. If submitted via AERO, the deficiencies are available online under "Reason Returned.". Incomplete FDME/FDHSs will need to be completed and resubmitted to USAAMA with the requested information. Disqualified FDME/FDHSs are discussed below. See Table 10 above for AAMA disposition codes.

## **Waiver/Exception to Policy (ETP) Review and Disposition**

Waiver (class 2, 3 and 4) and Exception to Policy (class 1) review and disposition is performed centrally at USAAMA in a similar manner to FDMEs/FDHSs. USAAMA performs the central medical review and renders its disposition. If incomplete, the AMS is stamped "Disqualified, Incomplete" and returned to the flight surgeon for remedy. If for information only, USAAMA completes its reviews and dispositions accordingly. Otherwise, USAAMA forwards the medical recommendation to the appropriate central waiver authority (e.g. HRC, NGB, etc.). The waiver/ETP recommendation is approved/disapproved by the centralized waiver authority and centrally managed. If granted, the waiver letter or the AERO Abbreviated Waiver Letter shall be filed in the Individual Flight Record Folder (IFRF) and medical record and follows the crewmember from duty station to duty station. Ensure any waiver letters in the IFRF do not contain any medical information that violates HIPAA.

## **The Waiver Process**

This process will be discussed using the central review process employed for Class 1, 2, 3 and 4. The waiver process has been developed to ensure the consistent and proper management of disqualified aviation personnel. This process has been responsible for the safe return of countless aviators to flying duties once effective treatment has been achieved. It also has been responsible for clearly identifying those individuals with medical conditions incompatible with continued safe flying or their continued good health. It allows for consistent health care management of individuals who routinely receive their health care from many different health care providers. With proper utilization of senior health care consultants, it ensures the highest level of health care and provides quality assurance. Most importantly, it ensures the maintenance of a readily mobile effective fighting force.

The entire waiver process normally starts with the local aeromedical provider's office at the time of the discovery of a disqualifying medical condition. Local evaluations and consultations are performed, and the crewmember's condition is carefully documented in an Aeromedical Summary (AMS) in AERO. The AMS is explained in the following section. In addition to documenting the crewmember's work-up, the aeromedical provider also annotates a local aeromedical disposition in the AMS. The recommendation on the medical disposition, qualified or disqualified, from the local aeromedical provider is critical and must be clearly stated. Aeromedical providers are encouraged and welcomed to contact USAAMA to review complex, interesting, or time-sensitive cases as well as the available results of the evaluation or requirements from the APLs. This serves several purposes that ultimately assist in ensuring the complete and necessary work-up is accomplished in a timely fashion to get towards a final disposition for the air crewmember, ATC or UAS operator. Once the AMS is submitted to USAAMA, it can take several different routes depending on the nature of the problem.

Most waiver requests are straightforward and routine (i.e., those with clear policy established), requiring little more than review for all the required information elements and endorsement. USAAMA's flight surgeon staff will process the AMS to include the final aeromedical disposition and recommendation along with annual follow-up requirements in the form of an official letter from the Director, USAAMA, to the appropriate waiver authority. The waiver authority will provide the final review and render the final decision, the granting of the recommended action in most cases. Any issues or concerns are brought to the attention of USAAMA for clarification. With AERO, time and delay has been greatly reduced in most cases. Occasionally, the USAAMA flight surgeon staff upon initial review may request further evaluation or additional information. Often, USAAMA will attempt to dialogue with the aeromedical provider via phone, email, or AERO messaging to discuss the case, work-up, questions, concerns, or notes from AHLTA. The AMS may be referred to the appropriate aeromedical consultant for input. Additional evaluations or studies may be requested locally or with the Naval Aerospace Medical Institute (NAMI), Pensacola, FL, or the USAF Aerospace Medicine Consultation Service (AMCS), Wright Patterson AFB, OH. With the rapid advancement in medicine, which may outpace policy changes, the ultimate goal is to develop the best recommendation to conserve the fighting strength while keeping in mind the health/welfare/safety of the air crewmember, ATC or UAS operator, unit, and mission.

Cases that are unusual, potentially precedent setting, or involve significant flight or other operational limitations may be presented to the Aeromedical Consultant Advisory Panel (ACAP) (see below). Such an example is a newly diagnosed, asymptomatic aviator with HIV. The ACAP is comprised of senior aviation and aeromedical personnel at Fort Rucker. Cases are presented, aeromedical and aviation-related issues are discussed, and a vote of the panel's recommendation is taken. The recommendation of the ACAP is reviewed and endorsed (approved or disapproved) by the Director, USAAMA and forwarded to the appropriate waiver authority. The waiver authority will then take appropriate action, producing a formal letter of waiver, exception to policy or termination notification (suspension).

Waiver processing may be time consuming. Complicated cases or cases that have no precedent often take additional time due to the need for specialty consultation, literature review, or query of other services management. Most routine waivers may be granted temporary clearance pending waiver, and telephonic approval from USAAMA is available for the uncertain or APL directed cases. For rush cases, the most expeditious method is AMS submission via AERO followed by a phone call or email to alert USAAMA AERO helpdesk staff of the need.

### **Aeromedical Consultant Advisory Panel (ACAP)**

Director, USAAMA, appoints voting members to the ACAP. Generally, all aerospace medicine specialists assigned to the Ft. Rucker area are appointed as voting members. Experienced flight practitioners credentialed at Lyster Army Health Clinic are also appointed. US Army Aviation Center of Excellence (USAACE) senior military and DAC aviation personnel are voting members, bringing in the "line" aspect

on cases. Director of USAAMA chairs the ACAP and reviews the recommendations, forwarding the final recommendation to the appropriate waiver authority. The goal of the ACAP is to establish a consensus opinion of aeromedical and aviation experts for case review/disposition and for policy formulation.

## **Waiver/ETP Criteria**

Factors commonly used in the consideration of granting a waiver include feasibility, in-flight safety, impacts on mission and deployability, progressive nature of the illness, requirement for treatment or medication which will not readily be available during mobilization and ultimately the needs of the Army. Just because the APLs say that a waiver may be possible does not mean that it will inevitably be granted. In considering a waiver case, the waiver authorities will take into account the above criteria, the condition or combination of conditions concerned, the treatment given to the patient and other relevant factors. If necessary, they will consult medical specialists and line authorities. A consensus of opinion will be developed and forwarded for approval through Director, USAAMA to the waiver authority. The question, "Can a previously terminated individual be returned to flying status?" is commonly asked. This is possible, but it is very dependent upon the condition and the current requirements of the Army. Aeromedical providers should brief patients who are facing likely disqualification accordingly.

To be considered waivable, any disqualifying physical or psychological defect is subjected to the following screening criteria:

1. The disqualifying defect must not pose a risk of sudden incapacitation (i.e., risk to aviation safety).
2. It must not pose any potential risk for subtle incapacitation that might not be detected by the individual and would affect alertness, special senses, or information processing.
3. It must be resolved or stable at time of the waiver request (i.e., non-progressive).
4. It must not be subject to aggravation by military service or continued flying.
5. It must not lead to significant loss of duty such as precludes unsatisfactory completion of training and/or military service.
6. It cannot require the use of uncommonly available tests, regular invasive procedures, or non-routine medication especially during deployment or assignment to austere areas.
7. Medication must not have any aeromedically significant side effects; the medication will not mask symptoms subject to acute incapacitation or complications in the aviation environment; and the individual is compliant with medication use.
8. If the possibility of progression or recurrence exists, the first signs or symptoms must be easily detectable and cannot constitute an undue hazard to the individual or to others.
9. It cannot jeopardize the successful completion of a mission.

## **Temporary Clearance Pending Waiver**

The aeromedical provider may grant temporary clearance for minor disqualifications, when following established policy. For example, an aviator with well-controlled hypertension on a stable dosage of an approved agent is routinely granted waivers barring any other underlying medical conditions. This being the case, it is not necessary to keep the aviator grounded pending receipt of the waiver from the waiver authority. The flight surgeon may grant a temporary clearance pending waiver in the interim, expediting return to full duty without compromising aviation safety and keeping with the spirit of applicable regulations. If unsure about granting a Temporary Clearance Pending Waiver, call/email USAAMA.

Exceptions: The following conditions listed in the table 11 below may NOT be granted temporary clearance pending waiver. Any aircrew that was previously medically disqualified and suspended from aviation duties who is seeking a waiver to return to flight duties and "re-qualification" should not be given temporary clearance beyond that needed for in-cockpit assessment.

Table 11: Conditions That May Not be Granted Temporary Clearance

<b>Condition</b>	<b>Qualifier</b>
Alcohol disorders	Alcohol dependency or abuse requires waiver approval by the waiver authority prior to return to full flight duties (FFD).
Atherosclerotic vascular disease (See Cardiovascular Screening program)	Those who fail LVL 1 CAD screen may be granted temporary clearance pending completion of further work-up without restriction if asymptomatic. If LVL 2 CAD is abnormal but the crew member is asymptomatic, a restricted dual status may be approved by contacting USAAMA.
Cancer	Except single episode of basal cell carcinoma.
CVA and other significant CNS disorders	Includes TIA and seizure disorders.
Loss of consciousness (LOC)	When unexplained.
Medically disqualified	Those who have been medically disqualified and suspended from aviation service. (Termination orders from HRC or NGB or a suspension letter from the local waiver authority for DACs and select contractors).
Myocardial infarction	Contact AAMA for further guidance.
Any condition which obviously impairs personal safety, safe flight, or mission completion	Contact AAMA for further guidance.
Seizure disorder	Contact AAMA for further guidance.
Significant visual disturbances	Includes visual acuity uncorrectable to 20/20 or impaired depth perception.
Skull fracture or other significant head trauma	Contact AAMA for further guidance.
Substance Abuse	Requires waiver to be granted by the waiver authority.

## **Aeromedical Summary: Guide to Completion**

An Aeromedical Summary (AMS) is required for any action that requires waiver/exception to policy, permanent medical disqualification/suspension (i.e., permanent termination from flying including UAS and ATC duties) or reinstatement after permanent termination from flying including UAS and ATC duties. The AMS is available in AERO. An abbreviated, focused AMS may be used for most common, straightforward conditions such as hearing loss or hypertension. These fairly standard abbreviated AMS consolidates the occupational, aviation, social, family, and past medical history as well as the chief complaint and physical exam findings.

AERO is the preferred method to prepare and submit an AMS. The AMS should be printed and placed in the HREC and updated with the final disposition. Storage in AERO foregoes the need to maintain a file copy for 2 years in the clinic.

If not done in AERO, it should be typed; handwritten submissions are acceptable but must be legible. The AMS should be typed on Optional Form 275, Medical Record Report, March 2002, available from the U.S. General Services Administration's' forms library website at: <http://www.gsa.gov/portal/forms/type/OP>. This will facilitate the incorporation of the AMS into the electronic health record. For typed summaries, at a minimum, an original and a copy of the AMS and supporting documents must be made. The original is forwarded to USAAMA for processing. The copy of the typed AMS must be maintained on file in the flight surgeon's office for a minimum of 2 years IAW AR 40-501, paragraph 6-10 (c & d). A copy of the AMS will be place it in the crewmembers electronic health record until the original is returned for filing in the electronic health record. This redundancy helps minimize problems with lost mail or PCSs of either the aircrew member or his/her aeromedical provider. NOTE: Legibility is key. Altered (white out, erased, blocked out, etc.) records are not accepted. Again, use AERO.

The AMS is often submitted with the annual FDME/FDHS, but this is not required. What is required is having a current FDME/FDHS on file within AERO. An AMS concludes with the aeromedical provider's recommendation, a simple declarative statement of what will be best for the individual, flying safety, and the Army. Make concrete and positive recommendations such as recommend waiver, exception to policy, suspension or information only. The recommendations should focus on whether the individual is medically qualified and safe to fly. The aeromedical provider should state the specific chapter/paragraph regulating the condition and any appropriate APLs. The aeromedical provider must remain strictly objective and not allow personal likes or dislikes, any outside pressure, or personal biases to influence this decision. This recommendation should include any restrictions as well as recommendations for follow-up or need for further consultation, which is appropriate but unavailable at the location. USAAMA can help coordinate further evaluation/consultation as necessary.

### **Organization of Documents for Hard Copy Submission of the AMS**

In order to expedite processing of the aeromedical summary, it is important to place documents neatly labeled, tabulated, and collated preferably in chronological order, earlier dates first. This will allow the reviewer to follow chronologically the development/resolution of the defect or condition. The documents should be assembled in the following order:

- Cover letter (optional)
- Aeromedical Summary

Enclosures:

- Any available supportive consultations
- Reports of all operations
- Lab reports, pathology report, tissue examinations
- Reports of all studies: x-rays, pictures, films, or procedures (ECG, AGXT, Holter, ECHO, cardiac scans, catheterization, endoscopic procedures, etc.)
- Hospital summaries and past medical care documentation; reports of any proceedings (tumor board, MEB, PEB, FEB)
- Letters of recommendation

NOTE: AMSs for civilian/contract personnel should indicate complete contact information for the waiver authority as well as whether the individual is also in the Reserves or National Guard so that the waiver can be forwarded to all appropriate waiver authorities. Follow the template below and you may combine sections as appropriate.

## **Aeromedical Summary Template**

1. Address (of originating facility):
  - a. Facility code:
  - b. Originating facility address:
  - c. Aeromedical provider's name:
  - d. Aeromedical provider's telephone number (DSN and commercial)
2. General Information:
  - a. Name:
  - b. Rank:
  - c. SSN::
  - d. Age:              DOB:
  - e. Component:
  - f. MOS/AOC:
  - g. Years of service:
  - h. Profiles:
    - i. Previous waivers/terminations:
    - j. Home address:      Phone:
    - k. Unit address:        Phone:
    - m. How was the condition discovered:
    - n. Primary aircraft
    - o. Military flight hours:
    - p. Current duty
    - q. Flying position:
    - r. Grounded: Yes or No
    - s. Date Grounded:
    - t. Temp FFD issued: Yes or No
    - u. Date temporary clearance issued:
    - v. Date of incapacitation: Date determined to be medically disqualified. This is used for suspensions only.
3. Military/Occupational History:
4. Aviation History:
5. Social and Family History:
6. Past Medical History:
7. Present Problem:
8. Physical Examination:
9. Laboratory and X-Ray Data:
10. Discussion:
11. Recommendations:
12. Synopsis of Diagnoses:

Example:

<b>Diagnosis</b>	<b>Tests</b>	<b>Procedures</b>	<b>Medications</b>
Hypertension	Chem 7, uric acid, CBC, UA		Lisinopril
Coronary Artery Disease	GXT, Echo	Cath	ASA

13. Enclosures:

E.g.: Discharge Summary, Outpatient Reports, Pathology Reports, Specialty consultations, Tests/Lab reports (include actual original tracings, Echo videos, cardiac cineangiograms, etc.), and letters of support from the command, SIPs, etc., as required.

14. Flight Surgeon's Signature Block

**AERO Submission and Documents**

With AERO being a web-based, electronic submission, follow the template within AERO to complete the submission. Cut and paste pertinent information from AHLTA or word processing documents as required. For complicated or lengthy information, it is acceptable to provide a summary of AHLTA referenced information. Upload as a PDF all supporting documents and required letters of support to AERO. Any documents not found in AHLTA must be uploaded to AERO to prevent delays in processing of the AMS.

**The Aeromedical Epidemiology Data Registry (AEDR)**

Enacted in 1973 per AR 40-501, the AEDR, maintained by USAAMA, contains the medical information concerning the physical and historical data related to Army aviators, which has been migrated and tied into AERO. With USAAMA disposition on FDME/FDHS, entries are made in AERO that appear in the medical history and printed cover sheet document. With hardcopy submissions, this document is returned with the original FDME/FDHS to the originating/return facility or becomes available electronically. The local FS office and the crewmember should review this on an annual basis, insure compliance with any annual waiver or information requirements, and submit corrections or changes electronically via the AERO/USAAMA helpdesk.

The AEDR provides the compilation of aeromedical history for use in retrospective analyses, ecologic demographic research, and queries from OTSG, HRC, and sister services. Data is used in review and revision of aeromedical policy and standards. AERO and the AEDR is closely secured and monitored to remain in compliance with HIPAA and security directives. Requests for research or queries should be directed to the Director, USAAMA, or Deputy Director for Administration. Information from the AEDR is sanitized of unique personal identifiers prior to release.

**Review of the AMS / Waiver Process**

1. The aeromedical provider prepares an aeromedical summary (AMS). The AMS is submitted to USAAMA and placed into AERO, if not already. USAAMA's Review/Disposition Service directs it to the Consult Service Inbox.
2. The USAAMA Consult Service reviews the AMS and current FDME/FDHS for its content, compliance, and annotations to support the recommended action. Straightforward cases with clear policies and directives are processed to the director. More complex, complicated, or precedent setting cases are further reviewed and discussed with the USAAMA Aeromedical staff, Aeromedical consultants, and/or with the Aeromedical Consultant's Advisory Panel (ACAP). Further information, review of AHLTA documentation, and review of AEDR may be utilized for these cases.
3. Complicated or complex cases are further reviewed as above. Some are handled within the Aeromedical Staff (Mini- ACAP) or taken to formal ACAP meetings. Results of Mini-ACAP and ACAP are forwarded to Director, USAAMA, for final review and recommendation.
4. Director's waiver recommendation is forwarded from USAAMA to HRC, NGB, or appropriate waiver authority for final waiver approval or disapproval.

**Table 12: Waiver Authorities**

<b>Component</b>	<b>Waiver Authority</b>
Active Army or USAR – Classes 1, 2 (aviators), 3 and 4	HRC – Pay Incentive Branch
Active Army or USAR – Classes 2F/P	HRC – Medical Corps Branch
Army National Guard – All classes	National Guard Bureau
Department of the Army Civilians	Commanding General or his/her designated waiver on each installation.  Send signed copy to USAAMA.
Contract Civilians	Commanding General or his/her designated waiver on each installation.  Send signed copy to USAAMA, and the contracting office.

## **ATB: Aeromedical Graded Exercise Test (AGXT)**

Updated 13 Jan 2008

1. The indications for the Aeromedical Graded Exercise Test (AGXT), also called graded exercise treadmill (GXT), are described in AR 40-501, Standards of Medical Fitness, paragraph 4-15, and various APLs where cardiac health is an issue, most often from conditions referenced in the Cardiology Chapter of the APLs, in particular the Cardiovascular Screening Program and Metabolic Syndrome APLs. The guidelines for performing an aeromedical GXT are outlined below to apply a uniform standard in the performance and interpretation of this test on aircrew members.
2. Prior to the AGXT, the aircrew member should be briefed by the local flight surgeon as to the indications for the test, the procedure, and the significance of the results. The patient should sign an informed consent statement.
3. The following conditions should be assured prior to testing:
  - a. Minimum of four hours fasting prior to test.
  - b. No tobacco or caffeine products one hour prior to test.
4. The aeromedical GXT must be a maximal effort, limited only by symptoms, exhaustion, or objective signs (medically significant ectopy, dysrhythmia, ischemia, or blood pressure response). Exercise should not be halted on attainment of a predicted maximal heart rate. Often, testing should proceed to 100% of predicted HR or beyond. Clinical decision-making may override termination.
5. A final report of the AGXT including date of study, interpretation, patient's activity level and attained workload should be annotated with the FDME/FDHS and /or AMS for review and disposition. Actual tracings do not need to be sent, and if required, will be requested by USAAMA.
6. A copy of Aeromedical Graded Exercise Test Report Form (enclosure 1) and Letter to the Attending Physician (enclosure 2) of this ATB should be forwarded with the patient to the attending physician conducting the AGXT.
7. Aeromedical standards for interpretation of treadmill exercise tests in Army aircrew members.
  - a. Baseline: The location of three consecutive coplanar ST segments, measured 80 milliseconds after the "J" junction, following 30 seconds of standing hyperventilation. This baseline may be on, above, or below the PQ segment, but must be parallel to it.
  - b. Definition of Abnormal tracing: 1.0 or more millimeters of ST depression in three (3) consecutive coplanar complexes, measured 80 milliseconds after the "J" junction, irrespective of slope. Other causes for an abnormal result include: atrial flutter or fibrillation, supraventricular or ventricular tachycardia (three or more consecutive premature beats including multifocal atrial tachycardia), supraventricular or ventricular pairs (couplets), multiform ventricular premature ectopy, ventricular premature R wave on preceding T wave, or hypotensive or excessive hypertensive response of any degree. Chest pain/pressure, angina, infarction, or the suspicion of significant peripheral vascular disease, likewise, constitutes an abnormal result requiring further evaluation and management. If abnormal, apply follow-up guidelines from the Abnormal Cardiac Function Testing APL

Enclosure 1:

**Aeromedical Graded Exercise Test Report Form**

Patient Name:		DoD ID#:		Date:	
Rank:	Age:	Gender:	Race:	HT/WT (in/lbs):	
Medications:			Facility:		
LDL:	HDL:	Chol/HDL ratio:		Tot Chol:	FRI:

Bruce Protocol

Pre-Exercise		Sitting Heart Rate:		Sitting BP:		Resting EKG Analysis:
		Hypervent Heart Rate:		Hypervent BP:		
		Supine Heart Rate:		Supine BP:		
Exercise	Minutes	MPH	% Grade	Heart Rate	BP	Comments (Sxs, EKG changes, etc.)
	0	1.7	10			
	1					
	2					
	3	2.5	12			
	4					
	5					
	6	3.4	14			
	7					
	8					
	9	4.2	16			
	10					
	11					
	12	5	18			
	13					
14						
15	5.5	20				
Post Exercise	Immediate	-	-			
	2	-	-			
	5	-	-			
	8	-	-			

Analysis

Total Exercise Time:	Max BP:	Peak Exercise Heart Rate:	Total Mets:
Reason for Termination			
<input type="checkbox"/> Exhaustion <input type="checkbox"/> Chest Pain/Angina <input type="checkbox"/> Dysrhythmia <input type="checkbox"/> ST Segment Changes <input type="checkbox"/> Hypertensive BP Response <input type="checkbox"/> Fatigue <input type="checkbox"/> Joint/Muscle Pain <input type="checkbox"/> Poor Conditioning <input type="checkbox"/> Other			
Physician Interpretation:			
<input type="checkbox"/> Normal <input type="checkbox"/> Abnormal			
Comments:			
Physician Stamp:		Physician Signature:	

ENCL 1 ATB 11-01

Enclosure 2: AGXT: Letter to the Attending Physician

TO: ATTENDING PHYSICIAN

FROM: FLIGHT SURGEON'S OFFICE SUBJECT: Aeromedical Graded Exercise Test

1. A graded exercise test has been requested by the US Army Aeromedical Activity on this US Army aircrew member to explore the possibility of aeromedically significant coronary disease and other cardiac abnormalities. Please follow the definitions and diagnostic criteria listed below in the interpretation of this test. Since this study has occupational medicine importance, these criteria are intended to yield maximal sensitivity. Please do not apply other criteria.
2. The following conditions should be assured prior to testing:
  - a. Minimum of four (4) hours fasting prior to test.
  - b. No tobacco or caffeine for one (1) hour prior to test.
3. The aeromedical GXT must be a maximal effort, limited only by symptoms, exhaustion, or objective signs (medically significant ectopy, dysrhythmia ischemia, or blood pressure response). Exercise should not be halted on attainment of a predicted maximal heart rate. Often, testing may proceed beyond 100% of predicted maximal HR, and clinical decision-making should be used for termination.
4. Determination of abnormal exercise tolerance tests for US Army aircrew members:
  - a. Baseline: The location of three (3) consecutive coplanar ST segments, measured 80 milliseconds after the "J" junction following 30 seconds of standing hyperventilation. This baseline may be on, above, or below the PQ segment, but must be parallel to it.
  - b. Abnormal: 1.0 or more millimeters of ST depression in three (3) consecutive coplanar complexes, measured 80 milliseconds after the "J" junction, irrespective of slope. Other causes for an abnormal result include: atrial flutter or fibrillation, supraventricular or ventricular tachycardia (three or more consecutive premature beats including multifocal atrial tachycardia), supraventricular or ventricular pairs (couplets), multiform ventricular premature ectopy, ventricular premature R wave on preceding T wave, or hypotensive or excessive hypertensive response of any degree. Chest pain/pressure, angina, infarction, or the suspicion of significant peripheral vascular disease, likewise, constitutes an abnormal result requiring further evaluation and management.

## **ATB: ATC Medical Standards (DAC and Civilian Contract)**

Updated 16 Feb 2015

**Aeromedical Concerns:** The duties of an ATC require a certain level of health status or fitness based on the nature of the position—duties involving a high degree of responsibility toward the public in view of their control of aircraft at and in the vicinity of military and civilian airfields.

**General:** This aeromedical technical bulletin will serve as a guide for the conduct of the Air Traffic Controller Medical Examination (ATCME) for DAC and civilian contract ATCs. The ATCME may be completed by an aeromedical provider (flight surgeon, APA, AMNP, or AME) from any branch of military service and will be completed annually for all DAC/civilian contract ATC. Per reference 3 listed below, medical standards for DAC and contract civilians are outlined in the OPM manual and summarized here.

This ATB implements the occupational health standards for DAC/civilian contract ATCs as outlined by the Office of Personnel Management (OPM). Current OPM standards address both application and retention for ATCs. These standards do not provide any specific means to apply those standards, nor do they outline any process to waive medical conditions or continued medical treatment for continued safe execution of ATC duties. Thus, personnel found to be outside medical standards within the current OPM standards must follow the Aeromedical Policy Letters for evaluation, waiver submission, and annual waiver requirements. Waiver or suspension requests for those conditions not meeting current application or retention standards will be processed per current USAAMA policy. Review of cases requiring waiver from the OPM standards involving DAC or civilian contract ATCs will include consideration of the very low, but real, likelihood of deployment to austere environments or stationing away from regular medical care. These waiver or suspension requests will be prepared, submitted, and processed as outlined in AR 40-501 and the Flight Surgeon Administrative Guide. Aeromedical Policy letters will serve as guidelines for required evaluation and information of such conditions. Evaluations will often need to be completed by the DAC/civilian contract ATC's regular civilian health care providers and will be reviewed by the aeromedical provider to complete the aeromedical summary for waiver or suspension. The patient, and not the MTF or US Government, is ultimately responsible for any costs accrued in the evaluation and maintenance of aeromedically disqualifying conditions.

**FAA Physicals:** FAA physicals for either category of ATC are not required by DA or the FAA and will not be accepted as certification of medical fitness. Any DAC or civilian contract ATC who pursues a FAA certificate does so at their own expense, unless specifically covered by their contract.

DD Form 2992, Medical Recommendation for Flying or Special Operational Duty (upslip and downslip): A DD Form 2992 signed by an aeromedical provider of any military service must be completed as part of the ATCME and serves as a recommendation to the local airfield commander of the individual's medical fitness for execution of ATC duties. A FAA examination or 8500-9 certificate for DAC or civilian contract ATCs will not be accepted or processed by USAAMA for this requirement. Aeromedical providers will not accept a FAA physical to issue a DA Form 4186 based on presentation of a FAA examination or certificate. Failure to comply with the annual requirement for an ATCME or a current valid DD Form 2992 may result in medical disqualification.

**ATC Medical Examinations (ATCME):** There are two broad categories of ATCMEs. They are:

1. Initial ATCME - Performed for initial employment purposes. They are valid for up to 18 months from the date of examination.
2. Retention ATCME - Performed on an ATC once already trained or in service. This is performed for re-certification for DAC and civilian contract ATC on an annual basis. It is generally valid for 12 months and is synchronized with the ATC's birth month.

For birth month alignment of the ATCME, see the Flight Surgeon Administrative Guide.

**Forms:** The initial and retention ATCMEs are performed on DD Forms 2807-1 and 2808. The ATCME will be submitted electronically to USAAMA using the AERO system. If AERO is not available then the physical may be mailed, faxed, or e-mailed to USAAMA. AERO does not have separate standards for these exams and the aeromedical examiner must ensure all of the required items per the OPM standards are included in the physical. Civilian or contract civilian ATCs do not have an interim FDHS (DA 4497-R).

## **OPM Standards for Air Traffic Controllers:**

The text below is extracted verbatim from OPM General Schedule Qualification Standards for Air Traffic Control Series, 2152. The link to the standards is <https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/2100/air-traffic-control-series-2152/>. Not summarized below, but also found at the above link are the individual occupational requirements to apply for an ATC position.

Table 13 is a summary of the DD Form 2808 requirements and Table 14 is a summary of the OPM/GS-2152 DAC/Civilian Contract ATC Standards.

**Medical Requirements:** In general, air traffic control specialist applicants and employees must have the capacity to perform the essential functions of these positions without risk to themselves or others. The provision of sufficient information about physical capacity for employment requires that before appointment applicants undergo appropriate pre-employment physical/medical evaluations.

The physical impairments/medical conditions that follow, unless otherwise noted, are disqualifying because there are medical and/or management reasons to conclude that an individual with such impairment/condition cannot perform the duties of the position without unacceptable risk to his or her own health, or to the health or safety of others (employees or the public).

**Initial Employment:** Applicants for initial employment to air traffic control specialist positions must meet the following requirements. (Unless otherwise indicated, these requirements are identical for all specializations.)

### **Eye**

#### **1. Visual Acuity**

- a. Terminal and Center Positions -- Applicants must demonstrate distant and near vision of 20/20 or better (Snellen or equivalent) in each eye separately. If glasses or contact lenses are required, refractive error that exceeds plus or minus 5.50 diopters of spherical equivalent or plus or minus 3.00 diopters of cylinder is disqualifying. The use of orthokeratology or radial keratotomy methods is not acceptable for purposes of meeting this requirement. The use of contact lenses for the correction of near vision only or the use of bifocal contact lenses for the correction of near vision is unacceptable.
- b. Flight Service Station Positions-- Applicants must demonstrate distant and near vision of 20/20 or better (Snellen or equivalent) in at least one eye. If glasses or contact lenses are required, a refractive error in at least one eye that exceeds plus or minus 8.00 diopters of spherical equivalent will necessitate an ophthalmological consultation to establish absence of ocular pathology that could interfere with visual function. The use of contact lenses for the correction of near vision only or the use of bifocal contact lenses for the correction of near vision is unacceptable.

#### **Equivalents in Near Visual Acuity Notations**

Standard Test Chart: 14/14

Snellen Metric: 0.50M

Jaeger: J-1

Metric: 6/6

#### **2. Color Vision -- For all specializations, applicants must demonstrate normal color vision.**

#### **3. Visual Fields**

- a. Terminal and Center Positions -- Applicants must demonstrate a normal central visual field, i.e., the field within 30 degrees of the fixation point, in each eye. They must also demonstrate a normal peripheral visual field, i.e., the field of vision beyond the central field that extends 140 degrees in the horizontal meridian and 100 degrees in the vertical meridian, in each eye.
- b. Flight Service Station Positions -- Applicants must demonstrate a normal central field of vision, i.e., the field within 30 degrees of the fixation point, in at least one eye.

4. Intraocular Pressure -- For all specializations, if tonometry reveals either intraocular pressure greater than 20 mm of mercury, or a difference of 5 or more mm of mercury intraocular pressure between the two eyes, ophthalmological consultation is required to rule out the presence of glaucoma. If a diagnosis of glaucoma is made, or if any medication is routinely required for control of intraocular tension, the applicant is disqualified.
5. Phorias
  - a. Terminal and Center Positions -- If an applicant demonstrates greater than 1-1/2 prism diopters of hyperphoria or greater than 10 prism diopters of esophoria or exophoria, evaluation by a qualified eye specialist is required. If this evaluation determines that bifoveal fixation and vergence-phoria relationships sufficient to prevent disruption of fusion under normal working conditions are not present, the applicant is disqualified.
  - b. Flight Service Station Positions -- Applicants must demonstrate the absence of diplopia in the cardinal fields of gaze.
6. Eye Pathology -- For all specializations, if examination of either eye or adnexa reveals any form of glaucoma or cataract formation, uveitis, or any other acute or chronic pathological condition that would be likely to interfere with proper function or likely to progress to that degree, the applicant is disqualified.
7. Chronic Eye Disease -- For all specializations, an applicant with any chronic disease of either eye that may interfere with visual function is disqualified.
8. Ocular Motility -- For terminal and center specialist positions, applicants must demonstrate full extraocular motility.
9. History of Eye Surgery -- For all specializations, a history of ocular surgery requires ophthalmological consultation. If consultation indicates that the condition that necessitated surgery could interfere with the visual function necessary for performance as an air traffic control specialist, the applicant is disqualified. A history of radial keratotomy is disqualifying.

### **Ear, Nose, Throat, Mouth**

1. Examination must show no outer, middle, or inner ear disease, either acute or chronic, unilateral or bilateral.
2. Examination must show no active disease of either mastoid.
3. Examination must show no unhealed perforation of either eardrum.
4. Examination must show no deformity of either outer ear that might interfere with the use of headphones of the applied or semi-inserted type.
5. Examination must show no disease or deformity of the hard palate, soft palate, or tongue that interferes with enunciation. The applicant must demonstrate clearly understandable speech, and an absence of stuttering or stammering.
6. Applicants must demonstrate, by audiometry, no hearing loss in either ear of more than 25 decibels in the 500, 1000, or 2000 Hz ranges and must demonstrate no hearing loss in these ranges of more than 20 decibels in the better ear, using ISO (1964) or ANSI (1969) standards. Hearing loss in either ear of more than 40 decibels in the 4000 Hz range may necessitate an otological consultation. Incipient disease processes that may lead to early hearing loss will be cause for disqualification.

### **Cardiovascular**

1. No medical history of any form of heart disease. Must demonstrate absence of heart disease to clinical examination, including resting and post-exercise electrocardiogram.
2. Blood pressure levels no greater than the appropriate values as shown below:

Age	Maximum Reclining Blood Pressure	
	Systolic	Diastolic
20 to 29	140	90
30 to 39	150	90
40 to 49	150	100
50 & over	160	100

Age	Maximum Reclining Blood Pressure	
	Systolic	Diastolic
20 to 29	140	90
30 to 39	150	90
40 to 49	150	100
50 & over	160	100

- 3. Must demonstrate to X-ray no evidence of increase in heart size beyond normal limits.
- 4. An applicant under any form of treatment for any disease of the cardiovascular system is disqualified.

### **Neurological**

- 1. No medical history or clinical diagnosis of a convulsive disorder.
- 2. No medical history or clinical diagnosis of a disturbance of consciousness without satisfactory medical explanation of the cause.
- 3. No other disease of the nervous system that would constitute a hazard to safety in the air traffic control system.
- 4. An applicant under any form of treatment, including preventive treatment, of any disease of the nervous system, is disqualified.

### **Musculoskeletal**

- 1. No deformity of spine or limbs of sufficient degree to interfere with satisfactory and safe performance of duty. Certain limitations of range of motion may be acceptable for certain specific options or positions, in which case acceptance of limitations will be noted specifically for that position or option only.
- 2. No absence of any extremity or digit or any portion thereof sufficient to interfere with the requirements for locomotion and manual dexterity of the position being sought. Acceptance of limitations for employment for a specific option or position will be noted for that option or position only.
- 3. No condition that predisposes to fatigue or discomfort induced by long periods of standing or sitting.

### **General Medical**

- 1. No medical history or clinical diagnosis of diabetes mellitus.
- 2. Must possess such a body build as not to interfere with sitting in an ordinary office armchair.
- 3. Must have no other organic, functional, or structural disease, defect, or limitation found to indicate clinically a potential hazard to safety in the air traffic control system. A pertinent history and clinical evaluation, including laboratory evaluations, will be obtained, and when clinically indicated, special consultations or examinations will be accomplished.

### **Psychiatric**

No established medical history or clinical diagnosis of any of the following:

- 1. A psychosis;
- 2. A neurosis; or
- 3. Any personality or mental disorder that clearly demonstrates a potential hazard to safety in the air traffic control system. Determinations will be based on medical case history (including past,

social, and occupational adjustment) supported by clinical psychologists and board-certified psychiatrists, including such psychological tests as may be required as part of medical evaluation.

### **Substance Dependency**

A history, review of all available records, and clinical and laboratory examination will be utilized to determine the presence or absence of substance dependency, including alcohol, narcotic, and non-narcotic drugs. Wherever clinically indicated, the applicant must demonstrate an absence of these on any clinical or psychological tests required as part of the medical evaluation.

### **Retention Requirements:**

The physical requirements in this section apply to: (1) air traffic control specialists in the center and terminal specializations who are actively engaged in the separation and control of air traffic, (2) immediate supervisors of air traffic control specialists actively engaged in the separation and control of air traffic, and (3) air traffic control specialists in the station specialization who regularly perform flight assistance services.

Employees occupying the types of positions described above must requalify in an annual medical examination, usually given during the employee's month of birth. Controllers incurring illness, injury, or incapacitation at any time between the annual examinations must be medically cleared before returning to air traffic control duty. Examinations, including laboratory tests and consultations, will be accomplished to the extent required to determine medical clearance for continued duty. New employees are required to meet the retention requirements by examination during the first 10 months of service.

Employees who are found to be not physically or emotionally qualified for air traffic control duties at any time will be subject to reassignment to a position for which they are fully qualified, retirement for disability if eligible, or separation from the service.

To be medically qualified for retention, an air traffic control specialist must meet the following requirements. (Unless otherwise indicated, these requirements are identical for all specializations.)

### **Eye**

Retention requirements for vision and eye conditions are identical to the requirements for initial hire.

### **Ear, Nose, and Throat**

1. Ear Disease; Equilibrium
  - a. Terminal and Center Positions -- Must demonstrate no chronic disease of the outer or middle ear, unilateral or bilateral, that might interfere with the comfortable, efficient use of standard headphone apparatus or that might interfere with accurate perception of voice transmissions or spoken communications. Must have no ear disease that might cause a disturbance of equilibrium.
  - b. Flight Service Station Positions -- Must demonstrate no chronic disease of the outer or middle ear, unilateral or bilateral, that might interfere with accurate perception of voice transmissions or spoken communications. Must have no ear disease that might cause a disturbance of equilibrium.
2. Mastoid -- No active disease of either mastoid.
3. Eardrum Perforation -- Must demonstrate no unhealed perforation of either eardrum.
4. Speech -- Must have no interference with enunciation, and must have clear speech free of stuttering or stammering.
5. Hearing Loss -- No hearing loss in either ear of more than 30 decibels in either the 500, 1000, or 2000 Hz ranges. No loss in these ranges greater than 25 decibels in the better ear. Non-static hearing loss in either ear of greater than 50 decibels in the 4000 Hz range will require an otological consultation.

## **Cardiovascular**

1. Heart Disease
  - a. Terminal and Center Positions -- No history or symptomatic form of heart disease or any form requiring therapy.
  - b. Flight Service Station Positions -- No symptomatic form of heart disease.
2. Disturbance of Rhythm; Other Abnormality; *EKG* -- Must demonstrate no disturbance of rhythm or other cardiac abnormality on clinical examination, including resting, and when clinically indicated, post-exercise electrocardiography.
3. Blood Pressure -- Retention requirements are identical to the requirements for initial hire.
4. Heart Size -- Must have no increase in heart size beyond normal limits.

## **Neurological**

Retention requirements are identical to the requirements for initial hire.

## **Musculoskeletal**

Retention requirements are identical to the requirements for initial hire.

## **General Medical**

1. Diabetes Mellitus
  - a. *Terminal and Center Positions* -- An employee who has an established clinical diagnosis of diabetes mellitus will be evaluated for continued duty based upon the degree of control of the disease. Whether by diet alone, or diet and hypoglycemic drugs, control that results in the absence of symptoms and the absence of complications of the disease or the therapy may be considered as satisfactory control. A controller with diabetes mellitus who cannot demonstrate satisfactory control over specified and observed periods of 48 hours is not cleared for duty involving active air traffic control.
  - b. Flight Service Station Positions -- An employee who has an established clinical diagnosis of diabetes mellitus will be evaluated for continued duty based upon the degree of control of the disease. Whether by diet alone, or diet and hypoglycemic drugs, control that results in the absence of symptoms and the absence of complications of the disease or the therapy may be considered as satisfactory control.
2. Body Configuration -- Must possess such a body build as not to interfere with sitting in an ordinary office armchair.
3. Other Medical Conditions -- Must have no other organic, functional, or structural disease, defect, or limitation found to indicate clinically a potential hazard to safety in the air traffic control system. A pertinent history and clinical evaluation, including laboratory screening, will be obtained, and when clinically indicated, special consultations and examinations will be accomplished.

## **Psychiatric**

1. Psychotic Disorder -- No established medical history or clinical diagnosis of a psychosis.
2. Mental, Neurotic, or Personality Disorder -- No neurosis, personality disorder, or mental disorder, that clearly indicates a potential hazard to safety in the air traffic control system. Determinations will be based on medical case history (including past, social, and occupational adjustment) supported by clinical psychologists and board-certified psychiatrists, including such psychological tests as may be required as part of medical evaluation.
3. Alcoholism and/or Alcohol Abuse -- No clinical diagnosis of alcoholism or alcohol abuse, since these constitute a hazard to safety in the air traffic control system. A history and clinical evaluation, including laboratory evaluation (when indicated) will be accomplished to determine the presence or absence of alcohol addiction, dependency, habituation, abuse, or use.
4. Addiction, Dependency, Habituation, or Abuse of Dangerous Drugs -- No clinical diagnosis of addiction, habituation, dependency, or abuse of any narcotic or non-narcotic drug, since these constitute a threat to safety in the air traffic control system. A history and clinical evaluation,

including laboratory evaluation (when indicated), will be accomplished to determine the presence or absence of drug addiction, dependency, habituation, abuse, or use.

### **ATCME CHECKLIST**

The following is a checklist to assist in completing the required items for both the initial employment and retention ATCMEs for DAC/civilian contract ATC. DD form 2807-1, Report of Medical History, will be completed as for all other classes of ATCME and will be submitted annually.

Table 13: Summary of DD Form 2808 for OPM Standards

Block # on DD Form 2808	Initial Applicants	Retention
1-16: Admin Data	Y	Y
17-29, 31-33 and 38-40: Clinical exam note: Only certain sites are required	Y	Y
45b: Urine Glucose	N	(1)
50: Drugs	(2)	(3)
51: Alcohol	(2)	(3)
57: Pulse	Y	Y
58a: Blood pressure (only one reading required)	Y	Y
61: Distant Vision	Y	Y
62: Manifest Refraction	(4)	(4)
63: Near Vision	Y	Y
64: Heterophorias Cover Test / Cross-cover Near Point of Convergence	Y Y Y	Y Y Y
66: Color Vision	Y	Y
67: Depth Perception	Y	Y
68: Field of Vision	Y	Y
70: Intraocular Pressures	Y	Y
71a: Audiometer	Y	Y
72a: Reading Aloud Test	Y	Y
73: Notes Additional Lab: Fasting Glucose ECG CXR Aeronautical Adaptability	N Y(5) Y (6)	(1) Y (3) (6)
74a: Qualification	Y	Y
77: Summary of Defects	Y	Y
78: Recommendations	Y	Y
81a-81b: Examiner names and signatures	Y	Y

Notes:

- (1) For retention examinations only, ATCs with a diagnosis of Diabetes Mellitus will undergo the FBS and urine glucose to demonstrate satisfactory control.
- (2) For initial applicants, the provisions of AR 600-85, Chapter 14, and Federal Acquisition Regulation (FAR), subpart 23.5 apply.
- (3) If clinically indicated.
- (4) Required if unaided near/distant vision is not 20/20-1.
- (5) For initial applicants must include resting and post-exercise electrocardiogram.
- (6) For initial or retention examinations, this will only be completed if there is no evidence by medical history or clinical diagnosis by clinical psychologists and board certified psychiatrists of a psychosis, neurosis, or any other personality or mental disorder that clearly demonstrates a potential hazard to safety in the air traffic control system.

- EKGs are required on all examinations and for initial require resting and post- exercise. If clinically indicated, the retention ATCME also requires a post-exercise study.
- Drug and alcohol screening will be done as listed above per regulatory guidance for initial applicants. For retention physicals, any questionable medical history or clinical findings should be referred to the local Alcohol and Substance Abuse Program office for evaluation.

- Reading Aloud Test (RAT) will be performed annually to assess for understandable speech and no pattern of stuttering or stammering.
- CXR will be done on initial applicants to assess for any increase in heart size beyond normal limits.
- OPM standards will be used as the measure for vision testing and these standards are identical for initial and retention physicals. To assist the aeromedical provider in the conduct of visual testing the current vision ATBs may be used as a guide.

Note: ATCME with approved aeromedical waiver(s) must adhere to the annual waiver requirements as specified in the APL(s) and the waiver granted letter.

REFERENCES:

1. 5 CFR Part 339.
2. AR 40-501, Standards of Medical Fitness, paragraph 4-33.
3. OPM Qualification Standards for General Schedule Positions, GS 2152: Air Traffic Control Series.
4. Flight Surgeon Administrative Guide.
5. AR 600-85, Army Substance Abuse Program.

Table 14: OPM/GS-2152 DAC/Civilian Contract ATC Standards Summary

Aeromedical Vision Standards							
Qualified if:			Corrected Visual Acuity, Qualified if Better Than:	Phorias, DQ if:			
Position			Distant	Near	Eso	Exo	Hyper
Terminal and Center	Spherical equivalent not exceeding +/- 5.50 diopters or cylinder +/- 3.00 diopters		20/20 in each eye	20/20 in each eye	>10	>10	>1.5
Flight Service Station	Spherical equivalent not exceeding +/- 8.00 diopters		20/20 in each eye	20/20 in each eye	Diplopia in any of the cardinal fields of gaze		
Aeromedical Audiology Standards							
<u>Applicants</u>							
Qualified if equal or better than:							
	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	
Either ear	25 dB	25 dB	25 dB	No standard	40 dB	No standard	
Best ear	20 dB	20 dB	20 dB	No standard	40 dB	No standard	
<u>Retention</u>							
Qualified if equal or better than:							
	500 Hz	1000 Hz	2000 Hz	3000 Hz	4000 Hz	6000 Hz	
Either ear	30 dB	30 dB	30 dB	No standard	50 dB	No standard	
Best eat	25 dB	25 dB	25 dB	No standard	50 dB	No standard	
Laboratory Normal Values							
Fasting blood sugar				<126 mg%			
Urine alcohol and drug screen				Negative (required for initials and as indicated for retention)			
Age	Maximum Reclining SBP			Maximum Reclining DBP			
20 - 29	140 mmHg			90 mmHg			
30 - 39	150 mmHg			90 mmHg			
40 - 49	150 mmHg			100 mmHg			
50 & over	160 mmHg			100 mmHg			

## **ATB: Color Vision Testing**

Updated 16 Feb 2015

(DD Form 2808, Block 66)

The current paper version of DD Form 2808 has a pre-printed 'PIP' and a pre-printed ' /14' in block 66. Although this is convenient for entering in the results of the Pseudo-Isochromatic Plate (PIP) color test, it is not intended to exclude other authorized color vision testing, such as the Farnsworth Lantern (FALANT) or the OPTEC-900 Color Vision Tester. If not using the PIP, line through the pre-printed entries and record the test used with the proper score. If using the PIP and then also another color vision test, record the PIP in block 66 and then record the additional color test findings in block 60 (Other Vision Test) or block 73 (Notes). For use of AERO's DD Form 2808, enter results on page 2A, block 66 and additional tests or comments on page 2B, block 73 Notes. Annotate PIP2 or F2 PASS block 73 Notes in AERO.

### **Purpose/Indications.**

Mandatory for all initial, comprehensive, and post-mishap FDMEs. This screens for color vision deficiencies. See note at the end of section. PIP is done first. FALANT is only done if failing PIP.

### **Equipment.**

#### **PIP Series (Pseudo-Isochromatic Plates, PIP1 AND F2/PIP2):**

- Only the PIP test which contains 14 test plates with numbers is authorized at this time (no traced lines). Most tests with 14 test plates also contain one or two 'demonstration' plates that can be seen readily, even in the presence of a color vision deficiency. Once the examinee understands the test with these demonstration plates, present the other 14 plates. Do not count the demonstration plates.
- F2 is a single test plate, used for assessing blue-yellow weakness or deficiency and some red-green deficiencies.
- PIP2 is a 10-plates series that should be administered with an eye specialist. Blue-yellow deficiency is normally rare without other deficits in the red-green axis, but may present with age, ocular diseases, or medication side- effects (such as Viagra®).
- The recommended source of illumination is the Macbeth Easel Lamp. However, the Daylight HRR Illuminator, "daylight" fluorescent bulb, other standard illuminant "C" light source, or other source providing a light source rating of C.R.I. 90 and 6200° Kelvin, may be used instead. If none of these are available, see the PIP Set-Up section below.

#### **FALANT (Farnsworth Lantern) or the OPTEC 900-Color Vision Tester:**

- The Farnsworth Lantern and the OPTEC-900 Color Vision Tester are equivalent for FDME test purposes.

#### **Cone Contrast Test (CCT):**

- This is the current color vision test used by the USAF. This is a computerized color vision tester.

### **Set-Up.**

#### **PIP Series (Pseudo-Isochromatic Plates, PIP1 and F2/PIP2):**

- Place the light source (Macbeth Easel Lamp, Daylight HRR Illuminator, "daylight" fluorescent bulb, or other standard illuminant "C" light source) on a table or shelf so that the subject's line of sight is at right angles to the plates, and so his/her eyes are at a distance of approximately 30 inches.
- If subject wears glasses for flight, test with glasses on.
- The subject should not face an open window or other strong light. Nearby incandescent lights (those with any yellow wavelengths) should be shielded (or off) so they do not illuminate the plates. Cover any nearby windows.
- If none of the recommended light sources are available, use regular room lighting but avoid any incandescent lights (yellow wavelengths).
- If the examinee fails in this case, you may do any of the following:
  - Retest using the FALANT or OPTEC-900 instead.
  - Retest using light reflected from the north sky (sunny day) or refer to the optometry clinic.

**FALANT (Farnsworth Lantern) or the OPTEC-900 Color Vision Tester:**

- Test distance is eight (8) feet with the aperture facing the subject.
- If subject wears glasses for flight, test with glasses on.
- Give the test in a normally lighted room; screen from glare; exclude sunlight. Subject should not face the source of room illumination.

**Army Aeromedical Standard.**

- PIP: 0-2 errors and passes PIP2 series/F2 single plate
- FALANT: no errors in one run (9 pairs)

**Step-By-Step Procedure**

**PIP Series (Pseudo-Isochromatic Plates) is done first:**

- Examiner instructs subject to, "Please read the numbers aloud" (or words to that effect). The subject is not allowed to trace the numbers or touch the test plates.
- Examiner must show the demonstration plate(s) first, then show the remaining 14 test plates, showing each for approximately 2-4 seconds. Do not count the demonstration plate(s) in scoring.
- With the exception of always showing the demonstration plate(s) first, the examiner may change the order of the plates if there is suspicion of memorization. However, do not 'mix and match' test plates from multiple tests. (In a multiple-subject environment, do not allow those waiting to test to overhear the responses to the PIP.)
- A patient fails PIP testing if there are three (3) or more errors on the PIP or fails PIP2 series/F2 single plate. Proceed to FALANT testing.
- Record the results as the number missed over the number possible. For example, a perfect score on the PIP would be: 'PIP 0/14 PASS'

**FALANT (Farnsworth Lantern) or the OPTEC-900 Color Vision Tester (done only if failed PIP series):**

- Instruct the patient that he/she will be seeing sets of two lights in combinations of the colors red, green, and/or white. The lights are oriented vertically and the subject is to respond with the colors seen in order from top to bottom.
- It is advisable to provide the subject with a 'trial set' to allow the patient to understand the test before proceeding. Do not record this set.
- Present nine (9) pairs of light sets. The first set presented should be a RED-GREEN or GREEN-RED combination but the remaining eight sets should be in random order. Each set of lights should be presented for approximately two (2) seconds.
- An error is considered the miscalling of one or both of a pair of lights. If an examinee changes the response before the next light is presented, record the second response only.
- A patient is qualified if he/she makes no errors in the nine (9) presentations.
- A patient is disqualified if he/she misses any of the nine (9) presentations.
- Retest with an additional 18 light pairs is no longer authorized for FDMEs
- Record the results as the number MISSED over the number possible. For example, a perfect score on the FALANT or OPTEC 900 would be: 'FALANT 0/9 PASS' or 'OPTEC-900 0/9 PASS'.

**Cone Contrast Test (CCT) may be used as an initial test or if failed PIP series:**

- USAAMA will accept a passing score using this test.
- Scores are provided for each eye for red, green and blue and are reported as a number (0-100) and rated as mild, moderate and severe. Passing is a score of 75 or greater for each of the three cone types in each eye.
- Must have a passing score in each eye for each color.
- If this test is used, provide USAAMA with the computer generated test results.

**Refer to Eye Clinic if subject fails color vision testing:**

- Misses three (3) or more of 14 test plates with PIP and/or fails F2 single plate or PIP2 series.
- Misses any of nine (9) test light pairs with the FALANT or OPTEC 900.
- CCT scores reported as anything other than normal.

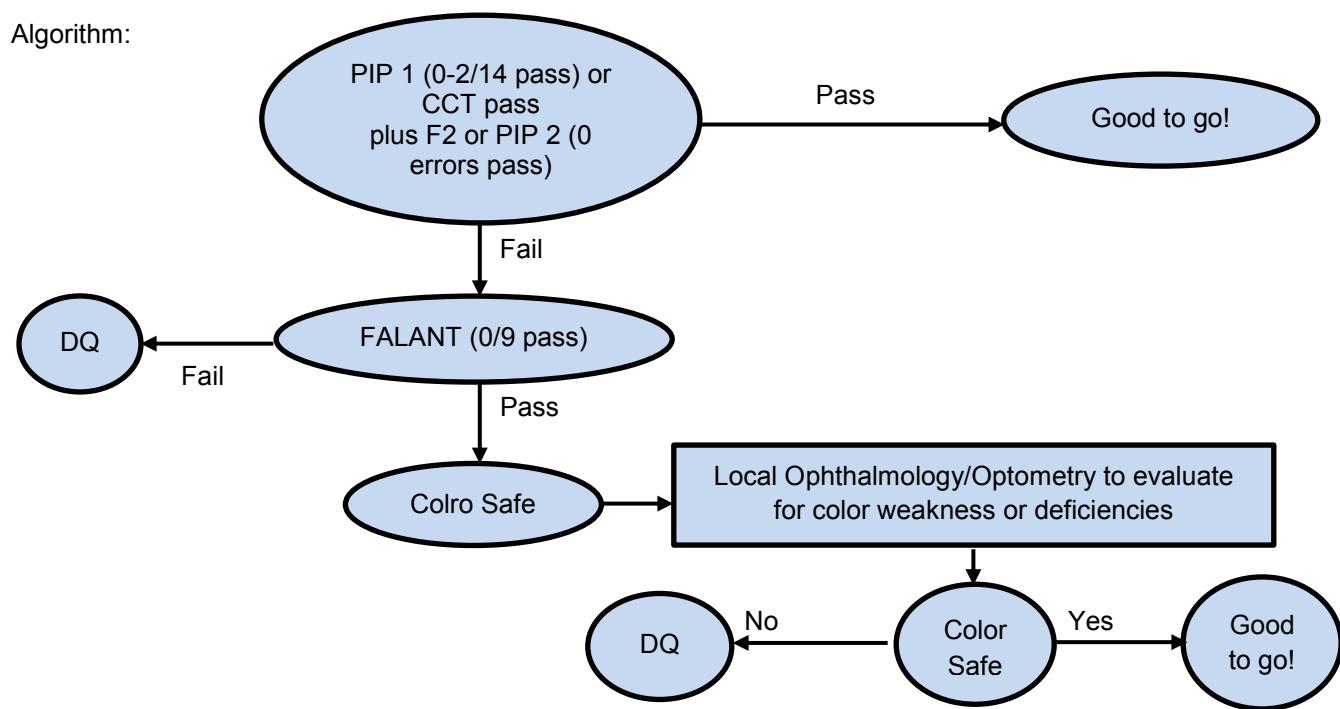
**DISCUSSION:** The importance of color vision has been a focus of tri-service attention with more advanced cockpit designs incorporating color symbology. More conditions and medications are being waived which may affect color vision (i.e., Viagra). The pilot population is also aging, which increases the small risk of acquired color vision deficiencies. Previously, color vision testing was only done on initial FDMEs. The requirement for color vision testing has been revised and updated. Color vision testing is now required for all initial, comprehensive, and post-mishap FDMEs. The standards have been tightened for PIP testing to 2 or less errors allowable and passing the PIP2/F2 single plate. Any more than 2 errors on PIP or failing the PIP2/F2 plate requires passing of FALANT (0/9) and a comprehensive ophthalmology/optometry evaluation to better define color discrimination tendencies and weaknesses. Aircrew passing FALANT are still deemed "color safe" which parallels the US Navy aeromedical standard. The USAF aeromedical standard is "color normal." Passing FALANT, the second screen test, is the acceptable standard for "color safe" determination after optometric/ophthalmologic evaluation for better defining color vision weaknesses, if any exist.

Those failing both tests would require further evaluation IAW the Color Vision Deficits APL with the note that rated aircrew would more than likely receive waivers based on demonstrated ability. Those applicants failing both tests may be offered further evaluation IAW the APL to rule-out false results, and if confirmed, most would not be recommended for exception to policies. Applicants passing the initial Class 1 FDME but failing during the Rucker RW/RO FDME would follow similar evaluation as above.

The ultimate goal of this change is to be able to continue to assess, train, and maintain Army aviators with current airframes that are color normal and mildly weak (but "color safe") but able to perform the current Army aviation mission and are prepared for the future changes and advance in cockpit design.

With isolated blue-yellow deficiencies being rare, unless clinically evident, the optometry clinic may not have the PIP2 or F2 plate. Aeromedical providers may annotate the lack of PIP2 or F2 plate availability during the completion of FDMEs.

Algorithm:



## **ATB: Cycloplegic Refraction**

Updated 16 Feb 2015

(DD Form 2808, Block 62. "Refraction by Autorefraction or Manifest")

Important note concerning the current DD Form 2808 for paper submissions.

Unfortunately, the pre-printed wording of block 62, "Refraction by Autorefraction or Manifest" may be very confusing. It is very important that anyone conducting testing for any FDME understand that an 'autorefraction' of any kind is not authorized and should never be entered on the DD Form 2808 unless it is in block 60 (Other Vision Test) or in block 73 (Notes) for reference only. Autorefraction results should never be entered into block 62! With AERO, enter information on page 2A in block 62 of DD Form 2808 and select manifest or cycloplegic from the dropdown. Place additional notes on page 2B in block 73.

Line through the entire "Refraction by Autorefraction or Manifest" wording and utilize the blank next to the refraction to enter the type of refraction utilized. For example:

By -0.50 S. -0.25 CX 180 (type of refraction here)

**All 'autorefraction' entries on FDME's in block 62 will be returned as incomplete.**

### **Purpose/Indications: Cycloplegic Refraction (Cyclo):**

Testing is mandatory for all Class 1 FDMEs. This measures a patient's refractive error in the absence of accommodation (focusing ability), which is useful in confirming the presence of latent hyperopia (hidden farsightedness). This is accomplished through the use of a cycloplegic topical ophthalmic solution, an anticholinergic solution that is used to block the responses of the iris sphincter muscle and the accommodative muscle of the ciliary body to cholinergic stimulation, producing pupillary dilation (mydriasis) and paralysis of accommodation (cycloplegia).

An Optometrist or Ophthalmologist must conduct the cycloplegic refraction in a very specific manner outlined under the step-by-step procedure below. Conduct the cycloplegic refraction after all other eye testing.

Note: there is additional mandatory testing with the cycloplegic refraction as outlined on the last page.

### **Equipment/Supplies: Cycloplegic Refraction.**

- Slit lamp biomicroscope
- Facial tissue(s)
- Mydriatic spectacles (disposable sunglasses)
- Topical anesthetic: (Proparacaine Hydrochloride Ophthalmic Solution, USP, 0.5%)
- Cycloplegic agent: (Cyclopentolate Hydrochloride Ophthalmic Solution, USP, 1.0%)
- Retinoscope (for objective start point or objective verification; an autorefractor may be used for an objective start point but in no instance will any autorefraction be entered onto an exam form.)
- Phoropter
- Projected Snellen distance visual acuity chart [must be projected IAW AR 40-501, paragraph 4-12a(1)].
  - Projected sources for a cycloplegic refraction include, but are not limited to:
    - Traditional projector with screen
    - Binocular Visual Acuity Tester (BVAT), or similar system
    - Refraction system with projected image (i.e. the Marco Nidek COS-1000 Compact Ophthalmic System, the Marco Nidek EPIC-2100, or similar system)
- Method for keratometry and/or topography (for new mandatory testing)

### **Set-up: Cycloplegic Refraction.**

- Conduct a cycloplegic refraction after completing all other eye testing and verifying any disqualifying parameters from other tests. Highly recommend a brief review of the physical exam

form to ensure all other eye testing is complete and that no re-testing is necessary (i.e. meets standards). One more check in the process will only help to ensure the physical is correct when finally forwarded to AAMA for review.

- Highly recommend using a slit-lamp biomicroscope to ensure patient has open anterior chamber angles before instilling any drops.

If an angle estimation is less than 0.25:1 (or Y:1), or a Van Herick angle estimation of '1', perform gonioscopy prior to instilling cycloplegic drops. If corneal epithelial disruption occurs with gonioscopy, confirm angles are open and have patient return in 24 hours for the cycloplegic refraction. If angles are narrow, refer to Ophthalmology for evaluation before proceeding.

- Ask patient about allergies, adverse reactions to any anesthetics (Proparacaine being utilized), or adverse reactions to any preservatives (Proparacaine is preserved with Benzalkonium Chloride, 0.01%).

#### **Step-By-Step Procedure: Cycloplegic Refraction (Cyclo).**

- Recommend verifying anterior chamber angles (see Set-Up).
- Verify allergies and possible adverse reactions (see Set-Up).
- Give patient a facial tissue and a pair of mydriatic spectacles. Explain effects from cycloplegic drops (especially temporary loss of focus at near and light sensitivity) and ensure this will not interfere with anything of pending importance (i.e., patient has final exam that evening, patient is not performing any type of flight duties within the following 24 hours, etc.).
- Instill drops in this exact order:
  - Instill one (1) drop of topical anesthetic (Proparacaine HCl 0.5%) into each eye. Record the drop and the time in block 60 or block 73 on DD Form 2808. Wait one (1) minute. Some think this is to make the patient more comfortable with the successive drops. Although this is a welcomed side effect, it is not the primary reason. The topical anesthetic helps ease the bonds between the corneal cell junctions, which allows increased permeability of the cycloplegic agent.
  - Instill one (1) drop of cycloplegic agent (Cyclopentolate HCl 1.0%) into each eye. Record the drop and the time in block 60 or block 73 on DD Form 2808. Wait five (5) minutes.
  - Instill one (1) drop of cycloplegic agent; wait a minimum of 45 minutes. Record the drop and the time in block 60 or block 73 on DD Form 2808.
- Perform a cycloplegic refraction between 45 minutes and 75 minutes after the last drop instillation (the minimum wait time of 45 minutes ensures all iris colors are in maximal cycloplegia before refraction). If the cycloplegic refraction cannot be performed between 45 and 75 minutes, there are two courses of action:
  - Instill another drop of Cyclopentolate HCl 1.0% in each eye and wait a minimum of 30 minutes more; -or-
  - Patient can return after a minimum of 48 hours to repeat the drop series and cycloplegic refraction.
- Enter the best corrected visual acuity in block 61 next to the pre-printed "Corr. to 20/" entries for each eye. See 'Important Note for Eye Care Providers' on the last page. Be aware of patients memorizing the eye chart. Many clinics are limited to only a few 20/20 lines and must be creative in randomizing the letters (reading them backwards, etc.).
- Record the cycloplegic refraction findings for each eye in block 62 on DD Form 2808:
  - The 'sphere' amount in the first blank between the pre-printed entries of "By" and "S." If zero, use '0.'
  - The 'cylinder' amount in the second blank between the pre-printed entries of "S." and "CX". If there is no cylinder amount, enter 'sphere', 'sph', '0' or 'DS'. In AERO only numbers may be entered.
  - The 'astigmatism axis' in the third blank after the pre-printed entry of "CX". If there is no astigmatism, enter a horizontal line here. In AERO only numbers may be entered.
  - After the astigmatism axis, write the word 'cycloplegic' (or 'cyclo') to indicate the refraction conducted. In AERO select cycloplegic from the dropdown.

A typical cycloplegic refraction entry on DD Form 2808:

	59. RED/GREEN (Army Only)	60. OTHER VISION TEST 1 x Proparacaine 0.5% @ 1200 1 x Cyclopentolate 1.0% @ 1201 1 x Cyclopentolate 1.0% @ 1206
61. DISTANT VISION	62. REFRACTION BY AUTOREFRACTION OR MANIFEST	63. NEAR VISION
Right 20/20 Corr. to 20/20	By +0.25 S. -0.25 CX 180 by cyclo	Right Corr. to
Left 20/25 Corr. to 20/20	By +0.75 S. -0.50 CX 180 by cyclo	Left Corr. to

If the refraction amount is outside of qualifying standards for flight school, make a note to the Flight Surgeon in block 73 or on a separate note. This should be discussed with the Physical Exam Section and flight surgeon per local SOP. All eye care providers and flight surgeons must know the most current standards and policies for entry to flight school.

#### **Entry Standards for Class 1 Flight Duty Medical Examinations.**

Hyperopia less than or equal to +3.00 diopters of sphere (in any meridian by transposition in either eye)

Myopia less than or equal to -1.50 diopters of sphere (in any meridian by transposition in either eye)

Astigmatism less than or equal to +/- 1.00 diopter of cylinder in either eye

Must meet above standards in both plus-cylinder and minus-cylinder formats because of the ability to write a disqualifying cycloplegic refraction as a qualifying one as in the example below. So, to prevent this error, transpose the refraction to ensure patient meets standards (spherical equivalent method does not apply). AERO does this automatically, and Table 15 below provides this information. Note: "B" is disqualifying, but in the range to consider for an ETP (see the Decreased Visual Acuity APL).

For example: the cycloplegic refraction of -1.00 – 0.75 x 180 (in minus-cylinder format) might appear qualified at first glance. However, after transposition into plus-cylinder format of -1.75 + 0.75 x 090 (in plus-cylinder format), it is apparent that this refraction is disqualifying because the sphere amount exceeds -1.50.

Note: If everything else is normal on the applicant, an ETP may be requested and granted if the cycloplegic refraction is within 0.75 diopters of the standard on each of the three cycloplegic refractions required by the Decreased Visual Acuity APL.

#### **Transposition Review:**

1. Algebraically sum the sphere and cylinder powers
2. Change the sign of the cylinder power
3. Change the axis by 90 degrees.

Example:

- Original cycloplegic refraction: -1.00 -0.75 x 180
- Step 1 -1.00 + -0.75 = -1.75 (sphere), Step 2 -0.75 to 0.75 (cylinder), and Step 3 180-90 = 90 (axis)
- Transposed cycloplegic refraction: -1.75 0.75 x 90

+Table15: Cycloplegic Transposition Table for Class 1 FDME

SPHERE	CYLINDER											
	-1.25	-1.00	-0.75	-0.50	-0.25	DS / SPH / 0.0	+0.25	+0.50	+0.75	+1.00	+1.25	
-1.75	DQ	DQ	DQ	B	B	B	B	B	B	B	B	
-1.50	DQ	DQ	B	B	B	Q	Q	Q	Q	Q	B	
-1.25	DQ	B	B	B	Q	Q	Q	Q	Q	Q	B	
-1.00	B	B	B	Q	Q	Q	Q	Q	Q	Q	B	
-0.75	B	B	Q	Q	Q	Q	Q	Q	Q	Q	B	
-0.50	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
-0.25	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
0.0 / Plano	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+0.25	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+0.50	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+0.75	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+1.00	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+1.25	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+1.50	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+1.75	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+2.00	B	Q	Q	Q	Q	Q	Q	Q	Q	Q	B	
+2.25	B	Q	Q	Q	Q	Q	Q	Q	Q	B	B	
+2.50	B	Q	Q	Q	Q	Q	Q	Q	B	B	B	
+2.75	B	Q	Q	Q	Q	Q	Q	B	B	B	DQ	
+3.00	B	Q	Q	Q	Q	Q	B	B	B	DQ	DQ	
+3.25	B	B	B	B	B	B	B	B	DQ	DQ	DQ	

DQ = Disqualified

Q = Qualified

B = Disqualified but may be okay for ETP (see APL)

### Important Note for Eye Care Providers

A cycloplegic refraction is not necessarily equal to the refraction you would give for spectacle lenses. If a patient is “on the border” of being qualified or disqualified, it is best for the Army and for the patient to use the least amount of prescription needed to see within standards approach.

For example, if a patient has a cycloplegic refraction that is +/- 0.25 diopters outside of standard but can still read to the 20/20<sup>-1</sup> standard with the refraction amount that is within standards, enter the lesser amount.

Do not, however, try to “push” the 20/20<sup>-1</sup> on borderline cases for three reasons. First, the current APL on “Decreased Visual Acuity” addresses policies for Exception to Policy for those within 0.75 diopters of the standards. Second, these patients receive an entirely new cycloplegic exam once they come to Fort Rucker to enter flight school. If outside of standards on the RO/RW (Rucker) physical, they will be required to request an exception to policy prior to starting training. Use professional judgment, but do not allow someone to come to flight school knowing he/she has a good chance of failing their detailed cycloplegic exam upon arrival and being held up from starting training.

### Additional mandatory Testing With Cycloplegic Refraction:

Since the patient is dilated during a cycloplegic refraction, it is a prime opportunity to conduct a brief slit lamp exam to check any disorders of the anterior segment and optic nerve. A fully dilated fundus exam (DFE) is required. Note: for refractive surgery patients outside of the standards, a DFE is required as part of the ETP information. Due to the advent and popularity of refractive surgery, it is now mandatory for the eye care provider conducting the cycloplegic exam to also provide the following information with all Class 1 FDMEs:

#### 1. Evidence of Refractive Surgery (Yes/No):

- Make an entry in block 73 (Notes) indicating that there is no evidence of refractive surgery. Highly advise that the patient also sign an entry stating he/she has not had refractive surgery. This can

easily be made part of the local overprint to DD Form 2808. This block is included on page 2A, DD Form 2808 in AERO.

- If patient has had refractive surgery, see the APL for Corneal Refractive Surgery and the required information listed in Table 8. Ensure the patient can supply all of the information required for an ETP or Qualified, Information Only. If the patient is missing the information or records, contact USAAMA to discuss the case to determine how to proceed. Allowable procedures include PRK, LASEK, and LASIK. All other forms of corneal refractive surgery are not authorized.
2. Evidence of Corneal Curvature: Provide evidence of corneal curvature with one of the following:
- Corneal Topography of each eye is required for all Class 1 physicals. Enter assessment in block 60 (Other Vision Test) or block 73 (notes). Attach full-size page to physical with assessment annotated if not using AERO or upload color images into AERO.
  - Manual or automated Keratometry readings of each eye. Enter in block 60 (Other Vision Test) or block 73 (Notes), photocopy to full-size page and attach to physical with assessment annotated if not using AERO, or upload document to AERO.
  - If abnormal or concerning (keratoconus, pre-keratoconus or suspect, or other), annotate and inform the aeromedical provider and physical exam clinic. Continue the evaluation per appropriate APL or discuss the findings with the aeromedical provider or USAAMA for further guidance and evaluation.

**Important Note for Eye Care Providers and Aeromedical Providers for Class 1 Applicant vision:**

With the advent and success of the Corneal Refractive Surgery program most individuals no longer require a waiver/exception to policy and meet the Information Only disposition criteria as outlined in the Corneal Refractive Surgery APL. The Army aeromedical standards for those with or without corneal refractive surgery are:

1. Distant visual acuity (DVA): 20/50 or better in each eye (and correctable to 20/20<sup>-1</sup>)
2. Near visual acuity (NVA): 20/20<sup>-1</sup> in each eye uncorrected.
3. Cycloplegic refraction: Per Table 15

For Exception to Policy, in coordination with HRC waiver Authority, an applicant may be considered providing meeting all of the following: DVA 20/70 or better in each eye and correctable to 20/20<sup>-1</sup>, NVA 20/40 or better in each eye and correctable to 20/20<sup>-1</sup>, and cycloplegic refraction within 0.75 diopters of the aeromedical standards (noted as "B" in Table 15). See the APL, Decreased Visual Acuity.

# **ATB: DD Form 2992 Medical Recommendation For Flying or Special Operational Duty**

Updated 16 Feb 2015

## **1. What is a DD Form 2992?**

DD Form 2992 is a required official means by which an aeromedical provider informs an aviation commander that military and civilian personnel are medically fit or unfit to perform Army aviation, air traffic control (ATC) or unmanned aerial systems (UAS) operator duties. This form is also known as the upslip or downslip and replaced the DA Form 4186.

## **2. Who needs a DD Form 2992?**

The DD Form 2992 applies to all aviation personnel, including Department of the Army civilian (DAC) pilots, civilian contractor pilots (only if they do an Army flight physical), military and civilian (DAC and contractor) air traffic controllers (ATC), DAC and military UAS operators. It is required for all personnel who must meet Army Class 1, 2, 3, or 4 medical fitness standards. Civilian contract pilots and civilian contract UAS operators who maintain a valid FAA Class 2 and Form 8500-9 certificate and civilian contract crewmembers who maintain a valid FAA Class 3 medical certificate do not require a DD Form 2992. Aviators in non-operational positions must complete a Class 2 flight physical and a DD Form 4992 issued annually (AR 600-105). Aviators in "simulator duty only" positions are required to maintain a current DD Form 2992.

## **3. Who prepares a DD Form 2992?**

Any medical or dental officer, who must inform a commander of the status of an aircrew member, may prepare and sign a DD Form 2992 recommending temporary medical suspension (duties not including flying or DNIF). A recommendation returning the aircrew member to flying duties (full flying duties or FFD) must be signed by a flight surgeon, aeromedical physician assistant (APA), aeromedical nurse practitioner (AMNP), or aviation medical examiner (AME). APAs and AMNPs may issue the DD Form 2992 without flight surgeon co-signature as outlined in AR 40-501. All other non-flight surgeon medical personnel require a flight surgeon countersignature for all upslips. All aeromedical physician assistants, aeromedical nurse practitioners or other non-flight surgeon medical providers require a flight surgeon countersignature when completing DD Form 2992 for Air Force, Navy, Marine Corps or Coast Guard personnel.

## **4. When is a DD Form 2992 Issued?**

The DD Form 2992 is to be completed:

- a. At the time of periodic examination (FDME/FDHS).
- b. After an aircraft mishap.
- c. When reporting to a new duty station or upon being assigned to operational flying duties. This includes changing units or companies at the same duty station, changing from "simulator only" to full flying duties (FFD), or returning from a deployment if assigned to a different commander's Aircrew Training Program (ATP) during the deployment.
- d. When admitted to a medical treatment facility, sick in quarters, entered into a drug or alcohol rehabilitation program, or when treated by health care professional who is not an aeromedical provider or otherwise authorized to issue a DD Form 2992 (AR 600-85 and AR 40-8).
- e. When treated as an outpatient for conditions or with drugs which are disqualifying for aviation duty. See APLs, AR 40-501, and AR 40-8.
- f. When being returned to flying status following restriction imposed under (d or e) above.
- g. After an FEB.
- h. Other occasions, as required.

## **5. How is the DD Form 2992 Prepared? The hard copy DD Form 2992 is prepared in three copies. The 2<sup>nd</sup> page of the form has the instructions**

To and From blocks (Blocks 1 and 2).

Found only on the top portion of the form. These blocks contain the mailing address of the individual's commander that the DD Form 2992 is being sent to, and the mailing address of the flight surgeon the DD Form 2992 is from.

Blocks three through ten contains demographic data are self-explanatory except as below.

- Block 5: Only use the DoD ID number or if Coast Guard use their employee number. The social security number is no longer used.
- Block 9: In this block enter the flying class and the duty performed. For example, Class 2 – Aviator, Class 3 – Crew Chief, Class 4 – UAS Operator, etc. If completing this form for members of the Air Force, Navy, Marines or Coast Guard please refer to the appropriate regulations in the instructions for this block to ensure the correct flying class and duty performed is utilized.
- Block 10: Enter the date the flight physical was completed. This only needs to be done when the form is being completed for the completion of the flight physical.

Block 11. Up: The Above Individual Has Been Found Qualified by Medical Authority – Qualifying actions (FFD).

- If the examinee is qualified to perform flying duties in accordance with chapters 2 and 4, AR 40-501, the flight surgeon completes Block 11, Up: The Above Individual Has Been Found Qualified by Medical Authority. Indicate the reason(s) for the medical clearance recommendations in blocks 11a (more than one box may be selected). Further explanation of each item should be explained as appropriate in Block 13: Remarks/Limitations.
- The following are the options for recommending a qualifying action (FFD)
  - Cleared after temporary medical disqualification is self-explanatory
  - Waiver recommended is used when a waiver or exception to policy has not yet been approved by the waiver authority. In AERO this will have a WR or ER next to the encounter. See the Table 11 in the ATBs for conditions that may not be granted temporary clearance. Note this block is not used for Air Force aircrew.
  - Aircraft mishap is used when clearing an individual who has been involved in an aircraft mishap.
  - Reporting to new duty station is used when an individual has arrived at a new duty station. It is also used when an individual is changing companies within the same unit or units on the same installation. If an individual is returning from deployment and they were attached to another commander for flight, UAS or ATC duties they will require a new duty upslip. Remember the unit commander is the one who approves or disapproves individuals to perform their aviation duties within the commander's aircrew training program (ATP). A new duty station upslip is not required if the company commander changes due to a change of command. The new commander assumes the ATP as is from the old company commander.
  - Waiver granter is used once the waiver authority has approved the waiver. In AERO this will have a WG or EG next to the encounter.
  - The other box is used only if one of the other boxes is not appropriate. Further explanation will be required in Block 13. Remarks/Limitations. For example, the annual flight physical is done off cycle and you are going to do a birth month realignment. In Block 13 annotate FFD – Flight physical completed off cycle due to (reason) and will do birth month realignment.
  - Cleared after flight duty medical examination is self-explanatory.

Block 12. Down: The Above Individual Has Been Found Disqualified by Medical Authority - Disqualifying actions (DNIF).

- Disqualifying action recommended by medical authority is completed when the examinee is found medically unfit for flying duties in accordance with the APLs and/or chapters 2 and 4, AR 40-501, or is medically disqualified because of a temporary medical problem or medication. Only one box may be selected.
- The choices in Block 12a are:
  - Temporary disqualification due to illness or injury is used for a typical sick call problem, medical conditions that are not permanently disqualifying or will not result in a disqualification longer than 365 days (AR 600-105).

- Temporary disqualification due to an aircraft mishap is used if the individual requires grounding after a mishap.
  - If the other box is used further explanation is required in Block 13. Remarks/Limitations.
  - Permanent disqualification is for conditions that have resulted in continuous grounding for longer than 365 days or for any medical condition that is determined to be permanently disqualifying per the APLs. If the waiver authority has granted a suspension or denied a waiver/exception to policy (SG or WD in AERO next to the encounter) use this box.
- If an individual is temporarily grounded the aeromedical provider may allow the individual to perform simulator duties, ground based flight line duties or other duties not involving flight by checking one of the three boxes in Block 12a. If the aeromedical provider does not check any of these boxes when an individual is grounded, they may not perform any of these duties. If the other box is checked please explain in Block 13. For example, if placed on quarters, ground run up and simulator duties would not be wise. If your examinee has a cast, ground run-up duties might not be allowed, but simulator duties might be authorized. Generally speaking, simulator duties can be authorized anyone who can safely get into the simulator, such as uncomplicated pregnancy. Ground run-up duty is specifically authorized when controls can be safely managed despite medical restriction from flying duty.
- Block 12b is the date the grounding is effective. This can be the date the individual is seeing the provider or it may be another date based on the date the condition was diagnosed. For example, an aviator is seen in the ER over the weekend and is still sick on Monday. The effective date would be the date he/she was seen in the ER.
- Block 12c is the estimated duration of grounding. This is just an estimate and if the individual is still not ready for an upslip when the estimated duration of grounding has elapsed, a new downslip is not required since this is just an estimate. The original downslip is valid until such time the individual gets an upslip.

If the medical incapacitation is expected to last more than 365 days without waiver, termination from aviation service (permanent medical suspension) is required (AR 600-105). An AMS will be prepared and submitted for completion of permanent suspension.

#### Block 13 – Remark/Limitations

- Regulations require the examinee's vision must be 20/20<sup>-1</sup> both near and far. Check the "Vision correction devices required in the performance of flight duties" and "Must carry extra spectacles" boxes in Block 13.
- Use Block 14 to communicate to the commander the medical recommendation to perform flight, UAS or ATC duties. Some example comments are "FFD Annual FDME (or FDHS) Completed"; if arriving at a new duty station remarks such as "FFD Current FDME (or FDHS) on file"; or "Temporary FFD 30 days pending receipt of FDME (or FDHS) further evaluation"; "FFD – Birth month extension to complete annual flight physical"; or "Temporary FFD 90 days pending in-cockpit evaluation."
- Information in block 13 shall not conflict with HIPAA. Do not put any medical information in this section. Although it is the commander's approval, the form is stored in the Individual Flight Record Folder (IFRF) and seen by anyone who works in flight records.

#### Block 14 – Aeromedical Provider's Signature.

- Check either flight surgeon or other as appropriate for the individual completing Blocks 14a-d. If not a flight surgeon see below for countersignature requirements.
- The provider's name and grade should be typed or stamped.
- If the provider is a flight surgeon no other signature is required.
- The flight surgeon countersignature (Blocks 14e-h) is required when the DD Form 2992 is completed for grounding or return to flight status by an aeromedical physician assistant or aeromedical nurse practitioner for Air Force, Navy, Marine or Coast Guard personnel. A healthcare provider who has not attended the flight surgeon course will always require a flight surgeon countersignature for all upslips (return to flight status). This is not required for grounding (downslip) Army personnel.

- If the form is completed by a provider who has not attended the Flight Surgeon Course there should be a remark in Block 13 detailing the name of the flight surgeon authorizing the upslip and the date and time they discussed the case with the flight surgeon if there will be a delay in obtaining the flight surgeon countersignature.
- The date of the signature may be different than the effective date annotated in Block 11b or Block 12b.

**Block 15 – Member Certification.**

- The examinee completes Block 15 when informed of the recommendations contained in Block 11 or 12 of the DD Form 2992. The examinee will check the "may" or "may not" block in block 15a as appropriate, sign and date the form in blocks 15b and c.
- If the aircrew member is not available, these blocks may be left blank. If the aircrew member refuses to sign, a notation to that effect should be made in block 13, Remarks/Limitations, and the commander notified immediately.

**Block 16 – Action Taken by Commander.**

- The commander either approves or disapproves the recommendation from the aeromedical provider.
- The commander will then sign and date the form using blocks 16a-c.

**DD Form 2992 Distribution.**

A copy of the DD Form 2992 is filed in the medical record per AR 40-66 and constitutes the medical recommendation pending the commander's signature. The DD Form 2292 will be scanned into the electronic medical record. The rest of the packet is sent to the aircrew member's commander by a distribution system agreed upon by the aeromedical provider and commander(s). The most expedient means is usually hand carried by the individual.

Once the commander has approved or disapproved the DD Form 2292 and signed it this copy is placed in the Individual Flight Records Folder maintained by flight records personnel.

The aircrew member can get a copy of the form before or after the commander signs the form.

**6. How are the DD Form 2992 and related forms filed in the outpatient medical record?**

AR 40-66 has not been updated to reflect the DD Form 2292 and the text below has been updated to reflect the use of the new form. The DD Form 2992 will be scanned into the electronic health record and also be filed as directed in AR 40-66.

File the most recent DD Form 2992 IAW AR 40-66, chapter 5-21b(6): "File the most recent DD Form 2992 or electronic equivalent according to figures 5-1 and 5-2. Additional DD Forms 2992 will be filed in order according to the guidelines in (a)-(c) below. Destroy other DD Forms 2992. Block 8b of DD Form 2766 will be updated in pencil to show the current flying status. When available, the AHLTA application will be used to capture this information."

- a. "The most recent DD Forms 2992 that shows a medical restriction from flying if the person is granted clearance to fly."
- b. The most recent DD Form(s) 2992 showing that a waiver has been granted for any cause of medical unfitness for flying."
- c. "Any additional DD Form(s) 2292 that the flight surgeon determines to be required as permanent record. (enter "Permanent Record" in "Remarks/Limitations" section.)"

**7. Extensions.**

The DD Form 2992 may be used by the flight surgeon to extend a currently valid medical examination clearance for a period not to exceed 1 month beyond the end of the birth month for the purpose of completing an examination begun before the end of the birth month (AR 600-105). In this case block 11a, "Other" will be checked and in block 13, "Remarks" will appear the statement "FFD – Extension to

complete annual FDME (or FDHS)." Blocks 11b and c will be dated appropriately. Extensions requested after the birth month will not be granted.

Exception to the Extension Rule (AR 600-105). Medically disqualified aircrew members have 365 days to complete their flight physical and request a waiver to continue flying duties despite the disqualification. Medical termination from aviation service is mandatory if the condition is not waivable within 365 days (AR 600-105), or is found to be non-waivable based on AR 40-501, policy letters (APLs) or consultation with USAAMA.

8. Alternate DD Form 2992s.

International agreements with allies permit the use of forms equivalent to the DD Form 2992 when the patient is examined by a non-U.S. Army flight surgeon. The DD Form 2992 is used by the Army, Air Force, Navy, Marines and Coast Guard so no agreement is required. However, during the transition to the DD Form 2292 from the existing service specific forms, the other services' forms will be accepted.

## **ATB: Depth Perception Testing**

Updated 16 Feb 2015

(DD Form 2808 Block 67 or DA Form 4497, Blocks 20a-c)

Please note that when not using AERO, the current DD Form 2808 has a pre-printed 'AFVT' in block 67. Although this is convenient for entering in the results of the Armed Forces Vision Tester (AFVT) depth perception test, it is not intended to exclude other authorized depth perception testing, such as the OPTEC 2300, the Random Dot (RANDOT) Circles Test, or the Titmus Graded Circles Stereoacuity Test. If not using the AFVT, line through the pre-printed entry and record the test used with the proper score. If using the AFVT and then also another depth perception test, record the AFVT in block 67 and then record the additional depth perception test findings in block 60 (Other Vision Test) or block 73 (Notes). With use of the AERO DD Form 2808, annotate results on page 2A, Block 67, and additional results/comments in the Notes, Block 73 on page 2B

Purpose/Indications.

Mandatory for all flight physicals. This measures fine depth perception through the ability to fuse stereoscopic targets.

Equipment.

AFVT (Armed Forces Vision Tester) or OPTEC 2300

- or -

RANDOT (Random Dot Circles Test) - with polarized glasses (included with test)

- or -

Titmus (Titmus Graded Circles Stereoacuity Test) - with polarized glasses (included with test)

Set-Up.

AFVT (Armed Forces Vision Tester) or OPTEC 2300:

- Patient seated comfortably at the AFVT (or OPTEC 2300).
- Patient wears habitual spectacle prescription (if applicable).
- May test without corrective prescription, but if fails, retest with corrective prescription.
- Test emulates distance test (optical infinity).
- Refer to manual for correct settings for model being used.

RANDOT (Random Dot Circles Test) or the Titmus (Titmus Graded Circles Stereoacuity Test):

- Patient wears habitual spectacle prescription (if applicable).
- May test without corrective prescription, but if fails, retest with corrective prescription.
- Polaroid spectacles worn (over habitual prescription if also worn).
- Test distance is 40 cm (16 inches).
- Provide adequate light but avoid reflections from the test's surface.
- Hold test upright to maintain the proper axis of polarization.
- Do not permit the patient's head to tilt during testing.

Step-By-Step Procedure.

AFVT (Armed Forces Vision Tester) or OPTEC 2300:

- Refer to manual for correct settings for model being used.
- Group A is for demonstration purposes only and should not be used as part of the actual test (see manual).
- Group B is at the level of the overall standard of 40 seconds of arc; there are three presentations of five circles each within Group B.
- Patient identifies the circle within each presentation that appears 'closest'.
- Patient must correctly identify all presentations within Group B to pass.
- You may test beyond Group B if desired, but it is not necessary.
- Record as "AFVT Group B – 40 arc sec PASS" or words to that effect.
- If fails any in Group B, retest using RANDOT and/or Titmus below.

RANDOT (Random Dot Circles Test):

- There are ten presentations of three circles each in the RANDOT.
- You must test all ten presentations; do not stop after number seven.
- You must test all presentation in order and do not jump around since each level is progressively more difficult.
- Patient identifies the circle that appears 'closest'.
- Test until the patient misses two levels in a row.
- Record the last level passed successfully.
- For RANDOT, a minimum passing score is correctly identifying presentations 1 THROUGH 7 which equals 40 seconds of arc.
- Record as the number missed over the number possible.
- For example, 'RANDOT 3/10 – 40 arc sec PASS' or words to that effect.
- If fails the RANDOT, may retest using AFVT/OPTEC 2300 or Titmus.

Titmus (Titmus Graded Circles Stereoacuity Test):

- There are nine presentations of four circles each in the Titmus.
- You must test all nine presentations.
- You must test all presentations in order and do not jump around since each level is progressively more difficult.
- Patient identifies the circle that appears 'closest'.
- Test until the patient misses two levels in a row or the last presentation.
- Record the last level passed successfully.
- For Titmus, a minimum passing score is correctly identifying ALL of the presentations 1 THROUGH 9 which equals 40 seconds of arc.
- Record as the number missed over the number possible.
- For example, 'Titmus 0/9 – 40 arc sec PASS' or words to that effect.
- If fails the Titmus, may retest using AFVT/OPTEC 2300 or RANDOT.

Note: Refer to Eye Clinic for further evaluation if subject fails any depth perception testing, i.e.:

- misses any presentations within Group B of the AFVT or OPTEC 2300;
- or, misses any of presentations 1 through 7 of the RANDOT;
- or, misses any of the nine presentations of the Titmus.

**Note: The Verhoeff Testing Apparatus is no longer authorized for depth perception screening on any flight physical.**

## **ATB: Field of Vision Testing**

Updated: May 2015

(DD Form 2808, Block 68, "Field of Vision")

### **Purpose/Indications.**

Mandatory for all initial flight physicals. This screens for gross visual field defects.

### **Equipment.**

- Occluder (and/or use palm of hand to cover respective eye).
- Examiner's fingers.

### **Set-Up.**

- Patient removes glasses (if applicable).
- Adequate lighting.
- Ideal lighting is bright illumination between patient and examiner with dim room illumination; avoid patient facing any direct source of light.
- Examiner is 60-80 centimeters (cm) from patient.
- Examiner must have full visual fields to be able to properly conduct this test.

### **Step-By-Step Procedure.**

- This is a monocular test; ensure you are testing only one eye at a time.
- Instruct the patient to cover his/her left eye first; you, as the examiner, cover your right eye (mirror-imaging patient).
- Tell the patient, "I want you to keep looking at my open eye and, without looking anywhere else, use your side vision and tell me how many fingers I am holding up." (Or, words to that effect.)
- Place your closed fist in the peripheral visual field in a location where you will be able to distinguish the number of fingers exposed.
- Present one, two, or five fingers in the plane mid-way between you and the patient; the fingers should not point toward the patient and you should not wiggle or move.
- Repeat the presentation of fingers in the appropriate eight locations in the field (on each side of the four visual field meridia).
- Repeat the entire procedure for the patient's left eye.
- If the patient successfully answers all presentations within the field, record the findings for each eye even though there is no longer a separate entry block on the new DD Form 2808 for each eye.
  - For example:  
OD FTC      OS FTC  
[FTC = "Full To Confrontations"]

- or -

Right NTC Left NTC  
[NTC = "Normal To Confrontations"]

Refer any deficiencies or abnormal findings to the eye clinic for verification and possible further testing.

# **ATB: MANAGEMENT OF INTERNATIONAL MILITARY PILOTS AND STUDENT PILOT CANDIDATES**

Updated: May 2015

## **1. DEFINITIONS/ABBREVIATIONS:**

- a. Parent Nation: country of origin
- b. Host Nation: country hosting training (for most cases, USA)
- c. STANAG: NATO Standardization Agreement
- d. AR: Army Regulation
- e. PfP: Partnership for Peace
- f. NATO: North Atlantic Treaty Organization
- g. DOD: Department of Defense
- h. DD Form 2992: Medical Recommendation for Flying or Special Operational Duty
- i. IMS: International Military Pilots and Student Pilots

## **2. REFERENCES:**

- a. AR 40-501: Standards of Military Fitness
- b. AR 12-15: Joint Security Cooperation, Education and Training
- c. STANAG 3526: Interchangeability of NATO Aircrew Medical Categories

**3. INTRODUCTION:** Per AR 12-15, 8-21a, International Military Pilots and Student pilots attending US Army flight training are required to meet the appropriate US Army Aviation Class medical standards per AR 40-501, paragraph 4-1c. AR 40-501, paragraph 4-1c specifies that “provisions in this chapter are subject to STANAG 3526, which applies to allied nation aircrews serving with U.S. Forces or attending U.S. Army training programs, and to U.S. aircrews serving with foreign forces...” STANAG 3526 applies to all international personnel from NATO/PfP nations. In contrast, AR 12-15, paragraphs 8-21a(2)(a-f) contains verbiage different from STANAG 3526 stating that all IMS are required to meet US Army Flight Class standards and the examination must be completed by US DOD flight surgeons. As opposed to NATO/PfP IMS, personnel from non-NATO/PfP nations are not covered with STANAG 3526 and must adhere to AR 12-15, paragraphs 8-21a(2)(a-f).

**4. GUIDANCE FOR NATO/PfP IMS:** IAW NATO/PfP STANAG 3526, NATO and AR 12-15, paragraphs 8-21a(1)(a-d) as detailed below. The information below has been corrected to reflect changes since the publication of AR 12-15.

### **a. AR 12-15, paragraphs 8-21a(1)(a-d)**

- 1) In accordance with NATO/PfP STANAG 3526 edition 7, NATO and PfP IMS members will conduct their normal flight physical examination using their military's qualified flight surgeons. Parent nations are responsible for standards of primary selection, permanent medical disqualification, and determination of temporary flying disabilities exceeding 30 days.
  - a) The U.S. Army will accept the medical category and qualification for flying status, including the expiration date. Parent nations will provide a medical statement in English describing the IMS's medical fitness for flying duties, and forward the latest flight physical report with pertinent medical information and other pertinent documentation helpful in case of post-mishap identification purposes (fingerprints, dental records, and so forth) to the U.S. Army Aero-medical Activity (USAAMA) (MCXY-AER), Building 110, 6<sup>th</sup> Avenue, Fort Rucker, AL, USA 36362.
  - b) Upon reporting to the U.S. Army training facility, the local flight surgeon will review the IMS's medical
  - c) information, insure there has been no change in medical status, and issue a DD Form 2992 (Medical Recommendation for Flying or Special Operational Duty), using the expiration date assigned by the parent nation, for medical clearance for local flying duties.
  - d) In cases where the expiration date for flying status occurs during training, periodic flight physical examinations will be conducted in accordance with U.S. Army policies and procedures, and entered in the Aeromedical Electronic Resource Office (AERO). A copy of the flight physical report will be forwarded to the appropriate aeromedical authority of the Parent Nation for review and determination of fitness to fly.

- e) If a medical issue is discovered or occurs prior to completion of training, any provider may temporarily ground the IMS until resolution using U.S. Army policies and procedures. Only a U.S. DOD Flight Surgeon may return the IMS to flying status. If the grounding condition is of more than 30 days or potentially permanently disqualifying, the case will be referred to the parent nation for action in accordance with its regulations. The parent nation is responsible for the costs per established agreements.
- b. NATO STANAG 3562 paragraphs 2a-c
2. Participating nations agree:
- a. That the following factors remain the responsibility of parent nations:
    - 1) Standards for primary selection.
    - 2) Permanent medical disqualification.
    - 3) Determination of temporary flying disabilities exceeding 30 days.
  - b. That with regard to the medical categories concerning the flying status of aircrew, the following procedures will apply:
    - 1) When aircrew are sent for temporary flying duty to another nation or become part of a combined NATO unit, the host nation or NATO unit will accept the medical category concerning the flying status issued by the parent nation, including the expiration date.
    - 2) Aircrew proceeding on such duty for periods of more than 30 days are to be accompanied by a medical statement in English or French, describing their medical fitness for flying duties. Nations will also forward:
      - a) Latest flight physical report with pertinent medical information.
      - b) Documentation helpful for post-accident identification purposes (fingerprints, dental charts, etc.).
    - 3) Periodic Flight Physical Examinations will be conducted by attending flight surgeons IAW the Host Nation's aircrew physical standards and physical examination periodicity policy. For the aircrew of NATO Airborne Early Warning (NAEW) E-3A Component, the Flight Physical Examinations will be conducted according the physical standards of the Flight Surgeons Manual of NATO E-3A Component. A copy of the flight physical report will be forwarded to the appropriate aeromedical authority of the parent nation. The medical authority of the host nation or NATO unit shall only apply their medical standards to new medical problems.
    - 4) Whenever aviation personnel are deployed as part of a multinational force, or when on temporary assignment in another NATO country, their routine Role/Echelon 1 medical care may be provided by a military Flight Surgeon of any NATO nation. This care may involve routine sick call, care for medical conditions found, and temporary grounding or ungrounding of aviation personnel. Any physician or dentist who feels that an aviator is unfit for flight may temporarily ground that aviator in accordance with his own national procedures. In nurse-led clinics, where a physician is not available, also other healthcare professionals have the authority to ground an aviator. But in all cases only a Flight Surgeon may return the aviator to flying duties. The medical determination as to when an aviator may return to flying duties will be determined by the servicing Flight Surgeon in accordance with his experience and training, using his own nation's Aviation Medicine Regulations for reference as needed. If conditions are found which in the opinion of the attending Flight Surgeon mandate long-term (more than 30 days) or potentially permanent disqualification, the case will be referred to the parent nation for action in accordance with their regulations.
  - c. That with regard of the transfer of medical records and information, the following procedures will apply:
    - 1) Transfer of medical records and information can only take place According to the laws and regulations of the different nations.
    - 2) If national laws and regulations do not allow transfer of information without permission of the individual, a written consent is necessary. If the individual chose to withhold consent, the only information that will be given to the parent nation will be a statement of fitness / unfitness for flying duties.

**5. GUIDANCE FOR Non-NATO/PfP IMS:** AR 12-15, paragraphs 8-21(2)(a-f) apply as detailed below. The information below has been updated to reflect changes since the publication of AR 12-15.

a. AR 12-15, paragraphs 8-21(2)(a-f)

- 1) If the IMS is not from a NATO/Pfp nation, and not subject to STANAG 3526, the IMS will need to meet U.S. Army standards with submission and approval through the USAAMA (MCXY-AER), Building 110, 6<sup>th</sup> Avenue, Fort Rucker, AL, USA 36362.
  - a) If available, a U.S. Army aviation medical examination will be performed by a qualified U.S. DOD flight
  - b) surgeon before the IMS departs from their home station; the cost of the examination and transportation will be borne by the foreign government. A flight student must meet Class 1 standards. A rated aviator must meet Class 2 standards.
  - c) If a U.S. DOD flight surgeon is not available, a U.S. Army aviation medical examination may be performed by a parent nation flight surgeon and submitted to the USAAMA for review. A flight student must meet Class 1 standards. A rated aviator must meet Class 2 standards.
  - d) Flight physical examinations should be documented in English on DD Forms 2807-1 and 2808 in accordance with U.S. Army flight standards. The flight physical examination will be given as soon as possible to prevent cancellation of training because of physical non-qualification.
  - e) Host nation waivers for medically disqualifying conditions will be reviewed by the U.S. Army Aviation School and the USAAMA.
  - f) Upon the IMS's arrival at the U.S. Army training location, a U.S. DOD flight surgeon will review Aeromedical Electronic Resource Office (AERO) and all examinations/applicable waivers prior to completing a DD Form 2992 and prior to the IMS participation in actual aerial flight.
  - g) If a new disqualifying defect is discovered upon arrival to the U.S. Army training location, the IMS will undergo the necessary evaluations for requesting the new medical waiver/exception to policy through the appropriate U.S. Army Aviation Waiver Authority. The parent nation is responsible for the costs per established agreements. The medical examination/aeromedical summary will be referred from the DOD flight surgeon to the Director, USAAMA (MCXY-AER), Building 110, 6<sup>th</sup> Avenue, Fort Rucker, AL 36362-5377, for advice, recommendation for waiver/exception to policy approval. Waiver approval authority for IMS will be in accordance with AR 40-501, chapter 6-20a, Commander, AHRC (AHRC-EPB-T), 1600 Spearhead Avenue, Room 2-1-021, Fort Knox, KY 40122-5408. Temporary up-slips (DD Form 2992) may be given pending receipt of the waiver per the aeromedical policy letters. For further questions or requests status please contact the U.S. Army Aeromedical Activity's AERO Helpdesk by phone at 334-255-7430/7575 or DSN 558 or e-mail: [usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil](mailto:usarmy.rucker.medcom-lahc.list.lahc-aero-helpdesk@mail.mil).

## **ATB: MANIFEST/SUBJECTIVE REFRACTION**

Updated: May 2015

(DD Form 2808, Block 62, "Refraction by Autorefractor or Manifest")

The pre-printed wording of block 62, "Refraction by Autorefraction or Manifest" may be very confusing. It is important that anyone conducting testing for any flight physical understand that an autorefraction of any kind is not authorized and should never be entered on the DD Form 2808 unless it is in block 60 (Other Vision Test) or in block 73 (Notes) for reference only. Autorefraction results should never be entered into block 62. With AERO, enter information on page 2A of DD Form 2808 with additional notes on page 2B.

In AERO select "Cycloplegic Class 1W/1A" from the dropdown on page 2A of the DD Form 2808.

If using the hardcopy DD Form 2808 line through the entire "By Autorefractor or Manifest" wording and utilize the blank next to the refraction to enter the type of refraction utilized. For example:

By -0.50 S. -0.25 CX 180      (type of refraction here)

**All autorefraction entries on FDME's in block 62 will be returned as incomplete.**

The terminology of cycloplegic, subjective, and manifest can be confusing when it comes to FDME/FDHSs. For standardization, this guide explains how these entries are commonly utilized:

Terminology	Class of Physical	When Indicated
Cycloplegic	Class 1 only (drops given)	Class 1 FDME only (See ATB-Cycloplegic Refraction)
Subjective or Manifest	All classes except Class 1 (no drops given) (phoropter used)	Corrected vision with current glasses (Hx Rx) or uncorrected vision worse than 20/20 <sup>-1</sup> in either eye at distance or near with no previous use of glasses.
Habitual or Historical (Hx Rx) = current glasses	All classes except Class 1 (no drops given) (lensmeter used)	Corrected vision with current glasses (Hx Rx) at least 20/20 <sup>-1</sup> in each eye at distance and near.

\* Some use the term manifest to mean Hx Rx also. See "Notes About Manifest Refraction" on the last page of this ATB.

### **Purpose/Indications.**

Needed for all classes of FDME/FDHS, other than Class 1 (requires cycloplegic refraction), if the patient is not 20/20<sup>-1</sup> in each eye uncorrected for both near and far vision. This measures a patient's refractive error without the use of a cycloplegic agent (no drops) as well as obtains the eyeglass prescription needed to bring the corrected vision to 20/20<sup>-1</sup> in each eye. This is often missed or omitted on FDHSs and comprehensive FDMEs, despite AERO reminders.

### **Equipment/Supplies.**

- Phoropter
- Projected Snellen distance visual acuity chart [must be projected IAW AR 40-501, paragraph 4-12a(1) and b(1)]. Projected sources for a subjective or manifest refraction include, but are not limited to:
  - Traditional Projector with screen
  - Binocular Visual Acuity Tester (BVAT), or similar system
  - Refraction system with projected image (i.e. the Marco Nidek COS-1000 Compact Ophthalmic System, the Marco Nidek EPIC-2100, or similar system)
- Standard Reduced Snellen near visual acuity card (needed if uncorrected near vision is worse than 20/20<sup>-1</sup> in either eye.)

## **Set-up.**

A subjective refraction should only be conducted after completing all other eye testing and verifying any disqualifying parameters from other tests. However, it can be done at any time in the physical exam procedure. Highly recommend a brief review of the physical exam form to ensure any other eye testing completed at that time does not require re-testing (i.e. meets standards). One more check in the process only helps ensure the physical is correct when sent to AAMA for review.

## **Step-By-Step Procedure.**

- This is not for any Class 1 FDME (cycloplegic refraction will be used for eyeglass prescription if needed).
- Perform a subjective refraction for either distance and/or near depending on the referral criteria and findings in blocks 61 and 63.
- Enter the best corrected distance visual acuity in block 61 and the best corrected near visual acuity in block 63 next to the pre-printed “Corr. to 20/” entries for each eye.
- Record the subjective refraction findings for each eye in block 62:
  - The sphere amount in the first blank between the pre-printed entries of “By” and “S” and in AERO “Sph.” If zero, enter 0 or plano. In AERO all entries must be a number.
  - The cylinder amount in the second blank between the pre-printed entries of “S.” and “CX” and in AERO “Cyl.” If there is no cylinder amount, enter sphere, sph, 0 or DS. In AERO entries must be a number.
  - The astigmatism axis in the third blank after the pre-printed entry of “CX” and in AERO “X”. If there is no astigmatism, enter a horizontal line here. In AERO all entries must be a number.
  - After the astigmatism axis, write the word subjective, subj, or manifest if using this term interchangeably with subjective to indicate the type of refraction conducted. In AERO select “Manifest, glasses RX” from the dropdown.
  - If the patient’s best-corrected near visual acuity utilizes the same prescription as the best-corrected distance visual acuity, simply enter the word “lens” next to the pre-printed entry of “by” under block 63 (“Near Vision”). If the best-corrected near visual acuity utilizes an “Add” (bifocal), enter the amount of the “add” that will always be a number preceded by a ‘+’ sign.
  - If you know the refraction still does not correct patient to qualifying standards at distance and/or near, perform a full eye exam to try and determine the cause. If undeterminable, refer to ophthalmology or optometry.

A typical ideal subjective refraction entry on DD Form 2808 (hardcopy):

	59. RED/GREEN (Army Only)	60. OTHER VISION TEST
61. DISTANT VISION	62. REFRACTION BY AUTOREFRACTION OR MANIFEST	63. NEAR VISION
Right 20/25 Corr. to 20/20	By Plano S. -0.50 CX 180 by Subj	Right 20/30 Corr. to 20/20 by +1.00
Left 20/30 Corr. to 20/20	By +0.25 S. -0.75 CX 180 by Subj	Left 20/30 Corr. to 20/20 by +1.00

### Referral Criteria – Subjective/Manifest Refraction:

- Class 1 FDME – ALL Class 1 FDMEs receive a cycloplegic exam.
- All other classes of FDME/FDHS – refer if either eye’s best corrected vision is worse than 20/20<sup>-1</sup> at distance or near.

## **Notes About Manifest Refraction.**

Over time, with physicals, many have come to use manifest refraction to identify the patient’s current spectacle prescription (the glasses the patient is wearing). However, most eye care providers utilize the words subjective and manifest interchangeably and use terms such as, “Hx Rx” or “Spec Rx” to identify the current spectacle prescription. If the patient meets standards in each eye with his/her current spectacle prescription, it should be entered on the physical in a clear manner as to show that the visual acuity was tested with the current spectacle prescription. This would never be entered for a Class 1 FDME and should be verified by subjective refraction if the prescription is older than one year.

## **ATB: NIGHT VISION**

Updated: May 2014

(DD Form 2808, Block 69. "Night Vision")

### **Purpose/Indications.**

Mandatory for all initial FDMEs to determine history of night vision problems. The current DD Form 2808 has a pre-printed 'Test used and score' in block 69. However, there is no established test for night vision and therefore no score. This part of the physical is still conducted through history only. If doubt or concern, refer to optometry/ophthalmology for further evaluation.

### **Equipment.**

None.

### **Set-Up.**

Patient privacy.

### **Step-By-Step Procedure.**

- Ask the patient, "Have you ever had any night vision problems?" (or words to that effect.)
- If the response is negative, record "NIBH" for "Not Indicated By History".
- Any positive responses are abnormal and must be referred to the eye clinic for further evaluation and investigation.

## **ATB: OCULAR MOTILITY**

Updated: May 2015

(DD Form 2808, Block 64. "Heterophoria")

### **Purpose/Indications.**

Block 64 includes several sub-tests for ocular motility along with true heterophoria testing, even though the title of the block is "Heterophoria". Therefore, each sub-test will be covered separately below. Abnormalities must be evaluated per the Excessive Phorias/Tropias/Amblyopia APL to include completion of the Ocular Motility Worksheet.

#### **Heterophoria Testing (ES°, EX°, R.H., L.H.):**

Mandatory for all Class 1 and comprehensive FDMEs. This measures the latent or relative deviation between the eyes that occurs when fusion is interrupted. A phoria can be lateral [ES° for esophoria (in), and EX° for exophoria (out)] and/or vertical (R.H. for right hyperphoria, and L.H. for left hyperphoria). Do not use hypophoria entries). A phoria does not apply to one eye or the other. It is basically a resting position of the eyes. Everyone has a phoria, but, it might be so small as to come out to zero (0) on testing.

#### **Tropia Testing (Cover Test ("CT") measured as "Prism div." or "Prism Conv." if needed):**

The "CT" (Cover Test) is mandatory for all initial and comprehensive FDMEs. A tropia is a manifest deviation of one eye and can be lateral and/or vertical with the same prefix identifiers as a phoria (eso, exo, and hyper). Tropia is also known by the names such as heterotropia, strabismus, and squint. A tropia applies to only one eye or the other at any given time. It can be constant or intermittent; unilateral or alternating. Not everyone has a tropia.

When the cover-uncover or unilateral cover test is performed properly, this test can detect the presence of a tropia. The presence of a tropia could lead to lack of fusion, reduced or no stereopsis (affecting depth perception), suppression of vision in one eye, or diplopia (double vision). These are all disqualifying conditions for flight school. Passing phoria testing does not necessarily mean a person is without a tropia. If a person fails the phoria testing or has difficulty with it, it could be an indicator that the patient may have a tropia. Do not confuse this cover- uncover or unilateral cover test that tests for tropia with the cross-cover or alternating cover test that is utilized by Optometry/Ophthalmology to verify a phoria.

This test is conducted at both distance and near. If any tropia is detected, the patient must be referred to Optometry or Ophthalmology for verification and measurement of the amount of tropia to be entered by the "Prism div." (prism divergence) and "Prism Conv." (prism convergence) entries. If no tropia is detected, the word "Ortho" is placed next to the preprinted entry of "CT". One entry presumes the test was conducted at both distance and near but the proper entry would be "Ortho @ distance and near" or words to that effect. The "Prism div." and "Prism Conv." entries are left blank if no tropia detected.

#### **NPR ["NPR" (Near Point of Recovery) on DD Form 2808 should be "NPC" (Near Point of Convergence)]:**

Mandatory for all initial FDMEs. Near point of convergence testing determines the patient's ability to converge the eyes while maintaining fusion.

#### **PD (Pupillary Distance):**

This test is not utilized for flight physicals. However, it is the measurement of the patient's inter-pupillary distance and can be included if known. Otherwise, leave blank.

#### **Equipment:**

#### **Heterophoria Testing (ES°, EX°, R.H., L.H.):**

- Armed Forces Vision Tester (AFVT) or OPTEC 2300
- The cross-cover or alternating cover test and/or the von Graefe method of measuring phorias should only be used for verification of a phoria by Optometry/Ophthalmology. Do not confuse the cross-cover test with the cover-uncover or unilateral cover test that detects tropia.

#### **Tropia Testing (CT – Cover Test):**

- Occluder for cover-uncover or unilateral cover test.
- Distance and near visual acuity charts or appropriate targets.
- Ideally, an appropriate target is an isolated letter on a visual acuity line that is one to two lines larger than the patient's best corrected visual acuity of the poorer seeing eye. If the patient is 20/20, then utilizing a 20/25 or 20/30 isolated letter at both distance and near would be ideal.

**NPR ["NPR" (Near Point of Recovery) on DD Form 2808 should be "NPC" (Near Point of Convergence)]:**

- Any instrument having an appropriate target that is one to two lines larger than the patient's best corrected near visual acuity in the poorer seeing eye. The instrument or device must be easy for the examiner to manipulate and not interfere with the testing method.
- Metric ruler for measuring in millimeters (mm).

**Set-up.**

**Heterophoria Testing (ES°, EX°, R.H., L.H.):**

- Patient seated comfortably at the AFVT or OPTEC 2300.
- Test emulates distance test (optical infinity).
- Refer to manual for correct settings for model being used.

**Tropia Testing (CT – Cover Test):**

- Patient wears habitual spectacle prescription (if applicable) for the distance being tested (distance spectacle prescription when testing distance; near spectacle prescription when testing near).
- Set up the target:
  - Distance (tested at 20 feet or 6 meters) – isolated letter, one to two lines larger than the visual acuity in the patient's poorer seeing eye with correction if spectacles required.
  - Near (tested at 16 inches or 40 cm) – reduced Snellen letter one to two lines larger than visual acuity in the patient's poorer seeing eye with correction if spectacles required. The patient may hold the target but verify the test distance.
- The examiner holds the occluder.
- Sufficient room illumination to see the patient's eye movements.
- The examiner must be in a position to be able to see the patient's eyes easily without interfering with the patient's view of the target.

**NPR ["NPR" (Near Point of Recovery) on DD Form 2808 should be "NPC" (Near Point of Convergence)]:**

- Patient wears habitual near prescription if applicable.
- If spectacles interfere with testing, attempt testing without spectacles.
- Sufficient room illumination to see the patient's eyes and for the patient to see the target.

**Step-By-Step Procedure.**

**Heterophoria Testing (ES°, EX°, R.H., L.H.):**

- Test distance vertical phoria and lateral phoria in accordance with the manual for the AFVT or OPTEC 2300.
- Use associated scoring key to determine amount of phoria in prism diopters.
- Vertical phoria must be 1 or less. If a subject has a number other than zero in "RH", then the "LH" entry must be zero and vice-versa.
- Lateral phoria must be 8 or less. If a subject has a number other than zero in "ES°", then the "EX°" entry must be zero and vice-versa.
- Refer to the Eye Clinic if vertical phoria is greater than 1 or if lateral phoria is greater than 8.

**Tropia Testing (CT – Cover Test):**

- This is the cover-uncover or unilateral cover test to test for tropia, and does not test for phoria.
- Test at distance (20 feet or 6 meters) and then near (16 inches or 40 cm).
- Cover and uncover the right eye three times while you:
  - Watch behind the occluder for eye movement
  - Watch for eye movement after occluder is removed

- Repeat for left eye.
- Repeat entire procedure for near.
- No movement detected is recorded as “Ortho” (distance and near).
- Refer to the eye clinic for verification if any movement detected.
- The eye clinic will verify any tropia and measure to enter amount into the “Prism div.” or “Prism Conv.” blocks on DD Form 2808.

**NPR [“NPR” (Near Point of Recovery) on DD Form 2808 should be “NPC” (Near Point of Convergence)]:**

- This is a binocular test. Ensure test is performed with both eyes open.
- Start the fixation target at 40 cm from the patient and ensure he/she sees only one image at that start point before proceeding.
- Explain to the patient to tell you when the target appears double or when it splits into two images. Further explain that it only matters when the target doubles and not when it appears blurry.
- Bring the fixation target toward the patient slowly to allow him/her to maintain fixation on the target.
- Observe patient’s eyes until the patient reports that the target appears double or split; or until it is apparent that one eye loses fixation (turns in or out).
- Record this distance from the patient’s eyes in millimeters (mm).
- Passing is 100 mm or less.
- If greater than 100 mm, first carefully retest with repeat explanation to the patient of reporting only when the image is double or splits and not only when the image is blurry. If still greater than 100 mm, refer to the eye clinic for verification.

## **ATB: Reading Aloud Test**

Updated: May 2015

(DD Form 2808, Block 72a. "Reading Aloud")

### **Background:**

Administer the reading aloud test (RAT) to aviation training applicants (all classes) as a standardized assessment of an individual's ability to communicate clearly in the English language, in a manner compatible with safe and effective aviation operations. Current communication systems degrade speech intelligibility. The radio environment separates the speaker and the listener from the benefits of watching lips and body language cues. Those with marginal English skills have problems communicating effectively in the operational aviation environment.

Failure of the screening RAT by applicants with English as their native language may indicate undiagnosed or concealed learning disabilities. Administration of the RAT occasionally reveals immature, indecisive, careless, or excessively introverted personalities, which may indicate a high risk for aviation training failure.

When administered to aviation personnel, to include ATC personnel, the RAT will be used to determine the individual's ability to clearly enunciate, in the English language, in a manner compatible with safe and effective aviation operations.

The RAT appears to be a nonsense story, but was designed as a phonetic exercise. Assessment by the flight surgeon is subjective. Applicants should read the RAT clearly, deliberately, without hesitation, error, or stuttering. The test is scored as "RAT-PASS" or "RAT-FAIL." The examining physician will consult with a local instructor pilot or ATC supervisor in questionable cases. Clear failure may warrant evaluation with a speech pathologist for further testing. Any failure requires an aeromedical summary (AMS) for an exception to policy (ETP) or waiver consideration with pertinent information.

### **Procedure:**

Have the examinee stand erect, face the examiner across the room and read aloud, as if he/she were confronting a class of students.

If he/she pauses, even momentarily, on any phrase or word, the examiner immediately and sharply says, "What's that?" and requires the examinee to start again with the first sentence of the test. The true stammerer usually will halt again at the same word or phonetic combination and will often reveal serious stammering.

Have the applicant read aloud as follows:

"You wished to know all about my grandfather. Well, he is nearly 93 years old; he dresses himself in an ancient black frock coat, usually minus several buttons; yet he still thinks as swiftly as ever. A long flowing beard clings to his chin giving those who observe him a pronounced feeling of the utmost respect. When he speaks, his voice is just a bit cracked and quivers a trifle. Twice each day he plays skillfully and with zest upon our small organ. Except in winter when the ooze of snow or ice is present, he slowly takes a short walk each day. We have often urged him to walk more and smoke less, but he always answers, "Banana oil!" Grandfather likes to be modern in his language."

## **ATB: Valsalva Maneuver**

Updated: May 2015

(DD Form 2808, Block 72b. "Valsalva" or in AERO use block 22.)

This is a very simple and quick physical exam technique used to assess gross Eustachian tube function. While the aeromedical provider views the crewmember's tympanic membrane (TM) through an otoscope, the crewmember pinches his/her nostrils and keeps his/her mouth closed while exhaling. Since the mouth and nose are closed preventing any air from escaping, the pressure in the nasopharynx increases. If the Eustachian tubes function properly, this increased pressure will open the collapsed Eustachian tubes and this increased pressure will be transmitted to the middle ear cavity. The visible result will be a bulging of the TM during the maneuver. The crewmember will also report he/she felt his/her ears clear. This maneuver is repeated while the aeromedical provider views the contralateral side. Visualization of good TM movement is taken as evidence of good Eustachian tube function.

The crewmember must be coached until he/she learns this maneuver. One will be surprised how difficult it can be to explain this maneuver to an applicant who has never flown in an airplane and has not had the need to clear his ears previously. Always caution the crewmember to perform the maneuver gently and to stop once he/she feels his/her ears clear. Too forceful a maneuver could over inflate the middle ear cavity and leave the TMs bulging making it difficult to visualize movement of the contralateral TM upon repetition.

Current aeromedical policy requires documentation of the Valsalva on all initial Class 1, 2 or 3 FDMEs. Eustachian tube function testing is not required for ATC and UAS operators. If not able to visualize good TM movement during the Valsalva maneuver or the applicant states he/she is unable to clear his/her ears, a tympanogram should be ordered. Refer to ENT for further evaluation if the tympanogram is abnormal or other disqualifying abnormalities are found on physical exam.

# **ATB: Visual Acuity Testing – Distant and Near Vision**

Updated: May 2015

(DD Form 2808, Block 61. "Distant Vision" and Block 63. "Near Vision")

## **Purpose/Indications. Distant and near vision.**

Mandatory for all classes and types of flight physicals. This measures the best visual acuity at distance (20 feet or 6 meters) and near (14 inches, 16 inches or 40 cm depending on the test used) without any kind of correction whatsoever, followed by best-corrected visual acuity at distance with spectacle prescription if the patient wears any. No contact lenses allowed during testing and must be removed at least 24 hours prior to examination.

This measures the clarity of vision or the ability of the visual system to resolve detail at distance and near. A patient's visual acuity at distance and near depends upon the accuracy of retinal focus, the integrity of the eye's neural elements, and the interpretive faculty of the brain. Near visual acuity also depends upon accommodation, which is the eye's ability to focus clearly for objects at closer distances.

It is important to conduct distant visual acuity testing on all patients before near acuity testing. Testing for near visual acuity before distant visual acuity may disadvantage the patient, depending on their accommodative (focusing) ability.

## **Equipment.**

- Occluder (to cover one eye at a time).
- Standard projected Snellen Distance Acuity Chart, AFVT (Armed Forces Vision Tester), or the OPTEC 2300. The AFVT and OPTEC 2300 are considered projected systems.
- Snellen near visual acuity card

## **Set-up.**

### **1. Distant Visual Acuity:**

#### **Projected Snellen Distance Acuity Chart:**

- Patient is 20 feet (or 6 meters) from acuity chart with center of chart at approximately eye-level for the patient. The intention is not to have any extreme angle between the patient and the chart.
- Patient holds occluder and covers eye as directed by tester. Patient may use palm of hand, if necessary, but ensure patient is using the palm, not the fingers, to preclude seeing between the fingers. Patient must keep both eyes open, must not press on either eye, and must not squint.

#### **AFVT or OPTEC 2300:**

- Patient is seated comfortably at the AFVT or OPTEC 2300.
- Far or near letter acuity slide(s) set correctly (see manual).
- Patient must push forehead against bar for internal light to work.

### **2. Near Visual Acuity:**

#### **Standard Reduced Snellen Near Visual Acuity Card:**

- Patient is at the designated test distance from the Reduced Snellen Acuity Card (test distances may vary so ensure the test distance is correct; typically they are set for 16 inches, 14 inches, or 40 cm). There should be adequate illumination, with the light source either above or slightly behind the patient. Care should be taken so that the light is not directed toward the patient's eyes.
- Patient holds occluder and covers eye as directed by tester. Patient may use palm of hand, if necessary, but ensure patient is using the palm, not the fingers, to preclude seeing between the fingers. Patient must keep both eyes open, must not press on either eye, and must not squint.

#### **AFVT or OPTEC 2300:**

- See under distant visual acuity above.

## **Step-By-Step Procedure.**

### **Uncorrected Distant and Near Vision:**

- Test uncorrected visual acuity first. This is important because a patient may be able to memorize the letters on the chart with corrected vision and, intentionally or unintentionally, say aloud the smaller letters on the chart when uncorrected, whether or not actually seen by the patient.
- Observe the patient during testing to ensure no squinting (or at least attempt to observe the patient behind the AFVT or OPTEC 2300).
- Instruct the patient to cover one eye or occlude the non-tested eye with the appropriate buttons on the AFVT or OPTEC 2300. Direct the patient not to squint. By convention, it is best to test the right eye first, then left eye for consistency.
- Instruct the patient to "read the smallest line of letters you can, without squinting" or words to that effect.
- If the patient reads at least 4 or 5 out of 5 letters on a 20/20 line, record 20/20<sup>-1</sup> or 20/20 for that eye, whichever is applicable. Repeat testing for other eye.
- If the patient misses two letters or more out of 5 letters on a 20/20 line, ask patient to read the next larger line of letters; continue this process until patient reads at least 4 out of 5 letters on a line of letters. Then, encourage the patient to read any letters on the next smallest line if they can. Record visual acuity based on standard methods. For example, if patient reads the entire 20/30 line easily, but can only read two of the letters on the 20/25 line, then record the visual acuity as 20/30<sup>+2</sup>.
- Repeat testing for the other eye.

#### **Note:**

- Per AR 40-501, paragraph 4-12a(1) for distant vision and paragraph 4-12a(2) for near vision, "...no more than 1 error per 5 presentations of 20/20 letters, in any combination, on either the Armed Forces Vision Tester (AFVT) or any projected Snellen chart set for 20 feet."
- The AFVT line has 10 letters but is split into two sets of five letters positioned next to each other on the same line. Test the entire line, if desired, but the patient is only required to get 4 out of 5 letters that are on a 20/20 line to be considered a pass for a flight physical. Therefore, entries of 20/20 or 20/20<sup>-1</sup> are both passing entries. Most projected Snellen charts have 6 letters (some have 4, 5, 7, or 8 letters) per line. The regulation allows for presentation of 5 letters in any combination so you may meet the requirement. If in question, refer to the eye clinic for verification.

### **Referral Criteria:**

- Class 1 FDME must see Optometrist or Ophthalmologist for cycloplegic refraction.
  - Uncorrected distant vision must be no worse than 20/50.
  - Uncorrected near vision worse than 20/20<sup>-1</sup> does not meet the visual acuity standards.
  - If standards are not met, an AMS is required. See the Decreased Visual Acuity APL for required testing. Exception to policy will be considered for uncorrected distant vision no greater than 20/70 or uncorrected near vision no greater than 20/40.
- All other classes of FDME/FDHS refer if either eye at distance or near the uncorrected visual acuity is worse than 20/400. See the Decreased Visual Acuity APL for required testing for waiver consideration.

### **Corrected Distant and Near Vision:**

- Test corrected visual acuity after uncorrected visual acuity.
- For Class 1 FDME, perform the visual acuity with spectacle prescription, if wears any, before instilling any drops for the cycloplegic refraction to ensure current spectacle prescription is adequate. If patient is not corrected to 20/20 or 20/20<sup>-1</sup>, have the eye clinic refract the patient to ensure he/she is correctable to standard before the cycloplegic refraction. However, do not record these results in block 62 since all Class 1 FDMEs will receive a cycloplegic refraction by an Optometrist or Ophthalmologist who will enter the patient's cycloplegic refractive error there. Therefore, record the

results in block 60 or block 73, but ensure these results do not get confused with the cycloplegic results. See standards under referral criteria below.

- For all other classes of FDMEs/FDHSs, repeat the distant and near visual acuity procedure for the right eye with distance or near spectacle correction as required if patient wears any. No contact lenses. Patient should be wearing the glasses he/she uses with aviation duties.
- For bifocal wearers, be certain patient is looking through the correct portion of the spectacles for the test being administered. For progressive bifocal wearers, also ensure patient is angled correctly for optimal visual acuity.
- Ensure the spectacles worn are not a reading only prescription before proceeding with distant visual acuity testing.
- If patient was at least 20/20<sup>-1</sup> at distance and near without correction, this test can be skipped and a horizontal line drawn next to "Corr. to 20/--".
- Repeat procedure for the left eye for corrected distant and near visual acuity.

**Referral Criteria:**

- Class 1 FDME must see Optometry or Ophthalmology for a cycloplegic refraction.
  - Uncorrected distant vision must be no worse than 20/50 and corrected to at least 20/20<sup>-1</sup>.
  - Uncorrected near vision no worse than 20/20<sup>-1</sup> to meet the visual acuity standards.
  - If standards are not met, an AMS is required. See the Decreased Visual Acuity APL for required testing. Exception to policy will be considered for uncorrected distant vision no greater than 20/70 or uncorrected near vision no greater than 20/40.
- All other classes of FDME/FDHS refer if either eye is worse than 20/20<sup>-1</sup> with correction for distant or near vision.